SPORTON LAB.

Certificate No: AI292202

CERTIFICATE

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

SPORTON LAB.

I HEREBY **CERTIFY THAT:**

THE MEASUREMENTS SHOWN IN THIS TEST REPORT WERE MADE IN ACCORDANCE WITH THE PROCEDURES GIVEN IN **AS/NZS CISPR 22**.
THE EQUIPMENT WAS ***PASSED*** THE TEST PERFORMED ACCORDING TO **AS/NZS CISPR 22:2009 Class A**.
THE TESTING WAS COMPLETED ON **Sep. 25, 2012** AT **SPORTON INTERNATIONAL INC.** LAB.

Alex Chen
Q.A Dept. Director

Testing Laboratory
1190

C-tick EMI TEST REPORT

according to

AS/NZS CISPR 22:2009 Class A

Equipment : Remote Ethernet Device

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

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

Statement

- The test result refers exclusively to the test presented test model / sample.
- Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.
- Certificate or Test Report must not be used by the applicant to claim the product in this test report endorsement by TAF.

SPORTON International Inc.

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

Table of Contents

History of this test report

Report No.	Version	Issue Date	Description
AI292202	Rev.01	Oct. 02, 2012	Initial issue of report

Certificate No. : AI292202

CERTIFICATE OF COMPLIANCE

Testing Laboratory 1190

according to

AS/NZS CISPR 22:2009 Class A

Equipment : Remote Ethernet Device

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

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

I **HEREBY** CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in **Australian/New Zealand Standard AS/NZS CISPR 22:2009.** The energy emitted by this equipment was ***passed*** both Radiated and Conducted Emissions **Class A** limits.

The test was carried out on ***Sep. 25, 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 Australian/New Zealand Standard AS/NZS CISPR 22.

b. The equipment under test were performed the following test modes:

Test Items	Function Type
AC Conducted Emission	Mode 1. LAN 1Gbps
ISN	Mode 1. LAN 10Mbps 10% (LAN Port) Mode 2. LAN 100Mbps 10% (LAN Port) Mode 3. LAN 1Gbps 10% (LAN Port) Mode 4. LAN 10Mbps 10% (WAN Port) Mode 5. LAN 100Mbps 10% (WAN Port) Mode 6. LAN 1Gbps 10% (WAN Port) cause “mode 1~3” generated the worst test result; it was reported as final data.
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

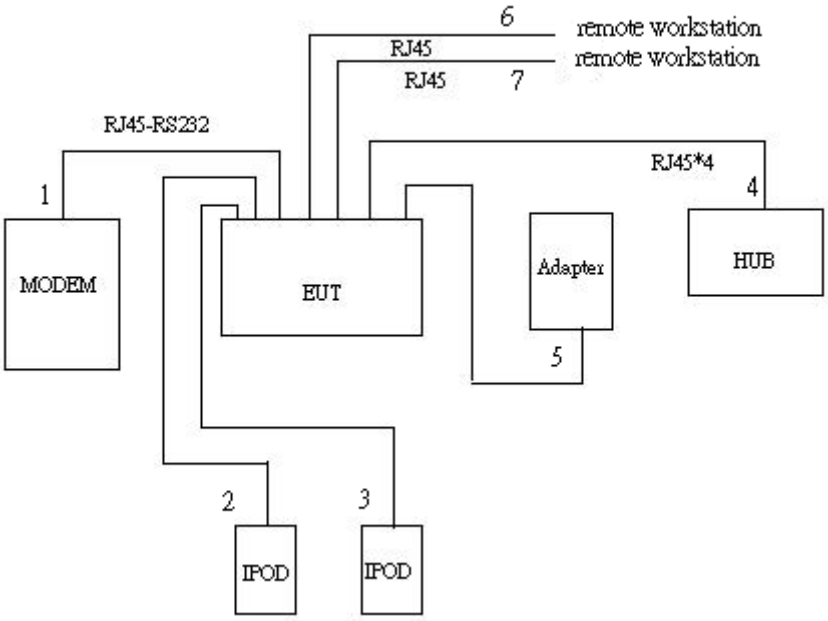
<Conducted and Radiated below 1GHz>

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	A1199	DoC	USB Cable, D-Shielded, 1.0m	Local
3	HUB	LanTEch	GE-800	N/A	RJ45 Cable, Non-Shielded,10m x4	Local
4	Notebook PC x2	DELL	PP32LB	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.

For ISN test, the remote workstation Executed "tfgen.exe" to traffic packet data generated software and keep 10% traffic load to link with the EUT 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. : 10CH02-HY

4.2. Test Voltage

AC 230V / 50Hz

4.3. Measurement Procedure

EMI Test (conducted and radiated) : Australian/New Zealand Standard AS/NZS CISPR 22

4.4. Test in Compliance with

EMI Test (conducted and radiated) : Australian/New Zealand Standard AS/NZS CISPR 22

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~1GHz).
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 Australian/New Zealand Standard AS/NZS CISPR 22. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meter above the ground plane as shown in section 5.4 The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position producing maximum conducted emissions.

5.1. Limits for conducted disturbance at mains terminals and telecommunication ports

Limits for conducted disturbance at mains terminals

Frequency range (MHz)	Class A Limits dB(μV)		Class B Limits dB(μV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 to 0.50	79	66	66 - 56	56 - 46
0.50 to 5	73	60	56	46
5 to 30	73	60	60	50

NOTE: The limits decrease linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

Limits for conducted disturbance at telecommunication ports

Frequency range (MHz)	Class A			
	Voltage limits dB (μV)		Current limits dB (μA)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 to 0.50	97 - 87	84 - 74	53 - 43	40 - 30
0.50 to 30	87	74	43	30

NOTE: The limits decrease linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

Frequency range (MHz)	Class B			
	Voltage limits dB (μV)		Current limits dB (μA)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 to 0.50	84 - 74	74 - 64	40 - 30	30 - 20
0.50 to 30	74	64	30	20

NOTE: The limits decrease linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

5.2. 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

5.3. Test Procedures

a. The EUT was placed on a desk 0.8 meter 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 meter from any other grounded conducting surface.

b. Connect EUT to the power mains through a line impedance stabilization network (LISN).

c. Connect Telecommunication port to ISN (Impedance Stabilization Network).

d. All the support units are connect to the other LISN.

e. The LISN provides 50 ohm coupling impedance for the measuring instrument.

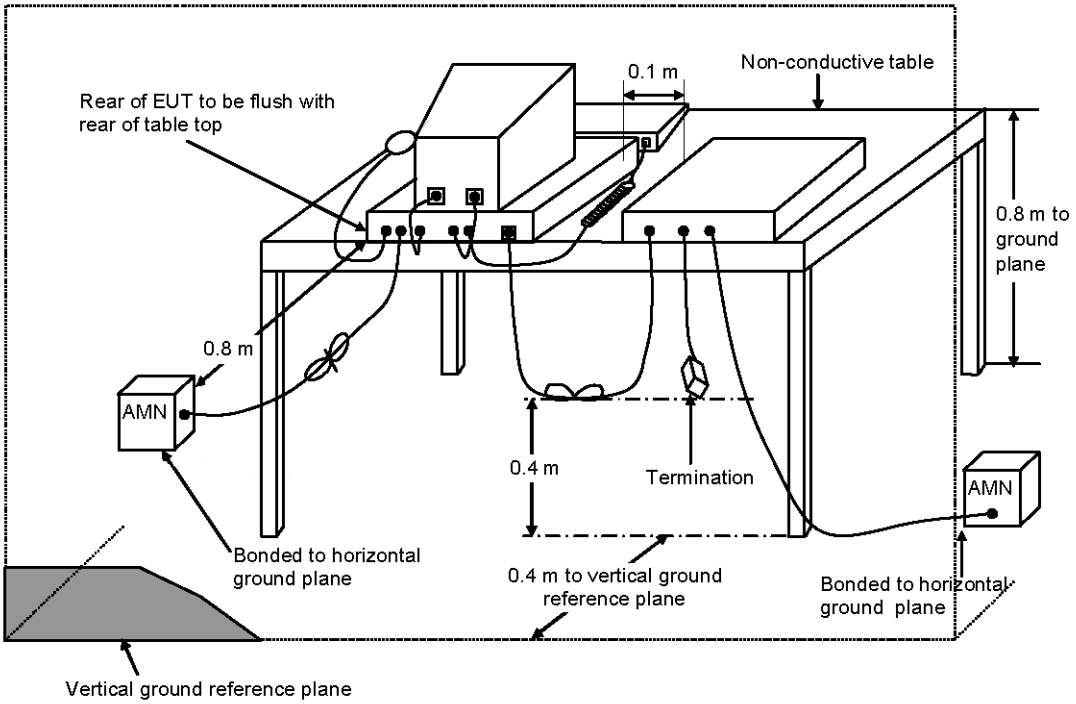
f. The CISPR states that a 50 ohm, 50 microhenry LISN should be used.

g. Both sides of AC line were checked for maximum conducted interference.

h. The frequency range from 150 kHz to 30 MHz was searched.

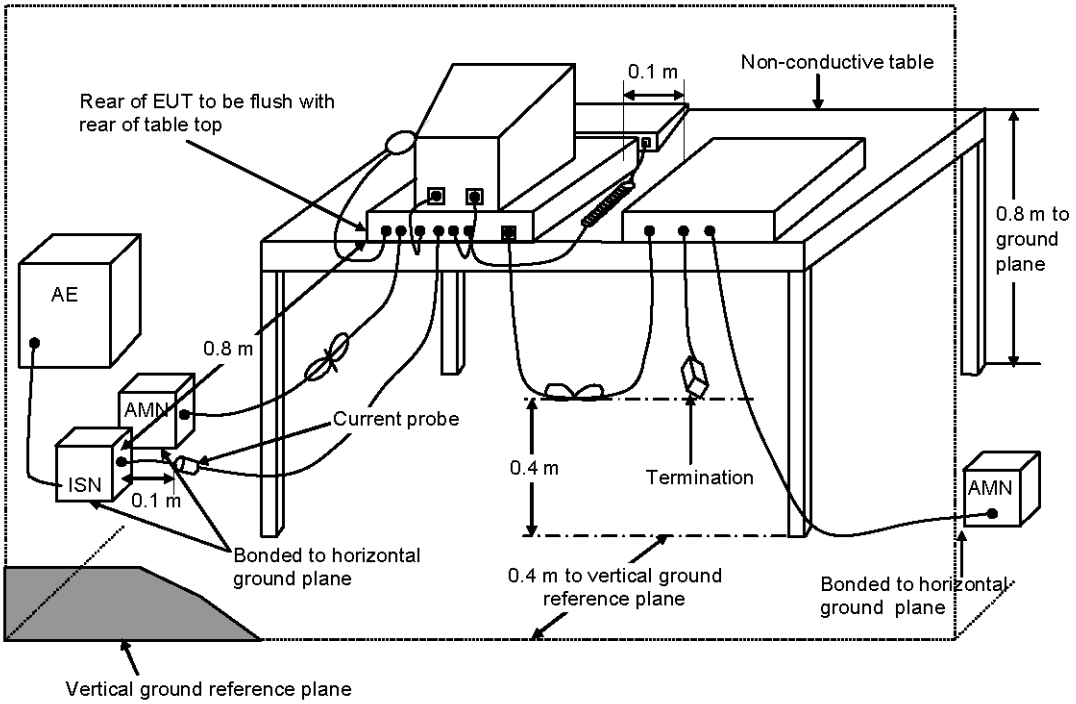
i. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

5.4. 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.

5.5. Typical Test Setup Layout of disturbances at telecommunication ports



a. AMN and ISN are 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.

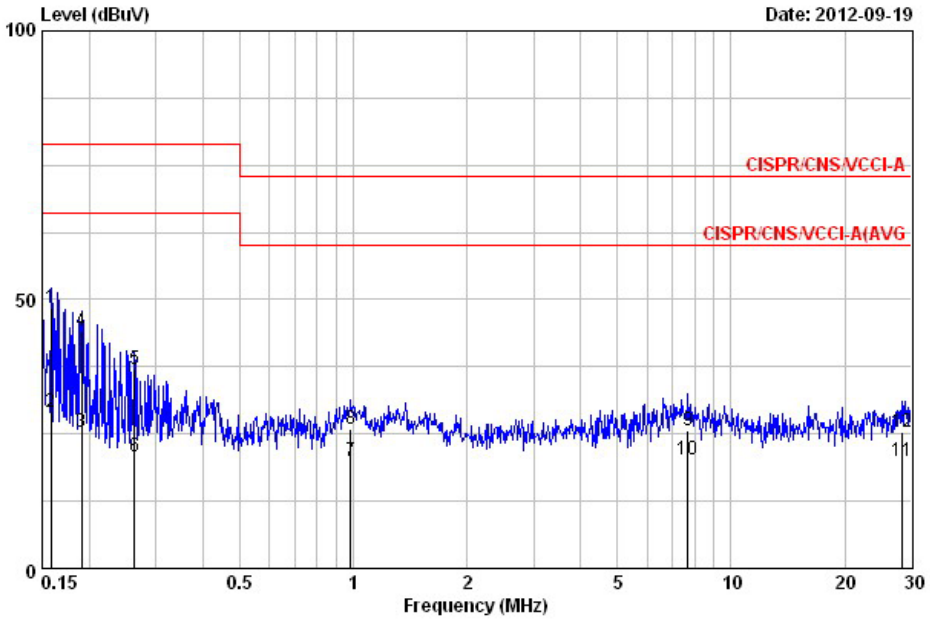
5.6. Test Result of AC Powerline Conducted Emission

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.

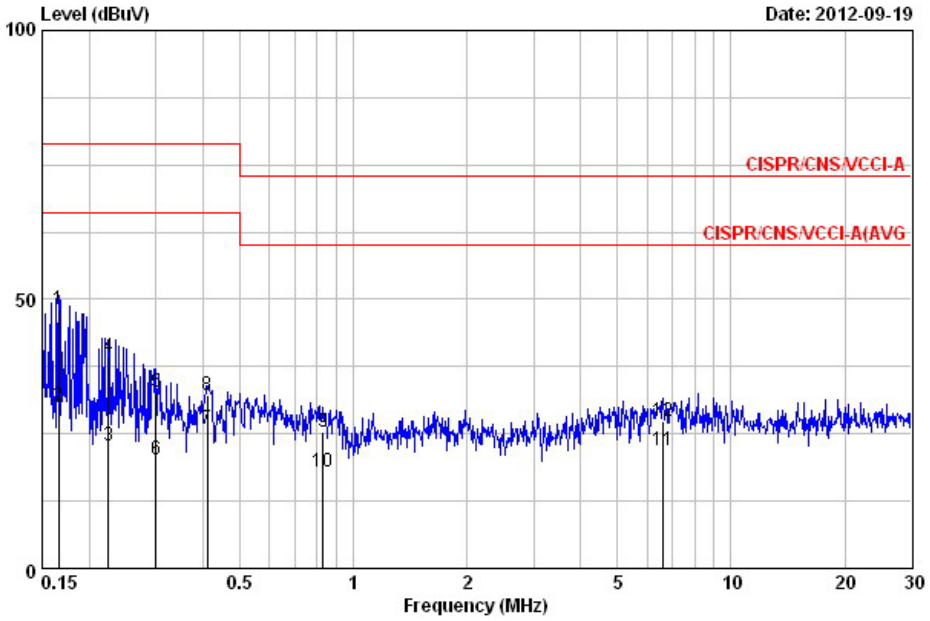
■ **The test was passed at the minimum margin that marked by the frame in the following data**

Line



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.158	48.50	-30.50	79.00	38.25	10.15	0.10	QP
2	0.158	28.92	-37.08	66.00	18.67	10.15	0.10	AVERAGE
3	0.190	25.34	-40.66	66.00	15.08	10.16	0.10	AVERAGE
4	0.190	44.27	-34.73	79.00	34.01	10.16	0.10	QP
5	0.263	36.91	-42.09	79.00	26.65	10.16	0.10	QP
6	0.263	20.83	-45.17	66.00	10.57	10.16	0.10	AVERAGE
7	0.984	19.87	-40.13	60.00	9.59	10.18	0.10	AVERAGE
8	0.984	26.02	-46.98	73.00	15.74	10.18	0.10	QP
9	7.687	25.74	-47.26	73.00	15.27	10.26	0.20	QP
10	7.687	20.24	-39.76	60.00	9.77	10.26	0.20	AVERAGE
11	28.302	20.08	-39.92	60.00	9.16	10.55	0.37	AVERAGE
12	28.302	25.33	-47.67	73.00	14.41	10.55	0.37	QP

Neutral



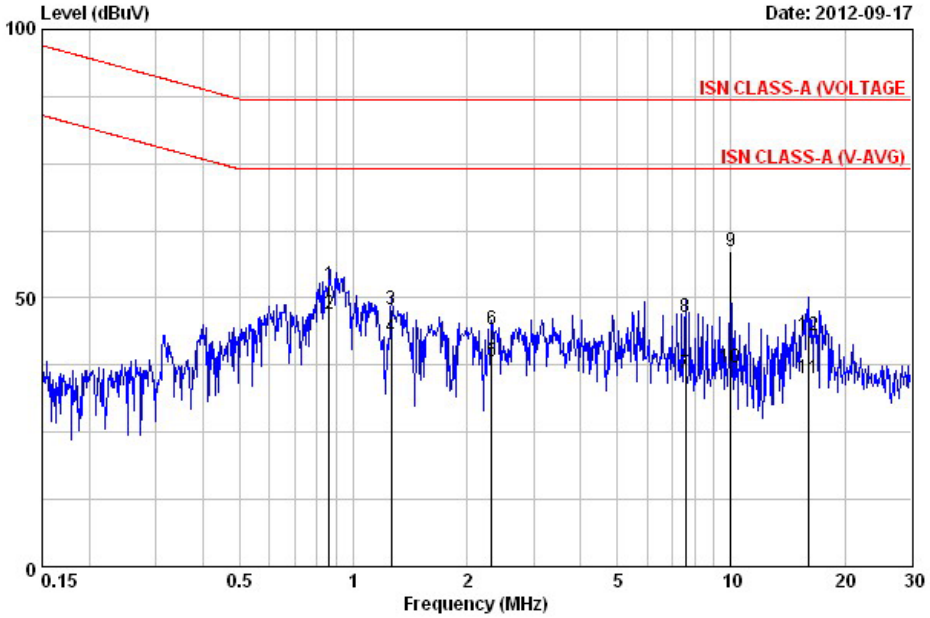
	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.166	48.29	-30.71	79.00	38.05	10.14	0.10	QP
2	0.166	30.10	-35.90	66.00	19.86	10.14	0.10	AVERAGE
3	0.224	22.88	-43.12	66.00	12.64	10.14	0.10	AVERAGE
4	0.224	39.25	-39.75	79.00	29.01	10.14	0.10	QP
5	0.300	32.74	-46.26	79.00	22.50	10.14	0.10	QP
6	0.300	20.30	-45.70	66.00	10.06	10.14	0.10	AVERAGE
7	0.410	25.95	-40.05	66.00	15.71	10.14	0.10	AVERAGE
8	0.410	32.05	-46.95	79.00	21.81	10.14	0.10	QP
9	0.830	25.33	-47.67	73.00	15.08	10.15	0.10	QP
10	0.830	18.08	-41.92	60.00	7.83	10.15	0.10	AVERAGE
11	6.627	21.91	-38.09	60.00	11.47	10.23	0.20	AVERAGE
12	6.627	27.21	-45.79	73.00	16.77	10.23	0.20	QP

5.7. Test Result of disturbances at telecommunication ports

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

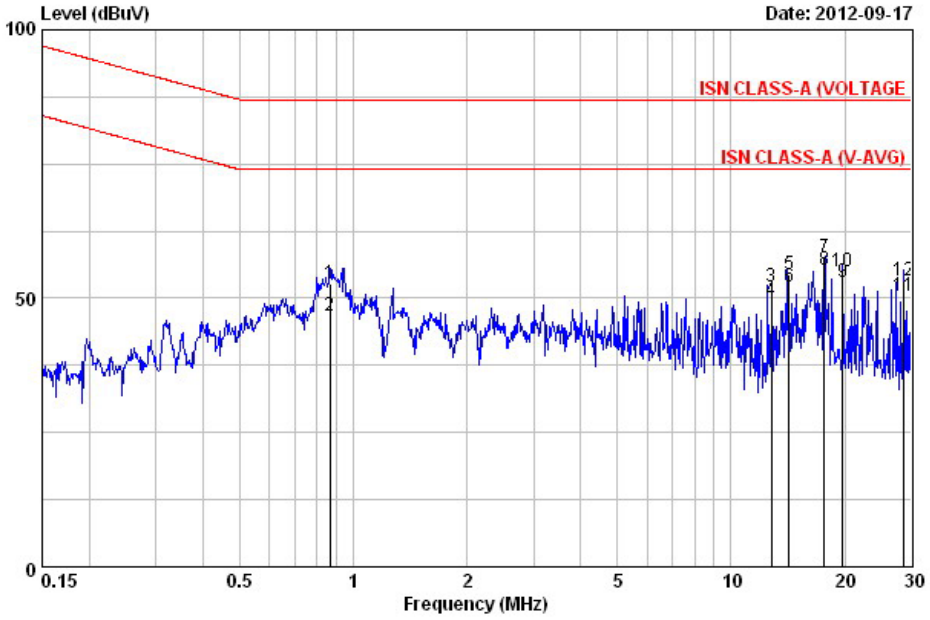


	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.862	52.53	-34.47	87.00	42.66	9.77	0.10	QP
2	0.862	47.09	-26.91	74.00	37.22	9.77	0.10	AVERAGE
3	1.262	47.84	-39.16	87.00	38.01	9.73	0.10	QP
4	1.262	42.70	-31.30	74.00	32.87	9.73	0.10	AVERAGE
5	2.321	38.07	-35.93	74.00	28.27	9.68	0.12	AVERAGE
6	2.321	44.11	-42.89	87.00	34.31	9.68	0.12	QP
7	7.566	35.76	-38.24	74.00	25.91	9.65	0.20	AVERAGE
8	7.566	46.35	-40.65	87.00	36.50	9.65	0.20	QP
9	10.000	58.81	-28.19	87.00	48.96	9.65	0.20	QP
10	10.000	37.12	-36.88	74.00	27.27	9.65	0.20	AVERAGE
11	15.970	34.97	-39.03	74.00	25.04	9.71	0.22	AVERAGE
12	15.970	42.93	-44.07	87.00	33.00	9.71	0.22	QP

Test Mode	Mode 2	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**

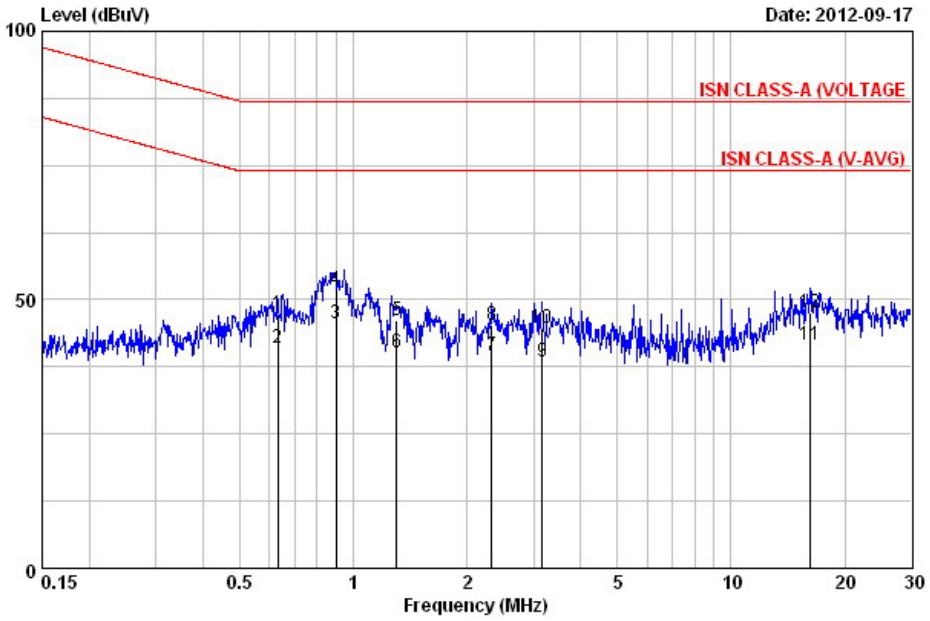


	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.866	52.57	-34.43	87.00	42.70	9.77	0.10	QP
2	0.866	46.59	-27.41	74.00	36.72	9.77	0.10	AVERAGE
3	12.807	52.10	-34.90	87.00	42.23	9.67	0.20	QP
4 @	12.807	49.66	-24.34	74.00	39.79	9.67	0.20	AVERAGE
5	14.212	54.44	-32.56	87.00	44.56	9.68	0.20	QP
6 @	14.212	52.10	-21.90	74.00	42.22	9.68	0.20	AVERAGE
7	17.693	57.47	-29.53	87.00	47.46	9.75	0.26	QP
8 @	17.693	55.34	-18.66	74.00	45.33	9.75	0.26	AVERAGE
9 @	19.708	53.12	-20.88	74.00	43.02	9.81	0.29	AVERAGE
10	19.708	54.94	-32.06	87.00	44.84	9.81	0.29	QP
11 @	28.684	50.53	-23.47	74.00	39.98	10.17	0.38	AVERAGE
12	28.684	53.39	-33.61	87.00	42.84	10.17	0.38	QP

Test Mode	Mode 3	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



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.630	47.27	-39.73	87.00	37.37	9.80	0.10	QP
2	0.630	40.90	-33.10	74.00	31.00	9.80	0.10	AVERAGE
3	0.899	45.68	-28.32	74.00	35.82	9.76	0.10	AVERAGE
4	0.899	51.97	-35.03	87.00	42.11	9.76	0.10	QP
5	1.303	46.18	-40.82	87.00	36.35	9.73	0.10	QP
6	1.303	40.08	-33.92	74.00	30.25	9.73	0.10	AVERAGE
7	2.321	39.56	-34.44	74.00	29.76	9.68	0.12	AVERAGE
8	2.321	45.23	-41.77	87.00	35.43	9.68	0.12	QP
9	3.156	38.36	-35.64	74.00	28.52	9.67	0.17	AVERAGE
10	3.156	44.82	-42.18	87.00	34.98	9.67	0.17	QP
11	16.226	41.55	-32.45	74.00	31.61	9.72	0.23	AVERAGE
12	16.226	47.70	-39.30	87.00	37.76	9.72	0.23	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 1,000 MHz and 1 MHz for above 1GHz according to the methods defines in Australian/New Zealand Standard AS/NZS CISPR 22. The EUT was placed on a nonmetallic stand, 0.8 meter above the ground plane, as shown in section 6.4 The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions.

6.1. Limits for radiated disturbance

Limits for radiated disturbance at a measuring distance of 10 m

Frequency range (MHz)	Class A	Class B
	Quasi-peak limits dB(μV/m)	Quasi-peak limits dB(μV/m)
30 to 230	40	30
230 to 1000	47	37

Limits for radiated disturbance at a measuring distance of 3 m

Frequency range (MHz)	Class A		Class B	
	Average limit dB(μV/m)	Peak limit dB(μV/m)	Average limit dB(μV/m)	Peak limit dB(μV/m)
1000 to 3000	56	76	50	70
3000 to 6000	60	80	54	74

6.2. 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	(EMCI EMC330)
RF Gain	30 dB
Signal Input	1 GHz – 8 GHz

Test Receiver Parameters	Setting
Test Receiver	(R&S ESI)
Attenuation	10 dB
Start Frequency	1000 MHz
Stop Frequency	6000 MHz
Resolution Bandwidth	1 MHz
Signal Input	20 Hz - 7 GHz

6.3. Test Procedures

For Below 1GHz

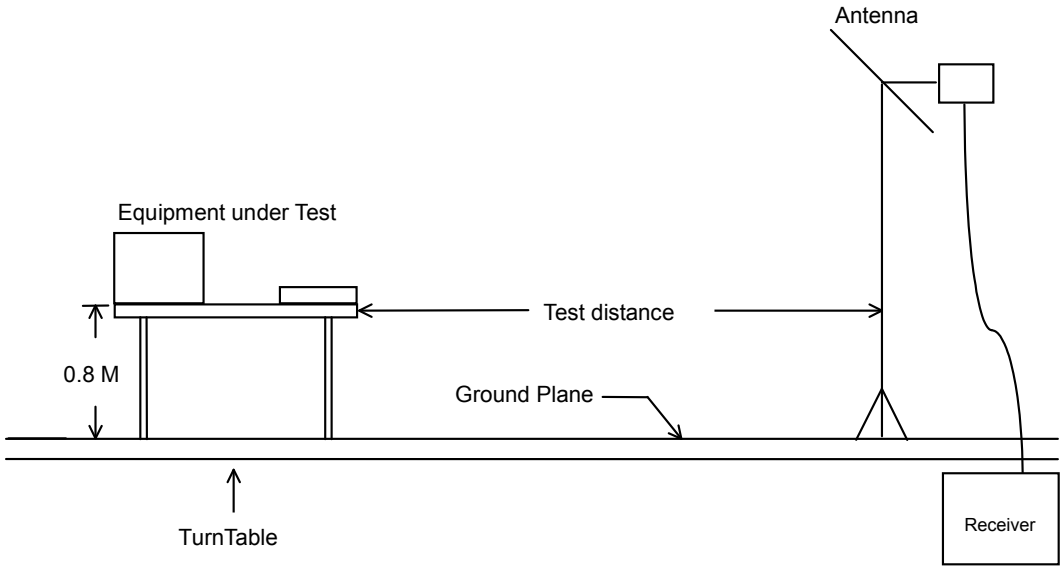
a. The EUT was placed on a rotatable table top 0.8 meter above ground.
b. The EUT was set 10 meters from the interference-receiving antenna which was mounted on the top of a variable height antenna tower.
c. The table was rotated 360 degrees to determine the position of the highest radiation.
d. The 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.

For above 1GHz

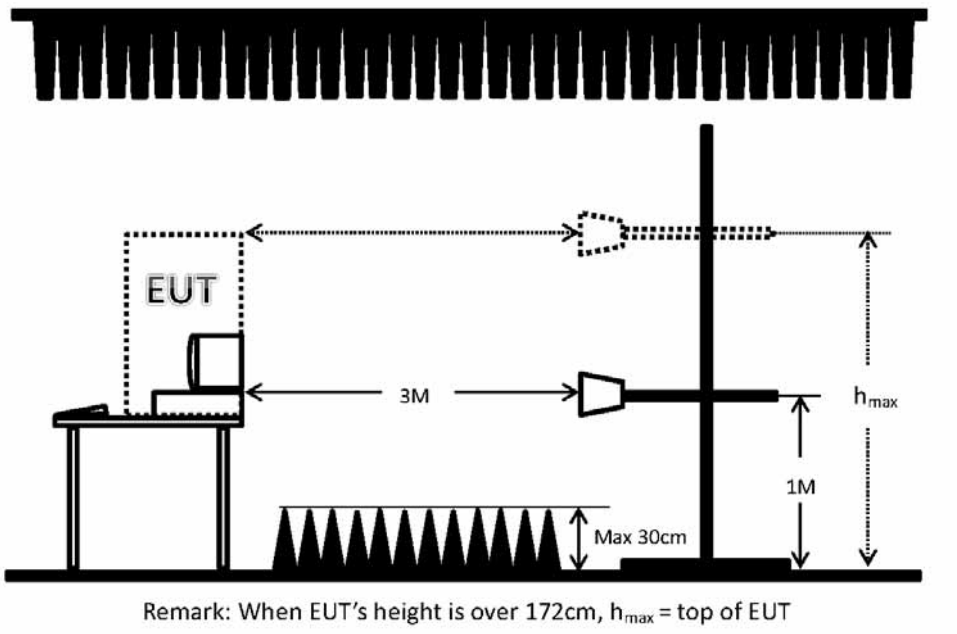
a. Same test set up as below 1GHz radiated testing.
b. The EUT was set 3 meters from the interference-receiving antenna which was mounted on the top of a variable height antenna tower.
c. There should be absorber placed between the EUT and Antenna and its located size should let the test site meet CISPR16-1-4 requirement.
d. The table was rotated 360 degrees to determine the position of the highest radiation.
e. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
f. Set the DRG Horn Antenna (Model: 3115) at 1M height, then run the turn table to get the maximum noise reading from Horizontal and Vertical polarity separately.
g. When EUT locating on the turn-table, and its height is over 172cm (Antenna's 3dB beam width of 6GHz is 27°), the DRG Horn Antenna must be raised up and descended down, then turning around the turn-table to get the maximum noise reading of the Horizontal and Vertical polarity separately. Note the maximum raise up height is same as the top of EUT.
h. If 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.

6.4. Typical Test Setup Layout of Radiated Emission

For Below 1GHz



For above 1GHz



Remark: When EUT's height is over 172cm, h_{max} = top of EUT

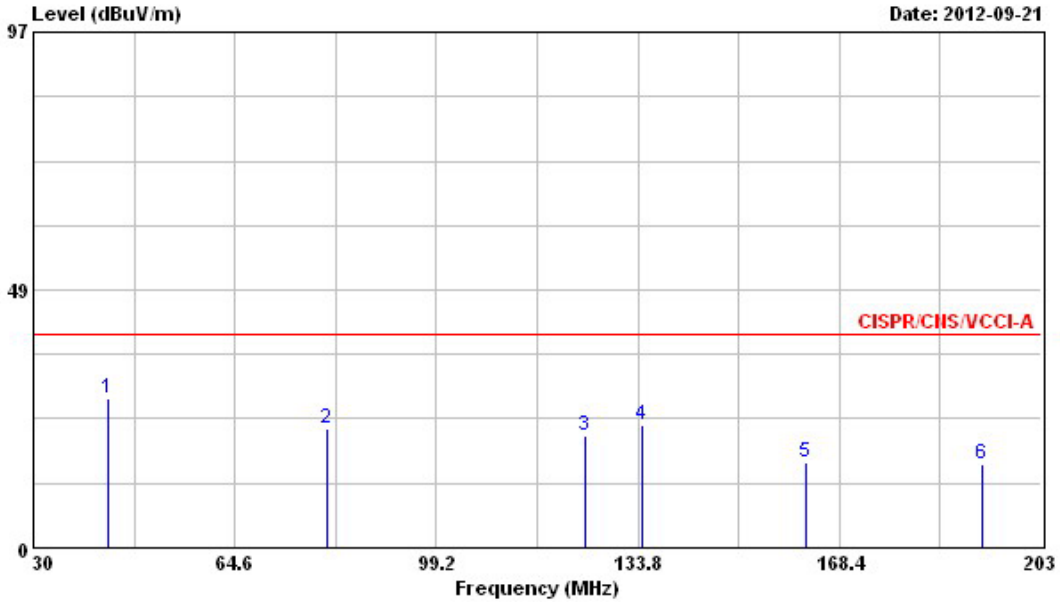
6.5. Test Result of Radiated Emission for Below 1GHz

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

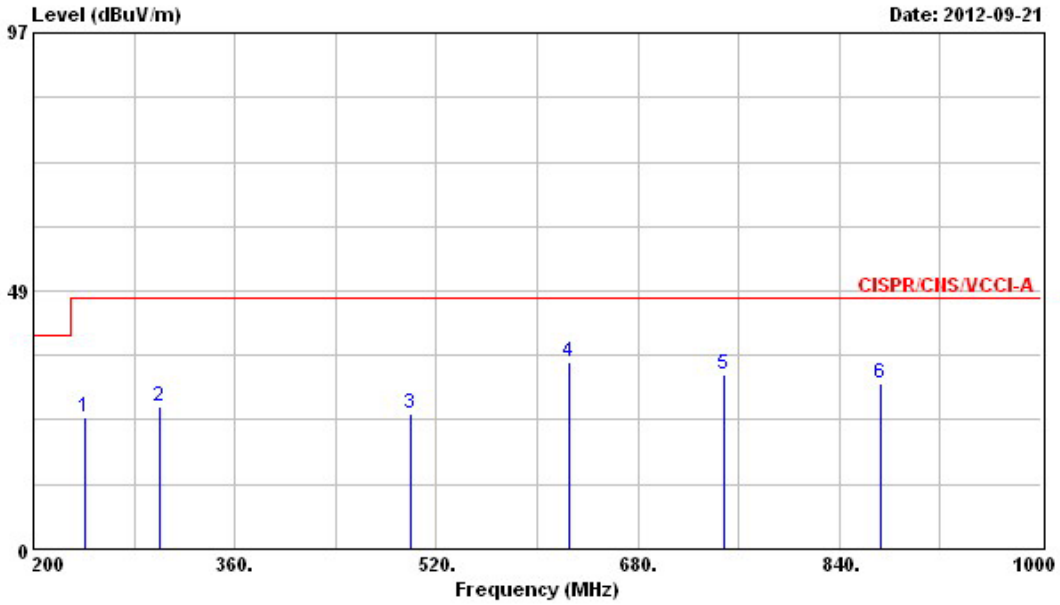
■ **The test was passed at the minimum margin that marked by the frame in the following data**

Vertical



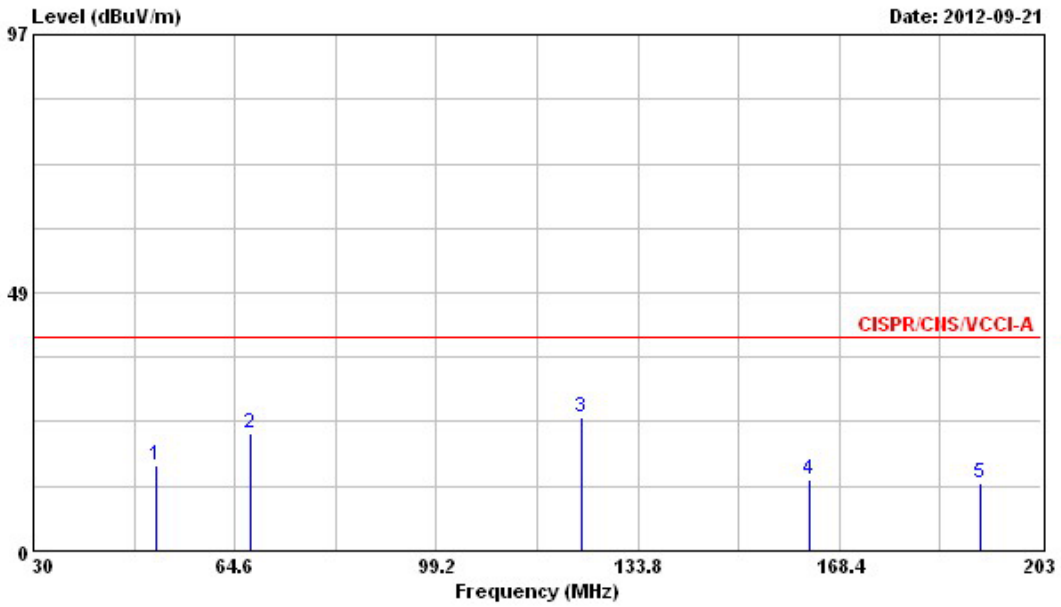
	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	42.800	28.07	-11.93	40.00	46.48	12.31	1.07	31.79	Peak	---	---
2	80.520	22.39	-17.61	40.00	45.42	7.21	1.50	31.74	Peak	---	---
3	124.800	21.14	-18.86	40.00	38.47	12.36	1.92	31.61	Peak	---	---
4	134.490	23.04	-16.96	40.00	41.29	11.36	1.98	31.59	Peak	---	---
5	162.690	16.04	-23.96	40.00	35.29	10.02	2.25	31.52	Peak	---	---
6	192.970	15.87	-24.13	40.00	35.52	9.23	2.56	31.44	Peak	---	---

Vertical



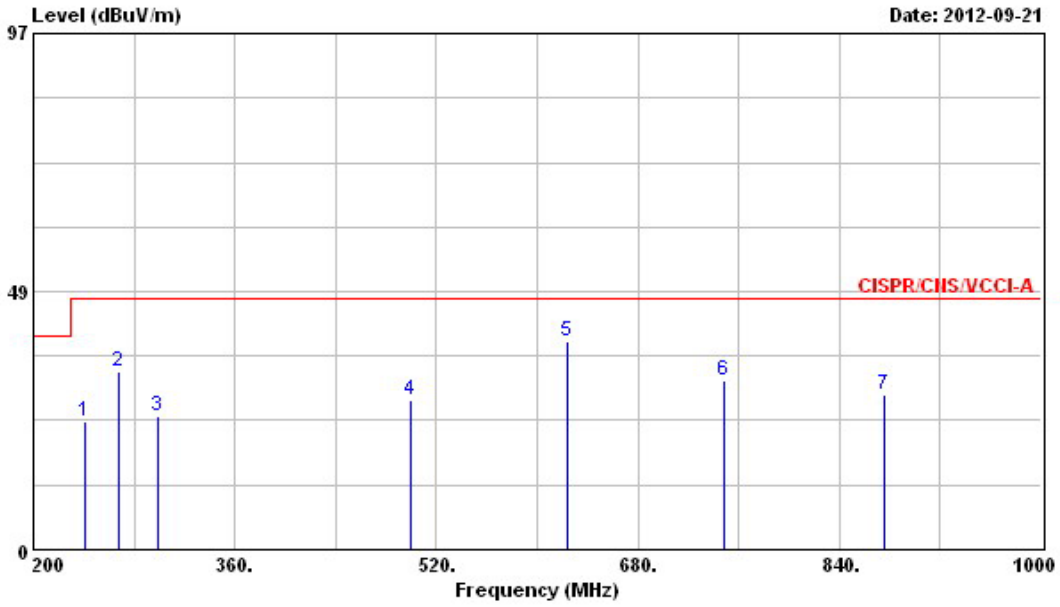
	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	240.800	24.77	-22.23	47.00	41.50	11.77	2.90	31.40	Peak	---	---
2	300.000	26.83	-20.17	47.00	41.62	13.25	3.32	31.36	Peak	---	---
3	500.000	25.56	-21.44	47.00	34.47	17.57	4.84	31.32	Peak	---	---
4 @	624.800	35.18	-11.82	47.00	41.48	19.15	5.82	31.27	Peak	---	---
5	748.800	32.88	-14.12	47.00	37.41	19.97	6.80	31.30	Peak	---	---
6	872.800	31.11	-15.89	47.00	33.08	21.35	7.92	31.24	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	16.00	-24.00	40.00	38.72	7.95	1.16	31.83	Peak	---	---
2	67.370	22.21	-17.79	40.00	46.24	6.35	1.40	31.78	Peak	---	---
3	124.110	25.13	-14.87	40.00	42.45	12.39	1.91	31.62	Peak	---	---
4	163.210	13.42	-26.58	40.00	32.67	10.02	2.25	31.52	Peak	---	---
5	192.620	12.86	-27.14	40.00	32.51	9.23	2.56	31.44	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	240.800	23.97	-23.03	47.00	40.70	11.77	2.90	31.40	Peak	---	---
2	267.200	33.47	-13.53	47.00	49.10	12.67	3.08	31.38	Peak	---	---
3	299.200	25.01	-21.99	47.00	39.80	13.25	3.32	31.36	Peak	---	---
4	500.000	28.26	-18.74	47.00	37.17	17.57	4.84	31.32	Peak	---	---
5 @	624.000	39.18	-7.82	47.00	45.49	19.15	5.81	31.27	QP	300	180
6	748.800	31.88	-15.12	47.00	36.41	19.97	6.80	31.30	Peak	---	---
7	876.000	29.14	-17.86	47.00	31.04	21.38	7.95	31.23	Peak	---	---

6.6. Test Result of Radiated Emission for Above 1GHz

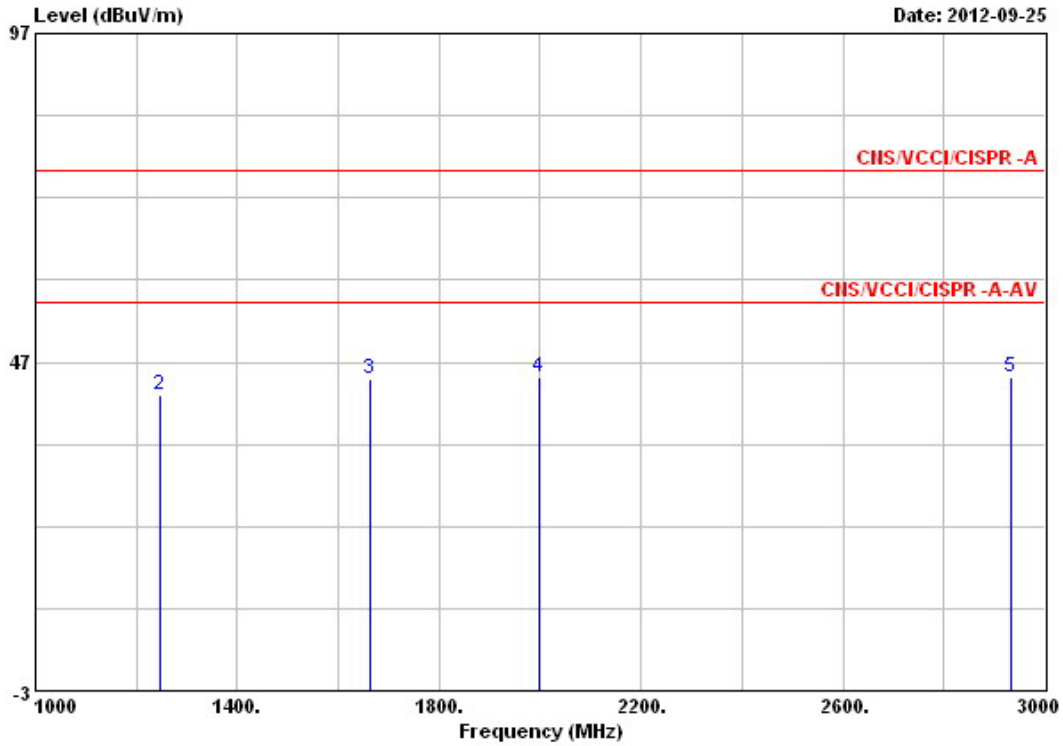
Test mode	Mode 1	Test Site No.	10CH02-HY
Test frequency	1 GHz ~ 6 GHz	Test Engineer	Teddy
Temperature	23 ℃	Relative Humidity	41 %

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

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

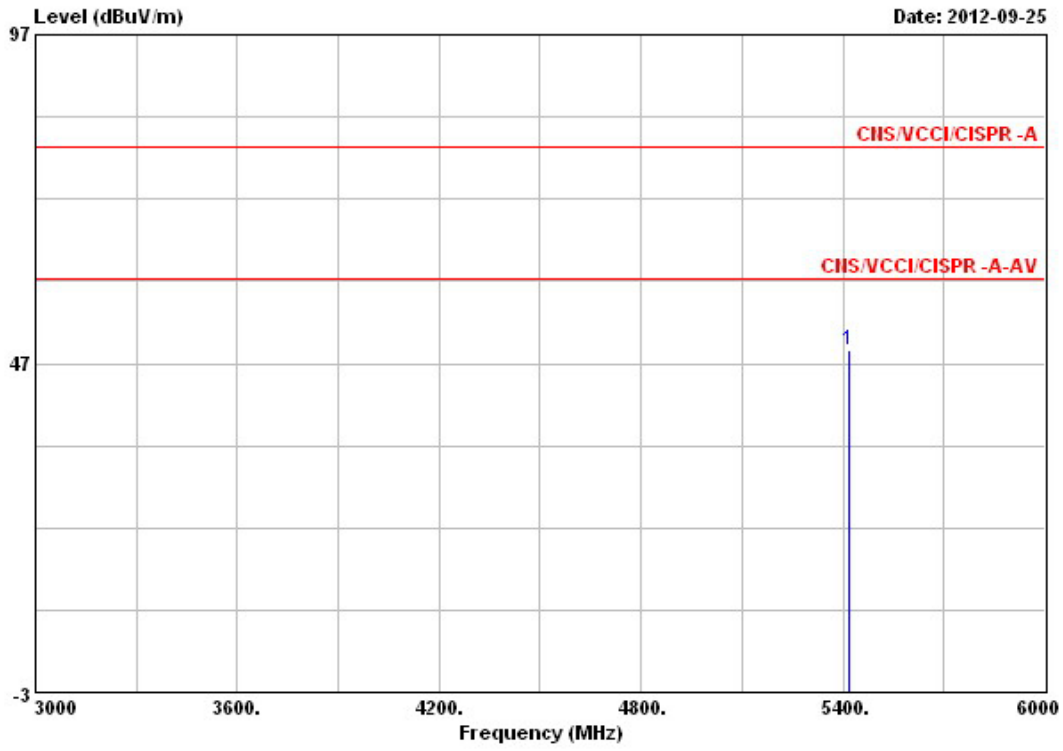
■ **The test was passed at the minimum margin that marked by the frame in the following data**

Vertical



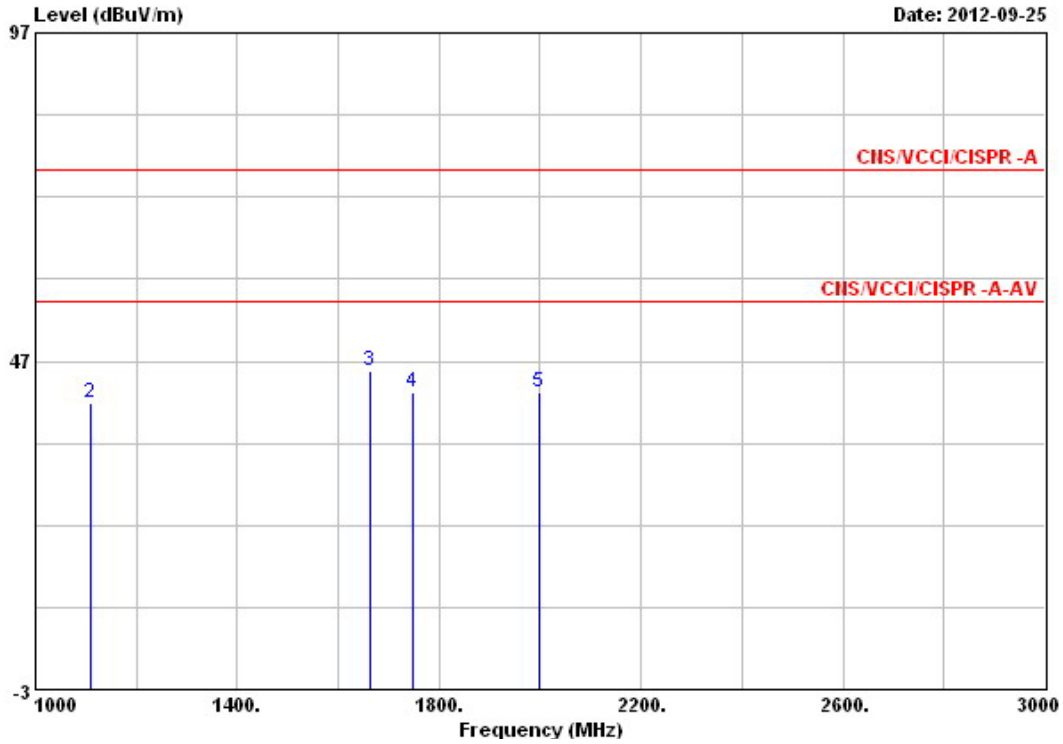
	Freq	Level	Over Limit	Limit Line	Read Level	Preamp Factor	Cable Loss	Antenna Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB/m		cm	deg
1	1000.000	43.00	-33.00	76.00	45.86	31.72	5.06	23.80	Peak	---	---
2	1246.000	41.90	-34.10	76.00	42.99	31.14	5.62	24.43	Peak	---	---
3	1662.000	44.32	-31.68	76.00	42.89	30.92	6.58	25.77	Peak	---	---
4	1998.000	44.79	-31.21	76.00	41.90	31.68	7.47	27.10	Peak	---	---
5	2934.000	44.77	-31.23	76.00	36.42	30.19	8.67	29.87	Peak	---	---

Vertical



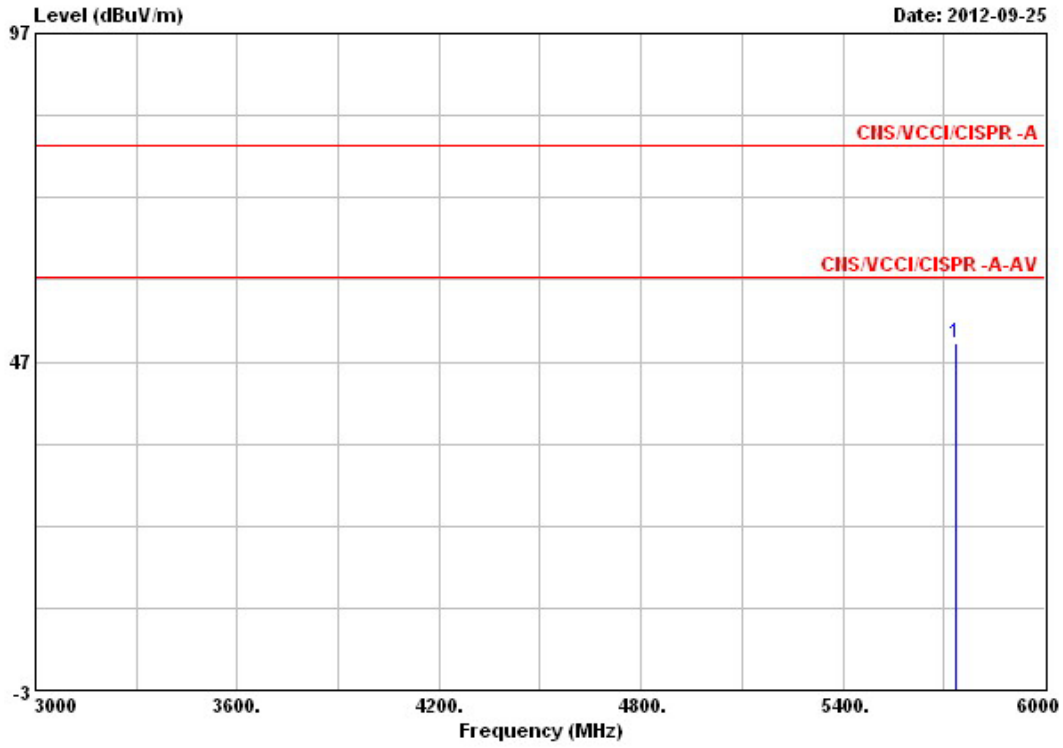
	Freq	Level	Over Limit	Limit Line	Read Level	Preamp Factor	Cable Loss	Antenna Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB/m		cm	deg
1	5418.000	49.05	-30.95	80.00	33.53	30.00	11.84	33.68	Peak	---	---

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Preamp Factor	Cable Loss	Antenna Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB/m		cm	deg
1	1000.000	43.42	-32.58	76.00	46.28	31.72	5.06	23.80	Peak	---	---
2	1110.000	40.76	-35.24	76.00	42.84	31.45	5.30	24.07	Peak	---	---
3 @	1662.000	45.38	-30.62	76.00	43.95	30.92	6.58	25.77	Peak	---	---
4	1748.000	42.27	-33.73	76.00	40.48	31.11	6.80	26.10	Peak	---	---
5	1998.000	42.17	-33.83	76.00	39.28	31.68	7.47	27.10	Peak	---	---

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Preamp Factor	Cable Loss	Antenna Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB/m		cm	deg
1 @	5733.000	49.87	-30.13	80.00	33.98	30.18	12.18	33.89	Peak	100	0

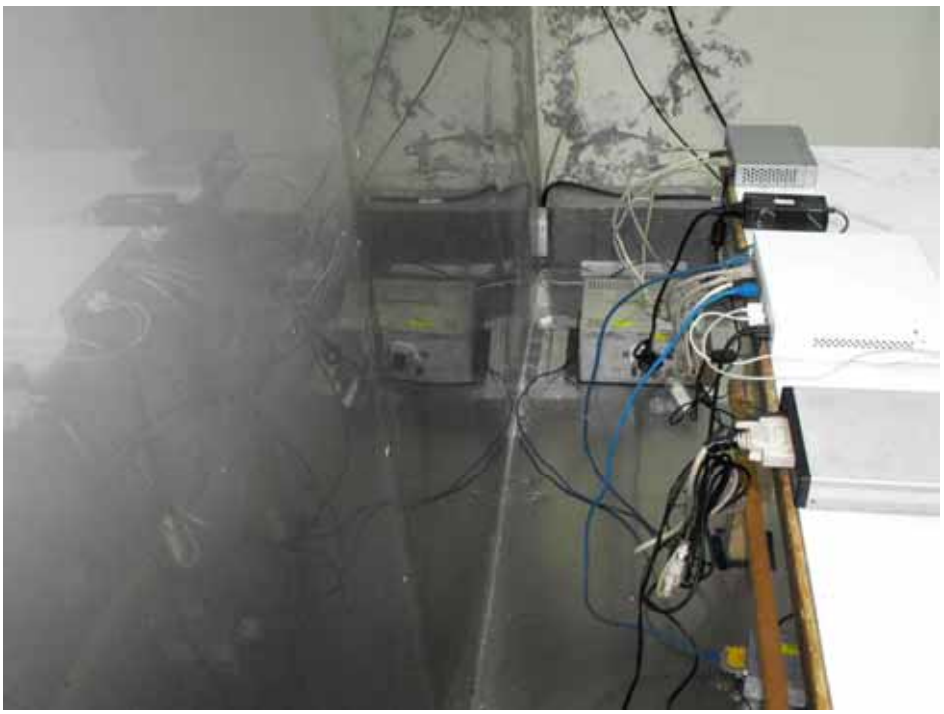
7. Photographs of Test Configuration

7.1. Photographs of AC Powerline Conducted Emissions and Disturbances at Telecommunication ports Test Configuration

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

FRONT VIEW

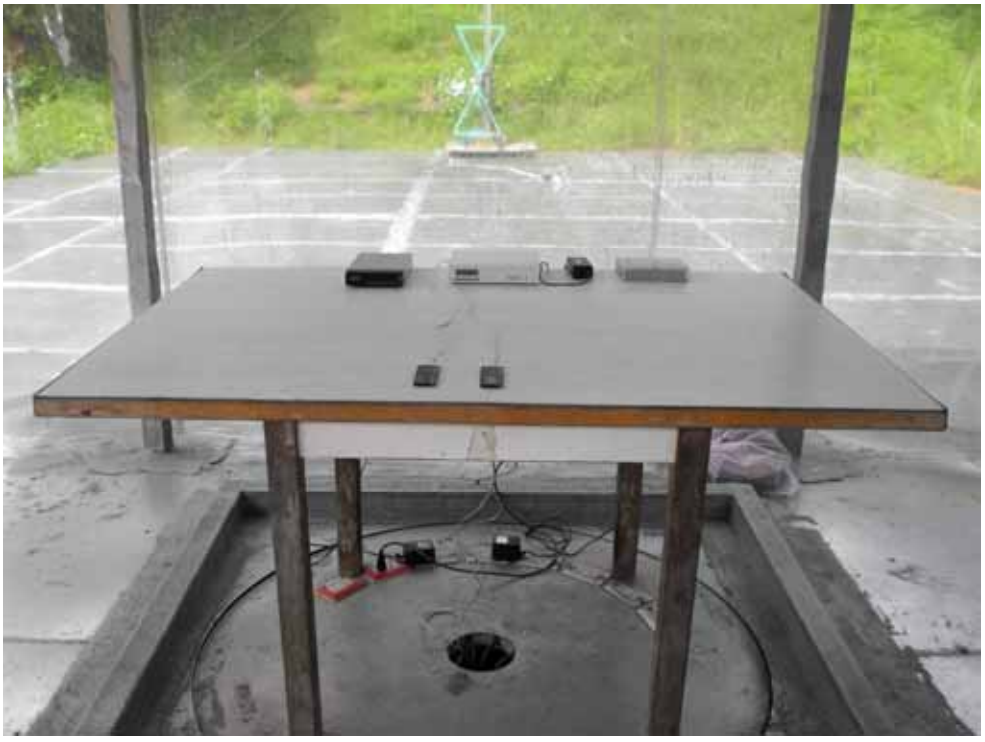
REAR VIEW



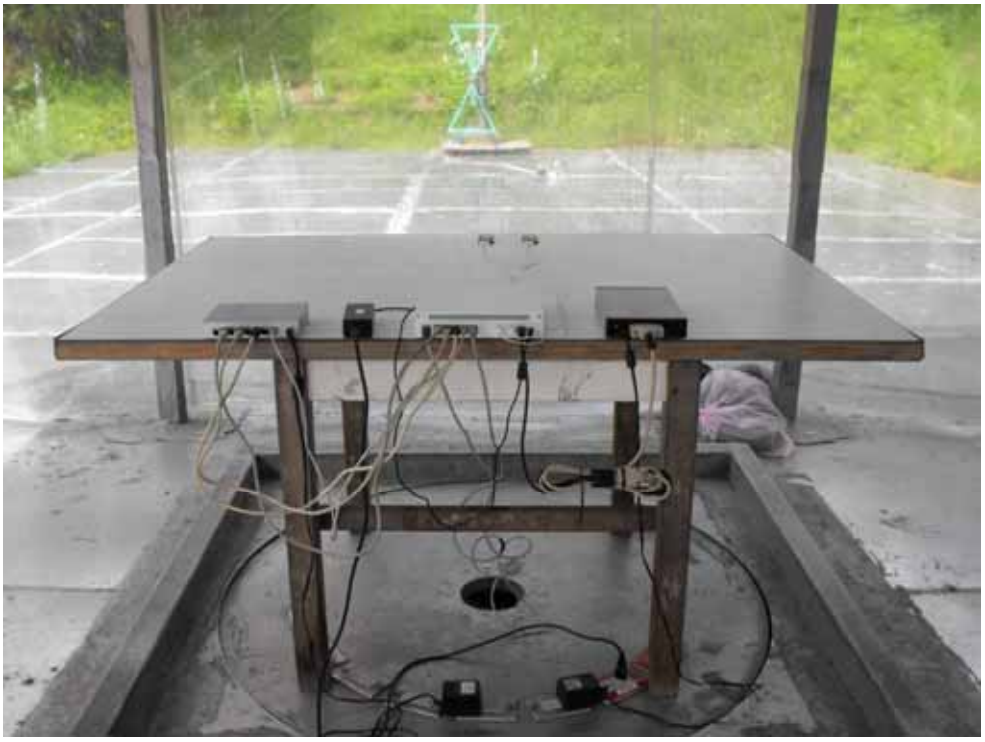
7.2. Photographs of Radiated Emissions Test Configuration

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

FRONT VIEW

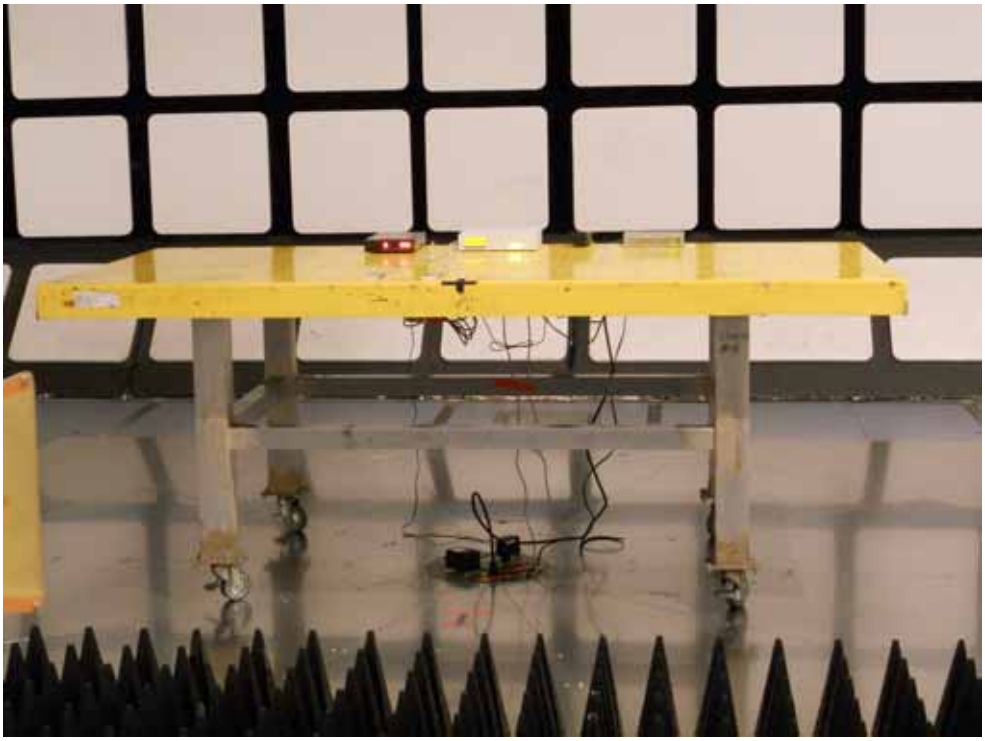


REAR VIEW



● 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)
Impedance Stabilization Network	TESEQ GMBH	ISN T800	26105	150 kHz ~ 30 MHz	Sep. 19, 2011	Conduction (CO01-NH)

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

Radiation Emission Below 1GHz

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
Amplifier	EMCI	EMC330	98007	1~8GHz	May 14, 2012	Radiation (10CH02-HY)
Horn Antenna	EMCO	3115	6903	1 ~ 8 GHz	May 04, 2012	Radiation (10CH02-HY)
Receiver	R&S	ESI	838496/008	20 Hz ~ 7 GHz	May 14, 2012	Radiation (10CH02-HY)
RF Cable 5M	SUHNER	SUCOFLEX 104	SN：304379/4	1 GHz ~ 18 GHz	Mar. 09, 2012	Radiation (10CH02-HY)
RF Cable 13M	SUHNER	SUCOFLEX 104	SN：16647/4	1 GHz ~ 18 GHz	Mar. 09, 2012	Radiation (10CH02-HY)
10m Semi Anechoic Chamber	TDK	SAC-10M	10CH02-HY	1 GHz ~ 6 GHz 3m	May 23, 2012	Radiation (10CH02-HY)

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

9. Notice for Class A Product

This Notice is for class A product only. If the Equipment under Test is a class B product, this notice should be disregarded.

Class A ITE is a category of all other ITE which satisfies the class A ITE limits but not the class B ITE limits. Such equipment should not be restricted in its sale but the following warning shall be included in the instructions for use:

Warning

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

10. 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**

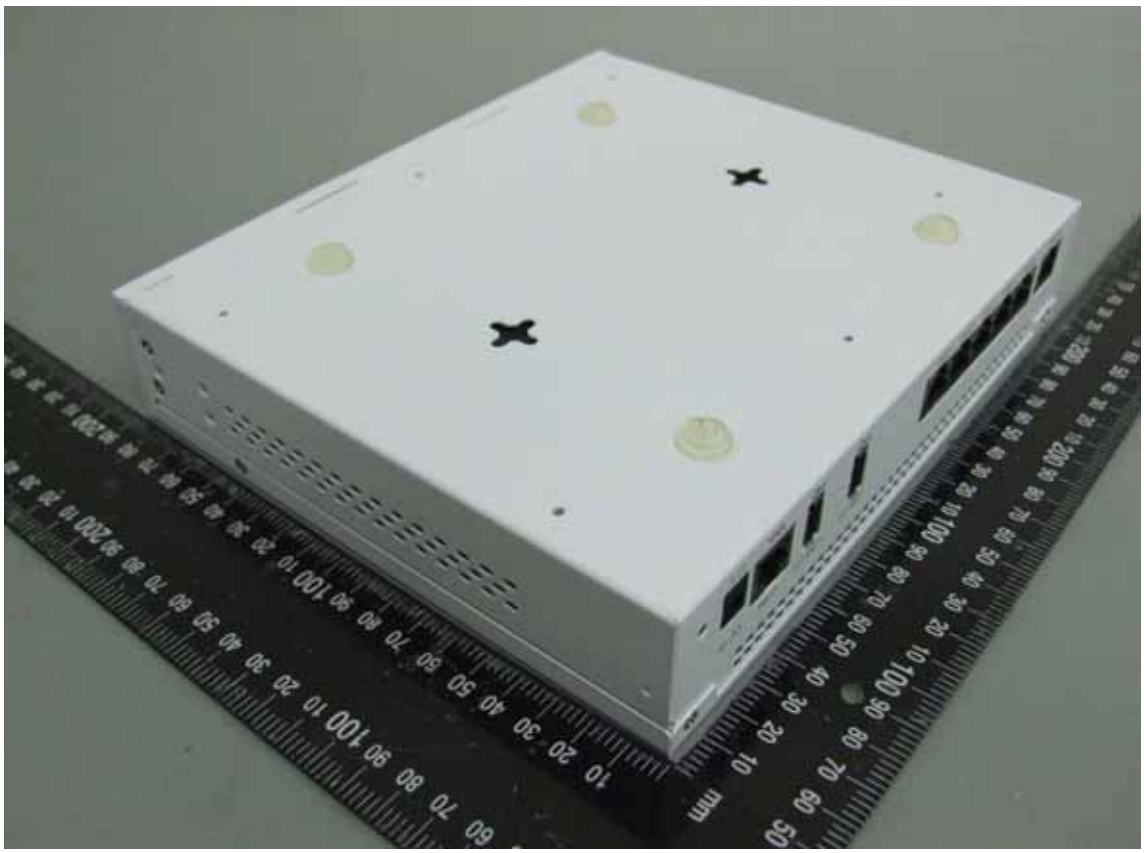
Uncertainty of Radiated Emission Measurement from 30MHz to 1000MHz

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**

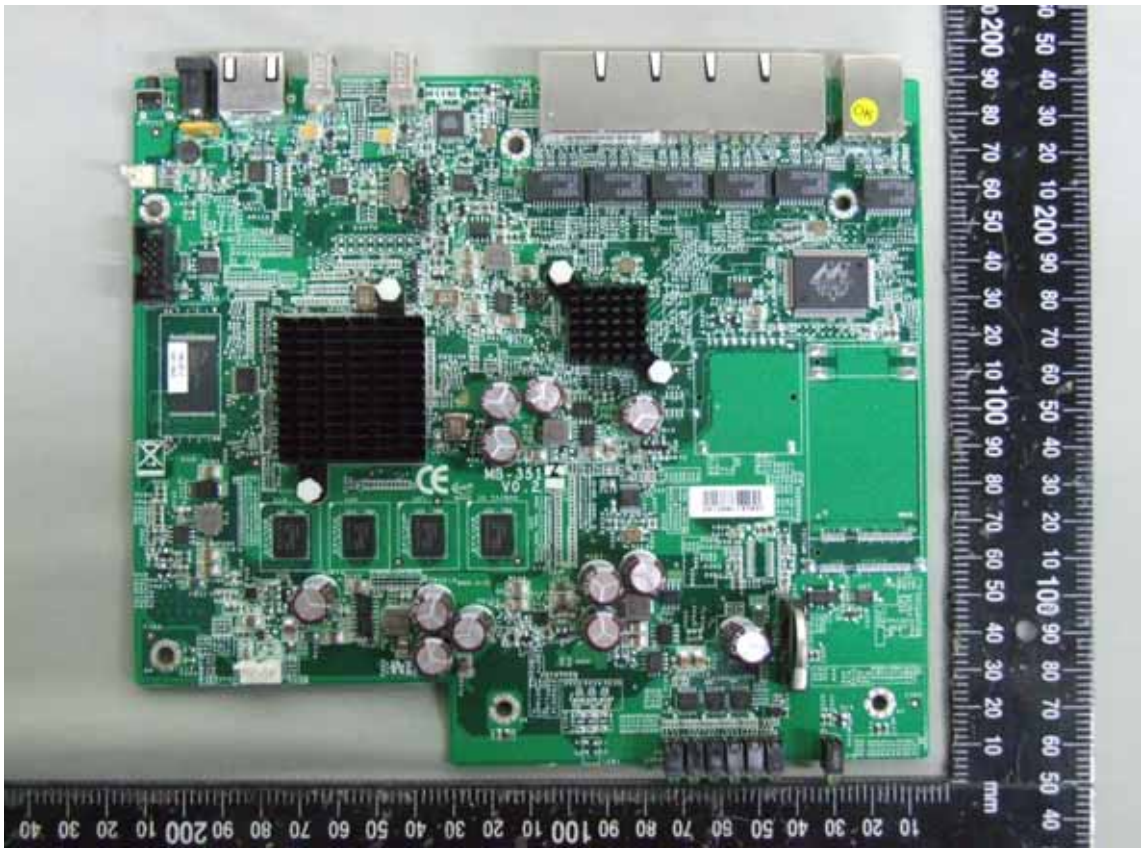
Uncertainty of Radiated Emission Measurement from 1 GHz to 18 GHz

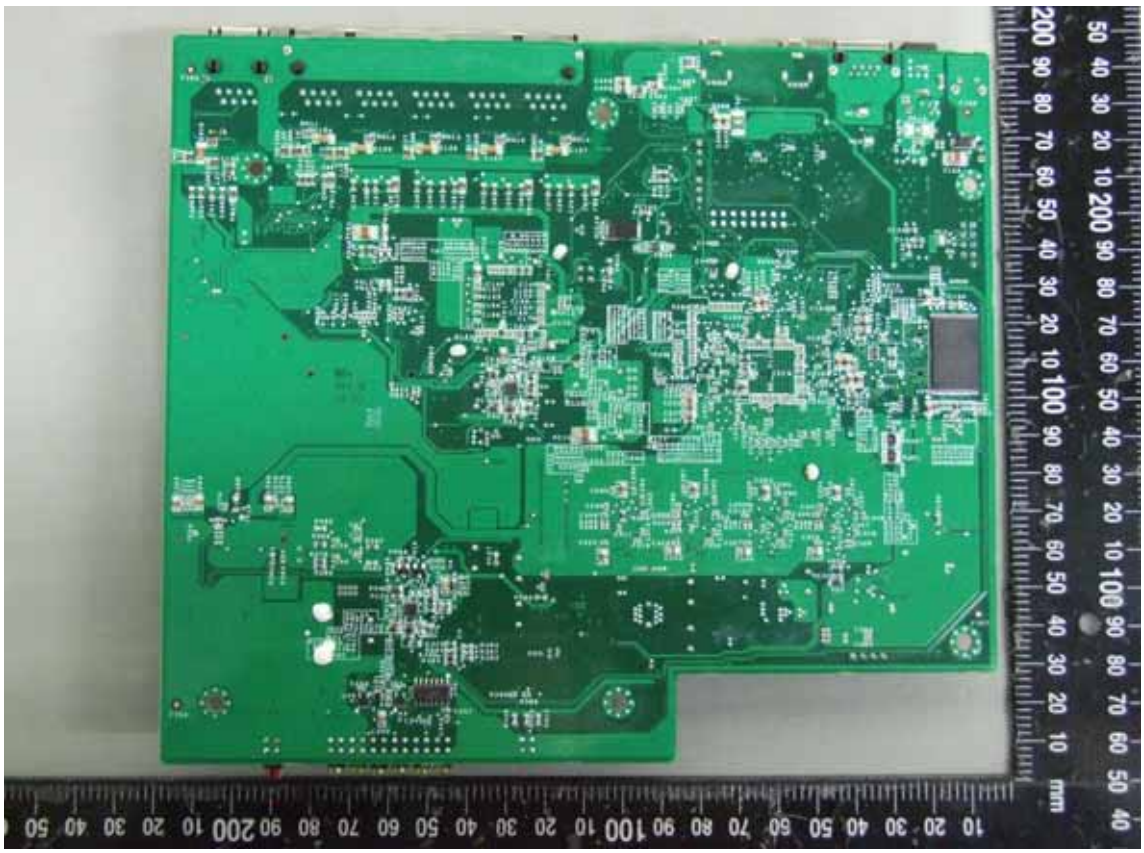
Input quantity	X_i	Uncertainty of x_i		$u(x_i)$	c_i	$c_i\ u(x_i)$
		dB	Probability distribution function	dB		dB
Spectrum reading	V_r	± 0.1	k=1	0.10	1	0.10
Attenuation: antenna-receiver	L_c	± 0.1	k=2	0.05	1	0.05
Spectrum corrections:	δ RC	± 1.0	k=2	0.50	1	0.50
Antenna factor	AF	± 1.3	k=2	0.65	1	0.65
Horn 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	δ Aph	± 1.0	Rectangular	0.58	1	0.58
Cross-polarization	δA_{CP}	± 0.9	Rectangular	0.52	1	0.52
Mismatch: antenna-receiver	δ M	+0.9/-1.0	U-shaped	0.67	1	0.67
Site corrections						
Site imperfections	δ SA	± 5.9	Triangular	2.42	1	2.42
Measurement system repeatability	R	± 1.43	Rectangular	0.826	1	0.826
Cable loss	C	± 0.03	Rectangular	0.018	1	0.018
Preamplifier factor	PA	± 0.11	Rectangular	0.064	1	0.064
				$u_c(y)=$		**2.90**
Measuring uncertainty for level of confidence of 90% (k=2)				$2\ u_c(y)=$		**5.80**

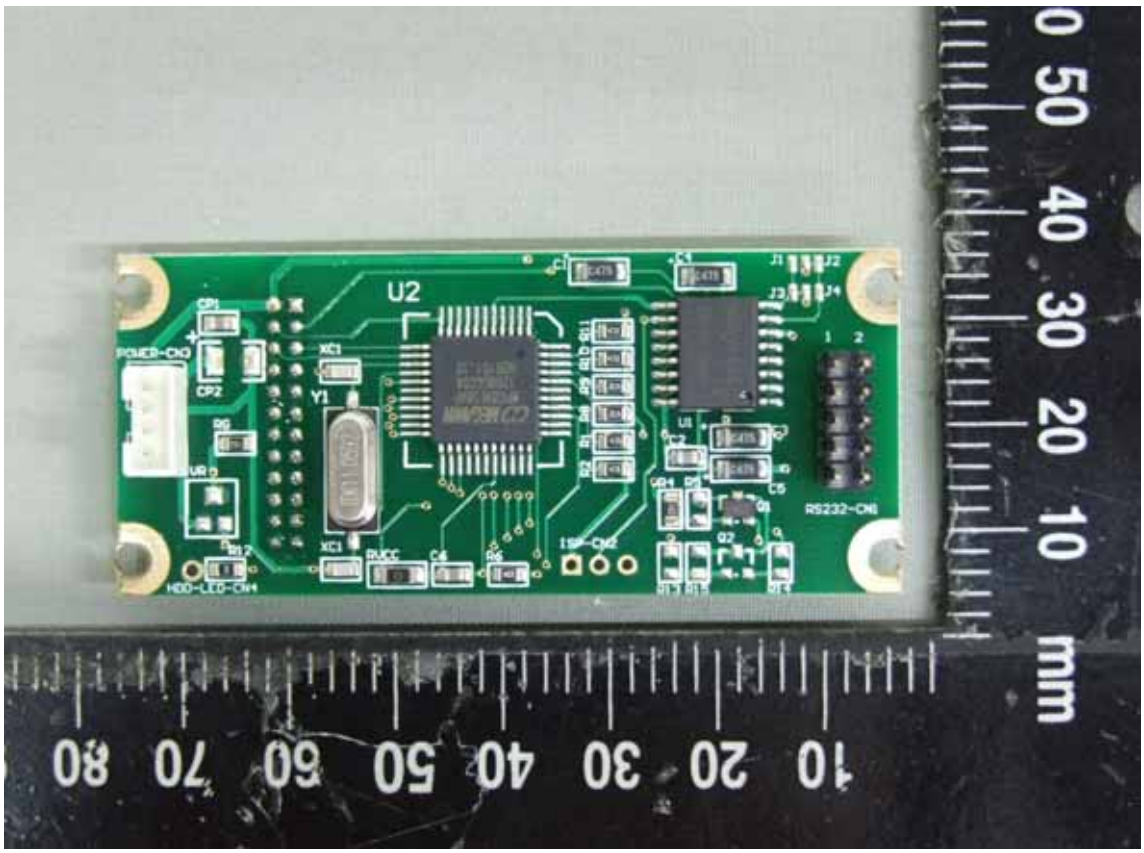
APPENDIX A. Photographs of EUT

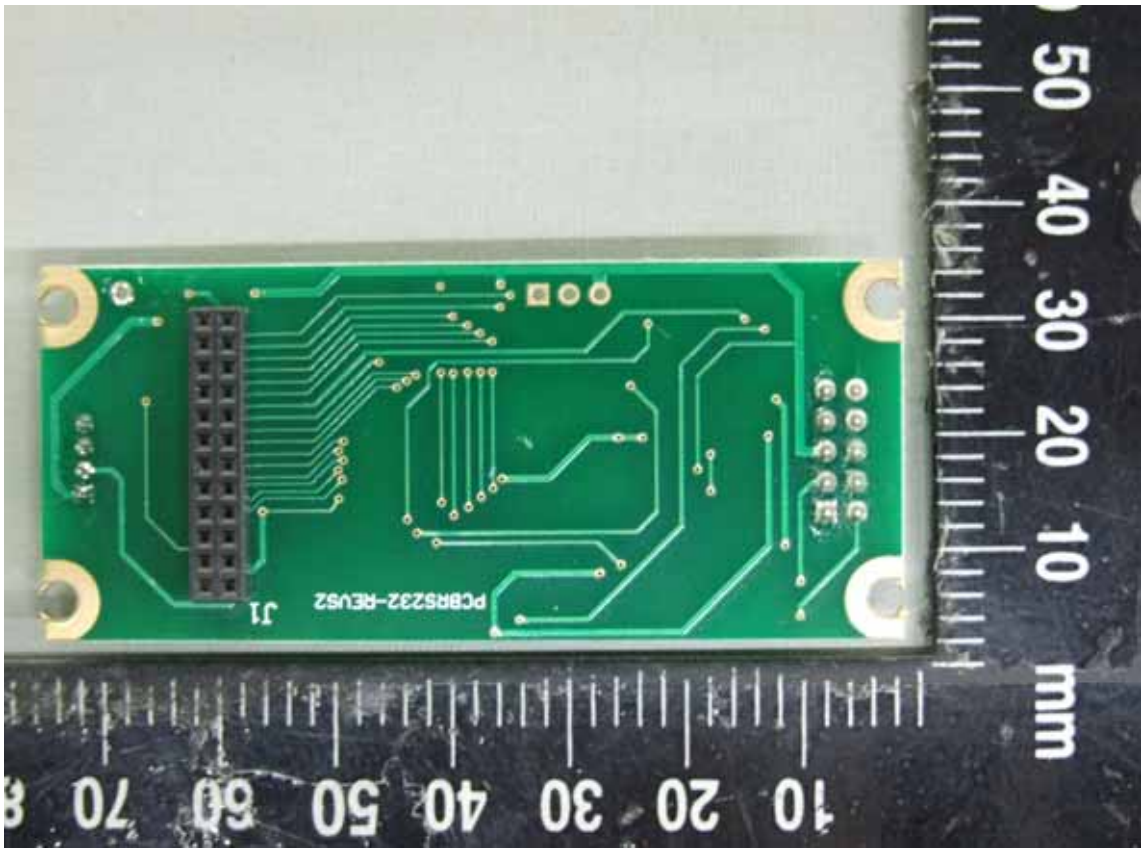


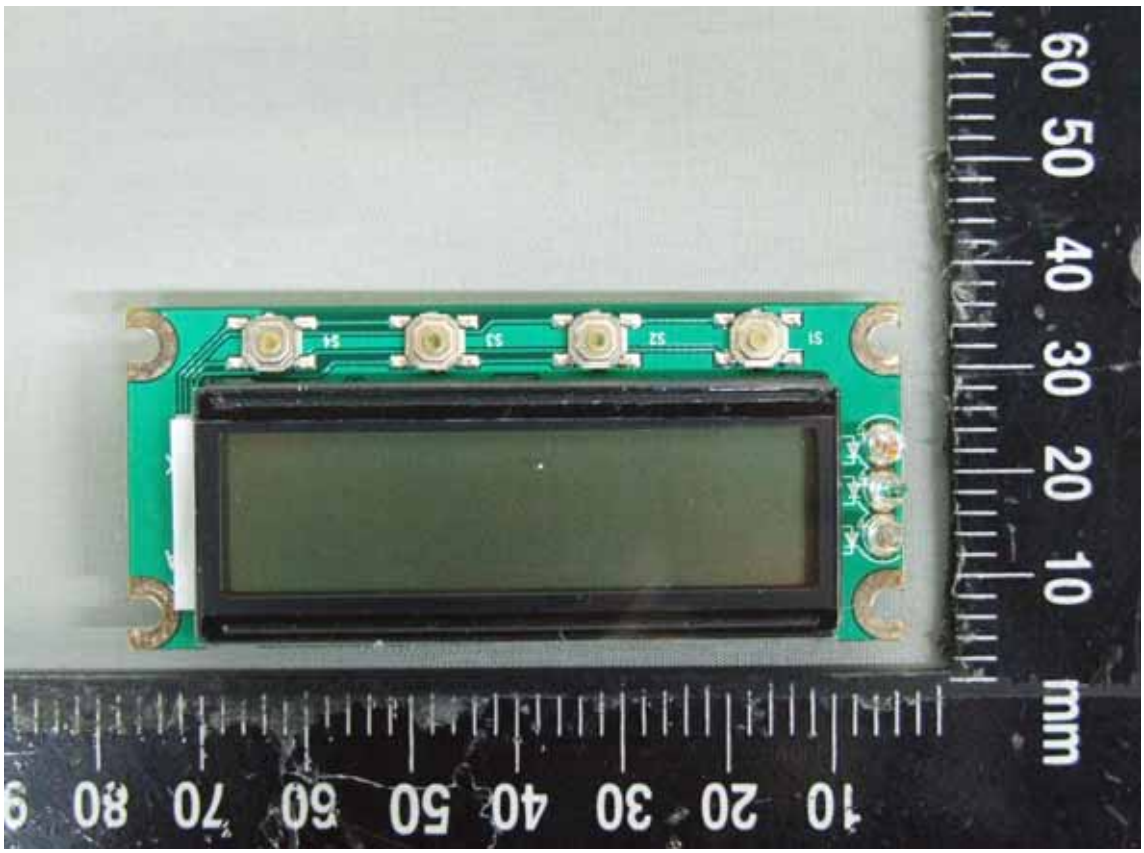

USB 2.0
USB 2.0
COM
DC IN
12 V
WAN2
WAN1
LAN4
LAN3
LAN2
LAN1

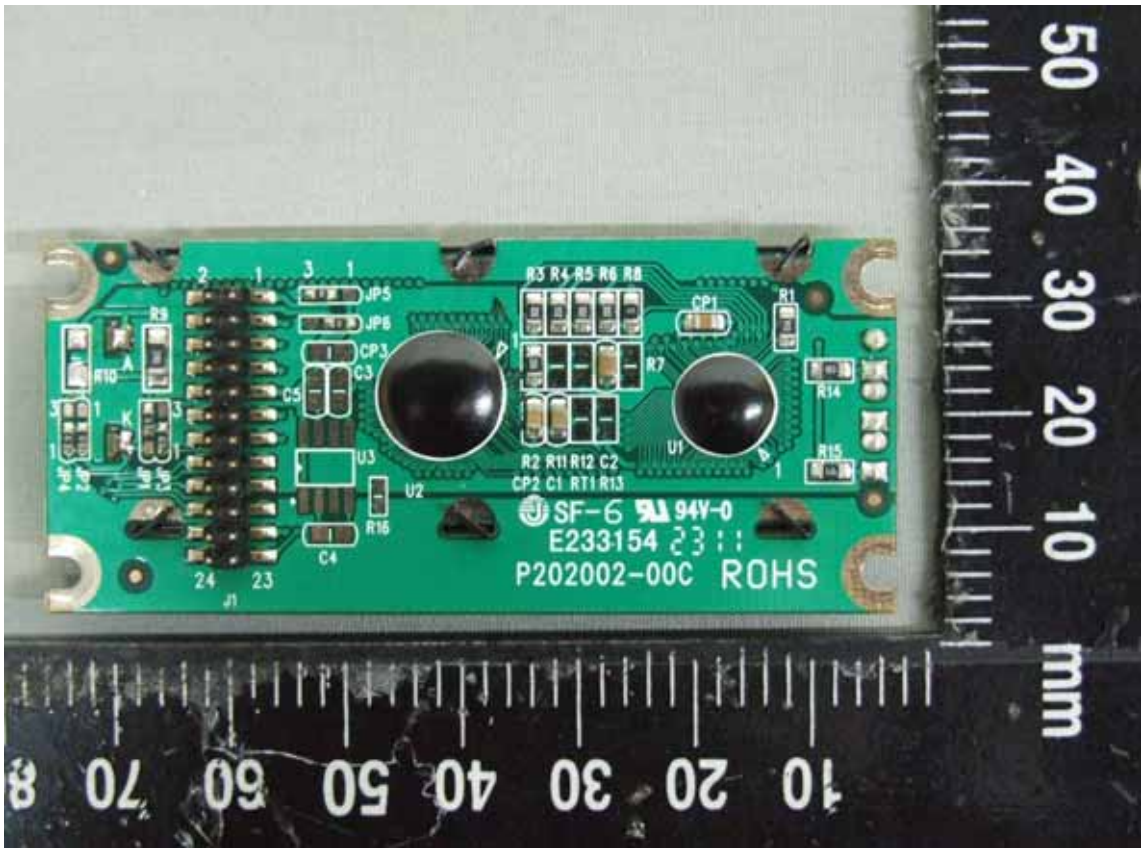





U2
RS232-CN6
ISP-CN2
HDD-LED-CN4
mm


J1
PCBRS232-REVS2
mm


S4
S3
S2
S1
mm


SF-6 94V-0
E233154
P202002-00C ROHS


FSP GROUP INC.
Switching Power Adapter
MODEL NO.: FSP040-DGAA1
AC INPUT: 100-240V~, 1.3A, 50-60Hz
DC OUTPUT: 12.0V ⎓ 3.33A MAX (40W MAX)
CAUTION:
FOR INDOOR USE ONLY.
For use with Information Technology Equipment.
ATTENTION:
Nur innerhalb von Gebäuden benutzen.
Nur zur Verwendung mit informationstechnischen Einrichtungen.
SAFETY MARK
0 9 2 5 6 9 - 1 1
EFFICIENCY LEVEL: V
I.T.E. POWER SUPPLY
L.P.S.
E190414
RA3001
MO05
RoHS
MADE IN CHINA