

Certificate of Test

January 2011

MSTRONIC CO., LTD.

Product Name : Power over Ethernet
Model Number : MIT-09-18, MIT-09-24, MIT-09-56, MIT-09-56D, MIT-09-18R,
MIT-09-24R, MIT-09-56R, MIT-09G-18, MIT-09G-24, MIT-09G-56, MIT-09G-56D,
MIT-09G-18R, MIT-09G-24R, MIT-09G-56R, MIT-09X-VVFF (X=Gigabit=G, or blank; VV=
Output Voltage for 18 or 24 or 56 or blank; FF=D(DETECTION) or R(REVERSE) or
blank
Brand Name : MSE
Test Report Number : 1111007E-01
Date of Test : October 19, 2011 - November 10, 2011

This report was based on GesTek report #1001018E-01, & 11005020E-01,
which remove two Inductances, because of the requirement of marketing.
We retest conducted emission and radiated emission and harmonic and flicker,
since it might influence EMI test result.

This product was tested according to the standards as below at the laboratory
of Global EMC Standard Tech. Corp..

In accordance with 2004/108/EC -EMC Directive
Standards:
EN 55022: 2006 + A1: 2007, Class B
EN 61000-3-2: 2006 + A1: 2009 + A2: 2009
EN 61000-3-3: 2008

[http : //www.gestek.com.tw](http://www.gestek.com.tw)



Sharon Chang, President

GESTEK EMC LAB

No.3, Pau-Tou-Tsao Valley, Lin Kou Dist.,
New Taipei City 244, Taiwan, R.O.C.
TEL:886-2-2603-5321
FAX:886-2-2603-5325

Issue Date: January 17, 2012



NVLAP LAB CODE 200085-0



Declaration of Conformity

We, Manufacturer/Importer
(full address)

declare that the product
(description of the apparatus, system, installation to which it refers)

EUT: Power over Ethernet

Model Number:

**MIT-09-18, MIT-09-24, MIT-09-56, MIT-09-56D, MIT-09-18R,
MIT-09-24R, MIT-09-56R, MIT-09G-18, MIT-09G-24, MIT-09G-56, MIT-09G-56D, MIT-
-09G-18R, MIT-09G-24R, MIT-09G-56R, MIT-09X-VVFF (X=Gigabit=G, or
blank; VV=Output Voltage for 18 or 24 or 56 or blank; FF=D(DETECTION) or
R(REVERSE) or blank**

is in conformity with

(reference to the specification under which conformity is declared)
in accordance with 2004/108/EC-EMC Directive

- | | | | |
|---|--|---|---|
| ☐ EN 55011 | Limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) high frequency equipment | ☒ EN 61000-3-2 | Disturbances in supply systems caused |
| ☐ EN 55013 | Limits and methods of measurement of radio disturbance characteristics of broadcast receivers and associated equipment | ☒ EN 61000-3-3 | Disturbances in supply systems caused by household appliances and similar electrical equipment "Voltage fluctuations" |
| ☐ EN 55014-1 | Limits and methods of measurement of radio disturbance characteristics of household electrical appliances, portable tools and similar electrical apparatus | ☐ EN 55024 | Information Technology equipment-Immunity characteristics-Limits and methods of measurement |
| ☐ EN 61000-6-3 | Generic standards-Emission standard for residential, commercial and light-industrial environments | ☐ EN 61000-6-1 | Generic standards-Immunity for residential, commercial and light-industrial environments |
| ☐ EN 61000-6-4 | Generic standards-Emission standard for industrial environments | ☐ EN 61000-6-2 | Generic standards-Immunity for industrial environments |
| ☐ EN 55015 | Limits and methods of measurement of radio disturbance characteristics of fluorescent lamps and luminaires | ☐ EN 55014-2 | Immunity requirements for household appliances tools and similar apparatus |
| ☒ EN 55022 | Limits and methods of measurement of radio disturbance characteristics of information technology equipment | ☐ EN 50091- 2 | EMC requirements for uninterruptible power systems (UPS) |
| ☐ DIN VDE 0855 | Cabled distribution systems; Equipment for receiving and/or distribution from sound and television signals | ☐ EN 55020 | Immunity from radio interference of broadcast receivers and associated equipment |
| ☐ part 10 | | ☐ EN 61204-3 | Low voltage power supplies, d.c. output - Part 3: Electromagnetic compatibility. (EMC) |
| ☐ part 12 | | | |

☒ **CE marking**



(EC conformity marking)

The manufacturer also declares the conformity of above mentioned product with the actual required safety standards in accordance with LVD 2006/95/EC

- | | | | |
|--|---|--|---|
| ☐ EN 60065 | Safety requirements for mains operated electronic and related apparatus for household and similar general use | ☐ EN 60950 | Safety for information technology equipment including electrical business equipment |
| ☐ EN 60335 | Safety of household and similar electrical appliances | ☐ EN 50091-1 | General and Safety requirements for uninterruptible power systems (UPS) |

Manufacturer/Importer

Signature: _____

(Stamp)

Date:

Name: _____

Appendix

**European Union [EU]
EMC Directive [2004/108/EC, As Amended]**

**EMC Test Report
For:**

MSTronic CO., LTD.

EUT: Power over Ethernet

Model Number:

**MIT-09-18,MIT-09-24,MIT-09-56,MIT-09-56D,MIT-09-18R,MIT-09-24R,
MIT-09-56R,MIT-09G-18,MIT-09G-24,MIT-09G-56,MIT-09G-56D,MIT-0
9G-18R,MIT-09G-24R,MIT-09G-56R,MIT-09X-VVFF(X=Gigabit=G,or
blank;VV=Output Voltage for 18 or 24 or 56 or
blank;FF=D(DETECTION) or R(REVERSE) or blank**

Prepared for:

MSTRONIC CO., LTD.

2F., NO.12, Gong shang Rd., Wugu Dist, New Taipei City 248, Taiwan (R.O.C.)

Report By : Global EMC Standard Tech. Corp.

**No.3, Pau-Tou-Tsao Valley, Lin Kou Dist., New
Taipei City 244, Taiwan, R.O.C.**

Tel : 886-2-2603-5321

Fax: 886-2-2603-5325

Test results given in this report only relate to the specimen(s) tested, measured.

This report is the property of GesTek, and shall not be reproduced, other than in full, without the written consent of GesTek.

The client should not use it to claim product endorsement by TAF, NEMKO or any government agencies.

All data in this report are traceable to national standard or international standard.

TABLE OF CONTENTS

Description	Page
1. CERTIFICATION	4
2. SUMMARY OF TEST RESULTS	5
2.1 UNCERTAINTY DESCRIPTION	5
3. GENERAL INFORMATION.....	6
3.1 PRODUCT DESCRIPTION	6
3.2 TEST MODES & EUT COMPONENTS DESCRIPTION	7
3.3 CONFIGURATION OF THE SYSTEM UNDER TEST.....	8
3.4 BLOCK DIAGRAM OF CONNECTIONS BETWEEN EUT AND SIMULATORS.....	10
3.5 LAB AMBIENT.....	11
3.6 TEST FACILITY ACCREDITATION.....	11
4. CONDUCTED EMISSION MEASUREMENT.....	12
4.1 TEST EQUIPMENTS	12
4.2 TEST METHOD.....	12
4.3 BLOCK DIAGRAM OF TEST SETUP	12
4.4 CONDUCTED EMISSION LIMITS.....	13
4.5 TEST CONFIGURATION ON MEASUREMENT	14
4.6 CONDUCTED EMISSION MEASURED PROCEDURE AND DATA	14
4.7 OPERATING CONDITIONS OF THE EUT.....	15
4.8 CONDUCTED EMISSION MEASUREMENT RESULTS	16
5. RADIATED EMISSION MEASUREMENT	22
5.1 TEST EQUIPMENT	22
5.2 TEST METHOD	22
5.3 OPEN AREA TEST SITE SETUP DIAGRAM	22
5.4 RADIATED EMISSION LIMITS.....	23
5.5 EUT CONFIGURATION	23
5.6 OPERATING CONDITIONS OF THE EUT.....	23
5.7 RADIATED EMISSION DATA.....	24
5.8 RADIATED EMISSIONS MEASUREMENT RESULTS.....	25
6. HARMONIC CURRENT EMISSIONS, VOLTAGE FLUCTUATIONS AND FLICKER MEASUREMENT	27
6.1 TEST EQUIPMENT	27
6.2 TEST METHOD	27
6.3 BLOCK DIAGRAM OF TEST SETUP	27
6.4 LIMITS OF FLICKER MEASUREMENT	28
6.5 OPERATING CONDITIONS OF THE EUT.....	28
6.6 TEST PROCEDURE	28
6.7 TEST RESULT	28
7. PHOTOGRAPHS FOR TEST.....	30
7.1 TEST PHOTOGRAPHS FOR CONDUCTION.....	30
7.2 TEST PHOTOGRAPHS FOR RADIATED	31
7.3 TEST PHOTOGRAPHS FOR HARMONIC/FLICKER	32
8. PHOTOGRAPHS FOR PRODUCT	33
9. EMI/EMS REDUCTION METHOD DURING COMPLIANCE TESTING	36

1. CERTIFICATION

Applicant : MSTRONIC CO., LTD.

EUT Description : Power over Ethernet

Model Number : MIT-09-18, MIT-09-24, MIT-09-56, MIT-09-56D, MIT-09-18R, MIT-09-24R, MIT-09-56R, MIT-09G-18, MIT-09G-24, MIT-09G-56, MIT-09G-56D, MIT-09G-18R, MIT-09G-24R, MIT-09G-56R, MIT-09X-VVFF (X=Gigabit=G, or blank; VV=Output Voltage for 18 or 24 or 56 or blank; FF=D(DETECTION) or R(REVERSE) or blank)

Brand Name : MSE

Serial Number : N/A

STANDARDS OF TEST METHOD:

EN 55022: 2006 + A1: 2007

EN 61000-3-2: 2006 + A1: 2009 + A2: 2009 & EN 61000-3-3: 2008

GENERAL REMARKS:

The tests were performed according to the technical requirement of EUT.

- ☒ Electro-magnetic Radiated Emission Interference Measurement (EN 55022)
- ☒ Electro-magnetic Conducted Emission Interference Measurement (EN 55022)
- ☒ Harmonic Current Emissions (EN 61000-3-2)
- ☒ Voltage Fluctuation and Flicker Measurement (EN 61000-3-3)

Sample Received Date : October 19, 2011

Date of Test : October 19, 2011 - November 10, 2011

Issue Date : January 17, 2012

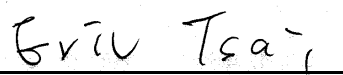
In order to ensure the quality and accuracy of this document, the contents have been thoroughly reviewed by the following qualified personnel from Gestek Lab.

Documented By :



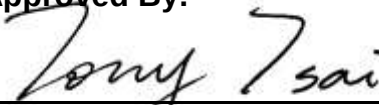
Susan Chen / Report Author

Tested By:



Eric Tsai / Eng. Dept. Supervisor

Approved By:



Tony Tsai / Director

2. SUMMARY OF TEST RESULTS

STANDARD	TEST ITEM	TEST RESULT	REMARKS
EN 55022 Class B	Conducted emission (Mode 1)	PASS	The worst emission frequency is <u>1.2275</u> MHz. And minimum passing margin is <u>-1.11</u> dB. The measurement uncertainty is <u>3.7</u> dB.
	Conducted emission (Mode 1) For LAN Port 100Mbps Idle	PASS	The worst emission frequency is <u>16.2283</u> MHz. And minimum passing margin is <u>-6.15</u> dB. The measurement uncertainty is <u>4.0</u> dB.
	Radiated emission (Mode 1)	PASS	The worst emission frequency is <u>66.6900</u> MHz at <u>Vertical</u> . And minimum passing margin is <u>-2.15</u> dB. Height of antenna is <u>1.2</u> M. Angle of turntable is <u>120°</u> . The measurement uncertainty is <u>6.6</u> dB.
EN 61000-3-2: 2006 + A1: 2009 + A2: 2009	Harmonic Current Emissions	PASS	EUT power level is below 75 Watts and therefore has no defined limits The measurement uncertainty is <u>5.1</u> mA
EN 61000-3-3: 2008	Voltage Fluctuation and Flicker Measurement	PASS	The Value of Pst shall not be greater than 1.0 The measurement uncertainty is <u>0.02</u> %

2.1 UNCERTAINTY DESCRIPTION

According to CISPR 16-4-2,

The measure level is compliance with the limit if

$$L_m < L_{lim} \text{ and } L_m + U(L_m) < L_{lim} + U_{cispr} = L_{eff}$$

Where,

U_{cispr} = Uncertainty value specified in Table 1 of CISPR 16-4-2

Measurement		U_{cispr}
Conducted disturbance (mains port)	(150 kHz – 30 MHz)	3.6 dB
Radiated disturbance (OATS or ATS)	(30 MHz – 1000 MHz)	5.2 dB

L_m = Measure value

L_{lim} = Emission limit level

$U(L_m)$ = Uncertainty value of test laboratory

L_{eff} = Effective emission limit level

The above stated condition will be taking as a criterion for pass/fail determination.

3. GENERAL INFORMATION

3.1 PRODUCT DESCRIPTION

Product Name : Power over Ethernet
Model Number : MIT-09-18, MIT-09-24, MIT-09-56, MIT-09-56D, MIT-09-18R, MIT-09-24R, MIT-09-56R, MIT-09G-18, MIT-09G-24, MIT-09G-56, MIT-09G-56D, MIT-09G-18R, MIT-09G-24R, MIT-09G-56R, MIT-09X-VVFF (X=Gigabit=G, or blank; VV=Output Voltage for 18 or 24 or 56 or blank; FF=D(DETECTION) or R(REVERSE) or blank)
Brand Name : MSE
Serial Number : N/A
Applicant : MSTRONIC CO., LTD.
Address : 2F., NO.12, Gong shang Rd., Wugu Dist, New Taipei City 248, Taiwan (R.O.C.)
Manufacturer : MSTRONIC CO., LTD.
Address : 2F., NO.12, Gong shang Rd., Wugu Dist, New Taipei City 248, Taiwan (R.O.C.)
Power Supply : Input: 90V-264V, 47-63Hz;
Output: MIT-09-18: 18V/2A
MIT-09-24: 24V/2A
MIT-09-56: 56V/0.9A
Power Cord : 3Pins, 1.8m, Non-Shielded, Detachable

3.2 TEST MODES & EUT COMPONENTS DESCRIPTION

Test Mode	Mode 1 – Worst Case	Mode 2 – Pre-Scan	Mode 3 – Pre-Scan
Test Model Number	MIT-09-18	MIT-09-24	MIT-09-56
Mother Board	MSTRONIC CO., LTD., M/N: MIT-09		

Note:

1. According to pre-scan data, we determine the data (Mode 1) shown in this test report, which reflects the worst-case data for each operation mode.
2. The EUT has serial model numbers for the requirement of marketing.
3. This report was based on GesTek report #1001018E-01, & 11005020E-01, which remove two Inductances, because of the requirement of marketing. We retest conducted emission and radiated emission and harmonic and flicker, since it might influence EMI test result.

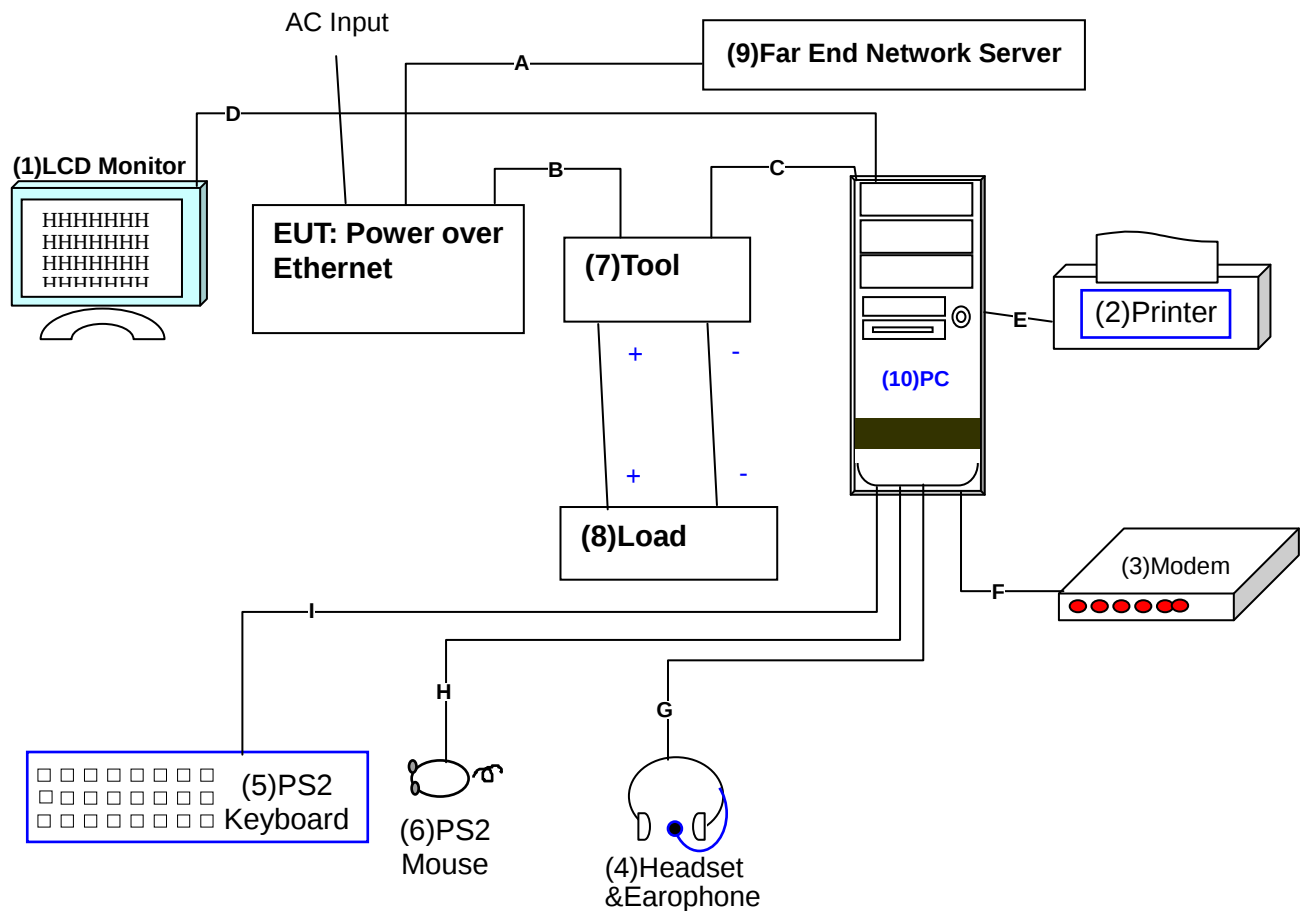
3.3 CONFIGURATION OF THE SYSTEM UNDER TEST

Item	Device	No.	Configuration
1	LCD MONITOR (DVI&D-SUB)	M01-072	Manufacturer : DELL Model Number : 2407WFPb Serial Number : N/A BSMI ID : R43002 FCC ID : N/A DVI&D-SUB Cable : Shielded, Detachable, 1.8m,cord POWER:AC INPUT :100-240V,50/60Hz,2A Adapter Power Cord : Non-Shielded, Detachable, 3Pin, 1.8m
2	Printer	P01-030	Manufacturer : EPSON Model Number : LQ-300+ BSMI ID : R33126 Data Cable : Shielded, Detachable, 1.8m, Parallel Cable Power Cord : Non-Shielded, undetachable, 2m
3	Modem	M03-021	Manufacturer : ACEEX Model Number : 1414V Serial Number : 0046174 BSMI ID : N/A FCC ID : IFAXDM1414 Data Cable : T Type:RS232, Shielded, Detachable, 1.2m Power Cord : Non-Shielded, Detachable, 1.8m Line : Type:RJ11(4P2C), Detachable, 1.8m Phone : Type:RJ11(4P2C), Detachable, 1.8m
4	Headset & Earphone	E01-081	Manufacturer : TOKYO Model Number : SX-M1 Serial Number : N/A Data Cable : Shielded, Undetachable, 1.8 m Power Cord : N/A Purchase Date : 2/22/1999
5	PS2 Keyboard	K01-114	Manufacturer : acer Model Number : T200-P BSMI ID : R41097 FCC ID : N/A Data Cable : Shielded, Undetachable, 1.8 m
6	PS2 Mouse	M02-407	Manufacturer : detrois Model Number : CanMouse CM-309 Serial Number : N/A BSMI ID : R63159 FCC ID : N/A Data Cable : Shielded, Undetachable, 1.8m
7	Tool	-----	Manufacturer : MStronic CO., LTD. Model Number : Tool
8	LOAD	-----	Load: 18Ω
9	Far End Network Server	-----	Manufacturer : ASUS Model Number : AP160R Power Cord : Non- Shielded, Detachable, 1.8m

Item	Device	No.	Configuration
10	PC System	lenovo PC04	Model Number : 8985-B79 BSMI ID : R33B65 C.P.U : Intel Celeron 1.8G DDR : Hynix DDR2-667 512MB H.D.D. : Manufacturer :Seagate M/N: ST3160815AS BSMI ID:D33027 DVD-ROM : Manufacturer : PHILIPS/BENQ M/N:DH-16A1P BSMI ID: D33C76 Mother Board : lenovo M/N: L-I946F BSMI ID: D33008 S.P.S : Seasonic M/N:SS-330HB Input AC:100~240V~5A 50-60Hz Output DC:+3.3A/20A,+5V/20A,+12V/22A, 12V/0.8A, +5VSB/2A BSMI ID: R33080

Note: All the peripherals above were selected specifically after confirming that there is no impact on test results.

3.4 BLOCK DIAGRAM OF CONNECTIONS BETWEEN EUT AND SIMULATORS



Signal Cable Description of the above support units

No.	Signal Cable Description	Shielded	Core type	Length (m)
A	RJ45 Cable	☐ Yes ☒ No	☒ No ☐ 1(near EUT) ☐ 1(near Aux) ☐ 2	10
B	RJ45 Cable	☐ Yes ☒ No	☒ No ☐ 1(near EUT) ☐ 1(near Aux) ☐ 2	1
C	RJ45 Cable	☐ Yes ☒ No	☒ No ☐ 1(near EUT) ☐ 1(near Aux) ☐ 2	1
D	D-Sub Cable	☒ Yes ☐ No	☐ No ☐ 1(near EUT) ☐ 1(near Aux) ☒ 2	1.7
E	Printer Cable	☒ Yes ☐ No	☒ No ☐ 1(near EUT) ☐ 1(near Aux) ☐ 2	1.75
F	RS232 Cable	☒ Yes ☐ No	☒ No ☐ 1(near EUT) ☐ 1(near Aux) ☐ 2	0.85
G	Earphone	☐ Yes ☒ No	☒ No ☐ 1(near EUT) ☐ 1(near Aux) ☐ 2	1.9
H	PS2 Cable	☐ Yes ☒ No	☒ No ☐ 1(near EUT) ☐ 1(near Aux) ☐ 2	1.4
I	PS2 Cable	☐ Yes ☒ No	☒ No ☐ 1(near EUT) ☐ 1(near Aux) ☐ 2	1.7

3.5 LAB AMBIENT

Items	Range Requirement
Temperature (°C)	10-40
Humidity (%RH)	10-90
Barometric pressure (mbar)	860-1060

3.6 TEST FACILITY ACCREDITATION

Global EMC Standard Tech. Corp. is accredited in respect of laboratory and the accreditation criteria is ISO/IEC 17025: 2005.

Site Description : December 31, 2013 File on NEMKO EMC Laboratory Authorization
Gaustadalleen 30, Postbox 73 Blindern, 0314 Oslo, Aut. No.: ELA 126
Accreditation on NVLAP effective through September 30, 2012.
For CISPR 22, FCC Method and AS/NZS CISPR 22 Measurement.
NVLAP Lab Code: 200085-0
Registration on VCCI effective through June 09, 2012.
Recognized by the Council of Taiwan Accreditation Foundation
As an accredited laboratory and registration No.:1082.
Registration on TAF effective through September 19, 2012.

Name of firm : Global EMC Standard Tech. Corp.

Site location : No. 3 Pau-Tou-Tsuo Valley, Chia-Pau Tsuen, Lin Kou Hsiang,
Taipei County, Taiwan, R.O.C.



NVLAP LAB CODE 200085-0

4. CONDUCTED EMISSION MEASUREMENT

4.1 TEST EQUIPMENTS

Item	Instrument	Manufacturer	Model	S/N or Version	Next Cal. Date
1	Test Receiver	R & S	ESCS30	100393	2012.04.05
2	L.I.S.N.(EUT)	R & S	ENV216	100108	2012.05.09
3	L.I.S.N.(AE)	ROLF HEINE	NNB-2/16Z	98091	2012.08.11
4	RF CABLE	GTK	N/A	GTK-E-A154-01	2012.01.13
5	50 Ohm Terminator	JYEBAO	BNC 0/3GHz	GTK-E-A425-01	2012.06.07
6	ISN	FCC	FCC-TLISN- T8-02	20326	2011.12.27
7	Software	FARAD	EZ-EMC	2A1.1(USB)	N/A

Note: 1. All equipments are calibrated and will be valid only for a period of 1 year.

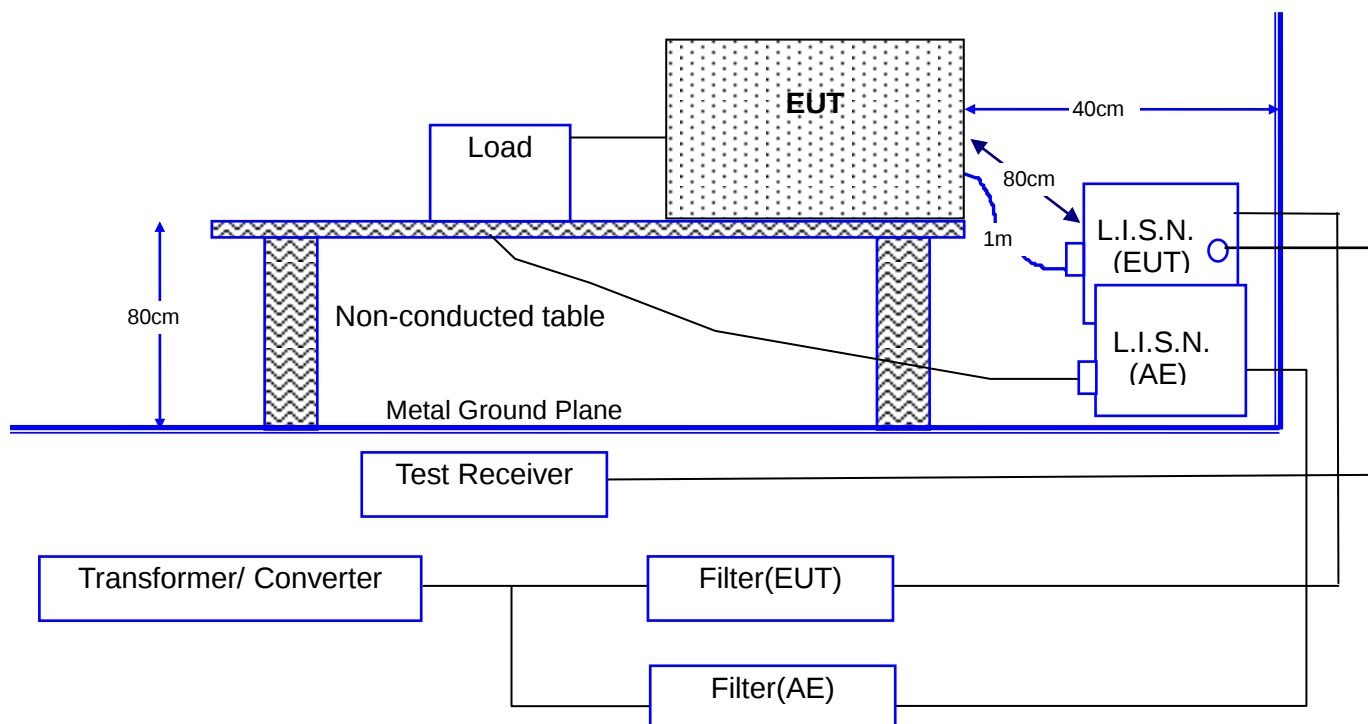
2. The test was performed at GTK Shielded Room B5.

4.2 TEST METHOD

According to EN 55022: 2006 + A1: 2007

4.3 BLOCK DIAGRAM OF TEST SETUP

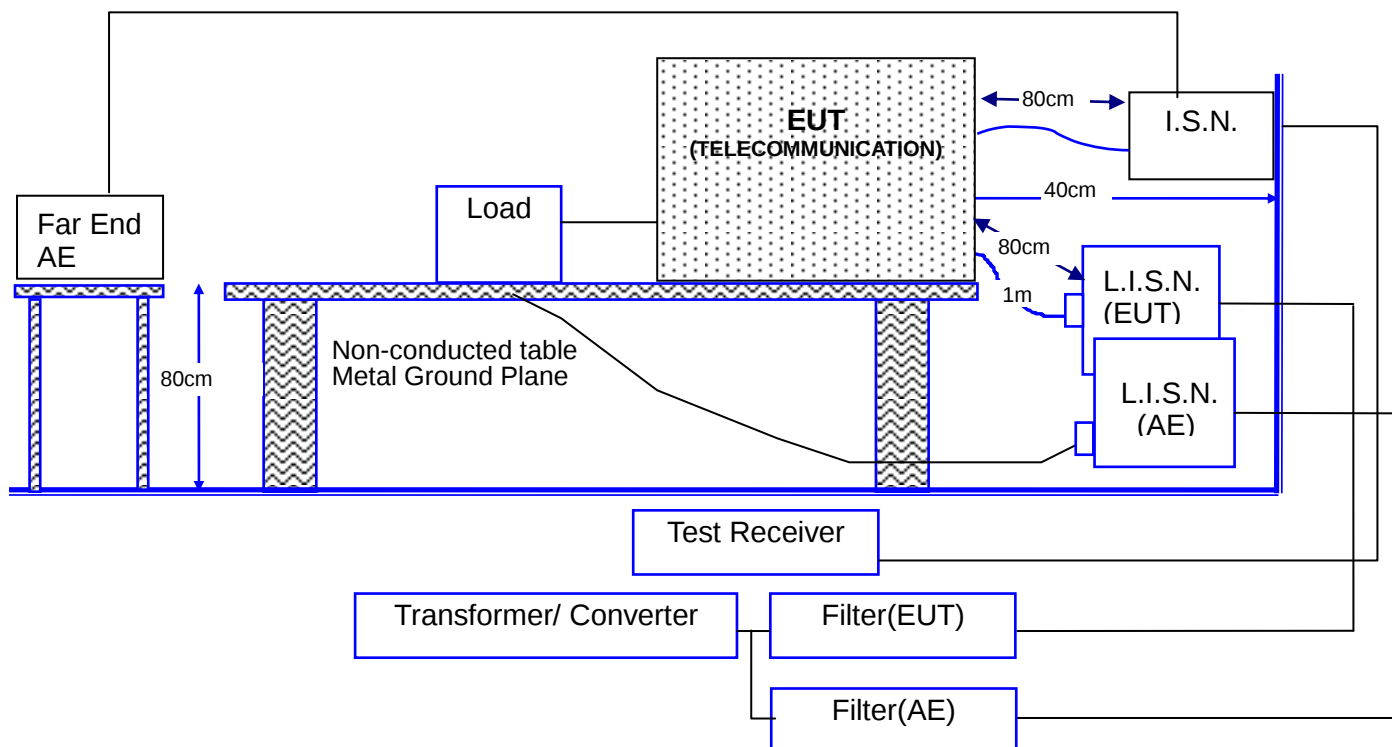
4.3.1 TEST SETUP FOR EMISSION MEASUREMENT AT MAINS TERMINAL



Note: This is a representative setup diagram for Table-top EUT.

For Floor-standing EUT, the table will be removed with all others setup condition remain the same.

4.3.2 TEST SETUP FOR CONDUCTED EMISSION MEASUREMENT AT TELECOMMUNICATION PORTS



Note: This is a representative setup diagram for Table-top EUT.

For Floor-standing EUT, the table will be removed with all others setup condition remain the same.

4.4 CONDUCTED EMISSION LIMITS

4.4.1 CONDUCTED EMISSION LIMITS (MAINS TERMINAL)

Frequency	Maximum RF Line Voltage dB(μV)	
	Class B	
MHz	QUASI-PEAK	AVERAGE
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5.0	56	46
5.0 to 30	60	50

Remarks: In the Above Table, the tighter limit applies at the band edges.

4.4.2 CONDUCTED EMISSION LIMITS (TELECOMMUNICATION PORTS)

Frequency	Voltage limits dB(μ V)	
	Class B	
MHz	QUASI-PEAK	AVERAGE
0.15 to 0.50	84 to 74	74 to 64
0.50 to 30	74	64

Remarks :

1. In the Above Table, the tighter limit applies at the band edges.
2. Either the voltage limits or the current limits as applicable, shall be met.

4.5 TEST CONFIGURATION ON MEASUREMENT

The equipments that are listed in section 4.1 are installed on Conducted Power Line Test in order to meet the requirement of the Commission and operating in a manner, which tends to maximize its emission characteristics in a normal application.

The device under test, installed in a representative system as described in section 4.3, was placed on a non-conductive table whose total height equal to 80cm. Powered from one L.I.S.N. which signal output to receiver, and the other peripherals was powered from another L.I.S.N. which signal output was terminated by 50 Ω .

4.6 CONDUCTED EMISSION MEASURED PROCEDURE AND DATA

4.6.1 CONDUCTED EMISSION (MAINS TERMINAL)

The measurement range of conducted emission, which is from 0.15 MHz to 30 MHz, was scan for peak emission curve of all the test modes. The worst mode is then measured using an average and/or quasi peak detector and record at least the disturbance levels and the frequencies of the six highest disturbances. The final measurement value is equal to the receiver reading plus the correction factor. If AMN insertion loss is more than 0.5dB, automatically the receiver will add the correction factor to the reading level.

4.6.2 CONDUCTED EMISSION LIMITS (TELECOMMUNICATION PORTS)

The measurement range of telecommunication port from 0.15 MHz to 30 MHz are been investigated. The measurement method prescribed should comply with the voltage limits; create a condition of LAN utilization in excess of 10% in order to emulate realistic types of data transmission. If the LAN maintains transmission during idle periods measurements shall also be made during idle periods. Connect an ISN to the test receiver during the measurement of voltage disturbance which should be corresponding to the number of line of the ISN. At the same time meet the common mode impedance of the telecommunication port under test.

The initial step is to scan all the test modes using a test receiver of the peak detector to find for the worst mode. The worst mode data are then measured based on RBW 10 KHz with an average and/or quasi peak detector and record at least the disturbance levels and the frequencies of the six highest disturbances.

4.7 OPERATING CONDITIONS OF THE EUT

The exercise program used during conducted emission measurement was designed to exercise the EUT in a manner similar to a typical use. The exercise sequence is listed as below:

1. Setup the EUT and simulators as shown on 3.4
2. Turn on the power of all equipments.
3. Boot the P.C. from Hard Disk and setup the video to Windows XP, active all devices.
4. Connect the Far End Network Server and run test program "test.bat".
5. The EUT exchange the information with the GesTek server via HUB.
6. Adjust to appropriate video resolution.
7. Active other internal devices such as network function.
8. Execute "EMC Ver.1.0" test program under Windows XP.
9. P.C. sent "H" pattern to monitor, make the "H" pattern full in the screen.
10. P.C. sent "H" pattern to parallel and serial port.
11. Repeat above steps.

4.8 CONDUCTED EMISSION MEASUREMENT RESULTS

Date of Test	November 10, 2011	Temperature	26 °C
EUT	Power over Ethernet	Humidity	60 %
Test Mode	Mode 1	Display Pattern	H Pattern
Test Power Supply	AC 230V/50Hz		

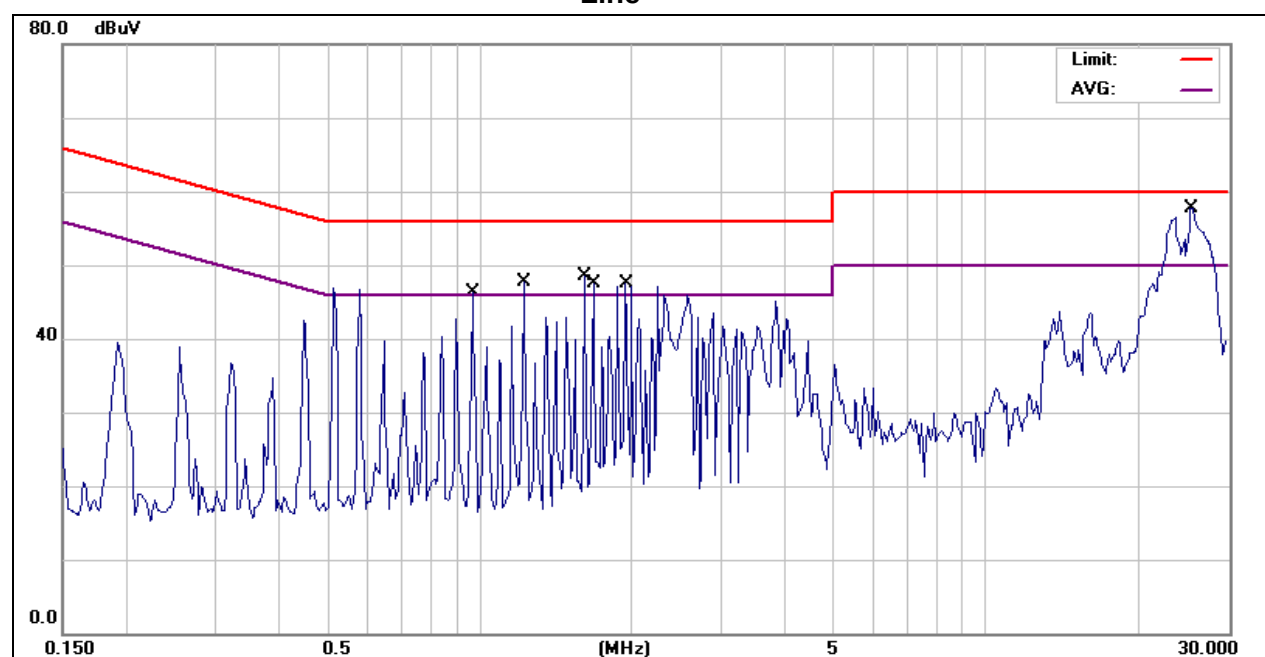
Line

No.	Frequency MHz	Reading Level dBμV	Factor dB	Measurement dBμV	Limit dBμV	Over Limit dB	Detector
1	0.9708	35.56	9.67	45.23	56.00	-10.77	QP
2	0.9708	32.94	9.67	42.61	46.00	-3.39	AVG
3	1.2275	37.34	9.68	47.02	56.00	-8.98	QP
4	★1.2275	35.21	9.68	44.89	46.00	-1.11	AVG
5	1.6160	37.00	9.69	46.69	56.00	-9.31	QP
6	1.6160	34.86	9.69	44.55	46.00	-1.45	AVG
7	1.6793	37.19	9.69	46.88	56.00	-9.12	QP
8	1.6793	33.93	9.69	43.62	46.00	-2.38	AVG
9	1.9347	37.15	9.70	46.85	56.00	-9.15	QP
10	1.9347	34.26	9.70	43.96	46.00	-2.04	AVG
11	25.6315	46.55	9.73	56.28	60.00	-3.72	QP
12	25.6315	39.12	9.73	48.85	50.00	-1.15	AVG

Remarks :

1. All readings are Quasi-peak and Average values.
2. Measurement = Reading + Factor (Could have ± 0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. Factor = L.I.S.N. insertion loss + cable loss
5. " ★ " means that this data is the worse case measurement level.
6. The measurement uncertainty is 3.7 dB.

Line



- Remark:
1. The Limit (The red line of the graph indicates the quasi-peak measurements).
 2. The AVG (The purple line of the graph indicates the average measurements).
 3. The scan curve indicates peak detector measurement.

Date of Test	November 10, 2011	Temperature	26 °C
EUT	Power over Ethernet	Humidity	60 %
Test Mode	Mode 1	Display Pattern	H Pattern
Test Power Supply	AC 230V/50Hz		

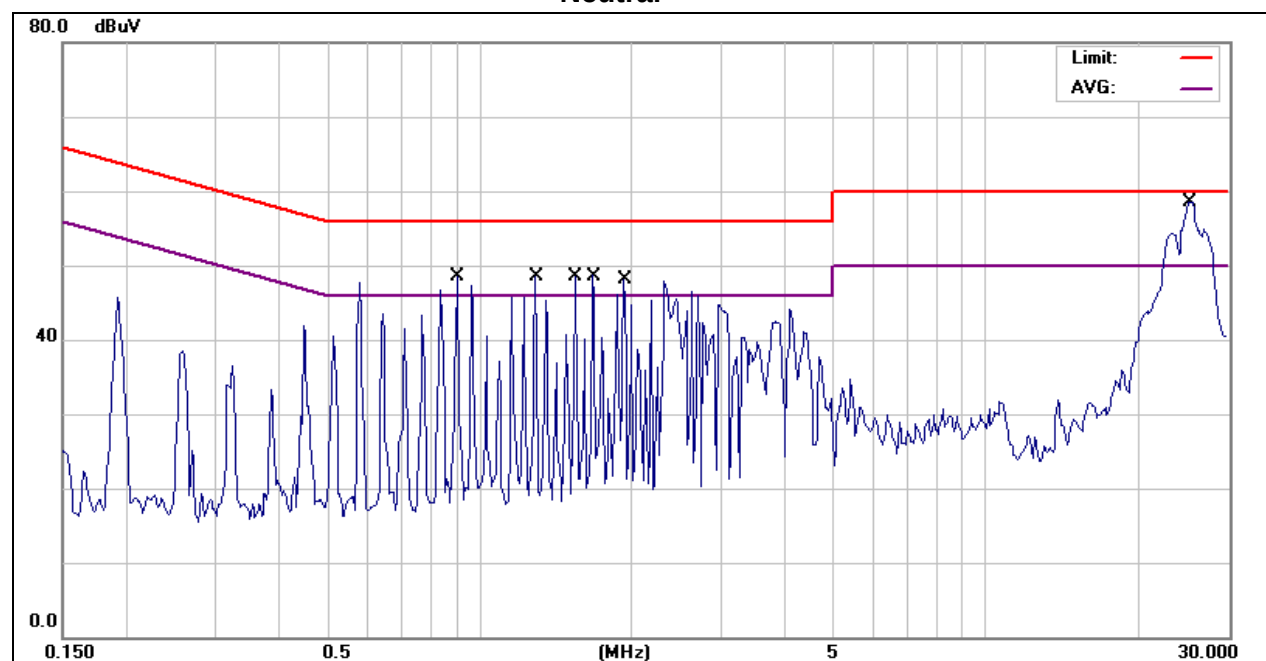
Neutral

No.	Frequency MHz	Reading Level dBμV	Factor dB	Measurement dBμV	Limit dBμV	Over Limit dB	Detector
1	0.9040	38.14	9.67	47.81	56.00	-8.19	QP
2	0.9040	35.12	9.67	44.79	46.00	-1.21	AVG
3	1.2892	38.35	9.68	48.03	56.00	-7.97	QP
4	★1.2892	35.20	9.68	44.88	46.00	-1.12	AVG
5	1.5469	37.15	9.70	46.85	56.00	-9.15	QP
6	1.5469	34.00	9.70	43.70	46.00	-2.30	AVG
7	1.6753	37.11	9.70	46.81	56.00	-9.19	QP
8	1.6753	33.88	9.70	43.58	46.00	-2.42	AVG
9	1.9327	36.48	9.72	46.20	56.00	-9.80	QP
10	1.9327	32.97	9.72	42.69	46.00	-3.31	AVG
11	25.6258	46.29	10.27	56.56	60.00	-3.44	QP
12	25.6258	38.60	10.27	48.87	50.00	-1.13	AVG

Remarks :

1. All readings are Quasi-peak and Average values.
2. Measurement = Reading + Factor (Could have ± 0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. Factor = L.I.S.N. insertion loss + cable loss
5. " ★ " means that this data is the worse case measurement level.
6. The measurement uncertainty is 3.7 dB.

Neutral



- Remark:
1. The Limit (The red line of the graph indicates the quasi-peak measurements).
 2. The AVG (The purple line of the graph indicates the average measurements).
 3. The scan curve indicates peak detector measurement.

Date of Test	October 19, 2011	Temperature	26 °C
EUT	Power over Ethernet	Humidity	60 %
Test Mode	Mode 1	Display Pattern	H Pattern
Test Power Supply	AC 230V/50Hz		

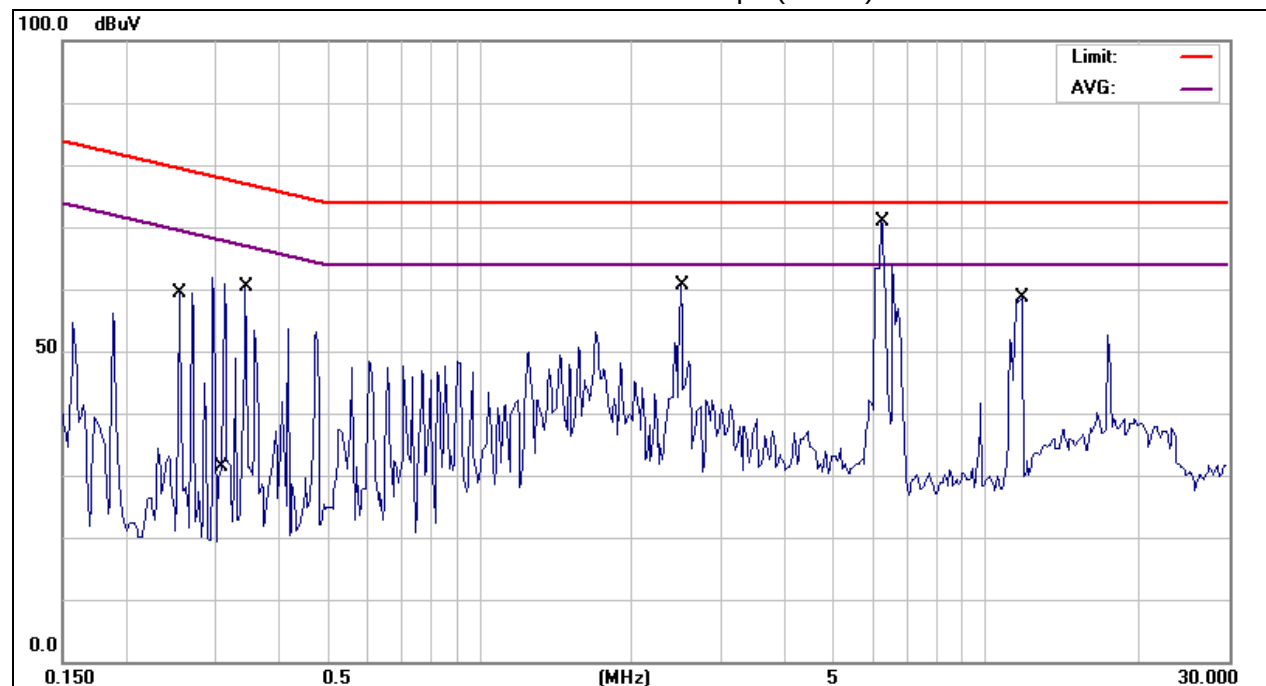
ISN-LAN-10Mbps (Active)

No.	Frequency MHz	Reading Level dBμV	Factor dB	Measurement dBμV	Limit dBμV	Over Limit dB	Detector
1	0.2551	42.60	10.20	52.80	79.59	-26.79	QP
2	0.2551	14.18	10.20	24.38	69.59	-45.21	AVG
3	0.3050	45.34	10.18	55.52	78.11	-22.59	QP
4	0.3050	18.68	10.18	28.86	68.11	-39.25	AVG
5	0.3461	44.78	10.17	54.95	77.06	-22.11	QP
6	0.3461	14.78	10.17	24.95	67.06	-42.11	AVG
7	2.4970	37.78	10.06	47.84	74.00	-26.16	QP
8	2.4970	25.41	10.06	35.47	64.00	-28.53	AVG
9	★6.2499	53.46	10.10	63.56	74.00	-10.44	QP
10	6.2499	37.03	10.10	47.13	64.00	-16.87	AVG
11	11.6877	29.24	10.13	39.37	74.00	-34.63	QP
12	11.6877	13.68	10.13	23.81	64.00	-40.19	AVG

Remarks :

1. All readings are Quasi-peak and Average values.
2. " ★ " means that this data is the worse case measurement level.
3. Measurement = Reading + Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
4. Factor = L.I.S.N. insertion loss + cable loss
5. The measurement uncertainty is 4.0 dB.

ISN-LAN-10Mbps (Active)



- Remark:
1. The Limit (The red line of the graph indicates the quasi-peak measurements).
 2. The AVG (The purple line of the graph indicates the average measurements).
 3. The scan curve indicates peak detector measurement.

Date of Test	October 19, 2011	Temperature	26 °C
EUT	Power over Ethernet	Humidity	60 %
Test Mode	Mode 1	Display Pattern	H Pattern
Test Power Supply	AC 230V/50Hz		

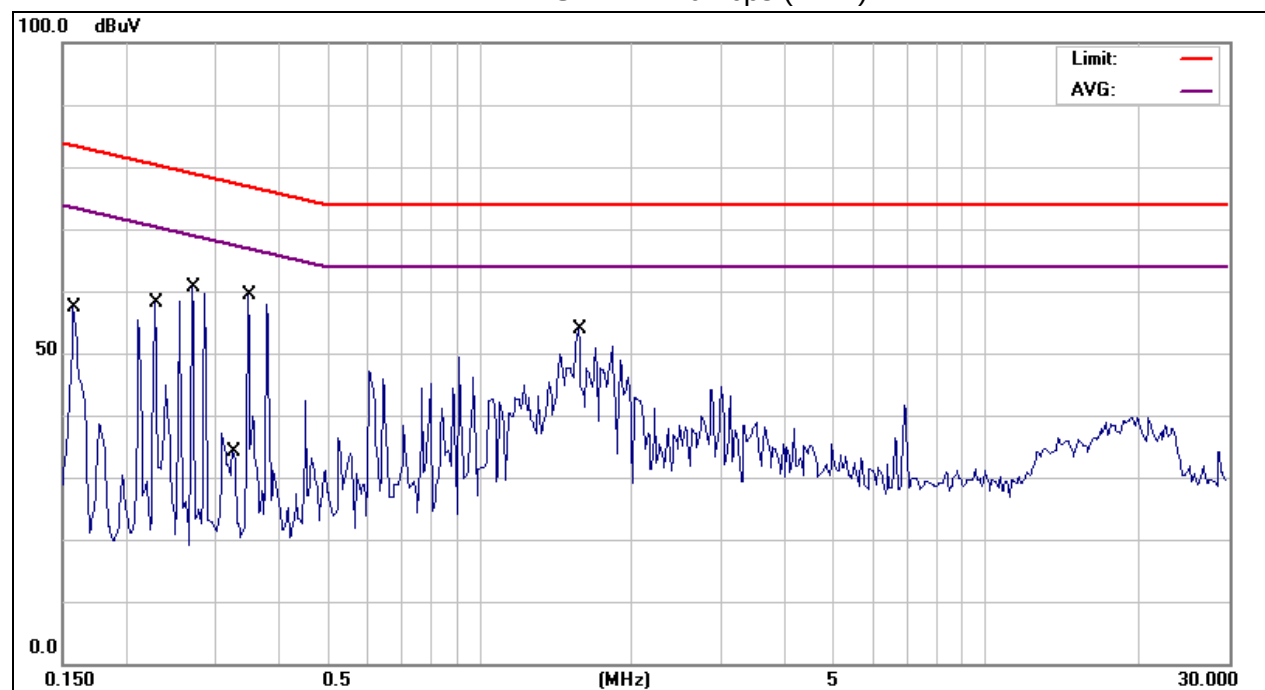
ISN-LAN-10Mbps (IDLE)

No.	Frequency MHz	Reading Level dBμV	Factor dB	Measurement dBμV	Limit dBμV	Over Limit dB	Detector
1	0.1574	45.80	10.25	56.05	83.60	-27.55	QP
2	0.1574	34.28	10.25	44.53	73.60	-29.07	AVG
3	0.2282	41.34	10.21	51.55	80.51	-28.96	QP
4	0.2282	16.59	10.21	26.80	70.51	-43.71	AVG
5	0.2702	43.50	10.20	53.70	79.11	-25.41	QP
6	0.2702	13.97	10.20	24.17	69.11	-44.94	AVG
7	0.3231	45.40	10.18	55.58	77.63	-22.05	QP
8	0.3231	19.17	10.18	29.35	67.63	-38.28	AVG
9	0.3491	44.34	10.17	54.51	76.98	-22.47	QP
10	0.3491	17.63	10.17	27.80	66.98	-39.18	AVG
11	1.5741	45.80	10.05	55.85	74.00	-18.15	QP
12	★1.5741	40.47	10.05	50.52	64.00	-13.48	AVG

Remarks :

1. All readings are Quasi-peak and Average values.
2. " ★ " means that this data is the worse case measurement level.
3. Measurement = Reading + Factor (Could have ± 0.01 tolerance due to computer automatically round off calculation).
4. Factor = L.I.S.N. insertion loss + cable loss
5. The measurement uncertainty is 4.0 dB.

ISN-LAN-10Mbps (IDLE)



- Remark:
1. The Limit (The red line of the graph indicates the quasi-peak measurements).
 2. The AVG (The purple line of the graph indicates the average measurements).
 3. The scan curve indicates peak detector measurement.

Date of Test	October 19, 2011	Temperature	26 °C
EUT	Power over Ethernet	Humidity	60 %
Test Mode	Mode 1	Display Pattern	H Pattern
Test Power Supply	AC 230V/50Hz		

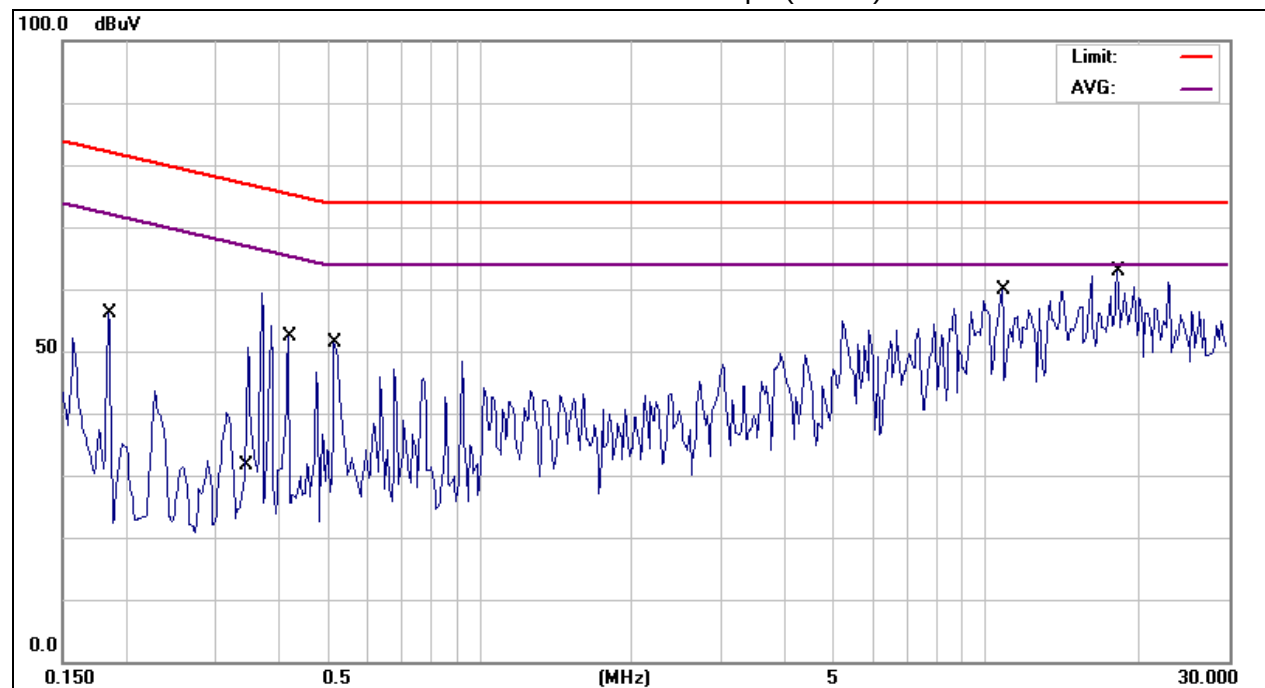
ISN-LAN-100Mbps (Active)

No.	Frequency MHz	Reading Level dBμV	Factor dB	Measurement dBμV	Limit dBμV	Over Limit dB	Detector
1	0.1850	38.70	10.23	48.93	82.26	-33.33	QP
2	0.1850	12.91	10.23	23.14	72.26	-49.12	AVG
3	0.3402	44.72	10.17	54.89	77.20	-22.31	QP
4	0.3402	15.16	10.17	25.33	67.20	-41.87	AVG
5	0.4128	39.74	10.14	49.88	75.59	-25.71	QP
6	0.4128	21.80	10.14	31.94	65.59	-33.65	AVG
7	0.5075	34.76	10.11	44.87	74.00	-29.13	QP
8	0.5075	19.70	10.11	29.81	64.00	-34.19	AVG
9	10.7941	48.98	10.14	59.12	74.00	-14.88	QP
10	10.7941	44.81	10.14	54.95	64.00	-9.05	AVG
11	18.3036	50.74	10.07	60.81	74.00	-13.19	QP
12	★18.3036	46.58	10.07	56.65	64.00	-7.35	AVG

Remarks :

1. All readings are Quasi-peak and Average values.
2. " ★ " means that this data is the worse case measurement level.
3. Measurement = Reading + Factor (Could have ± 0.01 tolerance due to computer automatically round off calculation).
4. Factor = L.I.S.N. insertion loss + cable loss
5. The measurement uncertainty is 4.0 dB.

ISN-LAN-100Mbps (Active)



- Remark:
1. The Limit (The red line of the graph indicates the quasi-peak measurements).
 2. The AVG (The purple line of the graph indicates the average measurements).
 3. The scan curve indicates peak detector measurement.

Date of Test	October 19, 2011	Temperature	26 °C
EUT	Power over Ethernet	Humidity	60 %
Test Mode	Mode 1	Display Pattern	H Pattern
Test Power Supply	AC 230V/50Hz		

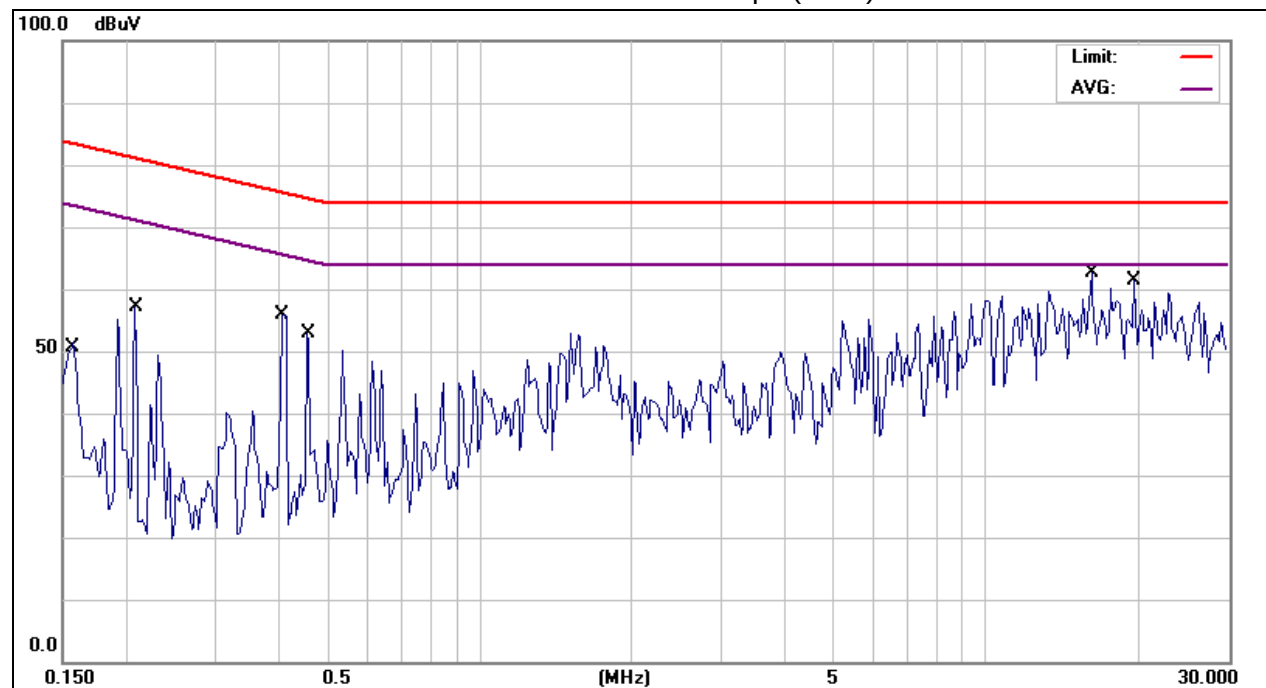
ISN-LAN-100Mbps (IDLE)

No.	Frequency MHz	Reading Level dBμV	Factor dB	Measurement dBμV	Limit dBμV	Over Limit dB	Detector
1	0.1542	45.52	10.26	55.78	83.77	-27.99	QP
2	0.1542	33.56	10.26	43.82	73.77	-29.95	AVG
3	0.2084	40.16	10.22	50.38	81.27	-30.89	QP
4	0.2084	11.52	10.22	21.74	71.27	-49.53	AVG
5	0.4094	40.16	10.14	50.30	75.66	-25.36	QP
6	0.4094	20.78	10.14	30.92	65.66	-34.74	AVG
7	0.4585	37.22	10.13	47.35	74.72	-27.37	QP
8	0.4585	14.59	10.13	24.72	64.72	-40.00	AVG
9	16.2283	51.86	10.09	61.95	74.00	-12.05	QP
10	★16.2283	47.76	10.09	57.85	64.00	-6.15	AVG
11	19.7109	49.54	10.05	59.59	74.00	-14.41	QP
12	19.7109	45.50	10.05	55.55	64.00	-8.45	AVG

Remarks :

1. All readings are Quasi-peak and Average values.
2. " ★ " means that this data is the worse case measurement level.
3. Measurement = Reading + Factor (Could have ± 0.01 tolerance due to computer automatically round off calculation).
4. Factor = L.I.S.N. insertion loss + cable loss
5. The measurement uncertainty is 4.0 dB.

ISN-LAN-100Mbps (IDLE)



- Remark:
1. The Limit (The red line of the graph indicates the quasi-peak measurements).
 2. The AVG (The purple line of the graph indicates the average measurements).
 3. The scan curve indicates peak detector measurement.

5. RADIATED EMISSION MEASUREMENT

5.1 TEST EQUIPMENT

The following test equipments are used during the radiated emission tests:

Item	Instrument	Manufacturer	Model	S/N or Version	Next Cal. Date
1	TEST RECEIVER	R & S	ESCS30	100393	2012.04.05
2	SPECTRUM	ADVANTEST	U3751	161000225	2012.04.21
3	PRE-AMPLIFIER	HP	8447D	2944A08273	2012.10.03
4	BILOG ANTENNA	SCHAFFNER	CBL6112B	2588	2012.07.04
5	CABLE	PEWC	CFD400-NL	GTK-E-A408-01	2012.02.28
6	Software	FARAD	EZ-EMC	2A1.1(USB)	N/A

Note: 1. All equipments are calibrated and will be valid only for a period of 1 year.

2. The test was performed at GTK Open Site B2.

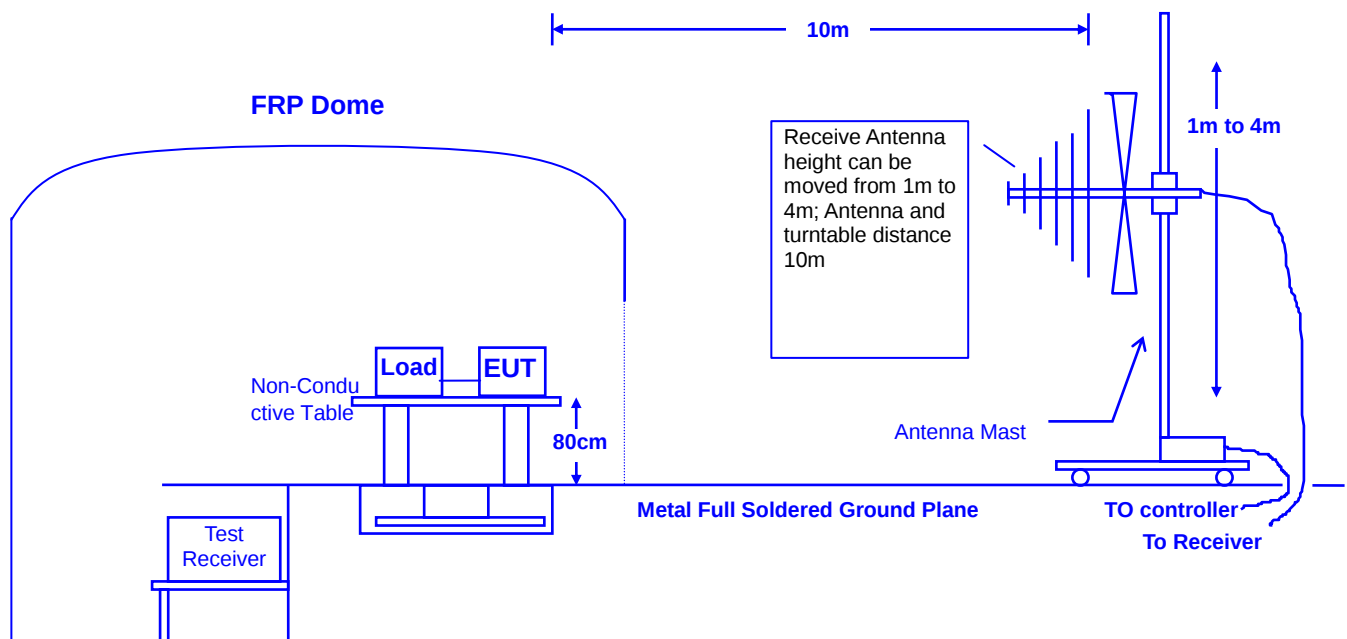
5.2 TEST METHOD

According to EN 55022: 2006 + A1: 2007

5.3 OPEN AREA TEST SITE SETUP DIAGRAM

Note: This is a representative setup diagram for Table-top EUT.

For Floor-standing EUT, the table will be removed with all others setup condition remain the same.



5.4 RADIATED EMISSION LIMITS

Frequency	Distance	Field Strength
	Class B	
MHz	Meter	dB(μ V/m)
30 to 230	10	30
230 to 1000	10	37

Remark: 1. The tighter limit shall apply at the edge between two frequency bands.

2. Distance refers to the distance in meters between the measuring antenna and the closest point of any part of the device or system.

5.5 EUT CONFIGURATION

The EUT, which is listed at 5.1, was installed at the Radiated Emission Test site to meet the Commission requirements and operated in a manner, which tends to maximize its emission characteristics in a normal application.

The EUT, installed in a representative system as described in section 5.3, was placed on a non-conductive table whose total height equaled 80 cm. This table can be rotated 360 degrees.

5.5.1 30 MHz to 1 GHz

The measurement antenna was mounted to a non-conductive mast capable of moving the antenna vertically. Antenna height was varied from 1 m to 4 m and the system under test was rotated from 0 degree through 360 degrees relative to the antenna position and polarization (Horizontal and Vertical). Also the I/O cable positions were investigated to find the maximum emission condition.

5.6 OPERATING CONDITIONS OF THE EUT

Same as conducted emission measurement, which is listed in 4.7

5.7 RADIATED EMISSION DATA

According EN 55022: 2006 + A1: 2007 Section 6.2, the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a radiated emission limit is specified, up to the frequency shown in the following table:

Highest frequency of the internal sources of the EUT (MHz)	Upper frequency of measurement rang (MHz)
<108	1000
108-500	2000
500-1000	5000
Above 1000	5 th harmonic of the highest frequency or 6 GHz, whichever is less

5.7.1 30 MHz to 1 GHz

The measurement range of radiated emission, which is from **30 MHz to 1 GHz**, was investigated. All readings are quasi-peak values with a resolution bandwidth of 120 kHz. The initial step in collecting radiated emission data is a spectrum analyzer peak scans of the measurement range for all the test modes and then use test receiver for final measurement and record at least the disturbance levels and the frequencies of the six highest disturbances. Then the worst modes were reported the following data pages.

5.8 RADIATED EMISSIONS MEASUREMENT RESULTS

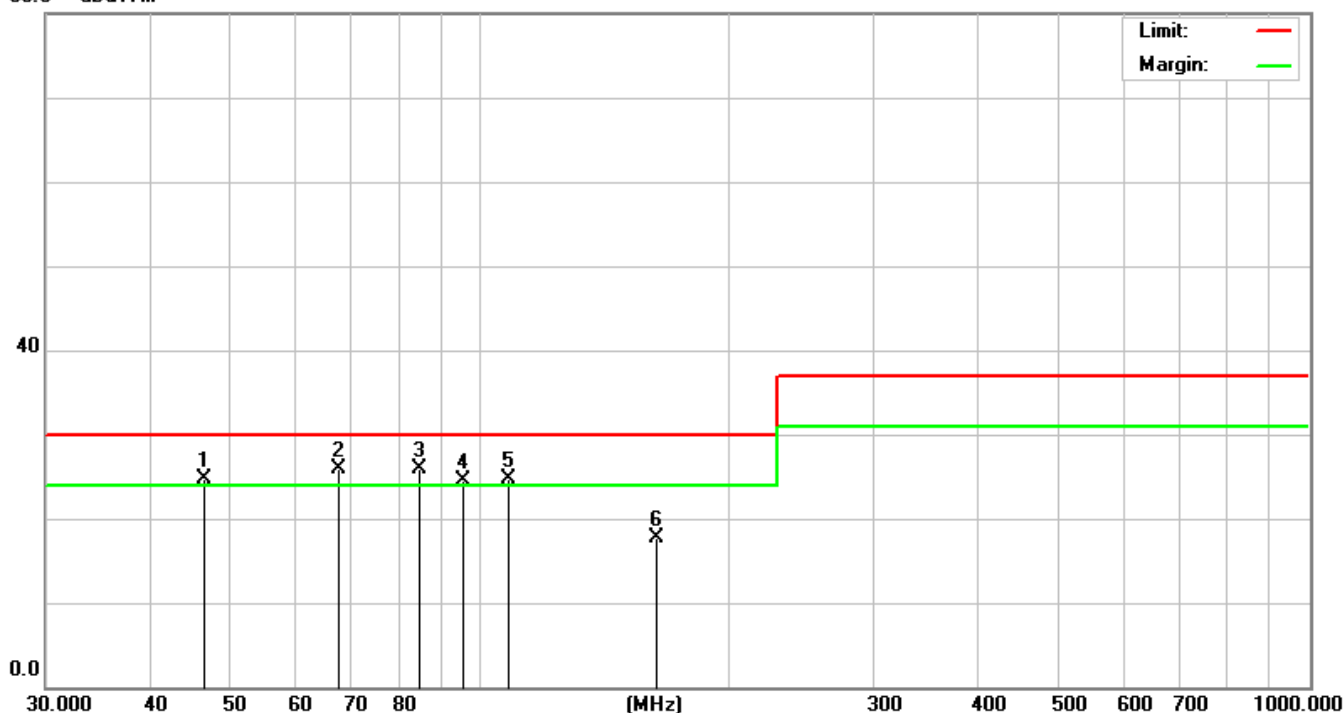
Date of Test	November 10, 2011	Temperature	26 deg/C
EUT	Power over Ethernet	Humidity	60 %RH
Working Cond.	Mode 1	Display Pattern	H Pattern
Antenna distance	10m at Horizontal	Test Frequency Range	30-1000MHz
Test Power Supply	AC 230V/50Hz		

No.	Frequency MHz	Reading Level dB μ V	Factor dB	Measurement dB μ V/m	Limit dB μ V/m	Over Limit dB	Detector
1	46.5400	41.23	-16.47	24.76	30.00	-5.24	QP
2	★67.8500	45.18	-19.22	25.96	30.00	-4.04	QP
3	84.8520	43.30	-17.41	25.89	30.00	-4.11	QP
4	95.6900	39.95	-15.43	24.52	30.00	-5.48	QP
5	108.6300	38.49	-13.69	24.80	30.00	-5.20	QP
6	163.6500	32.25	-14.64	17.61	30.00	-12.39	QP

Remarks:

1. All Readings below 1GHz are Quasi-Peak.
2. Measurement = Reading + Factor (Could have ± 0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. Factor = antenna factor + cable loss – amplifier gain.
5. “★” means that this data is the worst case measurement level.
6. The antenna height could have ± 1 cm tolerance and the turn table degree could have $\pm 1^\circ$ tolerance.
7. The measurement uncertainty is 6.6 dB.

80.0 dB μ V/m



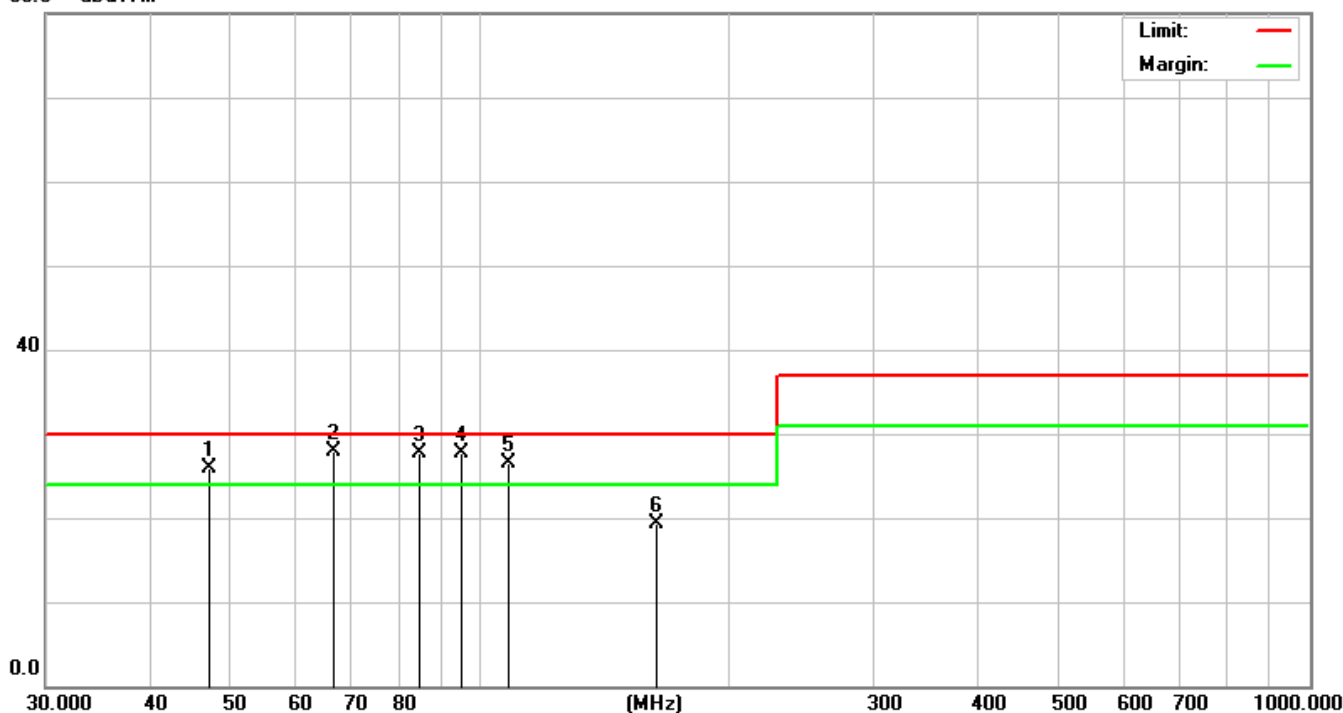
- Remark:
1. The Limit (The red line of the graph indicates the quasi -peak measurements).
 2. The Margin (The green line of the graph indicates the 6dB margin).

Date of Test	November 10, 2011	Temperature	26 deg/C
EUT	Power over Ethernet	Humidity	60 %RH
Working Cond.	Mode 1	Display Pattern	H Pattern
Antenna distance	10m at Vertical	Test Frequency Range	30-1000MHz
Test Power Supply	AC 230V/50Hz		

No.	Frequency MHz	Reading Level dBμV	Factor dB	Measurement dBμV/m	Limit dBμV/m	Over Limit dB	Detector
1	47.2500	42.36	-16.44	25.92	30.00	-4.08	QP
2	★66.6900	47.10	-19.25	27.85	30.00	-2.15	QP
3	84.6800	45.12	-17.43	27.69	30.00	-2.31	QP
4	95.2300	43.32	-15.53	27.79	30.00	-2.21	QP
5	108.3200	40.23	-13.72	26.51	30.00	-3.49	QP
6	163.6300	34.00	-14.64	19.36	30.00	-10.64	QP

Remarks:

1. All Readings below 1GHz are Quasi-Peak.
2. Measurement = Reading + Factor (Could have ± 0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. Factor = antenna factor + cable loss – amplifier gain.
5. “★” means that this data is the worst case measurement level.
6. The antenna height could have ± 1 cm tolerance and the turn table degree could have $\pm 1^\circ$ tolerance.
7. The measurement uncertainty is 6.6 dB.

80.0 dBμV/m


- Remark:
1. The Limit (The red line of the graph indicates the quasi -peak measurements).
 2. The Margin (The green line of the graph indicates the 6dB margin).

6. HARMONIC CURRENT EMISSIONS, VOLTAGE FLUCTUATIONS AND FLICKER MEASUREMENT

6.1 TEST EQUIPMENT

Item	Instrument	Manufacturer	Model	S/N or Version.	Next Cal. Date
1	Signal Conditioning Unit	SCHAFFNER	CCN1000-1	72282	2012.05.04
2	AC Power Source	PACIFIC	345AMX/UPC32	270	N/A
3	Software	SCHAFFNER	WIN2100 V3	3.2.0.31	N/A

Note: 1. All equipments are calibrated and will be valid only for a period of 1 year.

2. The test was performed at GTK Shielded Room B7.

6.2 TEST METHOD

According to EN 61000-3-2: 2006+A1: 2009+A2: 2009

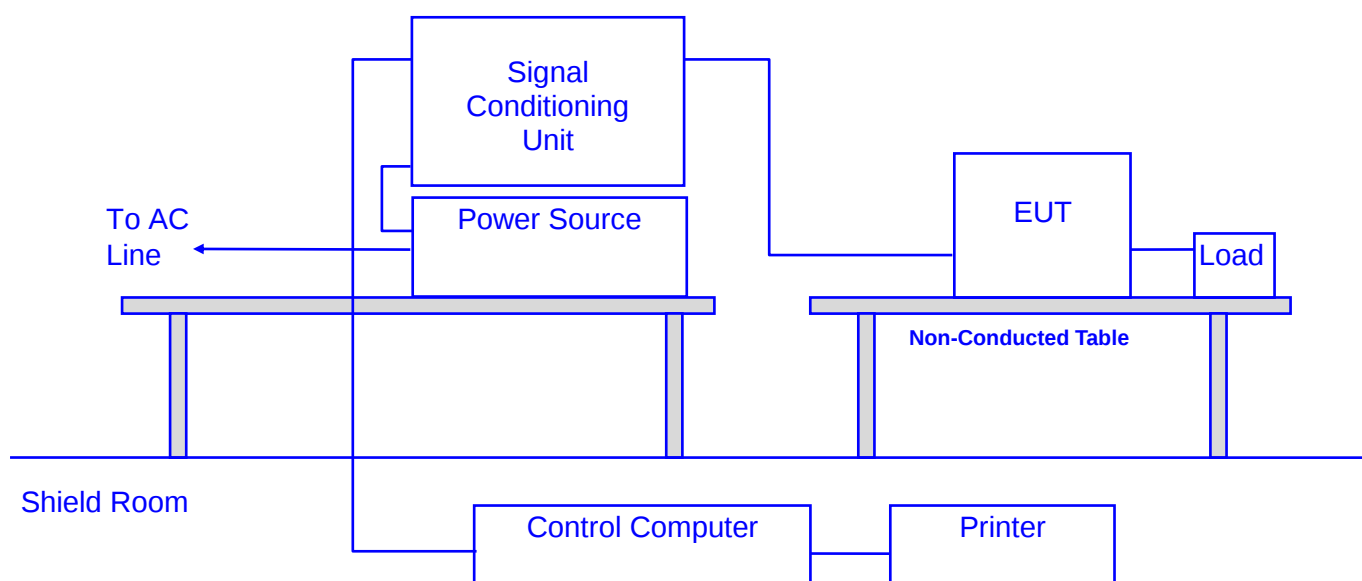
(Note: EUT power level is below 75 Watts and therefore has no defined limits)

EN 61000-3-3: 2008.

6.3 BLOCK DIAGRAM OF TEST SETUP

Note: This is a representative setup diagram for Table-top EUT.

For Floor-standing EUT, the table will be removed with all others setup condition remain the same.



6.4 LIMITS OF FLICKER MEASUREMENT

Flicker:

Limits	
P_{st}	1.0
P_{lt}	0.65
$d(t)$	3.3%
Time(ms)>dt	500ms
d_c	3.3%
d_{max}	4%

6.5 OPERATING CONDITIONS OF THE EUT

1. Setup the EUT and Test Equipment as shown on 6.3.
2. Power on the EUT. Acting performance checking program to allow EUT executing its usual operation mode during test.

6.6 TEST PROCEDURE

6.6.1 Flicker:

The test voltage supplied the EUT shall be maintained within $230V \pm 2\%$.

The frequency shall be $50Hz \pm 0.5\%$.

The observation period T_p :

-for P_{st} $T_p = 10\text{min}$.

-for P_{lt} $T_p = 2\text{h}$.

6.7 TEST RESULT

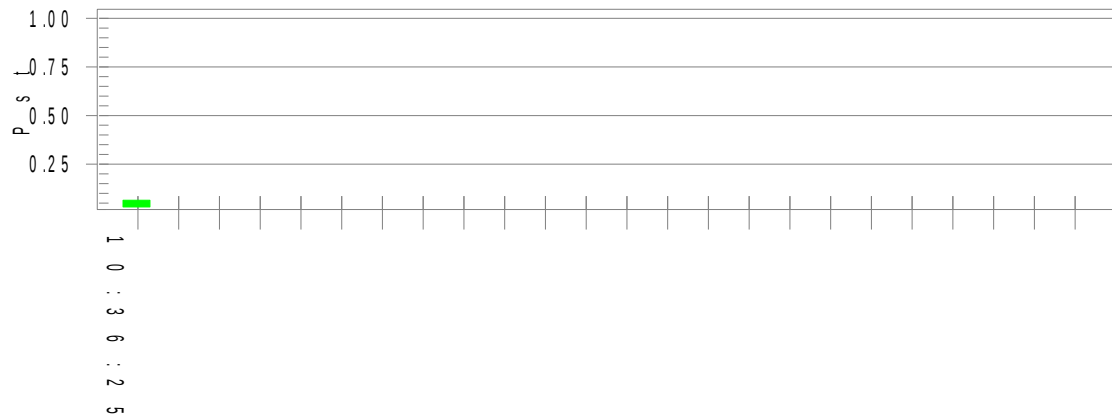
1. The measurement of the flicker, which test at the extremes of EUT's supply range was investigated, and the test result are reported the following data pages. The measurement limits were met, and the EUT passed the test.
2. The Flicker measurement uncertainty is 0.02 %.

Flicker Test Summary per EN/IEC61000-3-3 (Run time)

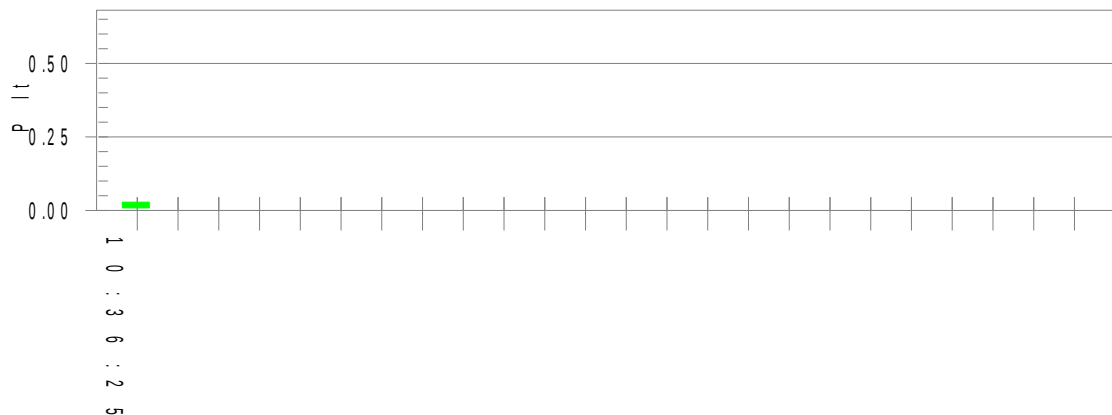
EUT: Power over Ethernet
Tested by: Eric Tsai
Test category: All parameters (European limits)
Test Margin: 100
Test date: 2011/11/10
Start time: AM 10:26:05
End time: AM 10:36:25
Test duration (min): 10
Data file name: F-000638.cts_data
Comment: M/N MIT-09G
Customer: MSTRONIC CO., LTD.
Test Result: Pass
Status: Test Completed

Pst_i and limit line

European Limits



Plt and limit line



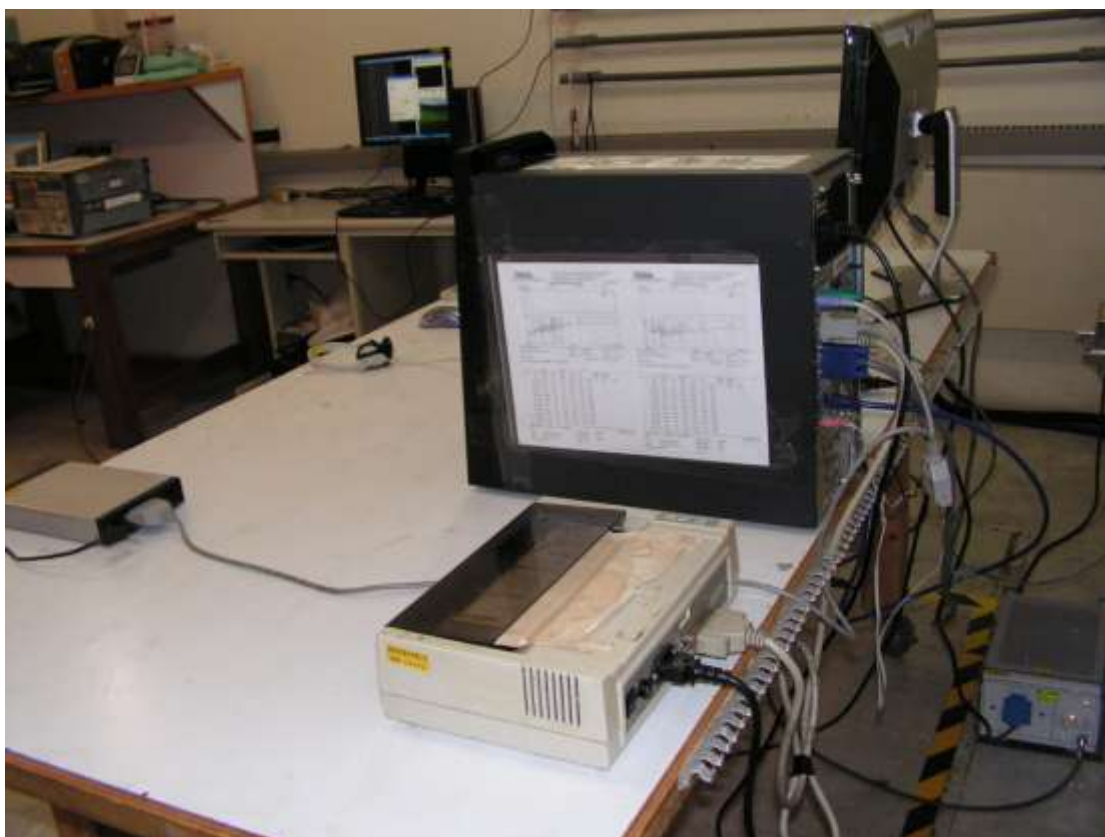
Parameter values recorded during the test:

Vrms at the end of test (Volt):	228.25			
Highest dt (%):	0.00	Test limit (%):	3.30	Pass
Time(mS) > dt:	0.0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	0.00	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.064	Test limit:	1.000	Pass
Highest Plt (2 hr. period):	0.028	Test limit:	0.650	Pass

7. PHOTOGRAPHS FOR TEST

7.1 TEST PHOTOGRAPHS FOR CONDUCTION

Mode 1



7.2 TEST PHOTOGRAPHS FOR RADIATED

Mode 1



7.3 TEST PHOTOGRAPHS FOR HARMONIC/FLICKER

Mode 1

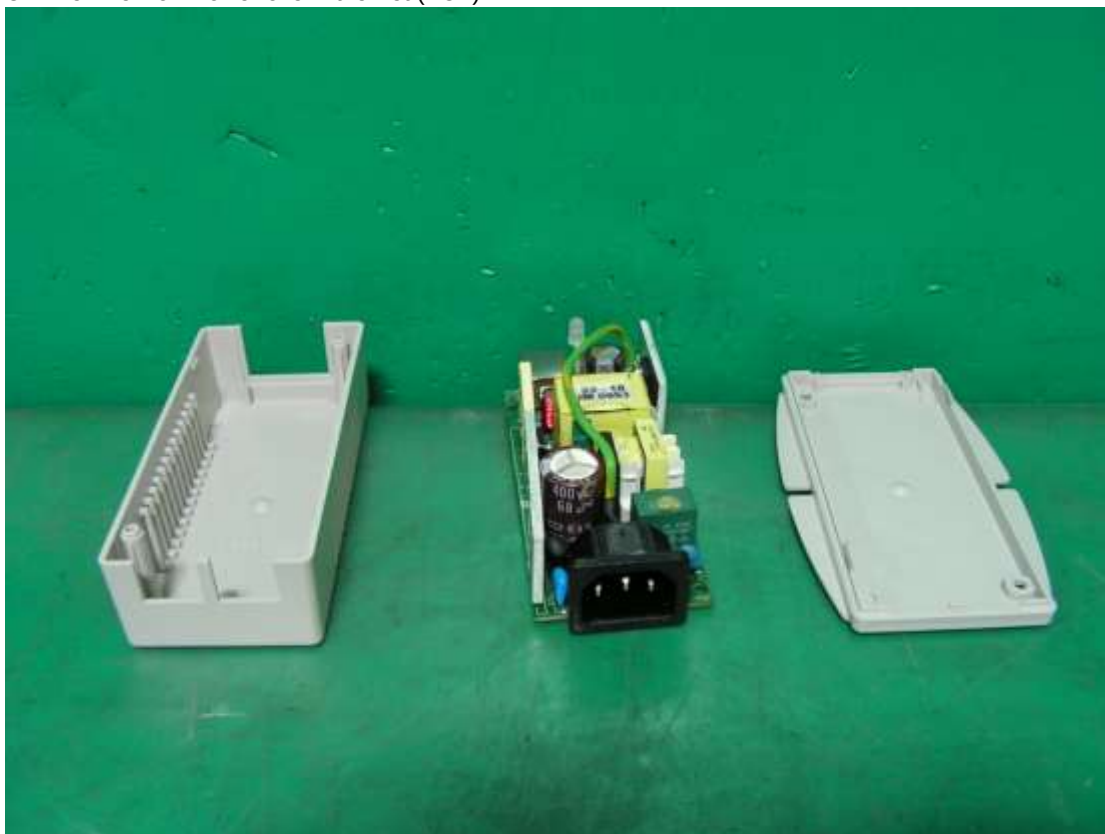


8. PHOTOGRAPHS FOR PRODUCT

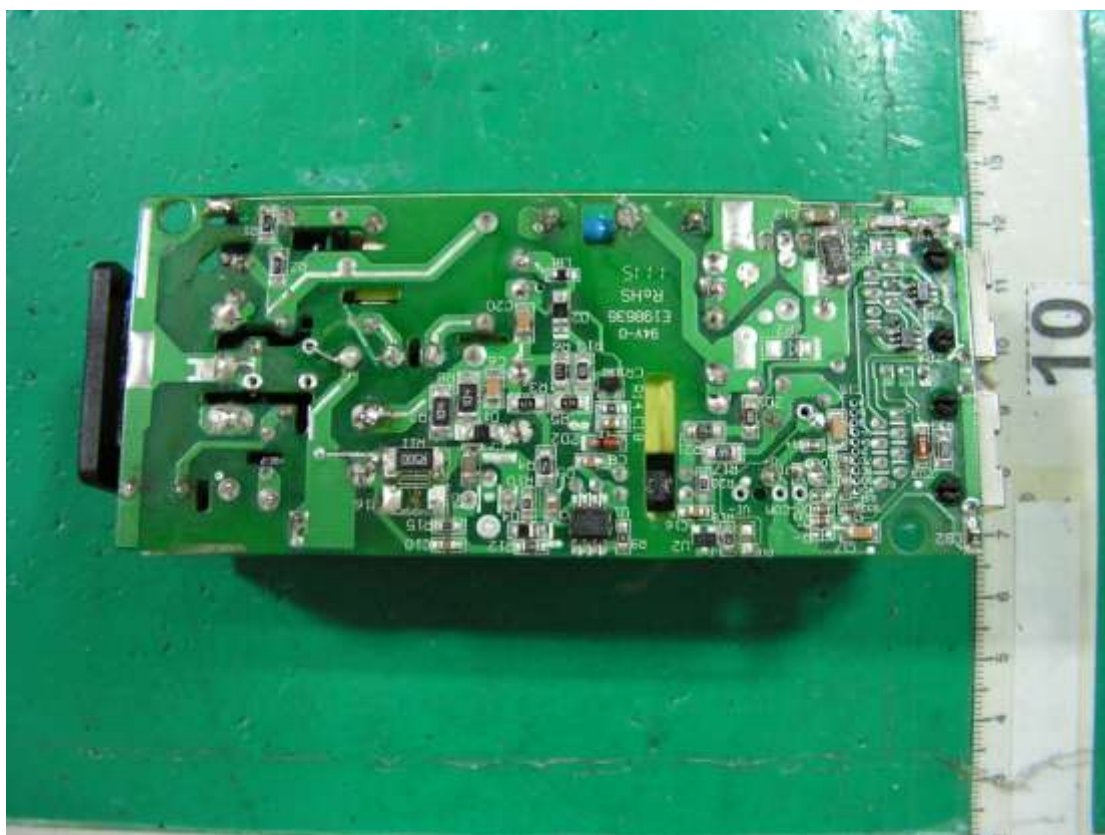
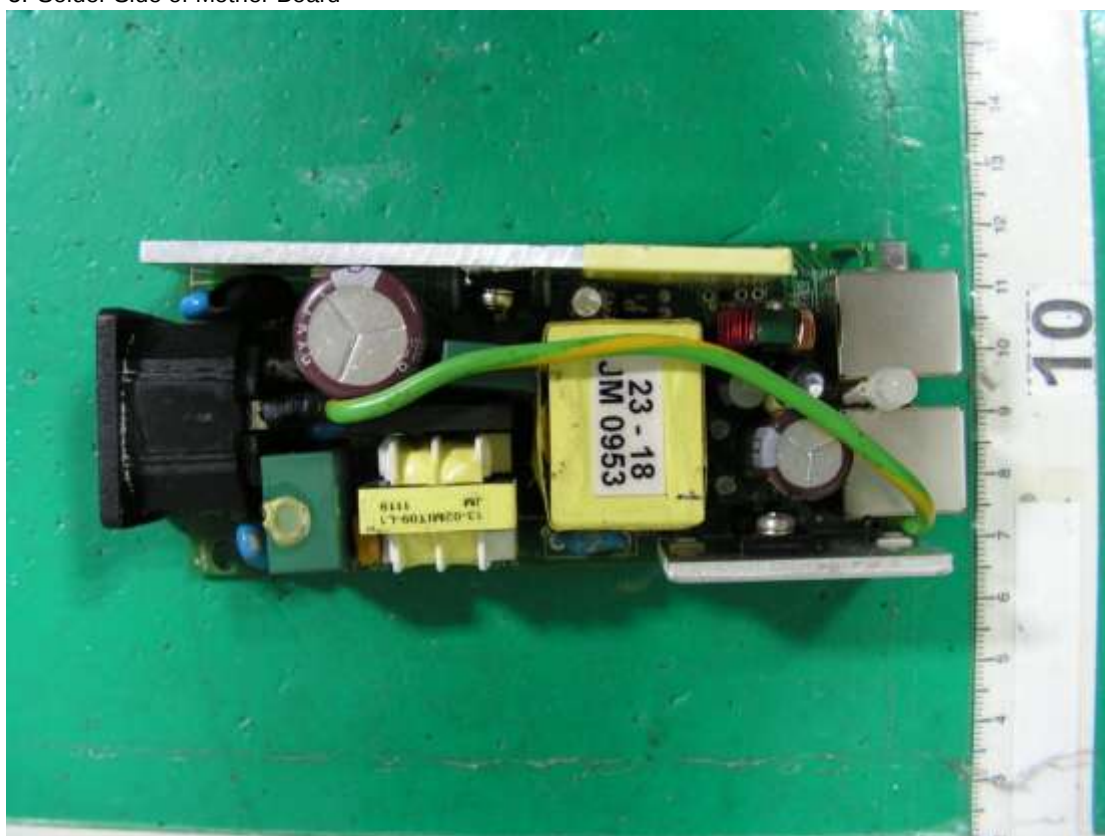
1. Front View of Power over Ethernet.(EUT)
2. Back View of Power over Ethernet.(EUT)



3. Inner View of Power over Ethernet.(EUT)



4. Component Side of Mother Board
5. Solder Side of Mother Board



9. EMI/EMS REDUCTION METHOD DURING COMPLIANCE TESTING

No modification was made during testing.