



Test Report

Product Name : ProNet

Model No. : ProNet

Applicant : Estun Automation Technology Co.,Ltd

Address : 155, Jiangjun Road,Jiangning Development
Zone,Nanjing 211106,P.R.China

Date of Receipt : Feb. 16, 2011

Test Date : Feb. 16, 2011 ~ Feb. 21, 2011

Issued Date : Feb. 22, 2011

Report No. : 112S007E-IT-CE-P01V01

Report Version : V2.0

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standards through the calibration of the equipment and evaluated measurement uncertainty herein.

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Test Report Certification

Issued Date : Feb. 22, 2011

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Product Name : ProNet
 Applicant : Estun Automation Technology Co.,Ltd
 Address : 155, Jiangjun Road,Jiangning Development Zone,Nanjing
 211106,P.R.China
 Manufacturer : Estun Automation Technology Co.,Ltd
 Address : 155, Jiangjun Road,Jiangning Development Zone,Nanjing
 211106,P.R.China
 Model No. : ProNet
 Brand Name : N/A
 EUT Voltage : AC 230V/50Hz
 Applicable Standard : EN 61326-1:2006
 Test Result : Complied
 Performed Location : Suzhou EMC Laboratory
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Laboratory Information

We, **Quietek Corporation**, are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted(audited or listed) by the following related bodies in compliance with ISO 17025, EN 45001 and specified testing scope:

Taiwan R.O.C.	: BSMI, NCC, TAF
Germany	: TUV Rheinland
Norway	: Nemko, DNV
USA	: FCC, NVLAP
Japan	: VCCI

The related certificate for our laboratories about the test site and management system can be downloaded from Quietek Corporation's Web Site :<http://www.quietek.com/tw/ctg/cts/accreditations.htm>
The address and introduction of Quietek Corporation's laboratories can be founded in our Web site :
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1. General Information**1.1. EUT Description**

Product Name	ProNet
Trade Name	N/A
Model No.	ProNet

1.2. Mode of Operation

QuieTek has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

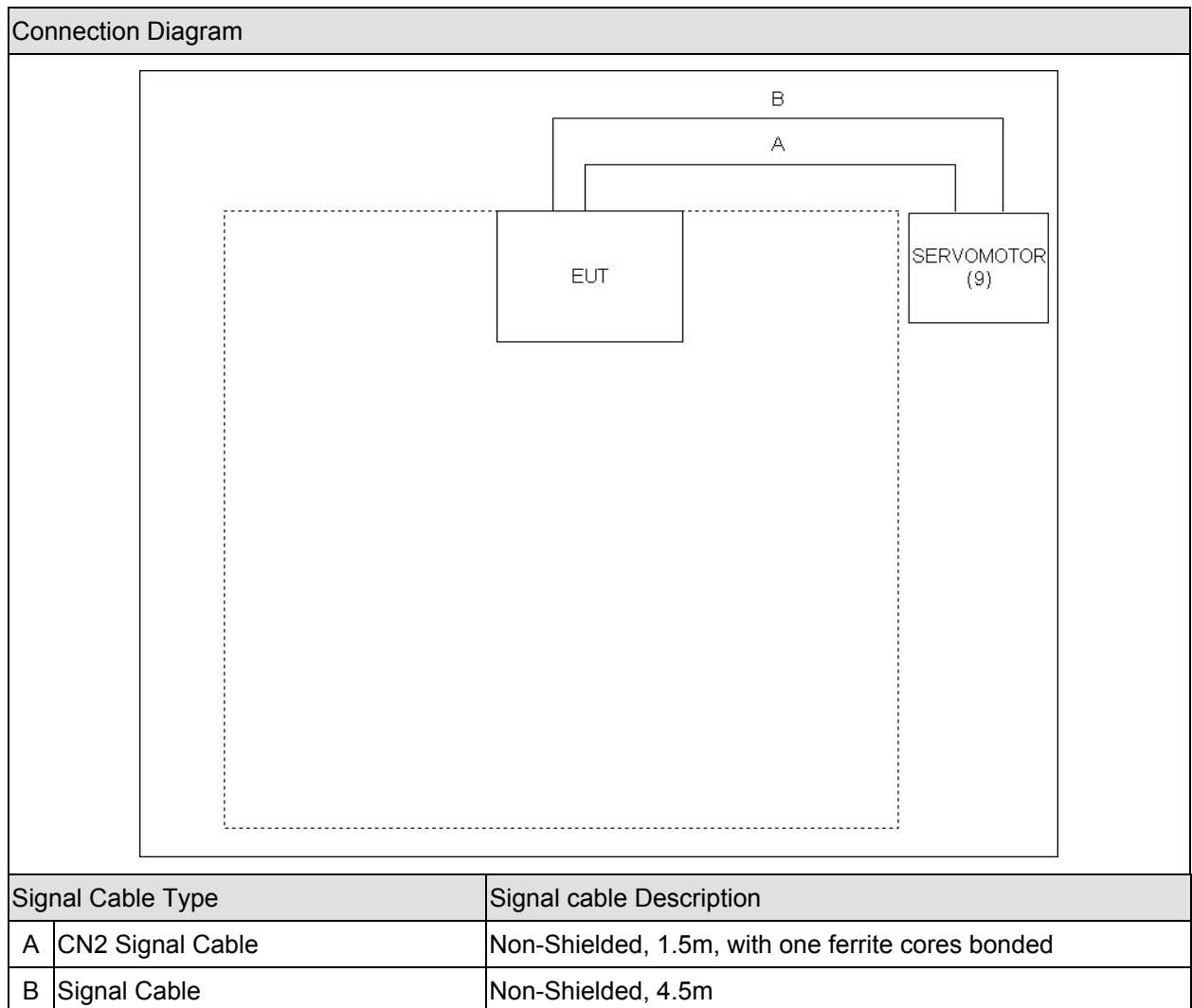
Test Mode	
Emission	Mode 1: Continuously operating
Immunity	Mode 1: Continuously operating

1.3. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	SERVOMOTOR	Estun	EMG-15ADAZZ	51458261019	N/A

1.4. Configuration of Tested System



1.5. EUT Exercise Software

1	Setup the EUT and simulators as shown.
2	Turn on the power of all equipment.
3	Make sure the EUT is in continuously operating mode.

2. Technical Test

2.1. Summary of Test Result

- ☒ No deviations from the test standards
- ☐ Deviations from the test standards as below description:

Emission			
Performed Test Item	Normative References	Test Performed	Deviation
Conducted Emission	CISPR 11:2004 Group 1 Class A	Yes	No
Radiated Emission	CISPR 11:2004 Group 1 Class A	Yes	No
Harmonic Current Emission	IEC 61000-3-2 Edition 3.2 (2009-04)	N/A	N/A
Voltage Fluctuation and Flicker	IEC 61000-3-3 Edition 2.0 (2008-06)	N/A	N/A

Immunity			
Performed Test Item	Normative References	Test Performed	Deviation
Electrostatic Discharge	IEC 61000-4-2 Edition 2.0 (2008-12)	Yes	No
Radiated Susceptibility	IEC 61000-4-3 Edition 3.1 (2008-04)	Yes	No
Electrical Fast Transient/Burst	IEC 61000-4-4 Ed. 2.0 (2004-07)	Yes	No
Surge	IEC 61000-4-5 Edition 2.0 (2005-11)	Yes	No
Conducted Susceptibility	IEC 61000-4-6 Edition 3.0 (2008-10)	Yes	No
Voltage Dips and Interruption	IEC 61000-4-11 Ed. 2 (2004-03)	Yes	No

2.2. List of Test Equipment

Conducted disturbance / TR1

Instrument	Manufacturer	Model No.	Serial No.	Cali. Due Date
EMI Test Receiver	R&S	ESCI	100906	2012.01.15
Two-Line V-Network	R&S	ENV216	101043	2011.06.18
Two-Line V-Network	R&S	ENV216	101044	2011.09.07
50ohm Termination	SHX	TF2	07081401	2011.09.27
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	2011.05.05
Coaxial Cable	Suhner	RG 223	TR1-C1	2011.05.05
Temperature/Humidity Meter	zhicheng	ZC1-2	TR1-TH	2012.01.14

Radiated disturbance / AC1

Instrument	Manufacturer	Model No.	Serial No.	Cali. Due Date
EMI Test Receiver	R&S	ESCI	100175	2011.09.27
EMI Test Receiver	R&S	ESCI	100726	2011.04.23
Spectrum Analyzer	Agilent	N9010A	MY48030494	2011.04.23
Preamplifier	Quietek	AP-025C	CHM-0511006	2011.05.05
Preamplifier	Quietek	AP-025C	CHM-0609028	2011.05.05
Preamplifier	Quietek	AP-180C	CHM-0602013	2011.05.05
Bilog Antenna	Schaffner	CBL6112B	2931	2011.10.18
Bilog Antenna	Schaffner	CBL6112B	2933	2011.10.18
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	499	2011.06.11
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC1-L	2011.05.05
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC1-R	2011.05.05
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC1-C	2011.05.05
Temperature/Humidity Meter	zhicheng	ZC1-2	AC1-TH	2012.01.14

Radiated disturbance / AC2

Instrument	Manufacturer	Model No.	Serial No.	Cali. Due Date
EMI Test Receiver	R&S	ESCI	100573	2011.04.23
Bilog Antenna	Teseq GmbH	CBL6112D	27611	2011.10.18
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC2-C	2011.05.05
Temperature/Humidity Meter	zhicheng	ZC1-2	AC2-TH	2012.01.14

Radiated disturbance / AC3

Instrument	Manufacturer	Model No.	Serial No.	Cali. Due Date
EMI Test Receiver	R&S	ESCI	100176	2011.09.27
Bilog Antenna	Teseq GmbH	CBL6112D	27613	2011.10.18
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC3-C	2011.05.05
Temperature/Humidity Meter	zhicheng	ZC1-2	AC3-TH	2012.01.14

Radiated disturbance / AC5

Instrument	Manufacturer	Model No.	Serial No.	Cali. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2011.04.23
Preamplifier	Quietek	AP-180C	CHM-0602013	2011.05.05
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	499	2011.06.11
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2011.05.05
Temperature/Humidity Meter	zhicheng	ZC1-2	AC5-TH	2012.01.14

Harmonic current emissions / TR1

Instrument	Manufacturer	Model No.	Serial No.	Cali. Due Date
Power Analyzer	California	PACS-1	72419	2011.11.11
AC Power Source	California	5001iX-208	56741	2011.11.11
Temperature/Humidity Meter	zhicheng	ZC1-2	TR1-TH	2012.01.14

Voltage fluctuation and flicker / TR1

Instrument	Manufacturer	Model No.	Serial No.	Cali. Due Date
Power Analyzer	California	PACS-1	72419	2011.11.11
AC Power Source	California	5001iX-208	56741	2011.11.11
Temperature/Humidity Meter	zhicheng	ZC1-2	TR1-TH	2012.01.14

Electrostatic discharge / TR3

Instrument	Manufacturer	Model No.	Serial No.	Cali. Due Date
ESD Simulator	EM TEST	Dito	V0616101367	2011.07.26
ESD Simulator	EMC PARTNER	ESD3000DN1	140	2011.05.05
Barometer	Fengyun	DYM3	0506048	2011.10.15
Temperature/Humidity Meter	zhicheng	ZC1-2	TR3-TH	2012.01.14

Radio-frequency electromagnetic field / AC4

Instrument	Manufacturer	Model No.	Serial No.	Cali. Due Date
Signal Generator	R&S	SML03	102324	2011.09.27
Power Meter	Boonton	4231A	144502	2011.09.27
Power Sensor	Boonton	51011-EMC	33859	2011.09.27
Power Meter	Agilent	E4416A	GB41293844	2011.09.27
Power Sensor	Agilent	E9304A	MY41497198	2011.09.27
RF Switch	MF	SW1072	RFSW980005	N/A
Power Amplifier	Schaffner	CBA9413B	43526	NA
Power Amplifier	Schaffner	CBA9428	43516	NA
Directional Coupler	Schaffner	CHA 9652B	0121	N/A
Directional Coupler	A&R	DC7144A	312249	N/A
E-Field Probe Type 8.3	Narda	2244/90.21	AZ-0030	2011.06.11
EMR-20C Radiation Meter	Narda	BN 2244/70	AW-0074	2011.06.11
Bilog Antenna	Schaffner	CBL6141A	4278	N/A
Horn Antenna	A&R	AT4002A	312312	N/A
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC4-TH	2012.01.14

Fast transients / TR2

Instrument	Manufacturer	Model No.	Serial No.	Cali. Due Date
Immunity Test System	KeyTek	EMCpro PLUS	508273	2011.04.23
CCL	KeyTek	CCL	0510181	2011.04.23
Temperature/Humidity Meter	zhicheng	ZC1-2	TR2-TH	2012.01.14

Surges / TR2

Instrument	Manufacturer	Model No.	Serial No.	Cali. Due Date
Immunity Test System	KeyTek	EMCpro PLUS	508273	2011.04.23
Coupler/Decoupler Telecom Line	KeyTek	CM-TELCD	0506277	N/A
Coupler/Decoupler Signal Line	KeyTek	CM-I/OCD	0508206	N/A
Temperature/Humidity Meter	zhicheng	ZC1-2	TR2-TH	2012.01.14

Radio-frequency continuous conducted / TR2

Instrument	Manufacturer	Model No.	Serial No.	Cali. Due Date
RF-Generator	Schaffner	NSG2070	1120	2011.09.27
Attenuator	Schaffner	INA2070-1	2120	2011.09.27
Coupling / Decoupling Network	Schaffner	CDN M016	21249	2011.09.27
Coupling / Decoupling Network	Teseq GmbH	CDN M016	24484	2011.09.01
Temperature/Humidity Meter	zhicheng	ZC1-2	TR2-TH	2012.01.14

Voltage dips and interruptions / TR2

Instrument	Manufacturer	Model No.	Serial No.	Cali. Due Date
Immunity Test System	KeyTek	EMCpro PLUS	508273	2011.04.23
Temperature/Humidity Meter	zhicheng	ZC1-2	TR2-TH	2012.01.14

2.3. Measurement Uncertainty

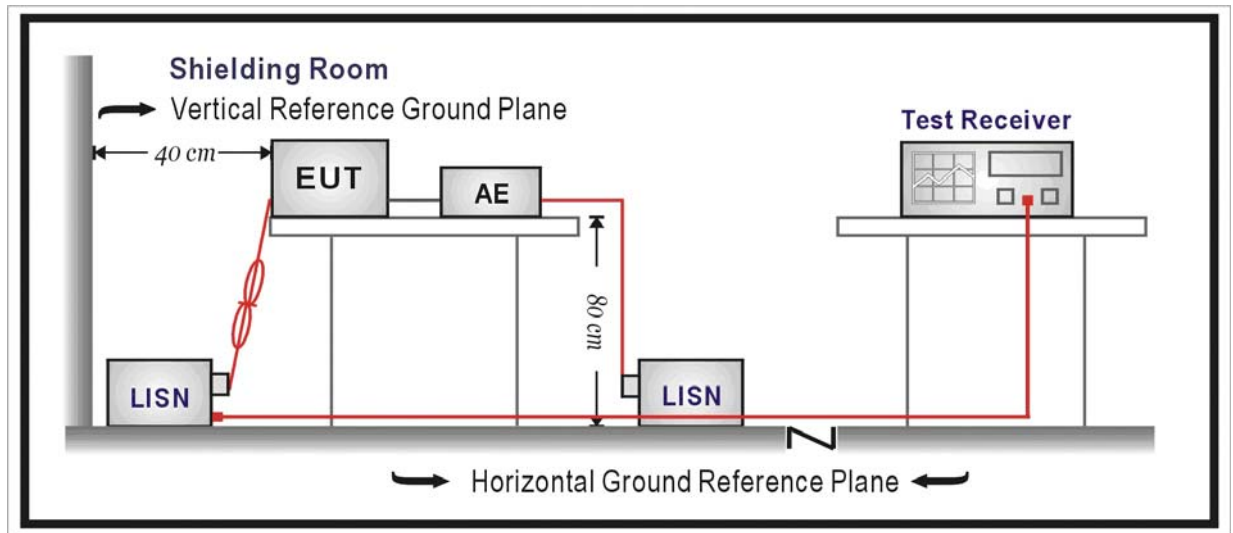
Conducted disturbance at mains terminals and telecommunication ports
The maximum measurement uncertainty is evaluated as $\pm 3.48\text{dB}$.
Radiated disturbance
The maximum measurement uncertainty is evaluated as $\pm 4.28\text{dB}$.
Harmonic current emissions
The maximum measurement uncertainty is evaluated as $\pm 0.2\%$.
Voltage fluctuation and flicker
The maximum measurement uncertainty is evaluated as d_c and $d_{\max}$: $\pm 0.095\%$, P_{st} and P_{lt} : $\pm 4\%$, $d_{(t)}$: $\pm 1.5\%$.
Electrostatic discharge
The maximum measurement uncertainty is evaluated as Voltage: $\pm 1.63\%$, Time: $\pm 2.76\%$.
Radio-frequency electromagnetic field
The maximum measurement uncertainty is evaluated as $\pm 2.72\text{dB}$.
Fast transients
The maximum measurement uncertainty is evaluated as Voltage: $\pm 1.63\%$, Frequency: $\pm 2.8 \times 10^{-10}$, Time: $\pm 2.76\%$.
Surges
The maximum measurement uncertainty is evaluated as Voltage: $\pm 1.63\%$, Time: $\pm 2.76\%$.
Radio-frequency continuous conducted
The maximum measurement uncertainty is evaluated as $\pm 3.72\text{dB}$.
Voltage dips and interruptions
The maximum measurement uncertainty is evaluated as Voltage: $\pm 1.63\%$, Time: $\pm 2.76\%$.

3. Conducted Emission

3.1. Test Specification

According to EMC Standard: CISPR 11: 2004 Group 1 Class A

3.2. Test Setup



3.3. Limit

Limits for Class A Equipment		
Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 - 0.50	79	66
0.50 - 30	73	60

Note: The lower limit shall apply at the transition frequencies.

Limits for Class B Equipment		
Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

3.4. Test Procedure

The EUT with the PLC functions inactive are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed on conducted measurement.

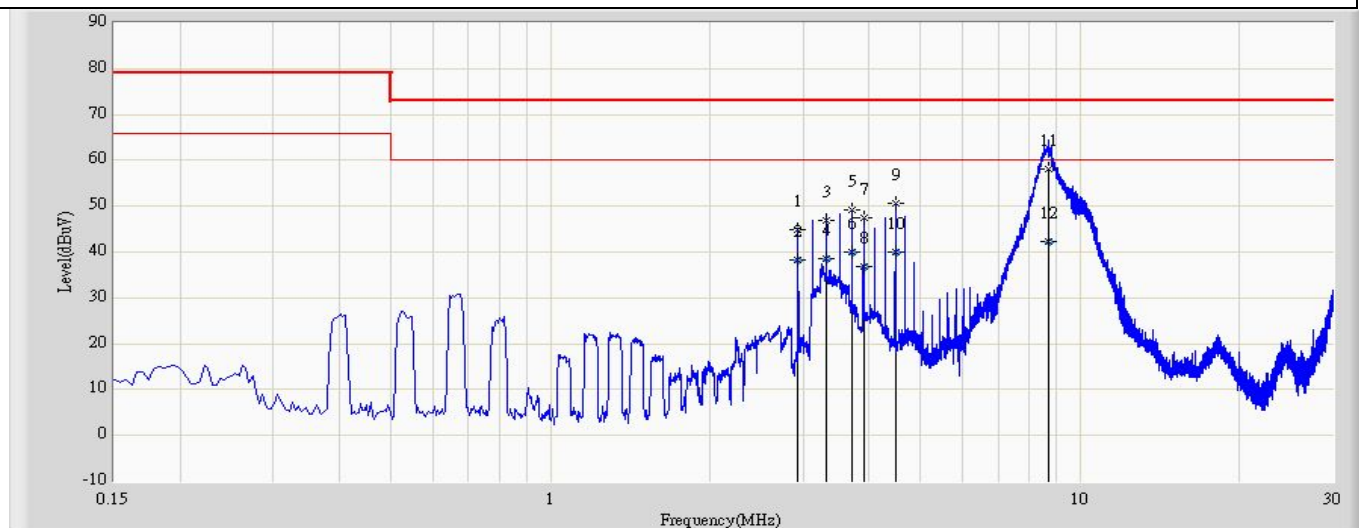
Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

3.5. Deviation from Test Standard

No deviation.

3.6. Test Result

Engineer: Jay	
Site: TR1	Time: 2011/02/16 - 13:55
Limit: CISPR11_CE_Mains_Group1_ClassA	Margin: 0
Probe: ENV216_101043(0.009-30MHz)	Polarity: Line
EUT: ProNet	Power: AC 230V/50Hz
Note: Mode 1: Continuously operating (Add filter and add core)	

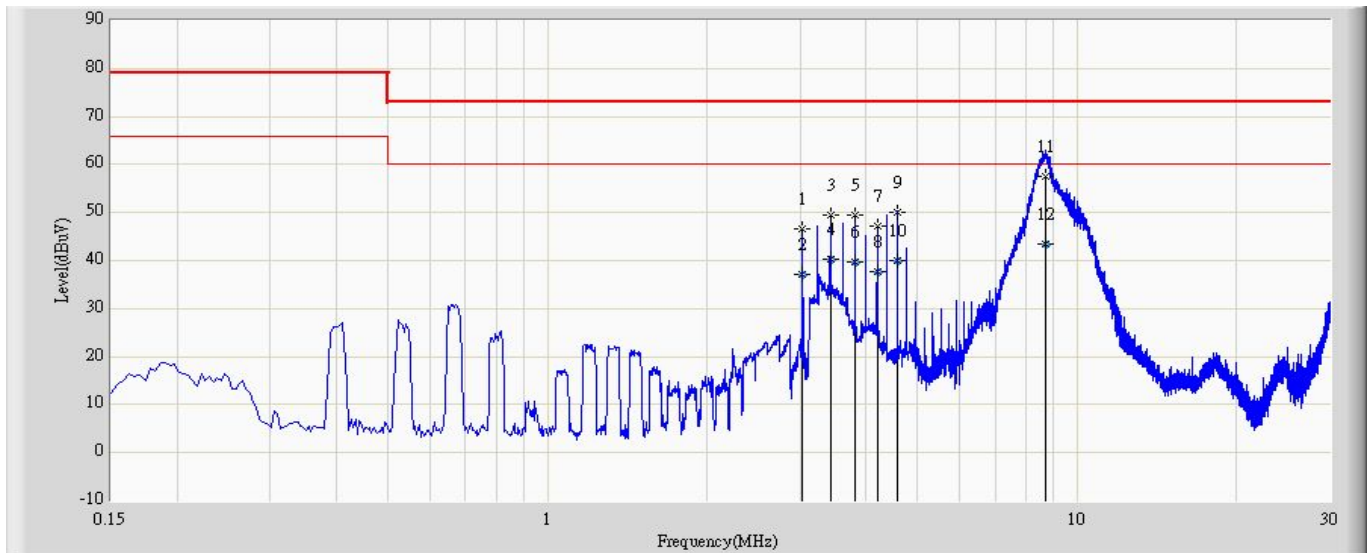


No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Probe (dB)	Cable (dB)	Amp (dB)	Type
1		2.934	45.027	35.268	-27.973	73.000	9.639	0.120	0.000	QP
2		2.934	38.386	28.627	-21.614	60.000	9.639	0.120	0.000	AV
3		3.322	46.955	37.182	-26.045	73.000	9.643	0.130	0.000	QP
4		3.322	38.525	28.752	-21.475	60.000	9.643	0.130	0.000	AV
5		3.706	49.304	39.527	-23.696	73.000	9.647	0.130	0.000	QP
6		3.706	39.901	30.124	-20.099	60.000	9.647	0.130	0.000	AV
7		3.898	47.414	37.625	-25.586	73.000	9.649	0.140	0.000	QP
8		3.898	36.713	26.924	-23.287	60.000	9.649	0.140	0.000	AV
9		4.474	50.629	40.824	-22.371	73.000	9.655	0.150	0.000	QP
10		4.474	40.053	30.248	-19.947	60.000	9.655	0.150	0.000	AV
11	*	8.702	58.026	48.100	-14.974	73.000	9.686	0.240	0.000	QP
12		8.702	42.326	32.400	-17.674	60.000	9.686	0.240	0.000	AV

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

Engineer: Jay	
Site: TR1	Time: 2011/02/16 - 13:59
Limit: CISPR11_CE_Mains_Group1_ClassA	Margin: 0
Probe: ENV216_101043(0.009-30MHz)	Polarity: Neutral
EUT: ProNet	Power: AC 230V/50Hz
Note: Mode 1: Continuously operating (Add filter and add core)	



No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Probe (dB)	Cable (dB)	Amp (dB)	Type
1		3.034	46.684	36.924	-26.316	73.000	9.640	0.120	0.000	QP
2		3.034	37.199	27.439	-22.801	60.000	9.640	0.120	0.000	AV
3		3.418	49.354	39.580	-23.646	73.000	9.644	0.130	0.000	QP
4		3.418	40.210	30.436	-19.790	60.000	9.644	0.130	0.000	AV
5		3.802	49.442	39.654	-23.558	73.000	9.648	0.140	0.000	QP
6		3.802	39.639	29.851	-20.361	60.000	9.648	0.140	0.000	AV
7		4.190	47.220	37.428	-25.780	73.000	9.652	0.140	0.000	QP
8		4.190	37.616	27.824	-22.384	60.000	9.652	0.140	0.000	AV
9		4.568	50.059	40.253	-22.941	73.000	9.656	0.150	0.000	QP
10		4.568	40.020	30.214	-19.980	60.000	9.656	0.150	0.000	AV
11	*	8.742	57.565	47.603	-15.435	73.000	9.722	0.240	0.000	QP
12		8.742	43.348	33.387	-16.652	60.000	9.722	0.240	0.000	AV

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

3.7. Test Photograph

Test Mode: Mode 1: Continuously operating

Description: Front View of Conducted Emission Test Setup



Test Mode: Mode 1: Continuously operating

Description: Back View of Conducted Emission Test Setup

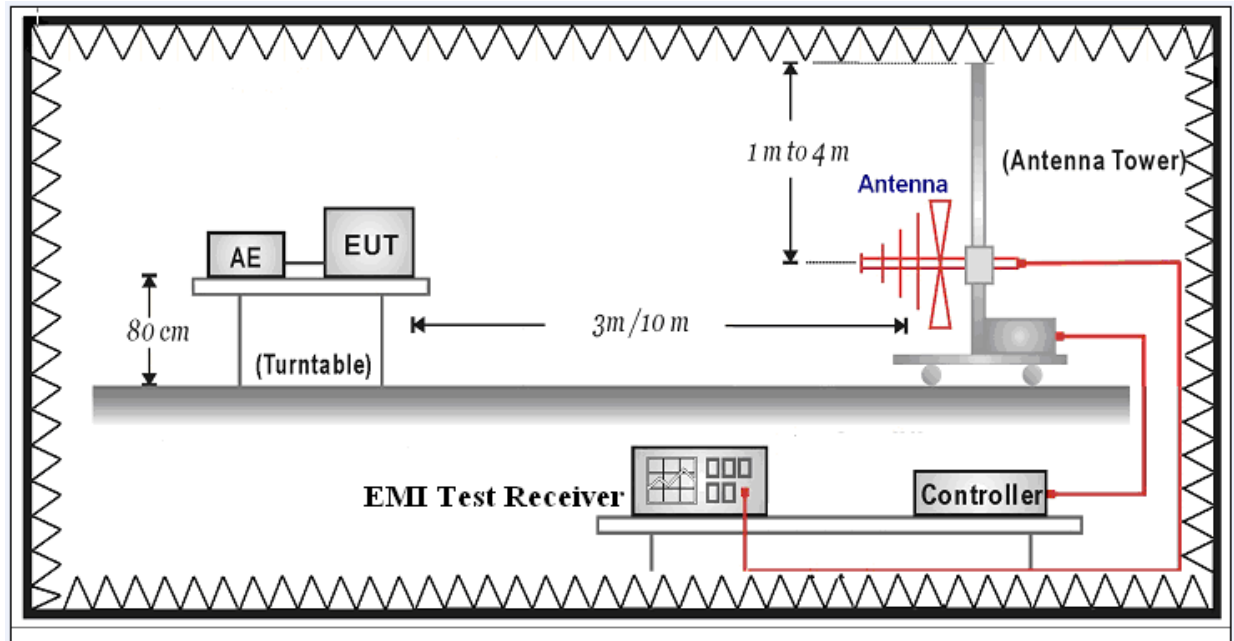


4. Radiated Emission

4.1. Test Specification

According to EMC Standard: CISPR 11: 2004 Group 1 Class A

4.2. Test Setup



4.3. Limit

Limits for Class A Equipment		
Frequency (MHz)	Distance (m)	QP (dBuV/m)
30 - 230	10	40
230 - 1000	10	47

Note 1: The lower limit shall apply at the transition frequency.

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

Limits for Class B Equipment		
Frequency (MHz)	Distance (m)	QP (dBuV/m)
30 - 230	10	30
230 - 1000	10	37

Note 1: The lower limit shall apply at the transition frequency.

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

4.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 10 meters. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated on radiated measurement.

Radiated emissions were investigated over the frequency range from 30MHz to 1GHz using a receiver bandwidth of 120kHz.

Note 1: Load cables of unknown length shall be arranged horizontally, equally separated from each other and shall be 1 m in length.

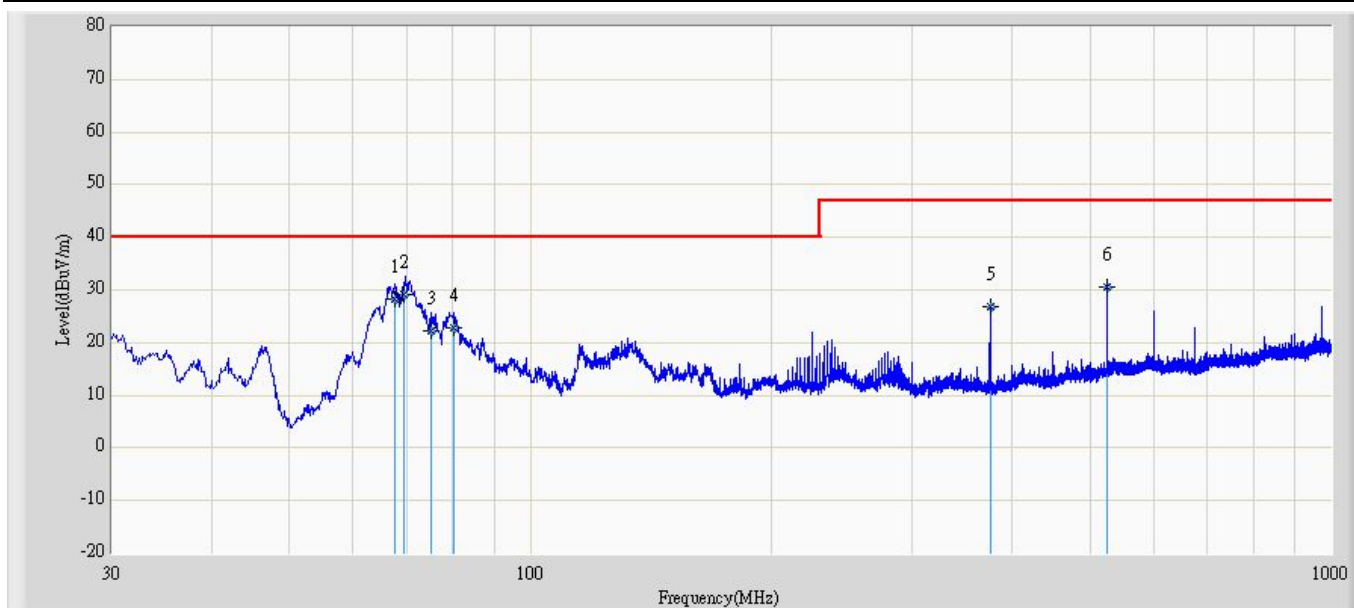
Note 2: The mains cable is arranged 1 m horizontally and then 0.8 m vertically to the ground where it is connected to the power source. Cables are unshielded, unless the PSU is supplied with a shielded cable.

4.5. Deviation from Test Standard

No deviation.

4.6. Test Result

Engineer: Nikissa	
Site: AC1	Time: 2011/02/16 - 10:36
Limit: CISPR11_RE(10m)_Group1_ClassA	Margin: 0
Probe: CBL6112B_2931(30-1000MHz)	Polarity: Horizontal
EUT: ProNet	Power: AC 230V/50Hz
Note: Mode 1: Continuously operating (Add filter and add core)	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Probe (dB/m)	Cable (dB)	Amp (dB)	Ant Pos (cm)	Table Pos (deg)	Type
1		67.628	28.404	55.383	-11.596	40.000	5.080	1.280	33.338	400	157	QP
2	*	69.607	29.131	55.953	-10.869	40.000	5.263	1.290	33.375	400	146	QP
3		75.030	22.248	48.519	-17.752	40.000	5.853	1.314	33.438	200	318	QP
4		80.142	22.902	48.303	-17.098	40.000	6.738	1.347	33.486	250	340	QP
5		375.010	26.751	41.683	-20.249	47.000	14.904	3.137	32.974	200	278	QP
6		525.033	30.584	41.527	-16.416	47.000	17.697	3.670	32.310	150	120	QP

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

Engineer: Nikissa

Site: AC1

Time: 2011/02/16 - 10:36

Limit: CISPR11_RE(10m)_Group1_ClassA

Margin: 0

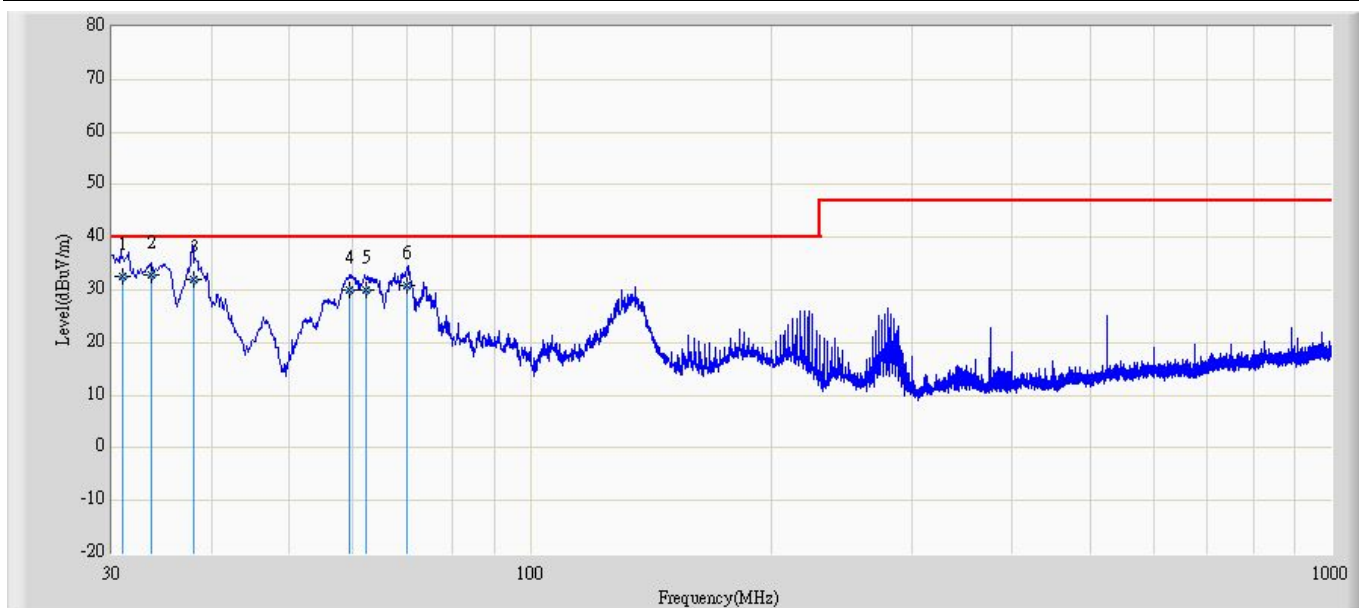
Probe: CBL6112B_2933(30-1000MHz)

Polarity: Vertical

EUT: ProNet

Power: AC 230V/50Hz

Note: Mode 1: Continuously operating (Add filter and add core)



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Probe (dB/m)	Cable (dB)	Amp (dB)	Ant Pos (cm)	Table Pos (deg)	Type
1		30.892	32.518	46.751	-7.482	40.000	17.550	1.102	32.884	100	350	QP
2	*	33.624	32.751	48.544	-7.249	40.000	16.110	1.087	32.990	100	316	QP
3		37.914	31.953	50.172	-8.047	40.000	13.659	1.142	33.020	100	289	QP
4		59.493	30.033	56.681	-9.967	40.000	5.279	1.268	33.196	269	0	QP
5		62.220	29.962	56.844	-10.038	40.000	5.000	1.312	33.194	300	102	QP
6		70.111	30.849	57.455	-9.151	40.000	5.301	1.414	33.321	250	149	QP

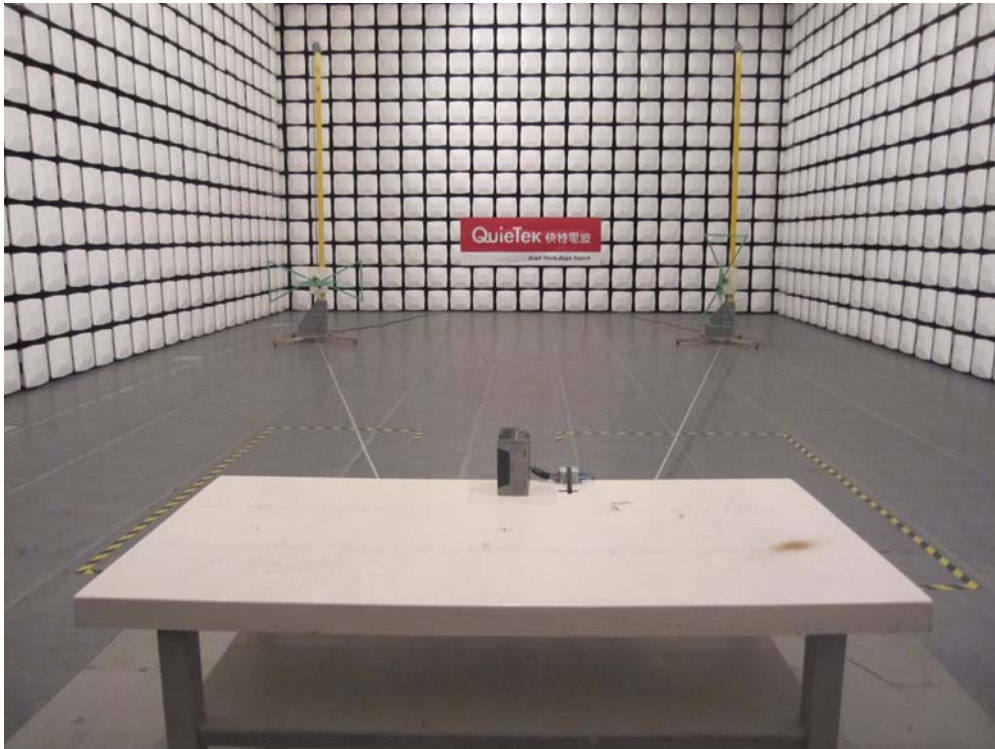
Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

4.7. Test Photograph

Test Mode : Mode 1: Continuously operating

Description : Front View of Radiated Emission Test Setup



Test Mode : Mode 1: Continuously operating

Description : Back View of Radiated Emission Test Setup

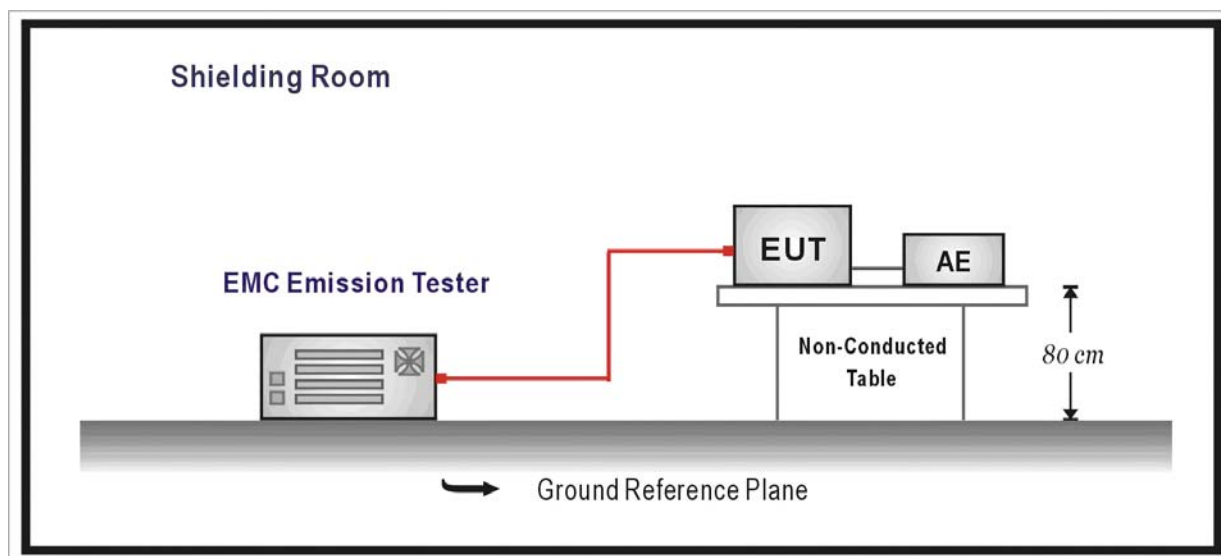


5. Harmonic Current Emission

5.1. Test Specification

According to EMC Standard: IEC 61000-3-2

5.2. Test Setup



5.3. Limit

(a) Limits of Class A Harmonics Currents

Harmonics Order n	Maximum Permissible harmonic current A	Harmonics Order n	Maximum Permissible harmonic current A
Odd harmonics		Even harmonics	
3	2.30	2	1.08
5	1.14	4	0.43
7	0.77	6	0.30
9	0.40	$8 \leq n \leq 40$	$0.23 * 8/n$
11	0.33		
13	0.21		
$15 \leq n \leq 39$	$0.15 * 15/n$		

(b) Limits of Class B Harmonics Currents

For Class B equipment, the harmonic of the input current shall not exceed the maximum permissible values given in table that is the limit of Class A multiplied by a factor of 1.5.

(c) Limits of Class C Harmonics Currents

Harmonics Order n	Maximum Permissible harmonic current Expressed as a percentage of the input current at the fundamental frequency %
2	2
3	$30 \cdot \lambda^*$
5	10
7	7
9	5
$11 \leq n \leq 39$ (odd harmonics only)	3
* λ is the circuit power factor	

(d) Limits of Class D Harmonics Currents

Harmonics Order n	Maximum Permissible harmonic current per watt mA/W	Maximum Permissible harmonic current A
3	3.4	2.30
5	1.9	1.14
7	1.0	0.77
9	0.5	0.40
11	0.35	0.33
$11 \leq n \leq 39$ (odd harmonics only)	$3.85/n$	See limit of Class A

5.4. Test Procedure

The EUT is supplied in series with power analyzer from a power source having the same normal voltage and frequency as the rated supply voltage and the equipment under test. And the rated voltage at the supply voltage of EUT of 0.94 times and 1.06 times shall be performed.

5.5. Deviation from Test Standard

No deviation.

5.6. Test Result

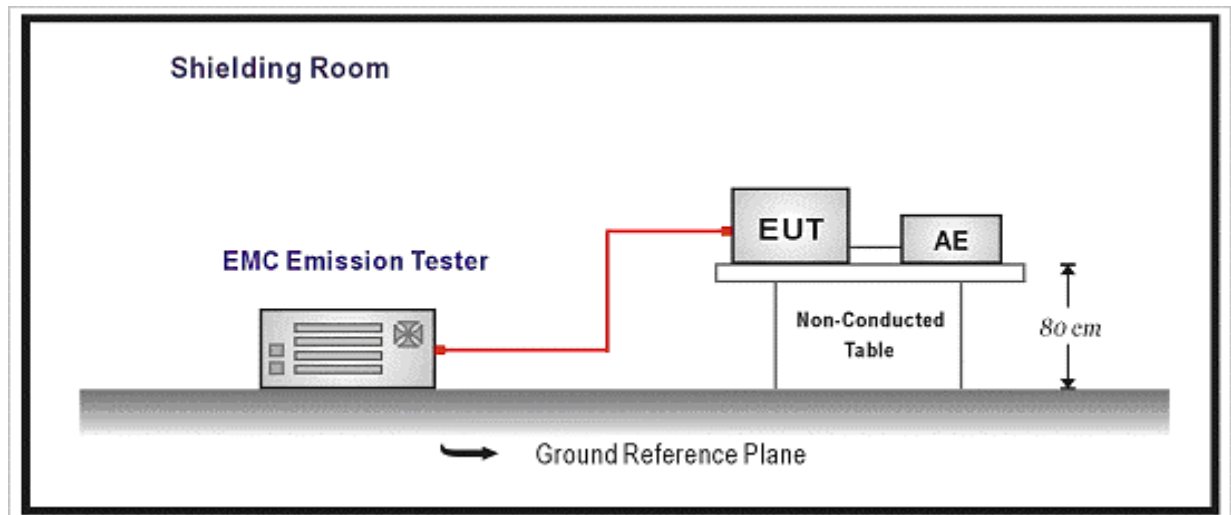
The EUT belong to Class A equipment, so this test is not required.

6. Voltage Fluctuation and Flicker

6.1. Test Specification

According to EMC Standard: IEC 61000-3-3

6.2. Test Setup



6.3. Limit

The following limits apply:

- the value of P_{st} shall not be greater than 1.0;
 - the value of P_{1t} shall not be greater than 0.65;
 - the value of $d(t)$ during a voltage change shall not exceed 3.3 % for more than 500 ms;
 - the relative steady-state voltage change, d_c , shall not exceed 3.3 %;
 - the maximum relative voltage change, d_{max} , shall not exceed;
- a) 4 % without additional conditions;
 - b) 6 % for equipment which is:
 - switched manually, or
 - switched automatically more frequently than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds), or manual restart, after a power supply interruption.

Note: The cycling frequency will be further limited by the P_{st} and P_{1t} limit.

For example: a d_{max} of 6% producing a rectangular voltage change characteristic twice per hour will give a P_{1t} of about 0.65.

- c) 7 % for equipment which is:
- attended whilst in use (for example: hair dryers, vacuum cleaners, kitchen equipment such as mixers, garden equipment such as lawn mowers, portable tools such as electric drills), or
 - switched on automatically, or is intended to be switched on manually, no more than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds) or manual restart, after a power supply interruption.

P_{st} and P_{1t} requirements shall not be applied to voltage changes caused by manual switching.

6.4. Test Procedure

The EUT is supplied in series with power analyzer from a power source having the same normal voltage and frequency as the rated supply voltage and the equipment under test. And the rated voltage at the supply voltage of EUT of 0.94 times and 1.06 times shall be performed.

6.5. Deviation from Test Standard

No deviation.

6.6. Test Result

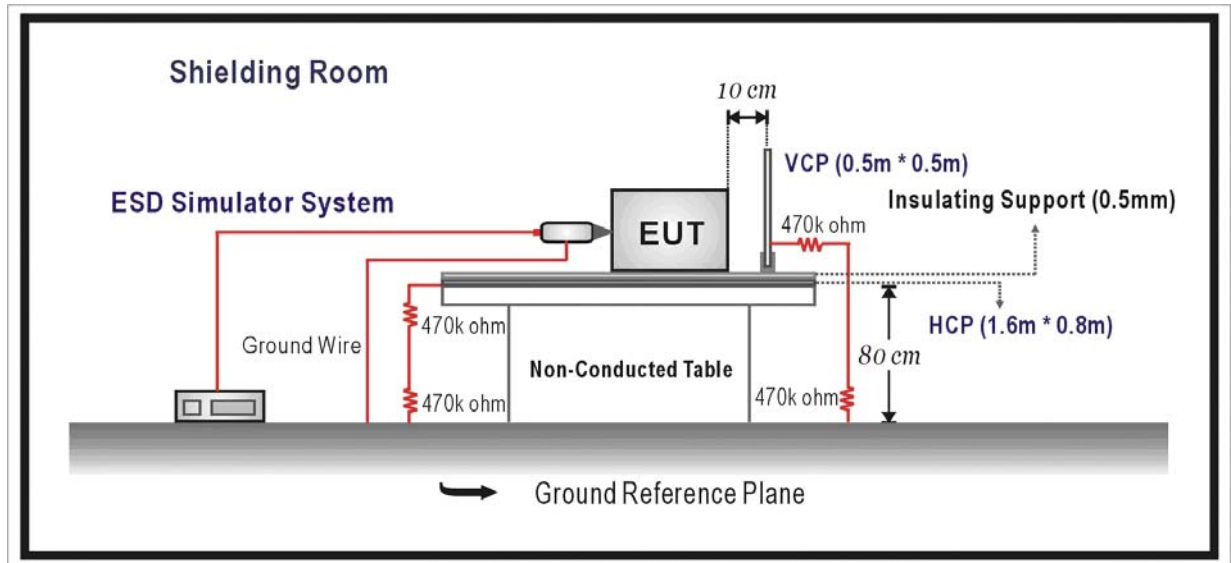
The EUT belong to Class A equipment, so this test is not required.

7. Electrostatic Discharge

7.1. Test Specification

According to Standard: IEC 61000-4-2

7.2. Test Setup



7.3. Limit

Item	Environmental Phenomena	Units	Test Specification	Performance Criteria
Basic immunity (Enclosure Port)				
	Electrostatic Discharge	kV(Charge Voltage)	±4 Air Discharge ±4 Contact Discharge	B
Equipment intended for use in industrial locations (Enclosure Port)				
	Electrostatic Discharge	kV(Charge Voltage)	±8 Air Discharge ±4 Contact Discharge	B
Equipment used in controlled EM environments (Enclosure Port)				
	Electrostatic Discharge	kV(Charge Voltage)	±8 Air Discharge ±4 Contact Discharge	B

7.4. Test Procedure

Direct application of discharges to the EUT:

Contact discharge was applied only to conductive surfaces of the EUT.

Air discharges were applied only to non-conductive surfaces of the EUT.

During the test, it was performed with single discharges. For the single discharge time between successive single discharges will be keep longer 1 second. It was at least ten single discharges with positive and negative at the same selected point.

The selected point, which was performed with electrostatic discharge, was marked on the red label of the EUT.

Indirect application of discharges to the EUT:

Vertical Coupling Plane (VCP):

The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance 0.1m from, the EUT, with the Discharge Electrode touching the coupling plane.

The four faces of the EUT will be performed with electrostatic discharge. It was at least ten single discharges with positive and negative at the same selected point.

Horizontal Coupling Plane (HCP):

The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the Discharge Electrode touching the coupling plane.

The four faces of the EUT will be performed with electrostatic discharge. It was at least ten single discharges with positive and negative at the same selected point.

7.5. Deviation from Test Standard

No deviation.

7.6. Test Result

Test Site	TR3	Date of Test	2011.02.21
EUT	ProNet	Test Voltage	AC 230V / 50Hz
Temperature	22°C	Humidity	48%RH
Barometric Pressure	101kPa	Test Engineer	Win
Test Mode	Mode 1: Continuously operating		

Air Discharge								
Test Location	Test Level						Observation	Result
	+2kV	-2kV	+4kV	-4kV	+8kV	-8kV		
Screen	A	A	A	A	A	A	Note	Pass
Front panel buttons	A	A	A	A	A	A	Note	Pass
Case Slots	A	A	A	A	A	A	Note	Pass
Enclosure	A	A	A	A	A	A	Note	Pass
Indicating lamp	A	A	A	A	A	A	Note	Pass
Connector	A	A	A	A	A	A	Note	Pass

Contact Discharge				
Test Location	Test Level		Observation	Result
	+4kV	-4kV		
Screw	A	A	Note	Pass
Metallic body	A	A	Note	Pass

Horizontal Coupling				
Test Location	Test Level		Observation	Result
	+4kV	-4kV		
Front	A	A	Note	Pass
Rear	A	A	Note	Pass
Left	A	A	Note	Pass
Right	A	A	Note	Pass

Vertical Coupling				
Test Location	Test Level		Observation	Result
	+4kV	-4kV		
Front	A	A	Note	Pass
Rear	A	A	Note	Pass
Left	A	A	Note	Pass

Right	A	A	Note	Pass
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NOTE: There was no change compared with initial operation during the test.

7.7. Test Photograph

Test Mode: Mode 1: Continuously operating

Description: Electrostatic Discharge Test Setup

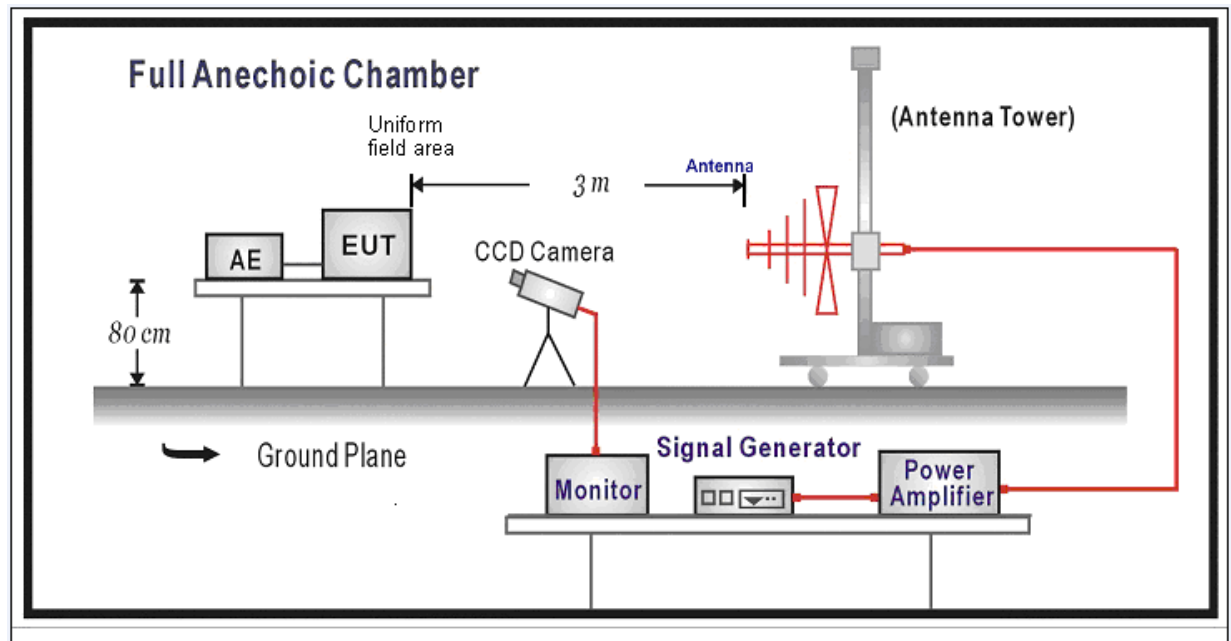


8. Radiated Susceptibility

8.1. Test Specification

According to Standard: IEC 61000-4-3

8.2. Test Setup



8.3. Limit

Item	Environmental Phenomena	Units	Test Specification	Performance Criteria
Basic immunity (Enclosure Port)				
Radio-Frequency	MHz	80 - 1000, 1400 - 2000	A	
Electromagnetic Field	V/m (Un-modulated, rms)	3		
Amplitude Modulated	% AM (1kHz)	80		
Radio-Frequency	MHz	2000 - 2700	A	
Electromagnetic Field	V/m (Un-modulated, rms)	1		
Amplitude Modulated	% AM (1kHz)	80		
Equipment intended for use in industrial locations (Enclosure Port)				
Radio-Frequency	MHz	80 - 1000	A	
Electromagnetic Field	V/m (Un-modulated, rms)	10		
Amplitude Modulated	% AM (1kHz)	80		

Radio-Frequency	MHz	1400 - 2000	A
Electromagnetic Field	V/m (Un-modulated, rms)	3	
Amplitude Modulated	% AM (1kHz)	80	
Radio-Frequency	MHz	2000 - 2700	A
Electromagnetic Field	V/m (Un-modulated, rms)	1	
Amplitude Modulated	% AM (1kHz)	80	
Equipment used in controlled EM environments (Enclosure Port)			
Radio-Frequency	MHz	80 - 1000, 1400 - 2000, 2000 - 2700	A
Electromagnetic Field	V/m (Un-modulated, rms)	1	
Amplitude Modulated	% AM (1kHz)	80	

8.4. Test Procedure

The EUT and load, which are placed on a table that is 0.8 meter above ground, are placed with one coincident with the calibration plane such that the distance from antenna to the EUT was 3 meters.

Both horizontal and vertical polarization of the antenna and four sides of the EUT are set on measurement.

In order to judge the EUT performance, a CCD camera is used to monitor EUT screen.

All the scanning conditions are as follows:

Condition of Test	Remarks
1. Field Strength	1 V/m (Level 1), 3 V/m (Level 2), 10 V/m (Level 3)
2. Radiated Signal	AM 80% Modulated with 1kHz
3. Scanning Frequency	80 - 1000MHz, 1400 - 2000MHz, 2000 - 2700MHz
4 Dwell Time	3 Seconds
5. Frequency step size Δf	1%

8.5. Deviation from Test Standard

No deviation.

8.6. Test Result

Test Site	AC4	Date of Test	2011.02.18
EUT	ProNet	Test Voltage	AC 230V / 50Hz
Temperature	20°C	Humidity	46%RH
Barometric Pressure	101kPa	Test Engineer	Alex
Test Mode	Mode 1: Continuously operating		

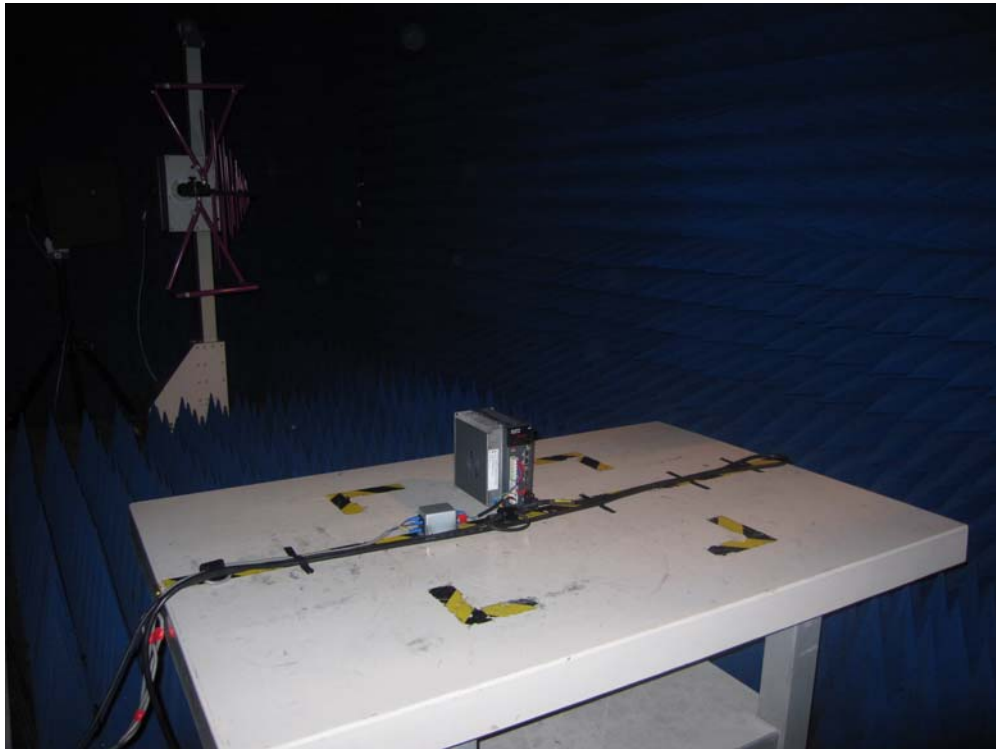
Frequency (MHz)	Polarity	Position	Field Strength (V/m)	Test Result Criterion	Observation	Result
80 - 1000	Horizontal	Front	10	A	Note	Pass
80 - 1000	Vertical	Front	10	A	Note	Pass
80 - 1000	Horizontal	Rear	10	A	Note	Pass
80 - 1000	Vertical	Rear	10	A	Note	Pass
80 - 1000	Horizontal	Left	10	A	Note	Pass
80 - 1000	Vertical	Left	10	A	Note	Pass
80 - 1000	Horizontal	Right	10	A	Note	Pass
80 - 1000	Vertical	Right	10	A	Note	Pass
1400 - 2000	Horizontal	Front	3	A	Note	Pass
1400 - 2000	Vertical	Front	3	A	Note	Pass
1400 - 2000	Horizontal	Rear	3	A	Note	Pass
1400 - 2000	Vertical	Rear	3	A	Note	Pass
1400 - 2000	Horizontal	Left	3	A	Note	Pass
1400 - 2000	Vertical	Left	3	A	Note	Pass
1400 - 2000	Horizontal	Right	3	A	Note	Pass
1400 - 2000	Vertical	Right	3	A	Note	Pass
2000 - 2700	Horizontal	Front	1	A	Note	Pass
2000 - 2700	Vertical	Front	1	A	Note	Pass
2000 - 2700	Horizontal	Rear	1	A	Note	Pass
2000 - 2700	Vertical	Rear	1	A	Note	Pass
2000 - 2700	Horizontal	Left	1	A	Note	Pass
2000 - 2700	Vertical	Left	1	A	Note	Pass
2000 - 2700	Horizontal	Right	1	A	Note	Pass
2000 - 2700	Vertical	Right	1	A	Note	Pass

NOTE: There was no change compared with initial operation during the test.

8.7. Test Photograph

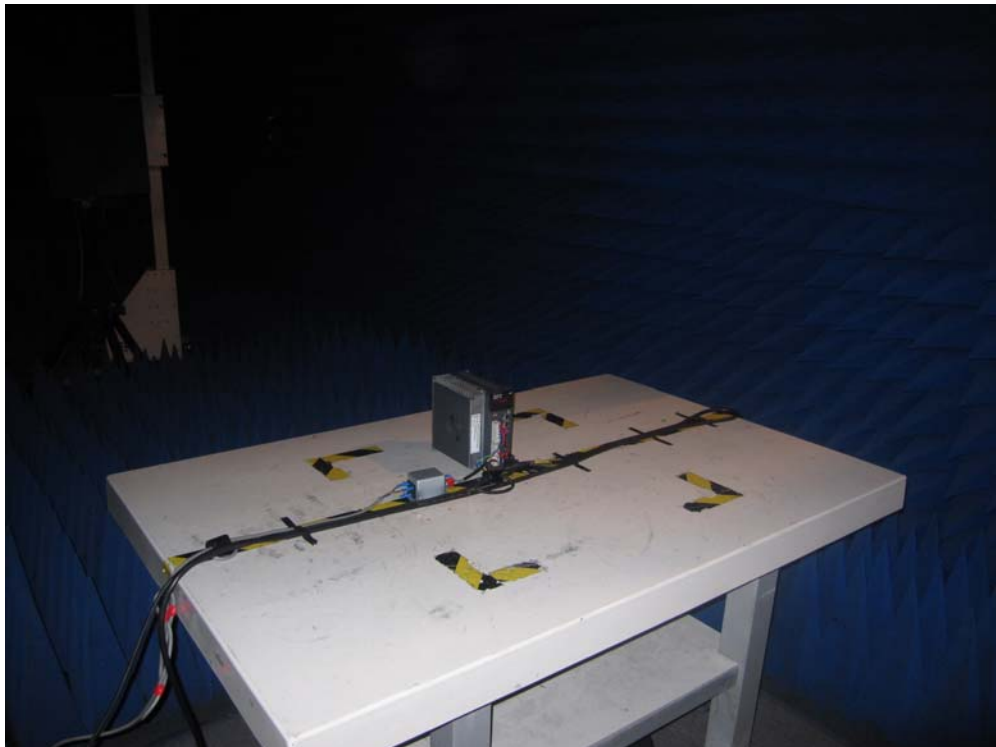
Test Mode: Mode 1: Continuously operating

Description: Radiated Susceptibility Test Setup for Below 1GHz



Test Mode: Mode 1: Continuously operating

Description: Radiated Susceptibility Test Setup for Above 1GHz

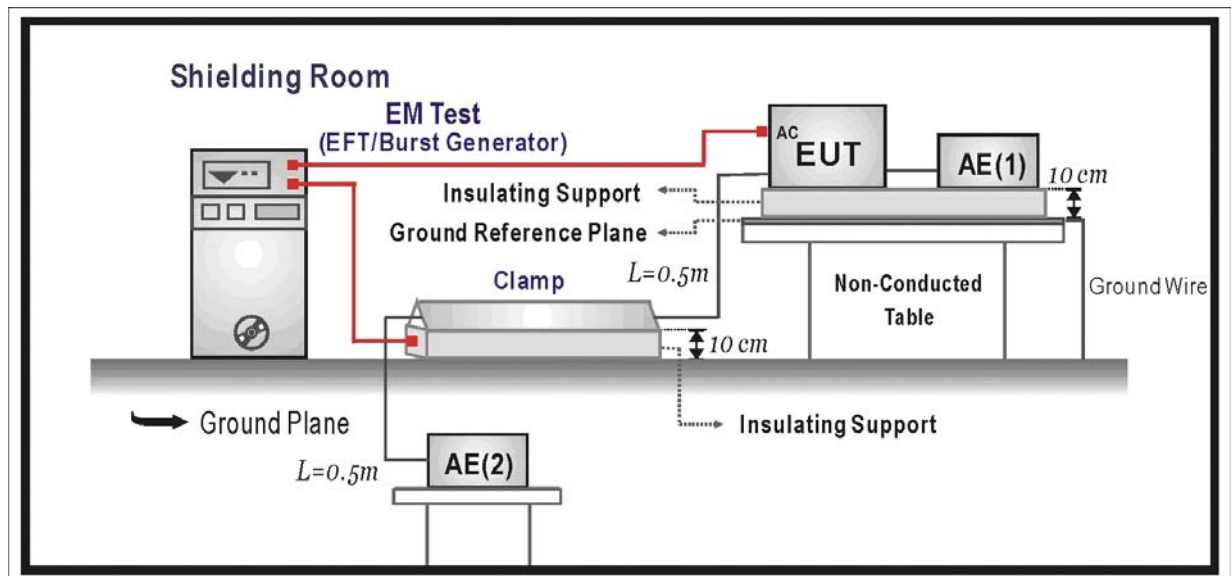


9. Electrical Fast Transient/Burst

9.1. Test Specification

According to Standard: IEC 61000-4-4

9.2. Test Setup



9.3. Limit

Item	Environmental Phenomena	Units	Test Specification	Performance Criteria
Basic immunity (AC Power, including protective earth)				
	Fast Transients Common Mode	kV (Peak) Tr/Th ns Rep. Frequency kHz	+1 5/50 5	B
Basic immunity (DC Power, including protective earth) (See Note(1))				
	Fast Transients Common Mode	kV (Peak) Tr/Th ns Rep. Frequency kHz	+1 5/50 5	B
Basic immunity (I/O signal/control, including lines connected to functional earth port) (See Note(1))				
	Fast Transients Common Mode	kV (Peak) Tr/Th ns Rep. Frequency kHz	+0.5 5/50 5	B
Basic immunity (I/O signal/control connect directly to mains supply)				
	Fast Transients Common Mode	kV (Peak) Tr/Th ns Rep. Frequency kHz	+1 5/50 5	B
Equipment intended for use in industrial locations (AC Power)				

Fast Transients Common Mode	kV (Peak) Tr/Th ns Rep. Frequency kHz	+2 5/50 5	B
Equipment intended for use in industrial locations (DC Power) (See Note(2))			
Fast Transients Common Mode	kV (Peak) Tr/Th ns Rep. Frequency kHz	+2 5/50 5	B
Equipment intended for use in industrial locations (I/O signal/control, including functional earth lines) (See Note(1))			
Fast Transients Common Mode	kV (Peak) Tr/Th ns Rep. Frequency kHz	+1 5/50 5	B
Equipment intended for use in industrial locations (I/O signal/control connected directly to power supply network)			
Fast Transients Common Mode	kV (Peak) Tr/Th ns Rep. Frequency kHz	+2 5/50 5	B
Equipment used in controlled EM environments (AC Power)			
Fast Transients Common Mode	kV (Peak) Tr/Th ns Rep. Frequency kHz	+1 5/50 5	B
Equipment used in controlled EM environments (DC Power) (See Note (1) and (2))			
Fast Transients Common Mode	kV (Peak) Tr/Th ns Rep. Frequency kHz	+1 5/50 5	B
Equipment used in controlled EM environments (I/O signal/control, including functional earth wire) (See Note (1))			
Fast Transients Common Mode	kV (Peak) Tr/Th ns Rep. Frequency kHz	+0.5 5/50 5	B
Equipment used in controlled EM environments (Measurement I/O) (See Note (1) and (3))			

Note 1: Only in the case of lines > 3 m.

Note 2: DC connections between parts of equipment/system which are not connected to a d.c. distribution network are treated as I/O signal/control ports.

Note 3: The rated disturbance values shall be stated in the product specification by the manufacturer.

9.4. Test Procedure

The EUT is placed on a table that is 0.8 meter height. A ground reference plane is placed on the table, and uses a 0.1m insulation between the EUT and ground reference plane.

The minimum area of the ground reference plane is 1m*1m, and 0.65mm thick min, and projected beyond the EUT by at least 0.1m on all sides.

For I/O signal/control lines:

The EFT interference signal is through a coupling clamp device couples to the signal and control lines of the EUT with burst noise for 1minute.

For AC and DC power ports:

The EUT is connected to the power mains through a coupling device that directly couples the EFT/B interference signal.

Each of the Line and Neutral conductors is impressed with burst noise for 1 minute.

The length of the signal and power lines between the coupling device and the EUT is 0.5m.

9.5. Deviation from Test Standard

No deviation.

9.6. Test Result

Test Site	TR2	Date of Test	2011.02.17
EUT	ProNet	Test Voltage	AC 230V / 50Hz
Temperature	22°C	Humidity	44%RH
Barometric Pressure	101kPa	Test Engineer	Jane
Test Mode	Mode 1: Continuously operating		

Inject Line	Polarity	Test Level (kV)	Test Duration (second)	Inject Method	Test Result Criterion	Observation	Result
L	+	2	60	Direct	A	Note	Pass
L	-	2	60	Direct	A	Note	Pass
N	+	2	60	Direct	A	Note	Pass
N	-	2	60	Direct	A	Note	Pass
PE	+	2	60	Direct	A	Note	Pass
PE	-	2	60	Direct	A	Note	Pass
L+N+PE	+	2	60	Direct	A	Note	Pass
L+N+PE	-	2	60	Direct	A	Note	Pass
Signal Cable	+	1	60	Clamp	A	Note	Pass
Signal Cable	-	1	60	Clamp	A	Note	Pass

NOTE: There was no change compared with initial operation during the test.

9.7. Test Photograph

Test Mode: Mode 1: Continuously operating

Description: Electrical Fast Transient/Burst Test Setup for AC Power Port



Test Mode: Mode 1: Continuously operating

Description: Electrical Fast Transient/Burst Test Setup for Signal Cable

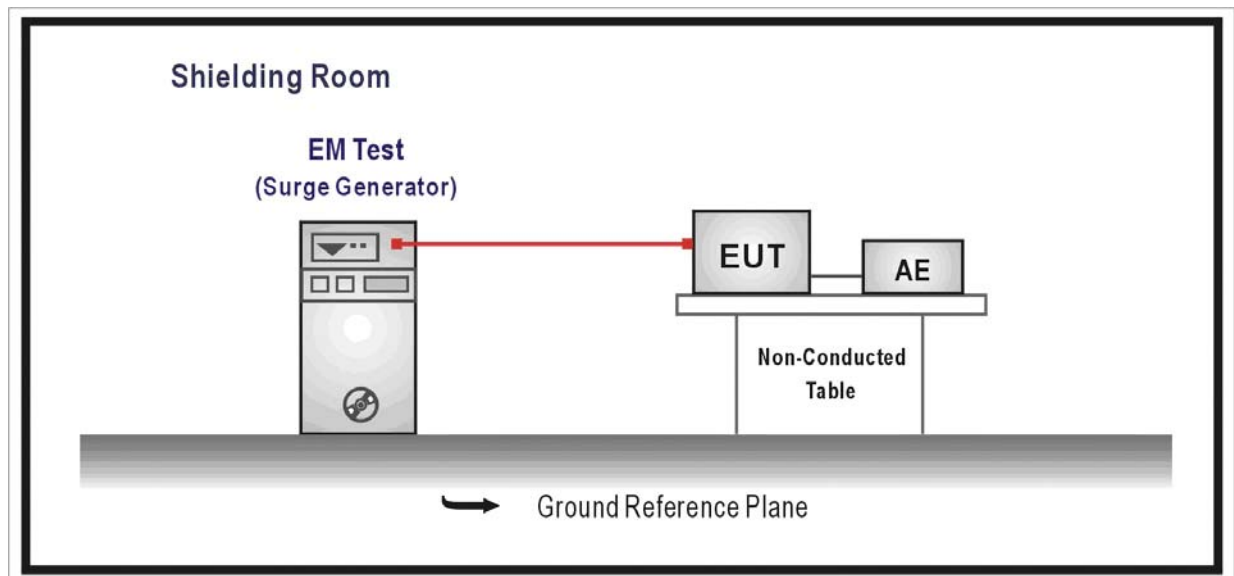


10. Surge

10.1. Test Specification

According to Standard: IEC 61000-4-5

10.2. Test Setup



10.3. Limit

Item	Environmental Phenomena	Units	Test Specification	Performance Criteria
Basic immunity (AC Power, including protective earth) (See Note(1) and (2))				
Surges	Tr/Th us	1.2/50 (8/20)	B	
Line to Line	kV	± 0.5		
Line to Ground	kV	± 1		
Basic immunity (DC Power, including protective earth) (See Note(1), (2) and (4))				
Surges	Tr/Th us	1.2/50 (8/20)	B	
Line to Line	kV	± 0.5		
Line to Ground	kV	± 1		
Basic immunity (I/O signal/control, including lines connected to functional earth port) (See Note(2) and (3))				
Surges	Tr/Th us	1.2/50 (8/20)	B	
Line to Ground	kV	± 1		
Basic immunity (I/O signal/control connect directly to mains supply) (See Note(1) and (2))				
Surges	Tr/Th us	1.2/50 (8/20)	B	
Line to Line	kV	± 0.5		
Line to Ground	kV	± 1		
Equipment intended for use in industrial locations (AC Power) (See Note(1) and (2))				

Surges Line to Line Line to Ground	Tr/Th us kV kV	1.2/50 (8/20) ± 1 ± 2	B
Equipment intended for use in industrial locations (DC Power) (See Note(1), (2) and (5))			
Surges Line to Line Line to Ground	Tr/Th us kV kV	1.2/50 (8/20) ± 1 ± 2	B
Equipment intended for use in industrial locations (I/O signal/control, including functional earth lines (See Note(2) and (3))			
Surges Line to Ground	Tr/Th us kV	1.2/50 (8/20) ± 1	B
Equipment intended for use in industrial locations (I/O signal/control connected directly to power supply network (See Note(1) and (2))			
Surges Line to Line Line to Ground	Tr/Th us kV kV	1.2/50 (8/20) ± 1 ± 2	B
Equipment used in controlled EM environments (AC Power) (See Note(1) and (2))			
Surges Line to Line Line to Ground	Tr/Th us kV kV	1.2/50 (8/20) ± 0.5 ± 1	B

Note 1: Line to line.

Note 2: Line to earth (ground).

Note 3: Only in the case of long-distance lines.

Note 4: Only in the case of lines > 3 m.

Note 5: DC connections between parts of equipment/system which are not connected to a d.c. distribution network are treated as I/O signal/control ports.

10.4. Test Procedure

The EUT and its load are placed on a table that is 0.8 meter above a metal ground plane measured 1m*1m min. and 0.65mm thick min. And projected beyond the EUT by at least 0.1m on all sides. The length of power cord between the coupling device and the EUT shall be 2m or less.

For AC and DC power ports:

The EUT is connected to the power mains through a coupling device that directly couples the Surge interference signal.

The surge noise shall be applied synchronized to the voltage phase at 0° , 90° , 180° , 270° and the peak value of the a.c. voltage wave. (Positive and negative)

Each of Line-Earth and Line-Line is impressed with a sequence of five surge voltages with interval of 1 min.

10.5. Deviation from Test Standard

No deviation.

10.6. Test Result

Test Site	TR2	Date of Test	2011.02.17
EUT	ProNet	Test Voltage	AC 230V / 50Hz
Temperature	22°C	Humidity	44%RH
Barometric Pressure	101kPa	Test Engineer	Jane
Test Mode	Mode 1: Continuously operating		

Inject Line	Polarity	Angle (degree)	Test Level (kV)	Test Interval (second)	Test Result Criterion	Observation	Result
L+N	+	0	1	60	A	Note	Pass
L+N	-	0	1	60	A	Note	Pass
L+N	+	90	1	60	A	Note	Pass
L+N	-	90	1	60	A	Note	Pass
L+N	+	180	1	60	A	Note	Pass
L+N	-	180	1	60	A	Note	Pass
L+N	+	270	1	60	A	Note	Pass
L+N	-	270	1	60	A	Note	Pass
L+PE	+	0	2	60	A	Note	Pass
L+PE	-	0	2	60	A	Note	Pass
L+PE	+	90	2	60	A	Note	Pass
L+PE	-	90	2	60	A	Note	Pass
L+PE	+	180	2	60	A	Note	Pass
L+PE	-	180	2	60	A	Note	Pass
L+PE	+	270	2	60	A	Note	Pass
L+PE	-	270	2	60	A	Note	Pass
N+PE	+	0	2	60	A	Note	Pass
N+PE	-	0	2	60	A	Note	Pass
N+PE	+	90	2	60	A	Note	Pass
N+PE	-	90	2	60	A	Note	Pass
N+PE	+	180	2	60	A	Note	Pass
N+PE	-	180	2	60	A	Note	Pass
N+PE	+	270	2	60	A	Note	Pass
N+PE	-	270	2	60	A	Note	Pass

NOTE: There was no change compared with initial operation during the test.

10.7. Test Photograph

Test Mode: Mode 1: Continuously operating

Description: Surge Test Setup for AC Power Port



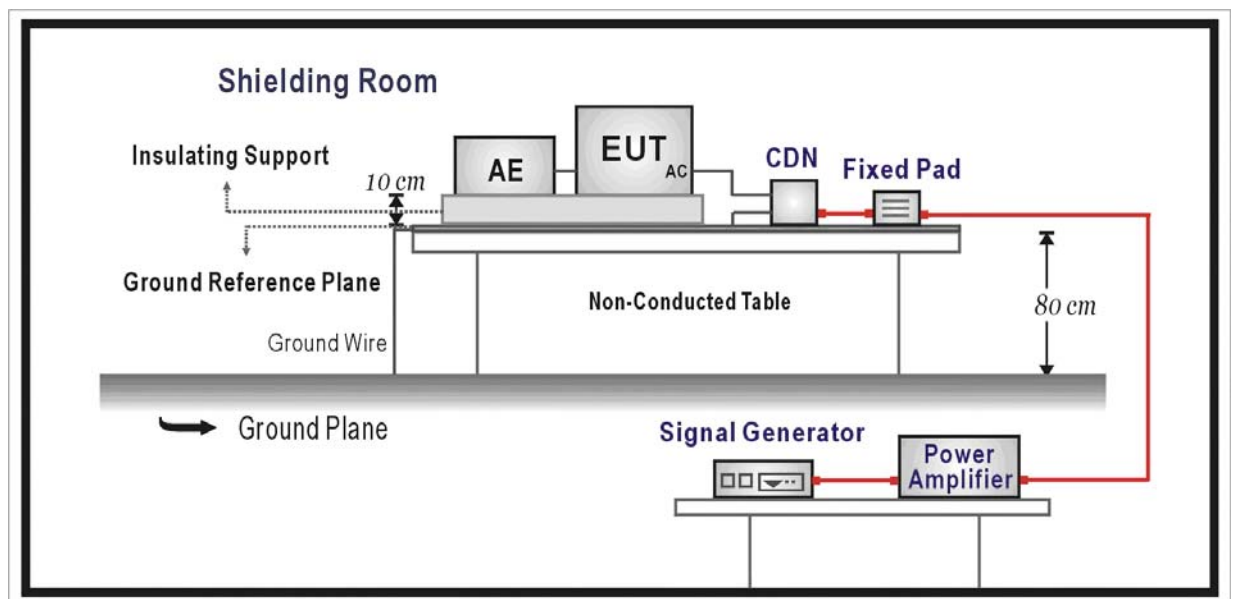
11. Conducted Susceptibility

11.1. Test Specification

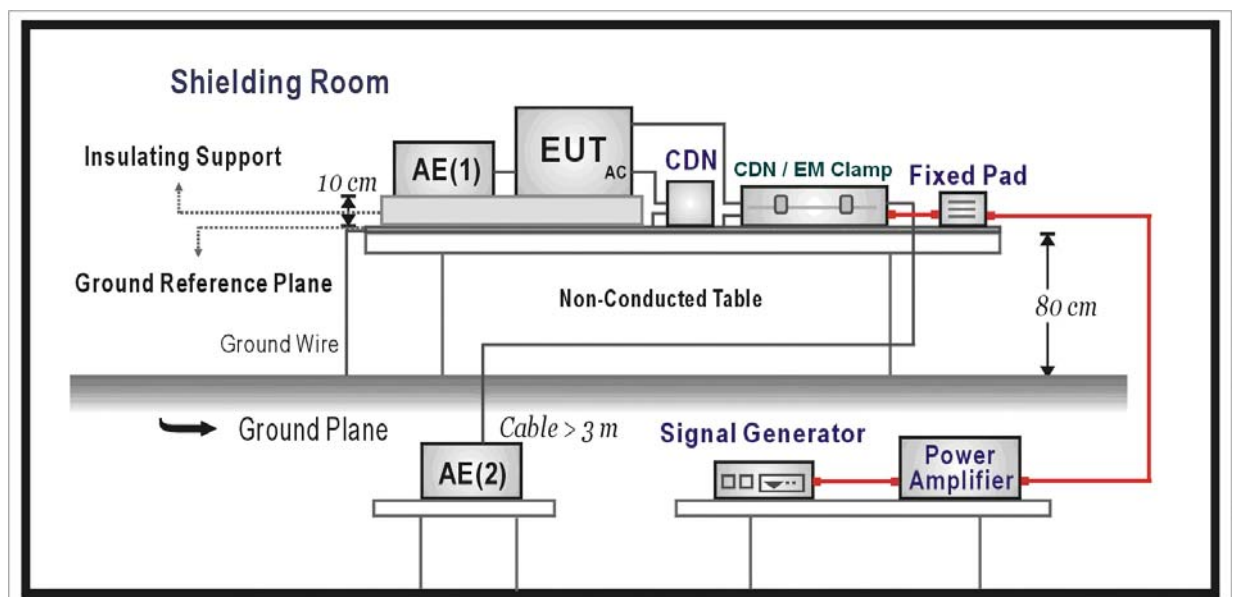
According to Standard: IEC 61000-4-6

11.2. Test Setup

CDN Test Setup



EM Clamp Test Setup



11.3. Limit

Item	Environmental Phenomena	Units	Test Specification	Performance Criteria
Basic immunity (AC Power, including protective earth)				
	Radio-Frequency Continuous Conducted	MHz V (rms, Un-modulated) % AM (1kHz)	0.15-80 3 80	A
Basic immunity (DC Power, including protective earth) (See Note(1))				
	Radio-Frequency Continuous Conducted	MHz V (rms, Un-modulated) % AM (1kHz)	0.15-80 3 80	A
Basic immunity (I/O signal/control, including lines connected to functional earth port) (See Note(1))				
	Radio-Frequency Continuous Conducted	MHz V (rms, Un-modulated) % AM (1kHz)	0.15-80 3 80	A
Basic immunity (I/O signal/control connect directly to mains supply)				
	Radio-Frequency Continuous Conducted	MHz V (rms, Un-modulated) % AM (1kHz)	0.15-80 3 80	A
Equipment intended for use in industrial locations (AC Power) (See Note(2))				
	Radio-Frequency Continuous Conducted	MHz V (rms, Un-modulated) % AM (1kHz)	0.15-80 3 80	A
Equipment intended for use in industrial locations (DC Power) (See Note(2) and (3))				
	Radio-Frequency Continuous Conducted	MHz V (rms, Un-modulated) % AM (1kHz)	0.15-80 3 80	A
Equipment intended for use in industrial locations (I/O signal/control, including functional earth lines) (See Note(1) and (2))				
	Radio-Frequency Continuous Conducted	MHz V (rms, Un-modulated) % AM (1kHz)	0.15-80 3 80	A
Equipment intended for use in industrial locations (I/O signal/control connected directly to power supply network) (See Note(2))				
	Radio-Frequency Continuous Conducted	MHz V (rms, Un-modulated) % AM (1kHz)	0.15-80 3 80	A
Equipment used in controlled EM environments (AC Power)				
	Radio-Frequency Continuous Conducted	MHz V (rms, Un-modulated) % AM (1kHz)	0.15-80 1 80	A
Equipment used in controlled EM environments (DC Power) (See Note (1) and (2))				
	Radio-Frequency Continuous Conducted	MHz V (rms, Un-modulated) % AM (1kHz)	0.15-80 1 80	A
Equipment used in controlled EM environments (I/O signal/control, including functional earth wire) (See Note (1))				
	Radio-Frequency Continuous Conducted	MHz V (rms, Un-modulated) % AM (1kHz)	0.15-80 1 80	A

Equipment used in controlled EM environments (Measurement I/O) (See Note (1) and (4))

Note 1: Only in the case of lines > 3 m.

Note 2: The test level for the conducted RF test is lower than the level for the EM field test because the conducted RF test simulates the resonance condition at each frequency and is thus a more severe test.

Note 3: DC connections between parts of equipment/system which are not connected to a d.c. distribution network are treated as I/O signal/control ports.

Note 4: The rated disturbance values shall be stated in the product specification by the manufacturer.

11.4. Test Procedure

The EUT are placed on a table that is 0.8 meter height, and a Ground reference plane on the table, EUT are placed upon table and use a 0.1m insulation between the EUT and Ground reference plane.

For I/O signal/control lines:

The disturbance signal is through a coupling and decoupling networks (CDN) or EM-clamp device couples to the signal and Telecommunication lines of the EUT.

For AC and DC power ports:

The EUT is connected to the power mains through a coupling and decoupling networks for power supply lines. And directly couples the disturbances signal into EUT.

Used CDN-M2 for two wires or CDN-M3 for three wires.

All the scanning conditions are as follows:

Condition of Test	Remarks
1. Field Strength	1V (Level 1), 3V (Level 2)
2. Radiated Signal	AM 80% Modulated with 1kHz
3. Scanning Frequency	0.15 - 80MHz
4 Dwell Time	3 Seconds
5. Frequency step size Δf	1%

11.5. Deviation from Test Standard

No deviation.

11.6. Test Result

Test Site	TR2	Date of Test	2011.02.17
EUT	ProNet	Test Voltage	AC 230V / 50Hz
Temperature	22°C	Humidity	44%RH
Barometric Pressure	101kPa	Test Engineer	Jane
Test Mode	Mode 1: Continuously operating		

Frequency (MHz)	Inject Voltage (V)	Inject Ports	Inject Method	Test Result Criterion	Observation	Result
0.15-80	3	AC Mains	CDN	A	Note	Pass
0.15-80	3	Signal Cable	Clamp	A	Note	Pass

NOTE: There was no change compared with initial operation during the test.

11.7. Test Photograph

Test Mode: Mode 1: Continuously operating

Description: Conducted Susceptibility Test Setup for AC Power Port



Test Mode: Mode 1: Continuously operating

Description: Conducted Susceptibility Test Setup for Signal Cable

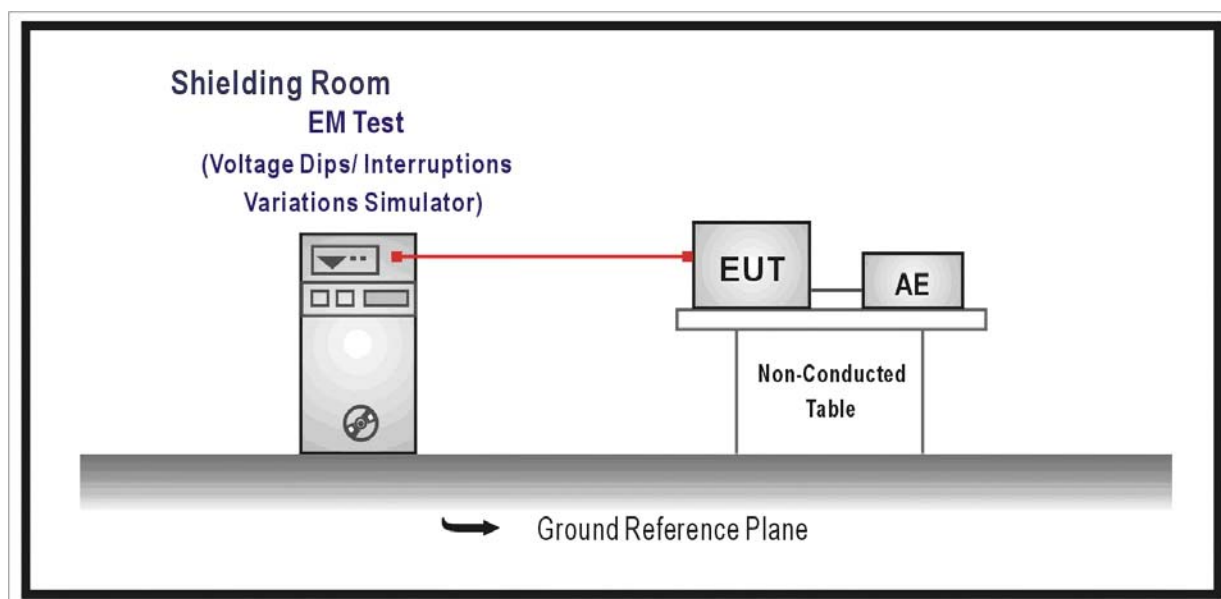


12. Voltage Dips and Interruption

12.1. Test Specification

According to Standard: IEC 61000-4-11

12.2. Test Setup



12.3. Limit

Item	Environmental Phenomena	Units	Test Specification	Performance Criteria
Basic immunity (AC Power, including protective earth) (See Note)				
Voltage Dip	% cycle	0 0.5		B
	% cycle	0 1		B
	% cycle	70 25/30		C
Short Interruptions	% cycle	70 250/300		C
Equipment intended for use in industrial locations (AC Power) (See Note)				
Voltage Dip	% cycle	0 1		B
	% cycle	40 10/12		C

	% cycle	70 25/30	C
Short Interruptions	% cycle	0 250/300	C
Equipment used in controlled EM environments (AC Power)			
Voltage Dip	% cycle	0 0.5	B

Note : 25/30 cycles means 25 cycles for 50 Hz test and 30 cycles for 60 Hz test.

12.4. Test Procedure

The EUT and its load are placed on a table which is 0.8 meter above a metal ground plane measured 1m*1m min. And 0.65mm thick min. And projected beyond the EUT by at least 0.1m on all sides. The power cord shall be used the shortest power cord as specified by the manufacturer.

For Voltage Dips/ Interruptions test:

The selection of test voltage is based on the rated power range. If the operation range is large than 20% of lower power range, both end of specified voltage shall be tested. Otherwise, the typical voltage specification is selected as test voltage.

The EUT is connected to the power mains through a coupling device that directly couples to the Voltage Dips and Interruption Generator.

Voltage phase shifting are shall occur at 0° , 45° , 90° , 135° , 180° , 225° , 270° , 315° of the voltage.

12.5. Deviation from Test Standard

No deviation.

12.6. Test Result

Test Site	TR2	Date of Test	2011.02.18
EUT	ProNet	Test Voltage	AC 230V / 50Hz
Temperature	22°C	Humidity	45%RH
Barometric Pressure	101kPa	Test Engineer	Jane
Test Mode	Mode 1: Continuously operating		

Voltage % Reduction	Test Duration (period)	Test Result Criterion	Observation	Result
100(Dips)	1	A	Note 1	Pass
60(Dips)	10	A	Note 1	Pass
30(Dips)	25	A	Note 1	Pass
100(Interruptions)	250	B	Note 2	Pass

NOTE 1: There was no change compared with initial operation during the test.

NOTE 2: The power of EUT has been shutdown during the test, but self-recoverable after the test.

12.7. Test Photograph

Test Mode : Mode 1: Continuously operating

Description : Voltage Dips and Interruption Test Setup



13. Attachment

➤ EUT Photograph

(1) EUT Photo



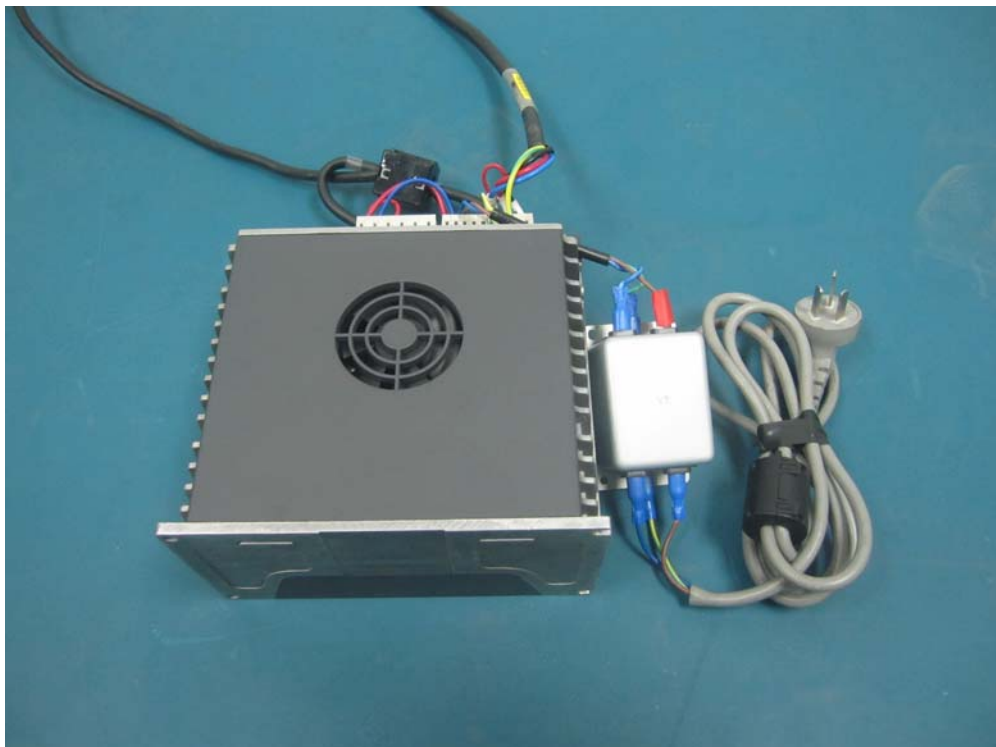
(2) EUT Photo



(3) EUT Photo



(4) EUT Photo



(5) EUT Photo



(6) EUT Photo



(7) EUT Photo

