
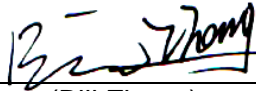



# EMC Test Report

**Project No.** : 1504C260A  
**Equipment** : PoE Injector  
**Model Name** : PoE15F  
**Applicant** : SHENZHEN TENDA TECHNOLOGY CO.,LTD  
**Address** : 6-8 Floor, Tower E3, No. 1001, Zhongshanyuan Road,  
Nanshan District, Shenzhen, China. 518052

**Date of Receipt** : Apr. 28, 2015  
Jan. 19, 2017  
**Date of Test** : Apr. 28, 2015 ~ May 21, 2015  
Jan. 19, 2017~ Feb. 09, 2017  
**Issued Date** : Feb. 10, 2017  
**Tested by** : BTL Inc.

**Testing Engineer** :   
(Kevin Li)

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**BTL's** laboratory quality assurance procedures are in compliance with the **ISO Guide 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

### **Limitation**

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

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### REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
BTL- EMC -1-1504C260	Original Report	May 22, 2015
BTL-EMC-1-1504C260A	Compared with the previous report (BTL- EMC -1-1504C260), the EN 55022 is updated to the EN 55032, the test items of EMI have been re-evaluated and recorded in the test report.	Feb. 10, 2017

## 1. CERTIFICATION

Equipment : PoE Injector  
Brand Name : Tenda  
Model Name : PoE15F  
Applicant : SHENZHEN TENDA TECHNOLOGY CO.,LTD  
Manufacturer : Shenzhen Tenda Technology Co.,Ltd.,Dongguan Branch  
Address : No. 79 Yuanyi street, Dalang Town, Dongguan City, Guangdong Province, China  
Date of Test : Apr. 28, 2015 ~ May 21, 2015  
: Jan. 19, 2017 ~ Feb. 09, 2017  
Test Sample : Engineering Sample  
Standard(s) : EN 55032: 2012+AC: 2013 Class A  
EN 61000-3-2: 2014 Class A  
EN 61000-3-3: 2013  
EN 55024: 2010+A1: 2015  
EN 61000-4-2: 2009  
EN 61000-4-3: 2006+A1: 2008+A2: 2010  
EN 61000-4-4: 2012  
EN 61000-4-5: 2014  
EN 61000-4-6: 2014+AC: 2015  
EN 61000-4-8: 2010  
EN 61000-4-11: 2004

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-EMC-1-1504C260A) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

## 2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

Emission					
Standard(s)	Test Item		Limit	Judgment	Remark
EN 55032: 2012+AC:2013	Radiated emissions up to 1 GHz		Class A	PASS	-----
	Radiated emissions above 1 GHz		Class A	N/A	NOTE (1) NOTE (2)
	Radiated emissions from FM receivers		-----	N/A	NOTE (1) NOTE (6)
	Conducted emissions AC mains power port		Class A	PASS	NOTE (7)
	Asymmetric mode conducted emissions	AAN	-----	PASS	NOTE (1) NOTE (8)
		Current Probe	-----	N/A	
		CVP	-----	N/A	
	Conducted differential voltage emissions		-----	N/A	NOTE (1) NOTE (9)

Standard	Test Item	Limit	Judgment	Remark
EN 61000-3-2	Harmonic current emissions	Class A	PASS	NOTE (3)
EN 61000-3-3	Voltage changes, voltage fluctuations and flicker		PASS	

Immunity EN 55024: 2010				
Section(s)	Test Item	Performance Criterion	Judgment	Remark
EN 61000-4-2:2009	Electrostatic discharge immunity	B	PASS	
EN 61000-4-3: 2006+A1:2008+A2:2010	Radiated, radio-frequency, electromagnetic field immunity	A	PASS	
EN 61000-4-4:2012	Electrical fast transient/burst immunity	B	PASS	
EN 61000-4-5:2014	Surge immunity	B/C	PASS	NOTE(4)
EN 61000-4-6: 2014+AC :2015	Immunity to conducted disturbances, induced by radio-frequency fields	A	PASS	
EN 61000-4-8:2010	Power frequency magnetic field immunity	A	PASS	
EN 61000-4-11:2004	Voltage dips, short interruptions and voltage variations immunity	B / C / C	PASS	NOTE(5)



**NOTE:**

- (1) "N/A" denotes test is not applicable to this device.
- (2) The EUT's max operating frequency is below 108 MHz, so the test will not be performed.
- (3) If the power consumption is less than 75W, there is no limit applied.
- (4) Performance Criterion C for signal ports and telecommunication ports.  
Performance Criterion B for input d.c. power port and a.c. power ports.
- (5) Voltage Dips: >95% reduction – Performance Criterion B  
Voltage Dips: 30% reduction – Performance Criterion C  
Voltage Interruptions: >95% reduction – Performance Criterion C
- (6) If the EUT has FM function the test will be performed.
- (7) If the EUT has AC power mains port the test will be performed.
- (8)

Cable Type	Number of pairs	Measurement type	Procedures
Balanced Unscreened	1 (2 wire) ;2 (4 wire); 3 (6 wire) ;4 (8 wire)	Voltage	AAN
Balanced Unscreened	See a)	Voltage and Current	CP+CVP
Screened or Coaxial	n/a	Voltage	AAN
Screened or Coaxial	n/a	Voltage or Current	CP or CVP
Unbalanced cables	n/a	Voltage and Current	CP+CVP

Ports connected to cables with more than 4 balanced pairs or where the port is unable to function correctly when connected through an AAN.

- (9) If the EUT has tuner port the test will be performed.
- (10) The requirement followed by the client's specification.

## 2.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.

## 2.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2 .The BTL measurement uncertainty is less than the CISPR 16-4-2  $U_{\text{CISPR}}$  requirement.

The reported uncertainty of measurement  $y \pm U$ , where expanded uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately **95 %**.

### A. Conducted emissions AC mains power port measurement:

Test Site	Method	Measurement Frequency Range	$U$ , (dB)
DG-C01	CISPR	150 kHz ~ 30MHz	3.16

### B. Radiated emissions up to 1 GHz measurement:

Test Site	Method	Measurement Frequency Range	Ant. H / V	$U$ , (dB)
DG-CB08(10m)	CISPR	30MHz ~ 200MHz	V	4.66
		30MHz ~ 200MHz	H	4.64
		200MHz ~ 1,000MHz	V	4.88
		200MHz ~ 1,000MHz	H	4.86

### C. Asymmetric Mode Conducted Emissions Measurement:

Test Site	Method	Measurement Frequency Range	$U$ ,(dB)
DG-C01	CISPR	AAN 50...40dB	3.76
		AAN 65...50dB	3.76
		AAN 75...60dB	3.76
		Capacitive Voltage Probe	3.04
		RF Current Probe	2.58

### D. Harmonic/ Flicker Measurement:

Test Site	Method	Test Item	$U$ (%)
TR06	EN 61000-3-2	Voltage	0.774
	EN 61000-3-3	Current	0.782

#### E. Immunity Measurement:

Test Site	Method	Test Item	U
SR02	EN 61000-4-2	Voltage (2kV/4kV/6kV/8kV/15kV/25kV/30kV)	1.0%
		Peak Current	6.0%
		30/60ns Current	6.0%
		Rise time	6.4%
CB05	EN 61000-4-3	80MHz~1GHz	2.175 dB
		1GHz~6GHz	2.175 dB
SR05	EN 61000-4-4	Impulse Voltage	4.0 %
		Impulse Rise Time	4.5 %
		Impulse duration Time	4.0 %
SR05	EN 61000-4-5	Impulse Voltage	4.0 %
		Impulse Rise Time	4.5 %
		Impulse duration Time	4.0 %
CB06	EN 61000-4-6	CDN: 150kHz~230MHz	2.509 dB
		EM Clamp: 150kHz~230MHz	3.094 dB
SR05	EN 61000-4-8	Magnetic Field Level	3 %
SR05	EN 61000-4-11	Impulse Amplitude	4 %
		Timing	3 %

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

Equipment	PoE Injector
Brand Name	Tenda
Model Name	PoE15F
Model Difference	N/A
Power Source	AC mains
Power Rating	I/P:AC 100-240V, 50/60Hz, 0.4A O/P:48V 15W

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

### 3.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	FULL SYSTEM
Mode 2	LAN 100Mbps
Mode 3	LAN 10Mbps
Mode 4	PoE 100Mbps
Mode 5	PoE 10Mbps

For Radiated Emission Up to 1G Test	
Final Test Mode	Description
Mode 1	FULL SYSTEM

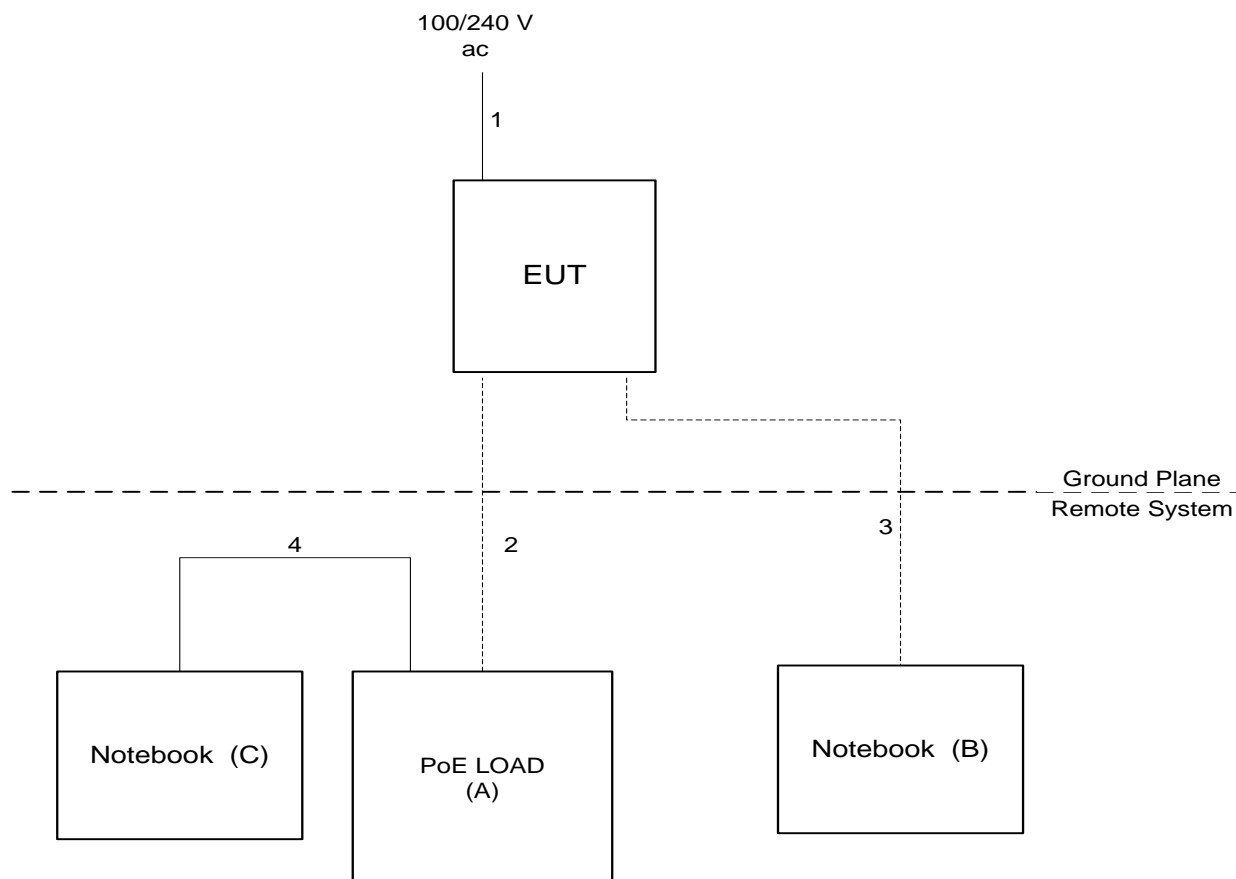
For Conducted emissions AC mains power port	
Final Test Mode	Description
Mode 1	FULL SYSTEM

For Asymmetric Mode Conducted port	
Final Test Mode	Description
Mode 2	LAN 100Mbps
Mode 3	LAN 10Mbps
Mode 4	PoE 100Mbps
Mode 5	PoE 10Mbps

For Harmonics / Flickers Test	
Final Test Mode	Description
Mode 1	FULL SYSTEM

For EMS Test	
Final Test Mode	Description
Mode 1	FULL SYSTEM

### 3.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



### 3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.
A	PoE LOAD	N/A	N/A	N/A	N/A
B	Notebook	DELL	Inspiron14-3421	DOC	35671Z1
C	Notebook	Lenovo	E46L	DOC	EB21809870

Item	Shielded Type	Ferrite Core	Length	Note
1	NO	NO	1.8m	AC main Cable
2	NO	NO	15m	RJ45 Cable
3	NO	NO	15m	RJ45 Cable
4	NO	NO	1m	RJ45 Cable

Note:

- (1) The support equipment was authorized by Declaration of Conformity.
- (2) For detachable type I/O cable should be specified the length in m in 『Length』 column.

## 4. EMC EMISSION TEST

### 4.1 RADIATED EMISSION

#### 4.1.1 LIMITS

Class A equipment up to 1000MHz

Table clause	Frequency MHz	Measurement		Class A limit dB(uV/m)
		Distance m	Detector type/bandwidth	OATS/SAC
A2.1	30-230	10	Quasi peak / 120 kHz	40
	230-1000			47
A2.2	30-230	3		50
	230-1000			57

Class B equipment up to 1000MHz

Table clause	Frequency MHz	Measurement		Class B limit dB(uV/m)
		Distance m	Detector type/bandwidth	OATS/SAC
A4.1	30-230	10	Quasi peak / 120 kHz	30
	230-1000			37
A4.2	30-230	3		40
	230-1000			47

Notes:

- (1) The limit for radiated test was performed according to as following: EN 55032
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).
- (4) The test result calculated as following:  
 Measurement Value = Reading Level + Correct Factor  
 Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)  
 Margin Level = Measurement Value - Limit Value

Required highest frequency for radiated measurement

Highest internal frequency ( $F_x$ ) MHz	Highest measured frequency MHz
$F_x \leq 108$	1000
$108 < F_x \leq 500$	2000
$500 < F_x \leq 1000$	5000
$F_x > 1000$	5 <sup>th</sup> up to a maximum 6 GHz,

Note for FM and TV broadcast receiver,  $F_x$  is determined from the highest frequency generated or used excluding the local oscillator and tuned frequencies.

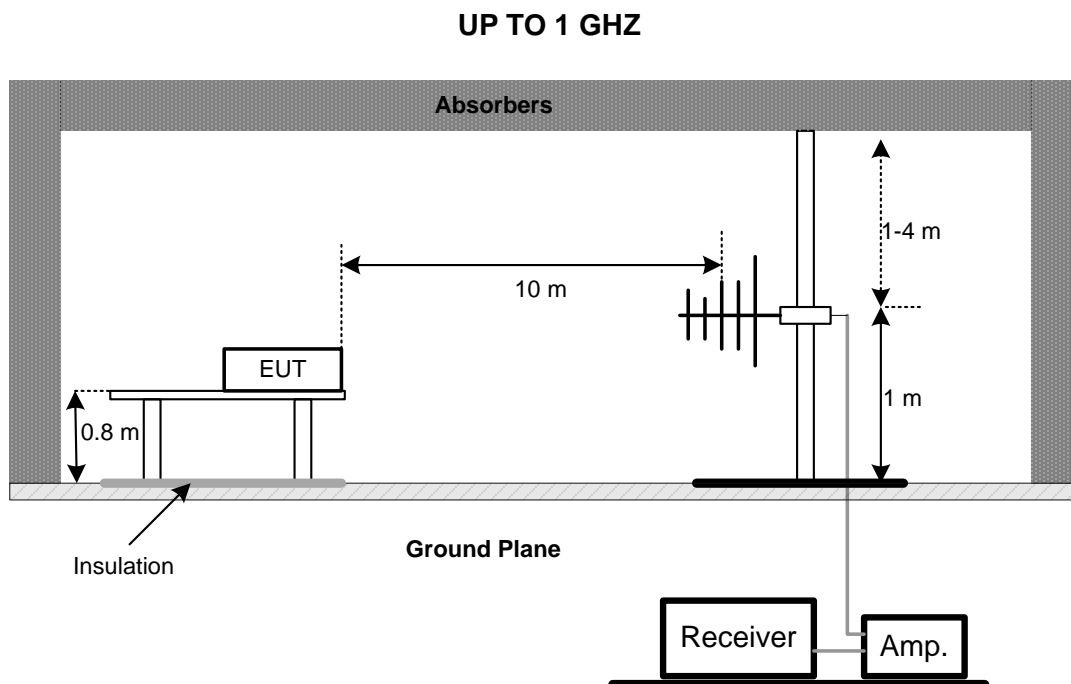
#### 4.1.2 TEST PROCEDURE

- The measuring distance of 10 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz).
- The height of the equipment or of the substitution antenna shall be 0.8 m, the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform. (below 1GHz)
- For the actual test configuration, please refer to the related Item - Block Diagram of system tested (please refer to 3.3).

#### 4.1.3 DEVIATION FROM TEST STANDARD

No deviation

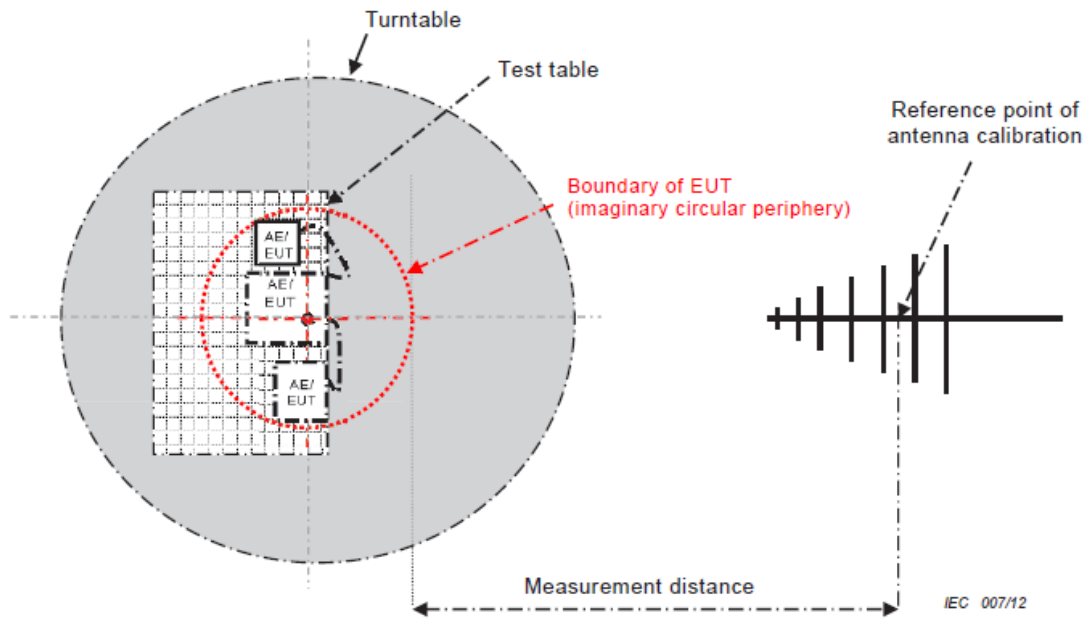
#### 4.1.4 TEST SETUP



Note: The antenna can be moved between 1 to 4 meters above the ground.

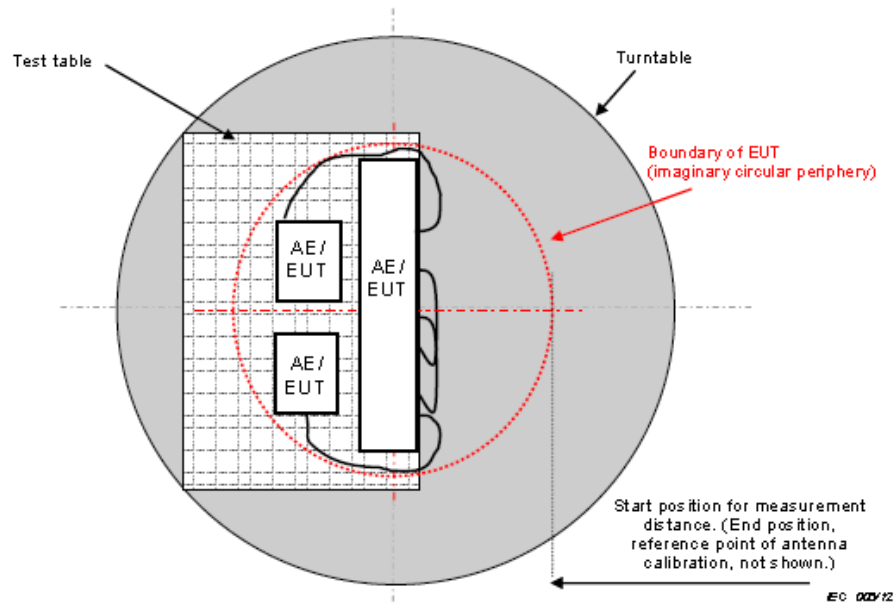


#### 4.1.5 MEASUREMENT DISTANCE



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CISPR 32 © IEC:2012



**Figure C.2 – Boundary of EUT, Local AE and associated cabling**

#### 4.1.6 TEST RESULTS (UP TO 1 GHZ)

Please refer to the Attachment A.

Temperature: 25°C Relative Humidity:45%

## 4.2 CONDUCTED EMISSION MEASUREMENT AT AC MAINS POWER PORTS

### 4.2.1 LIMITS

Requirements for conducted emissions from AC mains power ports of Class A equipment

Table clause	Frequency Range MHz	Coupling Device	Detector Type / bandwidth	Class A Limits (dB(μV) )
A8.1	0.15 - 0.5	AMN	Quasi Peak / 9 kHz	79
	0.5 - 30			73
A8.2	0.15 - 0.5	AMN	Average / 9 kHz	66
	0.5 - 30			60

Requirements for conducted emissions from AC mains power ports of Class B equipment

Table clause	Frequency Range MHz	Coupling Device	Detector Type / bandwidth	Class B Limits (dB(μV) )
A9.1	0.15 - 0.5	AMN	Quasi Peak / 9 kHz	66-56
	0.5 - 5			56
	5 - 30			60
A9.2	0.15 - 0.5	AMN	Average / 9 kHz	56-46
	0.5 - 5			46
	5 - 30			50

#### NOTE:

(1) The test result calculated as following:

Measurement Value = Reading Level + Correct Factor

Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor(if use)

Margin Level = Measurement Value – Limit Value

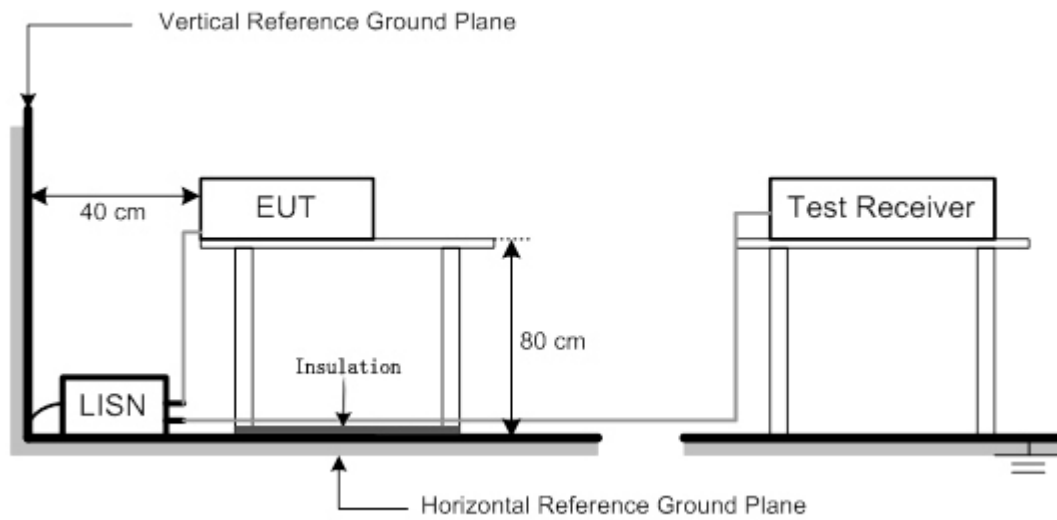
### 4.2.2 TEST PROCEDURE

- The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 4.2.3 DEVIATION FROM TEST STANDARD

No deviation

#### 4.2.4 TEST SETUP



#### 4.2.5 TEST RESULTS

Please refer to the Attachment B.

Temperature: 25°C Relative Humidity:45%

### 4.3 ASYMMETRIC MODE CONDUCTED EMISSIONS TEST

#### 4.3.1 LIMITS

Requirements for asymmetric mode conducted emissions from Class A equipment

Table clause	Frequency range MHz	Coupling device	Detector type / Bandwidth	Class A voltage limits dB(μV)	Class A current limits dB(μV)
A10.1	0.15 — 0.5	AAN	Quasi Peak / 9 kHz	97 — 87	n/a
	0.5 — 30			87	
	0.15 — 0.5	A□N	Average / 9 kHz	84 — 74	
	0.5 — 30			74	
A10.2	0.15 — 0.5	CVP and current probe	Quasi Peak / 9 kHz	97 — 87	53 — 43
	0.5 — 30			87	43
	0.15 — 0.5	CVP and current probe	Average / 9 kHz	84 — 74	40 — 30
	0.5 — 30			74	30
A10.3	0.15 — 0.5	Current probe	Quasi Peak / 9 kHz	n/a	53 — 43
	0.5 — 30				43
	0.15 — 0.5	Current probe	Average / 9 kHz		40 — 30
	0.5 — 30				30

Requirements for asymmetric mode conducted emissions from Class B equipment

Table clause	Frequency range MHz	Coupling device	Detector type / B□ndwidth	Class B voltage limits dB(μV)	Class B current limits dB(μV)
A11.1	0.15 — 0.5	AAN	Quasi Peak / 9 kHz	84 — 74	n/a
	0.5 — 30			74	
	0.15 — 0.5	AAN	Average / 9 kHz	74— 64	
	0.5 — 30			64	
A11.2	0.15 — 0.5	CVP and current probe	Quasi Peak / 9 kHz	84 — 74	40 — 30
	0.5 — 30			74	30
	0.15 — 0.5	CVP and current probe	Average / 9 kHz	74— 64	30 — 20
	0.5 — 30			64	20
A11.3	0.15 — 0.5	Current probe	Quasi Peak / 9 kHz	n/a	40 — 30
	0.5 — 30				30
	0.15 — 0.5	Current probe	Average / 9 kHz		30 — 20
	0.5 — 30				20

NOTE:

(1) The test result calculated as following:

Measurement Value = Reading Level + Correct Factor

Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor(if use)

Margin Level = Measurement Value – Limit Value

#### 4.3.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. For the actual test configuration, please refer to the related Item –EUT Test Photos.
- e. **AAN, CP or CVP** at least 80 cm from nearest part of EUT chassis.

#### NOTE:

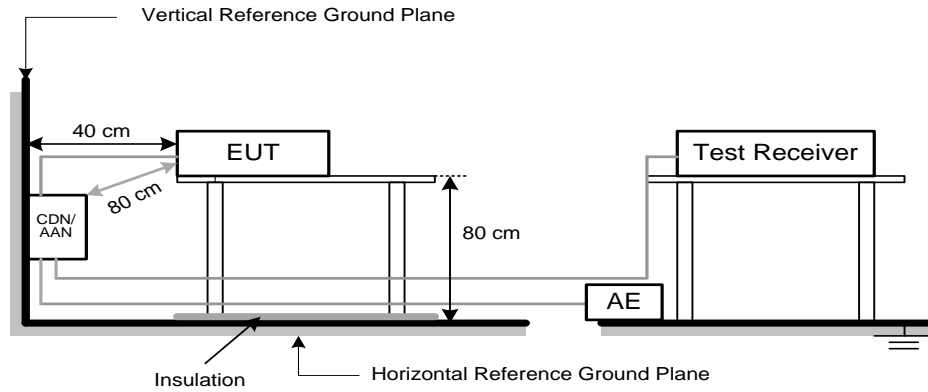
- f. The communication function of EUT was executed and AAN was connected between EUT and associated equipment and the AAN was connected directly to reference ground plane.  
Measure the voltage at the measurement port of the AAN  
Correct the measured voltage by adding the AAN voltage division factor  
Compare the corrected voltage with the limit(**For AAN**)
- g Measure the current with a current probe and compare to the current limit(**For CP**)
- h The current shall be measured with the current probe and the results compared with the current limits.  
The voltage measured shall be corrected at each frequency of interest as follows:  
- if the current margin with respect to the current limit is  $\leq 6$  dB, the actual current margin shall be subtracted from the measured voltage;  
-if the current margin with respect to the current limit is  $>6$  dB, 6 dB shall be subtracted from the measured voltage.  
The adjusted voltage shall be compared with the applicable voltage limit.  
Both the measured current and the corrected voltage shall be below the applicable current and voltage limits at all frequencies for the EUT to be deemed compliant with this publication.(**For CVP**)

#### 4.3.3 DEVIATION FROM TEST STANDARD

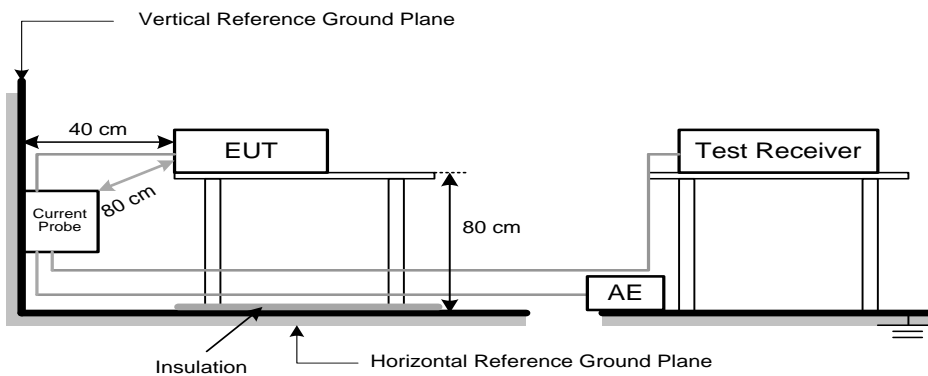
No deviation

#### 4.3.4 TEST SETUP

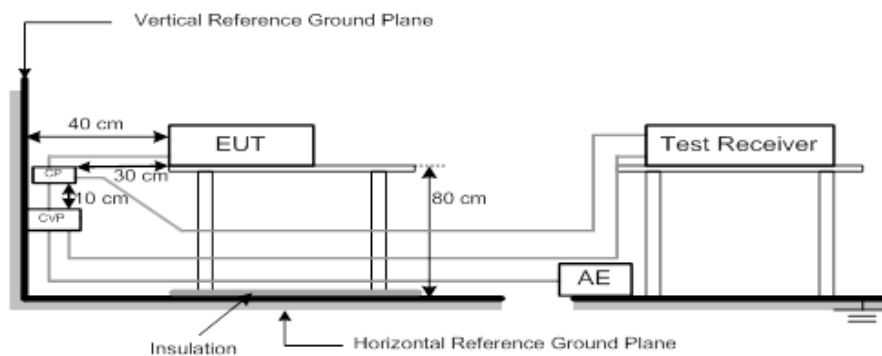
a) Cable Type: Balanced Unscreened, Screened or Coaxial



b) Cable Type: Screened or Coaxial



c) Cable Type: Balanced Unscreened, Unbalanced



#### 4.3.5 TEST RESULTS

Please refer to the Attachment C.

Temperature: 25°C Relative Humidity:45%

## 4.4 HARMONICS CURRENT MEASUREMENT

### 4.4.1 LIMITS OF HARMONICS CURRENT MEASUREMENT

EN 61000-3-2						
Equipment Category	Harmonic Order n	Max. Permissible Harmonic Current A	Equipment Category	Harmonic Order n	Max. Permissible Harmonic Current A      mA/w	
Class A	Odd Harmonics		Class D	Odd Harmonics only		
	3	2.30		3	2.30	3.4
	5	1.14		5	1.14	1.9
	7	0.77		7	0.77	1.0
	9	0.40		9	0.40	0.5
	11	0.33		11	0.33	0.35
	13	0.21		13	0.21	0.30
	15≤n≤39	0.15 x 15/n		15≤n≤39	0.15 x 15/n	3.85/n
	Even Harmonics					
	2	1.08				
	4	0.43				
	6	0.30				
	8≤n≤40	0.23 x 8/n				

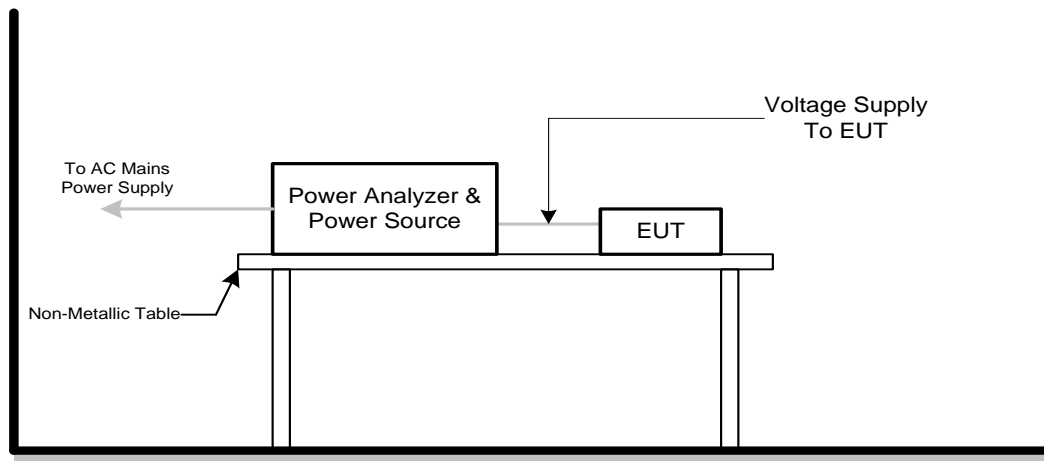
### 4.4.2 TEST PROCEDURE

- The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions.
- The classification of EUT is according to section 5 of EN 61000-3-2:2014. The EUT is classified as follows:
  - Class A: Balanced three-phase equipment, Household appliances excluding equipment as Class D, Tools excluding portable tools, Dimmers for incandescent lamps, audio equipment, equipment not specified in one of the three other classes.
  - Class B: Portable tools. Arc welding equipment which is not professional equipment.
  - Class C: Lighting equipment.
  - Class D: Equipment having a specified power less than or equal to 600 W of the following types: Personal computers and personal computer monitors and television receivers.
- The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the time necessary for the EUT to be exercised.
- For the actual test configuration, please refer to the related Item –Block Diagram of system tested (please refer to 3.3).

#### 4.4.3 DEVIATION FROM TEST STANDARD

No deviation

#### 4.4.4 TEST SETUP



#### 4.4.5 TEST RESULTS

Please refer to the Attachment D.

Temperature: 25°C    Relative Humidity: 50%



## 4.5 VOLTAGE FLUCTUATION AND FLICKS MEASUREMENT

### 4.5.1 LIMITS OF VOLTAGE FLUCTUATION AND FLICKS MEASUREMENT

Tests	Limits	Descriptions
	EN 61000-3-3	
Pst	$\leq 1.0$ , $T_p = 10$ min.	Short Term Flicker Indicator
Plt	$\leq 0.65$ , $T_p = 2$ hr.	Long Term Flicker Indicator
dc	$\leq 3.3\%$	Relative Steady-State V-Chang
dmax	$\leq 4\%$	Maximum Relative V-change
d (t)	$\leq 3.3\%$ for $> 500$ ms	Relative V-change characteristic

### 4.5.2 TEST PROCEDURE

a. Fluctuation and Flickers Test:

Tests was performed according to the Test Conditions/Assessment of Voltage Fluctuations specified in Clause 6.0/4.0 of EN 61000-3-3 depend on which standard adopted for compliance measurement.

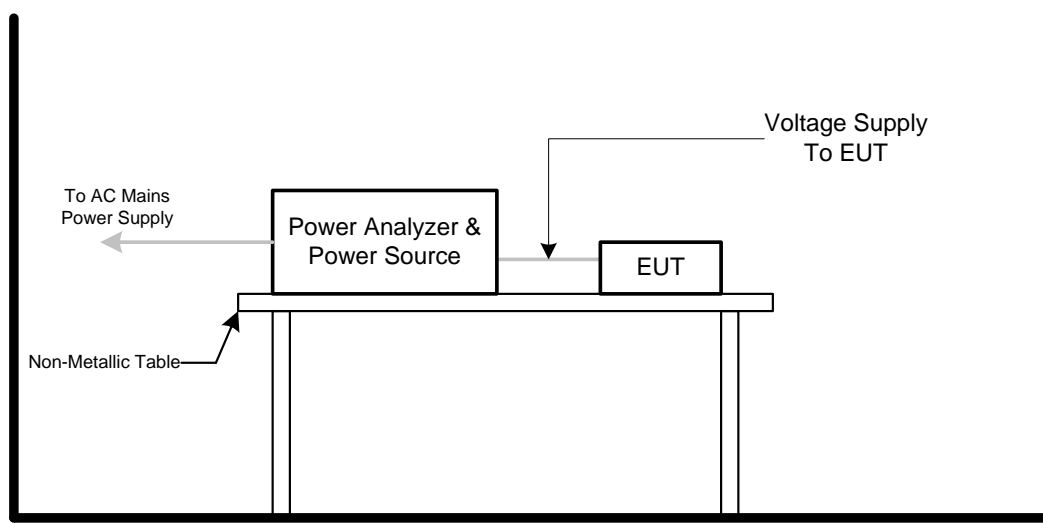
b. All types of harmonic current and/or voltage fluctuation in this report are assessed by direct measurement using flicker-meter.

c. For the actual test configuration, please refer to the related Item –Block Diagram of system tested (please refer to 3.3).

### 4.5.3 DEVIATION FROM TEST STANDARD

No deviation

### 4.5.4 TEST SETUP



### 4.5.5 TEST RESULTS

Please refer to the Attachment E.

Temperature: 25°C Relative Humidity: 50%

## 5. EMC IMMUNITY TEST

### 5.1 STANDARD COMPLIANCE/SEVERITY LEVEL/CRITERIA

Tests Standard No.	Test Specification Level / Test Mode	Test Ports	Criteria
Electrostatic discharge EN 61000-4-2 (ESD)	±8 kV air discharge ±4 kV contact discharge (Direct Mode)	Enclosure	B
	±4kV HCP discharge ±4kV VCP discharge (Indirect Mode)	Enclosure	B
Radiated, radio-frequency, electromagnetic field immunity EN 61000-4-3 (RS)	80 MHz to 1000 MHz 3V/m(unmodulated, r.m.s), 1 kHz, 80%,AM modulated	Enclosure	A
Electrical fast transient/burst immunity EN 61000-4-4 (EFT/Burst)	±0.5kV(peak) 5/50ns Tr/Th 5kHz Repetition Frequency (100kHz Repetition Frequency for xDSL equipment )	Signal ports and telecommunication ports (Only applicable to cable length>3 m)	B
	±0.5kV(peak) 5/50ns Tr/Th 5kHz Repetition Frequency	DC Power Ports	B
	±1 kV(peak) 5/50ns Tr/Th 5kHz Repetition Frequency	AC Power Ports	B
Surge immunity EN 61000-4-5 (Surges)	±1 kV(peak) 10/700 Tr/Th μs(NOTE) (without primary protection)	Signal ports and telecommunication ports (applicable only to ports connect directly to outdoor cables)	C
	±4 kV(peak) 10/700 Tr/Th μs(NOTE) (with primary protectors fitted)		C
	±0.5 kV(peak) 1.2/50(8/20) Tr/Th μs	DC Power Ports (applicable only to ports connect directly to outdoor cables)	B
	±1 kV(peak) 1.2/50(8/20) Tr/Th μs (line to line)	AC Power Ports	B
	±2 kV(peak) 1.2/50(8/20) Tr/Th μs (line to earth or ground)		B

Immunity to conducted disturbances, induced by radio-frequency fields EN 61000-4-6 (Injected Current)	0.15 MHz to 80 MHz 3V(unmodulated, r.m.s), 1kHz 80%, AM 150Ω source impedance	Signal ports and telecommunication ports (Only applicable to cable length>3 m)	A
	0.15 MHz to 80 MHz 3V(unmodulated, r.m.s), 1kHz 80%, AM 150Ω source impedance	DC Power Ports	A
	0.15 MHz to 80 MHz 3V(unmodulated, r.m.s), 1kHz 80%, AM 150Ω source impedance	AC Power Ports	A
Power frequency magnetic field immunity EN 61000-4-8 (PFMF)	50 Hz or 60Hz, 1A/m(r.m.s) μs	Enclosure	A
Voltage dips, short interruptions and voltage variations immunity EN 61000-4-11 (Voltage Interruption/Dips)	Voltage reduction > 95% 0.5 period Voltage reduction 30% 25 periods Voltage reduction > 95% 250 periods	AC Power Ports	B C C

Note. Where the coupling network for the 10/700 μs waveform affects the functioning of high speed data ports, the test shall be carried out using a 1,2/50 (8/20) μs waveform and appropriate coupling network.

### 5.1.1 GENERAL PERFORMANCE CRITERIA

According to **EN55024** standard, the general performance criteria as following:

<b>Criterion A</b>	<p>The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.</p> <p>If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.</p>
<b>Criterion B</b>	<p>After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomenon below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.</p> <p>During the test, degradation of performance is allowed. However, no change of operating state if stored data allowed to persist after the test. If the minimum performance level (or the permissible performance loss ) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.</p>
<b>Criterion C</b>	<p>Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.</p> <p>Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.</p>

## 5.2 ESD TESTING

### 5.2.1 TEST SPECIFICATION

Basic Standard:	EN 61000-4-2
Discharge Impedance:	330 ohm / 150 pF
Required Performance	B
Discharge Voltage:	Air Discharge: $\pm 2\text{kV}/\pm 4\text{kV}/\pm 8\text{kV}$ (Direct) Contact Discharge: $\pm 2\text{kV}/\pm 4\text{kV}$ (Direct/Indirect)
Polarity:	Positive & Negative
Number of Discharge:	Air Discharge: min. 20 times at each test point Contact Discharge: min. 200 times in total
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum

### 5.2.2 TEST PROCEDURE

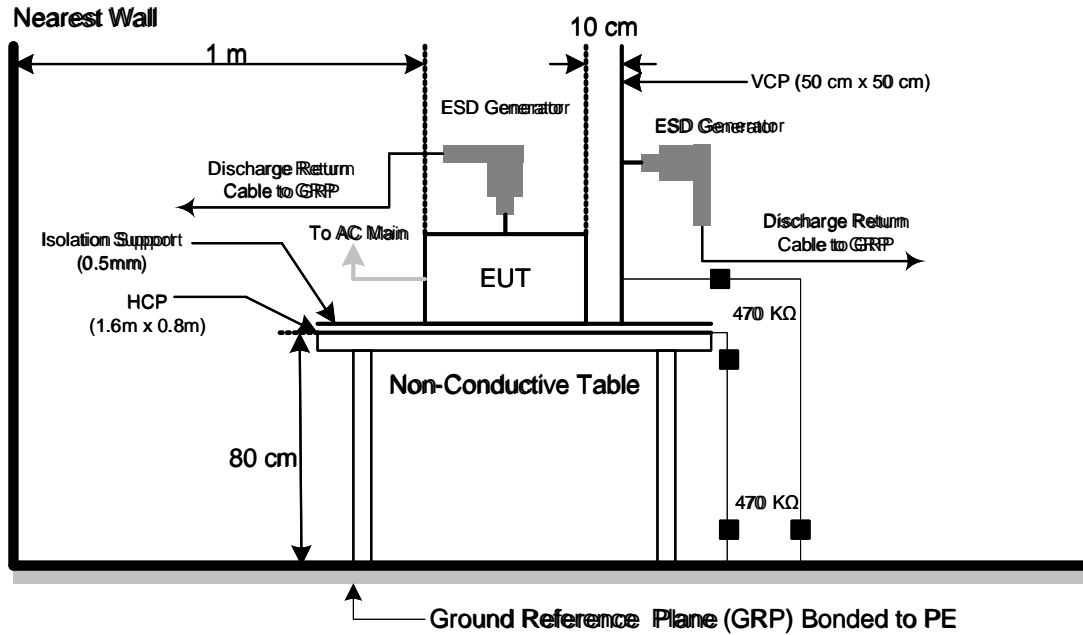
The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manner:

- Contact discharge was applied to conductive surfaces and coupling planes of the EUT.  
During the test, it was performed with single discharges. For the single discharge time between successive single discharges was at least 1 second. The EUT shall be exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points. One of the test points shall be subjected to at least 50 indirect discharges to the center of the front edge of the horizontal coupling plane. The remaining three test points shall each receive at least 50 direct contact discharges.  
If no direct contact test points are available, then at least 200 indirect discharges shall be applied in the indirect mode. Test shall be performed at a maximum repetition rate of one discharge per second.  
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.  
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.
- Air discharges at insulation surfaces of the EUT.  
It was at least ten single discharges with positive and negative at the same selected point.
- For the actual test configuration, please refer to the related Item –Block Diagram of system tested (please refer to 3.3).

### 5.2.3 DEVIATION FROM TEST STANDARD

No deviation

## 5.2.4 TEST SETUP



Note:

### TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table 0.8 meters high standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A Horizontal Coupling Plane (1.6m x 0.8m) was placed on the table and attached to the GRP by means of a cable with 940k total impedance. The equipment under test, was installed in a representative system as described in section 7 of IEC /EN 61000-4-2, and its cables were placed on the HCP and isolated by an insulating support of 0.5mm thickness. A distance of 1-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

### FLOOR-STANDING EQUIPMENT

The equipment under test was installed in a representative system as described in section 7 of EN 61000-4-2, and its cables were isolated from the Ground Reference Plane by an insulating support of 0.1-meter thickness. The GRP consisted of a sheet of aluminum that is at least 0.25mm thick, and 2.5meters square connected to the protective grounding system and extended at least 0.5 meters from the EUT on all sides.

## 5.2.5 TEST RESULTS

Please refer to the Attachment F.

Temperature: 26°C Relative Humidity: 40%

## 5.3 RS TESTING

### 5.3.1 TEST SPECIFICATION

Basic Standard:	EN 61000-4-3
Required Performance	A
Frequency Range:	80 MHz - 1000 MHz
Field Strength:	3 V/m
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1% of fundamental
Polarity of Antenna:	Horizontal and Vertical
Test Distance:	3 m
Antenna Height:	1.5 m
Dwell Time:	at least 3 seconds

### 5.3.2 TEST PROCEDURE

The EUT and support equipment, which are placed on a table that is 0.8 meter above ground and the testing was performed in a fully-anechoic chamber.

The testing distance from antenna to the EUT was 3 meters.

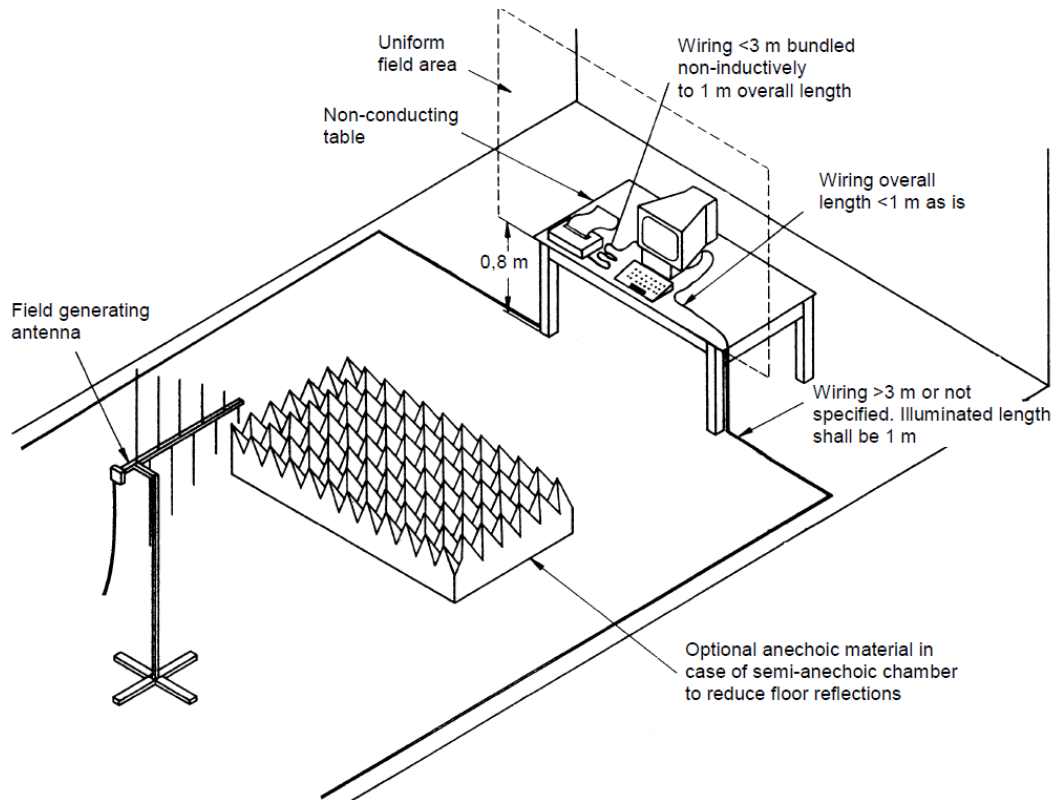
The other condition as following manner:

- The field strength level was 3V/m.
- The frequency range is swept from 80 MHz to 1000 MHz, with the signal 80% amplitude modulated with a 1kHz sine wave. The rate of sweep did not exceed  $1.5 \times 10^{-3}$  decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- Sweep Frequency 900 MHz, with the Duty Cycle:1/8 and Modulation: Pulse 217 Hz(if applicable)
- The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
- The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.
- For the actual test configuration, please refer to the related Item –Block Diagram of system tested (please refer to 3.3).

### 5.3.3 DEVIATION FROM TEST STANDARD

No deviation

### 5.3.4 TEST SETUP



Note:

#### TABLE-TOP EQUIPMENT

The EUT installed in a representative system as described in section 7 of EN 61000-4-3 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

#### FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of EN 61000-4-3 was placed on a non-conductive wood support 0.1 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

### 5.3.5 TEST RESULTS

Please refer to the Attachment G.

Temperature: 28°C    Relative Humidity: 45%



## 5.4 EFT/BURST TESTING

### 5.4.1 TEST SPECIFICATION

Basic Standard:	EN 61000-4-4
Required Performance	B
Test Voltage:	Power Line: $\pm 1$ kV Signal/Control Line: $\pm 0.5$ kV
Polarity:	Positive & Negative
Impulse Frequency:	5 kHz
Impulse Wave shape:	5/50 ns
Burst Duration:	15 ms
Burst Period:	300 ms
Test Duration:	Not less than 1 min.

### 5.4.2 TEST PROCEDURE

The EUT and support equipment(s) are placed on a table that is 0.8 meter high above a metal ground plane and should be located 0.1m $\pm$ 0.01m high above the Ground Reference Plane (1m\*1m min. and 0.65mm thick min).

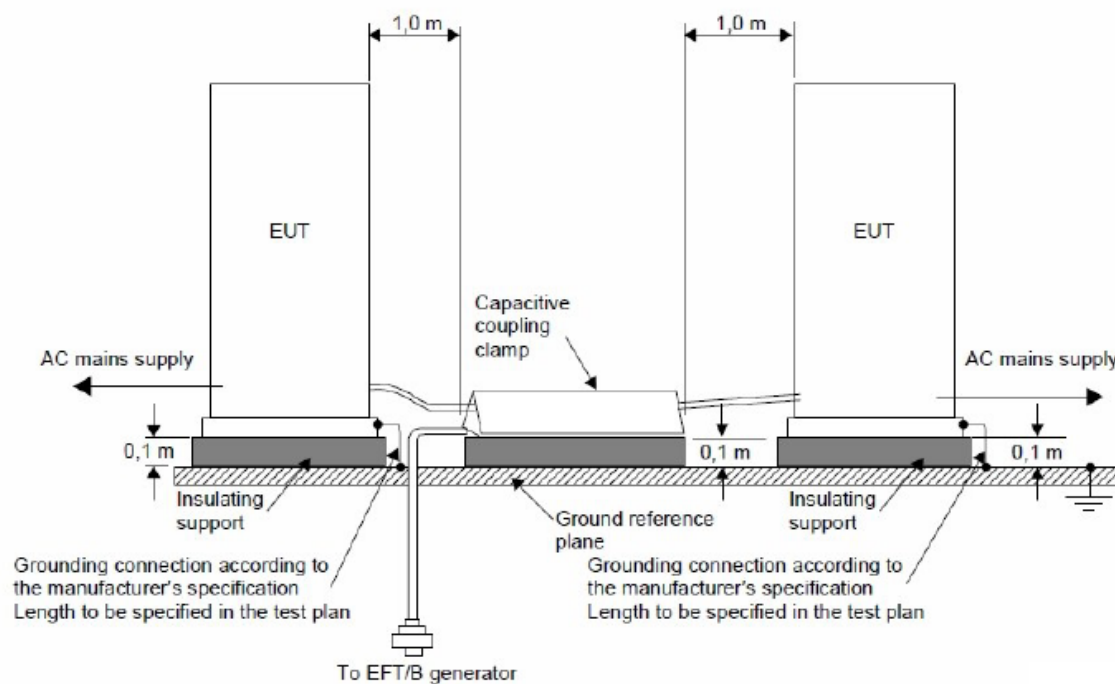
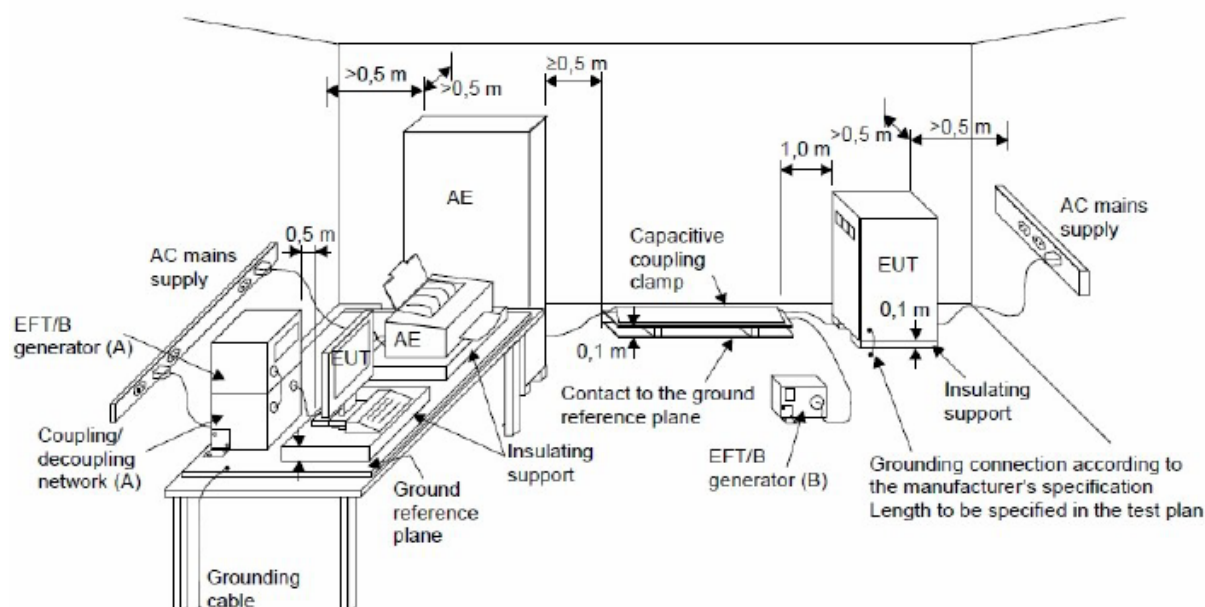
The other condition as following manner:

- The length of power cord between the coupling device and the EUT should not exceed 1 meter.
- Both positive and negative polarity discharges were applied.
- The duration time of each test sequential was 1 minute
- For the actual test configuration, please refer to the related Item –Block Diagram of system tested (please refer to 3.3).

### 5.4.3 DEVIATION FROM TEST STANDARD

No deviation

## 5.4.4 TEST SETUP



Note:

#### TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table (0.8m high) standing on the Ground Reference Plane and should be located 0.1m+/-0.01m above the Ground Reference Plane. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system. A minimum distance of 0.5m was provided between the EUT and the walls of the laboratory or any other metallic structure.

#### FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of EN 61000-4-4 and its cables, were isolated from the Ground Reference Plane by an insulating support that is 0.1-meter thick. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system.

#### 5.4.5 TEST RESULTS

Please refer to the Attachment H.

Temperature: 26°C    Relative Humidity: 45%

## 5.5 SURGE TESTING

### 5.5.1 TEST SPECIFICATION

Basic Standard:	EN 61000-4-5
Required Performance	B
Wave-Shape:	Combination Wave 1.2/50 us Open Circuit Voltage 8 /20 us Short Circuit Current
Test Voltage:	Power Line: $\pm 0.5$ kV, $\pm 1$ kV, $\pm 2$ kV
Surge Input/Output:	L1-L2, L1-PE, L2-PE
Generator Source:	2 ohm between networks
Impedance:	12 ohm between network and ground
Polarity:	Positive/Negative
Phase Angle:	0 /90/180/270
Pulse Repetition Rate:	1 time / min. (maximum)
Number of Tests:	5 positive and 5 negative at selected points

### 5.5.2 TEST PROCEDURE

a. For EUT power supply:

The surge is to be applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines, and to provide sufficient decoupling impedance to the surge wave. The power cord between the EUT and the coupling/decoupling networks shall be 2meters in length (or shorter).

b. For test applied to unshielded unsymmetrically operated interconnection lines of EUT:

The surge is applied to the lines via the capacitive coupling. The coupling /decoupling networks shall not influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

c. For test applied to unshielded symmetrically operated interconnection /telecommunication lines of EUT:

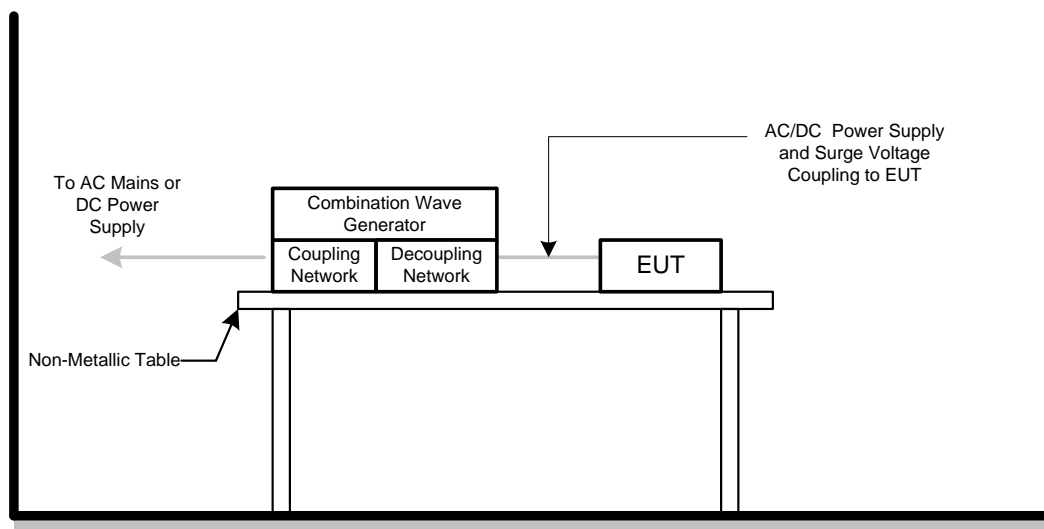
The surge is applied to the lines via gas arrestors coupling. Test levels below the ignition point of the coupling arrestor cannot be specified. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

d. For the actual test configuration, please refer to the related Item –Block Diagram of system tested (please refer to 3.3).

### 5.5.3 DEVIATION FROM TEST STANDARD

No deviation

#### 5.5.4 TEST SETUP



#### 5.5.5 TEST RESULTS

Please refer to the Attachment I.

Temperature: 26°C    Relative Humidity: 45%

## 5.6 INJECTION CURRENT TESTING

### 5.6.1 TEST SPECIFICATION

Basic Standard:	EN 61000-4-6
Required Performance	A
Frequency Range:	0.15 MHz - 80 MHz
Field Strength:	3 Vr.m.s.
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1% of fundamental
Dwell Time:	at least 3 seconds

### 5.6.2 TEST PROCEDURE

The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m\*1m min. and 0.65mm thick min.

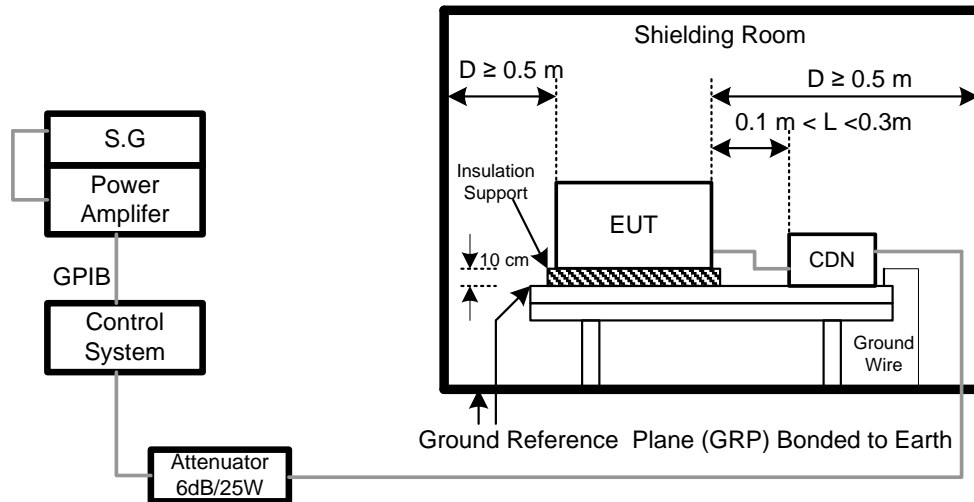
The other condition as following manner:

- The field strength level was 3V(unmodulated, r.m.s).
- The frequency range is swept from 150 KHz to 80 MHz, with the signal 80% amplitude modulated with a 1kHz sine wave. The rate of sweep did not exceed  $1.5 \times 10^{-3}$  decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
- For the actual test configuration, please refer to the related Item –Block Diagram of system tested (please refer to 3.3).

### 5.6.3 DEVIATION FROM TEST STANDARD

No deviation

#### 5.6.4 TEST SETUP



For the actual test configuration, please refer to the related Item –Block Diagram of system tested (please refer to 3.3).

#### NOTE:

##### FLOOR-STANDING EQUIPMENT

The equipment to be tested is placed on an insulating support of 0.1 meters height above a ground reference plane. All relevant cables shall be provided with the appropriate coupling and decoupling devices at a distance between 0.1 meters and 0.3 meters from the projected geometry of the EUT on the ground reference plane.

#### 5.6.5 TEST RESULTS

Please refer to the Attachment J.

Temperature: 28°C    Relative Humidity: 45%

## 5.7 POWER FREQUENCY MAGNETIC FIELD TESTING

### 5.7.1 TEST SPECIFICATION

Basic Standard:	EN 61000-4-8
Required Performance	A
Frequency Range:	50/60Hz
Field Strength:	1 A/m
Observation Time:	1 minute
Inductance Coil:	Rectangular type, 1mx1m

### 5.7.2 TEST PROCEDURE

The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m\*1m min. and 0.65mm thick min.

The other condition as following manner:

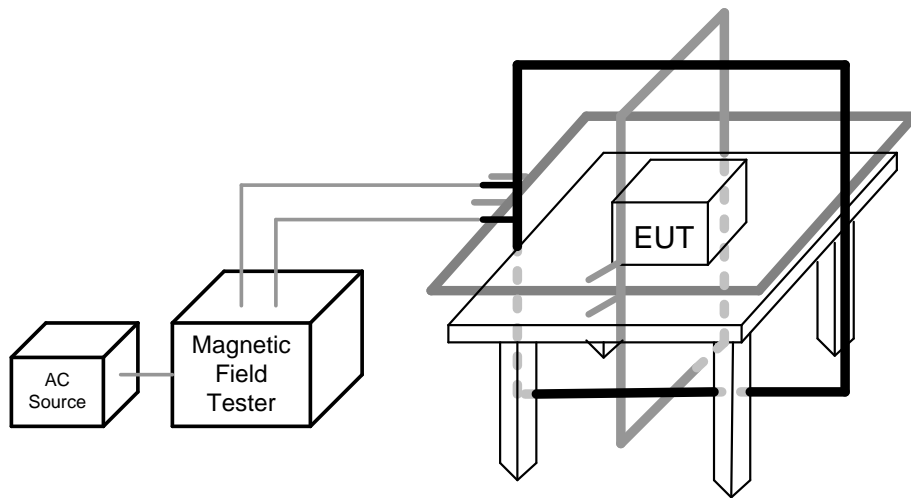
- The equipment cabinets shall be connected to the safety earth directly on the GRP via the earth terminal of the EUT.
- The cables supplied or recommended by the equipment manufacturer shall be used. 1 meter of all cables used shall be exposed to the magnetic field.
- For the actual test configuration, please refer to the related Item –Block Diagram of system tested (please refer to 3.3).

### 5.7.3 DEVIATION FROM TEST STANDARD

No deviation



#### 5.7.4 TEST SETUP



Note:

##### TABLE-TOP EQUIPMENT

The equipment shall be subjected to the test magnetic field by using the induction coil of standard dimension (1 m x 1 m). The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.

##### FLOOR-STANDING EQUIPMENT

The equipment shall be subjected to the test magnetic field by using induction coils of suitable dimensions. The test shall be repeated by moving and shifting the induction coils, in order to test the whole volume of the EUT for each orthogonal direction. The test shall be repeated with the coil shifted to different positions along the side of the EUT, in steps corresponding to 50% of the shortest side of the coil. The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.

#### 5.7.5 TEST RESULTS

Please refer to the Attachment K.

Temperature: 28°C    Relative Humidity: 45%

## 5.8 VOLTAGE INTERRUPTION/DIPS TESTING

### 5.8.1 TEST SPECIFICATION

Basic Standard:	EN 61000-4-11
Required Performance	B (For >95% Voltage Dips) C (For 30% Voltage Dips) C (For >95% Voltage Interruptions)
Test Duration Time:	Minimum three test events in sequence
Interval between Event:	Minimum ten seconds
Phase Angle:	0°/45°/90°/135°/180°/225°/270°/315°/360°
Test Cycle:	3 times

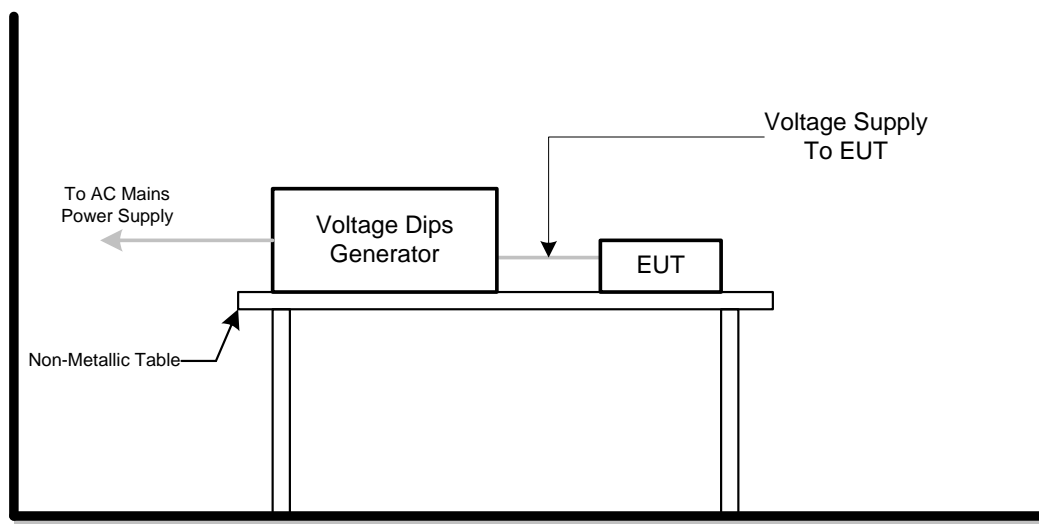
### 5.8.2 TEST PROCEDURE

The EUT shall be tested for each selected combination of test levels and duration with a sequence of three dips/interruptions with intervals of 10 s minimum (between each test event). Each representative mode of operation shall be tested. Abrupt changes in supply voltage shall occur at zero crossings of the voltage waveform.

### 5.8.3 DEVIATION FROM TEST STANDARD

No deviation

### 5.8.4 TEST SETUP



For the actual test configuration, please refer to the related Item –Block Diagram of system tested (please refer to 3.3).

### 5.8.5 TEST RESULTS

Please refer to the Attachment L.

Temperature: 26°C Relative Humidity: 45%

## 6. MEASUREMENT INSTRUMENTS LIST

Radiated emissions up to 1 GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Pre-Amplifier	Mini-Circuits	EMC 9135	980284	Mar. 27, 2017
2	Pre-Amplifier	Mini-Circuits	EMC 9135	980283	Mar. 27, 2017
3	Trilog-Broadband Antenna	Schwarzbeck	VULB9168	586	Feb. 04, 2017
4	Trilog-Broadband Antenna	Schwarzbeck	VULB9168	587	Jan. 26, 2017
5	Cable	emci	LMR-400(5m+11m+15m)	N/A	Dec. 27, 2017
6	Cable	emci	LMR-400(5m+8m+15m)	N/A	Dec. 27, 2017
7	Measurement Software	Farad	EZ-EMC Ver.BTL-2ANT-1	N/A	N/A
8	Multi-Device Controller	ETS-Lindgren	2090	N/A	N/A
9	Receiver	Keysight	N9038A	MY54450004	Sep. 04, 2017
	MXE EMI Receiver	Agilent	N9038A	MY53220133	Jun. 23, 2017

Conducted emissions AC mains power port					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
2	50Ω Terminator	SHX	TF2-3G-A	08122901	Mar. 27, 2017
3	TWO-LINE V-NETWORK	R&S	ENV216	100526	Mar. 27, 2017
4	EMI Test Receiver	R&S	ESR3	101862	Sep. 04, 2017
5	Artificial-Mains Network	SCHWARZBECK	NSLK 8127	8127685	Sep. 04, 2017
6	Cable	N/A	RG400 12m	N/A	Mar. 10, 2017

Asymmetric Mode Conducted port					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
2	50Ω Terminator	SHX	TF2-3G-A	08122901	Mar. 27, 2017
3	TWO-LINE V-NETWORK	R&S	ENV216	100526	Mar. 27, 2017
4	EMI Test Receiver	R&S	ESR3	101862	Sep. 04, 2017
5	Artificial-Mains Network	SCHWARZBECK	NSLK 8127	8127685	Sep. 04, 2017
6	Cable	N/A	RG400 12m	N/A	Mar. 10, 2017
7	ISN	FCC	F-070306-1057-1-09	100362	Mar. 27, 2017

### Harmonics & Flickers

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Harmonic & Flicker	California	PACS-1	72344	Jan. 16, 2016
2	Power Source	California	3001iX	56309	Jan. 16, 2016
3	Measurement Software	California	CTS3.0 Version 3.2.0.35	N/A	N/A

### ESD

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
2	ESD Generator	TESEQ AG	NSG 437	450	Jul. 10, 2015

### RS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Digital Signal Generator	HP	ESG-D3000A	US36260188	Mar. 28, 2016
2	Antenna	ETS	3142C	00047662	Mar. 28, 2016
3	Power amplifier	MILMEGA	80RF1000-250	N/A	Nov. 02, 2015
4	Amplifier	AR	50S1G4A	326720	Mar. 28, 2016
5	Measurement Software	TOYO	IM5/R Ver 3.8.050	N/A	N /A

### EFT

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Capacitive Clamp	Thermo	CCL	0502215	Mar. 28, 2016
2	THE MODULAR SOLUTION FOR 6 KV APPLICATIONS	Teseq	NSG 3060	1423	Aug. 29, 2015
3	Measurement Software	Teseq	Win 3000 Version 1.2.0	N/A	N/A

### Surge

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	THE MODULAR SOLUTION FOR 6 KV APPLICATIONS	Teseq	NSG 3060	1423	Aug. 29, 2015
2	CDN	EMC PARTNER	CDN-UTP8	040	Mar. 28, 2016
3	Measurement Software	Teseq	Win 3000 Version 1.2.0	N/A	N/A

CS					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Signal Generator	HP	8648A	3636A02964	Mar. 28, 2016
2	Power Amplifier	Teseq	CBA230M-080	T43748	Mar. 28, 2016
3	Power CDN	FCC	FCC-801-M2/ M3-16A	100271	Mar. 28, 2016
4	Signal Line CDN	FCC	F-090407-100 4-1	100518	Mar. 28, 2016
5	Measurement Software	TOYO	IM5/C Ver 3.7.028	N/A	N/A

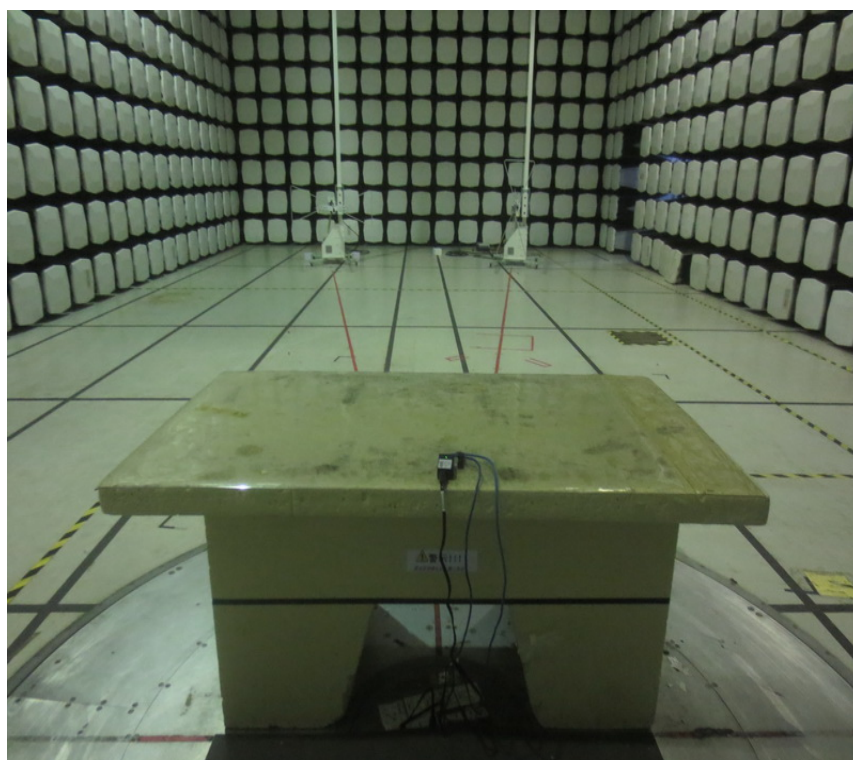
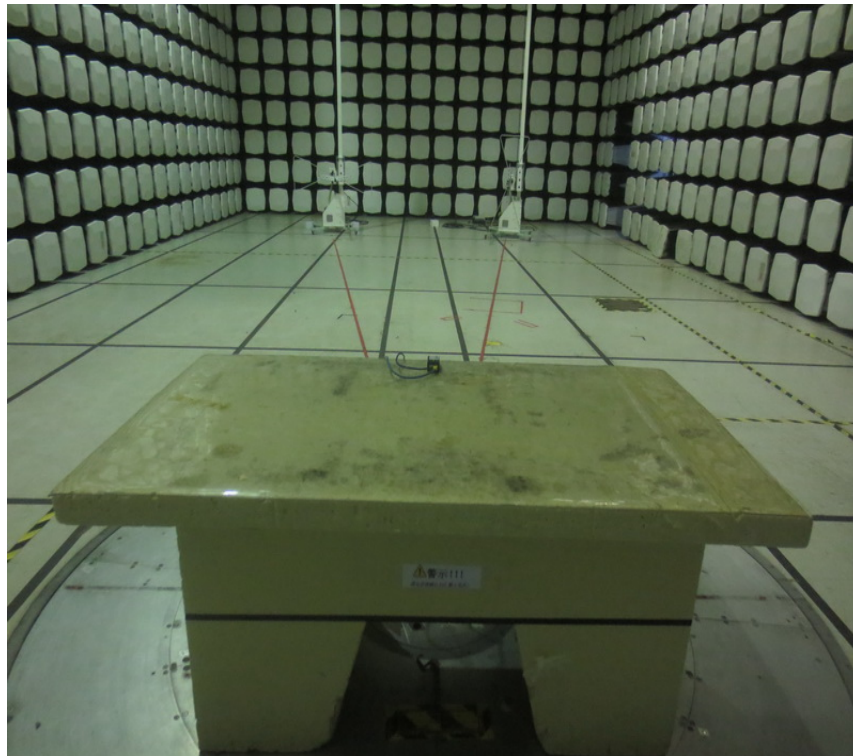
PMF					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Magnetic Field Test Generator	FCC	F-1000-4-8-G- 125A	04032	Mar. 28, 2016
2	Magnetic Field immunity loop	Thermo KeyTek	F-1000-4-8/9/1 0-L-1M	04024	Mar. 28, 2016

DIPS					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	THE MODULAR SOLUTION FOR 6 KV APPLICATIONS	Teseq	NSG 3060	1423	Aug. 29, 2015
2	Measurement Software	Teseq	Win 3000 Version 1.2.0	N/A	N /A

Remark: "N/A" denotes no model name, serial no. or calibration specified.  
All calibration period of equipment list is one year.

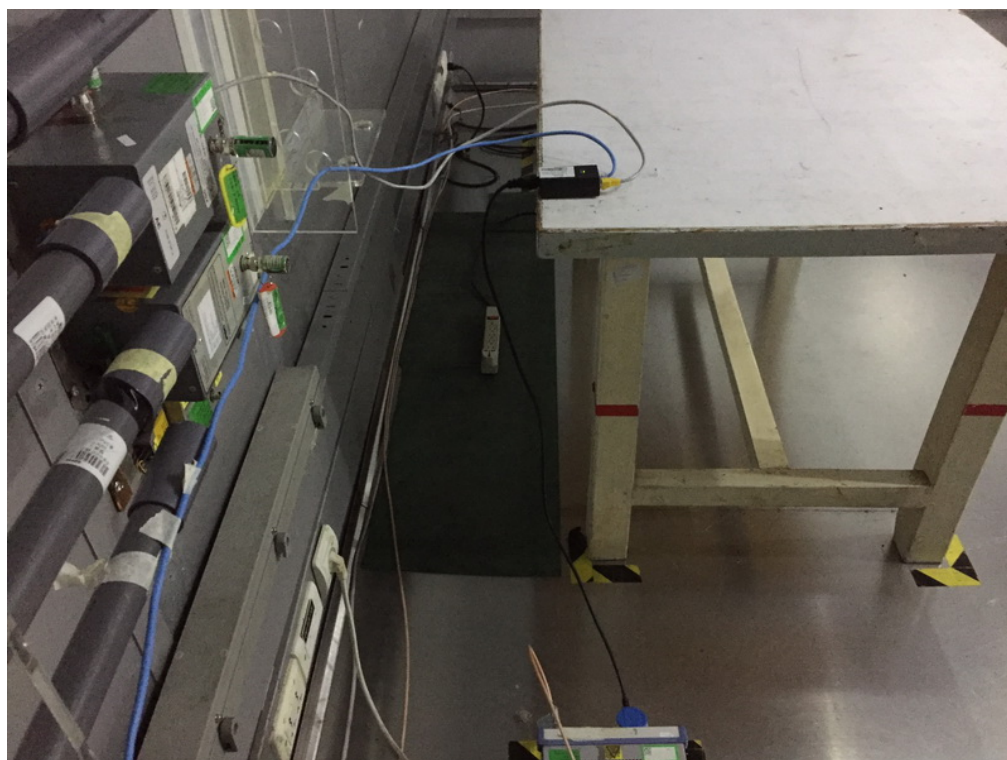
## 7. EUT TEST PHOTO

Radiated emissions up to 1 GHz

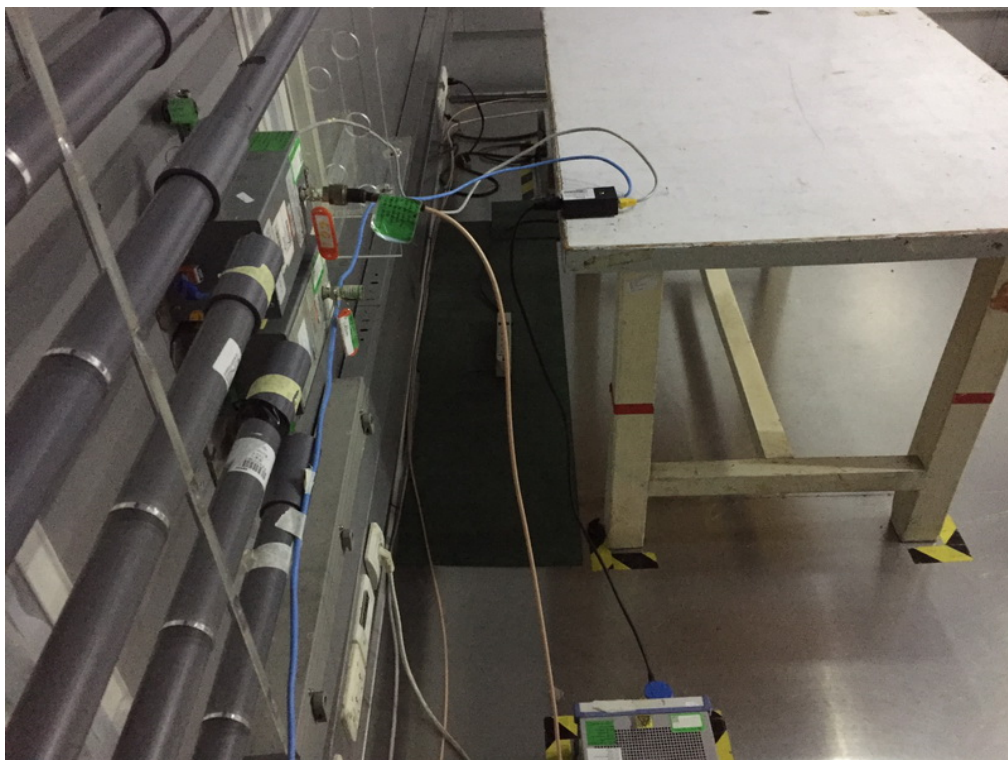




Conducted emissions AC mains power port



# Asymmetric mode conducted emissions\_AAN

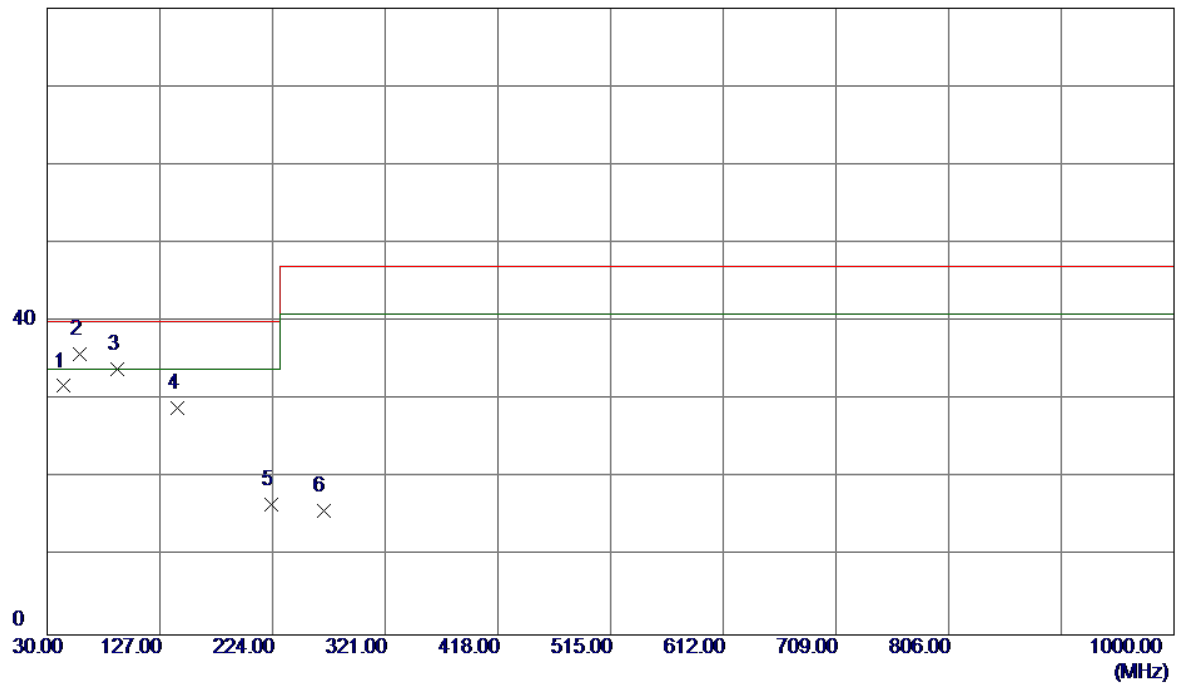




## ATTACHMENT A - RADIATED EMISSIONS UP TO 1 GHZ

Test Power:	AC 230V/50Hz
Test Mode:	FULL SYSTEM

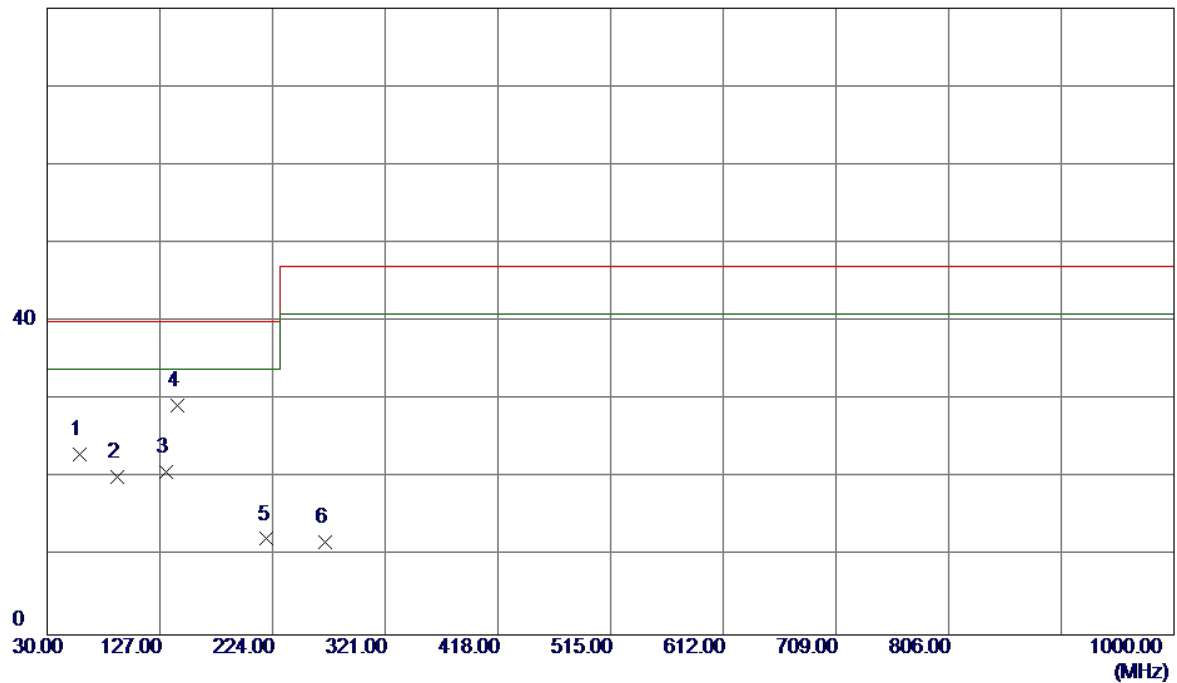
80 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector
1	43.5800	48.10	-16.34	31.76	40.00	-8.24	Peak
2 *	58.1300	55.01	-19.13	35.88	40.00	-4.12	QP
3	90.1400	53.24	-19.27	33.97	40.00	-6.03	Peak
4	142.5200	46.89	-18.00	28.89	40.00	-11.11	Peak
5	223.0300	30.17	-13.58	16.59	40.00	-23.41	Peak
6	267.6500	27.61	-11.84	15.77	47.00	-31.23	Peak

Test Power:	AC 230V/50Hz
Test Mode:	FULL SYSTEM

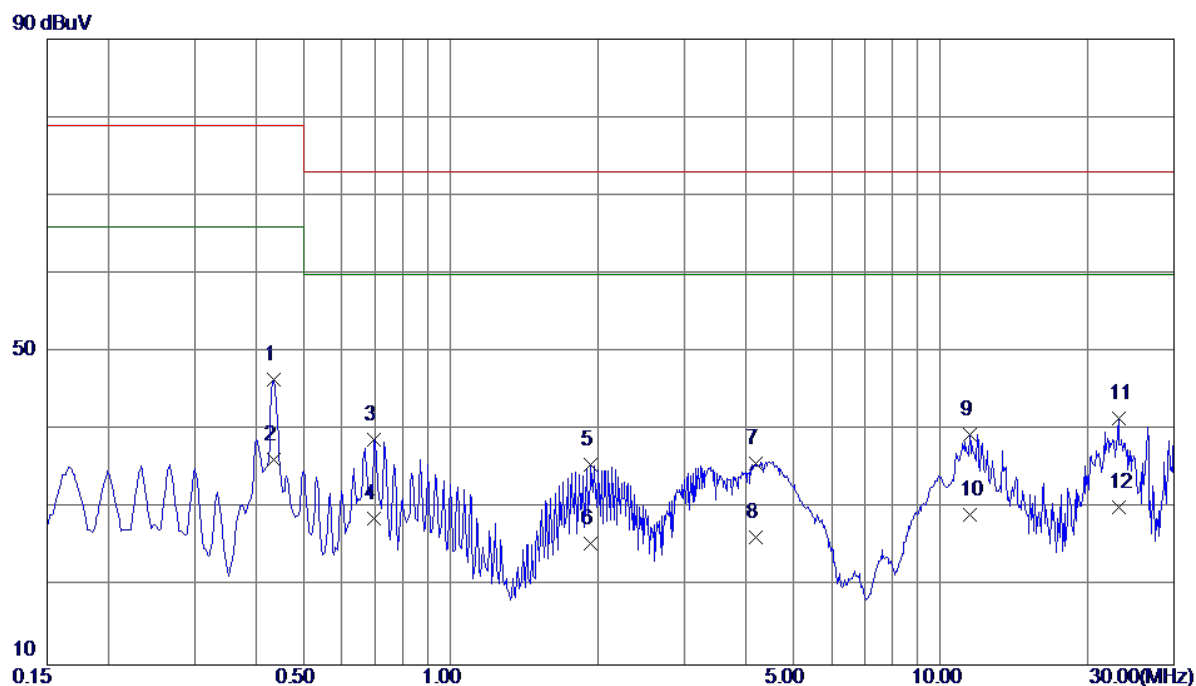
80 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector
1	58.1300	42.14	-19.13	23.01	40.00	-16.99	Peak
2	90.1400	39.38	-19.27	20.11	40.00	-19.89	Peak
3	132.8200	39.81	-19.01	20.80	40.00	-19.20	Peak
4 *	142.5200	47.27	-18.00	29.27	40.00	-10.73	Peak
5	219.1500	26.10	-13.86	12.24	40.00	-27.76	Peak
6	269.5900	23.65	-11.79	11.86	47.00	-35.14	Peak

## ATTACHMENT B - CONDUCTED EMISSIONS AC MAINS POWER PORT

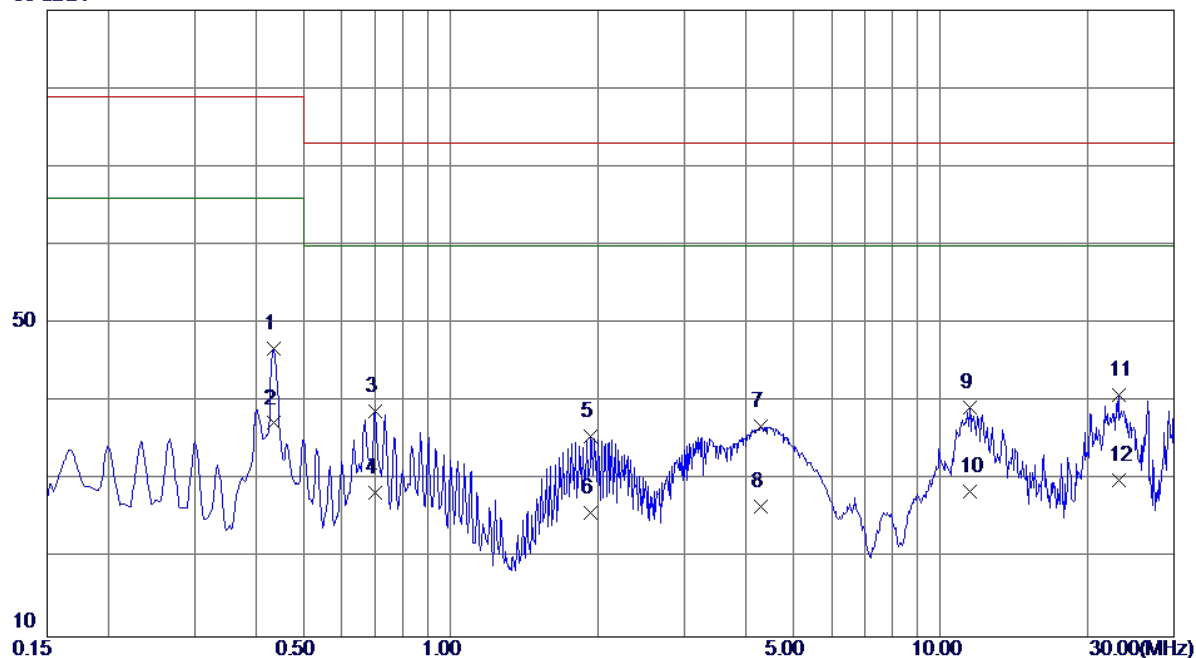
Test Power:	AC 230V/50Hz
Test Mode:	FULL SYSTEM



No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector
1	0.4357	36.53	9.88	46.41	79.00	-32.59	QP
2 *	0.4357	26.30	9.88	36.18	66.00	-29.82	AVG
3	0.6990	28.71	10.06	38.77	73.00	-34.23	QP
4	0.6990	18.70	10.06	28.76	60.00	-31.24	AVG
5	1.9320	25.49	10.08	35.57	73.00	-37.43	QP
6	1.9320	15.40	10.08	25.48	60.00	-34.52	AVG
7	4.2022	25.62	10.07	35.69	73.00	-37.31	QP
8	4.2022	16.20	10.07	26.27	60.00	-33.73	AVG
9	11.4652	28.96	10.52	39.48	73.00	-33.52	QP
10	11.4652	18.71	10.52	29.23	60.00	-30.77	AVG
11	23.1270	30.78	10.74	41.52	73.00	-31.48	QP
12	23.1270	19.40	10.74	30.14	60.00	-29.86	AVG

Test Power:	AC 230V/50Hz
Test Mode:	FULL SYSTEM

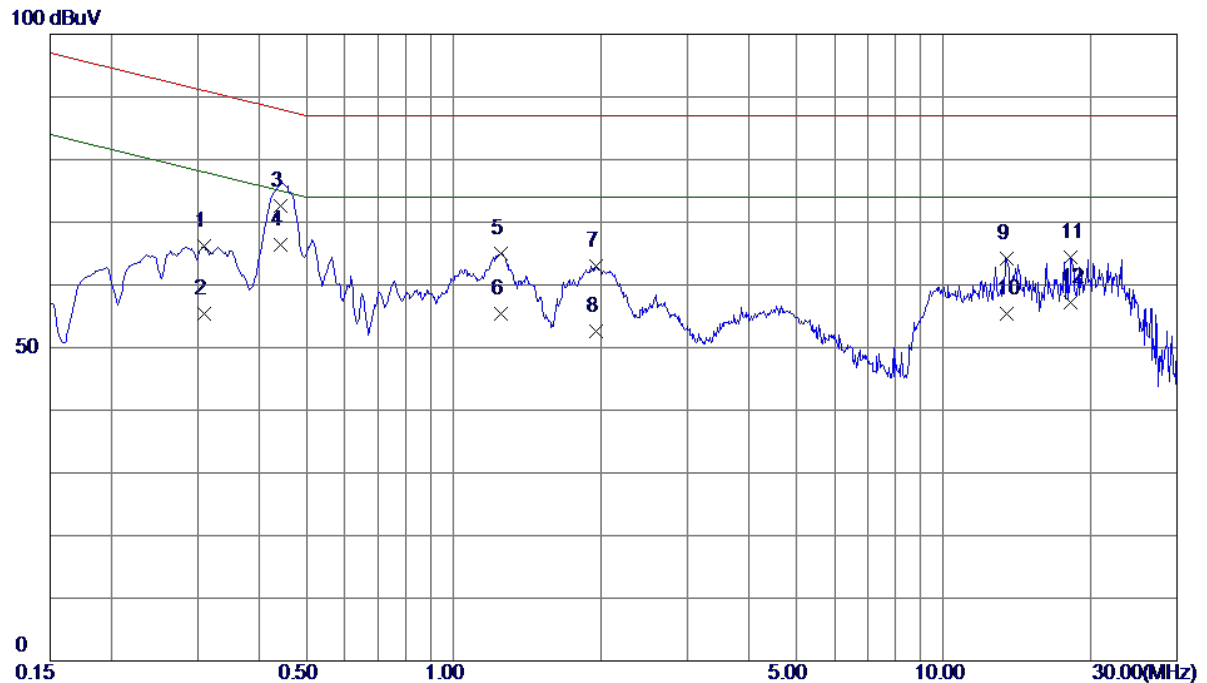
90 dBuV



No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector
1	0.4357	37.03	9.78	46.81	79.00	-32.19	QP
2 *	0.4357	27.50	9.78	37.28	66.00	-28.72	AVG
3	0.7012	28.94	9.86	38.80	73.00	-34.20	QP
4	0.7012	18.60	9.86	28.46	60.00	-31.54	AVG
5	1.9343	25.56	10.07	35.63	73.00	-37.37	QP
6	1.9343	15.70	10.07	25.77	60.00	-34.23	AVG
7	4.3034	26.70	10.21	36.91	73.00	-36.09	QP
8	4.3034	16.40	10.21	26.61	60.00	-33.39	AVG
9	11.4653	28.95	10.35	39.30	73.00	-33.70	QP
10	11.4653	18.21	10.35	28.56	60.00	-31.44	AVG
11	23.1293	30.20	10.74	40.94	73.00	-32.06	QP
12	23.1293	19.30	10.74	30.04	60.00	-29.96	AVG

## ATTACHMENT C - ASYMMETRIC MODE CONDUCTED EMISSIONS

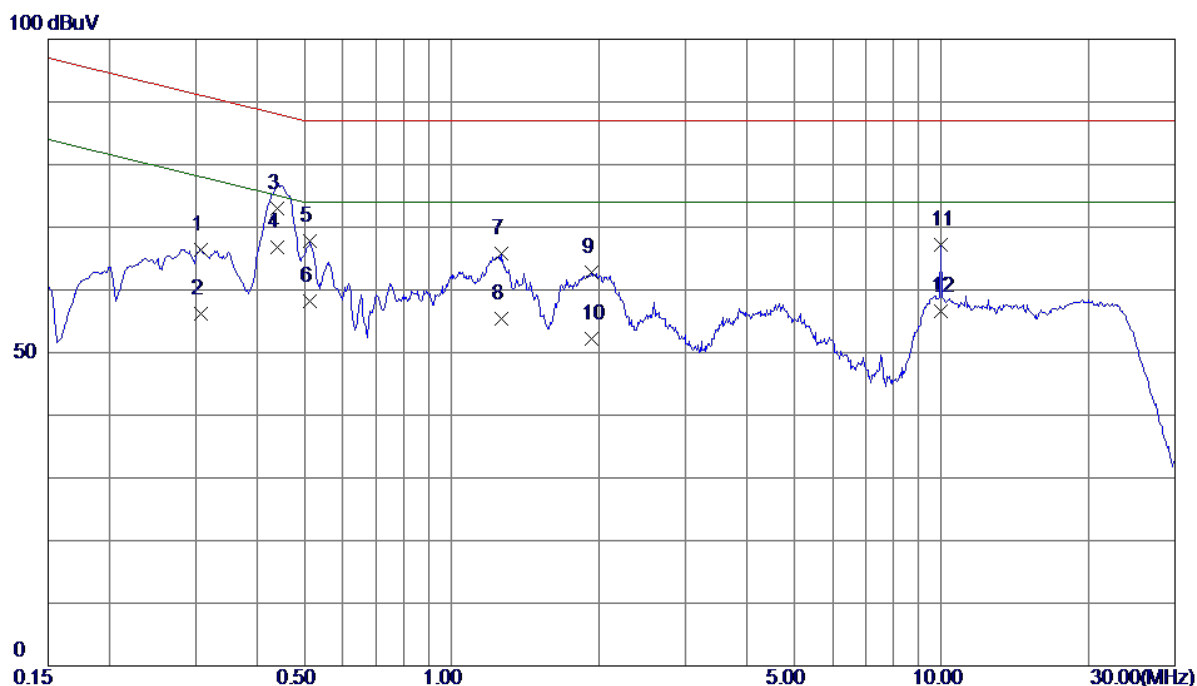
Test Voltage	AC 230V/50Hz
Test Mode	LAN 100Mbps



No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector
1	0.3097	56.60	9.62	66.22	90.98	-24.76	QP
2	0.3097	45.70	9.62	55.32	77.98	-22.66	AVG
3	0.4425	63.00	9.68	72.68	88.01	-15.33	QP
4 *	0.4425	56.80	9.68	66.48	75.01	-8.53	AVG
5	1.2480	55.16	9.84	65.00	87.00	-22.00	QP
6	1.2480	45.50	9.84	55.34	74.00	-18.66	AVG
7	1.9500	53.13	9.88	63.01	87.00	-23.99	QP
8	1.9500	42.80	9.88	52.68	74.00	-21.32	AVG
9	13.4790	53.83	10.28	64.11	87.00	-22.89	QP
10	13.4790	45.19	10.28	55.47	74.00	-18.53	AVG
11	18.2423	54.03	10.44	64.47	87.00	-22.53	QP
12	18.2423	46.80	10.44	57.24	74.00	-16.76	AVG

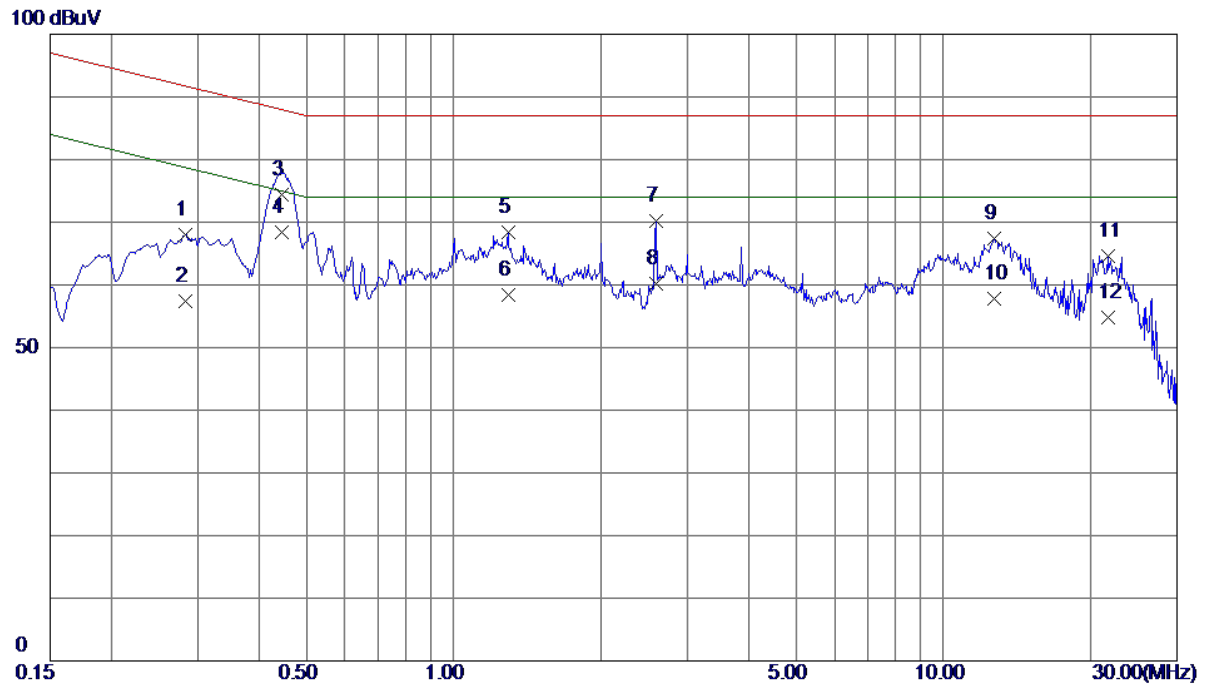


Test Voltage	AC 230V/50Hz
Test Mode	LAN 10Mbps



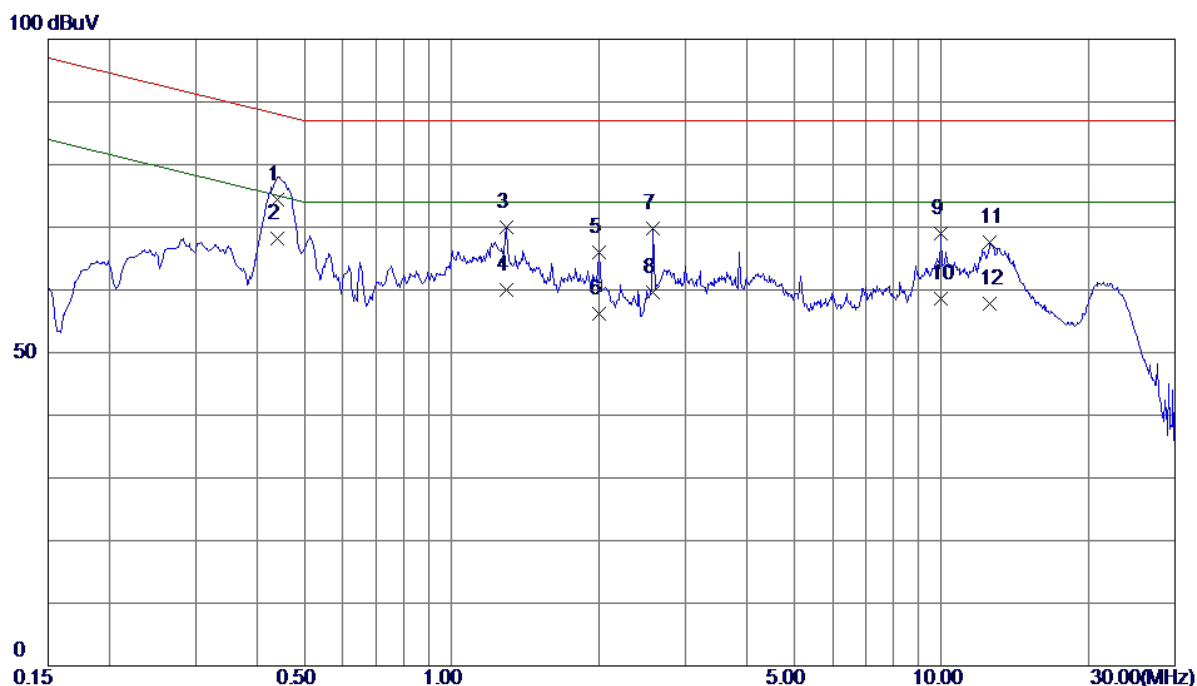
No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector
1	0.3075	56.85	9.62	66.47	91.04	-24.57	QP
2	0.3075	46.50	9.62	56.12	78.04	-21.92	AVG
3	0.4402	63.40	9.68	73.08	88.06	-14.98	QP
4 *	0.4402	57.10	9.68	66.78	75.06	-8.28	AVG
5	0.5144	58.00	9.71	67.71	87.00	-19.29	QP
6	0.5144	48.50	9.71	58.21	74.00	-15.79	AVG
7	1.2615	55.90	9.84	65.74	87.00	-21.26	QP
8	1.2615	45.60	9.84	55.44	74.00	-18.56	AVG
9	1.9298	52.87	9.88	62.75	87.00	-24.25	QP
10	1.9298	42.30	9.88	52.18	74.00	-21.82	AVG
11	10.0004	56.97	10.16	67.13	87.00	-19.87	QP
12	10.0004	46.50	10.16	56.66	74.00	-17.34	AVG

Test Voltage	AC 230V/50Hz
Test Mode	PoE 100Mbps



No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector
1	0.2827	58.47	9.61	68.08	91.74	-23.66	QP
2	0.2827	47.80	9.61	57.41	78.74	-21.33	AVG
3	0.4447	64.70	9.68	74.38	87.97	-13.59	QP
4 *	0.4447	58.80	9.68	68.48	74.97	-6.49	AVG
5	1.2930	58.61	9.84	68.45	87.00	-18.55	QP
6	1.2930	48.60	9.84	58.44	74.00	-15.56	AVG
7	2.5845	60.21	9.90	70.11	87.00	-16.89	QP
8	2.5845	50.21	9.90	60.11	74.00	-13.89	AVG
9	12.6848	57.06	10.25	67.31	87.00	-19.69	QP
10	12.6848	47.60	10.25	57.85	74.00	-16.15	AVG
11	21.6623	54.07	10.54	64.61	87.00	-22.39	QP
12	21.6623	44.20	10.54	54.74	74.00	-19.26	AVG

Test Voltage	AC 230V/50Hz
Test Mode	PoE 10Mbps

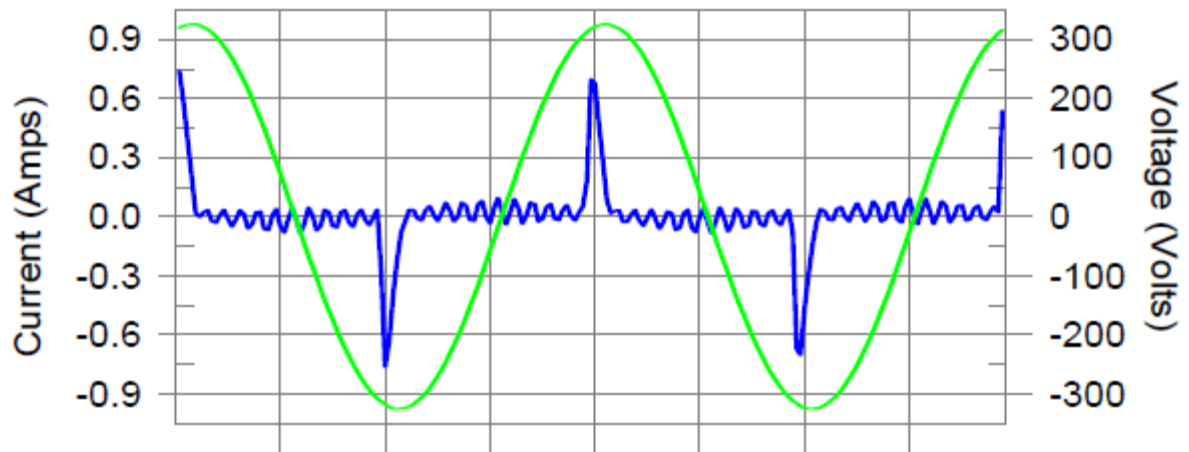


No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector
1	0.4402	64.80	9.68	74.48	88.06	-13.58	QP
2 *	0.4402	58.50	9.68	68.18	75.06	-6.88	AVG
3	1.2908	60.14	9.84	69.98	87.00	-17.02	QP
4	1.2908	50.20	9.84	60.04	74.00	-13.96	AVG
5	2.0018	56.18	9.88	66.06	87.00	-20.94	QP
6	2.0018	46.30	9.88	56.18	74.00	-17.82	AVG
7	2.5822	59.88	9.90	69.78	87.00	-17.22	QP
8	2.5822	49.61	9.90	59.51	74.00	-14.49	AVG
9	10.0004	58.93	10.16	69.09	87.00	-17.91	QP
10	10.0004	48.50	10.16	58.66	74.00	-15.34	AVG
11	12.5834	57.38	10.25	67.63	87.00	-19.37	QP
12	12.5834	47.50	10.25	57.75	74.00	-16.25	AVG

## ATTACHMENT D - HARMONICS CURRENT

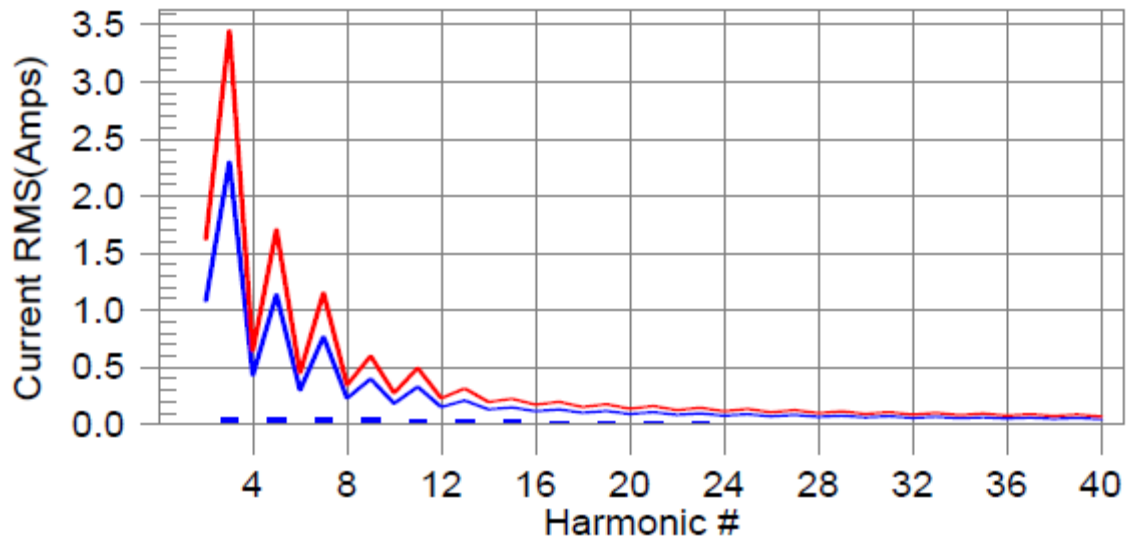
Harmonics – Class-A per Ed. 3.2(Run time)	
Test Voltage:	AC 230V/50Hz
Test Mode:	FULL SYSTEM

Current & voltage waveforms



Harmonics and Class A limit line

European Limits



Test result: Pass Worst harmonic was #15 with 21.53% of the limit.

### Current Test Result Summary (Run time)

Test Power: AC 230V/50Hz

Test Mode: FULL SYSTEM

#### Highest parameter values during test:

V RMS (Volts): 230.14

I Peak (Amps): 0.786

I Fund (Amps): 0.070

Power (Watts): 15.0

Frequency(Hz): 50.00

I RMS (Amps): 0.164

Crest Factor: 4.822

Power Factor: 0.402

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	1.080	0.1	0.002	1.620	0.09	Pass
3	0.064	2.300	2.8	0.065	3.450	1.87	Pass
4	0.001	0.430	0.2	0.001	0.645	0.15	Pass
5	0.060	1.140	5.3	0.061	1.710	3.55	Pass
6	0.000	0.300	0.1	0.001	0.450	0.13	Pass
7	0.056	0.770	7.3	0.056	1.155	4.87	Pass
8	0.000	0.230	0.2	0.000	0.345	0.14	Pass
9	0.051	0.400	12.7	0.051	0.600	8.47	Pass
10	0.000	0.184	0.2	0.000	0.276	0.17	Pass
11	0.045	0.330	13.6	0.045	0.495	9.06	Pass
12	0.000	0.153	0.2	0.000	0.230	0.18	Pass
13	0.038	0.210	18.3	0.039	0.315	12.23	Pass
14	0.000	0.131	0.2	0.000	0.197	0.21	Pass
15	0.032	0.150	21.5	0.032	0.225	14.37	Pass
16	0.000	0.115	0.3	0.000	0.173	0.26	Pass
17	0.027	0.132	20.1	0.027	0.199	13.34	Pass
18	0.000	0.102	0.3	0.000	0.153	0.30	Pass
19	0.021	0.118	18.1	0.021	0.178	12.07	Pass
20	0.000	0.092	0.4	0.000	0.138	0.33	Pass
21	0.017	0.107	16.2	0.017	0.161	10.82	Pass
22	0.000	0.084	0.4	0.000	0.125	0.37	Pass
23	0.014	0.098	14.7	0.014	0.147	9.80	Pass
24	0.000	0.077	0.4	0.000	0.115	0.36	Pass
25	0.012	0.090	13.8	0.012	0.135	9.22	Pass
26	0.000	0.071	0.4	0.000	0.106	0.34	Pass
27	0.011	0.083	13.4	0.011	0.125	8.96	Pass
28	0.000	0.066	0.4	0.000	0.099	0.33	Pass
29	0.010	0.078	13.3	0.010	0.116	8.95	Pass
30	0.000	0.061	0.4	0.000	0.092	0.37	Pass
31	0.010	0.073	13.2	0.010	0.109	8.82	Pass
32	0.000	0.058	0.4	0.000	0.086	0.34	Pass
33	0.009	0.068	12.8	0.009	0.102	8.65	Pass
34	0.000	0.054	0.3	0.000	0.081	0.33	Pass
35	0.008	0.064	12.2	0.008	0.096	8.23	Pass
36	0.000	0.051	0.4	0.000	0.077	0.36	Pass
37	0.007	0.061	11.2	0.007	0.091	7.57	Pass
38	0.000	0.048	0.4	0.000	0.073	0.37	Pass
39	0.006	0.058	10.1	0.006	0.087	6.76	Pass
40	0.000	0.046	0.4	0.000	0.069	0.41	Pass

Voltage Source Verification Data (Run time)	
Test Power:	AC 230V/50Hz
Test Mode:	FULL SYSTEM

**Highest parameter values during test:**

Voltage (Vrms):	230.14	Frequency(Hz):	50.00
I Peak (Amps):	0.786	I RMS (Amps):	0.164
I Fund (Amps):	0.070	Crest Factor:	4.822
Power (Watts):	15.0	Power Factor:	0.402

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.133	0.460	28.95	OK
3	0.565	2.071	27.26	OK
4	0.052	0.460	11.33	OK
5	0.065	0.921	7.09	OK
6	0.020	0.460	4.43	OK
7	0.044	0.690	6.41	OK
8	0.018	0.460	3.82	OK
9	0.038	0.460	8.28	OK
10	0.017	0.460	3.79	OK
11	0.033	0.230	14.43	OK
12	0.011	0.230	4.90	OK
13	0.017	0.230	7.35	OK
14	0.008	0.230	3.43	OK
15	0.029	0.230	12.64	OK
16	0.011	0.230	4.94	OK
17	0.020	0.230	8.60	OK
18	0.012	0.230	5.11	OK
19	0.020	0.230	8.86	OK
20	0.016	0.230	7.01	OK
21	0.019	0.230	8.39	OK
22	0.015	0.230	6.41	OK
23	0.013	0.230	5.78	OK
24	0.012	0.230	5.10	OK
25	0.018	0.230	7.82	OK
26	0.013	0.230	5.67	OK
27	0.010	0.230	4.41	OK
28	0.011	0.230	4.67	OK
29	0.016	0.230	6.79	OK
30	0.010	0.230	4.40	OK
31	0.013	0.230	5.47	OK
32	0.008	0.230	3.68	OK
33	0.016	0.230	7.06	OK
34	0.006	0.230	2.68	OK
35	0.015	0.230	6.31	OK
36	0.005	0.230	2.29	OK
37	0.009	0.230	3.94	OK
38	0.004	0.230	1.77	OK
39	0.012	0.230	5.40	OK
40	0.006	0.230	2.81	OK

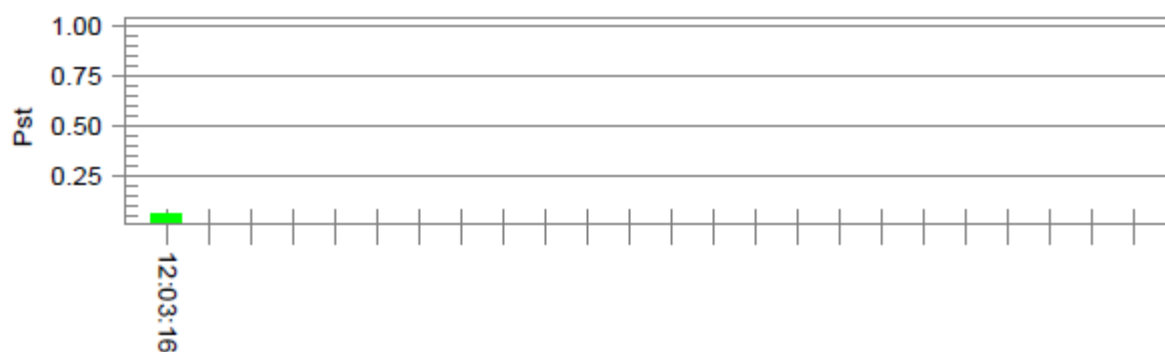
## ATTACHMENT E - VOLTAGE FLUCTUATION AND FLICKERS



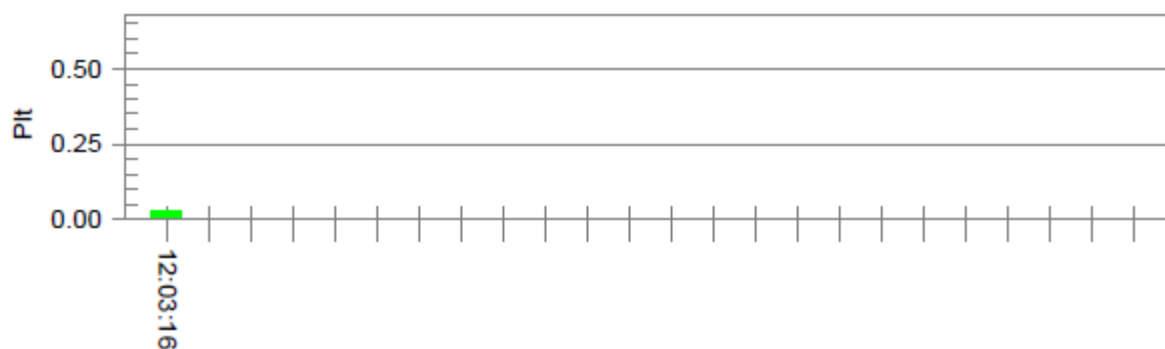
Test Power:	AC 230V/50Hz
Test Mode:	FULL SYSTEM

**Pst. and limit line**

**European Limits**



**Plt and limit line**



**Parameter values recorded during the test:**

Vrms at the end of test (Volt):	229.98		
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

## ATTACHMENT F - ESD

Test Power:	AC 230V/50Hz
Test Mode:	FULL SYSTEM

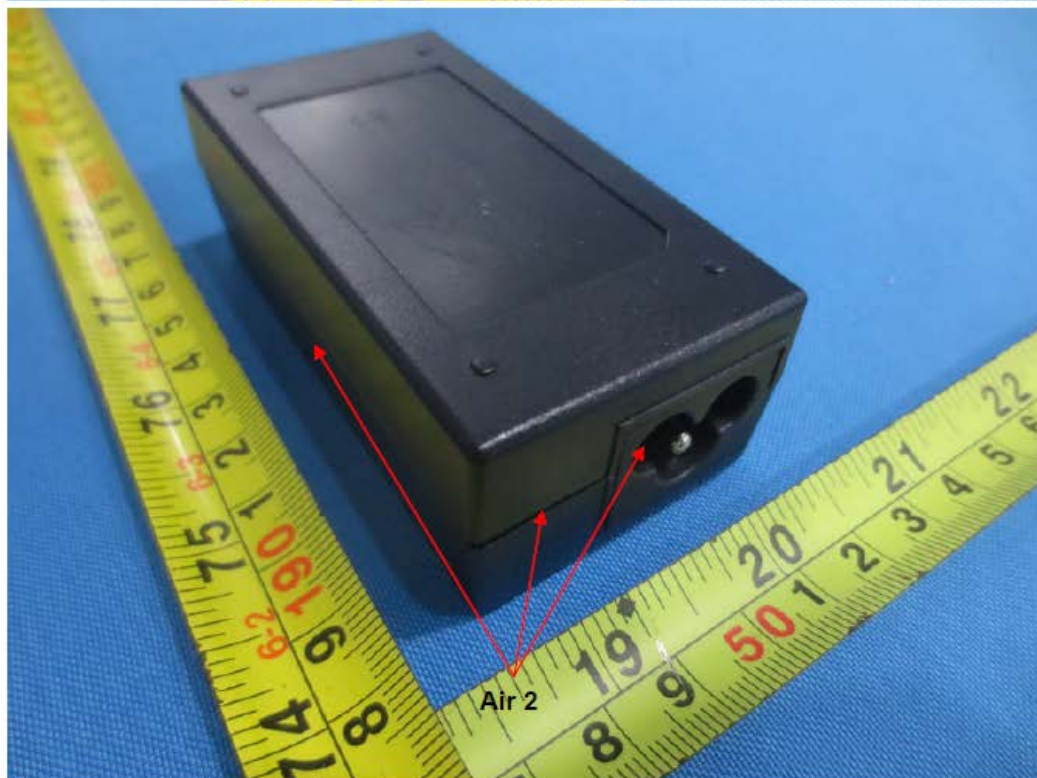
Mode	Air Discharge								Contact Discharge							
	2 kV		4 kV		8 kV		-kV		2 kV		4 kV		- kV		- kV	
Location	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N
1	A	A	A	A	B	B	-	-	A	A	B	B	-	-	-	-
2	A	A	A	A	B	B	-	-	-	-	-	-	-	-	-	-
Criteria	<b>B</b>								<b>B</b>							
Result	<b>B</b>								<b>B</b>							
Judgment	<b>PASS</b>				<b>PASS</b>				<b>PASS</b>				<b>PASS</b>			

Mode	HCP Discharge								VCP Discharge							
	2 kV		4 kV		- kV		- kV		2 kV		4 kV		- kV		- kV	
Location	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N
1	A	A	A	A	-	-	-	-	A	A	A	A	-	-	-	-
2	A	A	A	A	-	-	-	-	A	A	A	A	-	-	-	-
3	A	A	A	A	-	-	-	-	A	A	A	A	-	-	-	-
4	A	A	A	A	-	-	-	-	A	A	A	A	-	-	-	-
Criteria	<b>B</b>								<b>B</b>							
Result	<b>A</b>								<b>A</b>							
Judgment	<b>PASS</b>				<b>PASS</b>				<b>PASS</b>				<b>PASS</b>			

Note:

- 1) P/N denotes the Positive/Negative polarity of the output voltage.
- 2) Test condition:  
Direct / Indirect (HCP/VCP) discharges: Minimum 50 times (Positive/Negative) at each point. Air discharges: Minimum 10 times (Positive/Negative) at each point.
- 3) Test location(s) in which discharge (Air and contact discharge) to be applied illustrated by photos shown in next page(s)
- 4) The Indirect (HCP/VCP) discharges description of test point as following:  
1.left side 2.right side 3.front side 4.rear side
- 5) N/A - denotes test is not applicable to this device
- 6) Criteria A: No observation of any performance degradation.
- 7) Criteria B: Some degradation of performance is observed but the equipment continues to operate as intended.
- 8) Criteria C: Loss of functionality, but self-recoverable by user, without loss of information or settings.

**PHOTO(S) SHOWN THE LOCATION(S) OF ESD EVALUATED**



## ATTACHMENT G - RS

Test Voltage:	AC 230V/50Hz
Test Mode:	FULL SYSTEM

Frequency Range (MHz)	RF Field Position	R.F. Field Strength	Azimuth	Criteria	Results	Judgment
80 - 1000	V/H	3 V/m (rms) AM Modulated 1000Hz, 80%	0	<b>A</b>	<b>A</b>	<b>PASS</b>
			90			
			180			
			270			

Note:

- 1) P/N denotes the Positive/Negative polarity of the output voltage.
- 2) N/A - denotes test is not applicable to this device.
- 3) Criteria A: No observation of any performance degradation.
- 4) Criteria B: Some degradation of performance is observed but the equipment continues to operate as intended.
- 5) Criteria C: Loss of functionality, but self-recoverable by user, without loss of information or settings.

## ATTACHMENT H - EFT/BURST

Test Voltage:	AC 230V/50Hz
Test Mode:	FULL SYSTEM

Mode	( V ) AC Power Line		( ) DC Power Line		( V ) Signal/Control Line	
Test Level	1kV		0.5kV		0.5kV	
Port(s)	Polarity	Results	Polarity	Results	Polarity	Results
Line (L)	P	B	P	-	P	-
	N	B	N	-	N	-
Neutral (N)	P	B	P	-	P	-
	N	B	N	-	N	-
Ground (PE)	P	B	P	-	P	-
	N	B	N	-	N	-
Signal Line (PoE RJ45)	P	-	P	-	P	B
	N	-	N	-	N	B
Signal Line (LAN RJ45)	P	-	P	-	P	B
	N	-	N	-	N	B
Criteria	B		B		B	
Result	B		N/A		B	
Judgment	PASS		N/A		PASS	

Note:

- 1) P/N denotes the Positive/Negative polarity of the output voltage.
- 2) N/A - denotes test is not applicable to this device
- 3) Criterion A: No observation of any performance degradation.
- 4) Criterion B: Some degradation of performance is observed but the equipment continues to operate as intended.
- 5) Criterion C: Loss of functionality, but self-recoverable by user, without loss of information or settings.



## ATTACHMENT I - SURGE

Test Voltage:	AC 230V/50Hz
Test Mode:	FULL SYSTEM

Wave Form EUT Ports Tested	1.2/50(8/20)Ti/Th us						Criteria	Results	Judgment
	Polarity	Phase	Voltage						
			0.5 kV	1 kV	- kV	- kV			
L - N	+/-	0°	A	A	-	-	B	A	PASS
	+/-	90°	A	A	-	-			
	+/-	180°	A	A	-	-			
	+/-	270°	A	A	-	-			
L - PE	+/-	0°	A	A	A	A	B	A	PASS
	+/-	90°	A	A	A	A			
	+/-	180°	A	A	A	A			
	+/-	270°	A	A	A	A			
N - PE	+/-	0°	A	A	A	A	B	A	PASS
	+/-	90°	A	A	A	A			
	+/-	180°	A	A	A	A			
	+/-	270°	A	A	A	A			
Signal Line (N/A)	+/-	N/A	-	-	-	-	B	N/A	N/A

Note:

- 1) Polarity and Numbers of Impulses: 5 Pst / Ngt at each tested mode
- 2) N/A - denotes test is not applicable to this device
- 3) Criterion A: No observation of any performance degradation.
- 4) Criterion B: Some degradation of performance is observed but the equipment continues to operate as intended.
- 5) Criterion C: Loss of functionality, but self-recoverable by user, without loss of information or settings.

## ATTACHMENT J - INJECTION CURRENT

Test Voltage:	AC 230V/50Hz
Test Mode:	FULL SYSTEM

Test Ports (Mode)	Freq. Range MHz)	Field Strength	Criteria	Results	Judgment
Input/ Output AC. Power Port	0.15 ---80	3V(rms) AM Modulated 1000Hz, 80%	A	A	PASS
Input/ Output DC. Power Port	0.15 --- 80		A	N/A	N/A
Signal Line (PoE RJ 45)	0.15 --- 80		A	A	PASS
Signal Line (LAN RJ 45)	0.15 --- 80		A	A	PASS

Note:

- 1) N/A - denotes test is not applicable to this device.
- 2) Criterion A: No observation of any performance degradation.
- 3) Criterion B: Some degradation of performance is observed but the equipment continues to operate as intended.
- 4) Criterion C: Loss of functionality, but self-recoverable by user, without loss of information or settings.

## ATTACHMENT K - POWER FREQUENCY MAGNETIC FIELD

Test Voltage:	AC 230V/50Hz
Test Mode:	FULL SYSTEM

#### 50Hz

Test Mode	Test Level	Antenna aspect	Duration (s)	Criteria	Results	Judgment
Enclosure	1 A/m	X	60 s	A	A	PASS
Enclosure	1 A/m	Y	60 s	A	A	PASS
Enclosure	1 A/m	Z	60 s	A	A	PASS

#### 60Hz

Test Mode	Test Level	Antenna aspect	Duration (s)	Criteria	Results	Judgment
Enclosure	1 A/m	X	60 s	A	A	PASS
Enclosure	1 A/m	Y	60 s	A	A	PASS
Enclosure	1 A/m	Z	60 s	A	A	PASS

#### Note:

- 1) N/A - denotes test is not applicable to this device
- 2) Criterion A: No observation of any performance degradation.
- 3) Criterion B: Some degradation of performance is observed but the equipment continues to operate as intended.
- 4) Criterion C: Loss of functionality, but self-recoverable by user, without loss of information or settings.

## ATTACHMENT L - VOLTAGE INTERRUPTION/DIPS

Test Voltage:	AC 230V/50Hz
Test Mode:	FULL SYSTEM

AC 230V/50Hz				
Voltage Reduction	Periods	Criteria	Results	Judgment
Voltage dip > 95%	0.5	<b>B</b>	<b>A</b>	<b>PASS</b>
Voltage dip 30%	25	<b>C</b>	<b>A</b>	<b>PASS</b>
Interruption > 95%	250	<b>C</b>	<b>C</b>	<b>PASS</b>

AC 100V/50Hz				
Voltage Reduction	Periods	Criteria	Results	Judgment
Voltage dip > 95%	0.5	<b>B</b>	<b>A</b>	<b>PASS</b>
Voltage dip 30%	25	<b>C</b>	<b>C</b>	<b>PASS</b>
Interruption > 95%	250	<b>C</b>	<b>C</b>	<b>PASS</b>

AC 240V/50Hz				
Voltage Reduction	Periods	Criteria	Results	Judgment
Voltage dip > 95%	0.5	<b>B</b>	<b>A</b>	<b>PASS</b>
Voltage dip 30%	25	<b>C</b>	<b>A</b>	<b>PASS</b>
Interruption > 95%	250	<b>C</b>	<b>C</b>	<b>PASS</b>

Note:

- 1). N/A - denotes test is not applicable to this device.
- 2) Criterion A: No observation of any performance degradation.
- 3) Criterion B: Some degradation of performance is observed but the equipment continues to operate as intended.
- 4) Criterion C: Loss of functionality, but self-recoverable by user, without loss of information or settings.