

# EMC Test Report

**Certificate No.** : TB190822754  
**Applicant** : Shenzhen Terpres Technology Co., LTD.  
**Equipment Under Test (EUT)**  
**EUT Name** : Power Distribution Unit  
**Model No.** : XY110108Z13  
**Serial Model No.** : Please see the general description of EUT  
**Brand Name** : GWGJ  
**Receipt Date** : 2019-08-22  
**Test Date** : 2019-08-23 to 2019-08-26  
**Issue Date** : 2019-08-26  
**Standards** : EN 55032:2015  
EN 61000-3-2:2014  
EN 61000-3-3:2013  
EN 55024:2010+A1:2015  
**Conclusions** : **PASS**

In the configuration tested, the EUT complied with the standards specified above. The EUT technically complies with the 2014/30/EU directive requirements

**Test/Witness Engineer** :

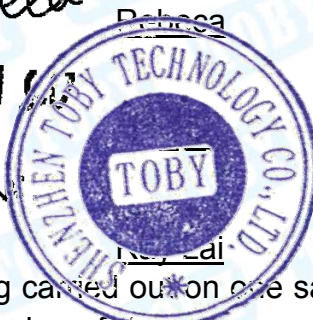
Rebecca

**Engineer Supervisor** :

Wan

**Approved & Authorized** :

Li



This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.



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## Revision History

Report No.	Version	Description	Issued Date
TB-EMC161387	Rev.01	Initial issue of report	2018-08-14
TB-EMC161516	Rev.02	Updated Applicant and Model name	2018-08-22
TB-EMC168413	Rev.03	Updated Model name	2019-08-26



## 1. General Information

### 1.1. Client Information

<b>Applicant</b>	:	Shenzhen Terpres Technology Co., LTD.
<b>Address</b>	:	15C Yuehua Garden, Donggui Miao Road, Nanshan Road, Nanshan District, Shenzhen, China
<b>Manufacturer</b>	:	Shenzhen Terpres Technology Co., LTD.
<b>Address</b>	:	15C Yuehua Garden, Donggui Miao Road, Nanshan Road, Nanshan District, Shenzhen, China

### 1.2. General Description of EUT (Equipment Under Test)

<b>EUT Name</b>	:	Power Distribution Unit
<b>Model(s)</b>	:	XY110108Z13, XY110108Z13-7, XY110108Z13-8, XY110108Z13-06, XY110108Z13-07, XY110108Z13, XY110108Z11, XY110108Z12, XY110108G13, XY110108G16, ZN12, ZN12-1, XY-G10-U, XY-G10-D, XY-G10-K, XY-G10-S, XY-G10-F, XY-G10-H, XY-G10-M, QIT-01, QIT-02, QIT-03, QIT-04, QIT-05, QIT-06, QIT-07.
<b>Model Difference</b>	:	All these models are identical in the same PCB layout and electrical circuit, the only difference is model name for commercial. therefore, EMI and EMS testing was performed with XY110108Z13 only.
<b>Brand Name</b>	:	GWGJ
<b>Class of EUT</b>	:	<input type="checkbox"/> Class A <input checked="" type="checkbox"/> Class B
<b>EUT Type</b>	:	<input checked="" type="checkbox"/> Table top <input type="checkbox"/> Floor standing <input type="checkbox"/> combination
<b>F<sub>x</sub></b>	:	N/A
<b>Power Supply</b>	:	Input: AC110-240V~, 50/60Hz, 10A Max Output: AC110-240V~, 10A
<b>F<sub>x</sub></b> : Highest internal frequency.		

### 1.3. Description of Operating Mode

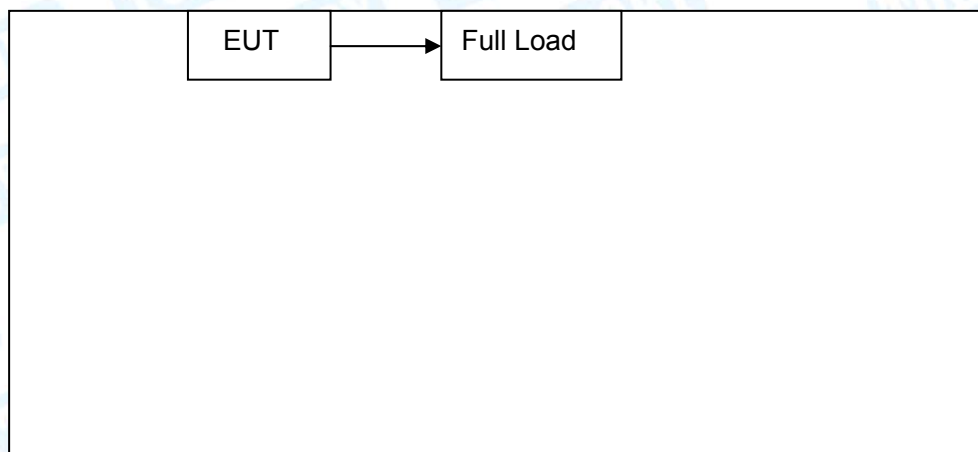
To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration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

Pretest Mode	Description
Mode 1	Normal Mode

The EUT system operated these modes were found to be the worst case during the pre-scanning test as Following:

For EMI Test	
Final Test Mode	Description
Mode 1	Normal Mode
For EMS Test	
Final Test Mode	Description
Mode 1	Normal Mode

### 1.4. Block Diagram Showing The Configuration of System Tested



### 1.5. Description of Support Units

The EUT has been tested as an independent unit.



## 1.6. Performance Criterion

**Criterion A:** 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.

**Criterion B:** 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 phenomena below a performance level specified by the manufacturer, when the equipment is used as intended.

**Criterion C:** 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.

## 1.7. Measurement Uncertainty

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 %.

Test	Parameters	Expanded Uncertainty ( $U_{Lab}$ )	Expanded Uncertainty ( $U_{Cispr}$ )
Conducted Emission	Level Accuracy: 9kHz~150kHz 150kHz to 30MHz	$\pm 3.42$ dB $\pm 3.42$ dB	$\pm 4.0$ dB $\pm 3.6$ dB
Radiated Emission	Level Accuracy: 9kHz to 30 MHz	$\pm 4.60$ dB	N/A
Radiated Emission	Level Accuracy: 30MHz to 1000 MHz	$\pm 4.40$ dB	$\pm 5.2$ dB
Radiated Emission	Level Accuracy: Above 1000MHz	$\pm 4.20$ dB	N/A
Mains Harmonic	Voltage	$\pm 3.11\%$	N/A
Voltage Fluctuations & Flicker	Voltage	$\pm 3.25\%$	N/A



## 1.8. Test Facility

The testing report were performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at 1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, Guangdong, China. At the time of testing, the following bodies accredited the Laboratory:

### **CNAS (L5813)**

The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

### **A2LA Certificate No.: 4750.01**

The laboratory has been accredited by American Association for Laboratory Accreditation (A2LA) to ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories for the technical competence in the field of Electrical Testing. And the A2LA Certificate No.: 4750.01.

### **IC Registration No.: (11950A-1)**

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A-1.



## 2. TEST Results Summary

EMISSION ( <input checked="" type="checkbox"/> EN 55032:2015 )			
Description of test items	Standards	Class	Results
Conducted disturbance at mains terminals	EN 55032: 2015	<input type="checkbox"/> Class A <input checked="" type="checkbox"/> Class B	Pass <sup>(1)</sup>
Conducted disturbance for asymmetric mode	EN 55032: 2015	<input type="checkbox"/> Class A <input checked="" type="checkbox"/> Class B	Pass <sup>(2)</sup>
Conducted differential voltage emission	EN 55032: 2015	Class B	N/A <sup>(2)</sup>
Radiated Disturbance	EN 55032: 2015	<input type="checkbox"/> Class A <input checked="" type="checkbox"/> Class B	Pass
Harmonic current emissions	EN 61000-3-2: 2014	<input checked="" type="checkbox"/> Class A <input type="checkbox"/> Class D	Pass <sup>(4)</sup>
Voltage fluctuation and flicker	EN 61000-3-3: 2013		Pass
Note: (1) Class A/Class B: Applicable to AC mains power ports (2) Class A: Applicable to wired network ports, optical fibre ports with metallic shield or tension members and antenna ports. Class B: Applicable to wired network ports, optical fibre ports with metallic shield or tension members, broadcast receiver tuner ports and antenna ports. Applicable to ports listed above and intended to connect to cables longer than 3 m. (3) Class B: Applicable to TV broadcast receiver tuner ports with an accessible connector, RF modulator output ports and FM broadcast receiver tuner ports with an accessible connector. (4) 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 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.			



IMMUNITY ( <input checked="" type="checkbox"/> EN 55024:2010+A1:2015 )		
Description of test items	Standards	Results
Electrostatic Discharge (ESD)	EN 61000-4-2: 2009	Pass
Radio-frequency, Continuous radiated disturbance	EN 61000-4-3: 2006+A2:2008+A2: 2010	Pass
EFT/B Immunity	EN 61000-4-4: 2012	Pass
Surge Immunity	EN 61000-4-5: 2014	Pass
Conducted RF Immunity	EN 61000-4-6: 2014	Pass
Power frequency magnetic field	EN 61000-4-8: 2010	N/A <sub>(1)</sub>
Voltage dips, >95% reduction	EN 61000-4-11: 2004	Pass
Voltage dips, 30% reduction		
Voltage interruptions		
<b>Note:</b> N/A is an abbreviation for Not Applicable. (1) Not applicable, the EUT is not containing devices susceptible to magnetic fields.		



### 3. Test Equipment Used

Conducted Emission Test					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
EMI Test Receiver	Rohde & Schwarz	ESCI	100321	Jul. 13, 2019	Jul. 12, 2020
RF Switching Unit	Compliance Direction Systems Inc.	RSU-A4	34403	Jul. 13, 2019	Jul. 12, 2020
AMN	SCHWARZBECK	NNBL 8226-2	8226-2/164	Jul. 13, 2019	Jul. 12, 2020
LISN	Rohde & Schwarz	ENV216	101131	Jul. 13, 2019	Jul. 12, 2020
Radiation Emission Test					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 13, 2019	Jul. 12, 2020
EMI Test Receiver	Rohde & Schwarz	ESCI	101165	Jul. 13, 2019	Jul. 12, 2020
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Jan. 27, 2019	Jan. 26, 2020
Bilog Antenna	ETS-LINDGREN	3142E	00117542	Jan. 27, 2019	Jan. 26, 2020
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar. 03, 2019	Mar. 02, 2020
Horn Antenna	ETS-LINDGREN	3117	00143209	Mar. 03, 2019	Mar. 02, 2020
Pre-amplifier	HP	11909A	185903	Mar. 04, 2019	Mar. 03, 2020
Pre-amplifier	HP	8449B	3008A00849	Mar. 03, 2019	Mar. 02, 2020
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar. 03, 2019	Mar. 02, 2020
Signal Generator	Rohde & Schwarz	SML03	IKW682-054	Mar. 03, 2019	Mar. 02, 2020
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A
Harmonic Current and Voltage Fluctuation and Flicker Test					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Harmonic Flicker Test System	CI	5001ix-CTS-400	100321	Jul. 12, 2019	Jul. 11, 2020
5K VA	CI	500liX	59468	Jul. 12, 2019	Jul. 11, 2020
Discharge Immunity Test					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
ESD Tester	TESEQ	NSG437	304	Jul. 13, 2019	Jul. 12, 2020
Radiated Immunity Test					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Signal Generator	Rohde & Schwarz	SMT03	200754	Mar. 20, 2019	Mar. 19, 2020
Power Meter	Rohde & Schwarz	NRVD	110562	Feb. 11, 2019	Feb. 10, 2020
Voltage Probe	Rohde & Schwarz	URV5-Z2	12056	Feb. 11, 2019	Feb. 10, 2020
Voltage Probe	Rohde & Schwarz	URV5-Z2	12074	Feb. 11, 2019	Feb. 10, 2020
RF Amplifier	AR	50S1G4A	326720	Feb. 11, 2019	Feb. 10, 2020

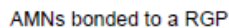
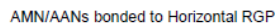


Bilog Antenna	ETS	3142C	00047662	Feb. 11, 2019	Feb. 10, 2020
Horn Antenna	ARA	DRG-118A	16554	Feb. 11, 2019	Feb. 10, 2020
<b>Electrical Fast Transient/ Surge/ Voltage Dip and Interruption Test</b>					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Simulator	EMTEST	UCS500N5	V0948105575	Jul. 13, 2019	Jul. 12, 2020
Auto-transformer	EMTEST	V4780S2	0109-41	Jul. 13, 2019	Jul. 12, 2020
Coupling Clamp	EMTEST	HFK	1109-04	Jul. 13, 2019	Jul. 12, 2020
<b>Conducted Immunity Test</b>					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
RF Generator	FRANKONIA	CIT-10/75	126B1126	Jul. 13, 2019	Jul. 12, 2020
Attenuator	FRANKONIA	59-6-33	A413	Jul. 13, 2019	Jul. 12, 2020
M-CDN	LUTHI	L-801 M2/M3	2599	Jul. 13, 2019	Jul. 12, 2020
AF2-CDN	LUTHI	L-801:AF2	2538	Mar. 03, 2019	Mar. 02, 2020
EM Injection Clamp	LUTHI	EM101	35958	Jul. 13, 2019	Jul. 12, 2020











#### 4.3. Test Procedure

Detailed test procedure was following clause 7 of CISPR 16-2-1.

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.

The bandwidth of EMI test receiver is set at 9kHz, and the test frequency band is from 0.15MHz to 30MHz.

#### 4.4. Test Data

Please refer to the Attachment A.



## 5 Conducted Emissions for Asymmetric Mode

### 5.1 Test Standard and Limit

#### 5.1.1. Test Standard

EN 55032: 2015

#### 5.1.2. Limits

Limits for class A equipment

Frequency range (MHz)	Voltage Limits dB( $\mu$ V)		Current limits dB( $\mu$ A)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 ~ 0.5	97 ~ 87	84 ~ 74	53 ~ 43	40 ~ 30
0.5 ~ 30	87	74	43	30

**Note:** if "150 $\Omega$  to 50 $\Omega$  adaptor" applied, correction factor of 9.5dB should be added to the test data.

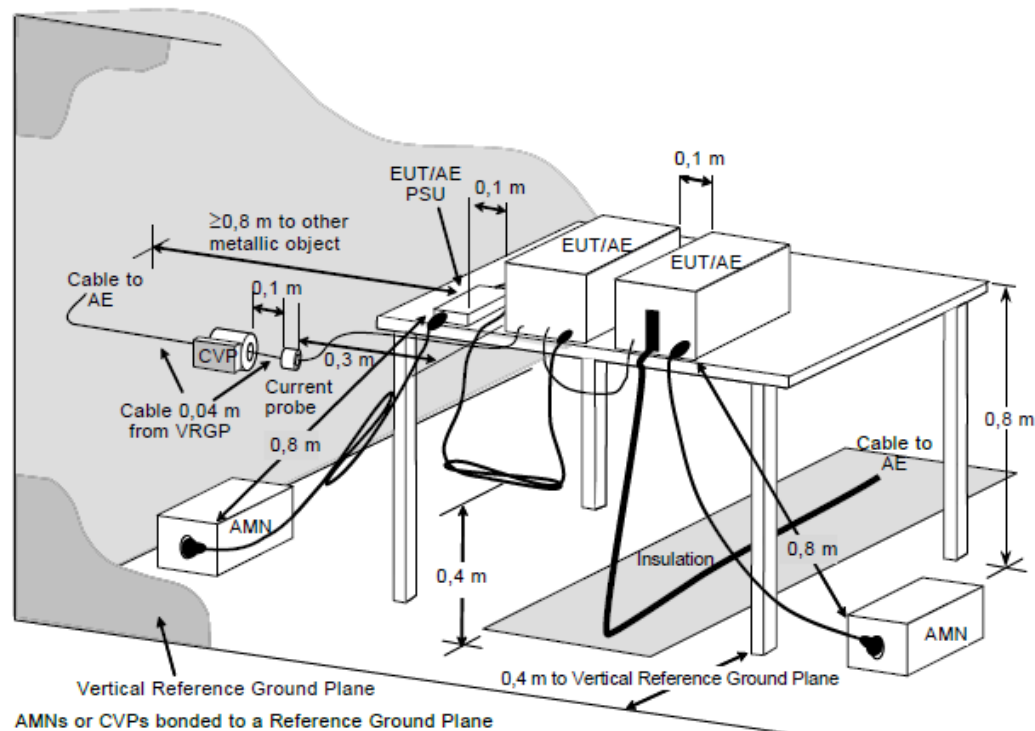
Limits for class B equipment

Frequency range (MHz)	Voltage Limits dB( $\mu$ V)		Current limits dB( $\mu$ A)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 ~ 0.5	84 ~ 74	74 ~ 64	40 ~ 30	30 ~ 20
0.5 ~ 30	74	64	30	20

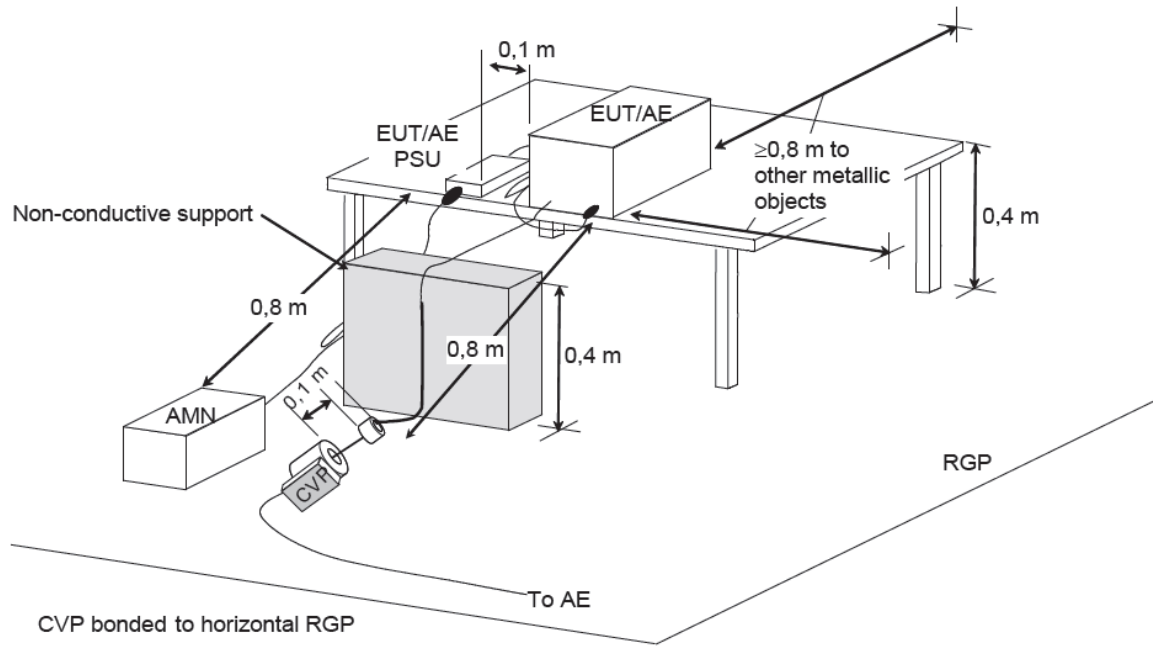
**Note:** if "150 $\Omega$  to 50 $\Omega$  adaptor" applied, correction factor of 9.5dB should be added to the test data.

### 5.2 Test setup

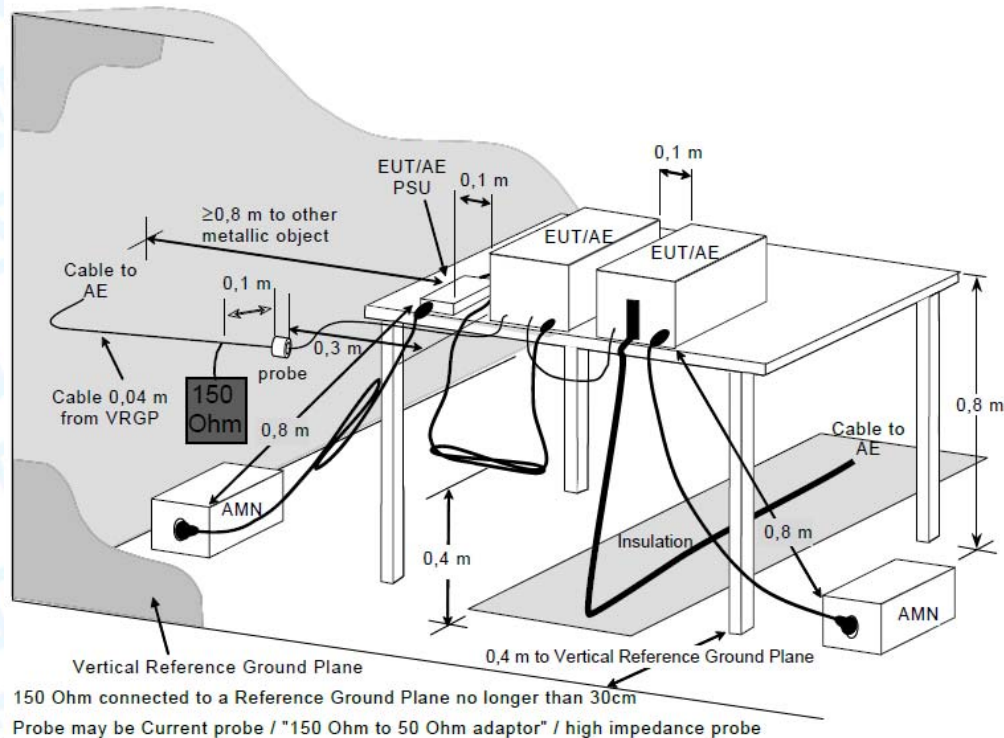
☒ Coupling device: CVP and Current probe (alternative method 1)



☐ Coupling device: CVP and Current probe (alternative method 2)



- ☐ Coupling device: Current probe / "150 $\Omega$  to 50 $\Omega$  adaptor" / high impedance probe (alternative method 1)



- ☐ Coupling device: Current probe / "150 $\Omega$  to 50 $\Omega$  adaptor" / high impedance probe



[illegible]

Probe may be Current probe / "150 Ohm to 50 Ohm adaptor" / high impedance probe

[illegible]

Frequency range 150kHz – 30MHz was checked and EMI receiver measurement bandwidth was set to 9 kHz.

Data Port	Measurement type	Coupling device	No. of Pairs
Balanced Unscreened	Voltage	AAN	$\leq 4$
Balanced Unscreened	Voltage and Current	CVP & Current probe	>4 or unable to AAN
Screened or Coaxial	Voltage	AAN	N/A
Screened or Coaxial	Voltage or Current	Current probe / "150 $\Omega$ to 50 $\Omega$ adaptor" / high impedance probe	N/A
Unbalanced cables	Voltage and Current	CVP & Current probe	N/A

## 5.4 Test Data

Please refer to the Attachment B.



## 6 Conducted Differential Voltage Emissions

### 6.1 Test Standard and Limit

#### 6.1.1. Test Standard

EN 55032: 2015

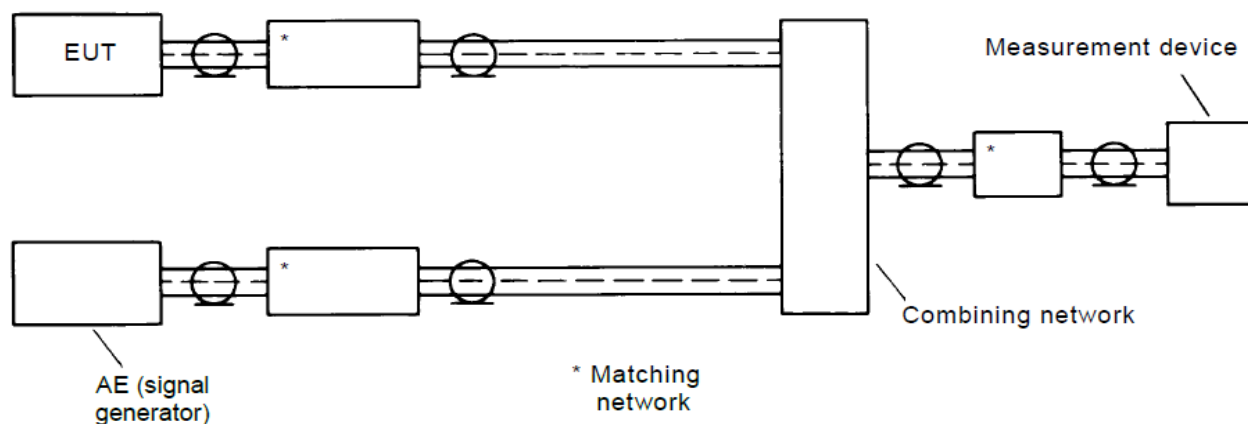
#### 6.1.2. Limits

#### Requirements for Conducted differential voltage emissions from Class B equipment

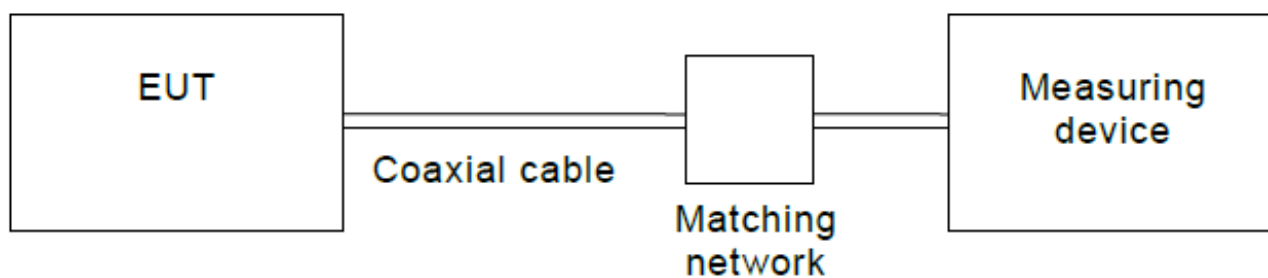
Applicability	Frequency range (MHz)	Differential voltage limit @ 75Ω (dBuV)		
		Other	Local Oscillator Fundamental	Local Oscillator Harmonics
Television receivers; LCD MONITORS; PC TV broadcast receiver tuner cards; Digital audio receivers;	30 ~ 950	46	46	46
	950 ~ 2 150	46	54	54
Tuner units (not the LNB) for satellite signal reception	950 ~ 2 150	46	54	54
FM audio receivers and PC tuner cards	30 ~ 300	46	54	50
	300 ~ 1 000	46	54	52
FM car radios	30 ~ 300	46	66	59
	300 ~ 1 000	46	66	52
RF modulator output ports connect to TV broadcast receiver tuner ports	30 ~ 950	46	76	46
	950 ~ 2150	46	/	54

### 6.2 Test setup

☐ TV/FM broadcast receiver tuner ports



☐ RF modulator output port



### 6.3 Test Setup and Test Procedure

Detailed test procedure was following clause C4.2 and C4.3 of EN55032. Frequency range 30MHz – 2150MHz was checked and EMI receiver measurement bandwidth was set to 120kHz /1MHz.

### 6.4 Test Data

This test is not applicable.



☐ TV tuner ports

After the preliminary scan, we found the following test mode (ATV 55.25MHz) producing the highest emission level.

Frequency MHz	Emission Level dB $\mu$ V	Limits dB $\mu$ V/75 $\Omega$	Margin dB	Remark
Remark: All readings are Quasi-Peak values.				

## 7 Radiated Emission Test

### 7.1 Test Standard and Limit

#### 7.1.1 Test Standard

EN 55032: 2015

#### 7.1.2 Test Limit

##### Bellow 1GHz

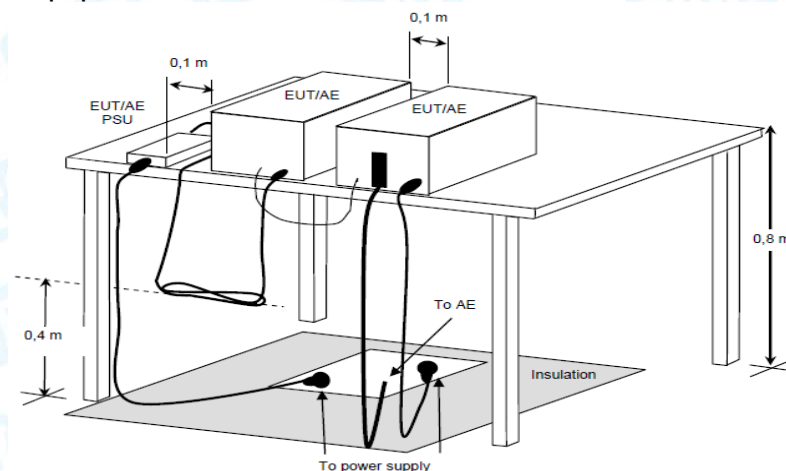
Frequency	Limit (dB $\mu$ V/m) (3m)	
	Quasi-peak Level	
	Class A	Class B
30MHz~230MHz	50	40
230MHz~1000MHz	57	47
<b>Remark:</b> 1. The lower limit shall apply at the transition frequency. 2. The test distance is 3m.		

##### Above 1GHz

Frequency (GHz)	Limit (dB $\mu$ V/m) (3m)			
	Class A		Class B	
	Peak	Average	Peak	Average
1~3	76	56	70	50
3~6	80	60	74	54
<b>Remark:</b> 1. The lower limit shall apply at the transition frequency. 2. The test distance is 3m.				

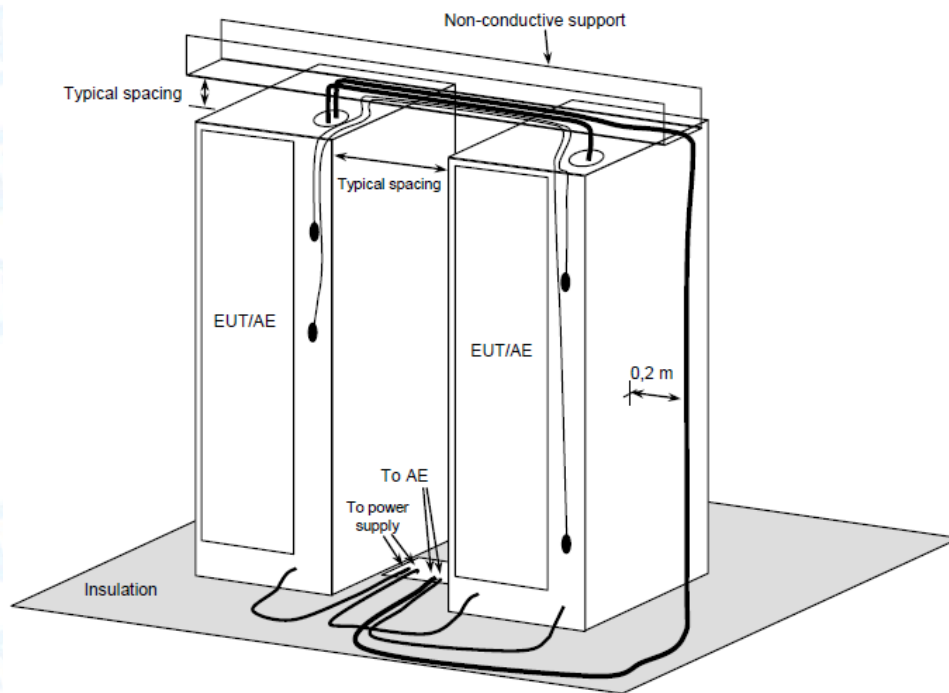
### 7.2 Test Setup

☒ For table top equipment

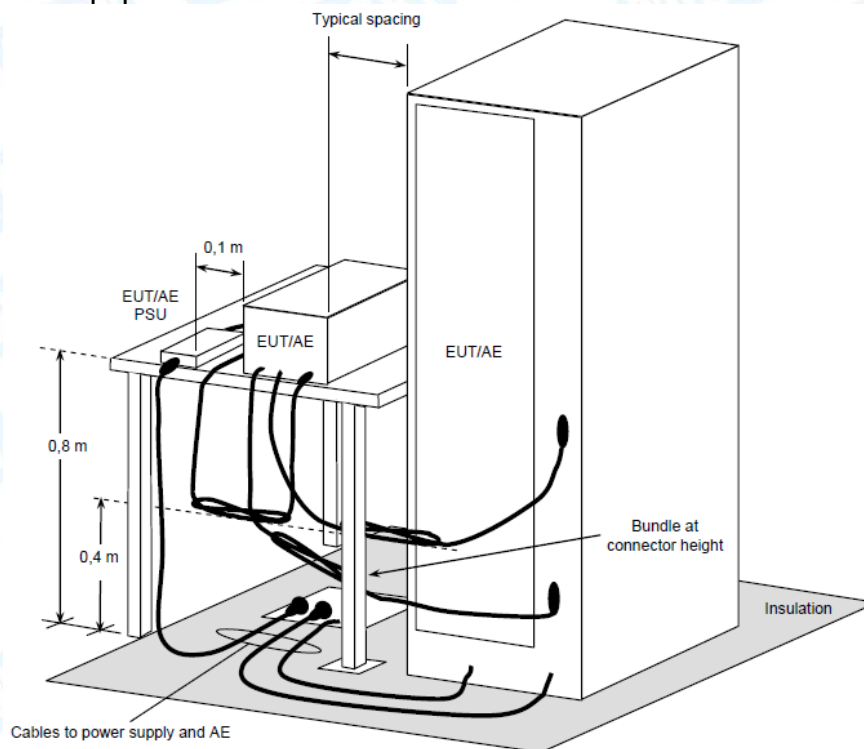




☐ For floor standing equipment



☐ For combination equipment



### 7.3 Test Procedure

Measurement was performed according to clause 7.3 of CISPR 16-2-3.

The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m. The table was rotated 360 degrees to determine the position of the highest radiation. 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 spectrum analyzer peak detector mode pre-scanning the measurement frequency range.

If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.

Highest internal frequency (Fx)	Highest measured frequency for radiated measurement	Measured Bandwidth
$F_x \leq 108 \text{ MHz}$	1 GHz	120kHz
$108 \text{ MHz} < F_x \leq 500 \text{ MHz}$	2 GHz	1MHz
$500 \text{ MHz} < F_x \leq 1 \text{ GHz}$	5 GHz	1MHz
$F_x > 1 \text{ GHz}$	5*Fx up to a maximum of 6 GHz	1MHz
<b>NOTE 1:</b> For FM and TV broadcast receivers, Fx is determined from the highest frequency generated or used excluding the local oscillator and tuned frequencies.		
<b>NOTE 2:</b> For outdoor units of home satellite receiving systems highest measured frequency shall be 18GHz.		

### 7.4 Test Data

Please refer to the Attachment C.



## 8 Harmonic Current Emission Test

### 8.1 Test Standard and Limit

#### 8.1.1. Test Standard

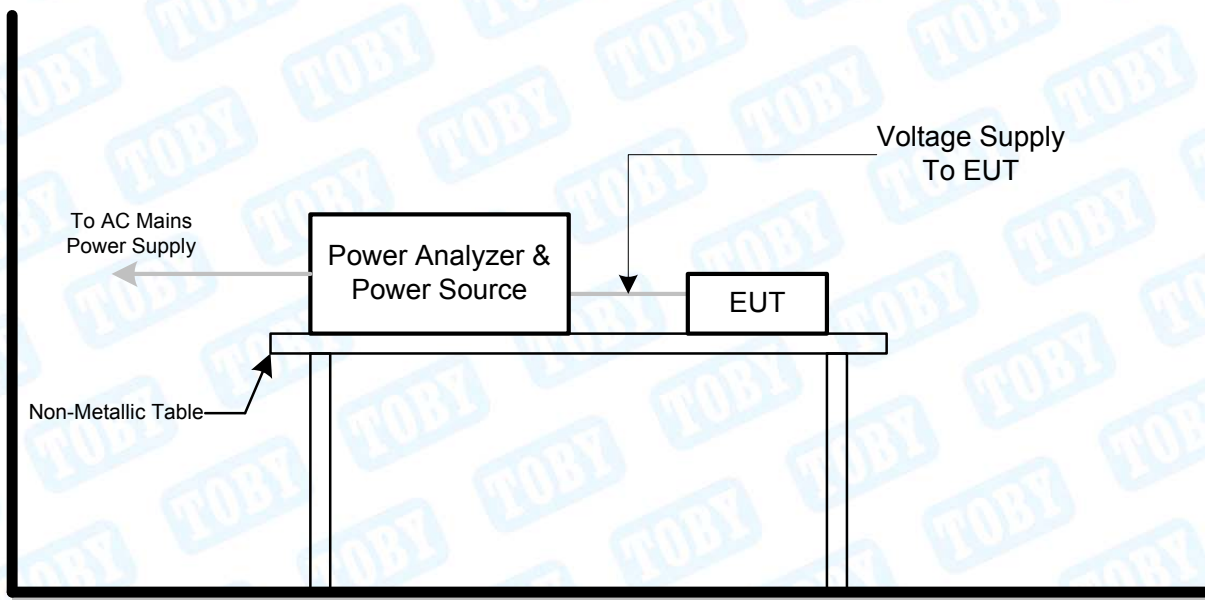
EN 61000-3-2:2014

#### 8.1.2 Limits

**Harmonic Current Test Limit**

Limits for Class A equipment				Limits for Class D equipment		
Odd Harmonics		Even Harmonics		Harmonic Order (n)	Maximum Permissible Harmonic Current per watt (mA/W)	Maximum Permissible Harmonic Current (A)
Harmonic Order (n)	Maximum permissible harmonic Current (A)	Harmonic Order (n)	Maximum permissible harmonic Current (A)			
3	2.30	2	1.08	3	3.4	2.30
5	1.14	4	0.43	5	1.9	1.14
7	0.77	6	0.30	7	1.0	0.77
9	0.40	$8 \leq n \leq 40$	$0.23 \times 8/n$	9	0.5	0.40
11	0.33			11	0.35	0.33
13	0.21			$15 \leq n \leq 39$ (odd harmonics only)	$3.85/n$	$0.15 \times 15/n$
$15 \leq n \leq 39$	$0.15 \times 15/n$					

### 8.2 Test Setup



### 8.3 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: 2006. 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.

### 8.4 Test Data

Please refer to the Attachment D.



## 9 Voltage Fluctuation and Flicker Test

### 9.1 Test Standard and Limit

#### 9.1.1. Test Standard

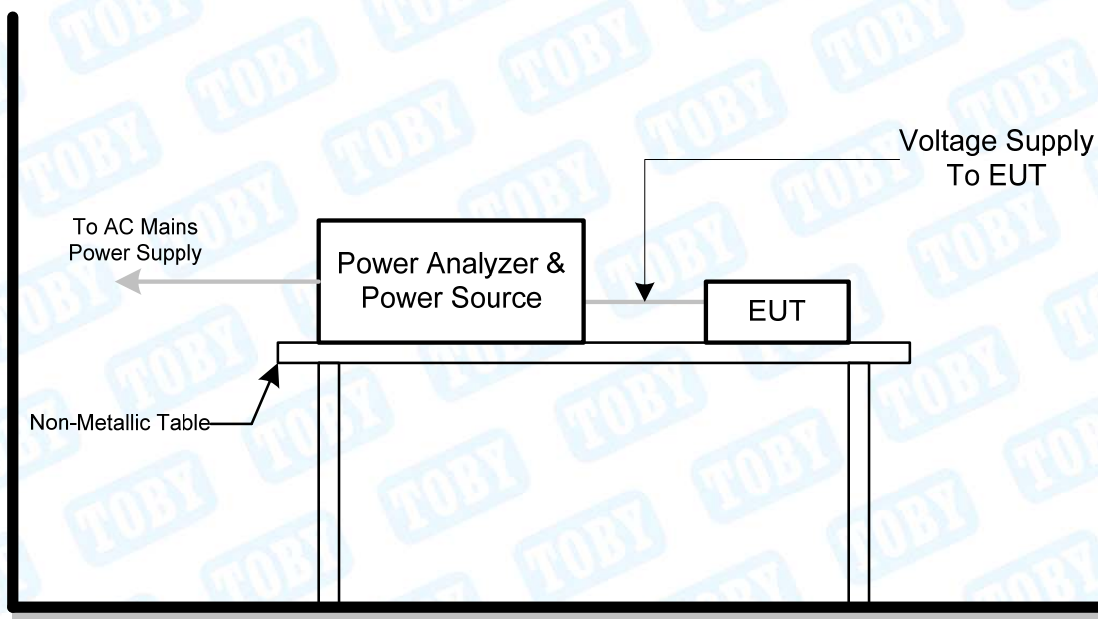
EN 61000-3-3:2013

#### 9.1.2. Limit

**Voltage Fluctuation and Flicker Test Limit**

Test Items	Limits
Pst	1.0
dc	3.3%
dmax	4.0%
dt	Not exceed 3.3% for 500ms

### 9.2 Test Setup



### 9.3 Test Procedure

#### 9.3.1 Harmonic Current Test

Test was performed according to the procedures specified in Clause 5.0 of IEC555-2 and/or Sub-clause 6.2 of IEC/EN 61000-3-2 depend on which standard adopted for compliance measurement.

### 9.3.2 Fluctuation and Flickers Test:

Tests was performed according to the Test Conditions/Assessment of Voltage Fluctuations specified in Clause 5.0/6.0 of IEC555-3 and/or Clause 6.0/4.0 of IEC/EN 61000-3-3 depend on which standard adopted for compliance measurement.

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

For the actual test configuration, please refer to the related Item –Block Diagram of system tested (please refer to 1.3).

### 9.4 Test Data

Please refer to the Attachment E.



## 10 Electrostatic Discharge Immunity Test

### 10.1 Test Requirements

#### 10.1.1. Test Standard

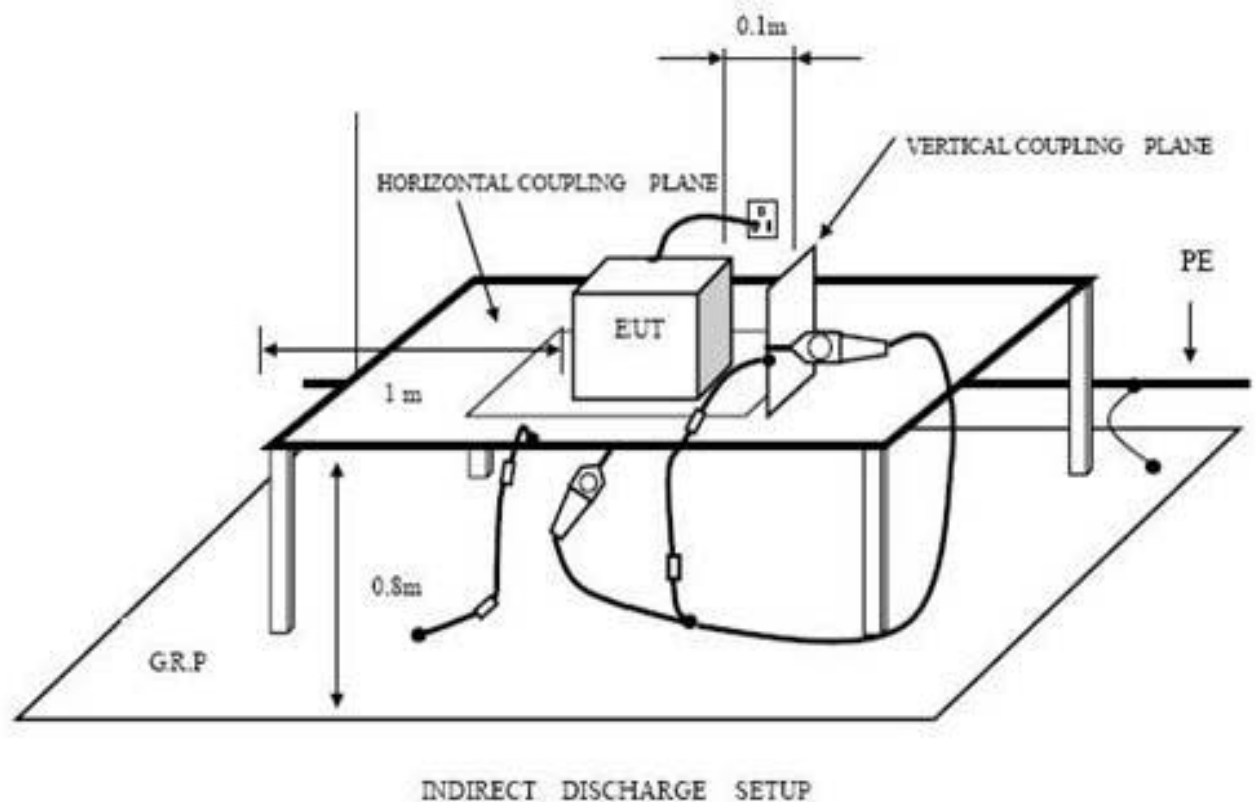
EN 55024:2010+A1:2015 (EN 61000-4-2:2009)

#### 10.1.2. Test Level

Level	Test Voltage Contact Discharge (Kv)	Test Voltage Air Discharge (Kv)
1	±2	±2
2	±4	±4
3	±6	±8
4	±8	±15
X	Special	Special

#### 10.1.2 Performance criterion: **B**

### 10.2 Test Setup



## 10.3 Test Procedure

### 10.3.1 Air Discharge:

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

### 10.3.2 Contact Discharge:

All the procedure shall be same as air discharge. Except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

### 10.3.3 Indirect discharge for horizontal coupling plane

At least 10 single discharges (in the most sensitive polarity) shall be applied at the front edge of each HCP opposite the center point of each unit (if applicable) of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge.

### 10.3.4 Indirect discharge for vertical coupling plane

At least 10 single discharges (in the most sensitive polarity) shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

## 10.4 Test Data

Please refer to the Attachment F.



# 11 Radiated Electromagnetic Field Immunity Test

## 11.1 Test Requirements

### 11.1.1. Test Standard

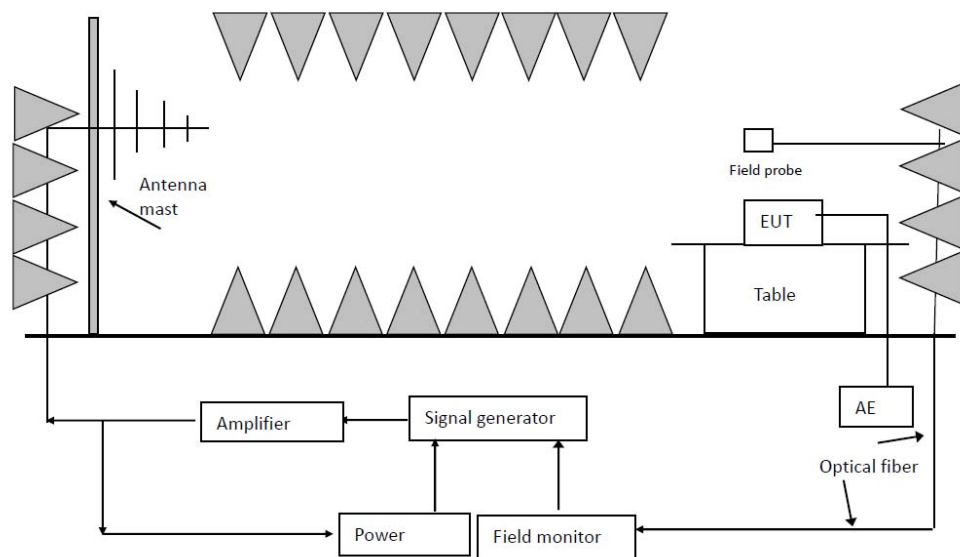
EN 55024:2010+A1:2015 (EN 61000-4-3:2006+A1:2008+A2:2010)

### 11.1.2. Test Level

Level	Field Strength V/m
1	1
2	3
3	10
X	Special

Performance criterion: **A**

## 11.2 Test Setup



## 11.3 Test Procedure

The EUT are placed on a table, which is 0.8 meter high above the ground. The EUT is set 3 meters away from the transmitting antenna, which is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna is set on test. Each of the four sides of the EUT must be faced this transmitting antenna and measured individually.

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

All the scanning conditions are as following:

Condition of Test	Remark
Fielded strength	3V/m (Severity Level 2)
Radiated signal	Modulated
Scanning frequency	80-1000MHz
Sweep time of radiated	0.0015 Decade/s
Dwell time	1 Sec.

#### 11.4 Test Data

Please refer to the Attachment G.



## 12 Electrical Fast Transient/Burst Test

### 12.1 Test Requirements

#### 12.1.1. Test Standard

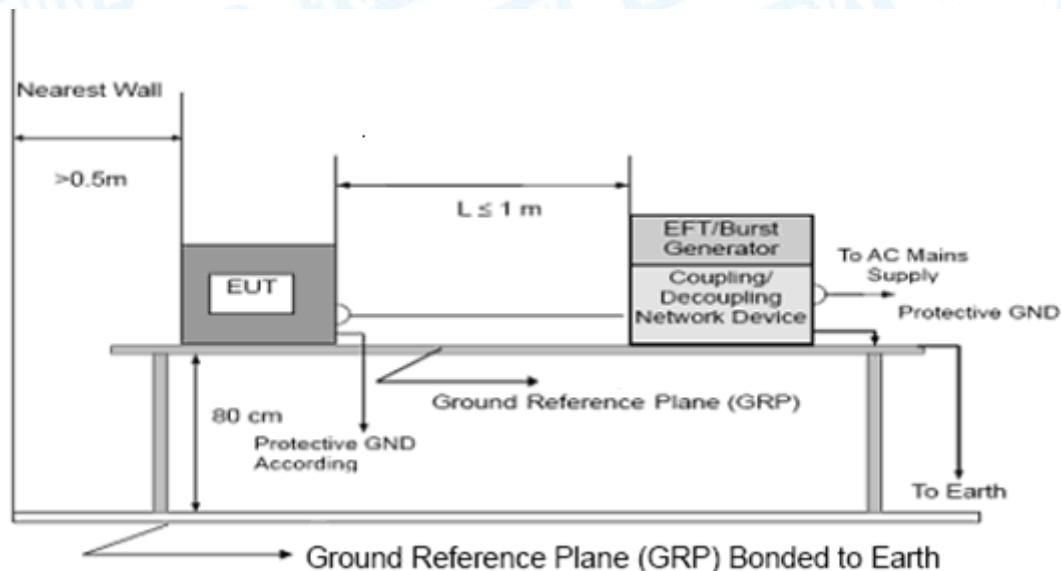
EN 55024:2010+A1:2015 (EN 61000-4-4:2012)

#### 12.1.2. Level

	On Switching Adapter Lines	On I/O (Input/Output) Signal data and DC Port
<b>Test Voltage:</b>	1 KV	0.5 KV
<b>Polarity:</b>	Positive&Negative	
<b>Impulse Wave Shape:</b>	5/50ns	
<b>Burst Duration:</b>	15ms	
<b>Burst Period:</b>	300ms	
<b>Test Duration:</b>	Not less than 1 min	

#### 12.1.3. Performance criterion: B

### 12.2 Test Setup



## 12.3 Test Procedure

### 12.3.1 For input and output AC power ports:

The EUT is connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 1minute.

### 12.3.2 For signal lines and control lines ports:

A coupling clamp is use to couple the EFT interference signal to the signal and control lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 1 minute.

### 12.3.3For DC input and DC output power ports:

The EUT is connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 1 minute.

## 12.4 Test Data

Please refer to the Attachment H.



## 13 Surge Immunity Test

### 13.1 Test Requirements

#### 13.1.1. Test Standard

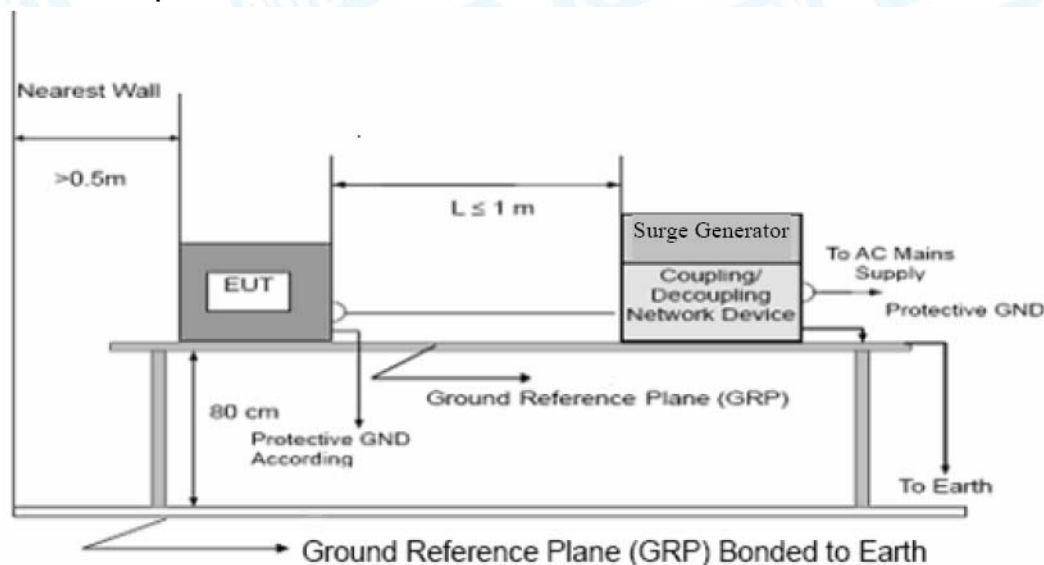
EN 55024:2010+A1: 2015 (EN 61000-4-5:2014)

#### 13.1.2. Level

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

#### 13.1.3. Performance criterion: B

### 13.2 Test Setup



### 13.3 Test Procedure

13.3.1 Set up the EUT and test generator as shown on Section 11.1.2.

13.3.2 For line to line coupling mode, provide a 1.0 KV 1.2/50us voltage surge  
(at open-circuit condition) and 8/20us current surge to EUT selected points.

13.3.3 At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.

13.3.4 Different phase angles are done individually.

13.3.5 Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

### 13.4 Test Data

Please refer to the Attachment I.



## 14 Conducted Immunity Test

### 14.1 Test Requirements

#### 14.1.1. Test Standard

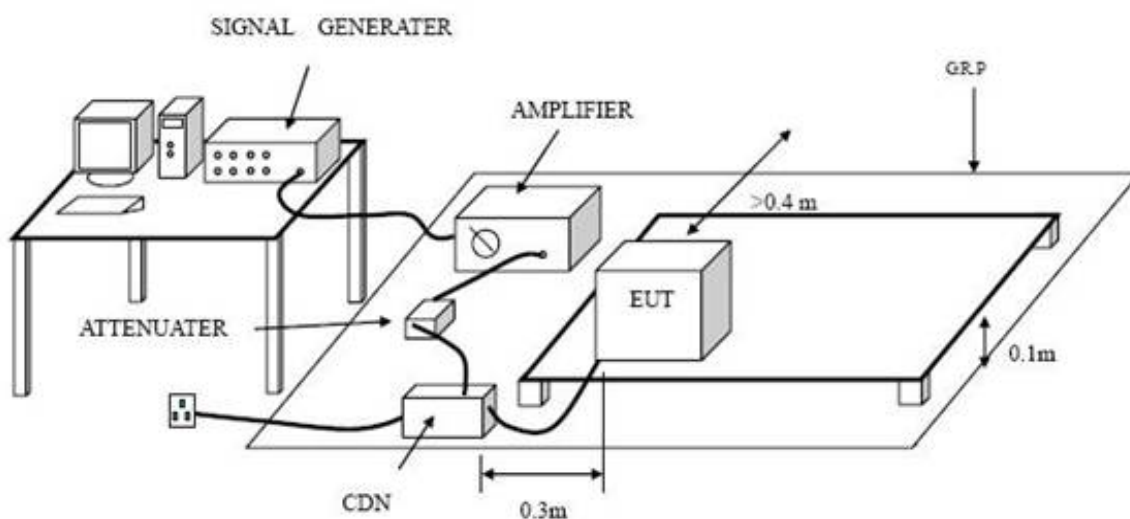
EN 55024:2010+A1: 2015 (EN 61000-4-6:2014)

#### 14.1.2. Level

Port	Test Specification
Input AC power port	0.15MHz~80MHz 3V(r.m.s.) (unmodulated)
Signal Port	
Input DC Port	

#### 14.1.3. Performance criterion: A

### 14.2 Test Setup



### 14.3 Test Procedure

14.3.1 Set up the EUT, CDN and test generators.

14.3.2 Let the EUT work in test mode and test it.

14.3.3 The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).

14.3.4 The disturbance signal description below is injected to EUT through CDN.

14.3.5 The EUT operates within its operational mode(s) under intended climatic conditions after power on.

14.3.6 The frequency range is swept from 0.150MHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1KHz sine wave.

14.3.7 The rate of sweep shall not exceed  $1.5 \times 10^{-3}$  decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.

14.3.8 Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

### 14.4 Test Data

Please refer to the Attachment J.



## 15 Voltage Dips and Interruptions Immunity Test

### 15.1 Test Requirements

#### 15.1.1. Test Standard

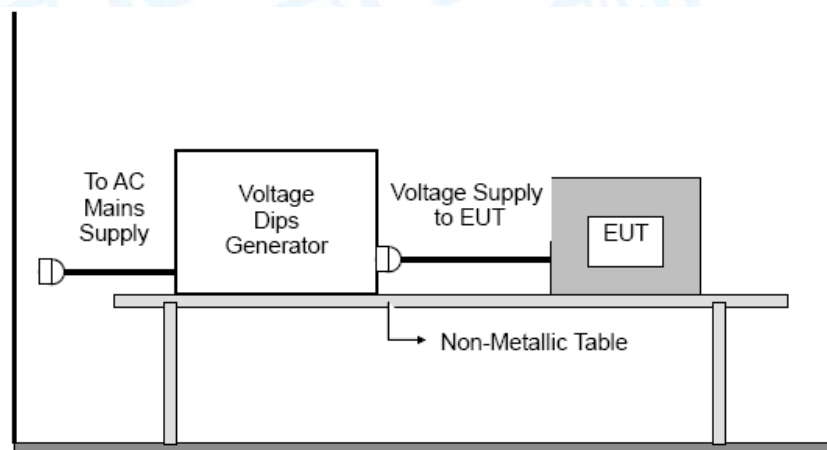
EN 55024:2010+A1: 2015 (EN 61000-4-11:2004)

#### 15.1.2. Level

<b>Basic Standard:</b>	<b>EN 61000-4-11</b>
<b>Required Performance:</b>	B(For 100%, 0.5 cycle Voltage Dips) C(For 70%, 25 cycle Voltage Dips) C(For 100%, 250 cycle Voltage Interruptions)
<b>Test Duration Time:</b>	Minimum three test events in sequence
<b>Interval Between Event:</b>	Minimum ten seconds
<b>Phase Angle:</b>	0°/45°/90°/135°/180°/225°/270°/315°/360°
<b>Test Cycle:</b>	3 times

#### 15.1.3. Performance criterion: **B&C**

### 15.2 Test Setup



### 15.3 Test Procedure

Set up the EUT and test generator as shown above. The EUT is tested for each selected combination of test level and duration with a sequence of three dips/interruptions with intervals of 10s minimum.

### 15.4 Test Data

Please refer to the Attachment K.

## 16 Photographs - Constructional Details

Photo 1 Appearance of EUT



Photo 2 Appearance of EUT





Photo 3 Internal of EUT

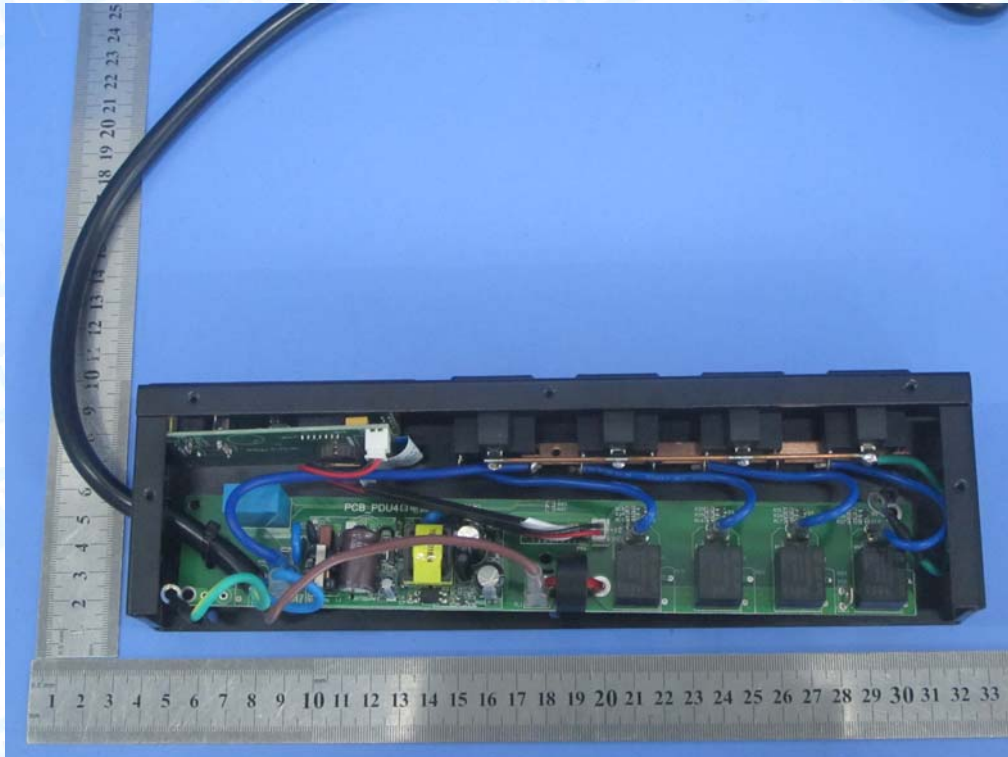


Photo 4 Appearance of PCB

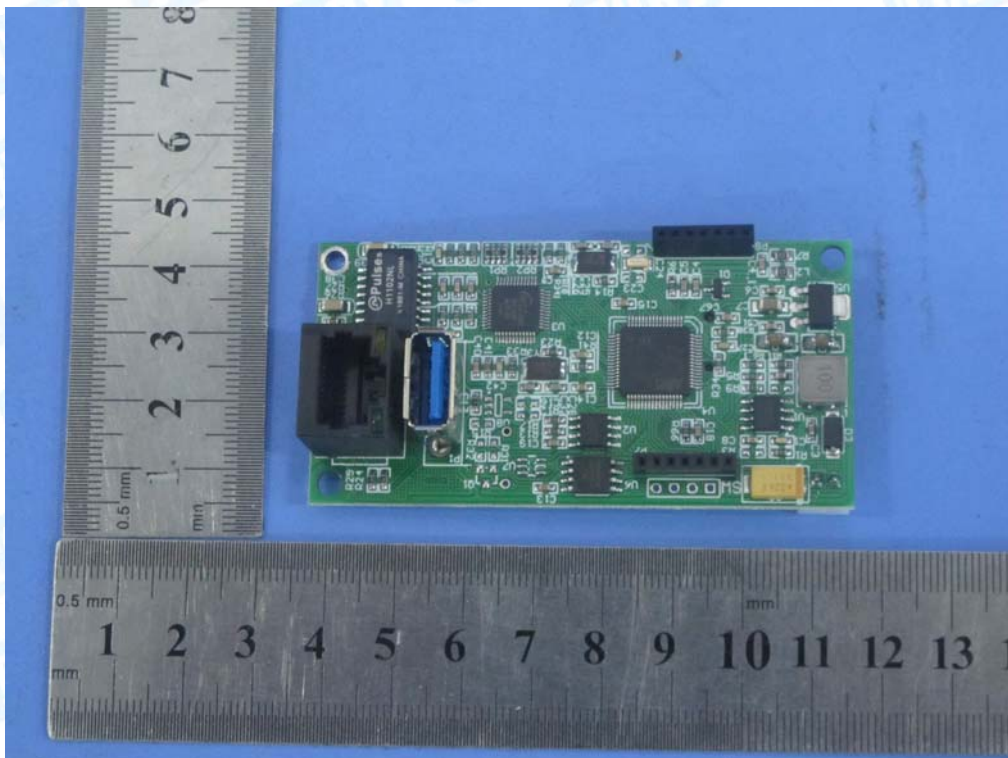




Photo 5 Appearance of PCB

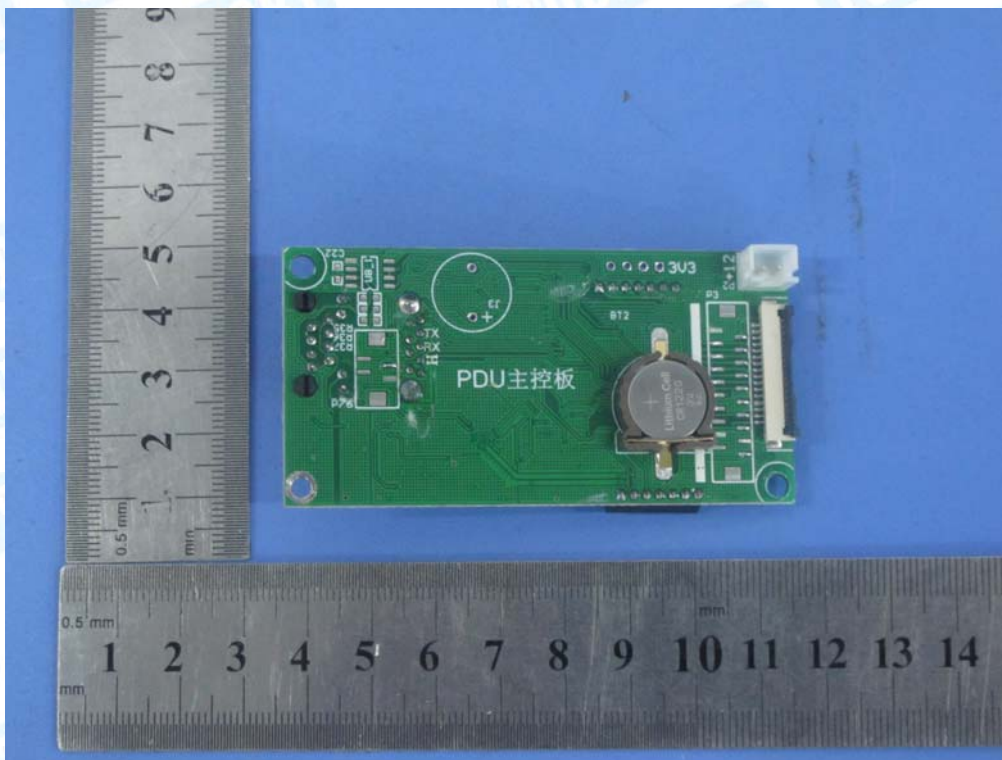


Photo 6 Appearance of PCB

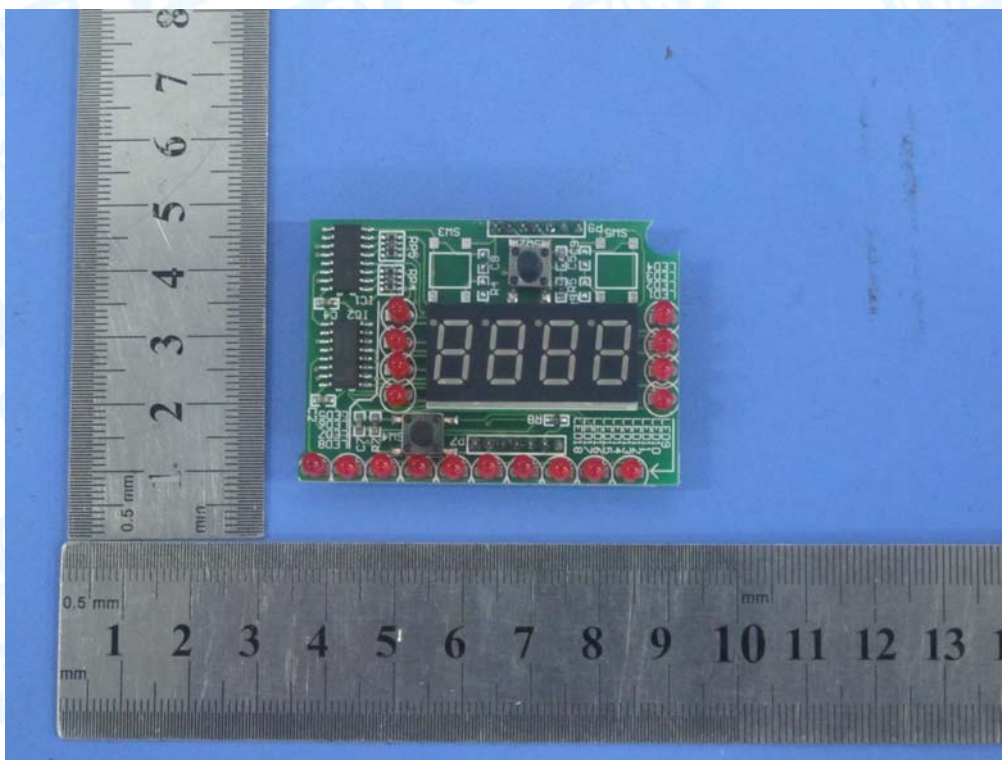
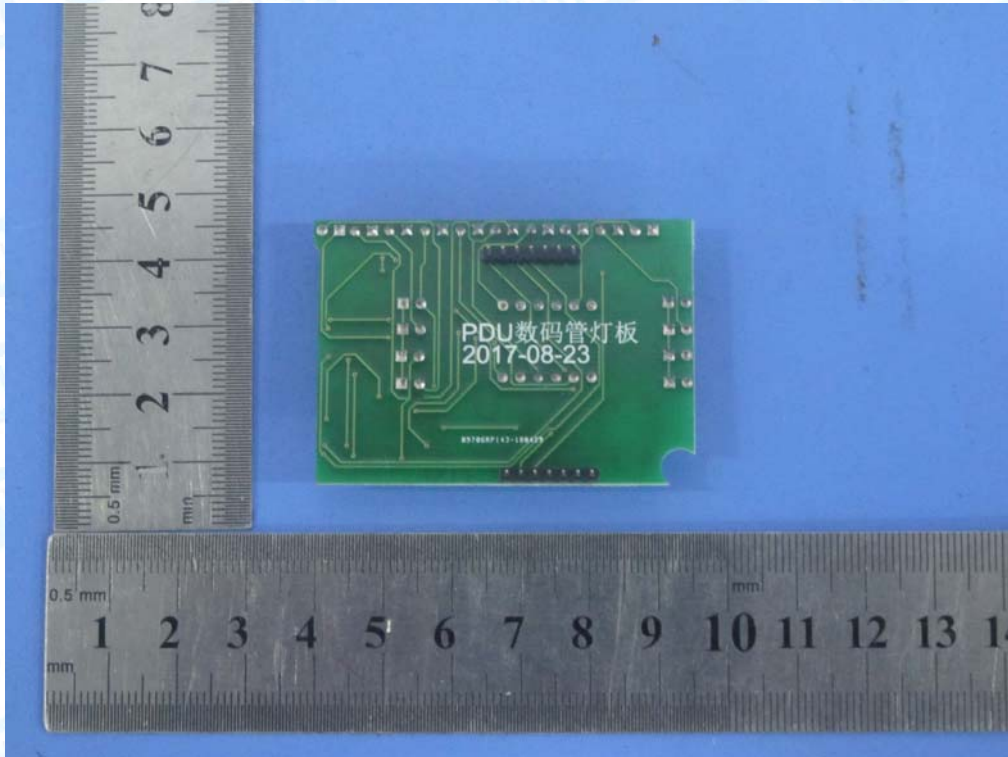




Photo 7 Appearance of PCB



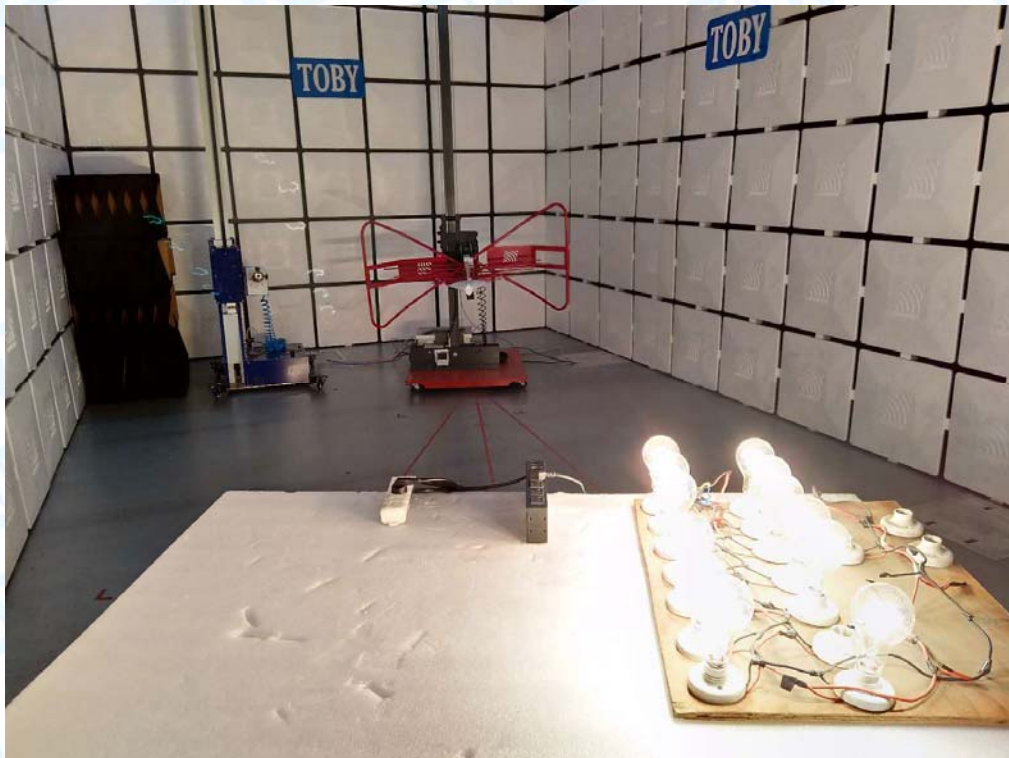


## 17 Photographs - Test Setup

### Conducted Emission Test Setup



### Radiated Emission Test Setup

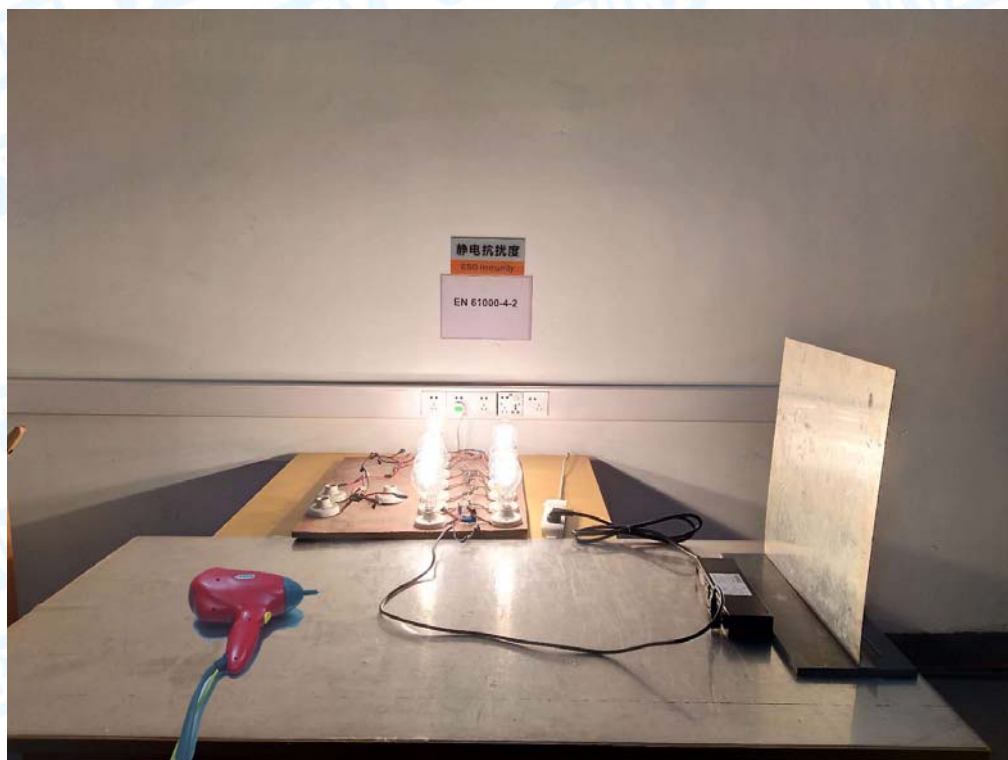


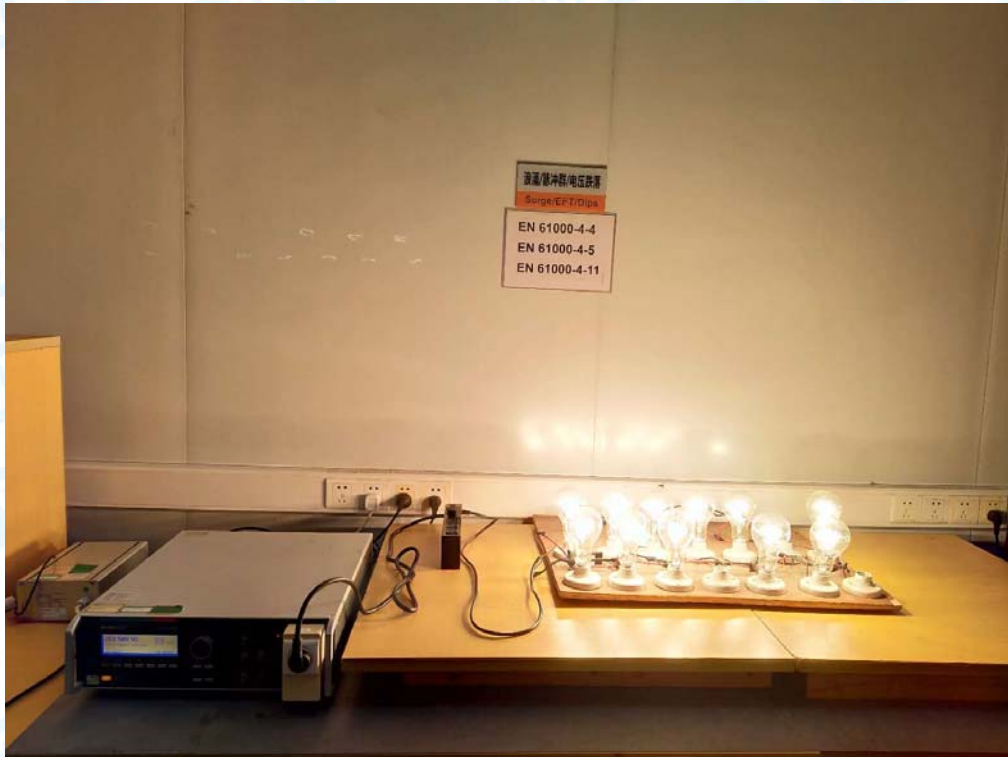
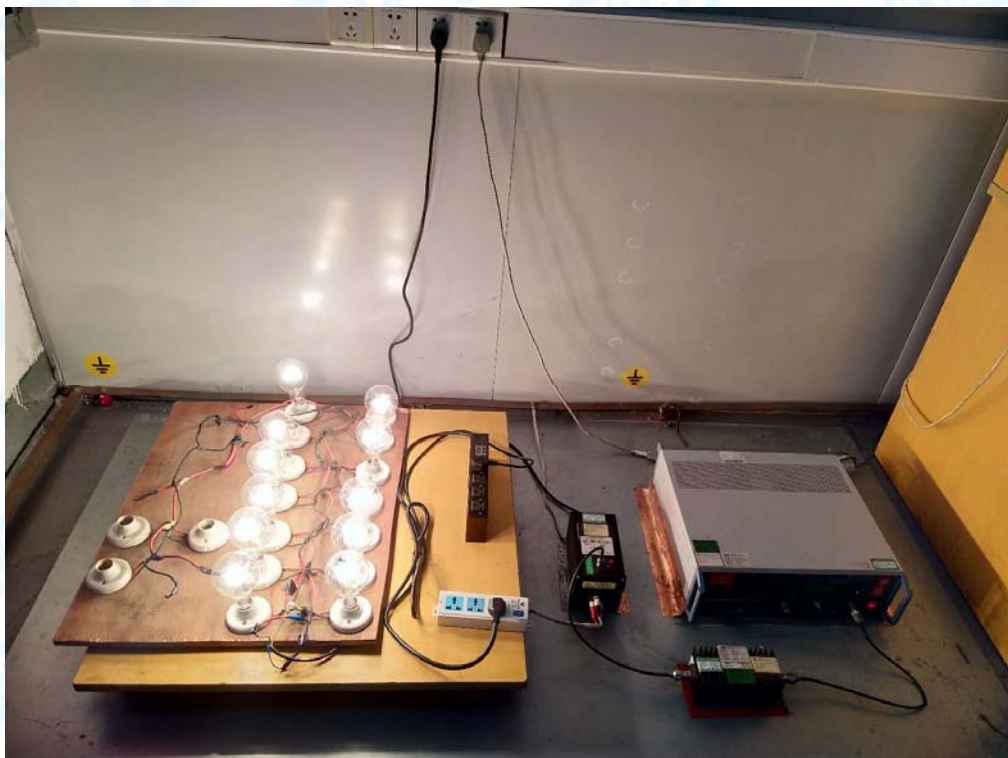


### Harmonic current emissions and Voltage fluctuations & flicker Test Setup



### Electrostatic Discharge Test Setup

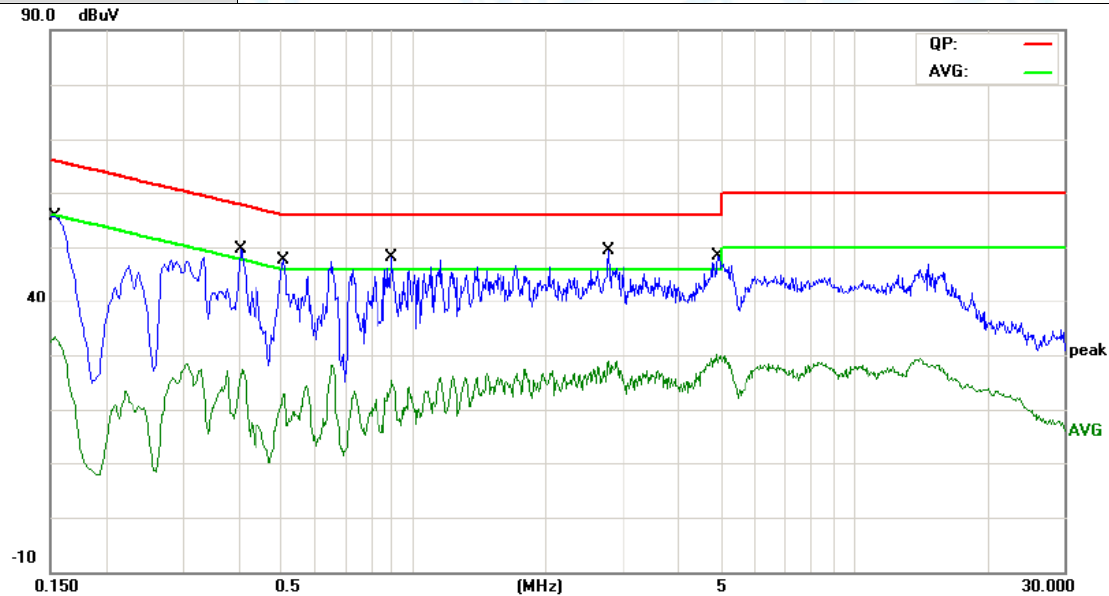


**EFT, Surge, Voltage Dips Test Setup****Radio-frequency, Continuous Conducted Disturbance Test Setup**



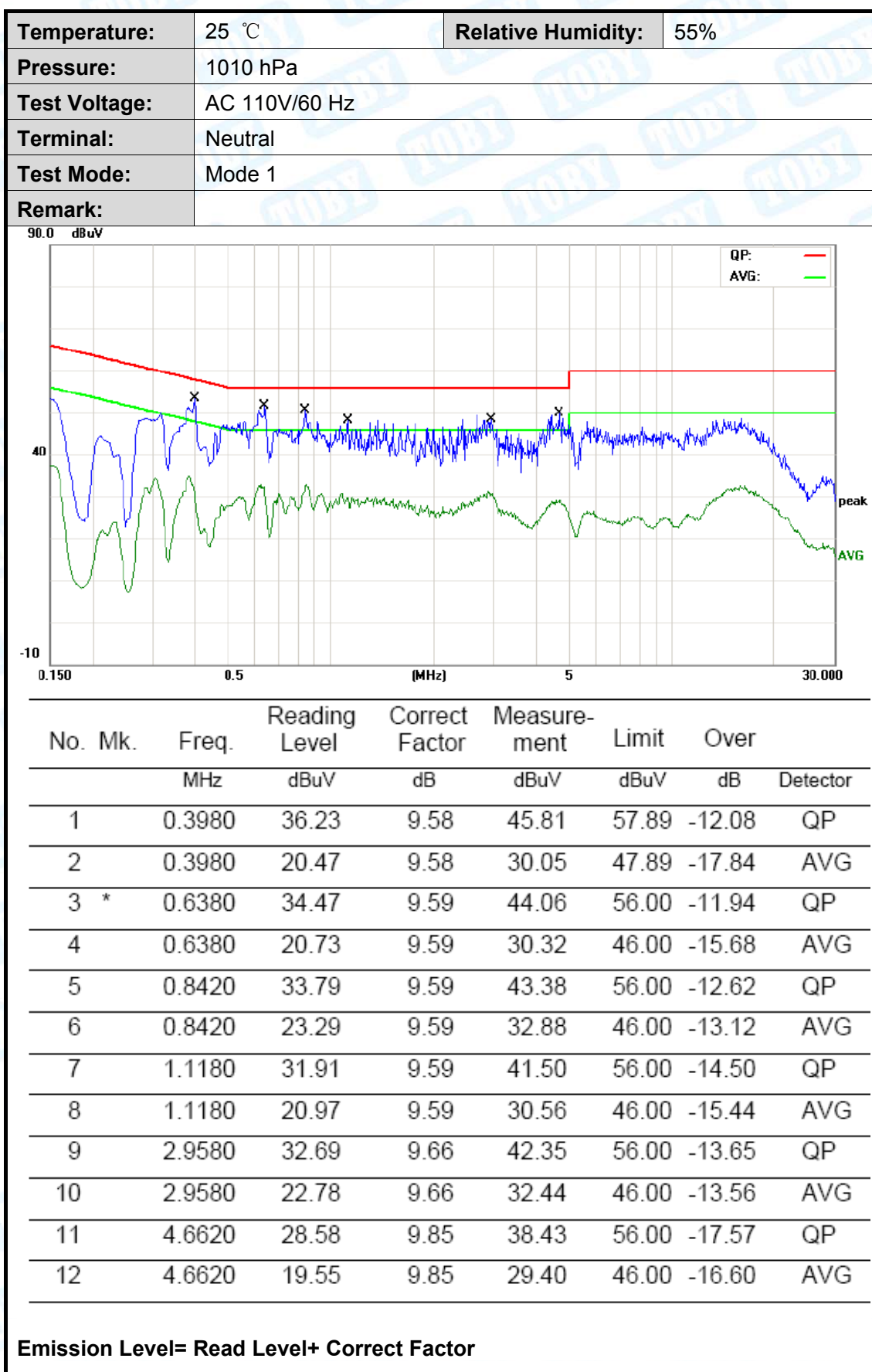
## Attachment A--Conducted Emission Data (AC Mains)

Temperature:	25 °C	Relative Humidity:	55%
Pressure:	1010 hPa		
Test Voltage:	AC 110V/60 Hz		
Terminal:	Line		
Test Mode:	Mode 1		
Remark:			

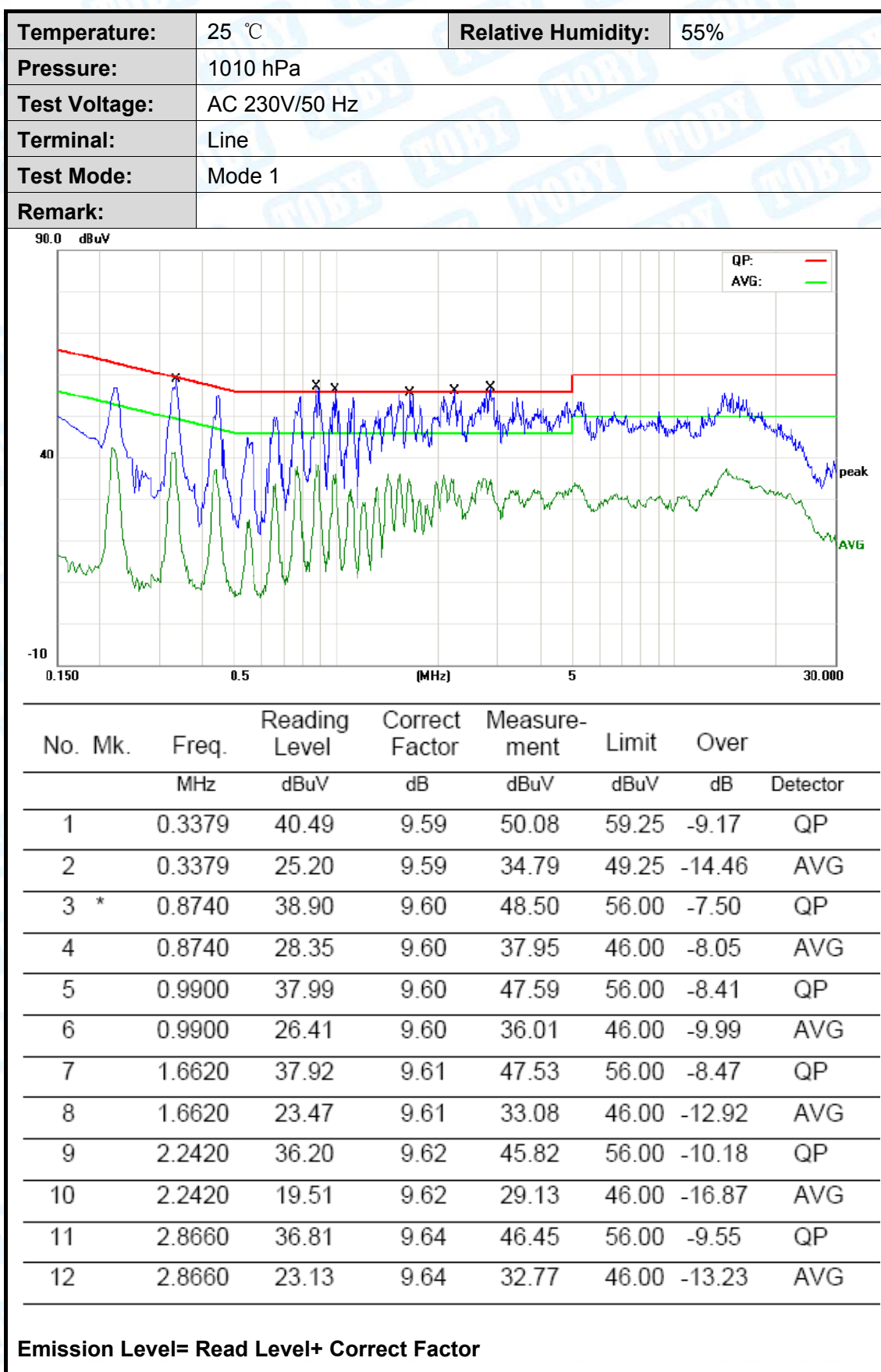


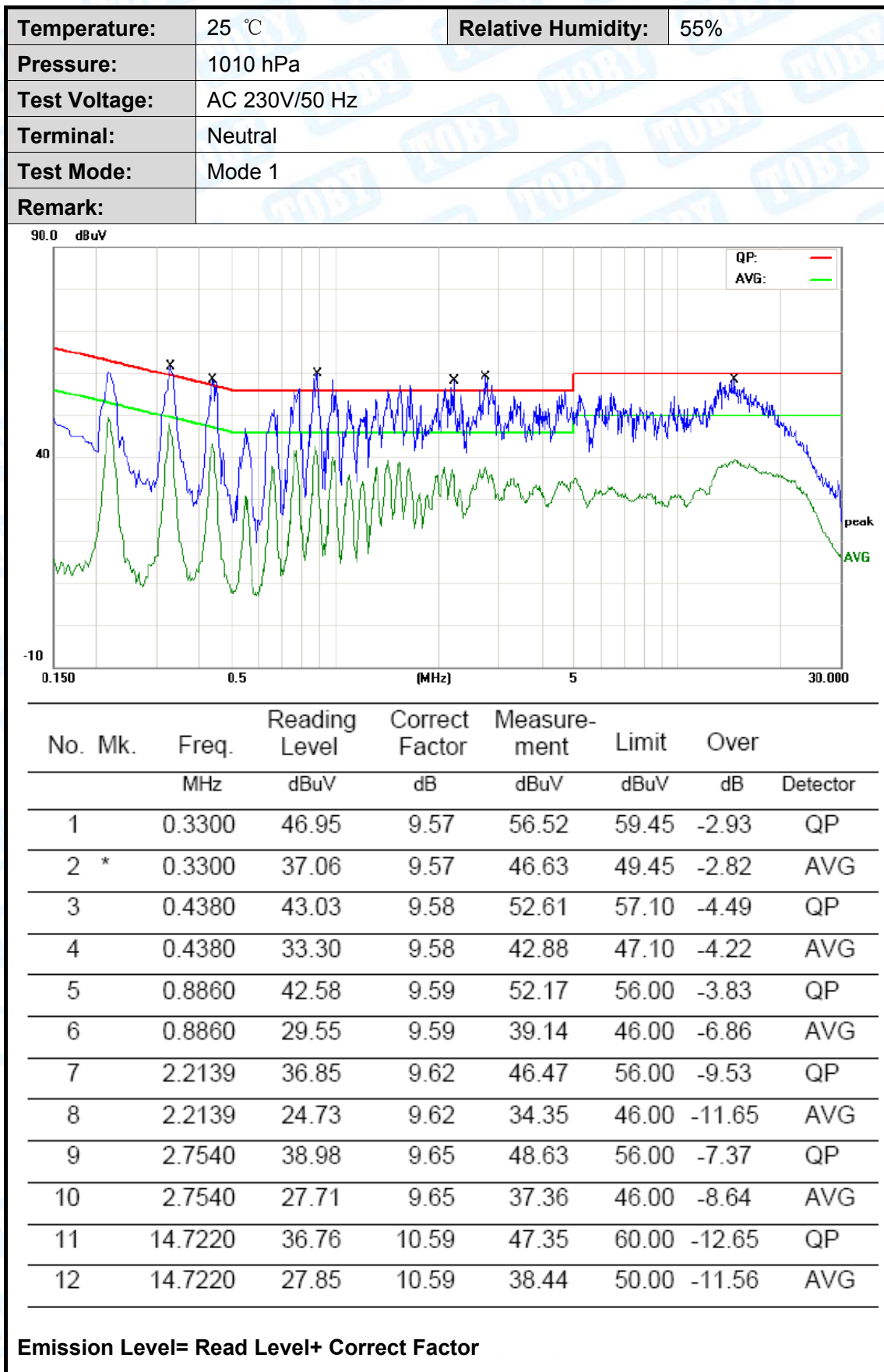
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		0.1539	35.67	9.64	45.31	65.78	-20.47	QP
2		0.1539	21.20	9.64	30.84	55.78	-24.94	AVG
3		0.4060	23.47	9.58	33.05	57.73	-24.68	QP
4		0.4060	7.85	9.58	17.43	47.73	-30.30	AVG
5		0.5100	25.48	9.58	35.06	56.00	-20.94	QP
6		0.5100	12.69	9.58	22.27	46.00	-23.73	AVG
7		0.8980	23.65	9.59	33.24	56.00	-22.76	QP
8		0.8980	12.00	9.59	21.59	46.00	-24.41	AVG
9		2.7659	29.77	9.65	39.42	56.00	-16.58	QP
10		2.7659	19.32	9.65	28.97	46.00	-17.03	AVG
11	*	4.9220	31.14	9.90	41.04	56.00	-14.96	QP
12		4.9220	19.45	9.90	29.35	46.00	-16.65	AVG

Emission Level= Read Level+ Correct Factor





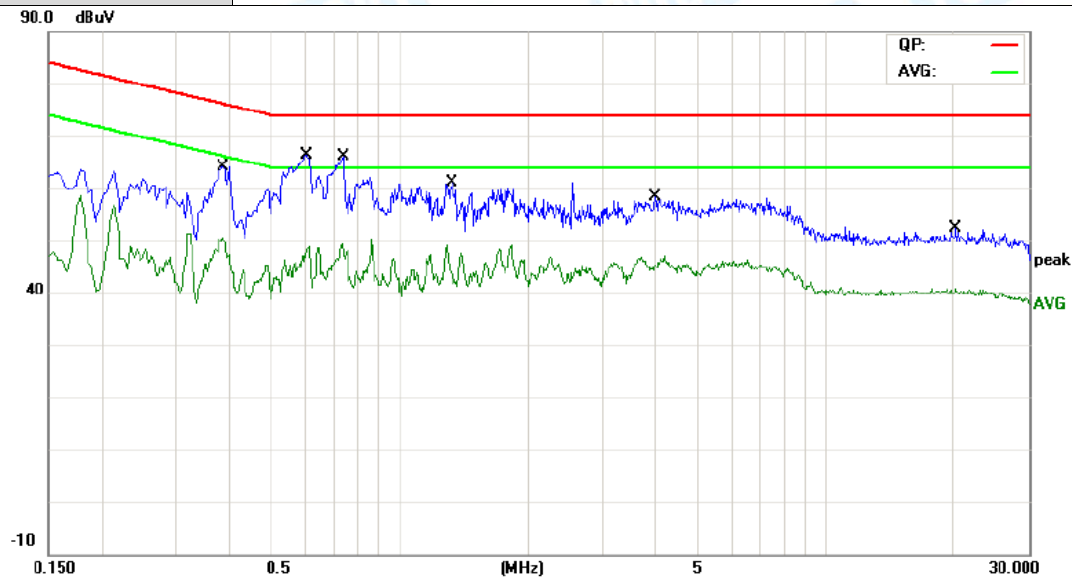






## Attachment B-- Conducted Emission Data (Asymmetric Mode)

Temperature:	25 °C	Relative Humidity:	55%
Pressure:	1010 hPa		
Test Voltage:	AC 230V/50 Hz		
Terminal:	LAN		
Test Mode:	Mode 1		
Remark:	100Mbps		



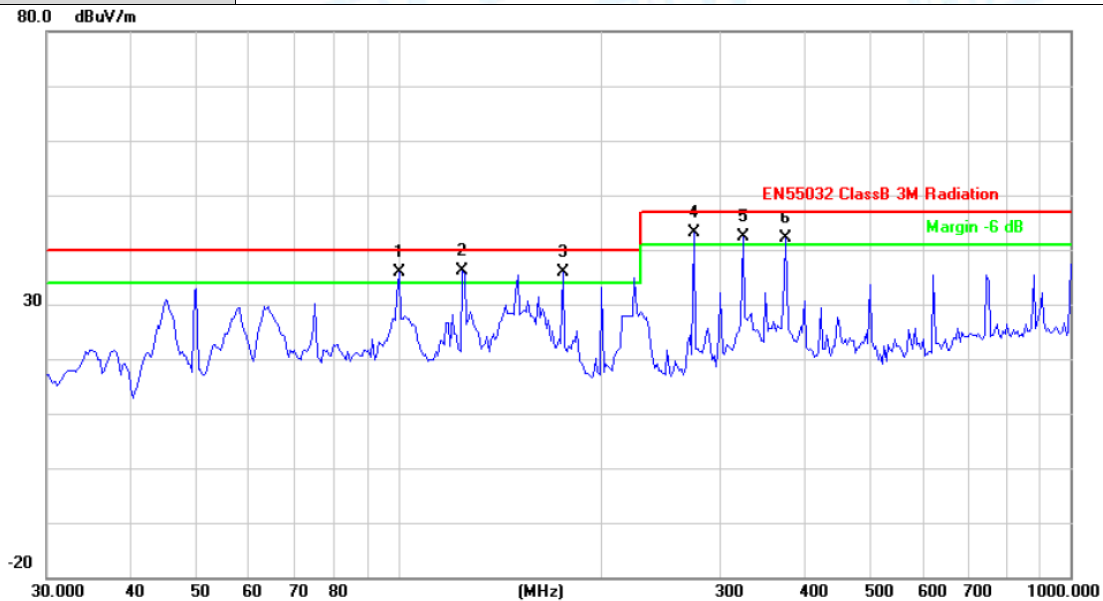
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		0.3860	50.80	9.64	60.44	76.15	-15.71	QP
2		0.3860	40.16	9.64	49.80	66.15	-16.35	AVG
3	*	0.6060	54.27	9.53	63.80	74.00	-10.20	QP
4		0.6060	38.96	9.53	48.49	64.00	-15.51	AVG
5		0.7380	54.15	9.49	63.64	74.00	-10.36	QP
6		0.7380	37.96	9.49	47.45	64.00	-16.55	AVG
7		1.3260	45.62	9.41	55.03	74.00	-18.97	QP
8		1.3260	33.69	9.41	43.10	64.00	-20.90	AVG
9		3.9700	41.81	9.28	51.09	74.00	-22.91	QP
10		3.9700	35.26	9.28	44.54	64.00	-19.46	AVG
11		20.2580	36.69	9.31	46.00	74.00	-28.00	QP
12		20.2580	30.99	9.31	40.30	64.00	-23.70	AVG

Emission Level= Read Level+ Correct Factor

## Attachment C--Radiated Emission Test Data

### Below 1 GHz

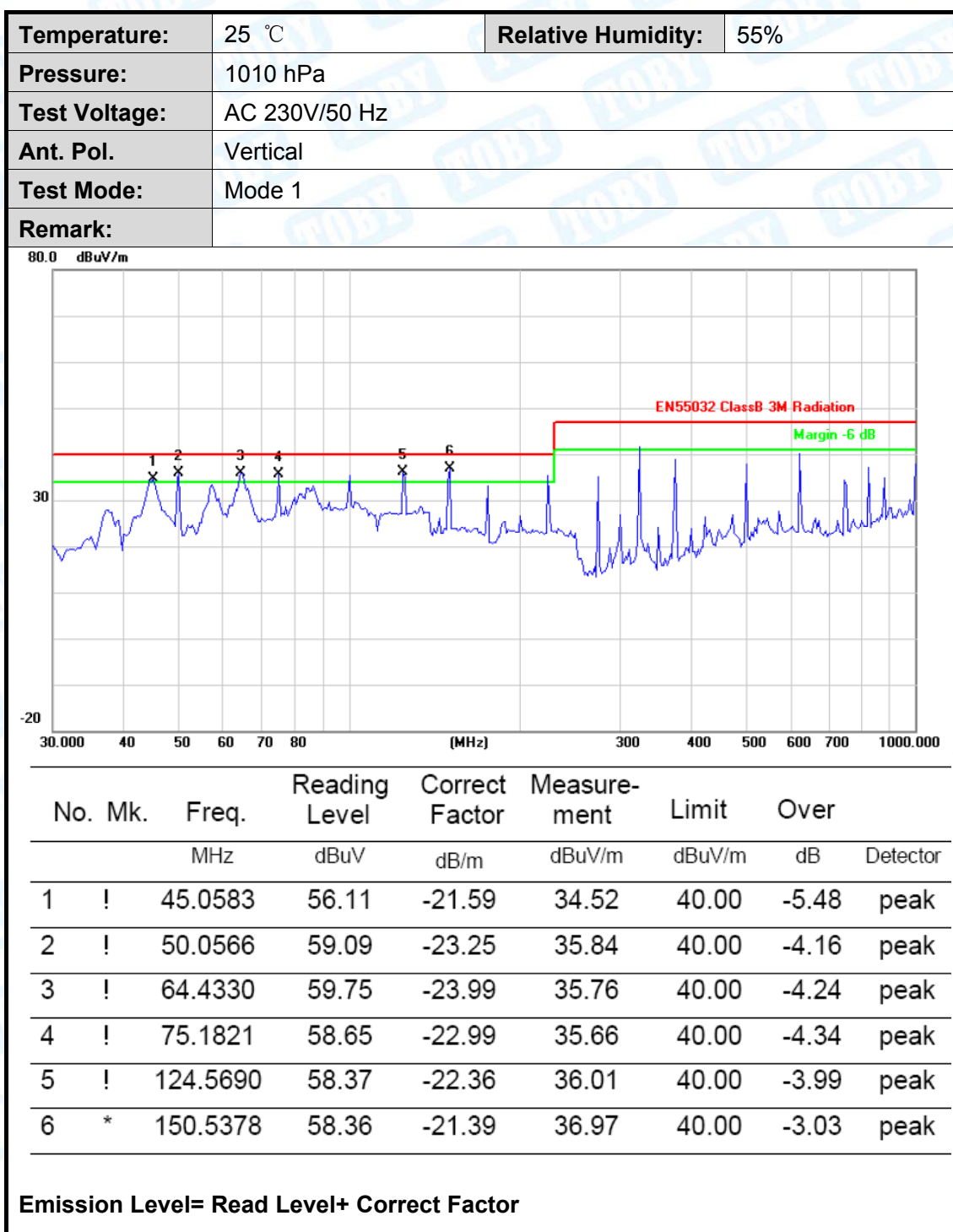
Temperature:	25 °C	Relative Humidity:	55%
Pressure:	1010 hPa		
Test Voltage:	AC 230V/50 Hz		
Ant. Pol.	Horizontal		
Test Mode:	Mode 1		
Remark:			



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1	!	100.2286	58.05	-22.11	35.94	40.00	-4.06	peak
2	*	124.5690	58.53	-22.36	36.17	40.00	-3.83	peak
3	!	175.6516	56.28	-20.32	35.96	40.00	-4.04	peak
4	!	275.1569	59.77	-16.69	43.08	47.00	-3.92	peak
5	!	325.5957	57.87	-15.37	42.50	47.00	-4.50	peak
6	!	377.2590	55.57	-13.32	42.25	47.00	-4.75	peak

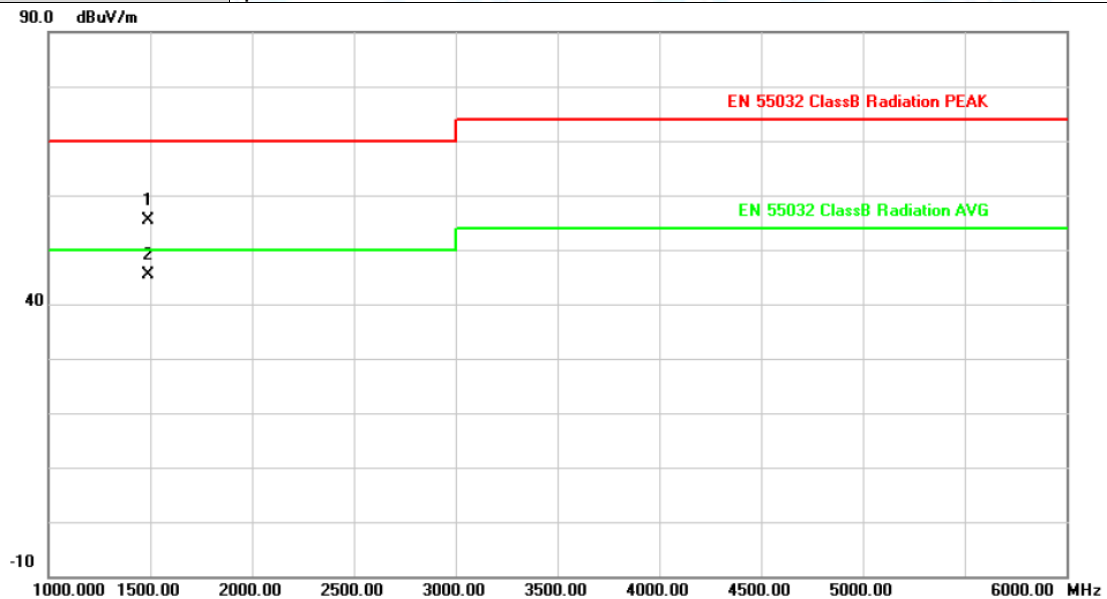
Emission Level= Read Level+ Correct Factor





**Above 1G**

Temperature:	25 °C	Relative Humidity:	55%
Pressure:	1010 hPa		
Test Voltage:	AC 230V/50 Hz		
Ant. Pol.	Horizontal		
Test Mode:	Mode 1		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		

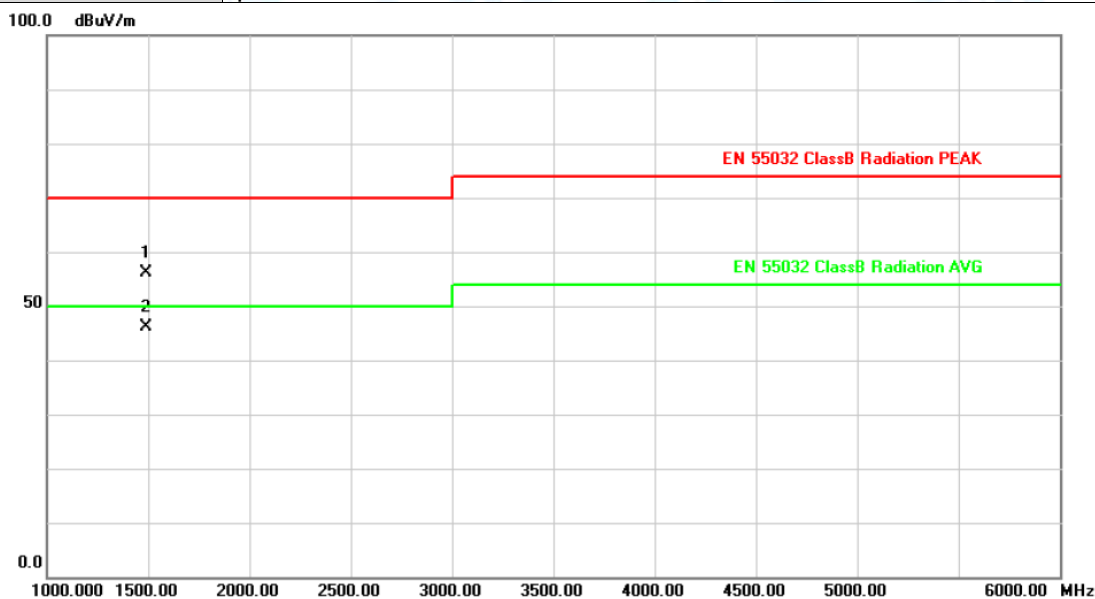


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		1489.640	57.56	-2.20	55.36	70.00	-14.64	peak
2	*	1489.640	47.47	-2.20	45.27	50.00	-4.73	AVG

**Emission Level= Read Level+ Correct Factor**



Temperature:	25 °C	Relative Humidity:	55%
Pressure:	1010 hPa		
Test Voltage:	AC 230V/50 Hz		
Ant. Pol.	Vertical		
Test Mode:	Mode 1		
Remark:	No report for the emission which more than 10 dB below the prescribed limit.		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector
1		1489.650	58.45	-2.20	56.25	70.00	-13.75	peak
2	*	1489.650	48.45	-2.20	46.25	50.00	-3.75	AVG

Emission Level= Read Level+ Correct Factor

## Attachment D--Harmonic Current Emission Test Data

### Harmonics – Class-A per Ed. 4.0 (2014)(Run time)

EUT: Power Distribution Unit

Tested by: HUA

Test category: Class-A per Ed. 4.0 (2014) (European limits)

Test Margin: 100

Test date: 2019/8/23

Start time: 17:03:54

End time: 17:06:35

Test duration (min): 2.5

Data file name: H-001188.cts\_data

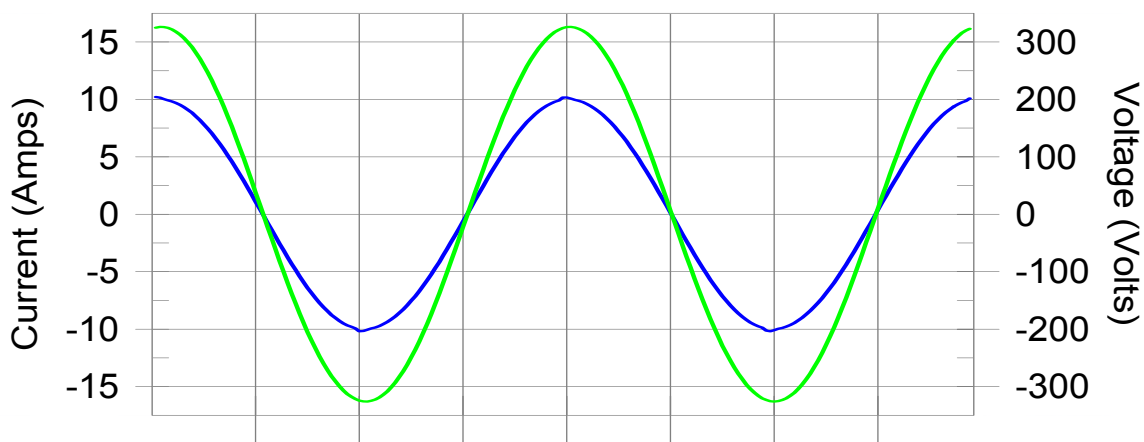
Comment: XY110108Z13

Customer: Customer information

Test Result: Pass

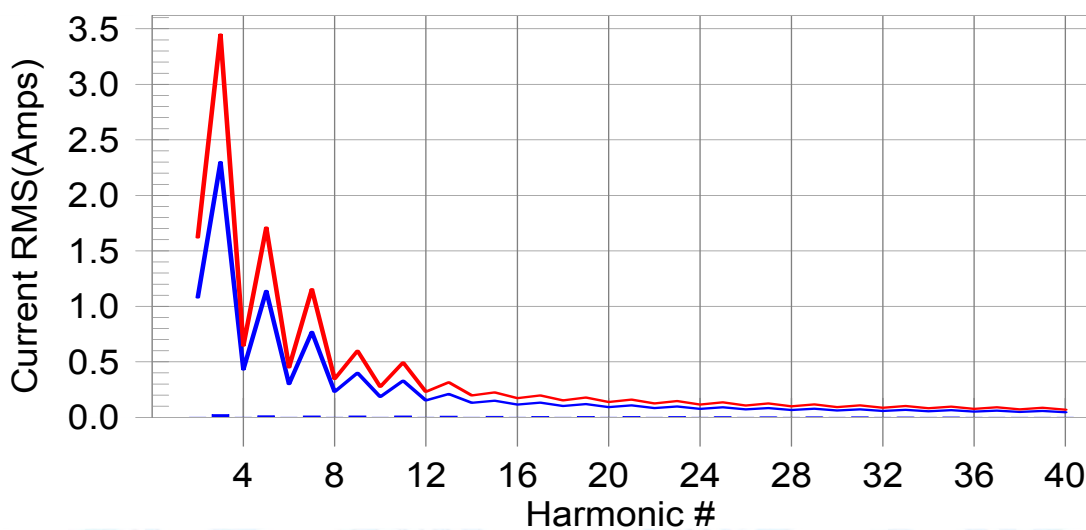
Source qualification: Normal

#### Current & voltage waveforms



#### Harmonics and Class A limit line

#### European Limits



Test result: Pass Worst harmonics H0-0.0% of 150% limit, H0-0% of 100% limit



## Current Test Result Summary (Run time)

EUT: Power Distribution Unit  
 Test category: Class-A per Ed. 4.0 (2014) (European limits)  
 Test date: 2019/8/23 Start time: 17:03:54 End time: 17:06:35  
 Test duration (min): 2.5 Data file name: H-001188.cts\_data  
 Comment: XY110108Z13  
 Customer: Customer information

Tested by: kai  
 Test Margin: 100

Test Result: Pass Source qualification: Normal  
 THC(A): 0.043 I-THD(%): 0.6 POHC(A): 0.014 POHC Limit(A): 0.251

## Highest parameter values during test:

V\_RMS (Volts): 230.65 Frequency(Hz): 50.00  
 I\_Peak (Amps): 10.216 I\_RMS (Amps): 7.094  
 I\_Fund (Amps): 7.093 Crest Factor: 1.441  
 Power (Watts): 1635.8 Power Factor: 1.000

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	1.080	N/A	0.002	1.620	N/A	Pass
3	0.025	2.300	N/A	0.027	3.450	N/A	Pass
4	0.001	0.430	N/A	0.001	0.645	N/A	Pass
5	0.014	1.140	N/A	0.015	1.710	N/A	Pass
6	0.000	0.300	N/A	0.000	0.450	N/A	Pass
7	0.013	0.770	N/A	0.013	1.155	N/A	Pass
8	0.001	0.230	N/A	0.001	0.345	N/A	Pass
9	0.012	0.400	N/A	0.012	0.600	N/A	Pass
10	0.001	0.184	N/A	0.001	0.276	N/A	Pass
11	0.012	0.330	N/A	0.012	0.495	N/A	Pass
12	0.000	0.153	N/A	0.001	0.230	N/A	Pass
13	0.011	0.210	N/A	0.011	0.315	N/A	Pass
14	0.000	0.131	N/A	0.000	0.197	N/A	Pass
15	0.010	0.150	N/A	0.010	0.225	N/A	Pass
16	0.000	0.115	N/A	0.000	0.173	N/A	Pass
17	0.009	0.132	N/A	0.009	0.198	N/A	Pass
18	0.000	0.102	N/A	0.000	0.153	N/A	Pass
19	0.009	0.118	N/A	0.009	0.178	N/A	Pass
20	0.000	0.092	N/A	0.001	0.138	N/A	Pass
21	0.007	0.107	N/A	0.008	0.161	N/A	Pass
22	0.000	0.084	N/A	0.000	0.125	N/A	Pass
23	0.007	0.098	N/A	0.007	0.147	N/A	Pass
24	0.000	0.077	N/A	0.000	0.115	N/A	Pass
25	0.006	0.090	N/A	0.006	0.135	N/A	Pass
26	0.000	0.071	N/A	0.000	0.107	N/A	Pass
27	0.005	0.083	N/A	0.005	0.125	N/A	Pass
28	0.000	0.066	N/A	0.000	0.099	N/A	Pass
29	0.004	0.078	N/A	0.004	0.116	N/A	Pass
30	0.000	0.061	N/A	0.000	0.092	N/A	Pass
31	0.003	0.073	N/A	0.004	0.109	N/A	Pass
32	0.000	0.058	N/A	0.000	0.086	N/A	Pass
33	0.003	0.068	N/A	0.003	0.102	N/A	Pass
34	0.000	0.054	N/A	0.000	0.081	N/A	Pass
35	0.002	0.064	N/A	0.002	0.096	N/A	Pass
36	0.000	0.051	N/A	0.000	0.077	N/A	Pass
37	0.002	0.061	N/A	0.002	0.091	N/A	Pass
38	0.000	0.048	N/A	0.000	0.073	N/A	Pass
39	0.001	0.058	N/A	0.002	0.087	N/A	Pass
40	0.000	0.046	N/A	0.000	0.069	N/A	Pass



## Voltage Source Verification Data (Run time)

EUT: Power Distribution Unit Tested by: kai  
 Test category: Class-A per Ed. 4.0 (2014) (European limits) Test Margin: 100  
 Test date: 2019/8/23 Start time: 17:03:54 End time: 17:06:35  
 Test duration (min): 2.5 Data file name: H-001188.cts\_data  
 Comment: XY110108Z13  
 Customer: Customer information

Test Result: Pass Source qualification: Normal

## Highest parameter values during test:

Voltage (Vrms):	230.65	Frequency(Hz):	50.00
I_Peak (Amps):	10.216	I_RMS (Amps):	7.094
I_Fund (Amps):	7.093	Crest Factor:	1.441
Power (Watts):	1635.8	Power Factor:	1.000

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.066	0.461	14.24	OK
3	0.559	2.075	26.93	OK
4	0.046	0.461	9.94	OK
5	0.097	0.922	10.48	OK
6	0.023	0.461	5.05	OK
7	0.035	0.692	4.99	OK
8	0.017	0.461	3.64	OK
9	0.027	0.461	5.95	OK
10	0.027	0.461	5.89	OK
11	0.019	0.231	8.28	OK
12	0.011	0.231	4.90	OK
13	0.013	0.231	5.61	OK
14	0.010	0.231	4.26	OK
15	0.015	0.231	6.36	OK
16	0.013	0.231	5.61	OK
17	0.011	0.231	4.91	OK
18	0.013	0.231	5.80	OK
19	0.014	0.231	5.95	OK
20	0.013	0.231	5.57	OK
21	0.009	0.231	4.00	OK
22	0.005	0.231	2.34	OK
23	0.009	0.231	3.88	OK
24	0.009	0.231	4.07	OK
25	0.009	0.231	3.87	OK
26	0.007	0.231	2.85	OK
27	0.007	0.231	2.85	OK
28	0.004	0.231	1.77	OK
29	0.010	0.231	4.42	OK
30	0.005	0.231	2.19	OK
31	0.008	0.231	3.39	OK
32	0.005	0.231	2.12	OK
33	0.007	0.231	3.16	OK
34	0.004	0.231	1.82	OK
35	0.007	0.231	2.97	OK
36	0.004	0.231	1.95	OK
37	0.006	0.231	2.65	OK
38	0.004	0.231	1.91	OK
39	0.005	0.231	2.33	OK
40	0.007	0.231	2.82	OK



## Attachment E--Voltage Fluctuation and Flicker Test Data

### Flicker Test Summary per EN/IEC61000-3-3 Ed. 3.0 (2013) (Run time)

EUT: Power Distribution Unit

Test category: All parameters (European limits)

Test date: 2019/8/23

Test duration (min): 10

Comment: XY110108Z13

Customer: Customer information

Tested by: hua

Test Margin: 100

End time: 17:02:44

Start time: 16:52:17

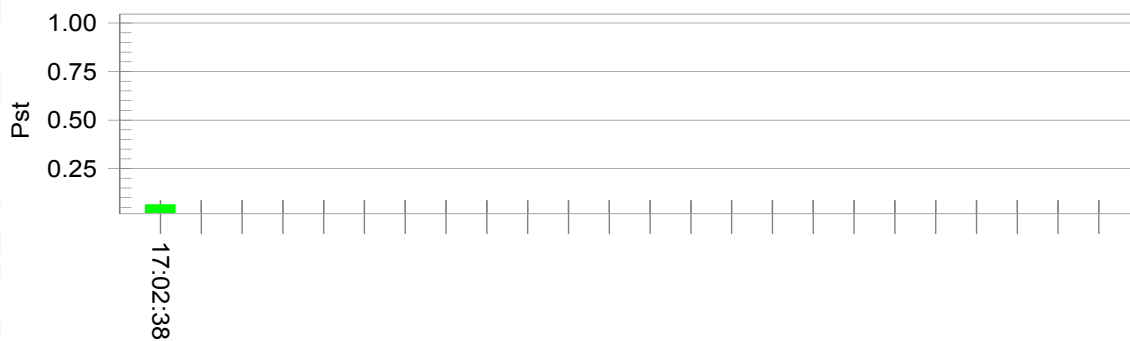
Data file name: F-001159.cts\_data

Test Result: Pass

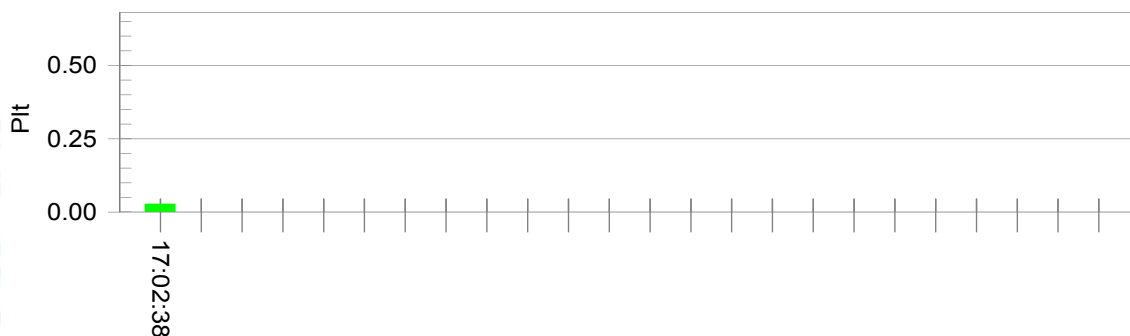
Status: Test Completed

Pst and limit line

European Limits



Plt and limit line



#### Parameter values recorded during the test:

Vrms at the end of test (Volt): 230.60

T-max (mS): 0

Highest dc (%): 0.00

Highest dmax (%): 0.00

Highest Pst (10 min. period): 0.064

Highest Plt (2 hr. period): 0.028

Test limit (mS): 500.0

Test limit (%): 3.30

Test limit (%): 4.00

Test limit: 1.000

Test limit: 0.650

Pass

Pass

Pass

Pass

Pass

**Attachment F--Electrostatic Discharge Test Data**

Temperature : 22℃		Humidity : 50%		
Power supply : AC 230V/50Hz		Test Mode : Mode 1		
Required Performance Criteria: B				
Air Discharge: ±2/±4/±8kV    Contact Discharge: ±2/±4kV				
Location	Test Level (kV)	No. of Discharge	Judgment	Result
A1	± 2kV±4kV±8kV	20	A	PASS
A2		20	A	
HCP	±4kV	40	A	
VCP	±4kV	40	A	



## Test Location Photos

A1



A2

## Note:

- 1) Criteria A: There was no change operated with initial operating during the test.
- 2) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
- 3) Criteria C: The system shut down during the test.

## Attachment G--RF Field Strength Susceptibility Test Data

Temperature	: 22°C	Humidity	: 50%		
Power supply	: AC 230V/50Hz	Test Mode	: Mode 1		
<b>Required Performance Criteria: A</b>					
Modulation: AM 80%					
Pulse: 1 kHz					
EUT Position	Actual Performance Criteria				Result
	Frequency Range 1: 80~1000MHz		Frequency Range 2: /		
	Horizontal	Vertical	Horizontal	Vertical	
Front	A	A	/	/	PASS
Right	A	A	/	/	PASS
Rear	A	A	/	/	PASS
Left	A	A	/	/	PASS
<b>Remark:</b>					
1) Criteria A: There was no change operated with initial operating during the test. 2) Criteria B: The EUT function loss during the test, but self-recoverable after the test. 3) Criteria C: The system shut down during the test.					



## Attachment H--Electrical Fast Transient/Burst Test Data

Temperature : 22°C Humidity : 50%

Power supply : AC 230V/50Hz Test Mode : Mode 1

### Required Performance Criteria: B

Line : ☒ AC Mains Coupling : ☐ Direct

Line : ☐ Signal ☐ I/O Cable Coupling : ☐ Capacitive

Line	Voltage(kV)	Required Performance Criteria		Actual Performance Criteria		Result
		(+)	(-)	(+)	(-)	
L	1.0	B	B	A	A	PASS
N	1.0	B	B	A	A	PASS
L-N	1.0	B	B	A	A	PASS
L-PE	1.0	B	B	A	A	PASS
N-PE	1.0	B	B	A	A	PASS
L-N-PE	1.0	B	B	A	A	PASS
RJ45	0.5	B	B	/	/	/

### Remark:

- 1) Criteria A: There was no change operated with initial operating during the test.
- 2) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
- 3) Criteria C: The system shut down during the test.

## Attachment I--Surge Immunity Test Data

Temperature : 22°C		Humidity : 50%				
Power supply : AC 230V/50Hz		Test Mode : Mode 1				
<b>Required Performance Criteria: B</b>						
Injected Line	Voltage (kV)	Phase	Actual Performance Criteria		Result	
			(+)	(-)	(+)	(-)
L-N	1.0	0°	A	A	PASS	PASS
		90°	A	A	PASS	PASS
		180°	A	A	PASS	PASS
		270°	A	A	PASS	PASS
L-PE	2.0	0°	A	A	PASS	PASS
		90°	A	A	PASS	PASS
		180°	A	A	PASS	PASS
		270°	A	A	PASS	PASS
N-PE	2.0	0°	A	A	PASS	PASS
		90°	A	A	PASS	PASS
		180°	A	A	PASS	PASS
		270°	A	A	PASS	PASS
RJ 45	1.0	+/-	/	/	/	/
<b>Remark:</b> <ol style="list-style-type: none"> <li>Criteria A: There was no change operated with initial operating during the test.</li> <li>Criteria B: The EUT function loss during the test, but self-recoverable after the test.</li> <li>Criteria C: The system shut down during the test.</li> </ol>						



## Attachment J--Conducted Immunity Test Data

Temperature : 22°C Humidity : 50%

Power supply : AC 230V/50Hz Test Mode : Mode 1

**Required Performance Criteria: A**

Frequency Range (MHz)	Injected Position	Voltage Level (e.m.f.)	Required Performance Criteria	Actual Performance Criteria	Result
0.15 ~ 80	AC Mains	3V(rms), AM 80% Modulated with 1 kHz	A	A	PASS
0.15 ~ 80	DC Mains	3V(rms), AM 80% Modulated with 1 kHz	A	/	/
0.15 ~ 80	Signal Line	3V(rms), AM 80% Modulated with 1 kHz	A	/	/

**Remark:**

- 1) Criteria A: There was no change operated with initial operating during the test.
- 2) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
- 3) Criteria C: The system shut down during the test.

## Attachment K--Voltage Dips and Interruptions Test Data

Temperature	: 25℃	Humidity	: 50%			
Power supply	: AC 230V/50Hz	Test Mode	: Mode 1			
Criterion: B&C						
Test Level % UT	Voltage Dips & Short Interruptions % UT	Duration (in period)	Phase Angle	Required Performance Criteria	Actual Performance Criteria	Result
0	100	250P	0°	C	C	Pass
70	30	25P	0°	C	C	Pass
0	100	0.5P	0°	B	B	Pass
<b>Remark:</b> $U_T$ is the rated voltage for the equipment. 1) Criteria A: There was no change operated with initial operating during the test. 2) Criteria B: The EUT function loss during the test, but self-recoverable after the test. 3) Criteria C: The system shut down during the test.						

-----END OF REPORT-----