中国认可
国际互认
检测
TESTING
CNAS L7728

EMC TEST REPORT
RZBG(E) 20180419001-C

Applicant	: GEOVISION INC. 9TH FL NO 246 NEIHU RD, SEC 1 NEIHU DISTRICT TAIPEI CITY, 114 TAIWAN
Manufacturer	: ZHEJIANG UNIVIEW TECHNOLOGIES CO LTD
Factory	: ZHEJIANG UNIVIEW TECHNOLOGIES CO LTD
Product Name	:HD IP camera/IP camera
Type/Model	:Appendix II
TEST RESULT	**:PASS**

SUMMARY

The equipment complies with the requirements according to the following standards: **EN55022:2010(Class A):** information technology equipment – Radio disturbance characteristics Limits and methods of measurement.

EN 55032:2015: Electromagnetic compatibility of multimedia equipment — Emission requirements.

EN 55024:2010: Information Technology Equipment – Immunity Characteristics – Limits and methods of measurement.

EN 61000-3-2:2014: Limits for harmonic current emissions (equipment input current <=16A per phase)

EN 61000-3-3: 2013: Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current <=16A

Date of issue: May 11, 2018

Prepared by: Limin Zheng

Limin Zheng 2018.05.11

Reviewed by: Bing Cai

Bing Cai (Reviewer) 2018.05.11

检测技术有限公司 报告专用章

Content

1. GENERAL INFORMATION

1.1 Description of equipment under Test (EUT)

Product Name	:	IP camera
Description of EUT	:	This is day/nightfixed domenetwork camera. The camera provides a 100-Mbps Ethernet port. The camera can implement image capturing, image processing, and video encoding, and is applicable for IP surveillance.
Model number	:	GV-ADR4701
Sample Identification No	:	/
I/O Port	:	FE; Audio in/out; Alarm in/out; POE
Category of EUT	:	Class A
Rating	:	100-240V~, 50/60Hz
EUT type	:	☒ Table top ☐ Floor standing
Highest operating frequency		: 800MHz
Sample received date	:	2017-12-25
Date of test	:	2017-12-25 ~ 2018-01-05

1.2 Description of Client

Applicants	:	GEOVISION INC. 9TH FL NO 246 NEIHU RD, SEC 1 NEIHU DISTRICT TAIPEI CITY, 114 TAIWAN
Person of contact	:	/
Telephone	:	/
Telefax	:	/
Manufacturer	:	ZHEJIANG UNIVIEW TECHNOLOGIES CO LTD
Factory	:	ZHEJIANG UNIVIEW TECHNOLOGIES CO LTD

1.3 Description of Test Facility

☒ Name: Hangzhou TDT Technologies Co., Ltd.

Address: Room 101, Building 3, No. 12, Binwen Road, Xixing Street, Binjiang district, Hangzhou, Zhejiang, China

Telephone: +86 0571-88317620

Telefax: +86 0571-88316350

A2LA Certification number: 4037.01

CNAS Certification number: CNAS L7728

VCCI Site registration number: C-4683, G-832, R-4200, T-2223

FCC Site registration number: 494386

IC Site registration number: 12179A

Note : The project Radiated immunity is not in the scope list of CNAS.

Subcontractor:

Note : The Recognition of CNAS including project Radiated immunity.

☒ Name: Zhejiang Testing and Inspection Institute for Mechanical and Electrical Products Quality (MEPQ Lab)

Address: No.125, Miaohouwang Road, Binjiang District, Hangzhou, Zhejiang, China

Telephone: +86 0571-88031780

CNAS Certification number: CNAS L0483

Note : The Recognition of CNAS including project Radiated immunity.

2. TEST SPECIFICATIONS

2.1 Standards

EN 55032:2015: Electromagnetic compatibility of multimedia equipment — Emission requirements.
EN 55024:2010: Information Technology Equipment – Immunity Characteristics – Limits and methods of measurement.
EN 61000-3-2:2014: Limits for harmonic current emissions (equipment input current <=16A per phase)
EN 61000-3-3: 2013: Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current <=16A

2.2 Mode of operation during the test / Test peripherals used

2.2.1 Configuration of the EUT

Configuration		EUT
		GV-ADR4701
Image Sensor		OV4689
Adaptor		DC 12V,1A; POE 48V,0.25A
Ports	Audio IN	/
	Audio Out	/
	Video out	/
	LAN	1
	Alarm in	/
	Alarm out	/
	POE	1

2.2.2 System Configuration during EMC Test

The Equipment under Test (EUT) was functioning correctly during all tests. The cables and auxiliary equipment detailed as below.

Cables Used during Test

Interface	Cable Type	Quantity	Length
AC Power	Unscreened	1	1.0m
Ethernet(100Base-T)	Unshielded LAN Cable	1	1.5m
Audio In	Unshielded cable	1	0.5m
Audio out	Unshielded cable	1	0.5m

Auxiliary Equipment Used during Test

Name	Model	Manufacture

Notebook PC	ThinkPad T400	Lenovo
Headphone	SHO4200	Philips
Microphone	SHO4200	Philips
60W Hi-Power POE Injector	PSE156G	UNIVIEW
Adapter	ADS-65LSI-12-1	HONOR

2.2.3 Description of Test modes

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of EUT operation mode 1-mode 2.

Mode 1:
GV-ADR4701 with DC adapter
LAN, connect to PC, open the display for IP camera
DC power supply

Mode 2:
GV-ADR4701 with POE adapter
LAN, connect to PC, open the display for IP camera
POE power supply

2.2.4 Block of Test Configurations

The PC was connected to ancillary in order to simulate normal operating conditions (with reference to the guidance given in the standard for this type of equipment).

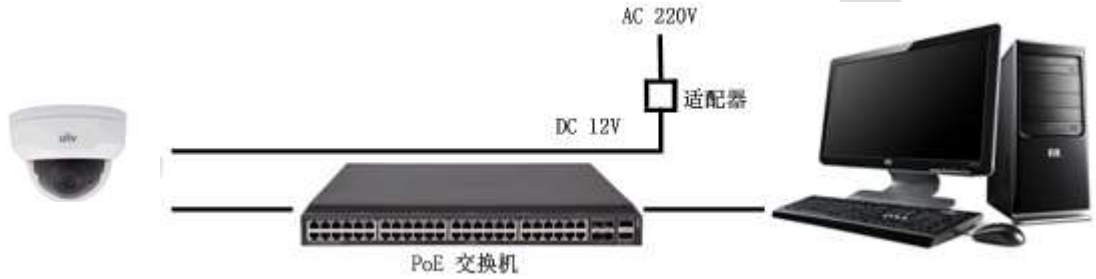


Figure 1.Test Configuration 1 EMI/EMS at enclosure and DC mains port

2.3 Instrument list

Test Item	Test Instrument	Model	Manufacturer	Serial No.	Calibration state
Radiated Emission (RE)	Chamber	9*6*6	Albatross projects	22603	effective
	EMI Test receiver	ESR7	R & S	101357	effective
	Signal Analyzer	FSV40	R & S	101015	effective
	PRE-AMPLIFIER (1-18GHz)	AFS44-01001800-42-10P-44	MITEQ	1890161	effective
	PRE-AMPLIFIER (18-40GHz)	CBL18404035	CERNEX	24496/24495	effective
	Bi-conical and log-periodic Antenna	AC-220	Com-power	61068	effective
	HORN Antenna	HF906	R & S	100373	effective
	HORN Antenna	AH-840	Com-power	101076	effective
	HORN Antenna	BBHA 9120D	Schwarzbeck	01794	effective
	Coaxial RF Cable	SUCOFLEX 106	Hubersuhner	NA	effective
		3545-2.92J2.92J-8M	Gore	NA	effective
Conducted Emission （CE）	EMI Test receiver	ESR7	R & S	101357	effective
	Artificial Mains Network	ENV216	R & S	101276	effective
		ENV4200	R & S	100263	effective
	ISN	ENY81	R & S	100183	effective
	Coaxial cable	SPARE 5M	Hubersuhner	1#	effective
	50Ω Terminator	T50	/	CE0001	effective
Current Harmonic	Harmonic/flicker analyzer	PHF4010	HAEFELY	153123	effective
Voltage fluctuation and Flicker	Harmonic/flicker analyzer	PHF4010	HAEFELY	153123	effective
Conducted Susceptibility (CS)	Signal Generator	CWS500N	EM TEST	P1453146258	effective
	Coupling and decoupling network	CDN-M1	EM TEST	110503	effective
		CDN-M2	EM TEST	110504	effective
		CDN-M3	EM TEST	110505	effective
		CDN-T8	EM TEST	A3022009	effective
		CDN-Clamp	EM TEST	3606030868	effective
Electrical fast transient (EFT)	Signal Generator	EMS61000-4A	EVERFINE	G118209TF1 341114	effective
	EFT Clamp	EFTC-2	EVERFINE	G100306CS1 341118	effective
Electrostatic discharge (ESD)	ESD Gun	ESS-B301118	NOISEKEN	ESS1745628	effective
SURGE	Signal Generator 1.2/50us 10kV	EMS61000-5H	EVERFINE	G134362CM 5361113	effective
	Signal Generator 10/700us 6kV	EMS61000-5D	EVERFINE	Y100370C01 321112	effective

	Coupling and decoupling network	SNG-8	EVERFINE	Y118625TN1 321112	effective
		SGN-7	EVERFINE	Y118626CJ1 331112	effective
		SGN-2H	EVERFINE	G117476TM1 341113	effective
Voltage dips,short interruptions and voltage variations on A.C	Signal Generator	EMS61000-11K	EVERFINE	G113317CA8 341119	effective
Power frequency magnetic field (PMS)	Signal Generator	EMS61000-8K_500	EVERFINE	G121941CS1 3K1113	effective
	Power magnetic coil	MFC-4	EVERFINE	G124238BS1 341113	effective
Electromagnetic field susceptibility（RS） (MEPQ Lab)	ANTENNA	HL046	R&S	4040-8708.02-10067	effective
	ANTENNA	STLP9149	Schwarzbeck	/	effective
	Amplifier	CBA 1G-250	TESEQ	T44132	effective
	Amplifier	CBA 3G-050	TESEQ	T43983	effective
	SG	SMB 100A	R&S	105929	effective
	Power Meter	NRP-Z91	R&S	101612	effective
	Field probe	FL7006	AR	0338716	effective

Auto Test Software Information			
Test Item	**Manufacturer**	**MODEL**	**Version**
Radiated emission	AUDIX	E3	8.2014-7-10A
Conducted emission	R&S	EMC32	V8.53
Conducted immunity	EM TEST	EM TEST	CWS500N
Current Harmonic	HAEFELY EMC	PHF X	V1.34
Voltage fluctuation and Flicker	HAEFELY EMC	PHF X	V1.34

2.4 Test Summary

TEST ITEM	RESULT	NOTE
Conducted disturbance voltage at mains terminals	PASS	
Conducted disturbance voltage at telecommunication ports	PASS	
Radiated emission	PASS	
Harmonics	PASS	
Flicker	PASS	
ESD	PASS	
EFT	PASS	
Surge	PASS	
Conducted immunity	PASS	
Radiated immunity	PASS	Test by MEPQ Lab
AC Dip, interrupt	PASS	
Power magnetic field	PASS	

Note 1: NA =Not Applicable

Note 2: This report applies to tested sample only. The test results have been compared directly with the limits, and the measurement uncertainty is recorded. This report shall not be reproduced in part without written approval of Hangzhou TDT Technologies Co., Ltd.

Emission Test

3. Conducted disturbance voltage at mains terminals

Test result: PASS

3.1 Limits

3.1.1 Limits for conducted disturbance voltage at the mains ports of class A

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

Applicable to 1. AC mains power ports (3.1.1)				
Table clause	**Frequency range** MHz	**Coupling device** (see Table A.8)	**Detector type / bandwidth**	**Class A limits dB(μV)**
A9.1	0,15 to 0,5	AMN	Quasi Peak / 9 kHz	79
	0,5 to 30			73
A9.2	0,15 to 0,5	AMN	Average / 9 kHz	66
	0,5 to 30			60
Apply A9.1 and A9.2 across the entire frequency range.				

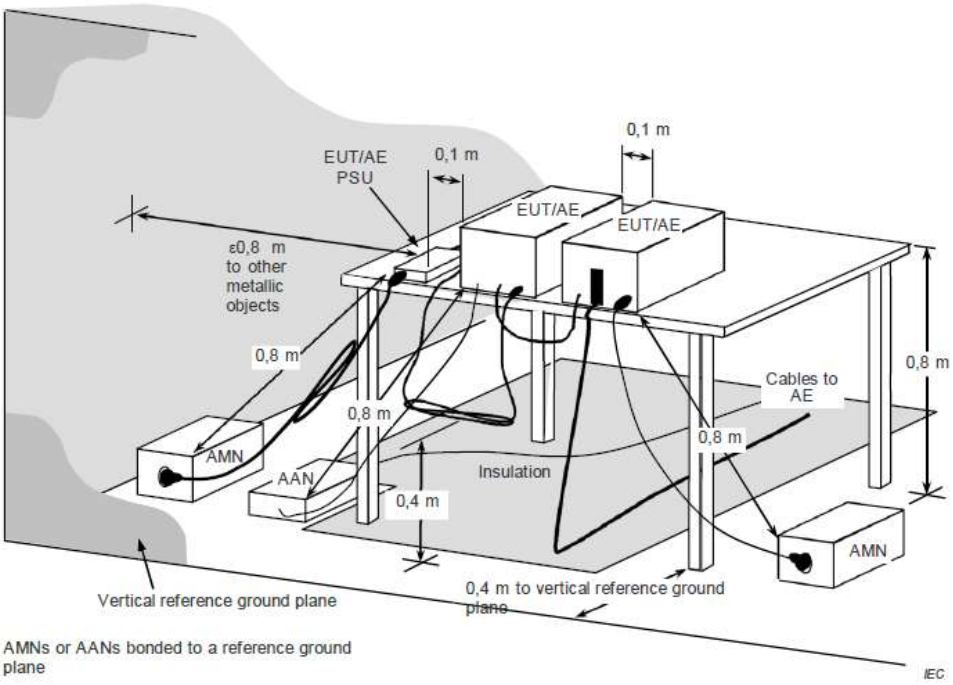
3.1.2 Limits for conducted disturbance voltage at the mains ports of class B device

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

Applicable to 1. AC mains power ports (3.1.1)				
Table clause	**Frequency range** MHz	**Coupling device** (see Table A.8)	**Detector type / bandwidth**	**Class B limits dB(μV)**
A10.1	0,15 to 0,5	AMN	Quasi Peak / 9 kHz	66 to 56
	0,5 to 5			56
	5 to 30			60
A10.2	0,15 to 0,5	AMN	Average / 9 kHz	56 to 46
	0,5 to 5			46
	5 to 30			50
Apply A10.1 and A10.2 across the entire frequency range.				

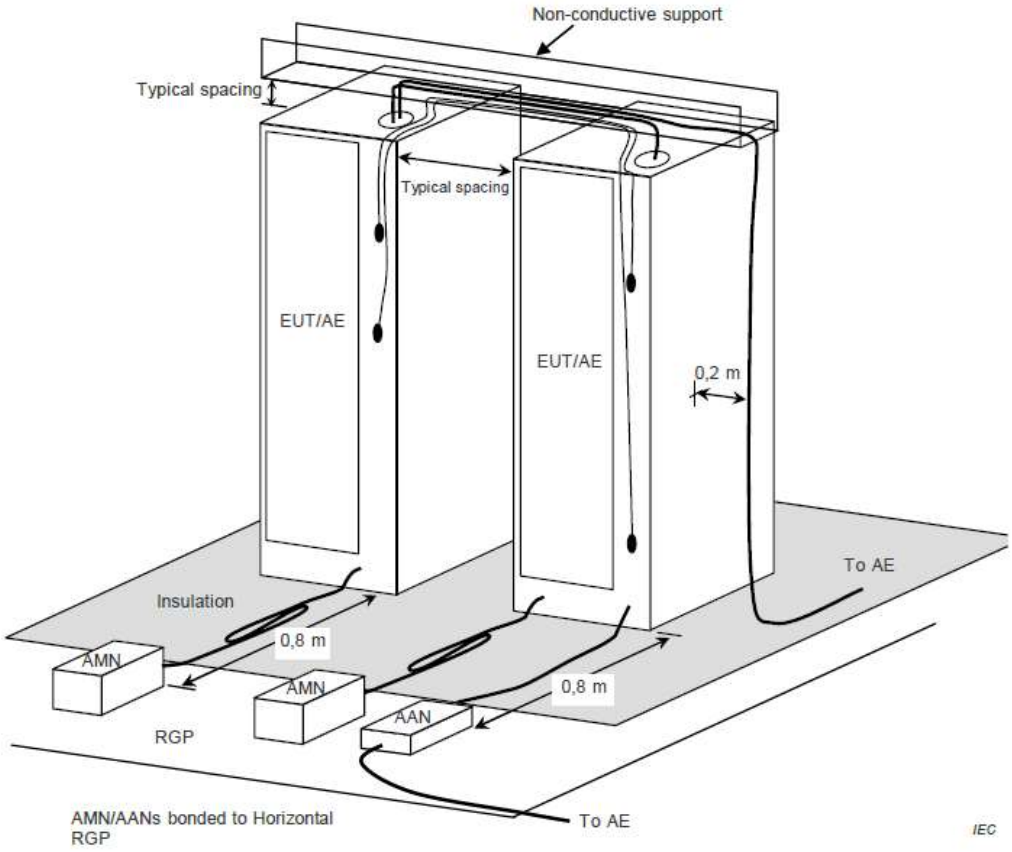
3.2 Test setup

☒ For table top equipment



The 0,8 m distance specified between EUT/AE/PSU and AMN/AAN, is applicable only to the EUT being measured. If the device is AE then it shall be ε0,8 m.

☐ For floor standing equipment



3.3 Test Setup and Test Procedure

Measurement was performed in shielded room, and instruments used were following clause 4 of CISPR 16-1-1 & CISPR 16-1-2.
Detailed test procedure was following clause 6.3 of EN 55032.
EUT arrangement and operation conditions were according to clause 6 of EN 55032.
Frequency range 150kHz – 30MHz was checked and EMI receiver measurement bandwidth was set to 9 kHz.

3.4 Test Protocol

Temperature	:	20°C
Relative Humidity	:	49 %RH
Atmospheric Pressure	:	101.1kPa

Mode 1 (GV-ADR4701 + DC adapter) Line+ Neutral

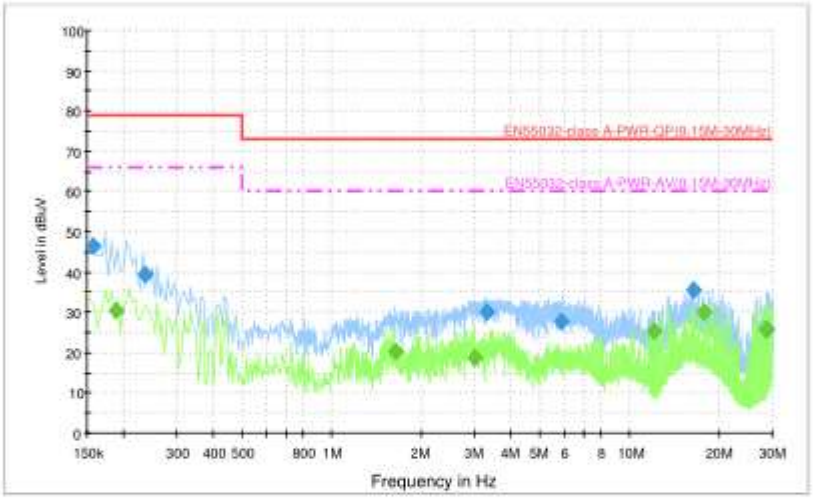
Hangzhou TDT Technologies Co., Ltd.
tel:0571-88317620
fax:0571-88316350

TDT

CE Test Report

Common Information

EUT:	
Power	AC 230V 50Hz
Note:	Level(dBuV)=Reading(dBuV)+Corr. (dB) Margin(dB)=Limit(dBuV)-Level(dBuV)
Environment Conditions:	21degrees Celsius,54%humidity,101KPa
Operator Name:	TANGSHITAO



Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)	Comment
0.157287	46.4	1000.0	9.000	On	L1	19.9	32.6	79.0	
0.234378	39.4	1000.0	9.000	On	N	19.9	39.6	79.0	
3.279739	30.0	1000.0	9.000	On	N	20.0	43.0	73.0	
5.889111	27.8	1000.0	9.000	On	L1	20.0	45.2	73.0	
16.227652	35.6	1000.0	9.000	On	N	20.3	37.4	73.0	
28.680688	25.8	1000.0	9.000	On	N	20.4	47.2	73.0	

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)	Comment
0.187359	30.4	1000.0	9.000	On	L1	19.9	35.6	66.0	
1.631379	20.4	1000.0	9.000	On	N	19.9	39.6	60.0	
2.983792	18.6	1000.0	9.000	On	N	20.0	41.4	60.0	
11.953740	25.4	1000.0	9.000	On	N	20.2	34.6	60.0	
17.690662	30.2	1000.0	9.000	On	N	20.4	29.8	60.0	
28.686520	25.6	1000.0	9.000	On	N	20.4	34.4	60.0	

Notes:

1. All possible modes of operation were investigated. Only the worst case emissions measured.

3.5 Measurement Uncertainty

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT.
Measurement uncertainty at mains terminal: ± 2.66dB.
The measurement uncertainty is given with a confidence of 95%, k=2.
The measurement uncertainty is traceable to internal procedure CXWJ22.

4. Conducted disturbance voltage at telecommunication ports

Test result: PASS

4.1 Limits

4.1.1 Limits of conducted common mode (asymmetric mode) disturbance at telecommunication ports in the frequency range 0.15 to 30MHz for class A equipment

Requirements for asymmetric mode conducted emissions from Class A equipment

Applicable to

1. wired network ports (3.1.32)
2. optical fibre ports (3.1.25) with metallic shield or tension members
3. antenna ports (3.1.3)

Table clause	Frequency range MHz	Coupling device (see Table A.8)	Detector type / bandwidth	Class A voltage limits dB(µV)	Class A current limits dB(µA)
A11.1	0,15 to 0,5	AAN	Quasi Peak / 9 kHz	97 to 87	n/a
	0,5 to 30			87	
	0,15 to 0,5	AAN	Average / 9 kHz	84 to 74	
	0,5 to 30			74	
A11.2	0,15 to 0,5	CVP and current probe	Quasi Peak / 9 kHz	97 to 87	53 to 43
	0,5 to 30			87	43
	0,15 to 0,5	CVP and current probe	Average / 9 kHz	84 to 74	40 to 30
	0,5 to 30			74	30
A11.3	0,15 to 0,5	Current Probe	Quasi Peak / 9 kHz	n/a	53 to 43
	0,5 to 30				43
	0,15 to 0,5	Current Probe	Average / 9 kHz		40 to 30
	0,5 to 30				30

The choice of coupling device and measurement procedure is defined in Annex C.

AC mains ports that also have the function of a wired network port shall meet the limits given in Table A.9.

The measurement shall cover the entire frequency range.

The application of the voltage and/or current limits is dependent on the measurement procedure used. Refer to Table C.1 for applicability.

Testing is required at only one EUT supply voltage and frequency.

Applicable to ports listed above and intended to connect to cables longer than 3 m.

4.1.2 Limits of conducted common mode (asymmetric mode) disturbance at telecommunication ports in the frequency range 0.15 to 30MHz for class B equipment

Requirements for asymmetric mode conducted emissions from Class B equipment

Applicable to

1. wired network ports (3.1.32)
2. optical fibre ports (3.1.25) with metallic shield or tension members
3. broadcast receiver tuner ports (3.1.8)
4. antenna ports (3.1.3)

Table clause	Frequency range MHz	Coupling device (see Table A.8)	Detector type / bandwidth	Class B voltage limits dB(µV)	Class B current limits dB(µA)
A12.1	0,15 to 0,5	AAN	Quasi Peak / 9 kHz	84 to 74	n/a
	0,5 to 30			74	
	0,15 to 0,5	AAN	Average / 9 kHz	74 to 64	
	0,5 to 30			64	
A12.2	0,15 to 0,5	CVP and current probe	Quasi Peak / 9 kHz	84 to 74	40 to 30
	0,5 to 30			74	30
	0,15 to 0,5	CVP and current probe	Average / 9 kHz	74 to 64	30 to 20
	0,5 to 30			64	20
A12.3	0,15 to 0,5	Current Probe	Quasi Peak / 9 kHz	n/a	40 to 30
	0,5 to 30				30
	0,15 to 0,5	Current Probe	Average / 9 kHz		30 to 20
	0,5 to 30				20

The choice of coupling device and measurement procedure is defined in Annex C.

Screened ports including TV broadcast receiver tuner ports are measured with a common-mode impedance of 150 Ω. This is typically accomplished with the screen terminated by 150 Ω to earth.

AC mains ports that also have the function of a wired network port shall meet the limits given in Table A.10.

The measurement shall cover the entire frequency range.

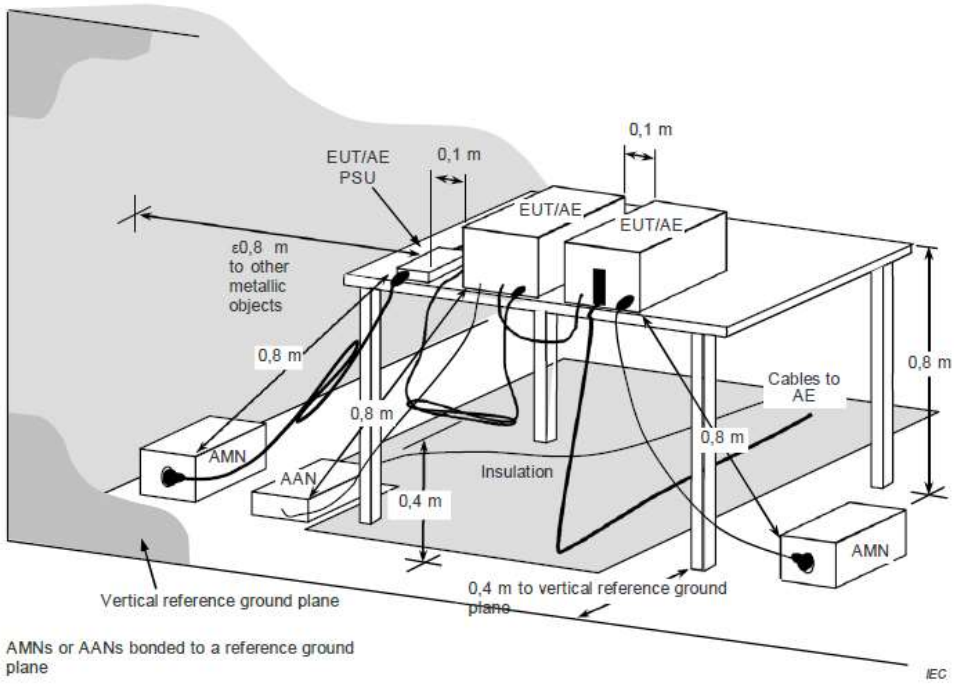
The application of the voltage and/or current limits is dependent on the measurement procedure used. Refer to Table C.1 for applicability.

Measurement is required at only one EUT supply voltage and frequency.

Applicable to ports listed above and intended to connect to cables longer than 3 m.

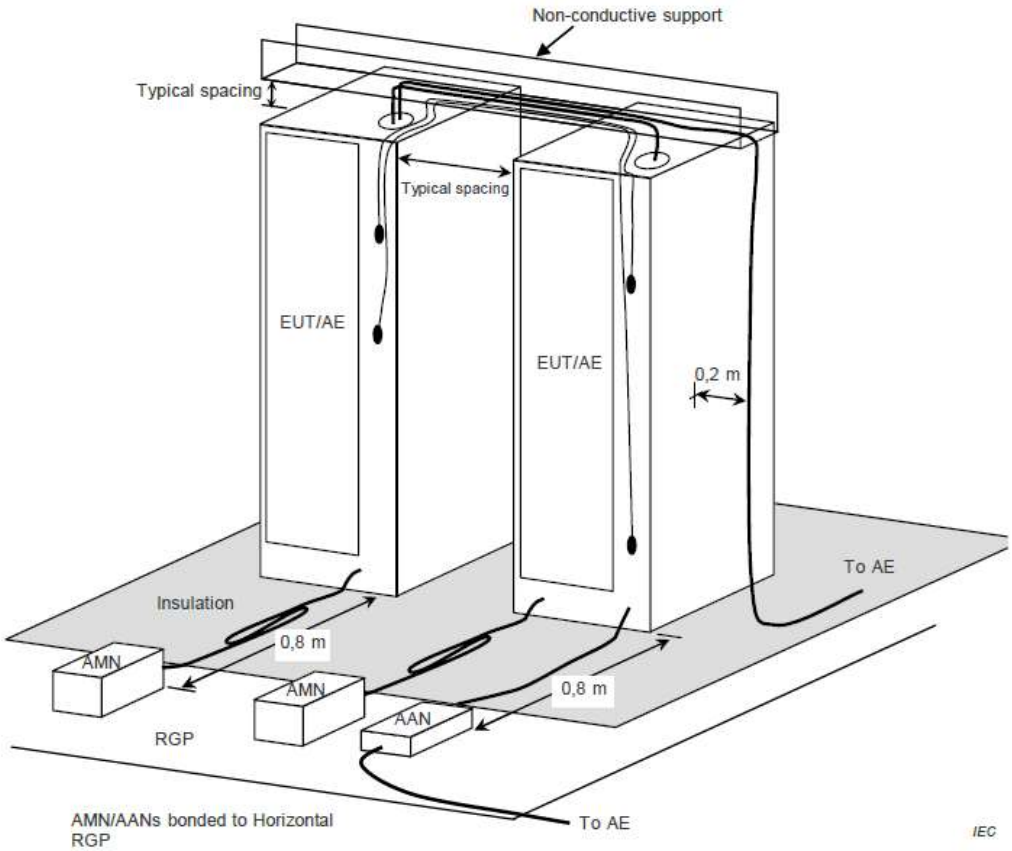
4.2 Test setup

☒ For table top equipment



The 0,8 m distance specified between EUT/AE/PSU and AMN/AAN, is applicable only to the EUT being measured. If the device is AE then it shall be ±0,8 m.

☐ For floor standing equipment



4.3 Test Setup and Test Procedure

Measurement was performed in shielded room, and instruments used were following clause CISPR 16-1-1 & CISPR 16-1-2.
Detailed test procedure was following clause 6.3 of EN 55032.
EUT arrangement and operation conditions were according to clause 6 of EN 55032.
Frequency range 150kHz – 30MHz was checked and EMI receiver measurement bandwidth was set to 9 kHz.

4.4 Test Protocol

Temperature	:	21 °C
Relative Humidity	:	49%RH
Atmospheric Pressure	:	101.1kPa

Mode 1 (GV-ADR4701 + DC adapter) LAN PORT

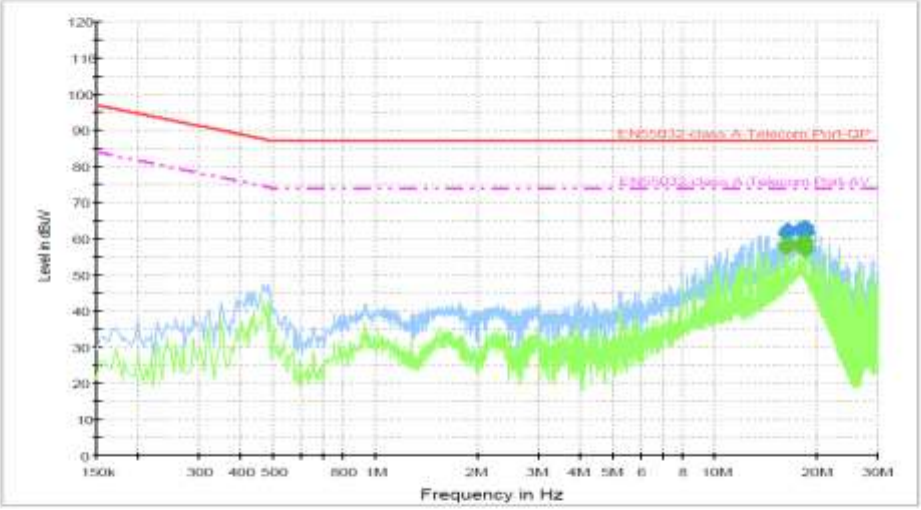
Hangzhou TDT Technologies Co., Ltd.
tel:0571-88317620
fax:0571-88316350

TDT

CE Test Report

Common Information

EUT:
Power AC 230V 50Hz
Note: Level=Reading+Corr. Margin=Limit-Level
Environment Conditions: 21°,54%RH,101KPa
Operator Name: QHH



Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
16.166659	61.6	1000.0	9.000		10.1
16.227849	62.7	1000.0	9.000		10.1
17.694259	62.6	1000.0	9.000		10.2
18.242036	63.4	1000.0	9.000		10.2
18.304625	62.2	1000.0	9.000		10.2
18.364740	61.5	1000.0	9.000		10.2

(continuation of the "Final Result 1" table from column 6 ...)

Frequency (MHz)	Margin (dB)	Limit (dBuV)
16.166659	25.4	87.0
16.227849	24.3	87.0
17.694259	24.4	87.0
18.242036	23.6	87.0
18.304625	24.8	87.0
18.364740	25.5	87.0

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
16.166718	57.5	1000.0	9.000		10.1
16.227314	58.7	1000.0	9.000		10.1
17.692618	58.3	1000.0	9.000		10.2
18.243368	59.1	1000.0	9.000		10.2
18.303881	57.8	1000.0	9.000		10.2
18.365795	56.8	1000.0	9.000		10.2

(continuation of the "Final Result 2" table from column 6 ...)

Frequency (MHz)	Margin (dB)	Limit (dBuV)
16.166718	16.5	74.0
16.227314	15.3	74.0
17.692618	15.7	74.0
18.243368	14.9	74.0
18.303881	16.2	74.0
18.365795	17.2	74.0

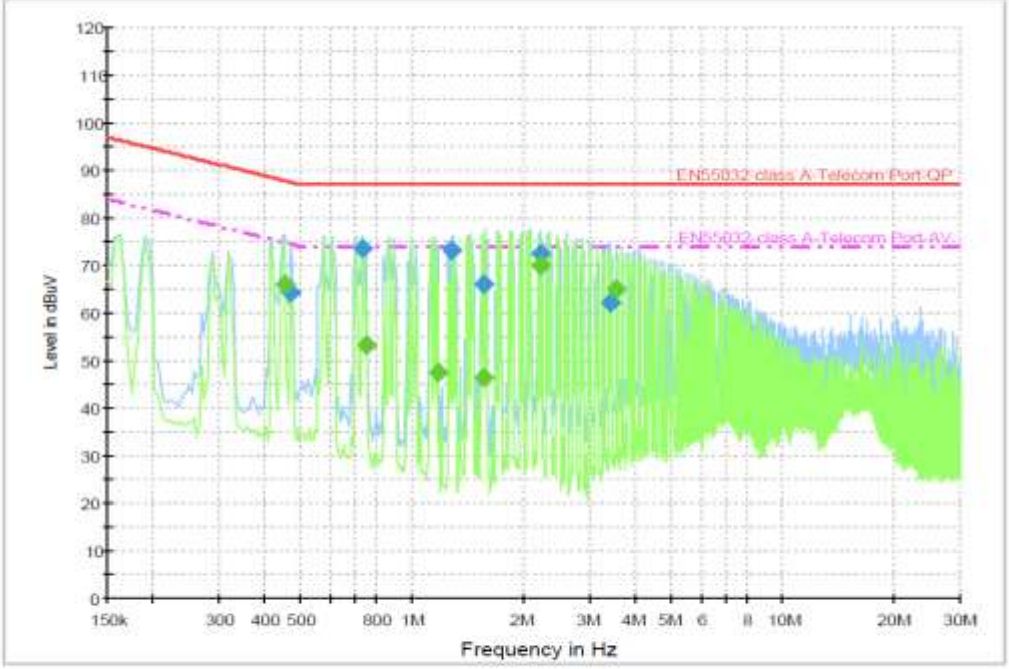
Mode 2 (GV-ADR4701 + POE) LAN PORT

Hangzhou TDT Technologies Co., Ltd.
tel:0571-88317620
fax:0571-88316350
TDT

CE Test Report

Common Information

EUT:
Power AC 230V 50Hz
Note: Level=Reading+Corr. Margin=Limit-Level
Environment Conditions: 21°,54%RH,101KPa
Operator Name: QHH



Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.469253	64.5	1000.0	9.000		10.1	23.1	87.5
0.733971	73.7	1000.0	9.000		10.0	13.3	87.0
1.279314	73.0	1000.0	9.000		9.9	14.0	87.0
1.549786	66.1	1000.0	9.000		10.0	20.9	87.0
2.201642	72.4	1000.0	9.000		10.1	14.6	87.0
3.399864	62.1	1000.0	9.000		10.1	24.9	87.0

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.451141	66.0	1000.0	9.000		10.1	8.9	74.9
0.746832	53.0	1000.0	9.000		10.0	21.0	74.0
1.171944	47.4	1000.0	9.000		9.9	26.6	74.0
1.546288	46.3	1000.0	9.000		10.0	27.7	74.0
2.205672	69.9	1000.0	9.000		10.1	4.1	74.0
3.549273	65.1	1000.0	9.000		10.1	8.9	74.0

Notes:

1. All possible modes of operation were investigated. Only the worst case emissions measured.

4.5 Measurement Uncertainty

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT.
Measurement uncertainty at telecom terminal: ±3.82 dB.
The measurement uncertainty is given with a confidence of 95%, k=2.
The measurement uncertainty is traceable to internal procedure CXWJ22.

5. Radiated emission

Test result: PASS

5.1 Radiated emission limits

5.1.1 Limits for radiated disturbance of class A device

Requirements for radiated emissions at frequencies up to 1 GHz for class A equipment

Table clause	Frequency range MHz	Measurement			Class A limits dB(μV/m)
		Facility (see Table A.1)	Distance m	Detector type / bandwidth	
A2.1	30 to 230	OATS/SAC	10	Quasi Peak / 120 kHz	40
	230 to 1 000				47
A2.2	30 to 230	OATS/SAC	3		50
	230 to 1 000				57
A2.3	30 to 230	FAR	10	Quasi Peak / 120 kHz	42 to 35
	230 to 1 000				42
A2.4	30 to 230	FAR	3		52 to 45
	230 to 1 000				52
Apply only A2.1 or A2.2 or A2.3 or A2.4 across the entire frequency range.					

Requirements for radiated emissions at frequencies above 1 GHz for class A equipment

Table clause	Frequency range MHz	Measurement			Class A limits dB(μV/m)
		Facility (see Table A.1)	Distance m	Detector type / bandwidth	
A3.1	1 000 to 3 000	FSOATS	3	Average / 1 MHz	56
	3 000 to 6 000				60
A3.2	1 000 to 3 000			Peak / 1 MHz	76
	3 000 to 6 000				80
Apply A3.1 and A3.2 across the frequency range from 1 000 MHz to the highest required frequency of measurement derived from Table 1.					

5.1.2 Limits for radiated disturbance of class B device

Requirements for radiated emissions at frequencies up to 1 GHz for class B equipment

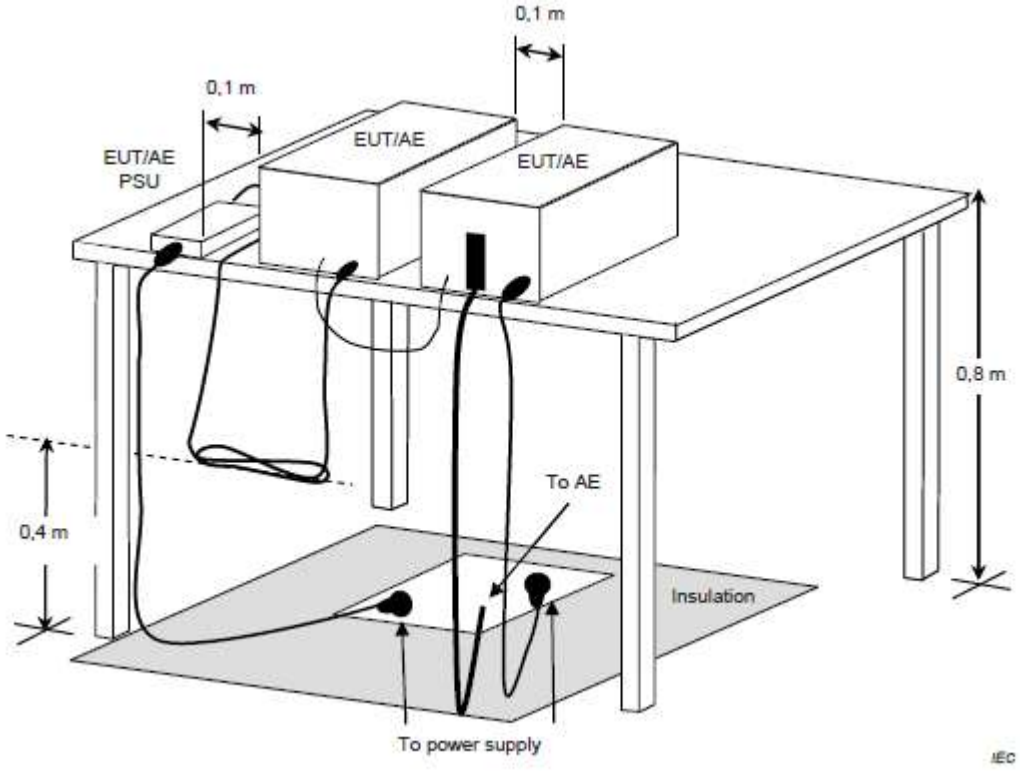
Table clause	Frequency range MHz	Measurement			Class B limits dB(μV/m)
		Facility (see Table A.1)	Distance m	Detector type / bandwidth	
A4.1	30 to 230	OATS/SAC	10	Quasi Peak / 120 kHz	30
	230 to 1 000				37
A4.2	30 to 230	OATS/SAC	3		40
	230 to 1 000				47
A4.3	30 to 230	FAR	10	Quasi Peak / 120 kHz	32 to 25
	230 to 1 000				32
A4.4	30 to 230	FAR	3		42 to 35
	230 to 1 000				42
Apply only table clause A4.1 or A4.2 or A4.3 or A4.4 across the entire frequency range. These requirements are not applicable to the local oscillator and harmonics frequencies of equipment covered by Table A.6.					

Requirements for radiated emissions at frequencies above 1 GHz for class B equipment

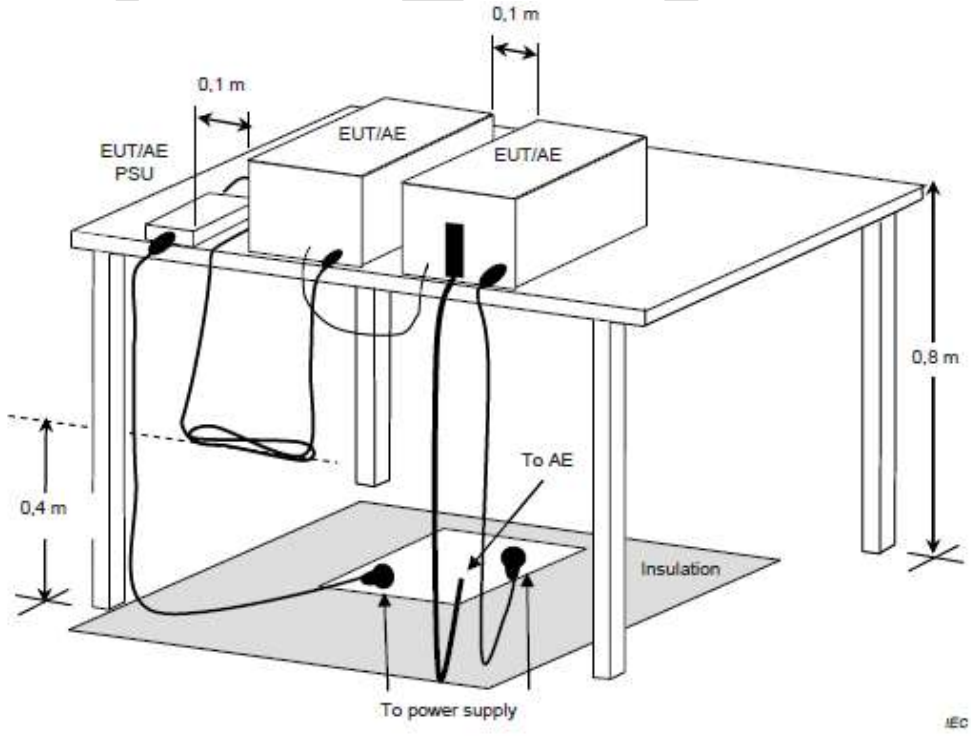
Table clause	Frequency range MHz	Measurement			Class B limits dB(μV/m)
		Facility (see Table A.1)	Distance m	Detector type/ bandwidth	
A5.1	1 000 to 3 000	FSOATS	3	Average/ 1 MHz	50
	3 000 to 6 000				54
A5.2	1 000 to 3 000			Peak/ 1 MHz	70
	3 000 to 6 000				74
Apply A5.1 and A5.2 across the frequency range from 1 000 MHz to the highest required frequency of measurement derived from Table 1.					

5.2 Block diagram and test set up

☒ For table top equipment



☐ For floor standing equipment



5.3 Test Setup and Test Procedure

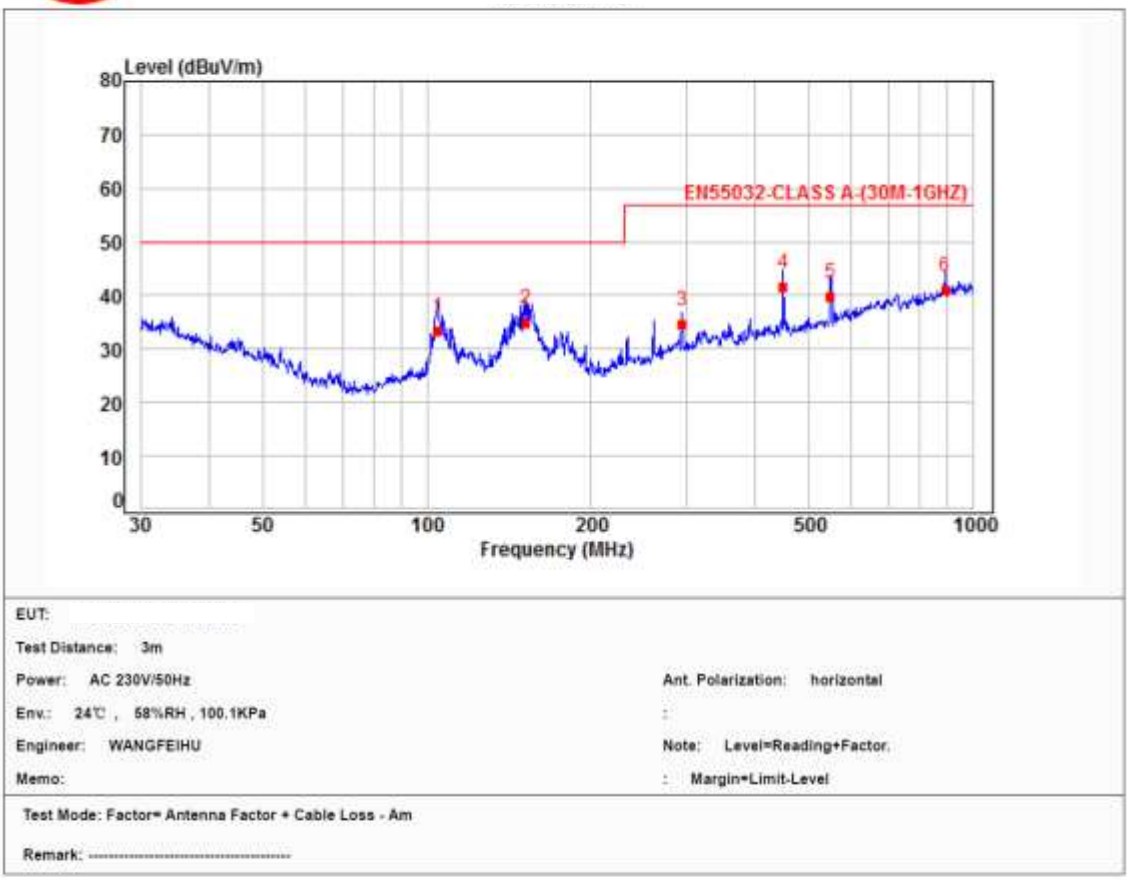
The measurement was performed in a semi-anechoic chamber below 1GHz while performed in a full-anechoic chamber above 1GHz.
The distance from EUT to receiving antenna is 3 meter for 30MHz – 6000MHz.
Measurement was performed according to clause 6 of EN 55032.
The bandwidth setting on Test Receiver ESR7 was 120 kHz in frequency band 30 – 1000MHz
The bandwidth setting on FSV40 was 1 MHz in frequency band 1000 – 6000MHz
The frequency range from 30MHz to 6000MHz was checked.
For the frequency between 30MHz to 1000MHz, an Bi-conical and log-periodic Antenna was used.
For the frequency between 1000MHz to 6000MHz, a horn antenna was used.

5.4 Test Protocol

Temperature	:	24 °C
Relative Humidity	:	52 %RH
Atmospheric Pressure	:	101.5kPa

Mode 1 (GV-ADR4701 + DC adapter) Horizontal (30M-1GHz)

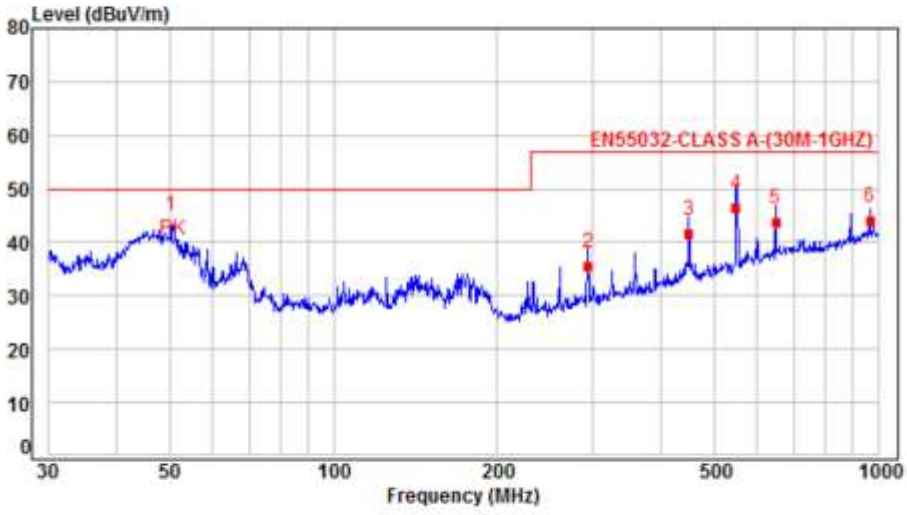
Hangzhou TDT Technologies Co., Ltd.
tel:0571-88317620
fax:0571-88316350



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (°)	Remark
1	104.903	11.88	21.63	33.51	50	16.49	QP	200	159	
2	151.597	10.31	24.78	35.09	50	14.91	QP	200	332	
3	293.084	14.56	20.34	34.9	57	22.1	QP	100	295	
4	449.556	18.17	23.68	41.85	57	15.15	QP	100	148	
5	549.019	19.57	20.36	39.93	57	17.07	QP	200	274	
6	890.728	24.59	16.67	41.26	57	15.74	QP	100	2	

Mode 1 (GV-ADR4701 + DC adapter) Vertical (30M-1GHz)

Hangzhou TDT Technologies Co., Ltd.
tel:0571-88317620
fax:0571-88316350



EUT:

Test Distance: 3m

Power: AC 230V/50Hz

Ant. Polarization: vertical

Env.: 24℃ , 58%RH , 100.1KPa

:

Engineer: WANGFEIHU

Note: Level=Reading+Factor,

Memo:

: Margin=Limit-Level

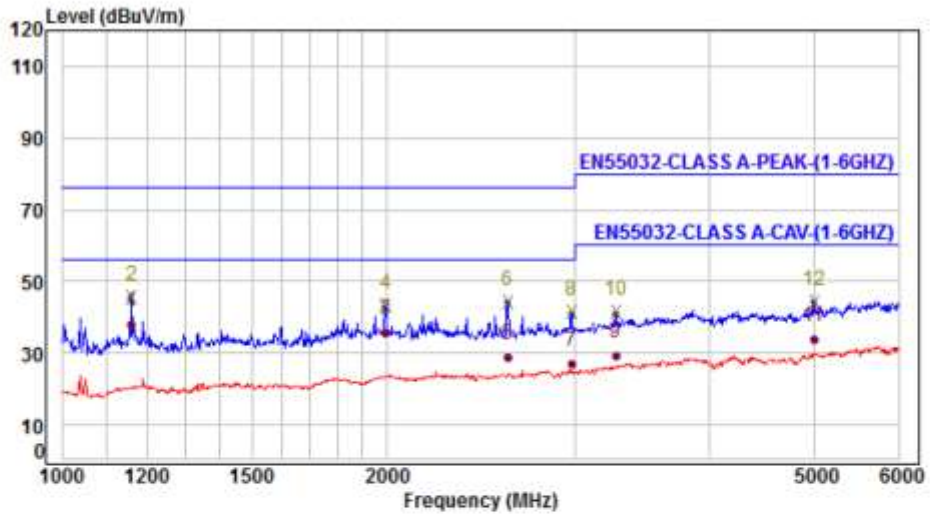
Test Mode: Factor= Antenna Factor + Cable Loss - Am

Remark: ----------

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (°)	Remark
1	50.409	12.08	30.75	42.83	50	7.17		100	156	
2	293.084	14.56	21.28	35.84	57	21.16	QP	200	207	
3	449.556	18.17	23.54	41.71	57	15.29	QP	100	156	
4	549.019	19.57	27.07	46.64	57	10.36	QP	100	180	
5	649.66	21.6	22.33	43.93	57	13.07	QP	100	152	
6	965.542	25.44	18.88	44.32	57	12.68	QP	100	54	

Mode 1 (GV-ADR4701+ DC adapter) Horizontal (1-6GHz)

Hangzhou TDT Technologies Co., Ltd.
tel:0571-88317620
fax:0571-88316350



EUT:

Test Distance: 3m

Power: AC 230V/50Hz

Ant. Polarization: Horizontal

Env.: 23.8℃ , 58%RH , 100.0KPa

:

Engineer: QHH

Note: Level=Reading+Factor.

Memo:

: Margin=Limit-Level

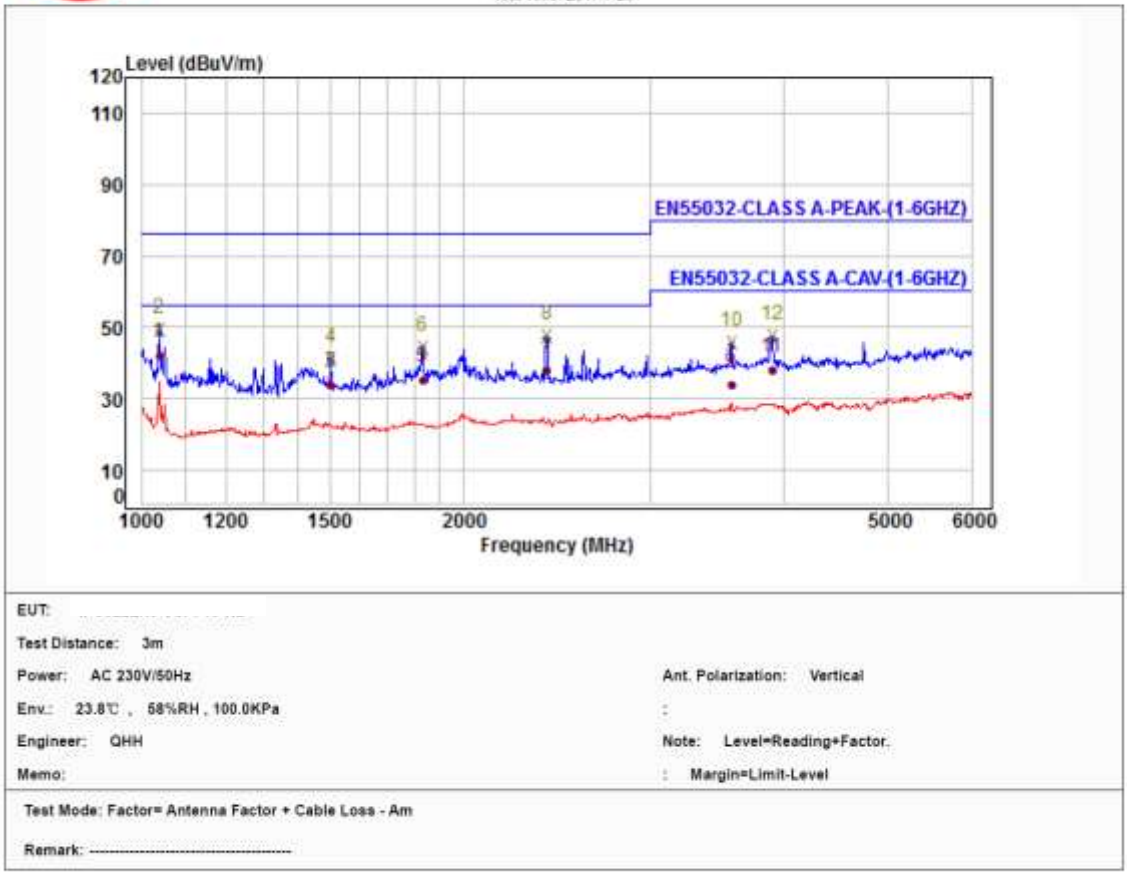
Test Mode: Factor= Antenna Factor + Cable Loss - Am

Remark: ----------

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (°)	Remark
1	1158.266	-14.56	52.81	38.25	56	17.75	Average	100	198	
2	1158.266	-14.56	59.81	45.25	76	30.75	Peak	100	198	
3	1996.946	-10.2	46.17	35.97	56	20.03	Average	100	122	
4	1996.946	-10.2	53.17	42.97	76	33.03	Peak	100	122	
5	2594.039	-8.81	37.86	29.05	56	26.95	Average	100	234	
6	2594.039	-8.81	52.86	44.05	76	31.95	Peak	100	234	
7	2972.46	-8.04	35.3	27.26	56	28.74	Average	100	225	
8	2972.46	-8.04	49.3	41.26	76	34.74	Peak	100	225	
9	3268.571	-6.47	35.68	29.21	60	30.79	Average	100	327	
10	3268.571	-6.47	47.68	41.21	80	38.79	Peak	100	327	
11	4997.811	-2.07	36.22	34.15	60	25.85	Average	100	144	
12	4997.811	-2.07	46.22	44.15	80	35.85	Peak	100	144	

Mode 1 (GV-ADR4701 + DC adapter) Vertical (1-6GHz)

Hangzhou TDT Technologies Co., Ltd.
tel:0571-88317620
fax:0571-88316350



EUT:

Test Distance: 3m

Power: AC 230V/50Hz

Ant. Polarization: Vertical

Env.: 23.8℃ , 58%RH , 100.0KPa

:

Engineer: QHH

Note: Level=Reading+Factor.

Memo:

: Margin=Limit-Level

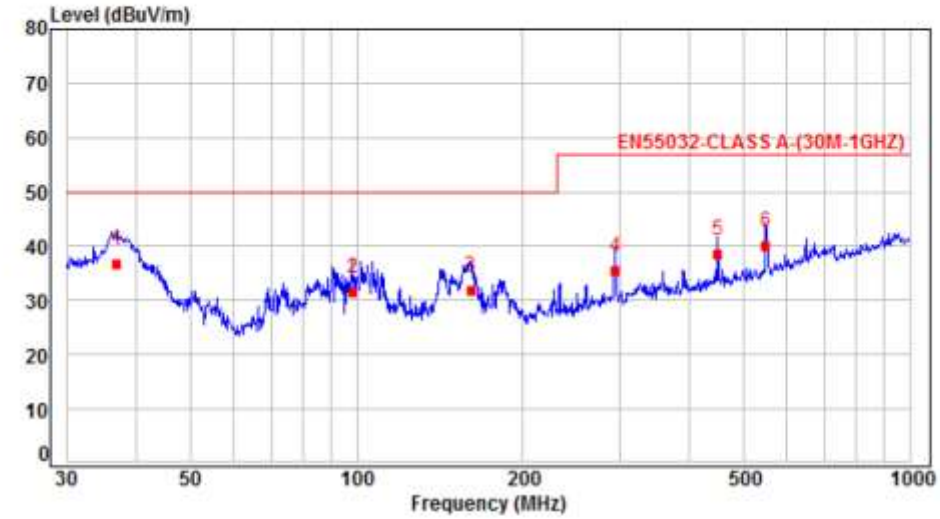
Test Mode: Factor= Antenna Factor + Cable Loss - Am

Remark: ----------

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (°)	Remark
1	1038.344	-15.11	57.09	41.98	56	14.02	Average	100	359	
2	1038.344	-15.11	64.09	48.98	76	27.02	Peak	100	359	
3	1501.898	-12.74	46.65	33.91	56	22.09	Average	100	360	
4	1501.898	-12.74	53.65	40.91	76	35.09	Peak	100	360	
5	1832.378	-11.12	46.36	35.24	56	20.76	Average	100	302	
6	1832.378	-11.12	55.36	44.24	76	31.76	Peak	100	302	
7	2397.385	-9.17	47.35	38.18	56	17.82	Average	100	207	
8	2397.385	-9.17	56.35	47.18	76	28.82	Peak	100	207	
9	3568.514	-4.89	39.07	34.18	60	25.82	Average	100	352	
10	3568.514	-4.89	50.07	45.18	80	34.82	Peak	100	352	
11	3895.981	-4.52	42.66	38.14	60	21.86	Average	100	217	
12	3895.981	-4.52	51.66	47.14	80	32.86	Peak	100	217	

Mode 2(GV-ADR4701 +POE) Horizontal (30M-1GHz)

Hangzhou TDT Technologies Co., Ltd.
tel:0571-88317620
fax:0571-88316350



EUT:

Test Distance: 3m

Power: AC 230V/50Hz

Ant. Polarization: horizontal

Env.: 23.5℃ , 49%RH , 100.2KPa

:

Engineer: WANGFEIHU

Note: Level=Reading+Factor.

Memo:

: Margin=Limit - Level

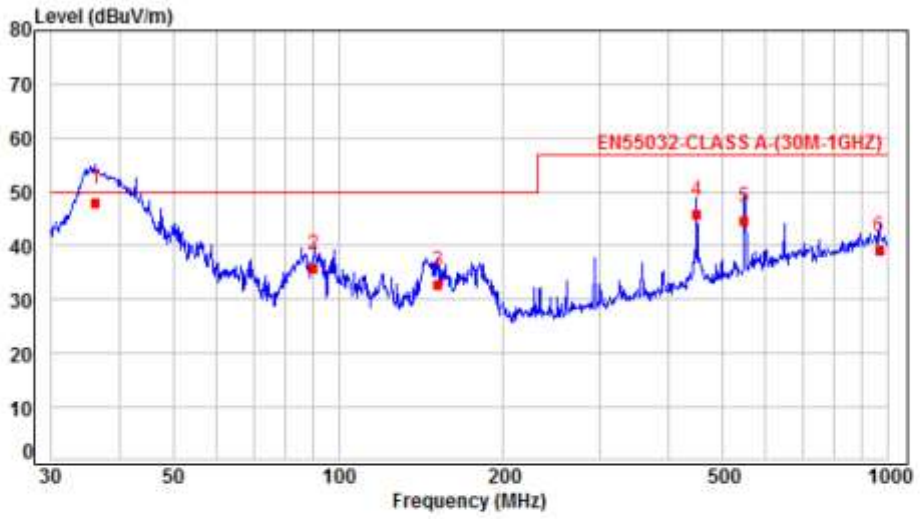
Test Mode: Factor= Antenna Factor + Cable Loss - Am

Remark: ----------

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (°)	Remark
1	36.895	18.09	18.88	36.97	50	13.03	QP	100	146	
2	98.487	10.92	20.73	31.65	50	18.35	QP	200	149	
3	160.909	9.64	22.46	32.1	50	17.9	QP	200	153	
4	293.084	14.56	21.3	35.86	57	21.14	QP	100	313	
5	449.556	18.17	20.61	38.78	57	18.22	QP	100	150	
6	549.019	19.57	20.84	40.41	57	16.59	QP	100	144	

Mode 2 (GV-ADR4701 + POE) Vertical (30M-1GHz)

Hangzhou TDT Technologies Co., Ltd.
tel:0571-88317620
fax:0571-88316350



EUT:

Test Distance: 3m

Power: AC 230V/50Hz

Ant. Polarization: vertical

Env.: 23.5℃ , 49%RH , 100.2KPa

:

Engineer: WANGFEIHU

Note: Level=Reading+Factor.

Memo:

: Margin=Limit - Level

Test Mode: Factor= Antenna Factor + Cable Loss - Am

Remark: ----------

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (°)	Remark
1	36.127	18.79	29.5	48.29	50	1.71	QP	100	140	
2	90.22	9.45	26.62	36.07	50	13.93	QP	100	296	
3	151.597	10.31	22.55	32.86	50	17.14	QP	100	99	
4	449.556	18.17	27.93	46.1	57	10.9	QP	100	146	
5	549.019	19.57	25.28	44.85	57	12.15	QP	100	105	
6	965.542	25.44	13.85	39.29	57	17.71	QP	100	92	

5.5 Measurement uncertainty

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT.

Measurement uncertainty of semi-anechoic chamber radiated emission is: ± 6.28dB. (without tilting)

Measurement uncertainty of fully anechoic chamber radiated emission is: ± 5.42dB.

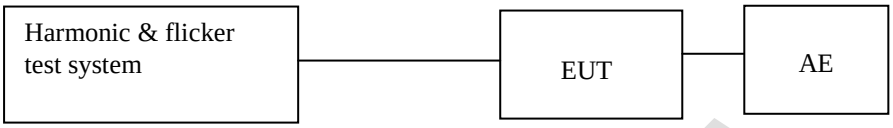
The measurement uncertainty is given with a confidence of 95%, k=2.

The measurement uncertainty is traceable to internal procedure CXWJ22.

6. Harmonics

Test result: PASS

6.1 Block Diagram of Test Setup



6.2 Test Setup and Test Procedure

Harmonics of the fundamental current were measured up to 40 order harmonics using a digital power meter with an analogue output and frequency analyser which was integrated in the harmonic & flicker test system. The measurements were carried out under steady conditions.

☐

This product is not defined as lighting equipment, and has rated power less than 75W, therefore, no limit apply according to EN 61000-3-2

6.3 Test Protocol

Temperature	:	24 °C
Relative Humidity	:	55 %RH
Atmospheric Pressure	:	100.5kPa

GV-ADR4701

Harmonics testing according EN61000-3-2

Measuring protocol printed at 06. December 2016 10:35:18
Measuring file:g:\PHF\logging.phf is dated 06. December 2016 10:34:28

Name	Department	Firma	Device	Type	Manufacturer	Serial N
CNF	EMC Lab	TDT	IPC			NA

An example
PHF Version 1.34 was used.
Standard: EN61000-4-7
Limits: EN61000-3-2:2014.
The smoothing filter was switched off. Grouping off.
Measuring time was : 00:30:00
Class A was chosen

Description

Table 1

Phase	1
Measuring instrument	PHF
Serial number	08580511
Software version	3.131
Voltage range	250.0 V
Current range	0.6 A
Voltage scale	1.0
Current scale	1.0

Test results

Table 2

Phase	1
Voltage harmonics check	ok
Voltage magnitude check	ok
Frequency check	ok
Crest factor check	not tested
Phase angle check	not tested
Current harmonics 100% check	ok
Current harmonics 150/200% check	ok
Fluctuating harmonics check	ok

Values measured at 00:00:00 before end of measurement (informative only)

Table 3

Phase	1
Utrms, V	230.8907
Itrms, A	0.0585
S, VA	13.5170
P, W	4.9941
Q, VAr	12.5606
PF	0.3695
f, Hz	50.0016

Detailed evaluation results (informative only)

Table 4

n	Iaver, A	fluct., %	Imax, A	I/Iim, %	Frame	Umax, V
0	0.008	---	0.009	---	---	0.40
1	0.032	---	0.033	0.0	0	230.90
2	0.003	---	0.003	0.0	0	0.04
3	0.020	---	0.021	0.9	8	0.15
4	0.003	---	0.003	0.0	0	0.03
5	0.019	---	0.020	1.7	8	0.02
6	0.003	---	0.003	0.0	0	0.01
7	0.018	---	0.019	2.5	8	0.01
8	0.002	---	0.003	0.0	0	0.01
9	0.017	---	0.018	4.4	8	0.01
10	0.002	---	0.002	0.0	0	0.01
11	0.016	---	0.016	4.9	8	0.01
12	0.002	---	0.002	0.0	0	0.01
13	0.014	---	0.014	6.9	8	0.01
14	0.002	---	0.002	0.0	0	0.01
15	0.012	---	0.013	8.4	6	0.01
16	0.001	---	0.002	0.0	0	0.00
17	0.011	---	0.011	8.2	6	0.01
18	0.001	---	0.001	0.0	0	0.01
19	0.009	---	0.009	7.6	6	0.01
20	0.001	---	0.001	0.0	0	0.00
21	0.007	---	0.007	6.7	5270	0.01
22	0.001	---	0.001	0.0	0	0.00
23	0.005	---	0.006	5.7	5270	0.01
24	0.001	---	0.001	0.0	0	0.00
25	0.004	---	0.004	0.0	0	0.01
26	0.001	---	0.001	0.0	0	0.00
27	0.003	---	0.003	0.0	0	0.00
28	0.001	---	0.001	0.0	0	0.00
29	0.002	---	0.002	0.0	0	0.00
30	0.001	---	0.001	0.0	0	0.00
31	0.001	---	0.001	0.0	0	0.00
32	0.001	---	0.001	0.0	0	0.00
33	0.001	---	0.001	0.0	0	0.00
34	0.001	---	0.001	0.0	0	0.00
35	0.001	---	0.001	0.0	0	0.00
36	0.001	---	0.001	0.0	0	0.00
37	0.001	---	0.001	0.0	0	0.00
38	0.001	---	0.001	0.0	0	0.00
39	0.002	---	0.002	0.0	0	0.01
40	0.000	---	0.001	0.0	0	0.00

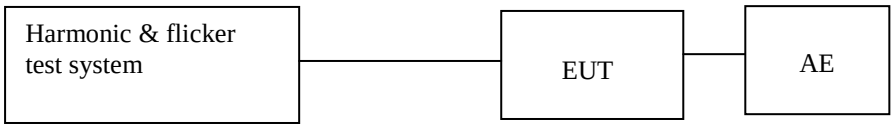
6.4 Measurement Uncertainty

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT.
Measurement uncertainty of harmonic test is: Iave=0.474%, Imax=1.16%.
The measurement uncertainty is traceable to internal procedure CXWJ22.

7. Voltage Fluctuations-Flicker

Test result: **PASS**

7.1 Block Diagram of Test Setup



7.2 Test Setup and Test Procedure

7.2.1 Definition

Flicker: impression of unsteadiness of visual sensation induced by a lighting stimulus whose luminance or spectral distribution fluctuates with time.

Pst: Short-term flicker indicator The flicker severity evaluated over a short period (in minutes); Pst=1 is the conventional threshold of irritability

Plt: long-term flicker indicator; the flicker severity evaluated over a long period (a few hours). Using successive Pst values.

dc: the relative steady-state voltage change

dmax: the maximum relative voltage change

d(t): the value during a voltage change

7.2.2 Test condition

The EUT was set to produce the most unfavorable sequence of voltage changes.

7.3 Test Protocol

The tested object operated under the operating condition specified in EN61000-3-3.
The following limits apply

-- "Plt" shall not exceed 0.65.
-- "Pst" shall not exceed 1.0.
-- "dc" shall not exceed 3.3%.
-- "dmax" shall not exceed 4/6/7%*
-- d(t) shall not exceed 3.3% for more than 500ms.

Notes: * means for 4% limit, without additional conditions
6% limit, switched manually or automatically more than twice per day
7% limit, switched automatically for no more than twice per day or attended while in use.

Temperature	:	24 °C
Relative Humidity	:	57 %RH
Atmospheric Pressure	:	100.5kPa

GV-ADR4701

Harmonics testing according EN61000-3-2

Measuring protocol printed at 06. December 2016 10:35:18
Measuring file:g:\PHF\logging.phf is dated 06. December 2016 10:34:28

Name	Department	Firma	Device	Type	Manufacturer	Serial N
CNF	EMC Lab	TDT	IPC			NA

An example
PHF Version 1.34 was used.
Standard: EN61000-4-7
Limits: EN61000-3-2:2014.
The smoothing filter was switched off. Grouping off.
Measuring time was : 00:30:00
Class A was chosen

Description

Table 1

Phase	1
Measuring instrument	PHF
Serial number	08580511
Software version	3.131
Voltage range	250.0 V
Current range	0.6 A
Voltage scale	1.0
Current scale	1.0

Test results

Table 2

Phase	1
Voltage harmonics check	ok
Voltage magnitude check	ok
Frequency check	ok
Crest factor check	not tested
Phase angle check	not tested
Current harmonics 100% check	ok
Current harmonics 150/200% check	ok
Fluctuating harmonics check	ok

Values measured at 00:00:00 before end of measurement (informative only)

Table 3

Phase	1
Utrms, V	230.8907
Itrms, A	0.0585
S, VA	13.5170
P, W	4.9941
Q, VAr	12.5606
PF	0.3695
f, Hz	50.0016

Detailed evaluation results (informative only)

Table 4

n	Iaver, A	fluct., %	Imax, A	I/lim, %	Frame	Umax, V
0	0.008	---	0.009	---	---	0.40
1	0.032	---	0.033	0.0	0	230.90
2	0.003	---	0.003	0.0	0	0.04
3	0.020	---	0.021	0.9	8	0.15
4	0.003	---	0.003	0.0	0	0.03
5	0.019	---	0.020	1.7	8	0.02
6	0.003	---	0.003	0.0	0	0.01
7	0.018	---	0.019	2.5	8	0.01
8	0.002	---	0.003	0.0	0	0.01
9	0.017	---	0.018	4.4	8	0.01
10	0.002	---	0.002	0.0	0	0.01
11	0.016	---	0.016	4.9	8	0.01
12	0.002	---	0.002	0.0	0	0.01
13	0.014	---	0.014	6.9	8	0.01
14	0.002	---	0.002	0.0	0	0.01
15	0.012	---	0.013	8.4	6	0.01
16	0.001	---	0.002	0.0	0	0.00
17	0.011	---	0.011	8.2	6	0.01
18	0.001	---	0.001	0.0	0	0.01
19	0.009	---	0.009	7.6	6	0.01
20	0.001	---	0.001	0.0	0	0.00
21	0.007	---	0.007	6.7	5270	0.01
22	0.001	---	0.001	0.0	0	0.00
23	0.005	---	0.006	5.7	5270	0.01
24	0.001	---	0.001	0.0	0	0.00
25	0.004	---	0.004	0.0	0	0.01
26	0.001	---	0.001	0.0	0	0.00
27	0.003	---	0.003	0.0	0	0.00
28	0.001	---	0.001	0.0	0	0.00
29	0.002	---	0.002	0.0	0	0.00
30	0.001	---	0.001	0.0	0	0.00
31	0.001	---	0.001	0.0	0	0.00
32	0.001	---	0.001	0.0	0	0.00
33	0.001	---	0.001	0.0	0	0.00
34	0.001	---	0.001	0.0	0	0.00
35	0.001	---	0.001	0.0	0	0.00
36	0.001	---	0.001	0.0	0	0.00
37	0.001	---	0.001	0.0	0	0.00
38	0.001	---	0.001	0.0	0	0.00
39	0.002	---	0.002	0.0	0	0.01
40	0.000	---	0.001	0.0	0	0.00

☐

The EUT has no means to generate the flicker exceed the specific limit, so it is deemed to fulfill with the requirement without testing.

Immunity Test

Performance criteria

The performance criteria are based on the general criteria of the standard and derived from the product specification

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. The performance level may be replaced by a permissible loss of performance. 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.

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. The performance level may be replaced by a permissible loss of performance.
During the test, degradation of performance is allowed. However, no change of operating state or stored data is 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.

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.
Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

Basic EMC standard for immunity test

IEC 61000-4-2: 2008: Electromagnetic Compatibility (EMC) – Part 4: testing and measurement techniques – section 2: electrostatic discharge immunity test

IEC 61000-4-3: 2010: Electromagnetic Compatibility (EMC) – Part 4: testing and measurement techniques – section 3: radiated, radio frequency, electromagnetic field immunity test

IEC61000-4-4: 2012: Electromagnetic Compatibility (EMC) – Part 4: testing and measurement techniques – section 4: electric fast transient/burst immunity test

IEC 61000-4-5: 2014: Electromagnetic Compatibility (EMC) – Part 4: testing and measurement techniques – section 5: surge immunity test

IEC 61000-4-6: 2013: Electromagnetic Compatibility (EMC) – Part 4: testing and measurement techniques – section 6: immunity to conducted disturbance, induced by radio frequency field

IEC 61000-4-8:2009: Electromagnetic compatibility (EMC) — Part 4: Testing and measurement techniques — Section 8: Power frequency magnetic field immunity test.

IEC61000-4-11: 2004: Electromagnetic Compatibility (EMC) – Part 4: testing and measurement techniques – section 11: voltage dips, short interruption and voltage variations immunity test

8. Electrostatic Discharge (ESD)

Test result **PASS**

8.1 Severity Level and Performance Criterion

8.1.1 Test level

1a – Contact discharge		1b – Air discharge	
Level	Test voltage kV	Level	Test voltage kV
1	2	1	2
2	4	2	4
3	6	3	8
4	8	4	15
X	Special	X	Special

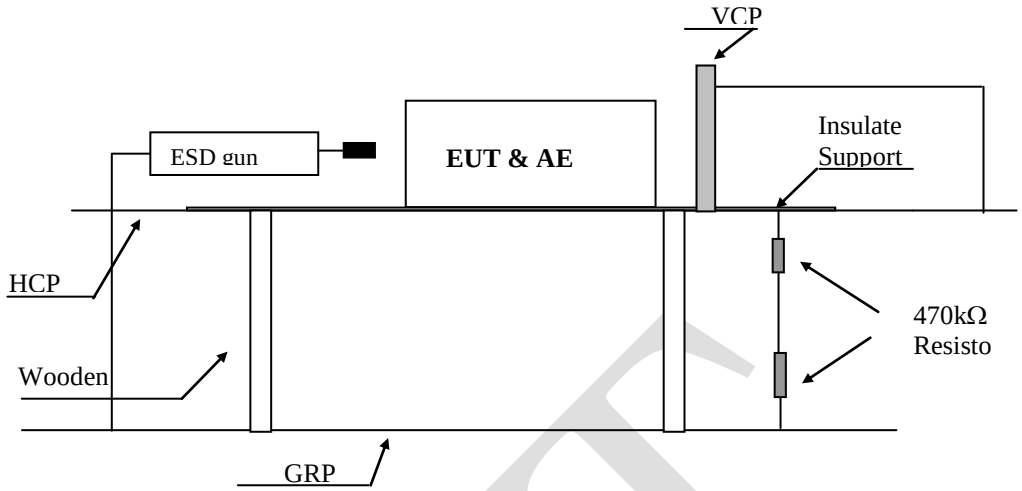
Notes: 1."X" is an open level. The level has to be specified in the dedicated equipment specification. If higher voltages than those shown are specified, special test equipment may be needed.
2. The gray rows were the selected test level.

8.1.2 Performance Criterion

Performance criterion: **B**

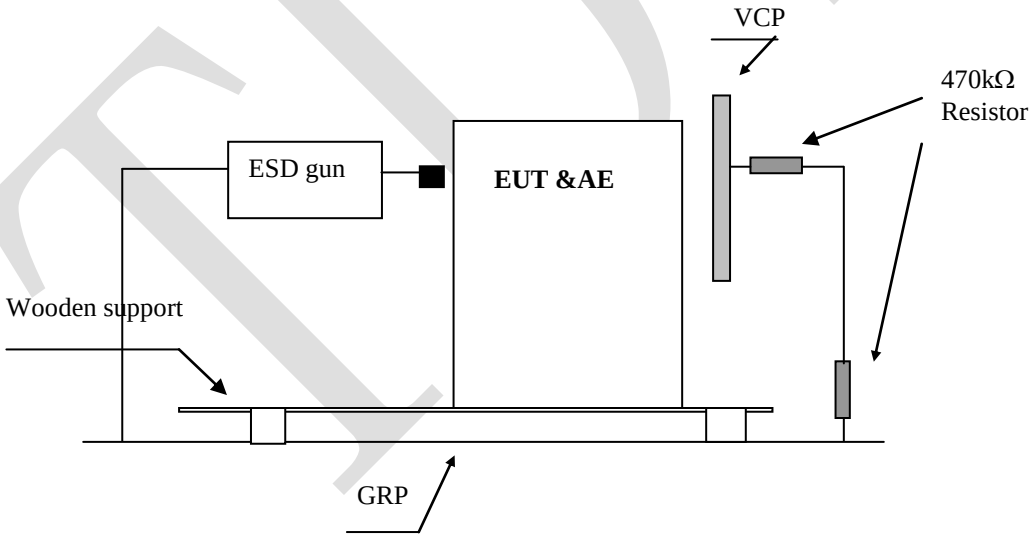
8.2 Block Diagram of Test Setup

☒ For table-top equipment



Note: HCP means Horizontal Coupling Plane
VCP means Vertical Coupling Plane
GRP means Ground Reference Plane
Wooden support is a 0.8m height table

☐ For floor standing equipment



Note: VCP means Vertical Coupling Plane
GRP means Ground Reference Plane
Wooden support is a 0.1m height rack

8.3 Test Setup and Test Procedure

Measurement was performed in shielded room.
Measurement and setting of EUT was applied according to IEC61000-4-2 clause 7.1.

8.4 Test Protocol

Temperature : 24 °C
Relative Humidity : 54 %RH
Atmospheric Pressure : 99.5kPa

Direct discharges were applied at the following selected points:

Discharge point (Circumference of:)		Contact discharge (6kV)		Air discharge (2kV, 4 kV, 8kV)	
		(+)	(-)	(+)	(-)
GV-ADR4701	Cover	NA	NA	PASS	PASS
	LAN Port	NA	NA	PASS	PASS
	Screw	NA	NA	PASS	PASS
	DC PORT	NA	NA	PASS	PASS

Indirect contact discharges were applied to the VCP and the HCP at the following selected points:

☒ For table top equipment

Point	Description	Point	Result
HCP f	0,1m from the front of the EUT	Edge of centre,corner on HCP	PASS
HCP b	0,1m from the back of the EUT	Edge of centre,corner on HCP	PASS
HCP r	0,1m from the right side of the EUT	Edge of centre,corner on HCP	PASS
HCP l	0,1m from the left side of the EUT	Edge of centre,corner on HCP	PASS
VCP f	0,1m from the front of the EUT	Edge of centre,corner on VCP	PASS
VCP b	0,1m from the back of the EUT	Edge of centre,corner on VCP	PASS
VCP r	0,1m from the right of the EUT	Edge of centre,corner on VCP	PASS
VCP l	0,1m from the left of the EUT	Edge of centre,corner on VCP	PASS

☐ For floor standing equipment

Point	Description	Point	Result
VCP f	0,1m from the front of the EUT	Edge of centre,corner on VCP	-
VCP b	0,1m from the back of the EUT	Edge of centre,corner on VCP	-
VCP r	0,1m from the right of the EUT	Edge of centre,corner on VCP	-
VCP l	0,1m from the left of the EUT	Edge of centre,corner on VCP	-

Observation: No any change after the test.

Conclusion: The EUT complied with performance criteria B of this test.

8.5 ESD test points

Red: contact discharge
Green: air discharge

GV-ADR4701:

8.6 Additions, Deviations and Exclusions from Standards

None

9. Electromagnetic field susceptibility

Test result **PASS**

9.1 Severity Level and Performance Criterion

9.1.1 Test level

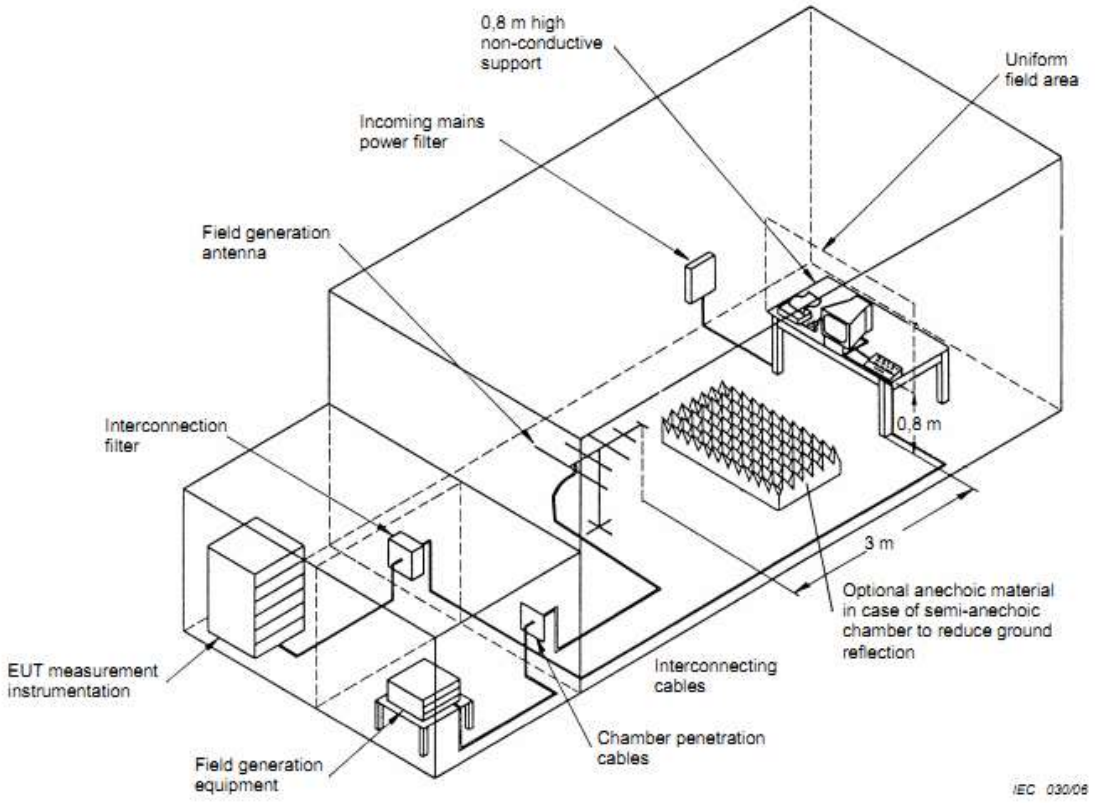
Level	Test field strength V/m
1	1
2	3
3	10
X	Special

Note: 1. X is an open test level. This level may be given in the product specification.
2. The gray row is the selected test level.

9.1.2 Performance Criterion

Performance criterion: **A**

9.2 Block diagram of test setup



9.3 Test Setup and Test Procedure

Measurement was performed in full-anechoic chamber.
Measurement and setting of EUT was applied according to IEC61000-4-3 clause 7.

9.4 Test Protocol

Temperature : 21 °C
Relative Humidity : 42 %RH
Atmospheric Pressure : 100.3kPa

Test no.:	Frequency (MHz)	Polarization	Test level V/m	Sides tested	Result	Comment
1	80-1000	H & V	3	Front, Back, Left, Right	PASS	Test by MEPQ Lab

Observation: No any change during the test.

Conclusion: The EUT complied with performance criteria A of this test.

9.5 Additions, deviations and exclusions from standards

None

10. Electric Fast Transient/Burst Immunity Test

Test result **PASS**

10.1 Severity Level and Performance Criterion

10.1.1 Test level

Open circuit output test voltage (+/-10%) and repetition rate of the impulses (+/- 20%)				
Level	On power supply ports PE		On I/O (input & output) signal, data and control ports	
	Voltage peak kV	Repetition rate kHz	Voltage peak kV	Repetition rate kHz
1	0.5	5	0.25	5
2	1	5	0.5	5
3	2	5	1	5
4	4	2.5	2	5
X	Special	Special	Special	Special
Notes : 1. "X" is a an open level. The level has to be specified in the dedicated equipment specification. 2. The gray rows were the selected test level.				

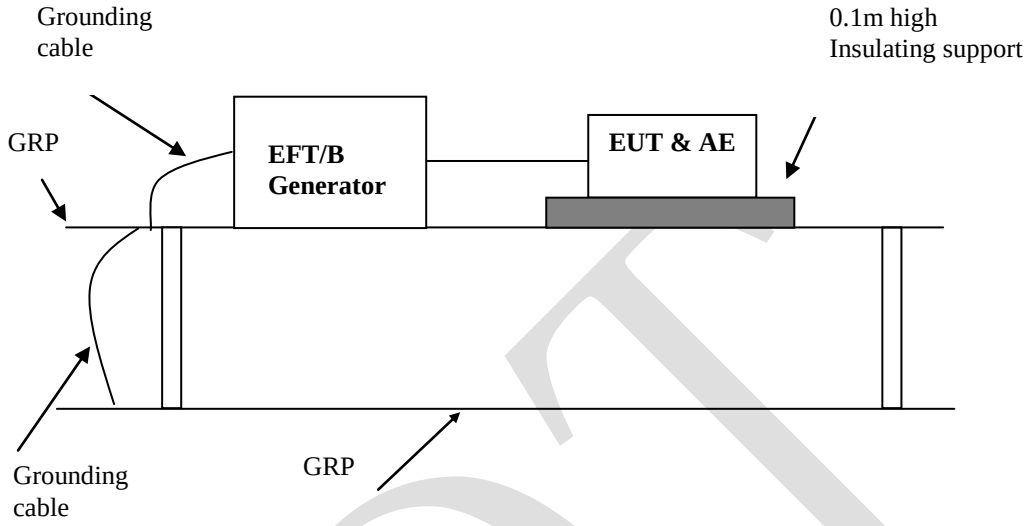
10.1.2 Performance Criterion

Performance criterion **B**

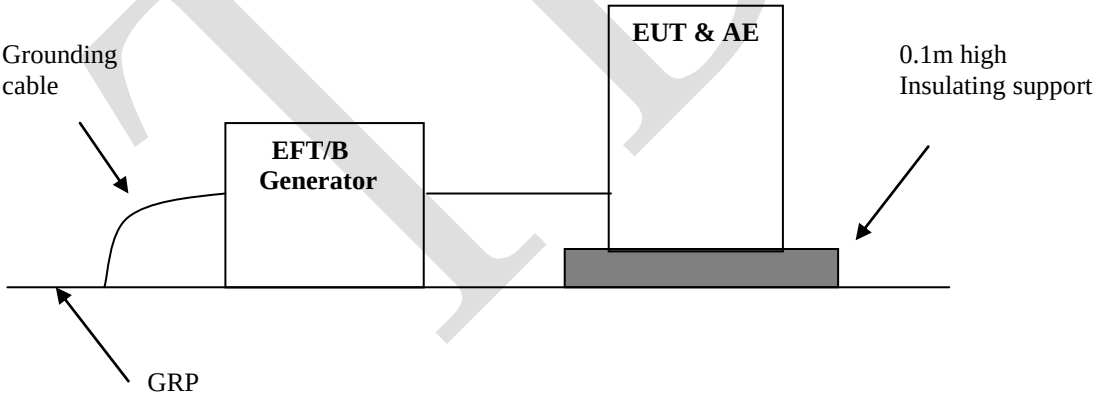
10.2 Block Diagram of Test Setup

10.2.1 Block Diagram for input a.c./d.c. power line

☒ For table-top equipment

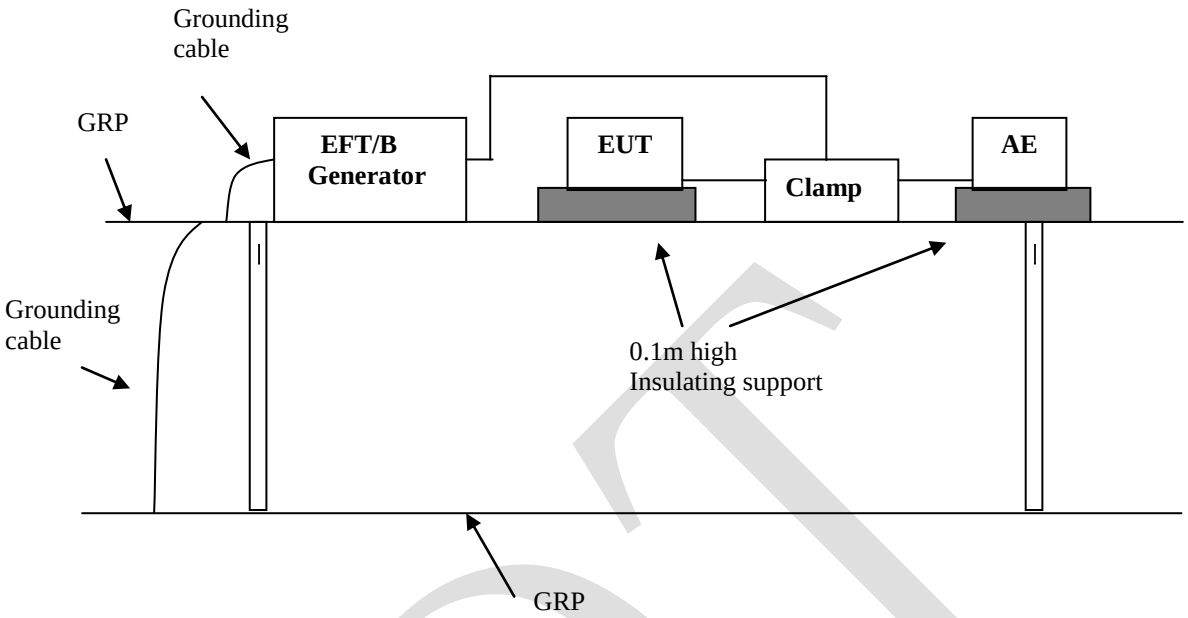


☐ For floor standing equipment

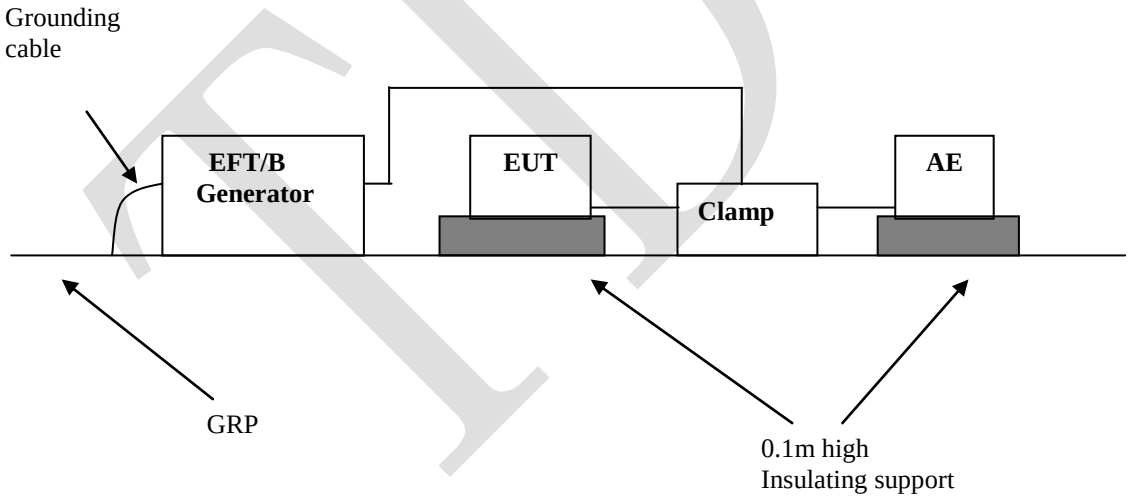


10.2.2 Block Diagram for output a.c./d.c. power line or signal/control lines

☒ For table-top equipment



☐ For floor standing equipment



10.3 Test Setup and Test Procedure

Measurement was performed in shielded room.
Measurement and setting of EUT was applied according to IEC61000-4-4 clause 7.2.

10.4 Test Protocol

Temperature : 23°C
Relative Humidity : 44 %RH
Atmospheric Pressure : 102.5kPa

Port			Test Level [kV]	Result
DC port	Power line	L-PE	±1.0; ±2.0	PASS
		N-PE	±1.0; ±2.0	PASS
Signal port	Signal cable		±0.5; ±1.0	PASS
Notes: "NA" means not applicable.				

Observation: No any change after the test.

Conclusion: The EUT complied with performance criteria B of this test.

10.5 Additions, Deviations and Exclusions from Standards

None

11. Surge Immunity Test

Test result **PASS**

11.1 Severity Level and Performance Criterion

11.1.1 Test level

Level	Open-sircuit test voltage +/-10% kV
1	0.5
2	1.0
3	2.0
4	4.0
X*	Special

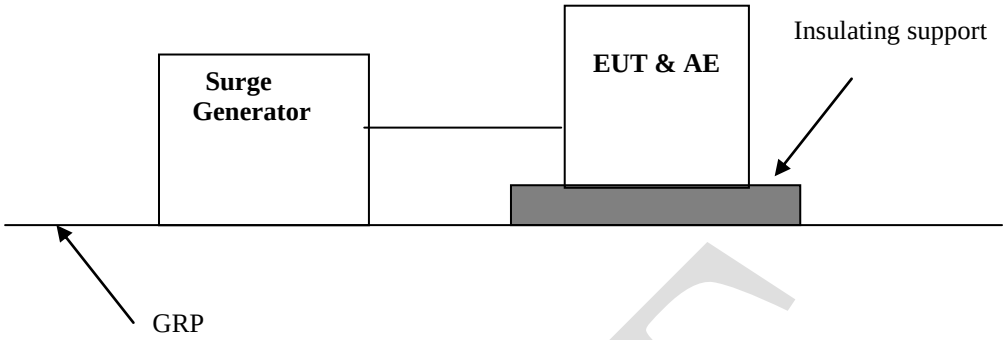
Notes: 1."X" is an open class. This level can be specified in the product Specification
2. The gray rows are the selected level. Class 2 is applied to Phase to Phase (L-N) Class 3 is applied to Phase to PE (L-PE),(N-PE)

11.1.2 Performance Criterion

Performance criterion **B**

11.2 Block Diagram of Test Setup

11.2.1 Block Diagram for surge



11.3 Test Setup and Test Procedure

Measurement was performed in shielded room.
Measurement and setting of EUT was applied according to IEC61000-4-5 clause 7.

11.4 Test Protocol

Temperature : 23 °C
Relative Humidity : 44 %RH
Atmospheric Pressure : 102.5kPa

Configurator	Port		Matching Resister Ω	Wave μs	Level kV	Judge Limit	Result
GV-ADR4701	DC12 V	Line to earth	12	1.2/50	±1,2,4KV	B	PASS
	LAN	Signal to earth	40	10/700	±0.5,1,2KV	B	PASS

Note: Number of tests: at least five positive and five negative at the selected points;
Repetition rate: maximum 1/min

Observation: No any change after the test.

Conclusion: The EUT complied with performance criteria B of this test.

11.5 Additions, Deviations and Exclusions from Standards

None

12. Immunity to Conducted Disturbances, Induced by Radio-frequency Fields

Test result **PASS**

12.1 Severity Level and Performance Criterion

12.1.1 Test level

Frequency range 150 kHz – 80MHz		
Level	Voltage level (e.m.f.) U0 [dB(uV)]	U0 (V)
1	120	1
2	130	3
3	140	10
X	Special	Special

Notes: 1. "X" is an open level
2. The gray row is the selected test level.

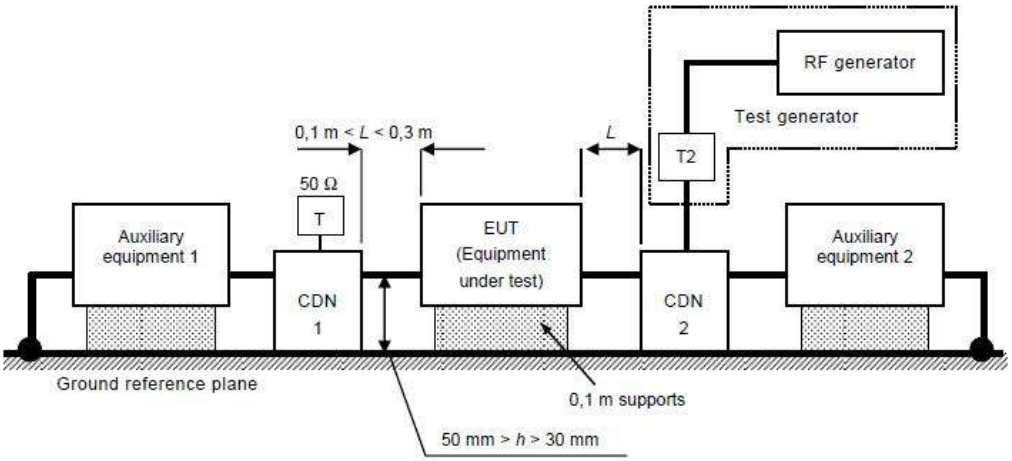
12.1.2 Performance Criterion

Performance criterion **A**

12.2 Block Diagram of Test Setup

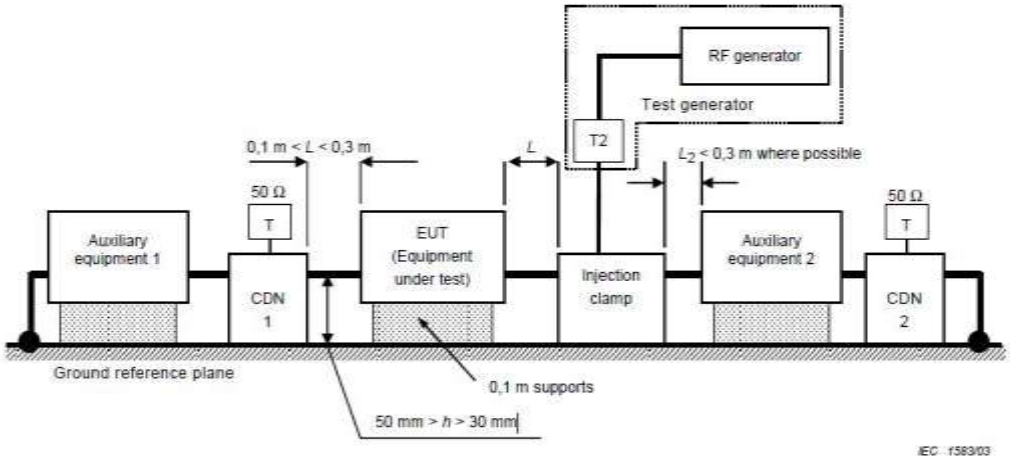
12.2.1 Block Diagram for a.c./d.c input power line

☒ Block Diagram for d.c input power line

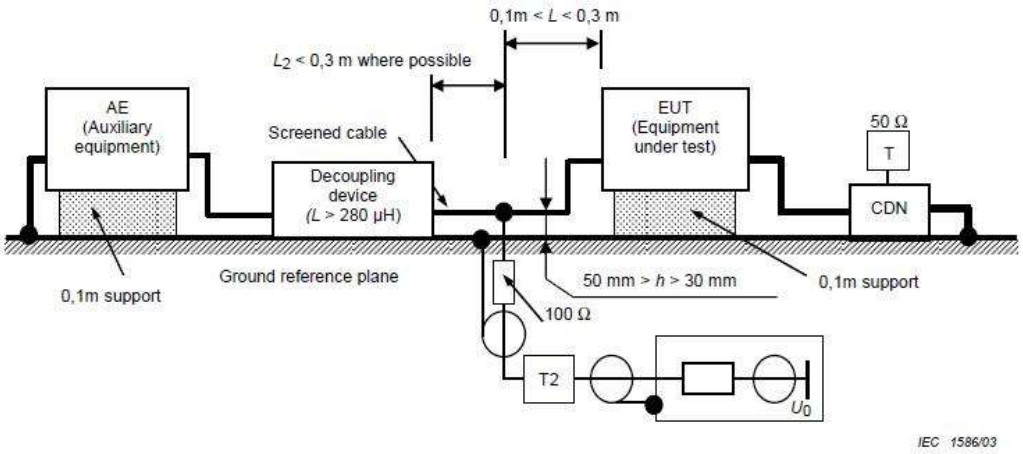


12.2.2 Block Diagram for output d.c. power line or signal/control lines

☒ Unshielded line



☐ Shielded line



T termination 50Ω
T2 power attenuator (6dB)
CDN coupling and decoupling network
Injection clamp current clamp or EM clamp

12.3 Test Setup and Test Procedure

Measurement was performed in shielded room.
Measurement and setting of EUT was applied according to IEC61000-4-6 clause 7.

12.4 Test Protocol

Temperature : 23 °C
Relative Humidity : 44%RH
Atmospheric Pressure : 101.5kPa

Test No.	Frequency (MHz)	Level V (e.m.f.)	Amplitude modulation	Injected point	Result
1	0.15~80	3	1kHz 80% AM	DC port	Pass
2	0.15~80	3	1kHz 80% AM	LAN port	Pass

Observation: All the functions were operated as normal during and after test.

Conclusion: The EUT met the requirements of Performance A

12.5 Additions, Deviations and Exclusions from Standards

None

13. Voltage Dips and voltage Interruptions

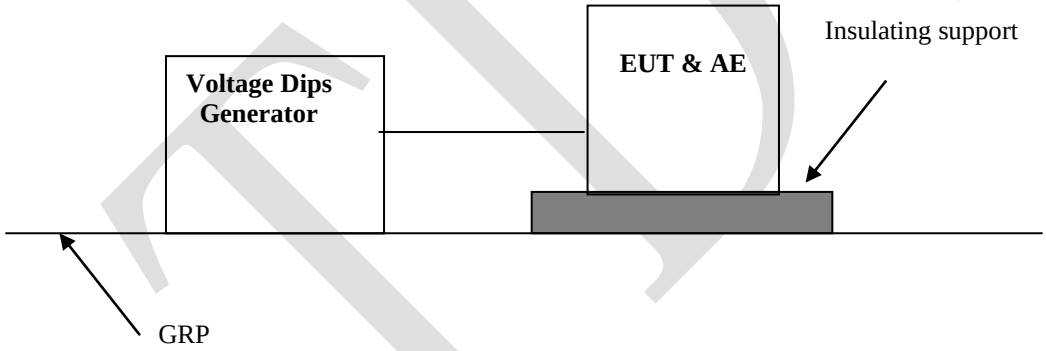
Test result **PASS**

13.1 Severity Level and Performance Criterion

13.1.1 Test level and performance criterion

Test level Reduction (%)	Voltage level in % of rated Ut	Duration (in period)	Performance criterion
>95	<5	0.5	B
30	70	25	C
>95	<5	250	C

13.2 Block diagram of test setup



13.3 Test Setup and Test Procedure

Measurement was performed in shielded room.
Measurement and setting of EUT was applied according to IEC61000-4-11 clause 7.
The test method and equipment was specified by IEC61000-4-11 with additions and modifications by clause 4.2.6 and 6 of EN 55024.

13.4 Test Protocol

Temperature : 25 °C
Relative Humidity : 42 %RH
Atmospheric Pressure : 102.5kPa

Rated voltage [V]	Item	Test level of reduction [%]	Duration (period)	Result
100 (Lower voltage)	Voltage dip	>95	0.5	PASS
		30	25	PASS
	Short interruption	>95	250	PASS
240 (Upper voltage)	Voltage dip	>95	0.5	PASS
		30	25	PASS
	Short interruption	>95	250	PASS

Observation: All the functions were operated as normal during and after test.

Conclusion: The EUT met the requirements of Performance B or C.

13.5 Additions, deviations and exclusions from standards

None

14. Power Frequency Magnetic field

Test result: **PASS**

14.1 Severity Level and Performance Criterion

14.1 Test level

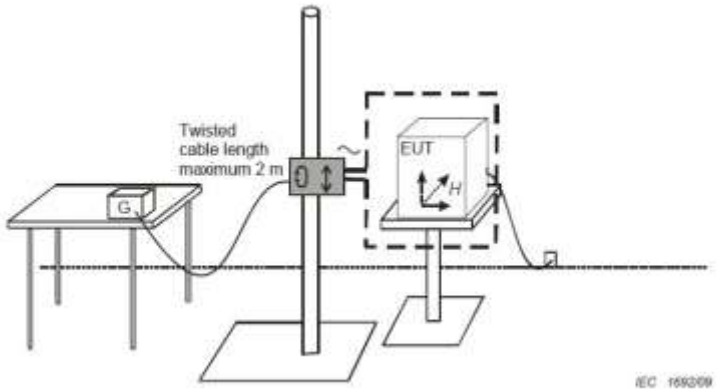
Level	Magnetic field strength A/m
1	1
2	3
3	10
4	30
5	100
X	Special

Note: 1. X is an open test level; this level may be given in the product specification.
2. The gray row is the selected test level.

14.1.2 Performance Criterion

Performance criterion **A**

14.2 Diagram of Test Setup



14.3 Test Setup and Test Procedure

Measurement was performed in shielded room.

Measurement and setting of EUT was applied according to clause 7 and 8 of IEC61000-4-8.

The test method and equipment was specified by IEC61000-4-8 with additions and modifications by clause 4.2.6 and 6 of EN 55024.

14.4 Test Protocol

Temperature : 24 °C
Relative Humidity : 54 %RH
Atmospheric Pressure : 100.5kPa

Test No.	Level A/m	Axis	Duration s	Result	Comment
1	1	X	900	PASS	NA
2	1	Y	900	PASS	NA
3	1	Z	900	PASS	NA

Observation: All the functions were operated as normal during and after test.

Conclusion: The EUT met the requirements of Performance A

14.5 Additions, Deviations and Exclusions from Standards

None

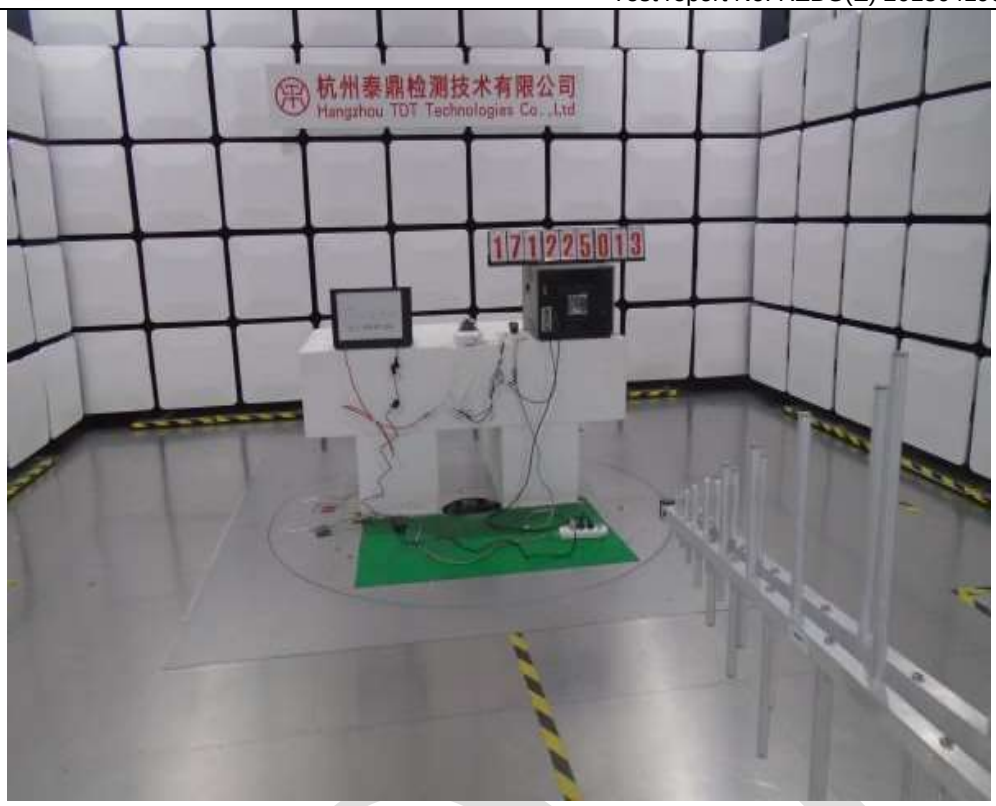
Appendix I: Photograph of equipment under test

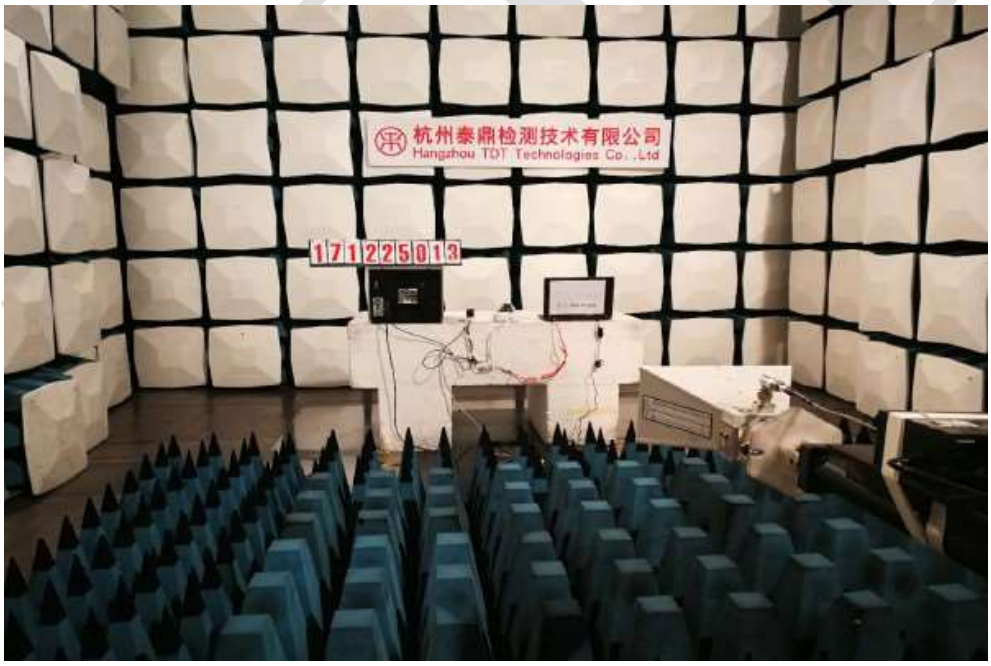
Appendix II: Model Names

Internal Models	Certificate Models	Differences	Note
GV-ADR4701	GV-ADR4701	NA	**Original Report:** RZBG(E) 20171225013-C **This Report:** RZBG(E)20180419001-C

Appendix III: Photograph of test arrangement

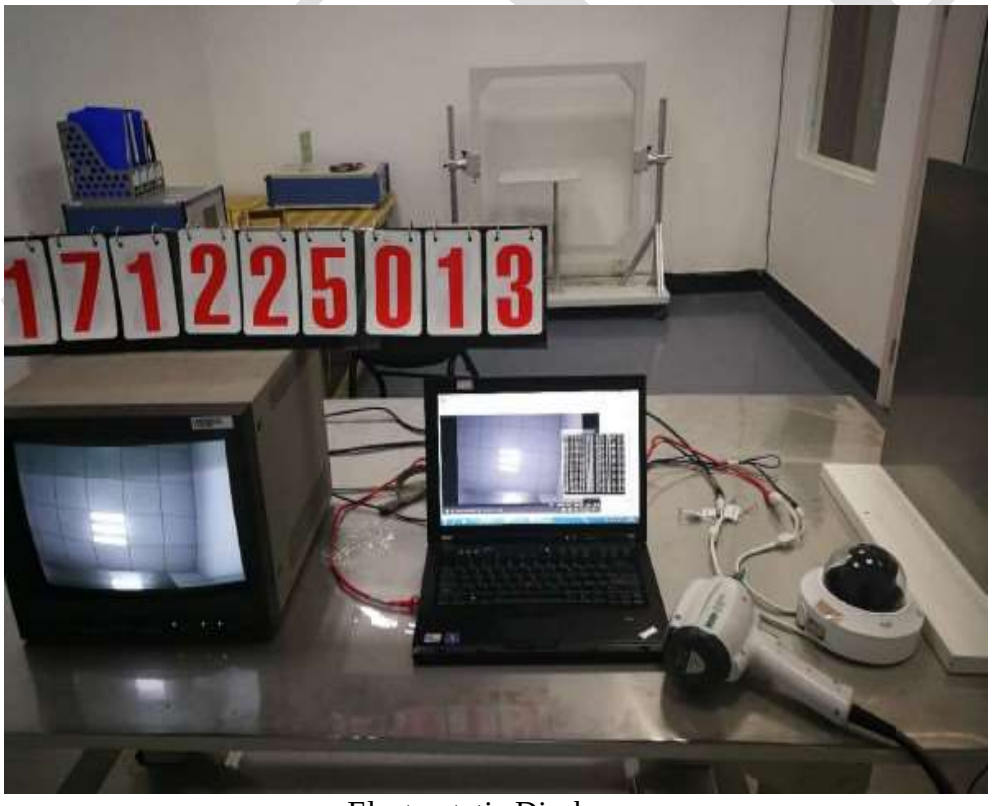
Conducted emission





Radiated emission

Harmonics& Flicker



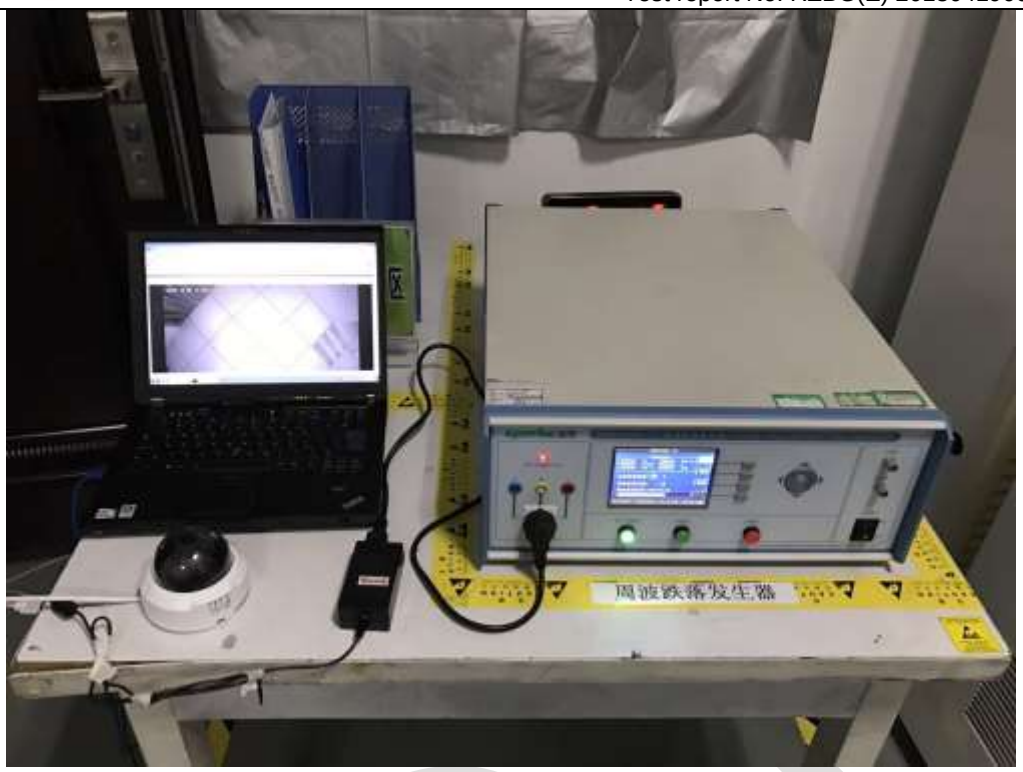
Electrostatic Discharge

Electromagnetic field susceptibility

Electric Fast Transient/Burst Immunity Test

Surge Immunity Test

Immunity to Conducted Disturbances, Induced by Radio-frequency Fields



Voltage Dips and voltage Interruptions

Power Frequency Magnetic field

----------**END**----------