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Report No.: SZEM170700707901
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TEST REPORT

Application No.: SZEM1707007079AV
Applicant: ZHEJIANG DAHUA VISION TECHNOLOGY CO., LTD
Address of Applicant: No.1199 Binan Road, Changhe Street, Binjiang District, Hangzhou, P.R.China
Manufacturer/Factory: ZHEJIANG DAHUA VISION TECHNOLOGY CO., LTD
Address of Manufacturer/Factory: No.1199 Binan Road, Changhe Street, Binjiang District, Hangzhou, P.R.China
Equipment Under Test (EUT):
EUT Name: LCD Display Wall Unit (LCD Monitor)
Model No.: Please refer to section 2 ♣
♣ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Trade mark: 
Standards: EN 55032:2015
EN 61000-3-2:2014
EN 61000-3-3:2013
EN 55024:2010 +A1:2015
Date of Receipt: 2017-07-07
Date of Test: 2017-07-19 to 2017-07-24
Date of Issue: 2017-07-26

Test Result :	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EU Declaration of Conformity and compliance with all relevant EU Directives.





Jack Zhang
EMC Laboratory Manager



The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2017-07-26		Original

Authorized for issue by:			
			
		<hr/> Foray Chen /Project Engineer	
			
		<hr/> Eric Fu /Reviewer	

2 Test Summary

Emission Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at Mains Terminals (150kHz-30MHz)	EN 55032:2015	EN 55032:2015	Class B	Pass
Radiated Emissions (30MHz-1GHz)	EN 55032:2015	EN 55032:2015	Class B	Pass
Harmonic Current Emission	EN 61000-3-2:2014	EN 61000-3-2:2014	Class D	Pass
Voltage Fluctuations and Flicker	EN 61000-3-3:2013	EN 61000-3-3:2013	Clause 5 of EN 61000-3-3	Pass

Immunity Part				
Item	Standard	Method	Requirement	Result
Electrostatic Discharge	EN 55024:2010 +A1:2015	EN 61000-4-2:2009	4kV Contact Discharge 8kV Air Discharge	Pass
Radiated Immunity (80MHz-1GHz)	EN 55024:2010 +A1:2015	EN 61000-4-3:2006 +A1:2008+A2:2010	3V/m, 80%, 1kHz Amp. Mod.	Pass
Electrical Fast Transients/Burst at Power Port	EN 55024:2010 +A1:2015	EN 61000-4-4:2012	1kV 5/50ns Tr/Td 5kHz Repetition Frequency	Pass
Surge at Power Port	EN 55024:2010 +A1:2015	EN 61000-4-5:2014	1.2/50µs Tr/Td 1kV Line to Line 2kV Line to Ground	Pass
Conducted Immunity at Power Port (150kHz-80MHz)	EN 55024:2010 +A1:2015	EN 61000-4-6:2014	3Vrms (emf), 80%, 1kHz Amp. Mod.	Pass
Voltage Dips and Interruptions	EN 55024:2010 +A1:2015	EN 61000-4-11:2004	0 % UT for 0.5per 0 % UT for 250per 70 % UT for 25per UT is Supply Voltage	Pass

InternalSource	UpperFrequency
Below 108MHz	1GHz
108MHz to 500MHz	2GHz
500MHz to 1GHz	5GHz
Above 1GHz	5 times the highest frequency or 6 GHz, whichever is less

Declaration of EUT Family Grouping:

Model No.:DHL460UTS, DH-DHL460UTS, DHL460UT-E, DH-DHL460UT-E, DHL460UTS-E, DH-DHL460UTS-E, DHL460UCH-ES, DH-DHL460UCH-ES, DHL460UCM-ES, DH-DHL460UCM-ES, DHL460UDH-ES, DH-DHL460UDH-ES, DHL460UDM-ES, DH-DHL460UDM-ES, DHL470UI, DH-DHL470UI, DHL470UT-E, DH-DHL470UT-E, DHL470UTS-E, DH-DHL470UTS-E, DHL490UCS-ES, DH-DHL490UCS-ES, LS490YXS-EF, DH-LS490YXS-EF, DHL490UCM-EG, DH-DHL490UCM-EG, DHL490UCH-ES, DH-DHL490UCH-ES, DHL490UDH-ES, DH-DHL490UDH-ES, DHL550UT-E, DH-DHL550UT-E, DHL550UTS-E, DH-DHL550UTS-E, DHL550UCM-EF, DH-DHL550UCM-EF, DHL550UCH-ES, DH-DHL550UCH-ES, DHL550UCM-ES, DH-DHL550UCM-ES, DHL550UCM-EG, DH-DHL550UCM-EG, DHL550UCH-EG, DH-DHL550UCH-EG, DHL550UDH-ES, DH-DHL550UDH-ES, DHL550UDM-ES, DH-DHL550UDM-ES, DHL550UDH-EG, DH-DHL550UDH-EG, DHL550UDM-EG, DH-DHL550UDM-EG, DHL600UT-E, DH-DHL600UT-E, DHL600UTS-E, DH-DHL600UTS-E, DHL19, DHL190UX, DHL22-F500, DHL22-F600, DHL22-S200, DHL22-L200, DHL27-S200, DHL32, DHL32-S200, DHL32-F600, DHL42-S200, DHL43-S200, DHL43-F600, DH-DHL43-F600, DHL49-S200, DHL49-S300, DH-DHL49-S300, DHL49-S400, DHL49-F600, DH-DHL49-F600, DHL55-S200, DHL55-S400, DHL65, DHL70, DHL84-S400, DH-LM75-S400, DH-LM86-S400, DHL98, DHL110

Only the model DH-DHL490UCS-ES was tested, since the electrical circuit design, PCB layout, components used and internal wiring were identical for the above models, with only difference being of sales customer.

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4 General Information

4.1 Details of E.U.T.

Power supply: Input: AC100-240V 50/60Hz
3.0V DC (1.5V x 2 "AAA" Size batteries) for remote control

Cable: AC cable: 150cm unshielded

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Laptop	Lenovo	T430u	REF. No.SEA1800
U-disk	Sandisk	SDCZ60-016G	REF. No.SEA0100
Router	NETGEAR	DGN2200	REF. No.SEA2200
HDMI Cable	Apple	MC838FE/B	REF. No.SEA0900
DVI Cable	SGS	N/A	REF. No.SEA1200
VGA Cable	SGS	N/A	REF. No.SEA1000
Network Cable	SGS	N/A	REF. No.SEA1100
Mouse	Lenovo	M-U0025-O	REF. No.:SEA2400
CVBS input camera	Supply by client	DH-HAC-HDBW2401RN-Z	N/A
IR module	Supply by client	N/A	N/A
Control Software	Supply by client	N/A	N/A

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Conduction emission	3.0dB (150kHz to 30MHz)
2	Radiated emission	4.5dB (30MHz-1GHz)
3	Radiated Immunity	1.64dB
4	Conducted Immunity	0.96dB
5	ESD	6 %
6	EFT (Electrical Fast Transients)	5 %
7	Surge Immunity	5 %
8	Voltage Dips and Interruptions	4 %
9	Temperature test	1 °C
10	Humidity test	3%

4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 respectively.

- **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

- **Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

4.8 Monitoring of EUT for All Immunity Test

Visual: Monitored the light and display of the EUT

Audio: None

5 Equipment List

Conducted Emissions at Mains Terminals (150kHz-30MHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Shielding Room	ChangZhou ZhongYu	GB-88	SEM001-06	2017-05-10	2018-05-10
Measurement Software	AUDIX	e3 V5.4.1221d	N/A	N/A	N/A
LISN	Rohde & Schwarz	ENV216	SEM007-01	2016-10-09	2017-10-09
LISN	ETS-LINDGREN	3816/2	SEM007-02	2017-04-14	2018-04-13
EMI Test Receiver	Rohde & Schwarz	ESCI	SEM004-02	2017-04-14	2018-04-13

Radiated Emissions (30MHz-1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
10m Semi-Anechoic Chamber	SAEMC	FSAC1018	SEM001-03	2017-05-10	2018-05-10
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
EMI Test Receiver (9k-3GHz)	Rohde & Schwarz	ESR	SEM004-03	2017-04-14	2018-04-13
Trilog-Broadband Antenna (30M-1GHz)	Schwarzbeck	VULB9168	SEM003-18	2016-06-29	2019-06-29
Pre-amplifier	Sonoma Instrument Co	310N	SEM005-04	2017-06-05	2018-06-04

Voltage Fluctuations and Flicker					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
AC Power Source	California Instruments	5001ix	SEM016-02	2017-04-14	2018-04-13
Power Analyzer	California Instruments	PACS-1	SEM016-01	2017-04-14	2018-04-13
Measurement Software	California Instruments	CTS 3.0 V3.2.0.6	N/A	N/A	N/A

Electrostatic Discharge					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
ESD Ground Plane	SGS(3m*3m)	N/A	SEN006-01	N/A	N/A
ESD Generator	TESEQ AG	NSG 437	SEM019-02	2017-06-08	2018-06-07

Radiated Immunity (80MHz-1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Fully-Anechoic Chamber 2	Chang Zhou Zhong Shuo	854	SEM001-05	2015-05-13	2018-05-13
Measurement Software	Rohde & Schwarz	EMC32 V9.25.00	N/A	N/A	N/A
Signal Generator	Rohde & Schwarz	SMB100A	SEM006-11	2017-04-14	2018-04-13
Broadband Amplifier (80MHz-1GHz)	Rohde & Schwarz	BBA150-BC250	SEM005-12	2016-10-09	2017-10-09
Broadband Amplifier (800MHz-3GHz)	Rohde & Schwarz	BBA150-D110	SEM005-13	2016-10-09	2017-10-19
Broadband Amplifier (2.5GHz-6GHz)	Rohde & Schwarz	BBA150-E60	SEM005-16	2017-05-08	2018-05-07
Power Sensor	Rohde & Schwarz	NRP-Z91	SEM009-09	2017-04-14	2018-04-13
Power Sensor	Rohde & Schwarz	NRP-Z91	SEM009-08	2017-04-14	2018-04-13
Stacked Log.-Per.-Broadband Antenna (70MHz-10GHz)	Schwarzbeck	STLP 9129	SEM003-25	N/A	N/A

Electrical Fast Transients/Burst at Power Port					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Ultra Compact Simulator	EM TEST	UCS 500N7	SEM018-02	2016-10-10	2017-10-10
Measurement Software	EM TEST	IEC CONTROL V6.0.1	N/A	N/A	N/A

Surge at Power Port					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Ultra Compact Simulator	EM TEST	UCS 500N7	SEM018-02	2016-10-10	2017-10-10
Measurement Software	EM TEST	IEC CONTROL V6.0.1	N/A	N/A	N/A

Conducted Immunity at Power Port (150kHz-80MHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
RF-Generator	SCHAFFNER	NSG 2070	SEM006-01	2016-10-09	2017-10-09
Coupling/Decoupling Network	SCHAFFNER	CDN M016	SEM007-03	2016-10-09	2017-10-09

Voltage Dips and Interruptions					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Ultra Compact Simulator	EM TEST	UCS 500N7	SEM018-02	2016-10-10	2017-10-10
Measurement Software	EM TEST	IEC CONTROL V6.0.1	N/A	N/A	N/A

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2016-10-12	2017-10-12
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2016-10-12	2017-10-12
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2016-10-12	2017-10-12
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2017-04-18	2018-04-18

6 Emission Test Results

6.1 Conducted Emissions at Mains Terminals (150kHz-30MHz)

Test Requirement:	EN 55032:2015
Test Method:	EN 55032:2015
Frequency Range:	150kHz to 30MHz
Limit:	
0.15M-0.5MHz	66dB(μ V)-56dB(μ V) quasi-peak, 56dB(μ V)-46dB(μ V) average
0.5M-5MHz	56dB(μ V) quasi-peak, 46dB(μ V) average
5M-30MHz	60dB(μ V) quasi-peak, 50dB(μ V) average
Detector:	Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

6.1.1 E.U.T. Operation

Operating Environment:

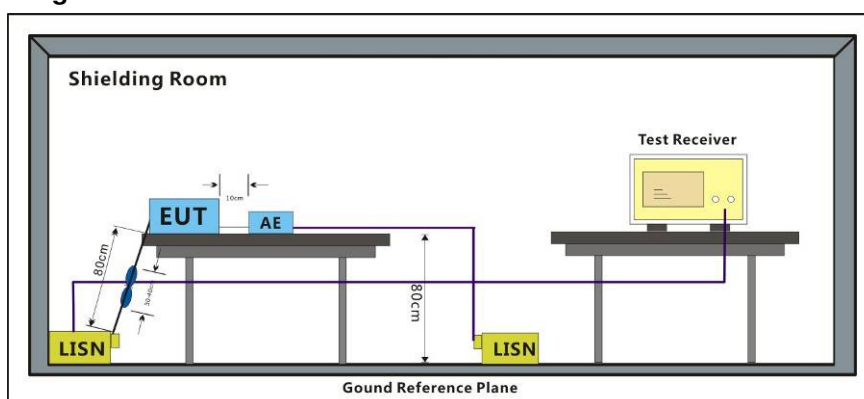
Temperature: 25 °C Humidity: 51 % RH Atmospheric Pressure: 1005 mbar

Pretest these mode to find the worst case:

- a: HDMI mode, keep EUT working with external HDMI source.
- b: VGA mode, keep EUT working with external VGA source.
- c: DVI mode, keep EUT working with external DVI source.
- d: CVBS mode, keep EUT working with external CVBS source.
- e: USB play mode, keep EUT playing with USB stick.
- f: LAN mode, keep EUT working via LAN in port.
- g: Idle mode.

The worst case for final test: a: HDMI mode, keep EUT working with external HDMI source.

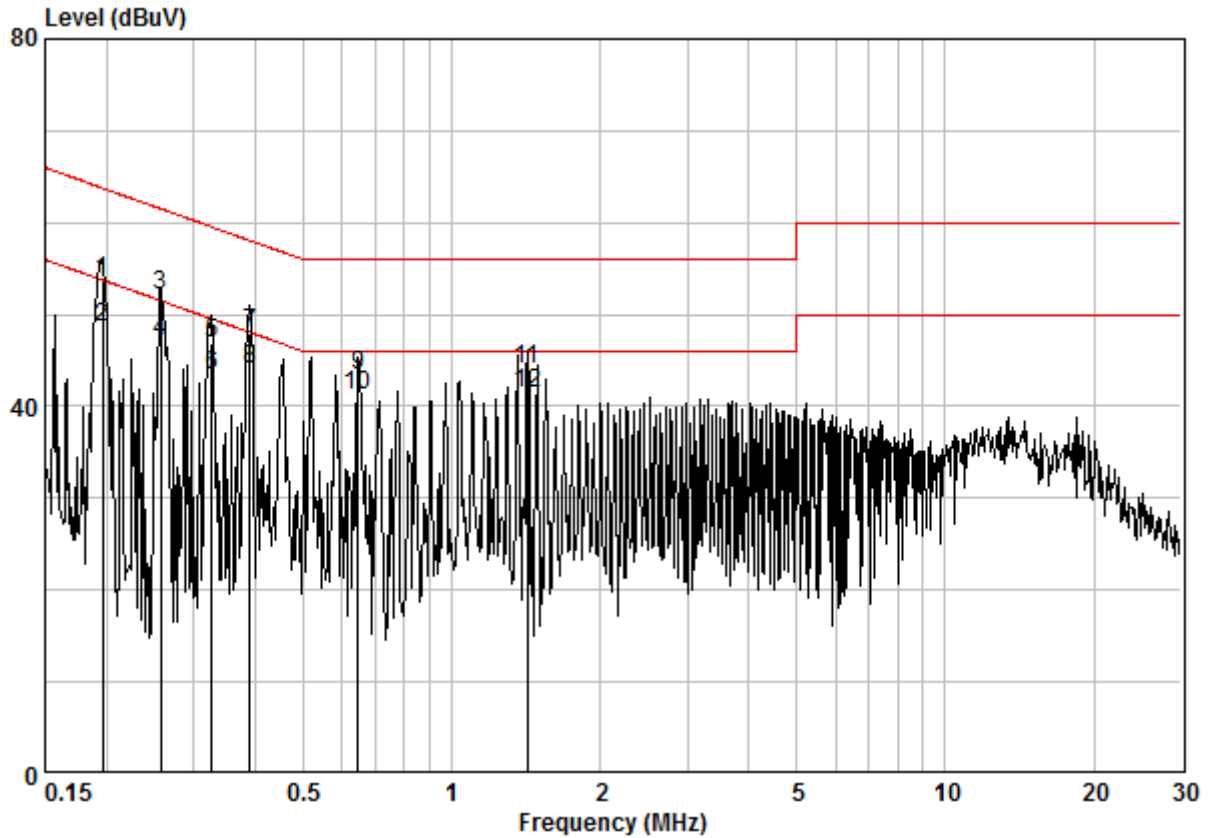
6.1.2 Test Setup Diagram



6.1.3 Measurement Data

An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.

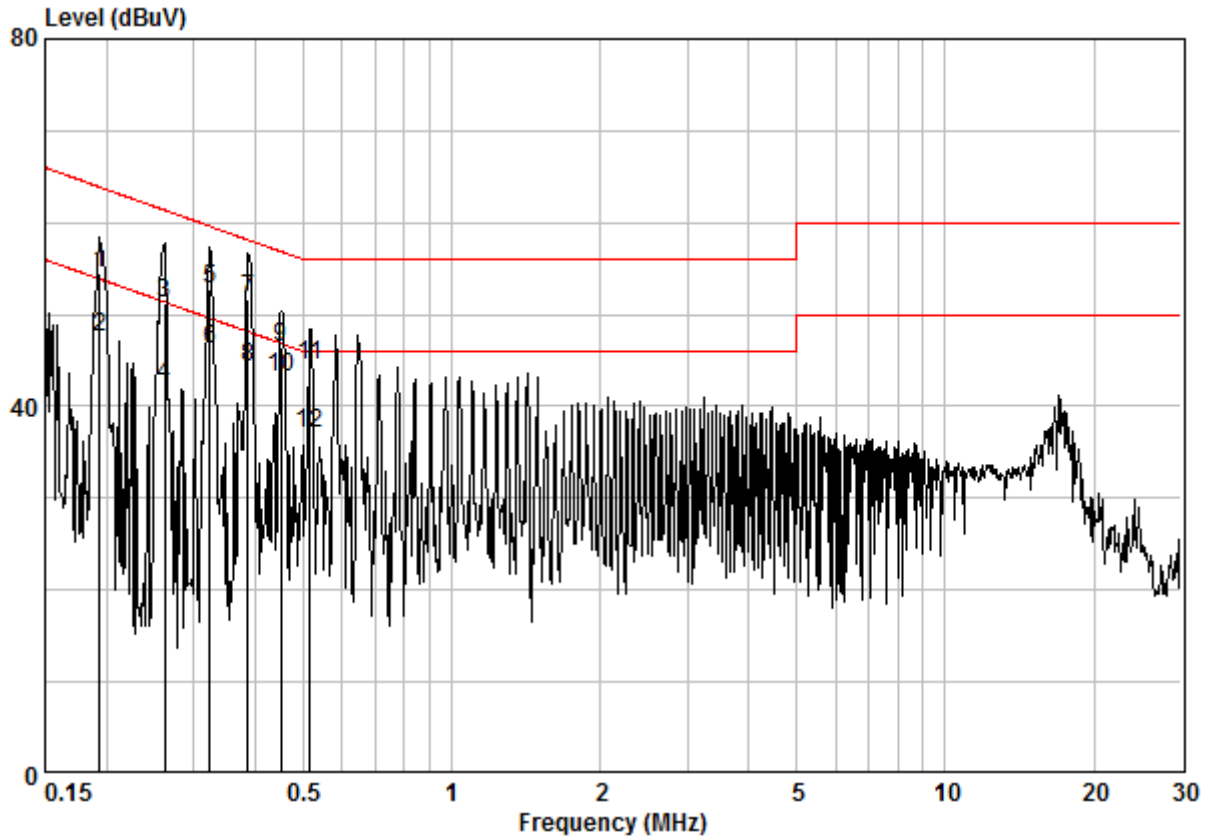
Mode:a; Line:Live Line



Site : Shielding Room
Condition : CE LINE
Job No. : 07079AV
Test Mode : a

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.19654	0.02	9.64	43.89	53.55	63.76	-10.20	QP
2	0.19654	0.02	9.64	39.01	48.67	53.76	-5.08	AVERAGE
3	0.25751	0.02	9.64	42.36	52.02	61.51	-9.49	QP
4	0.25751	0.02	9.64	37.41	47.07	51.51	-4.44	AVERAGE
5	0.32685	0.02	9.64	37.20	46.86	59.53	-12.67	QP
6	0.32685	0.02	9.64	33.70	43.36	49.53	-6.17	Average
7	0.38929	0.02	9.64	38.40	48.06	58.08	-10.02	QP
8	0.38929	0.02	9.64	34.30	43.96	48.08	-4.12	Average
9	0.64740	0.02	9.65	33.75	43.42	56.00	-12.58	QP
10	0.64740	0.02	9.65	31.45	41.12	46.00	-4.88	Average
11	1.426	0.03	9.66	34.37	44.06	56.00	-11.94	QP
12	1.426	0.03	9.66	31.82	41.51	46.00	-4.49	Average

Mode:a; Line:Neutral Line



Site : Shielding Room
Condition : CE NEUTRAL
Job No. : 07079AV
Test Mode : a

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.19344	0.02	9.63	44.79	54.44	63.89	-9.45	QP
2	0.19344	0.02	9.63	37.90	47.55	53.89	-6.34	Average
3	0.26164	0.02	9.63	41.68	51.33	61.38	-10.05	QP
4	0.26164	0.02	9.63	32.68	42.33	51.38	-9.05	Average
5	0.32340	0.02	9.63	43.17	52.82	59.62	-6.80	QP
6 @	0.32340	0.02	9.63	36.51	46.16	49.62	-3.46	AVERAGE
7	0.38724	0.02	9.63	41.96	51.61	58.12	-6.52	QP
8 @	0.38724	0.02	9.63	34.71	44.36	48.12	-3.76	AVERAGE
9	0.45155	0.02	9.63	36.70	46.35	56.85	-10.50	QP
10 @	0.45155	0.02	9.63	33.60	43.25	46.85	-3.60	Average
11	0.51550	0.02	9.63	34.73	44.38	56.00	-11.62	QP
12	0.51550	0.02	9.63	27.30	36.95	46.00	-9.05	Average

6.2 Radiated Emissions (30MHz-1GHz)

Test Requirement:	EN 55032:2015
Test Method:	EN 55032:2015
Frequency Range:	30MHz to 1GHz
Measurement Distance:	10m
Limit:	
30MHz-230MHz	30 dB(μ V/m) quasi-peak
230MHz-1GHz	37 dB(μ V/m) quasi-peak
Detector:	Peak for pre-scan (120kHz resolution bandwidth) 30M to 1000MHz

6.2.1 E.U.T. Operation

Operating Environment:

Temperature: 26 °C Humidity: 56 % RH Atmospheric Pressure: 1005 mbar

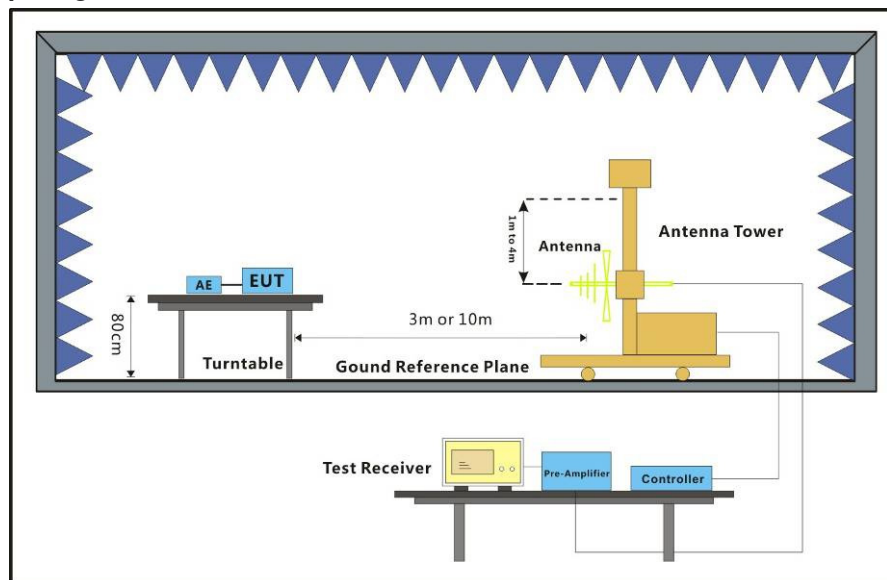
Pretest these mode to find the worst case:

- a: HDMI mode, keep EUT working with external HDMI source.
- b: VGA mode, keep EUT working with external VGA source.
- c: DVI mode, keep EUT working with external DVI source.
- d: CVBS mode, keep EUT working with external CVBS source.
- e: USB play mode, keep EUT playing with USB stick.
- f: LAN mode, keep EUT working via LAN in port.
- g: Idle mode.

The worst case for final test:

- a: HDMI mode, keep EUT working with external HDMI source.

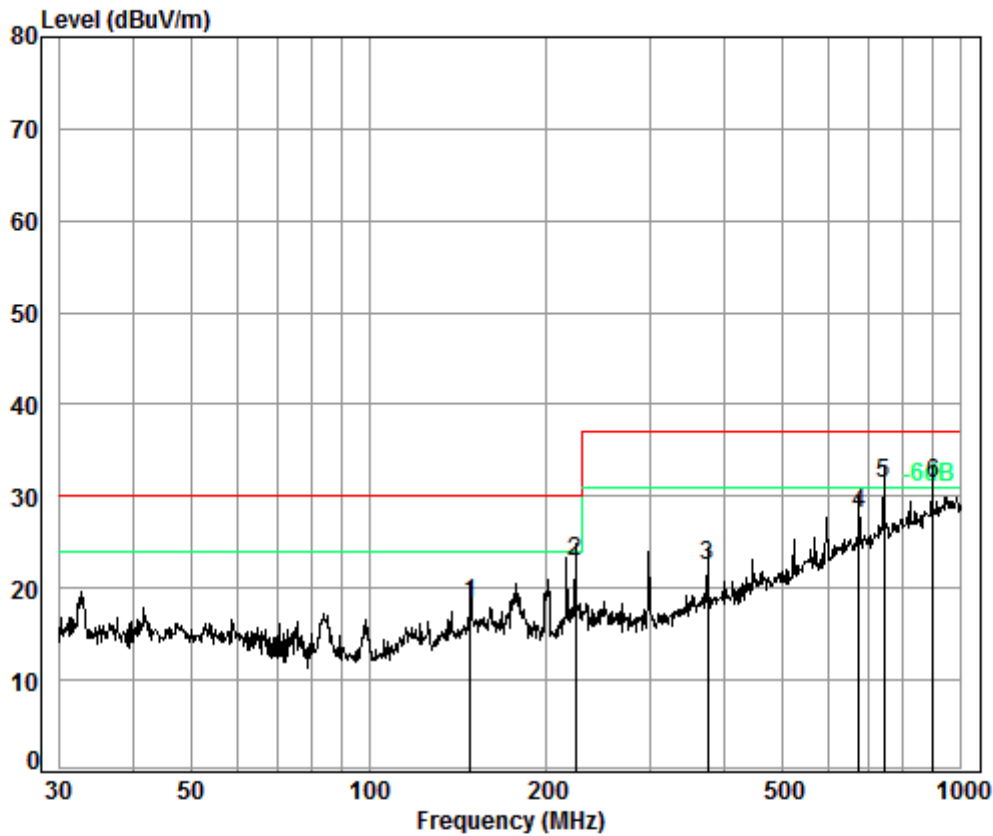
6.2.2 Test Setup Diagram



6.2.3 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.

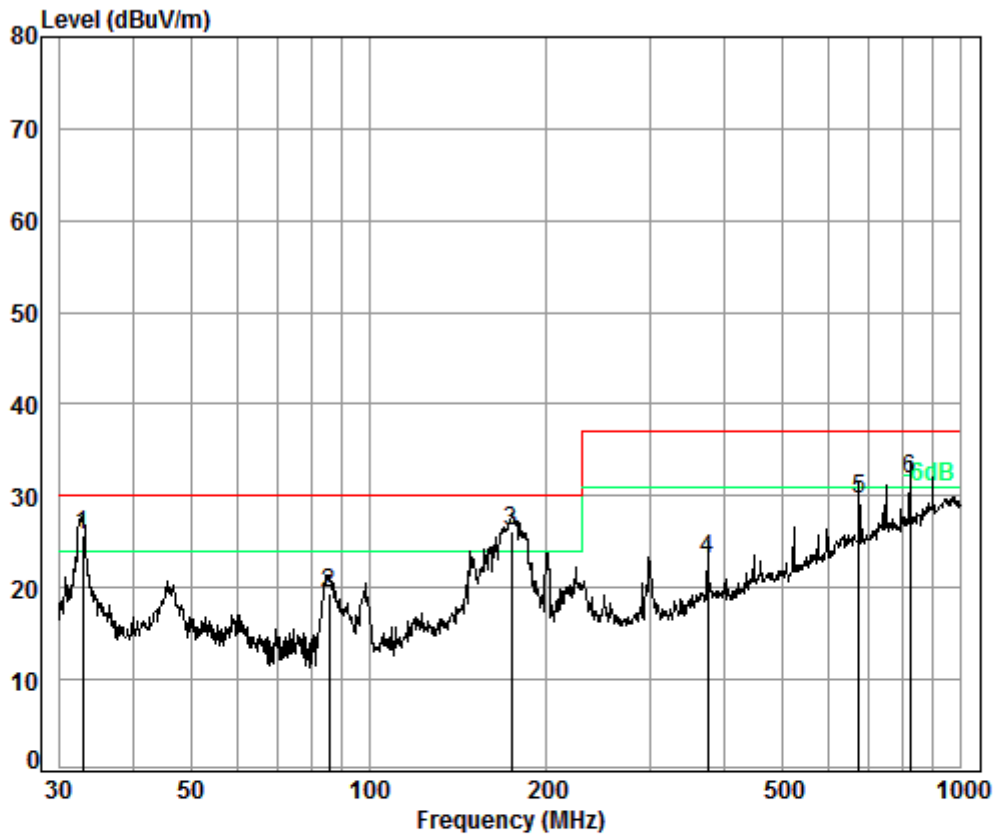
Mode:a; Polarization:Horizontal



Condition: 10m HORIZONTAL
Job No. : 07079AV
Test Mode: a

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	148.44	7.44	13.31	32.43	30.07	18.39	30.00	-11.61
2	223.73	7.72	10.39	32.44	37.24	22.91	30.00	-7.09
3	373.31	8.30	14.35	32.34	32.10	22.41	37.00	-14.59
4	672.84	9.08	19.81	32.27	31.52	28.14	37.00	-8.86
5 pp	742.26	9.20	20.68	32.26	33.83	31.45	37.00	-5.55
6	897.00	9.50	22.18	31.42	31.07	31.33	37.00	-5.67

Mode:a; Polarization:Vertical



Condition: 10m VERTICAL
Job No. : 07079AV
Test Mode: a

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	32.86	6.70	12.57	32.50	39.06	25.83	30.00	-4.17
2	85.60	7.16	8.63	32.51	36.17	19.45	30.00	-10.55
3 pp	174.42	7.50	11.75	32.45	39.38	26.18	30.00	-3.82
4	373.31	8.30	14.35	32.34	32.75	23.06	37.00	-13.94
5	672.84	9.08	19.81	32.27	32.92	29.54	37.00	-7.46
6	821.71	9.30	21.39	32.06	33.18	31.81	37.00	-5.19

6.3 Harmonic Current Emission

Test Requirement: EN 61000-3-2:2014

Test Method: EN 61000-3-2:2014

Frequency Range: 100Hz to 2kHz

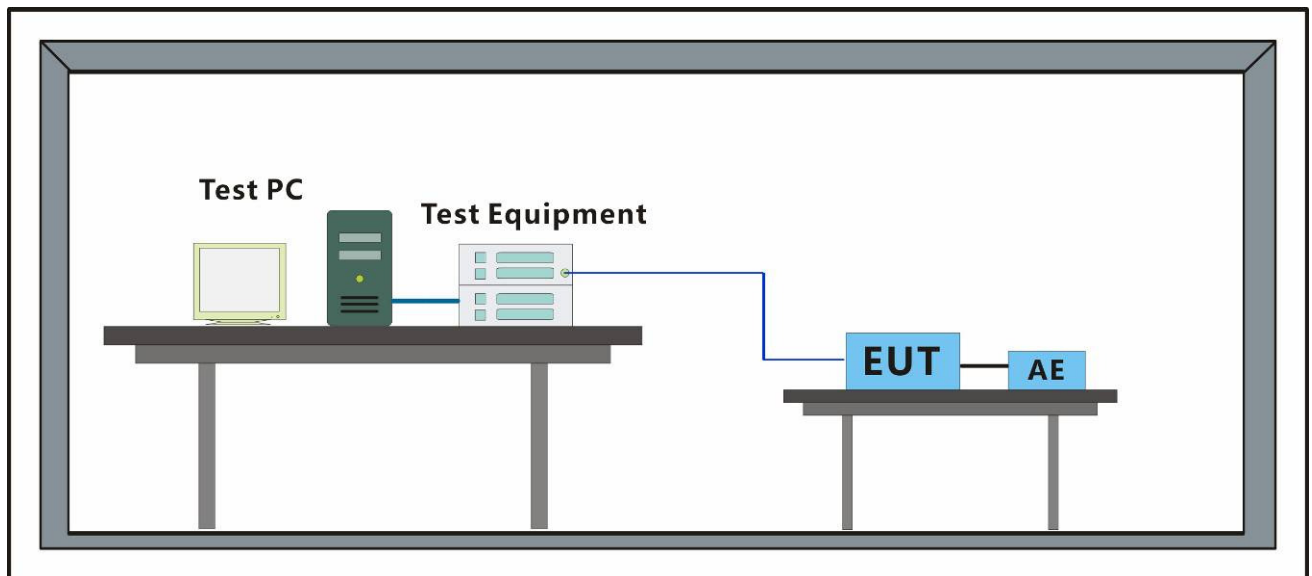
Pretest these mode to find the worst case:

- a: HDMI mode, keep EUT working with external HDMI source.
- b: VGA mode, keep EUT working with external VGA source.
- c: DVI mode, keep EUT working with external DVI source.
- d: CVBS mode, keep EUT working with external CVBS source.
- e: USB play mode, keep EUT playing with USB stick.
- f: LAN mode, keep EUT working via LAN in port.
- g: Idle mode.

The worst case for final test:

- a: HDMI mode, keep EUT working with external HDMI source.

6.3.1 Test Setup Diagram

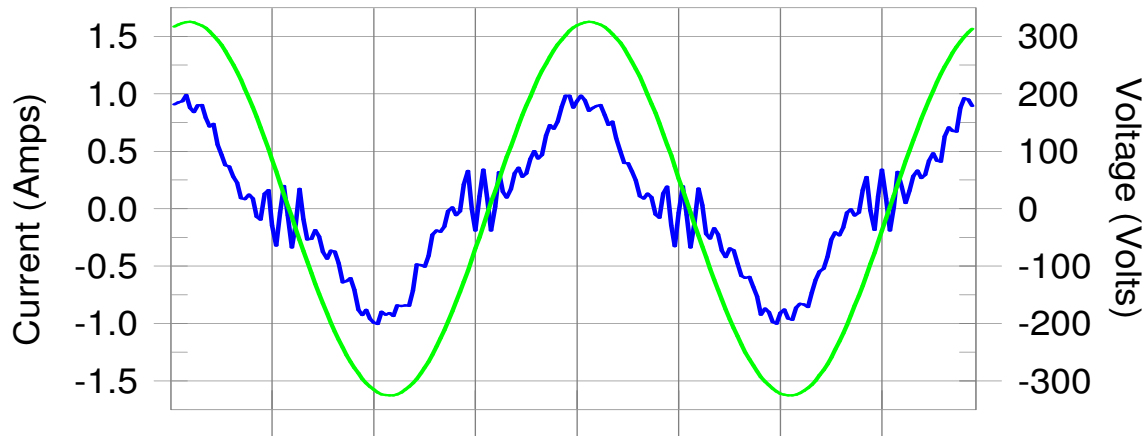


6.3.2 Measurement Data

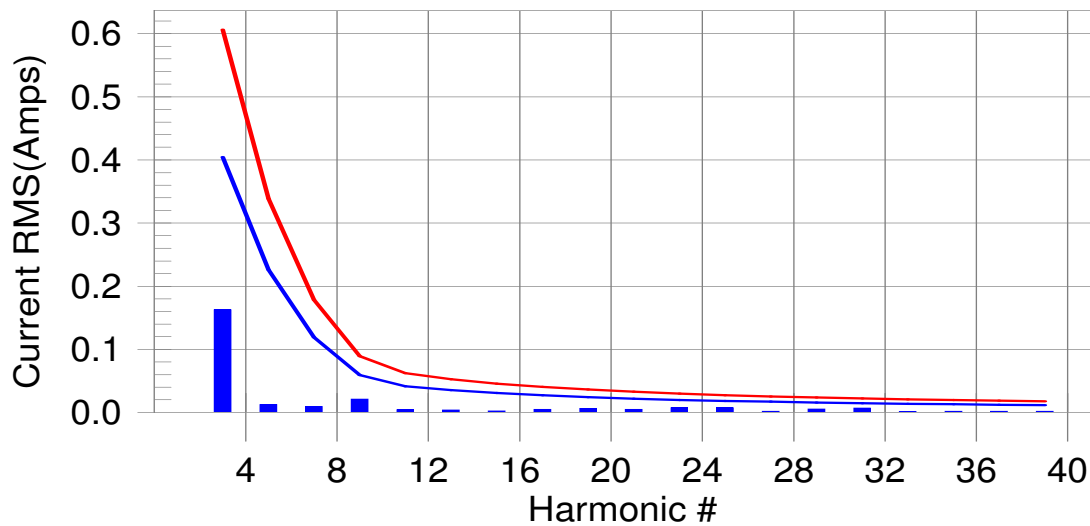
Mode:a

Test Result: Pass Source qualification: Normal

Current & voltage waveforms



Harmonics and Class D limit line European Limits



Test result: Pass Worst harmonic was #31 with 32.91% of the limit.

Test Result: Pass Source qualification: Normal
 THC(A): 0.16 I-THD(%): 31.32 POHC(A): 0.015 POHC Limit(A): 0.051
 Highest parameter values during test:

V_RMS (Volts):	230.17	Frequency(Hz):	50.00
I_Peak (Amps):	1.053	I_RMS (Amps):	0.562
I_Fund (Amps):	0.528	Crest Factor:	1.883
Power (Watts):	118.9	Power Factor:	0.921

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.000						
3	0.161	0.404	39.7	0.163	0.607	26.87	Pass
4	0.000						
5	0.012	0.226	5.5	0.013	0.339	3.78	Pass
6	0.000						
7	0.009	0.119	7.6	0.010	0.178	5.34	Pass
8	0.000						
9	0.021	0.059	35.0	0.021	0.089	23.79	Pass
10	0.000						
11	0.004	0.042	9.7	0.004	0.062	7.01	Pass
12	0.000						
13	0.004	0.036	10.1	0.004	0.053	7.76	Pass
14	0.000						
15	0.002	0.031	8.0	0.003	0.046	5.94	Pass
16	0.000						
17	0.005	0.027	17.2	0.005	0.040	12.66	Pass
18	0.000						
19	0.006	0.024	24.3	0.006	0.036	17.38	Pass
20	0.000						
21	0.005	0.022	21.0	0.005	0.033	15.14	Pass
22	0.000						
23	0.007	0.020	37.3	0.008	0.030	25.94	Pass
24	0.000						
25	0.007	0.018	39.7	0.008	0.027	27.74	Pass
26	0.000						
27	0.002	0.017	9.7	0.002	0.025	7.84	Pass
28	0.000						
29	0.005	0.016	32.4	0.006	0.024	23.59	Pass
30	0.000						
31	0.007	0.015	46.6	0.007	0.022	32.91	Pass
32	0.000						
33	0.001	0.014	9.1	0.002	0.021	7.53	Pass
34	0.000						
35	0.002	0.013	13.7	0.002	0.020	10.69	Pass
36	0.000						
37	0.002	0.012	15.4	0.002	0.019	11.61	Pass
38	0.000						
39	0.002	0.012	16.2	0.002	0.018	12.34	Pass
40	0.000						

Test Result: Pass Source qualification: Normal

Highest parameter values during test:

Voltage (Vrms):	230.17	Frequency(Hz):	50.00
I_Peak (Amps):	1.053	I_RMS (Amps):	0.562
I_Fund (Amps):	0.528	Crest Factor:	1.883
Power (Watts):	118.9	Power Factor:	0.921

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.137	0.460	29.73	OK
3	0.533	2.071	25.75	OK
4	0.090	0.460	19.45	OK
5	0.051	0.920	5.49	OK
6	0.076	0.460	16.45	OK
7	0.050	0.690	7.26	OK
8	0.040	0.460	8.64	OK
9	0.071	0.460	15.33	OK
10	0.031	0.460	6.64	OK
11	0.017	0.230	7.26	OK
12	0.015	0.230	6.31	OK
13	0.017	0.230	7.39	OK
14	0.011	0.230	4.67	OK
15	0.007	0.230	3.12	OK
16	0.014	0.230	6.08	OK
17	0.005	0.230	2.12	OK
18	0.015	0.230	6.42	OK
19	0.011	0.230	4.88	OK
20	0.013	0.230	5.81	OK
21	0.008	0.230	3.62	OK
22	0.009	0.230	3.72	OK
23	0.006	0.230	2.46	OK
24	0.006	0.230	2.61	OK
25	0.013	0.230	5.80	OK
26	0.009	0.230	4.08	OK
27	0.007	0.230	2.94	OK
28	0.007	0.230	3.25	OK
29	0.005	0.230	2.28	OK
30	0.005	0.230	2.32	OK
31	0.010	0.230	4.31	OK
32	0.006	0.230	2.50	OK
33	0.007	0.230	2.88	OK
34	0.004	0.230	1.53	OK
35	0.003	0.230	1.48	OK
36	0.004	0.230	1.68	OK
37	0.008	0.230	3.48	OK
38	0.003	0.230	1.41	OK
39	0.003	0.230	1.14	OK
40	0.005	0.230	2.18	OK

6.4 Voltage Fluctuations and Flicker

Test Requirement: EN 61000-3-3:2013

Test Method: EN 61000-3-3:2013

6.4.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 51 % RH Atmospheric Pressure: 1005 mbar

Pretest these mode to find the worst case: a: HDMI mode, keep EUT working with external HDMI source.

b: VGA mode, keep EUT working with external VGA source.

c: DVI mode, keep EUT working with external DVI source.

d: CVBS mode, keep EUT working with external CVBS source.

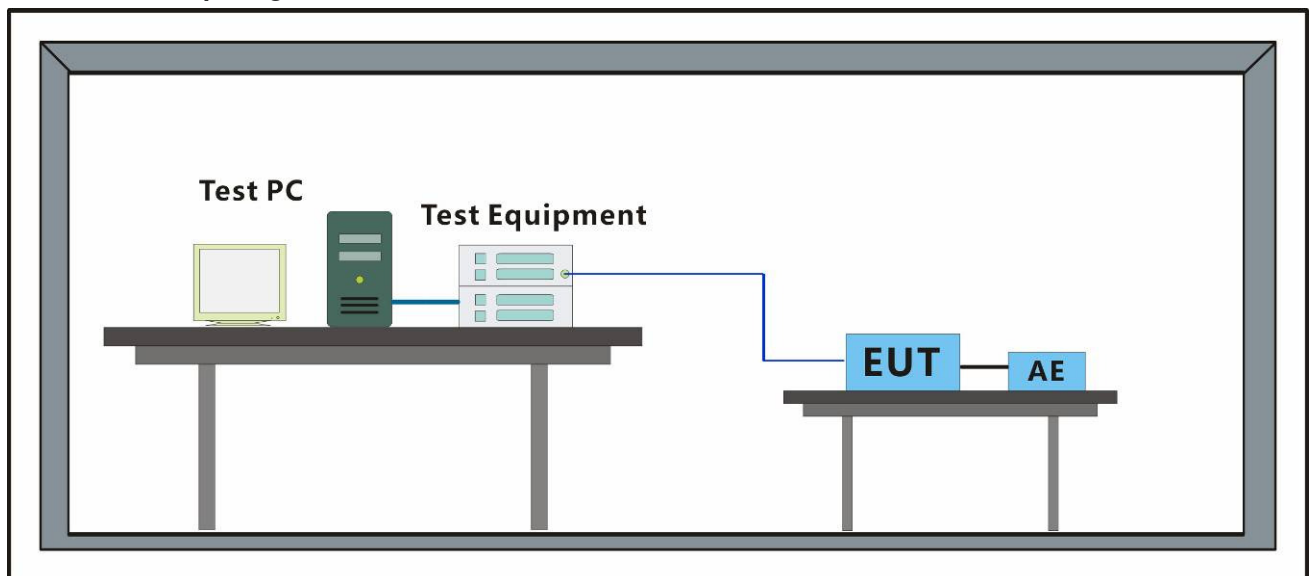
e: USB play mode, keep EUT playing with USB stick.

f: LAN mode, keep EUT working via LAN in port.

g: Idle mode.

The worst case for final test: a: HDMI mode, keep EUT working with external HDMI source.

6.4.2 Test Setup Diagram



6.4.3 Measurement Data

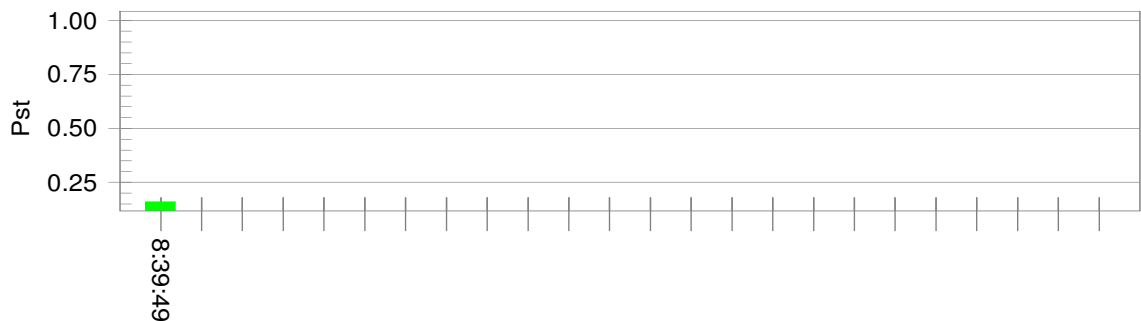
Mode:a

Test Result: Pass

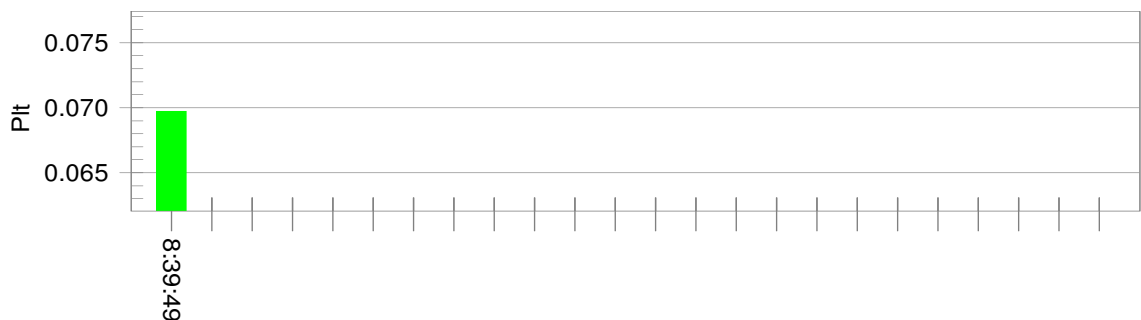
Status: Test Completed

Pst_i and limit line

European Limits



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt):	229.97		
Highest dt (%):	0.00	Test limit (%):	3.30 Pass
Time(mS) > dt:	0.0	Test limit (mS):	500.0 Pass
Highest dc (%):	0.00	Test limit (%):	3.30 Pass
Highest dmax (%):	0.00	Test limit (%):	4.00 Pass
Highest Pst (10 min. period):	0.160	Test limit:	1.000 Pass

7 Immunity Test Results

7.1 Performance Criteria Description in EN 55024:2010 +A1:2015

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

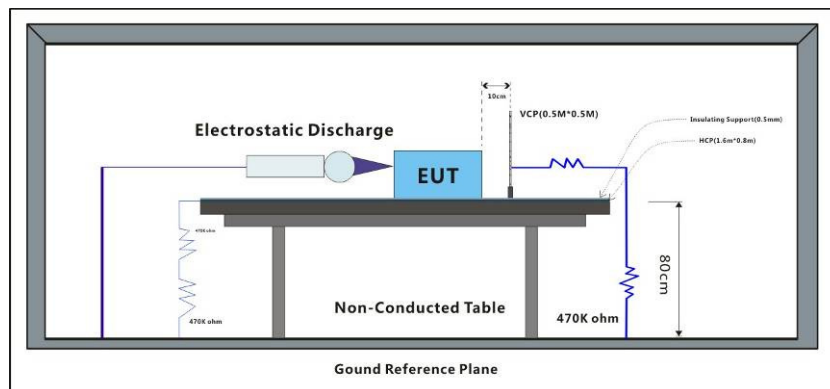
Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.

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

7.2 Electrostatic Discharge

Test Requirement:	EN 55024:2010 +A1:2015
Test Method:	EN 61000-4-2:2009
Performance Criterion:	B
Discharge Impedance:	330Ω/150pF
Number of Discharge:	Minimum of four test points (a minimum of 50 discharges at each point)
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum

7.2.1 Test Setup Diagram



7.2.2 E.U.T. Operation

Operating Environment:

Temperature:	22 °C	Humidity:	53 % RH	Atmospheric Pressure:	1005 mbar
Test mode:	a: HDMI mode, keep EUT working with external HDMI source. b: VGA mode, keep EUT working with external VGA source. c: DVI mode, keep EUT working with external DVI source. d: CVBS mode, keep EUT working with external CVBS source. e: USB play mode, keep EUT playing with USB stick. f: LAN mode, keep EUT working via LAN in port. g: Idle mode.				

7.2.3 Test Results:

Observations:	Test Point:
	1. All insulated enclosure and seams.
	2. All accessible metal parts of the enclosure.
	3. All side

Discharge type	Level (kV)	Polarity	Test Point	Result / Observations
Air Discharge	2,4,8	+	1	A
Air Discharge	2,4,8	-	1	A
Contact Discharge	4	+	2	A
Contact Discharge	4	-	2	A
Horizontal Coupling	4	+	3	A
Horizontal Coupling	4	-	3	A
Vertical Coupling	4	+	3	A
Vertical Coupling	4	-	3	A

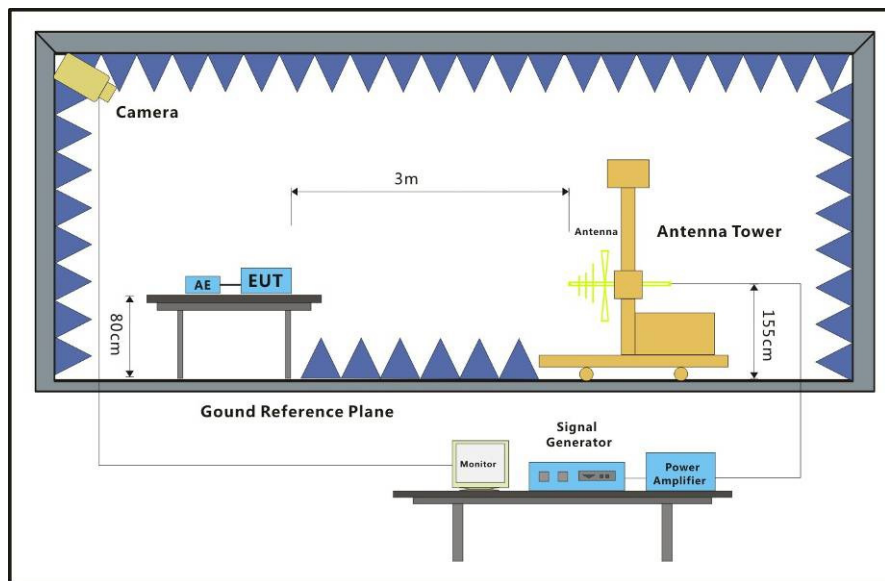
Results:

A: No degradation in the performance of the EUT was observed.

7.3 Radiated Immunity (80MHz-1GHz)

Test Requirement: EN 55024:2010 +A1:2015
Test Method: EN 61000-4-3:2006 +A1:2008+A2:2010
Performance Criterion: A
Frequency Range: 80MHz to 1GHz
Antenna Polarisation: Vertical and Horizontal
Modulation: 1kHz,80% Amp. Mod,1% increment

7.3.1 Test Setup Diagram



7.3.2 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 54 % RH Atmospheric Pressure: 1005 mbar

Test mode:

- a: HDMI mode, keep EUT working with external HDMI source.
- b: VGA mode, keep EUT working with external VGA source.
- c: DVI mode, keep EUT working with external DVI source.
- d: CVBS mode, keep EUT working with external CVBS source.
- e: USB play mode, keep EUT playing with USB stick.
- f: LAN mode, keep EUT working via LAN in port.
- g: Idle mode.

7.3.3 Test Results:

Frequency	Level (V/m)	EUT Face	Dwell time	Result / Observations
80MHz-1GHz	3	Front	2s	A
80MHz-1GHz	3	Back	2s	A
80MHz-1GHz	3	Left	2s	A
80MHz-1GHz	3	Right	2s	A
80MHz-1GHz	3	Top	2s	A
80MHz-1GHz	3	Underside	2s	A

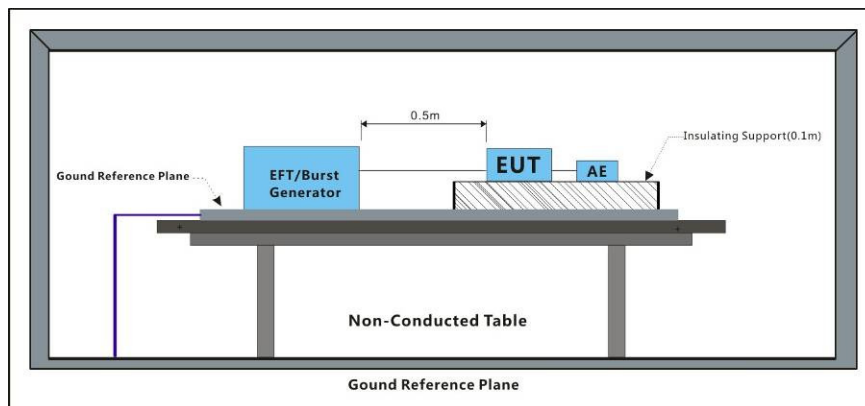
Results:

A: No degradation in the performance of the EUT was observed.

7.4 Electrical Fast Transients/Burst at Power Port

Test Requirement:	EN 55024:2010 +A1:2015
Test Method:	EN 61000-4-4:2012
Performance Criterion:	B
Repetition Frequency:	5kHz
Burst Period:	300ms
Test Duration:	2 minute per level & polarity

7.4.1 Test Setup Diagram



7.4.2 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 51 % RH Atmospheric Pressure: 1005 mbar

Test mode:

- a: HDMI mode, keep EUT working with external HDMI source.
- b: VGA mode, keep EUT working with external VGA source.
- c: DVI mode, keep EUT working with external DVI source.
- d: CVBS mode, keep EUT working with external CVBS source.
- e: USB play mode, keep EUT playing with USB stick.
- f: LAN mode, keep EUT working via LAN in port.
- g: Idle mode.

7.4.3 Test Results:

Test Line	Level (kV)	Polarity	CDN/Clamp	Result / Observations
AC power port	1	+	CDN	A
AC power port	1	-	CDN	A

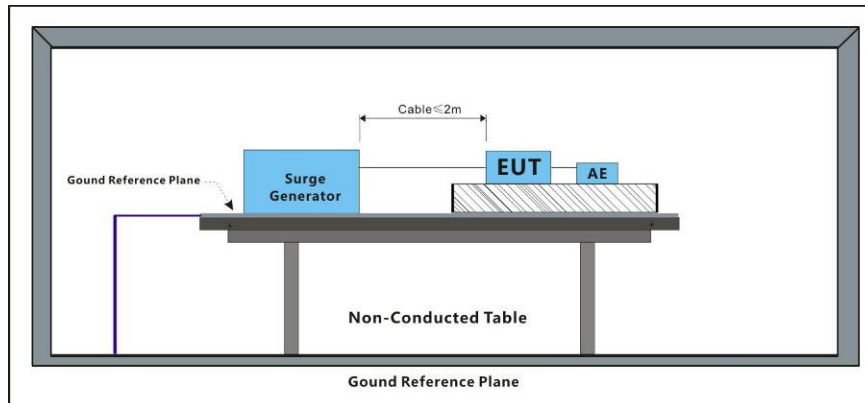
Results:

A: No degradation in the performance of the EUT was observed.

7.5 Surge at Power Port

Test Requirement: EN 55024:2010 +A1:2015
Test Method: EN 61000-4-5:2014
Performance Criterion: B
Interval: 60s between each surge
No. of surges: 5 positive, 5 negative at 0°, 90°, 180°, 270°.

7.5.1 Test Setup Diagram



7.5.2 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 51 % RH Atmospheric Pressure: 1005 mbar

Test mode:
a: HDMI mode, keep EUT working with external HDMI source.
b: VGA mode, keep EUT working with external VGA source.
c: DVI mode, keep EUT working with external DVI source.
d: CVBS mode, keep EUT working with external CVBS source.
e: USB play mode, keep EUT playing with USB stick.
f: LAN mode, keep EUT working via LAN in port.
g: Idle mode.

7.5.3 Test Results:

Test Line	Level (kV)	Polarity	Phase (deg)	Result / Observations
L-N	1	+	0°	A
L-N	1	-	0°	A
L-N	1	+	90°	A
L-N	1	-	90°	A
L-N	1	+	180°	A
L-N	1	-	180°	A
L-N	1	+	270°	A
L-N	1	-	270°	A
L-PE	2	+	0°	A
L-PE	2	-	0°	A
L-PE	2	+	90°	A
L-PE	2	-	90°	A
L-PE	2	+	180°	A
L-PE	2	-	180°	A
L-PE	2	+	270°	A

L-PE	2	-	270°	A
N-PE	2	+	0°	A
N-PE	2	-	0°	A
N-PE	2	+	90°	A
N-PE	2	-	90°	A
N-PE	2	+	180°	A
N-PE	2	-	180°	A
N-PE	2	+	270°	A
N-PE	2	-	270°	A

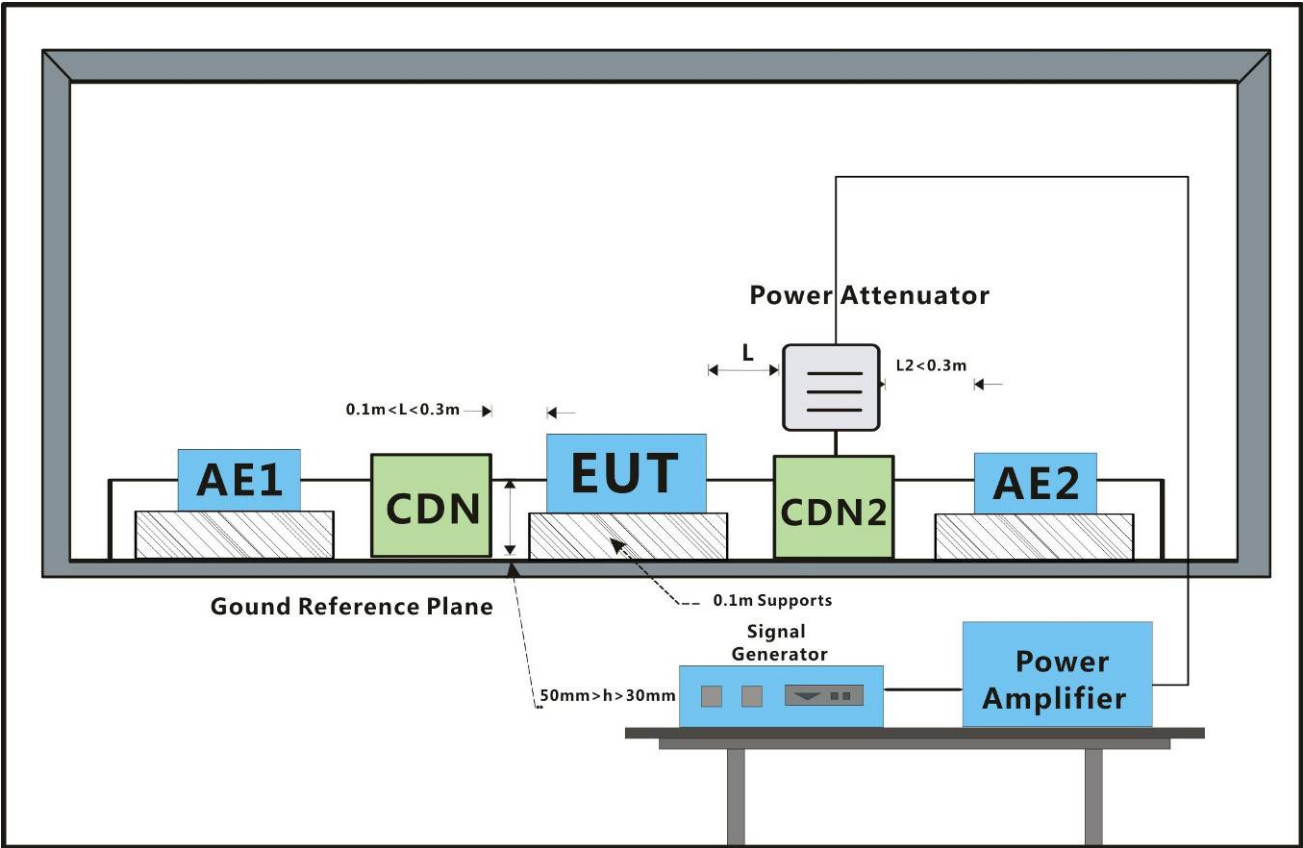
Results:

A: No degradation in the performance of the EUT was observed.

7.6 Conducted Immunity at Power Port (150kHz-80MHz)

Test Requirement: EN 55024:2010 +A1:2015
Test Method: EN 61000-4-6:2014
Performance Criterion: A
Frequency Range: 0.15MHz to 80MHz
Modulation: 80%, 1kHz Amplitude Modulation
Step Size 1%

7.6.1 Test Setup Diagram



7.6.2 E.U.T. Operation

Operating Environment:
Temperature: 25 °C Humidity: 51 % RH Atmospheric Pressure: 1005 mbar
Test mode:
a: HDMI mode, keep EUT working with external HDMI source.
b: VGA mode, keep EUT working with external VGA source.
c: DVI mode, keep EUT working with external DVI source.
d: CVBS mode, keep EUT working with external CVBS source.
e: USB play mode, keep EUT playing with USB stick.
f: LAN mode, keep EUT working via LAN in port.
g: Idle mode.

7.6.3 Test Results:

Cable port	Level (Vrms)	CDN/Clamp	Dwell time	Result / Observations
AC power port	3	CDN	2s	A

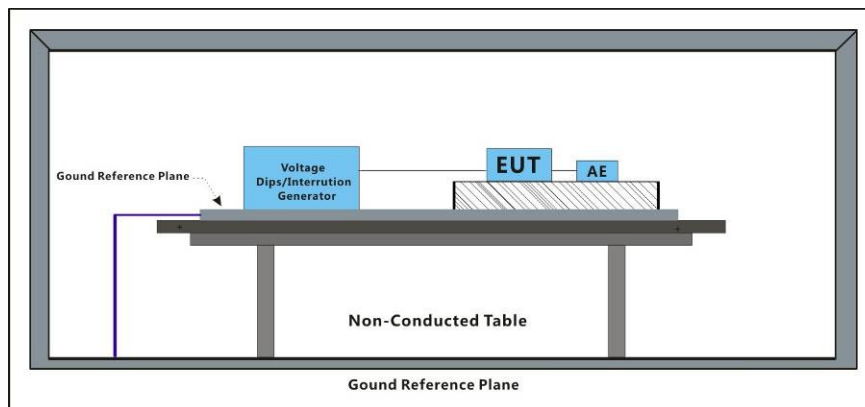
Results:

A: No degradation in the performance of the EUT was observed.

7.7 Voltage Dips and Interruptions

Test Requirement: EN 55024:2010 +A1:2015
Test Method: EN 61000-4-11:2004
Performance Criterion: 0% of UT (Supply Voltage) for 0.5 Periods:B; 0% of UT for 250 Periods:C;
70 % of UT for 25 Periods:C
No. of Dips / Interruptions: 3 per Level
Time between dropout 10s

7.7.1 Test Setup Diagram



7.7.2 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 51 % RH Atmospheric Pressure: 1005 mbar

Test mode:

- a: HDMI mode, keep EUT working with external HDMI source.
- b: VGA mode, keep EUT working with external VGA source.
- c: DVI mode, keep EUT working with external DVI source.
- d: CVBS mode, keep EUT working with external CVBS source.
- e: USB play mode, keep EUT playing with USB stick.
- f: LAN mode, keep EUT working via LAN in port.
- g: Idle mode.

7.7.3 Test Results:

Level % UT	Phase (deg)	Duration	No. of Dips / Interruptions	Result / Observations
0	0°	0.5 Cycles	3	A
0	180°	0.5 Cycles	3	A
0	0°	250 Cycles	3	C
0	180°	250 Cycles	3	C
70	0°	25 Cycles	3	A
70	180°	25 Cycles	3	A

Results:

A: No degradation in the performance of the EUT was observed.

C: The EUT power off during the test, but it can be recovered by user after the test

8 Photographs

8.1 Conducted Emissions at Mains Terminals (150kHz-30MHz) Test Setup



8.2 Radiated Emissions (30MHz-1GHz) Test Setup



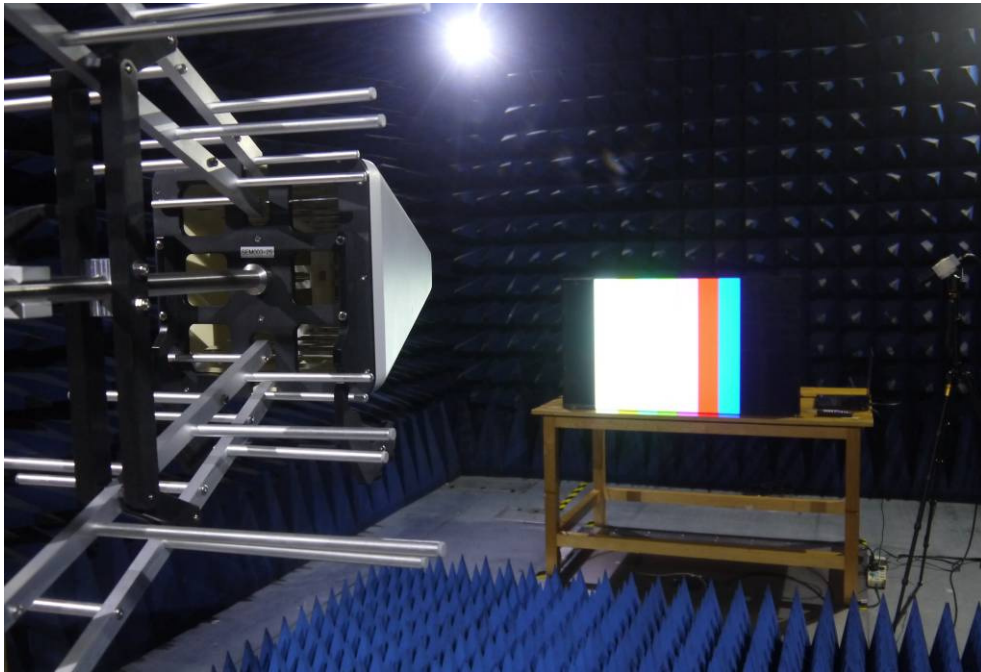
8.3 Voltage Fluctuations and Flicker Test Setup



8.4 Electrostatic Discharge Test Setup



8.5 Radiated Immunity (80MHz-1GHz) Test Setup



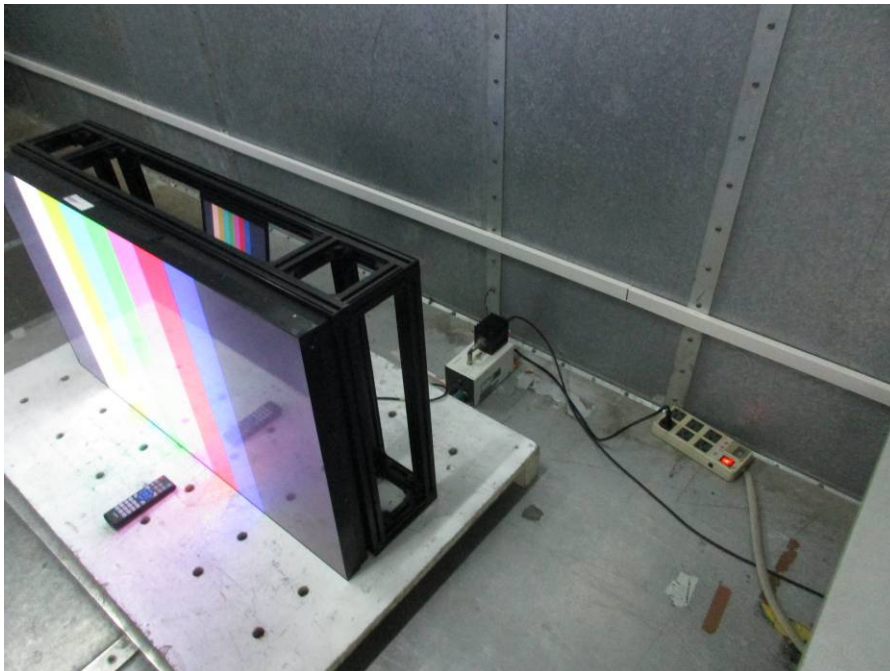
8.6 Electrical Fast Transients/Burst at Power Port Test Setup



8.7 Surge at Power Port Test Setup



8.8 Conducted Immunity at Power Port (150kHz-80MHz) Test Setup



8.9 Voltage Dips and Interruptions Test Setup



8.10 EUT Constructional Details







