

EMC TEST REPORT

Report No. : ACS-E19168

Applicant : TPV Electronics (FuJian) Co., Ltd.
Rongqiao Economic and Technological Development
Zone, Fuqing City, Fujian Province, P.R. China

Product : LCD Monitor

Model No. : M245AZ; MultiSync E242N; MultiSync E242N-BK

Brand : NEC

Test Lab. : Audix Technology (Shenzhen) Co., Ltd.
No. 6, Kefeng Road, Science & Technology Park,
Nanshan District, Shenzhen, Guangdong, China
Tel: (0755) 26639496
Fax: (0755) 26632877

Date of Test : Jun.07~18,2019

Date of Report : Jul.01,2019



TESTING

NVLAP LAB CODE 200372-0

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TEST REPORT VERIFICATION

Applicant : TPV Electronics (FuJian) Co., Ltd.
Product : LCD Monitor
Model No. : M245AZ; MultiSync E242N; MultiSync E242N-BK
Brand : NEC
Report No. : ACS-E19168
Power Supply : AC 100-240V, 50/60Hz
Test Voltage : AC 230V/50Hz, AC 110V/60Hz, AC 100V/50Hz
Standards : EN 55032: 2012+AC: 2013 (Class B)
EN 55032: 2015
EN 55032: 2015+AC: 2016
CISPR 32: 2012
CISPR32: 2015/COR1: 2016 (AS/NZS CISPR 32: 2015)
EN 61000-3-2: 2014, EN 61000-3-3: 2013
EN 55024: 2010
EN 55024: 2010+A1: 2015
(IEC 61000-4-2: 2008, IEC 61000-4-3: 2006+A1:2007+A2:2010,
IEC 61000-4-4: 2012, IEC 61000-4-5: 2014,
IEC 61000-4-6: 2013, IEC 61000-4-8: 2009
IEC 61000-4-11: 2004, IEC 61000-4-11: 2004+A1: 2017)

The device described above is tested by Audix Technology (Shenzhen) Co., Ltd. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The test results are contained in this test report and Audix Technology (Shenzhen) Co., Ltd. is assumed full responsibility for the accuracy and completeness of test. Also, this report shows that the EUT is technically compliant with the requirements of EN 55032, EN 61000-3-2, EN 61000-3-3 and EN 55024 standards.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Audix Technology (Shenzhen) Co., Ltd.

Date of Test : Jun.07~18,2019 Report of date: Jul.01,2019

Prepared by : Yena Xu Reviewed by : Bensun Chen
Yena Xu / Assistant Bensun Chen / Deputy Manager

Approved & Authorized Signer : Signature: David Jin
David Jin / Manager



1. SUMMARY OF STANDARDS AND RESULTS

1.1. Description of Standards and Results

The EUT has been tested according to the applicable standards as referenced below.

EMISSION				
Description of Test Item	Standard	Results	Remark	
Conducted emission at mains terminals	EN 55032: 2012+AC: 2013 EN 55032: 2015 EN 55032: 2015+AC: 2016	PASS	Minimum passing margin is 12.69dB at 0.15MHz	
Conducted emission at telecommunication port	EN 55032: 2012+AC: 2013 EN 55032: 2015 EN 55032: 2015+AC: 2016	N/A	N/A	
Radiated emission (30-1000MHz)	EN 55032: 2012+AC: 2013 EN 55032: 2015 EN 55032: 2015+AC: 2016	PASS	Minimum passing margin is 4.22dB at 73.65MHz	
Radiated emission (1-6GHz)	EN 55032: 2012+AC: 2013 EN 55032: 2015 EN 55032: 2015+AC: 2016	PASS	Minimum passing margin is 7.39dB at 2072.13MHz	
Harmonic current emissions	EN 61000-3-2: 2014	PASS	Meets the Class D requirement	
Voltage fluctuations & flicker	EN 61000-3-3: 2013	PASS	Meets the requirement	
IMMUNITY				
Description of Test Item	Basic Standard	Results	Performance Criteria	Observation Criteria
Electrostatic discharge (ESD)	IEC 61000-4-2: 2008	PASS	B	A & B
Radiated, radio-frequency, electromagnetic field immunity test	IEC 61000-4-3: 2006+A1:2007+A2:2010	PASS	A	A
Electrical fast transient (EFT)	IEC 61000-4-4: 2012	PASS	B	A & B
Surge (Input a.c. power port)	IEC 61000-4-5: 2014	PASS	B	A & B
Surge(Telecommunication port)		N/A	N/A	N/A
Continuous Conducted disturbance	IEC 61000-4-6: 2013	PASS	A	A
Power frequency magnetic field	IEC 61000-4-8: 2009	PASS	A	A
Voltage dips, >95% reduction	IEC 61000-4-11: 2004 IEC-61000-4-11: 2004+A1: 2017	PASS	B	A
Voltage dips, 30% reduction		PASS	C	A
Voltage interruptions		PASS	C	C
N/A is an abbreviation for Not Applicable.				

2. GENERAL INFORMATION

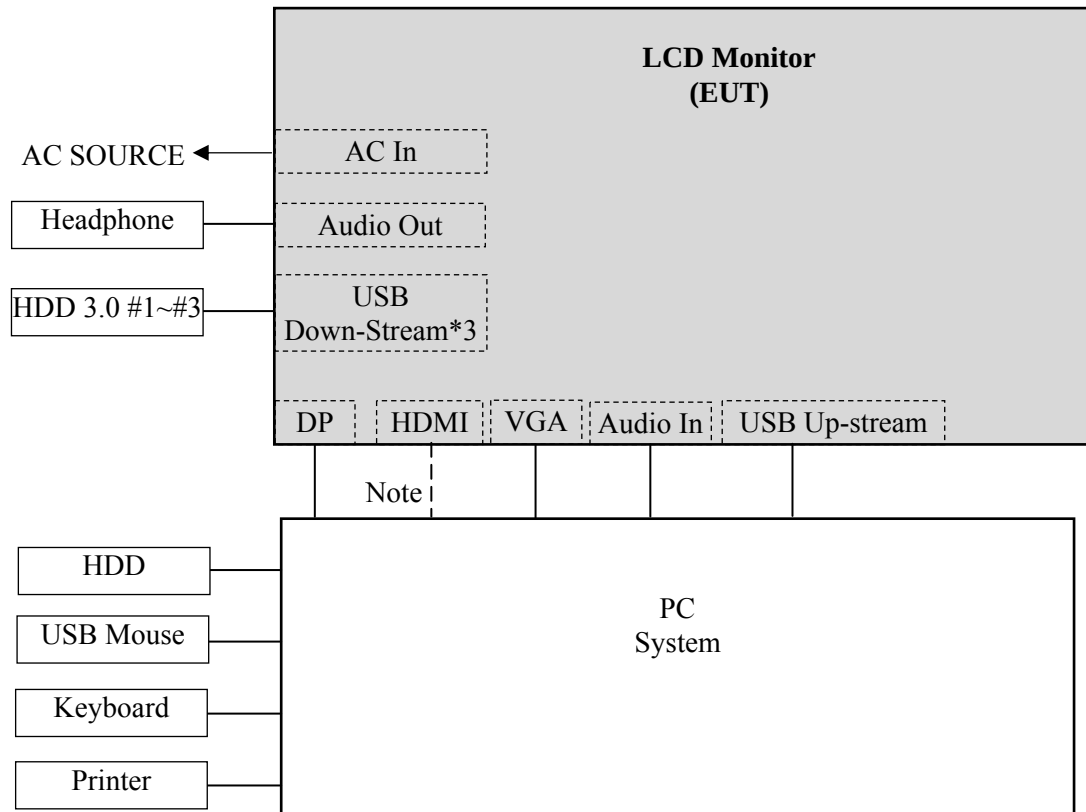
2.1. Description of Device (EUT)

Product	: LCD Monitor
Model no.	: M245AZ; MultiSync E242N; MultiSync E242N-BK
Brand	: NEC
Applicant	: TPV Electronics (FuJian) Co., Ltd. Rongqiao Economic and Technological Development Zone, Fuqing City, Fujian Province, P.R. China
Max. Resolution	: 1920*1080@60Hz
Max. Work Frequency	: 170MHz
I/O Port	: (1) One AC In Port (2) One DP Port (3) One HDMI Port (4) One VGA Port (5) One Audio Out Ports (6) One Audio In Port (7) One USB Up-stream Port (8) Three USB Down-stream Ports
VGA Cable	: Shielded, Detachable, 1.8m/1.5m(with two cores)
HDMI Cable	: Shielded, Detachable, 1.8m/1.5m
DP Cable	: Shielded, Detachable, 1.8m/1.5m
Audio Cable	: Shielded, Detachable, 1.8m/1.5m
USB Cable	: Shielded, Detachable, 1.8m/1.5m
Power Cord	: Unshielded, Detachable, 1.8m/1.5m (3 pins)
Date of Test	: Jun.07~18,2019
Date of Receipt	: Jun.05,2019
Sample Type	: Prototype production

2.2. Tested Supporting System Details

No.	Description	ACS No.	Manufacturer	Model	Serial Number
1.	Personal Computer	Test PC Q	acer	Veriton T630	DTVMKCN00560900F629600
		Power Cord: Unshielded, Detachable, 1.8m Display Card: (VGA+DVI+HDMI)			
2.	USB Keyboard	ACS-EMC-K03R	DELL	SK-8120	CN-ODJ365-71616-2BE-0DCE-A00
		USB Cable: Shielded, Undetachable, 1.5m			
3.	USB Mouse	ACS-EMC-M03R	Dell	M0C5UO	512023253
		USB Cable: Shielded, Undetachable, 1.8m			
4.	Printer	ACS-EMC-PT04	HP	C9079A	---
		USB Cable: Shielded, Detachable, 1.8m Power Cord: Unshielded, Detachable, 1.8m			
5.	Headphone	ACS-EMC-EP01	OVANN	0V-T880V	---
		Data Cable: Shielded, Undetachable, 2.0m			
6.	HDD	ACS-EMC-HDD01	Terasys	F12-UF	A0100215-5390031
		USB Cable: Shielded, Detachable, 1.8m			
7.	DVD	ACS-EMC-DVD	PHILIPS	BDP3100/12	---
		Power Cord: Unshielded, Detachable, 1.8m			
8.	HDD 3.0#1	ACS-EMC-HDD33	WD	WD My Book Studio	WCAV5C987862
		USB Cable: Shielded, Detachable, 1.8m			
9.	HDD 3.0#2	ACS-EMC-HDD34	WD	WD My Book Studio	WCAV4302542
		USB Cable: Shielded, Detachable, 1.8m			
10.	HDD 3.0#3	ACS-EMC-HDD35	WD	WD My Book Studio	WCAV5D02502
		USB Cable: Shielded, Detachable, 1.8m			

2.3. Block Diagram of connection between EUT and simulators



Note : PC Mode and DVD Mode can not link the HDMI Port at the same time.
(EUT: LCD Monitor)

2.4. Test Facility

Site Description

Name of Firm : Audix Technology (Shenzhen) Co., Ltd.
No. 6, Kefeng Road, Science & Technology Park,
Nanshan District, Shenzhen, Guangdong, China

EMC Lab. : Certificated by DAkkS, Germany
Registration No: D-PL-12151-01-00
Valid Date: Dec.07, 2021

Accredited by NVLAP, USA
NVLAP Code: 200372-0
Valid Date: Mar.31, 2020

Certificated by FCC, USA
Designation No: CN5022
Valid Date: Mar.31, 2020

Certificated by TAF, Taiwan
Registration No: 1418
Valid Date: Nov.08, 2020

2.5. Measurement Uncertainty (95% confidence levels, k=2)

Test Item	Uncertainty
Uncertainty for Conduction emission test in No. 2 Conduction	2.4dB (150kHz to 30MHz)
Uncertainty for Radiation Emission test in 10m chamber (Distance: 10m)	3.6dB (30~200MHz, Polarization: H)
	3.8dB (30~200MHz, Polarization: V)
	4.0dB (200M~1GHz, Polarization: H)
	4.2dB (200M~1GHz, Polarization: V)
Uncertainty for Radiation Emission test in 10m chamber (1GHz-18GHz)	5.0dB (1-6GHz, Distance: 3m)
	5.4dB (6-18GHz, Distance: 3m)
Uncertainty for S _{VSWR} in 10m Chamber	2.8dB (1-6GHz, Distance: 3m)
	2.8dB (6-18GHz, Distance: 3m)
Uncertainty for Flicker test	1.5%
Uncertainty for Harmonic test	8.0%
Uncertainty for C/S Test	1.4dB (Using CDN test)
	3.2dB (Using EM clamp test)
Uncertainty for R/S Test	2.31dB (80MHz~200MHz)
	2.31dB (200MHz~1000MHz)
Uncertainty for Magnetic field immunity test	2%
Uncertainty for test site temperature and humidity and Pressure	0.6℃
	3%
	1kPa

Note: EMI uncertainty is evaluated by CISPR16-4-2.

The value of measurement uncertainty of EMI is less than U_{CISPR} .

The value is not calculated in the test results."

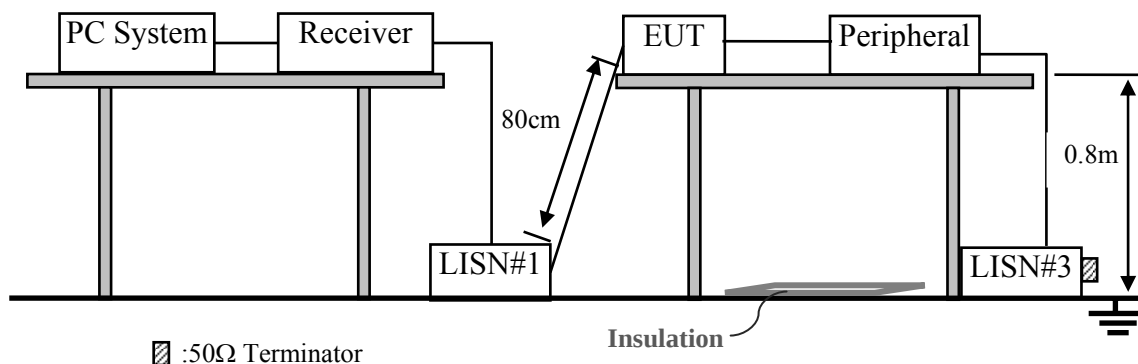
3. CONDUCTED EMISSION AT MAINS TERMINALS TEST

3.1. Test Equipments

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	2# Shielding Room	AUDIX	N/A	N/A	Apr.15,18	3 Year
2.	Test Receiver	Rohde & Schwarz	ESCI	100843	Oct.13,18	1 Year
3.	L.I.S.N.#1	Rohde & Schwarz	ENV4200	100041	Apr.18,19	1 Year
4.	L.I.S.N.#2	Kyoritsu	KNW-407	8-1636-1	Apr.18,19	1 Year
5.	Terminator	Hubersuhner	50Ω	No.4	Apr.14,19	1 Year
6.	Terminator	Hubersuhner	50Ω	No.5	Apr.14,19	1 Year
7.	RF Cable	Fujikura	RG55/U	No.3	Apr.13,19	1 Year
8.	Test Software	AUDIX	e3	6.100913a	N/A	N/A

Note: N/A means Not applicable.

3.2. Block Diagram of Test Setup



3.3. Test Standard

EN 55032: 2012+AC: 2013 Class B

EN 55032: 2015

EN 55032: 2015+AC: 2016

3.4. Power Line Conducted Emission at Mains Terminals Limit

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. * Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

3.5. EUT Configuration on Test

The following equipments are installed on Conducted Emission Test to meet EN 55032 requirement and operating in a manner which tends to maximize its emission characteristics in a normal application.

3.5.1.LCD Monitor (EUT)

Model No. : M245AZ

3.5.2.Support Equipment : As Tested Supporting System Detail, in Section 2.2.

3.6. Operating Condition of EUT

3.6.1.Setup the EUT and simulator as shown as Section 3.2.

3.6.2.Turn on the power of all equipments.

3.6.3.For EMI: PC system sent “Color Bars with moving picture element” to LCD Monitor (EUT) through VGA / HDMI / DP ports.

3.6.4.For EMS: PC system ran the Self-test program “EMC Test” by windows 7 and sent “H” Character to LCD Monitor (EUT) through VGA/ HDMI / DP ports, the Screen of EUT displayed and filled with “H” pattern.

3.6.5.DVD Mode: The DVD player played DVD Disk and sent “DVD 1kHz Signal Playing” image to the LCD Monitor (EUT).

3.6.6.The PC system was running the program “1kHz signal playing” and sending sound to EUT.

3.6.7.The other peripheral devices were driven and operated in turn during all testing.

3.6.8.The EUT is designed with AC power of rating AC 230V/50Hz & AC 110V/60Hz (for EN55032 & CISPR 32 & AS/NZS CISPR 32) had been covered during the pre-test. The worst data was found at AC 230V/50Hz and recorded in the applied test report.

3.7. Test Procedure

The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power connected to the power mains through a line impedance stabilization network (L.I.S.N. #1). This provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N. #3). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to EN 55032 Class B on conducted Emission test.

The bandwidth of test receiver (R & S ESCI) is set at 9kHz.

The frequency range from 150kHz to 30MHz is checked. These test results of the conducted disturbance are recorded in section 3.8.

3.8. Conducted Emission at Mains Terminals Test Results

PASS. (All emissions not reported below are too low against the prescribed limits.)

EUT: LCD Monitor

Model No. : M245AZ

Test Date: Jun.11,2019 Temperature: 24.1℃ Humidity: 55% Pressure: 101.6kPa

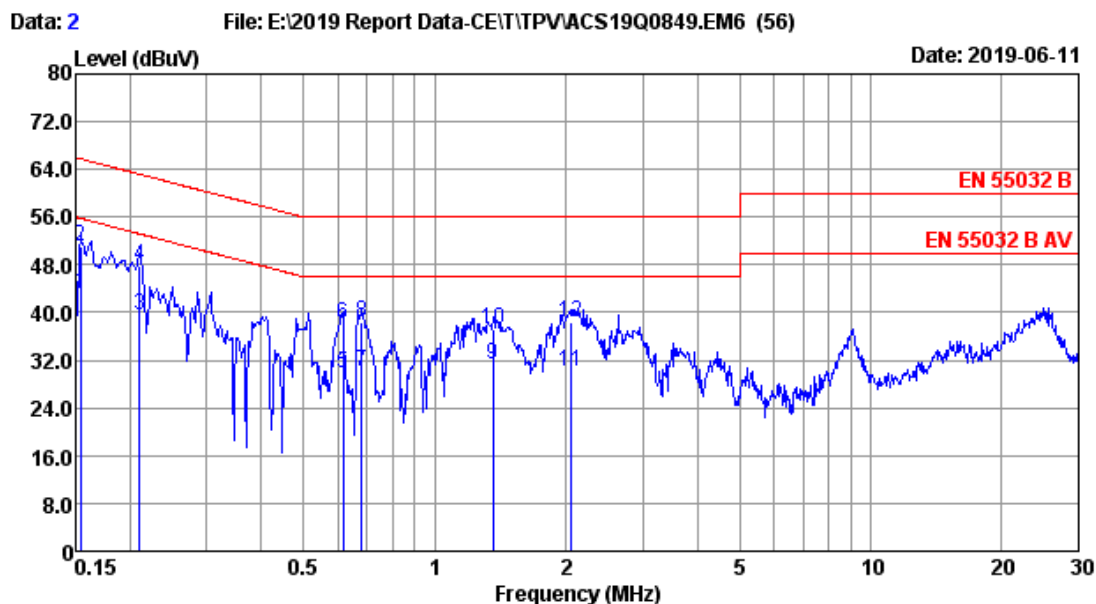
The EUT with following test modes were pre-tested:

No.	Test Voltage	Test Mode	Input Port	Cable Length	Resolution & Frequency
1.	AC 230V/50Hz	PC Mode	HDMI	1.8m	640*480@60Hz
2.					1280*1024@75Hz
3.					1920*1080@60Hz
4.					1080*1920@60Hz (Panel is Vertical)(+90°)
5.					1080*1920@60Hz (Panel is Vertical)(-90°)
6.			DP	1.5m	1920*1080@60Hz
7.				1.8m	640*480@60Hz
8.					1280*1024@75Hz
9.					1920*1080@60Hz
10.			VGA	1.8m	640*480@60Hz
11.					1280*1024@75Hz
12.					1920*1080@60Hz
13.		DVD Mode	HDMI	1.8m	Color Bar
14.		Standby	---	---	---
15.	AC 110V/60Hz	PC Mode	HDMI	1.8m	1920*1080@60Hz

The result of worst test mode is presented in the report as below and the test data are listed in next pages.

No.	Test Voltage	Cable Length	Test Mode	Input Port	Resolution & Frequency	Reference Test Data No.	
						Line	Neutral
1. *	AC 230V/50Hz	1.8m	PC (Running ITU-R BT 1729)	HDMI	1920*1080@60Hz	#2	#1
2.			PC (Running ITU-R BT 471-1)		1920*1080@60Hz	#4	#3

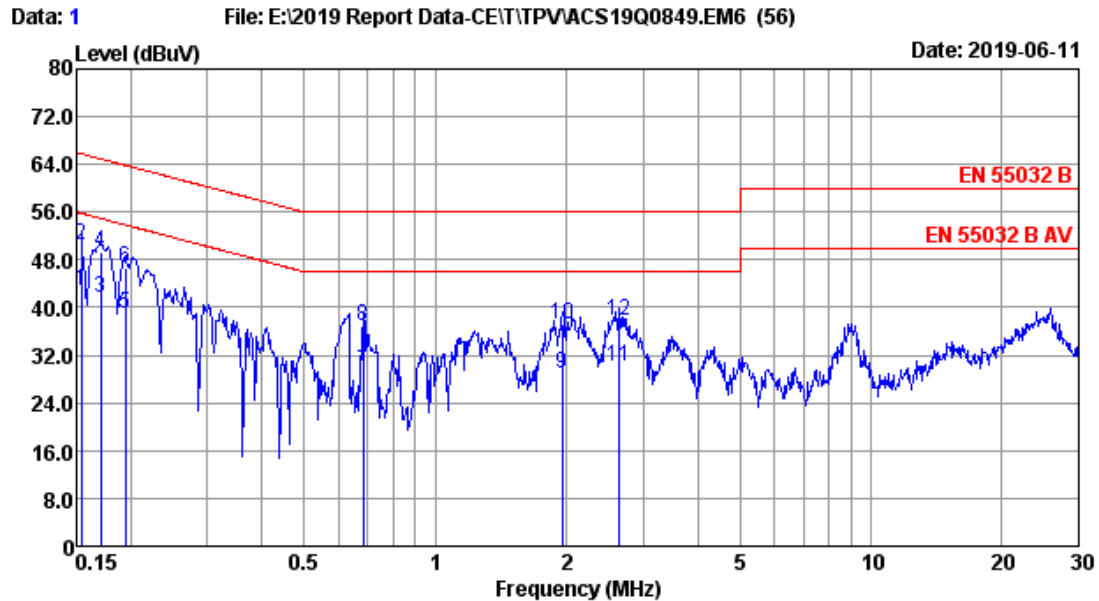
(* means the worst test mode)



Site no :2# Conduction Data No :2
 Dis./Lisn :2019 ENV4200-L1 LISN phase:LINE
 Limit :EN 55032 B Pressure : 101.6kPa
 Env./Ins. :24.1°C/55% Engineer :Gavin
 EUT :M245AZ
 Power Rating :AC 230V/50Hz
 Test Mode :Running ITU-R BT 1729
 HDMI:1920*1080@60Hz
 Line:1.8m

No	Freq (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin limit (dB)	Remark
1	0.15	9.90	0.03	33.16	43.09	55.78	12.69	Average
2	0.15	9.90	0.03	41.03	50.96	65.78	14.82	QP
3	0.21	9.90	0.03	29.74	39.67	53.18	13.51	Average
4	0.21	9.90	0.03	37.90	47.83	63.18	15.35	QP
5	0.62	9.70	0.03	20.18	29.91	46.00	16.09	Average
6	0.62	9.70	0.03	28.35	38.08	56.00	17.92	QP
7	0.68	9.70	0.03	20.42	30.15	46.00	15.85	Average
8	0.68	9.70	0.03	28.73	38.46	56.00	17.54	QP
9	1.36	9.70	0.03	21.69	31.42	46.00	14.58	Average
10	1.36	9.70	0.03	27.45	37.18	56.00	18.82	QP
11	2.04	9.70	0.04	20.35	30.09	46.00	15.91	Average
12	2.04	9.70	0.04	28.78	38.52	56.00	17.48	QP

Remarks: 1.Emission Level=LISN Factor+Cable Loss+Reading.
 2.If the average limit is met when using a quasi-peak detector.
 the EUT shall be deemed to meet both limits and measurement
 with average detector is unnecessary.

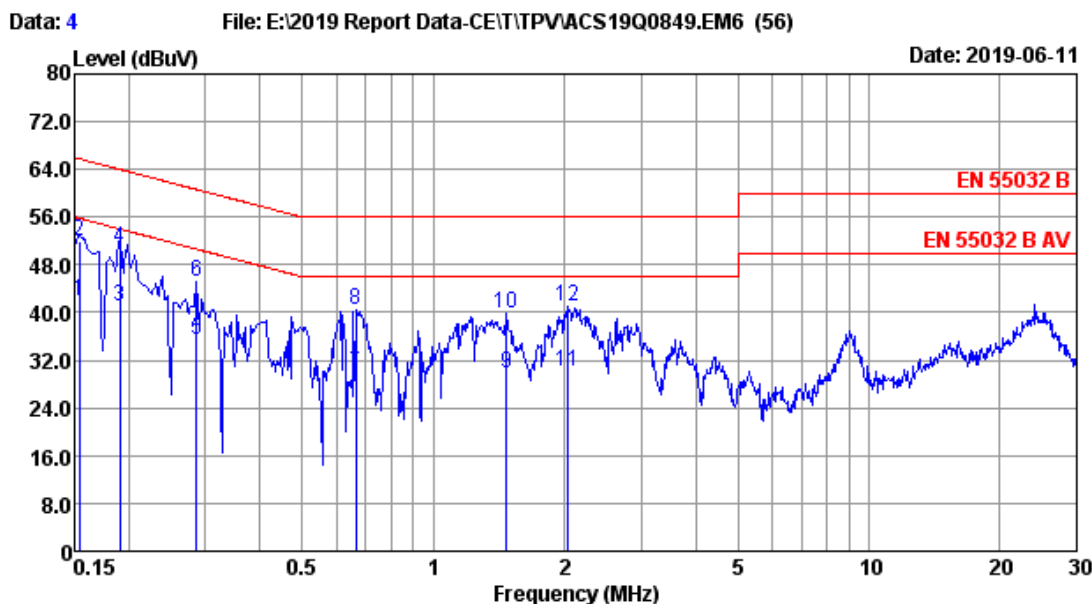


Site no :2# Conduction
 Dis./Lisn :2019 ENV4200-N
 Limit :EN 55032 B
 Env./Ins. :24.1°C/55%
 EUT :M245AZ
 Power Rating :AC 230V/50Hz
 Test Mode :Running ITU-R BT 1729
 HDMI:1920*1080@60Hz
 Line:1.8m

Data No :1
 LISN phase:NEUTRAL
 Pressure : 101.6kPa
 Engineer :Gavin

No	Freq (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin limit (dB)	Remark
1	0.15	10.00	0.03	32.64	42.67	55.78	13.11	Average
2	0.15	10.00	0.03	40.31	50.34	65.78	15.44	QP
3	0.17	9.95	0.03	31.78	41.76	54.94	13.18	Average
4	0.17	9.95	0.03	39.32	49.30	64.94	15.64	QP
5	0.19	9.95	0.03	28.91	38.89	53.84	14.95	Average
6	0.19	9.95	0.03	36.61	46.59	63.84	17.25	QP
7	0.68	9.60	0.03	19.53	29.16	46.00	16.84	Average
8	0.68	9.60	0.03	27.39	37.02	56.00	18.98	QP
9	1.96	9.60	0.03	19.35	28.98	46.00	17.02	Average
10	1.96	9.60	0.03	27.55	37.18	56.00	18.82	QP
11	2.65	9.60	0.04	20.37	30.01	46.00	15.99	Average
12	2.65	9.60	0.04	28.12	37.76	56.00	18.24	QP

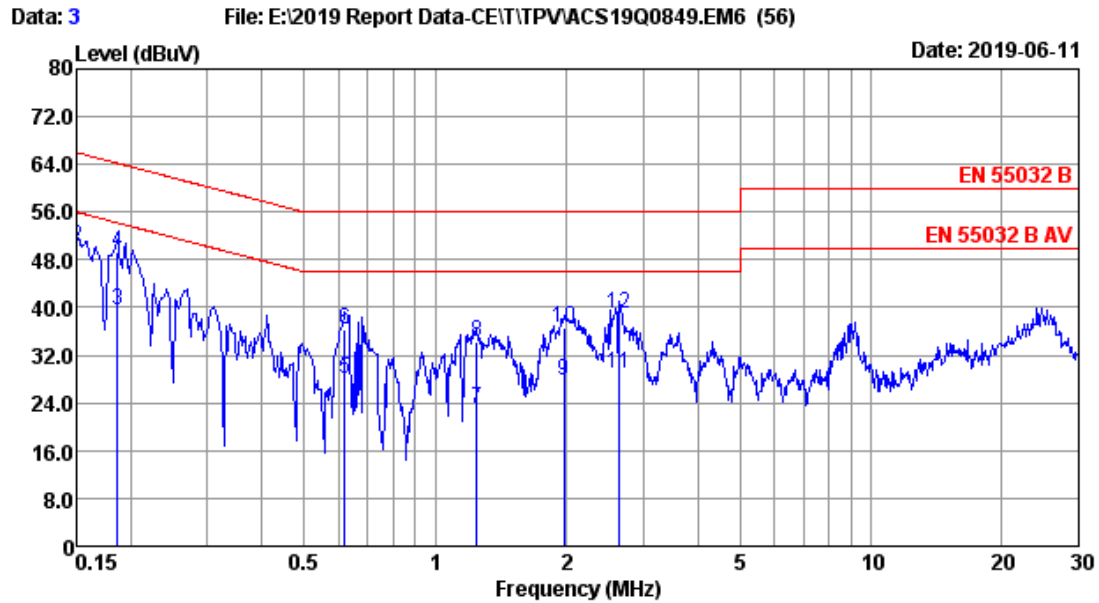
Remarks: 1.Emission Level=LISN Factor+Cable Loss+Reading.
 2.If the average limit is met when using a quasi-peak detector.
 the EUT shall be deemed to meet both limits and measurement
 with average detector is unnecessary.



Site no :2# Conduction Data No :4
 Dis./Lisn :2019 ENV4200-L1 LISN phase:LINE
 Limit :EN 55032 B Pressure : 101.6kPa
 Env./Ins. :24.1°C/55% Engineer :Gavin
 EUT :M245AZ
 Power Rating :AC 230V/50Hz
 Test Mode :Running ITU-R BT 471-1
 HDMI:1920*1080@60Hz
 Line:1.8m

No	Freq (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin limit (dB)	Remark
1	0.15	9.90	0.03	32.13	42.06	55.78	13.72	Average
2	0.15	9.90	0.03	42.13	52.06	65.78	13.72	QP
3	0.19	9.90	0.03	31.02	40.95	54.02	13.07	Average
4	0.19	9.90	0.03	40.92	50.85	64.02	13.17	QP
5	0.29	9.84	0.03	25.63	35.50	50.63	15.13	Average
6	0.29	9.84	0.03	35.32	45.19	60.63	15.44	QP
7	0.66	9.70	0.03	20.12	29.85	46.00	16.15	Average
8	0.66	9.70	0.03	30.73	40.46	56.00	15.54	QP
9	1.47	9.70	0.03	20.13	29.86	46.00	16.14	Average
10	1.47	9.70	0.03	30.12	39.85	56.00	16.15	QP
11	2.03	9.70	0.04	20.43	30.17	46.00	15.83	Average
12	2.03	9.70	0.04	31.38	41.12	56.00	14.88	QP

Remarks: 1.Emission Level=LISN Factor+Cable Loss+Reading.
 2.If the average limit is met when using a quasi-peak detector.
 the EUT shall be deemed to meet both limits and measurement
 with average detector is unnecessary.



Site no :2# Conduction Data No :3
 Dis./Lisn :2019 ENV4200-N LISN phase:NEUTRAL
 Limit :EN 55032 B Pressure : 101.6kPa
 Env./Ins. :24.1°C/55% Engineer :Gavin
 EUT :M245AZ
 Power Rating :AC 230V/50Hz
 Test Mode :Running ITU-R BT 471-1
 HDMI:1920*1080@60Hz
 Line:1.8m

No	Freq (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin limit (dB)	Remark
1	0.15	10.00	0.03	30.26	40.29	56.00	15.71	Average
2	0.15	10.00	0.03	40.14	50.17	66.00	15.83	QP
3	0.19	9.95	0.03	29.56	39.54	54.20	14.66	Average
4	0.19	9.95	0.03	39.43	49.41	64.20	14.79	QP
5	0.62	9.60	0.03	18.43	28.06	46.00	17.94	Average
6	0.62	9.60	0.03	26.64	36.27	56.00	19.73	QP
7	1.24	9.60	0.03	13.43	23.06	46.00	22.94	Average
8	1.24	9.60	0.03	24.67	34.30	56.00	21.70	QP
9	1.97	9.60	0.04	18.25	27.89	46.00	18.11	Average
10	1.97	9.60	0.04	27.06	36.70	56.00	19.30	QP
11	2.65	9.60	0.04	19.23	28.87	46.00	17.13	Average
12	2.65	9.60	0.04	29.29	38.93	56.00	17.07	QP

Remarks: 1.Emission Level=LISN Factor+Cable Loss+Reading.
 2.If the average limit is met when using a quasi-peak detector.
 the EUT shall be deemed to meet both limits and measurement
 with average detector is unnecessary.

4. RADIATED EMISSION MEASUREMENT

4.1. Test Equipments

4.1.1. For frequency range 30MHz~1000MHz (In 10m Anechoic Chamber)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	10m Chamber	AUDIX	N/A	N/A	Apr.15,19	1 Year
2.	Signal Analyzer	Rohde & Schwarz	FSV30	103669	Oct.14,18	1 Year
3.	Signal Analyzer	Rohde & Schwarz	FSV30	103670	Oct.14,18	1 Year
4.	EMI Test Receiver	Rohde & Schwarz	ESR3	101931	Apr.14,19	1 Year
5.	Amplifier	EMCI	EMC9135	980347	Sep.08,18	1 Year
6.	Amplifier	EMCI	EMC9135	980348	Mar.07,19	1 Year
7.	Tri-log-Broadband Antenna	SCHWARZBEC K	VULB 9168	710	Aug.22,18	1 Year
8.	Tri-log-Broadband Antenna	SCHWARZBEC K	VULB 9168	429	May.08,19	1 Year
9.	RF Cable	SPUMA	CFD400NL-LW	No.4	Sep.08,18	1 Year
10.	RF Cable	SPUMA	CFD400-NM-NM	160727+160728	Sep.08,18	1 Year
11.	Coaxial Switch	Anritsu	MP59B	6201397220	Apr.14,19	1 Year
12.	Coaxial Switch	Anritsu	MP59B	6201397221	Apr.14,19	1 Year
13.	Coaxial Switch	Anritsu	MP59B	6201397224	Apr.14,19	1 Year
14.	Test Software	AUDIX	e3	6.100913a	N/A	N/A

Note: N/A means Not applicable.

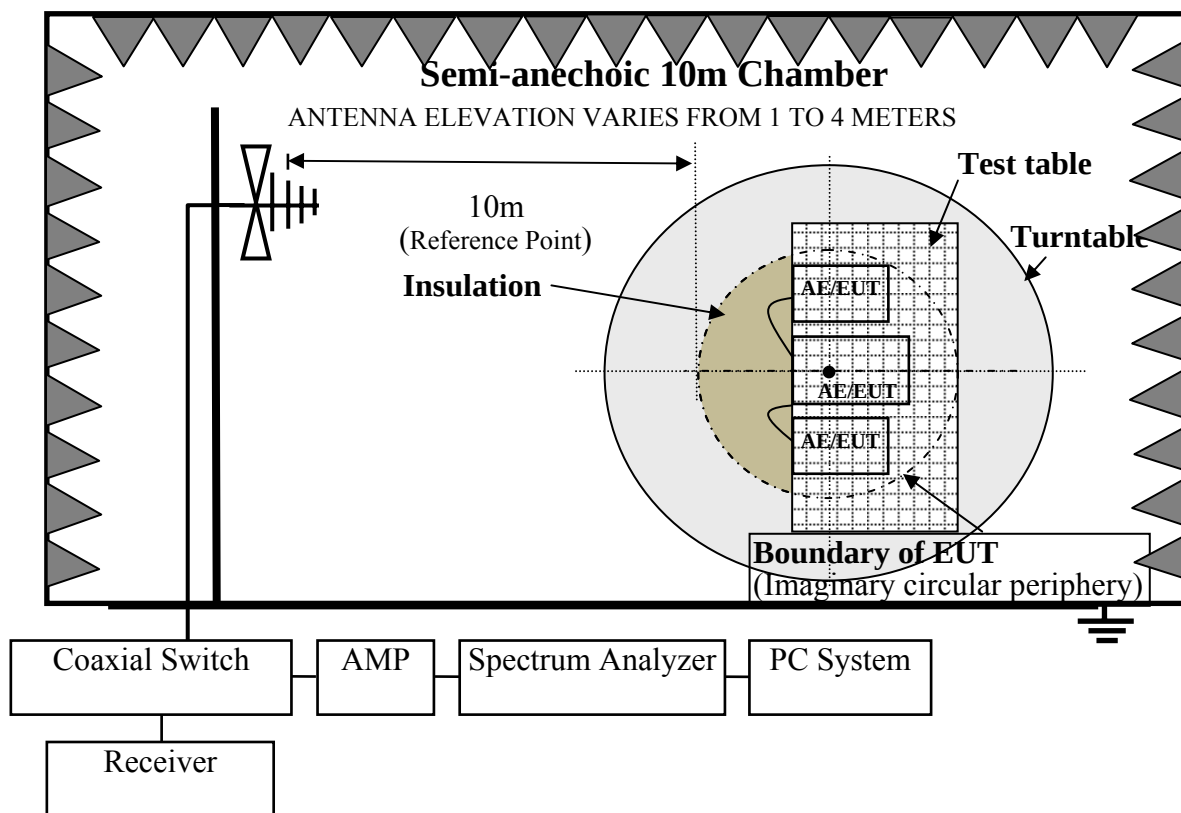
4.1.2. For frequency range 1GHz~6GHz (In 10m Anechoic Chamber)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	10m Chamber	AUDIX	N/A	N/A	Apr.15,19	1 Year
2.	Signal Analyzer	Rohde & Schwarz	FSV30	103670	Oct.14,18	1 Year
3.	Horn Antenna	ETS	3117	00218552	Dec.13,18	1 Year
4.	Amplifier	KEYSIGHT	83017A	39500711	Aug.18,18	1 Year
5.	RF Cable	ETS	SMS-100-SMS-350IN	NO.1	May.13,19	1 Year
6.	Test Software	AUDIX	e3	6.100913a	N/A	N/A

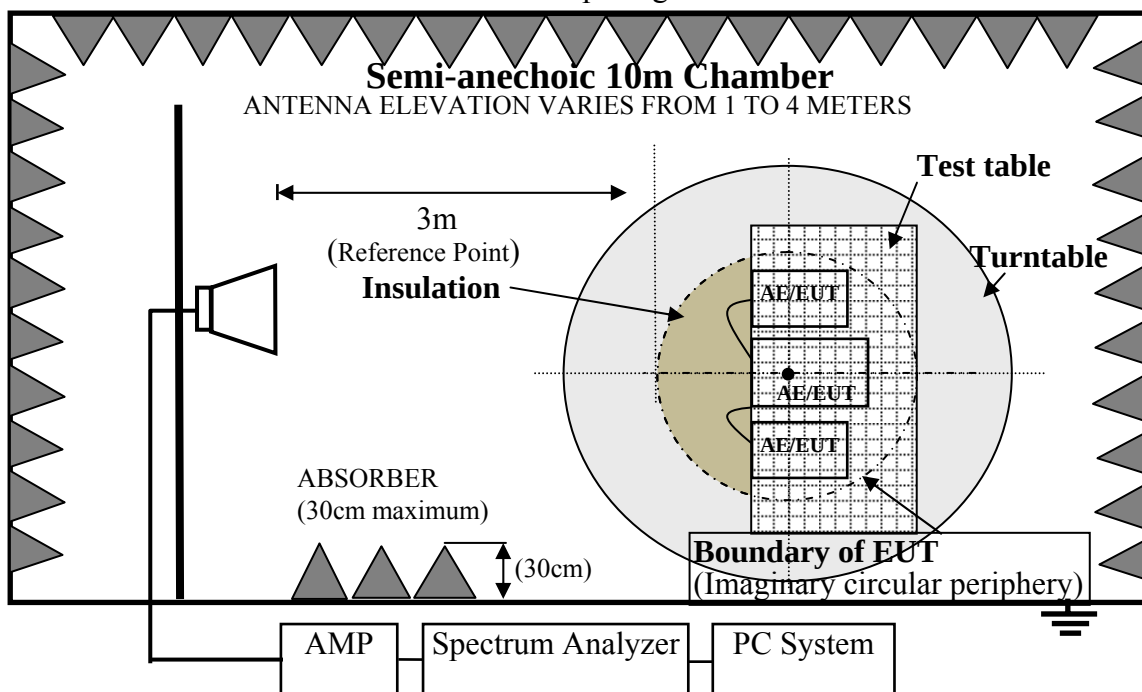
Note: N/A means Not applicable.

4.2. Block Diagram of Test Setup

4.2.1. In 10m Anechoic Chamber Test Setup Diagram for 30-1000MHz



4.2.2. In 10m Anechoic Chamber Test Setup Diagram for 1-6GHz



4.3. Test Standard

EN 55032: 2012+AC: 2013 Class B

EN 55032: 2015

EN 55032: 2015+AC: 2016

4.4. Radiated Emission Limit

All emanations from a Class B computing devices or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMITS (dB μ V/m)
30 ~ 230	10	30
230 ~ 1000	10	37
1000~3000	3	70(Peak) 50(Average)
3000~6000	3	74(Peak) 54(Average)

Notes: (1) Emission level = Antenna Factor + Cable Loss + Reading (below 1000MHz)
Emission level = Antenna Factor -Amp Factor +Cable Loss + Reading (above 1000MHz)
(2) The lower limit shall apply at the transition frequencies.

4.5. EUT Configuration on Test

The configurations of EUT are listed in Section 3.5.

4.6. Operating Condition of EUT

Same as Conducted Emission test that listed in Section 3.6. Except the test set up replaced by Section 4.2.

4.7. Test Procedure

The EUT was placed on a non-metallic table, 80 cm above the ground plane measurement distance was 10m at a semi-anechoic chamber. An antenna was located 10m from the periphery of test system on an adjustable mast. A pre-scan was first performed in order to find prominent radiated emissions. For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all the interface cables were changed according to EN 55032 Class B on Radiated Emission test.

The bandwidth setting on the test receiver (R&S ESR3) is 120 kHz.

The resolution bandwidth of the Agilent Spectrum Analyzer FSV30 was set at 1MHz. (For above 1GHz)

The frequency range from 30MHz to 1000MHz was pre-scanned with a peak detector and all final readings of measurement from Test Receiver are Quasi-Peak values.

The frequency range from 1GHz to 6GHz was checked and all final readings of measurement were with Peak and Average detector, measurement distance was 3m at semi-anechoic chamber. The EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. The portion of the test volume that was obstructed by absorber placed on the floor (30cm maximum).

Finally, selected operating situations at Anechoic Chamber measurement, all the test results are listed in section 4.8.

4.8. Radiated Emission Test Results

PASS. (All emissions not reported below are too low against the prescribed limits.)

EUT: LCD Monitor

Model No. : M245AZ

For frequency range 30MHz~1000MHz

Test Date: Jun.07,2019 Temperature: 24.5℃ Humidity: 51% Pressure: 101.7kPa

The EUT with following test modes were pre-tested:

No.	Test Voltage	Test Mode	Input Port	Cable Length	Resolution & Frequency
1.	AC 230V/50Hz	PC Mode	HDMI	1.8m	640*480@60Hz
2.					1280*1024@75Hz
3.					1920*1080@60Hz
4.					1080*1920@60Hz (Panel is Vertical)(+90°)
5.					1080*1920@60Hz (Panel is Vertical)(-90°)
6.				1.5m	1920*1080@60Hz
7.			VGA	1.8m	640*480@60Hz
8.					1280*1024@75Hz
9.					1920*1080@60Hz
10.					640*480@60Hz
11.					1280*1024@75Hz
12.					1920*1080@60Hz
13.		DVD Mode	HDMI	1.8m	Color Bar
14.		Standby	---	---	---
15.	AC 110V/60Hz	PC Mode	HDMI	1.8m	1920*1080@60Hz

The result of worst test mode is presented in the report as below and the test data are listed in next pages.

No.	Test Voltage	Cable Length	Test Mode	Input Port	Resolution & Frequency	Reference Test Data No.	
						Horizontal	Vertical
1. *	AC 230V/50Hz	1.8m	PC (Running ITU-R BT 1729)	HDMI	1920*1080@60Hz	#2	#1
2.			PC (Running ITU-R BT 471-1)		1920*1080@60Hz	#4	#3

(* means the worst test mode)

For frequency range 1GHz~6GHz

Test Date: Jun.07 Temperature: 24.5℃ Humidity: 51% Pressure: 101.7kPa

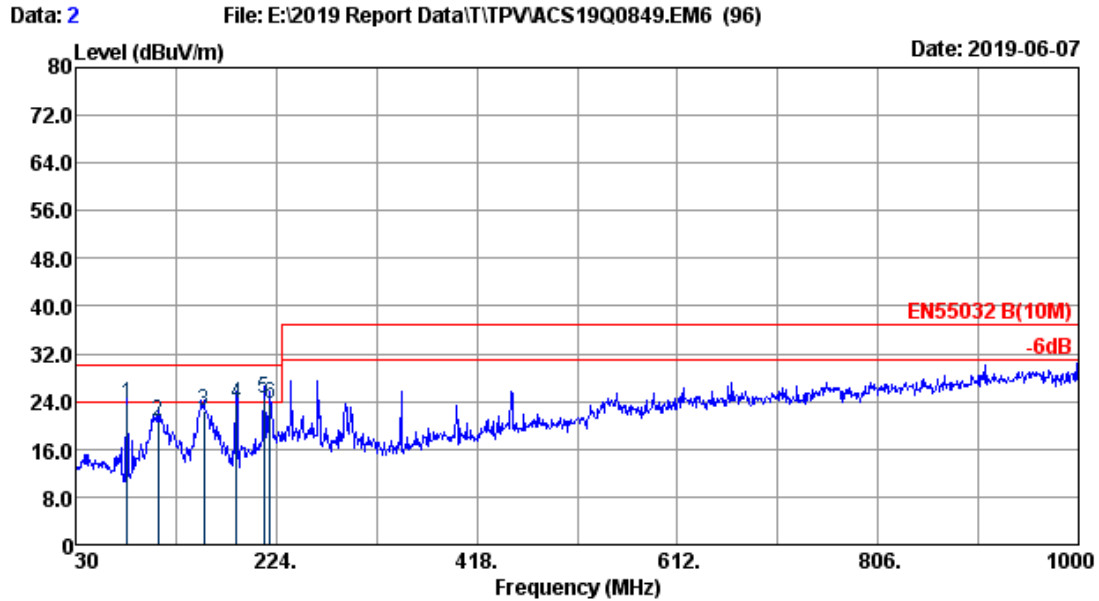
The EUT with following test modes were pre-tested:

No.	Test Voltage	Test Mode	Input Port	Cable Length	Resolution & Frequency
1.	AC 230V/50Hz	PC Mode	HDMI	1.8m	1280*1024@75Hz
2.					1920*1080@60Hz
3.					1080*1920@60Hz (Panel is Vertical)(+90°)
4.					1080*1920@60Hz (Panel is Vertical)(-90°)
5.			VGA	1.5m	1920*1080@60Hz
6.				1.8m	1280*1024@75Hz
7.					1920*1080@60Hz
8.					1280*1024@75Hz
9.					1920*1080@60Hz
10.		DVD Mode	HDMI	1.8m	Color Bar
11.		Standby	---	---	---
12.	AC 110V/60Hz	PC Mode	HDMI	1.8m	1920*1080@60Hz

The result of worst test mode is presented in the report as below and the test data are listed in next pages.

No.	Test Voltage	Cable Length	Test Mode	Input Port	Resolution & Frequency	Reference Test Data No.	
						Horizontal	Vertical
1. *	AC 230V/50Hz	1.8m	PC (Running ITU-R BT 1729)	HDMI	1920*1080@60Hz	#10	#9
2.			PC (Running ITU-R BT 471-1)		1920*1080@60Hz	#12	#11

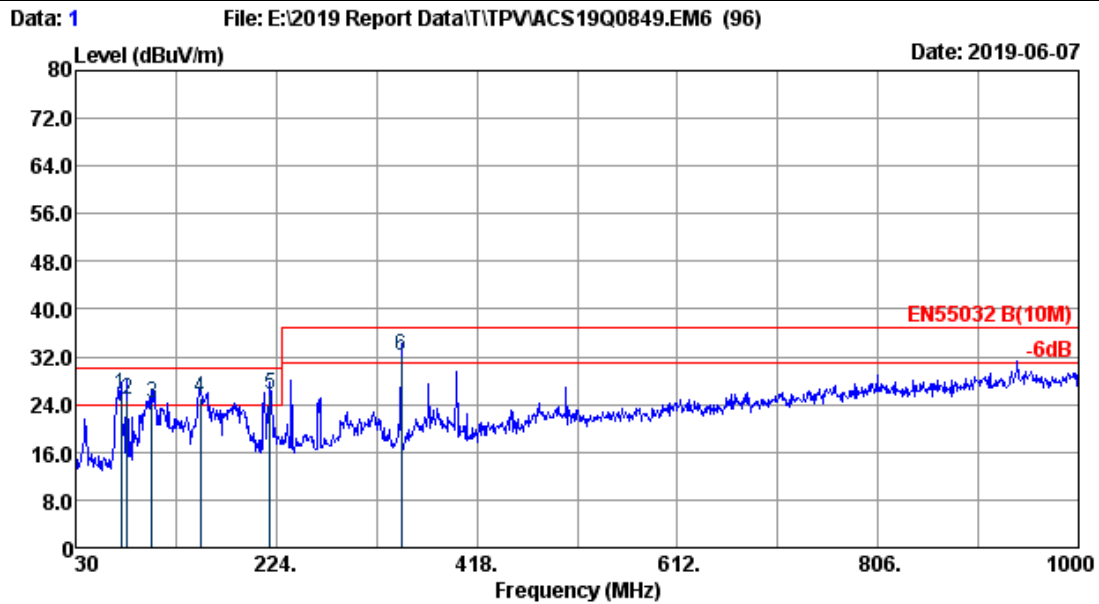
(* means the worst test mode)



Site no.	: 10m Chamber	Data no.	: 2
Dis. / Ant.	: 10m 2019 VULB9168-429	Ant. pol.	: HORIZONTAL
Limit	: EN55032 B(10M)	Pressure	: 101.7kPa
Env. / Ins.	: 24.5°C/51%	Engineer	: Johnny
EUT	: M245AZ		
Power rating	: AC 230V/50Hz		
Test Mode	: Running ITU-R BT 1729		
	HDMI:1920*1280@60Hz		
	Line:1.8m		

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Emission		Limits (dBuV/m)	Margin (dB)	Remark
				Reading (dBuV)	Level (dBuV/m)			
1	79.47	15.00	0.62	8.12	23.74	30.00	6.26	QP
2	109.54	16.40	0.69	3.48	20.57	30.00	9.43	QP
3	154.16	19.30	0.72	2.31	22.33	30.00	7.67	QP
4	185.20	17.10	0.74	5.73	23.57	30.00	6.43	QP
5	212.36	15.74	0.79	7.94	24.47	30.00	5.53	QP*
6	218.18	15.86	0.81	6.93	23.60	30.00	6.40	QP

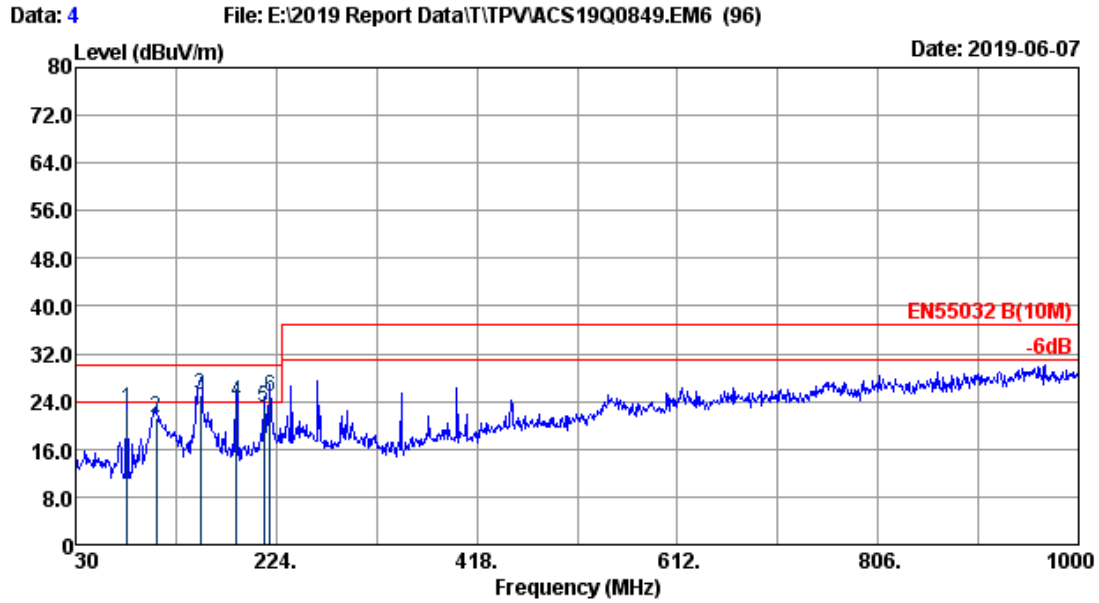
- Remarks:
1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.
 3. The worst emission was detected at 212.36MHz with corrected signal level of 24.47dB μ V/m. (Antenna height 3.5m; Turntable degree 301°).
 4. 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.



Site no. : 10m Chamber Data no. : 1
 Dis. / Ant. : 10m 2018 VULB9168-710 Ant. pol. : VERTICAL
 Limit : EN55032 B(10M) Pressure : 101.7kPa
 Env. / Ins. : 24.5°C/51% Engineer : Johnny
 EUT : M245AZ
 Power rating : AC 230V/50Hz
 Test Mode : Running ITU-R BT 1729
 HDMI:1920*1280@60Hz
 Line:1.8m

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	73.65	16.10	1.31	8.37	25.78	30.00	4.22	QP*
2	79.47	14.40	1.34	9.19	24.93	30.00	5.07	QP
3	103.72	15.30	1.49	7.49	24.28	30.00	5.72	QP
4	150.28	19.20	1.74	4.05	24.99	30.00	5.01	QP
5	218.18	15.56	2.08	8.01	25.65	30.00	4.35	QP
6	345.25	20.10	2.63	9.42	32.15	37.00	4.85	QP

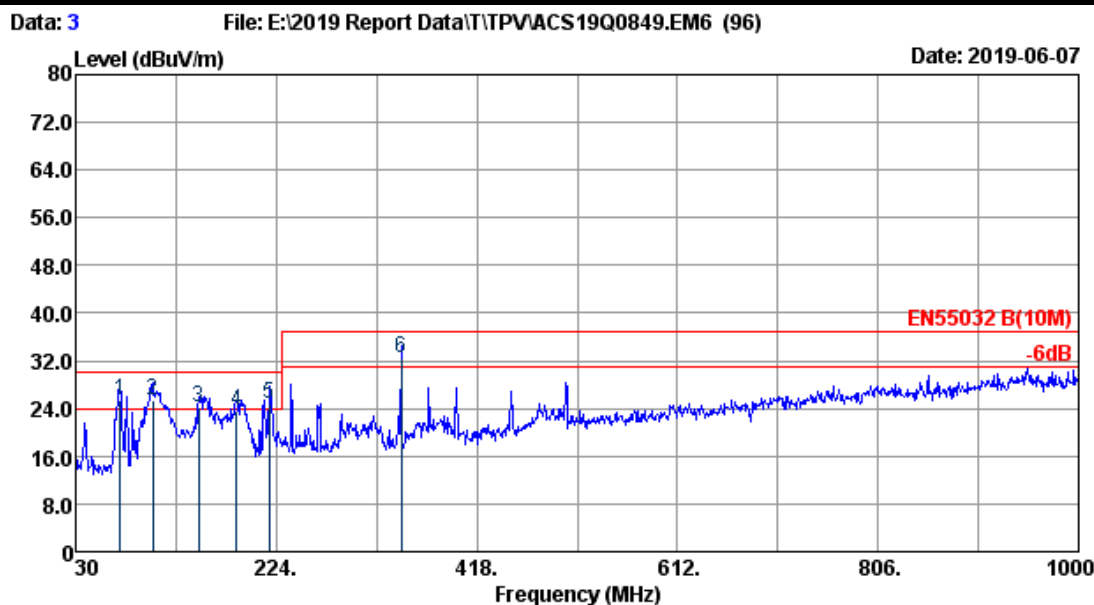
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.
 3. The worst emission was detected at 73.65MHz with corrected signal level of 25.78dBμV/m. (Antenna height 1.2m; Turntable degree 147°).
 4. 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.



Site no. :	10m Chamber	Data no. :	4
Dis. / Ant. :	10m 2019 VULB9168-429	Ant. pol. :	HORIZONTAL
Limit :	EN55032 B(10M)	Pressure :	101.7kPa
Env. / Ins. :	24.5°C/51%	Engineer :	Johnny
EUT :	M245AZ		
Power rating :	AC 230V/50Hz		
Test Mode :	Running ITU-R BT 471-1		
	HDMI:1920*1280@60Hz		
	Line:1.8m		

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Emission		Limits (dBuV/m)	Margin (dB)	Remark
				Reading (dBuV)	Level (dBuV/m)			
1	79.47	15.00	0.62	6.98	22.60	30.00	7.40	QP
2	107.60	16.08	0.69	4.58	21.35	30.00	8.65	QP
3	150.28	19.30	0.72	4.94	24.96	30.00	5.04	QP
4	185.20	17.10	0.74	6.03	23.87	30.00	6.13	QP
5	212.36	15.74	0.79	6.36	22.89	30.00	7.11	QP
6	218.18	15.86	0.81	8.24	24.91	30.00	5.09	QP

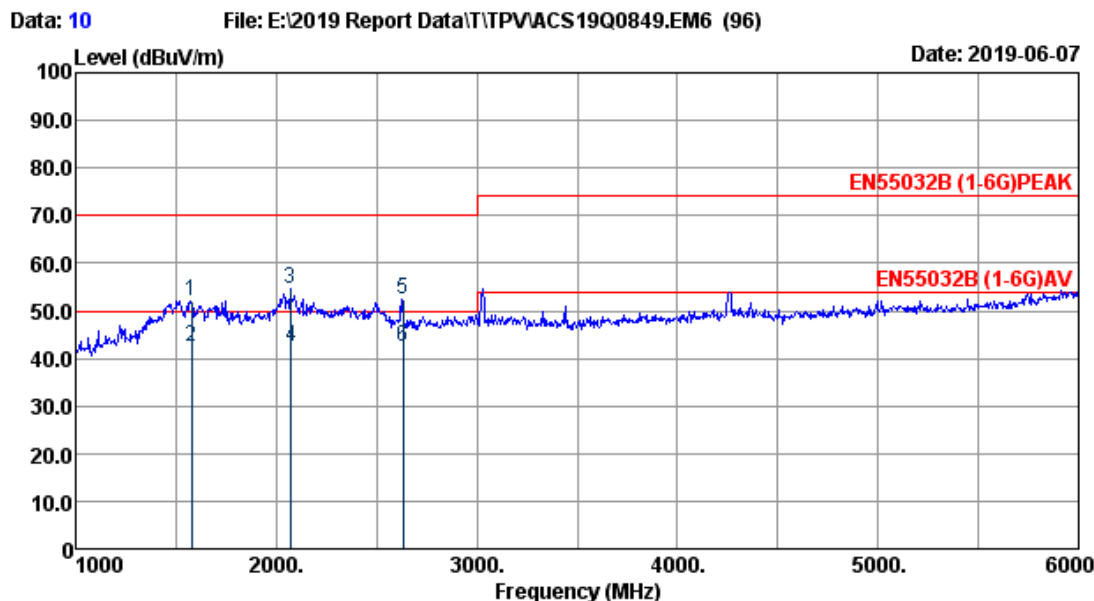
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 10m Chamber Data no. : 3
 Dis. / Ant. : 10m 2018 VULB9168-710 Ant. pol. : VERTICAL
 Limit : EN55032 B(10M) Pressure : 101.7kPa
 Env. / Ins. : 24.5°C/51% Engineer : Johnny
 EUT : M245AZ
 Power rating : AC 230V/50Hz
 Test Mode : Running ITU-R BT 471-1
 HDMI:1920*1280@60Hz
 Line:1.8m

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	72.68	16.50	1.31	7.53	25.34	30.00	4.66	QP
2	104.69	15.50	1.50	8.35	25.35	30.00	4.65	QP
3	149.31	19.20	1.73	3.15	24.08	30.00	5.92	QP
4	185.20	16.90	1.92	4.66	23.48	30.00	6.52	QP
5	217.21	15.54	2.08	7.12	24.74	30.00	5.26	QP
6	345.25	20.10	2.63	9.70	32.43	37.00	4.57	QP

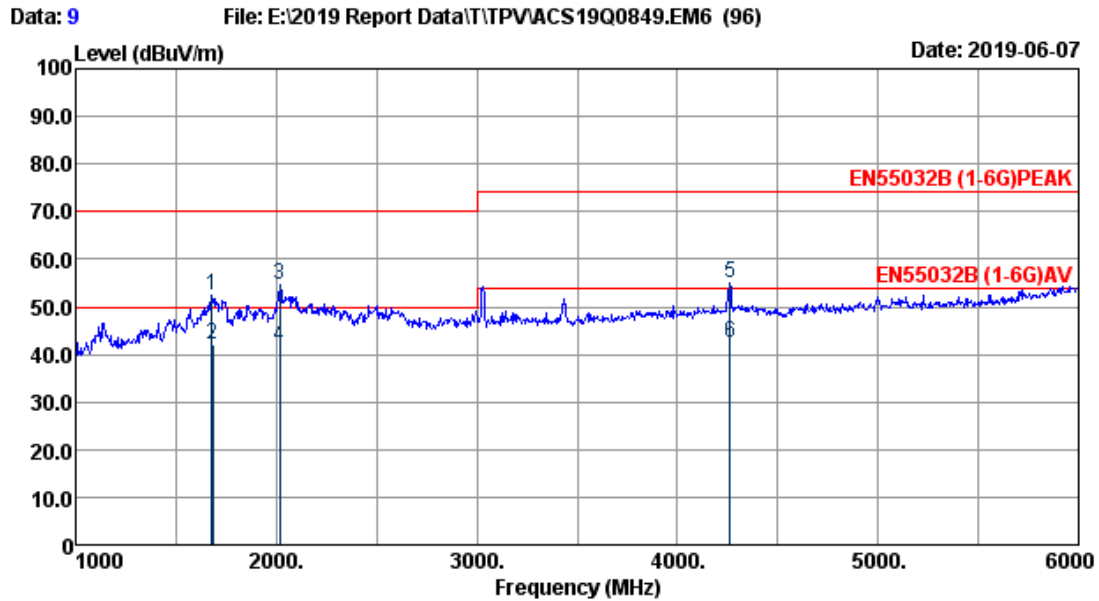
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no.	: 10m Chamber	Data no.	: 10
Dis. / Ant.	: 3m 2018 3117	Ant. pol.	: HORIZONTAL
Limit	: EN55032B (1-6G) PEAK	Pre	: 101.7kPa
Env. / Ins.	: 24.5°C/51%	Engineer	: Johnny
EUT	: M245A2		
Power rating	: AC 230V/50Hz		
Test Mode	: Running ITU-R BT 1729		
	HDMI:1920*1280@60Hz		
	Line:1.8m		

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	1575.74	27.46	2.91	33.37	55.18	52.18	70.00	17.82	Peak
2	1576.38	27.46	2.91	33.37	45.28	42.28	50.00	7.72	Average
3	2070.94	31.24	3.38	32.06	52.01	54.57	70.00	15.43	Peak
4	2072.13	31.24	3.38	32.06	40.05	42.61	50.00	7.39	Average
5	2630.72	31.96	3.81	31.72	48.51	52.56	70.00	17.44	Peak
6	2632.46	31.96	3.81	31.72	38.51	42.56	50.00	7.44	Average

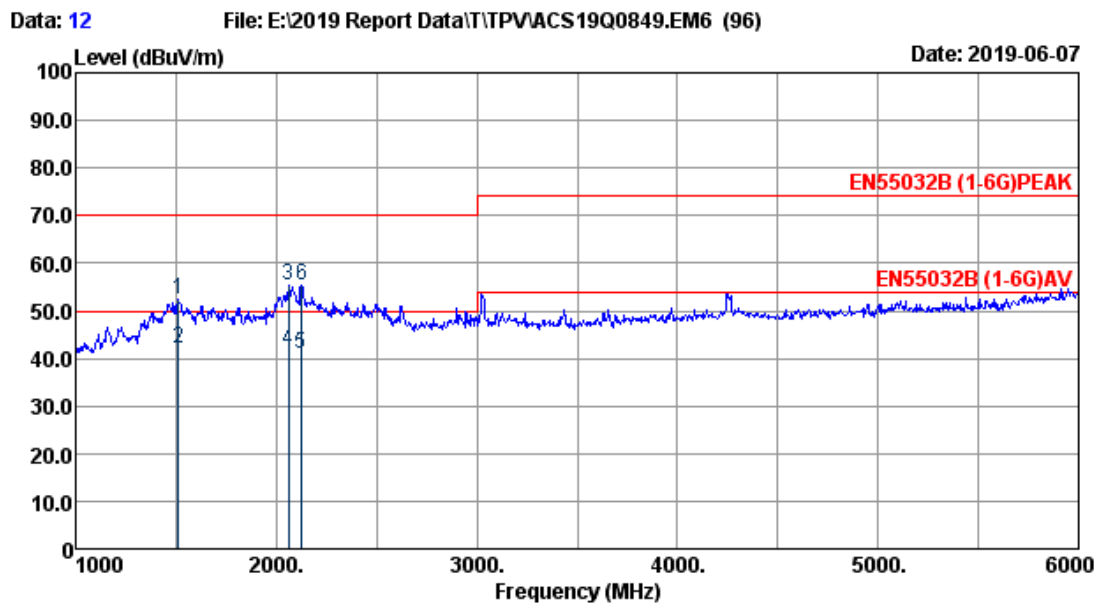
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
-Amp Factor
2. The emission levels that are 20dB below the official
limit are not reported.



Site no. : 10m Chamber Data no. : 9
 Dis. / Ant. : 3m 2018 3117 Ant. pol. : VERTICAL
 Limit : EN55032B (1-6G)PEAK Pre : 101.7kPa
 Env. / Ins. : 24.5°C/51% Engineer : Johnny
 EUT : M245AZ
 Power rating : AC 230V/50Hz
 Test Mode : Running ITU-R BT 1729
 HDMI:1920*1280@60Hz
 Line:1.8m

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	1680.42	28.50	3.01	33.07	53.86	52.30	70.00	17.70	Peak
2	1682.16	28.50	3.01	33.07	43.62	42.06	50.00	7.94	Average
3	2015.75	31.22	3.34	32.09	52.31	54.78	70.00	15.22	Peak
4	2016.34	31.22	3.34	32.09	39.28	41.75	50.00	8.25	Average
5	4260.94	32.93	4.91	30.71	47.75	54.88	74.00	19.12	Peak
6	4262.16	32.93	4.91	30.71	35.24	42.37	54.00	11.63	Average

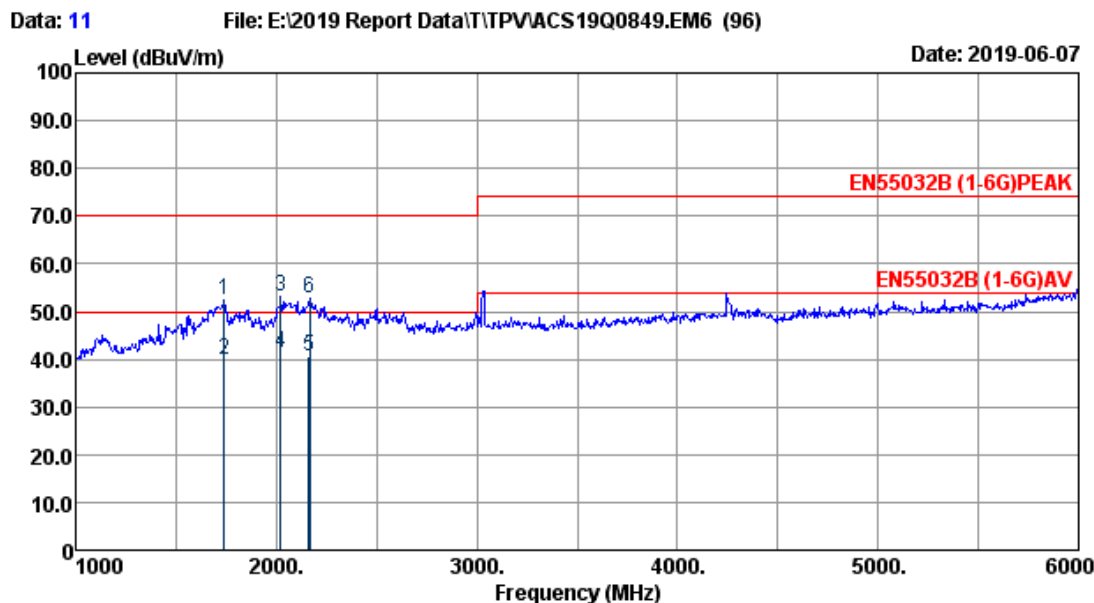
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp Factor
 2. The emission levels that are 20dB below the official
 limit are not reported.



Site no. : 10m Chamber Data no. : 12
 Dis. / Ant. : 3m 2018 3117 Ant. pol. : HORIZONTAL
 Limit : EN55032B (1-6G) PEAK Pre : 101.7kPa
 Env. / Ins. : 24.5°C/51% Engineer : Johnny
 EUT : M245AZ
 Power rating : AC 230V/50Hz
 Test Mode : Running ITU-R BT 471-1
 HDMI:1920*1280@60Hz
 Line:1.8m

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	1510.43	27.78	2.84	33.57	55.45	52.50	70.00	17.50	Peak
2	1512.13	27.78	2.84	33.57	45.13	42.18	50.00	7.82	Average
3	2060.92	31.23	3.37	32.07	52.75	55.28	70.00	14.72	Peak
4	2062.17	31.23	3.37	32.07	39.05	41.58	50.00	8.42	Average
5	2122.13	31.24	3.42	32.03	38.47	41.10	50.00	8.90	Average
6	2125.94	31.24	3.42	32.03	52.81	55.44	70.00	14.56	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp Factor
 2. The emission levels that are 20dB below the official
 limit are not reported.



Site no. : 10m Chamber Data no. : 11
 Dis. / Ant. : 3m 2018 3117 Ant. pol. : VERTICAL
 Limit : EN55032B (1-6G) PEAK Pre : 101.7kPa
 Env. / Ins. : 24.5°C/51% Engineer : Johnny
 EUT : M245AZ
 Power rating : AC 230V/50Hz
 Test Mode : Running ITU-R BT 471-1
 HDMI:1920*1280@60Hz
 Line:1.8m

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	1740.47	29.33	3.08	32.86	52.76	52.31	70.00	17.69	Peak
2	1742.16	29.33	3.08	32.86	40.27	39.82	50.00	10.18	Average
3	2020.63	31.22	3.34	32.09	50.72	53.19	70.00	16.81	Peak
4	2022.76	31.22	3.34	32.09	39.01	41.48	50.00	8.52	Average
5	2162.14	31.21	3.45	32.01	38.01	40.66	50.00	9.34	Average
6	2165.93	31.20	3.46	32.00	49.99	52.65	70.00	17.35	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp Factor
 2. The emission levels that are 20dB below the official
 limit are not reported.

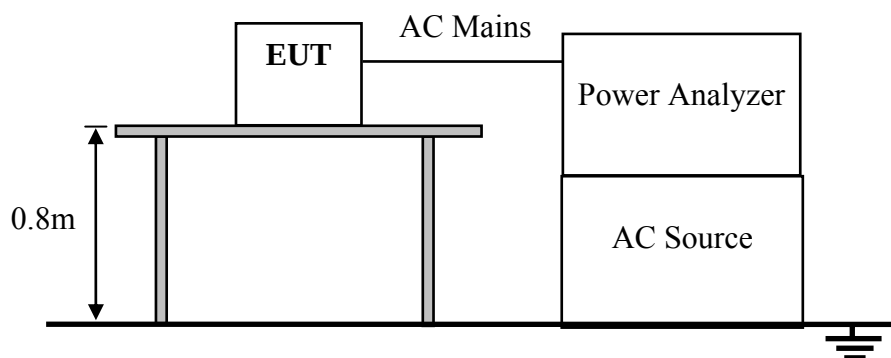
5. HARMONIC CURRENT TEST

5.1. Test Equipments

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	H/F Room	AUDIX	N/A	N/A	Apr.16,19	3 Year
2.	AC Power Source	California Instruments	500Lix	58481	Oct.13,18	1 Year
3.	Impedance Network	California Instruments	OMNI 1-18i	1247A02235	Oct.15,18	1 Year
4.	Power Analyzer	California Instruments	PACS-1	72627	Oct.15,18	1 Year
5.	Test Software	California Instruments	CTS 4.0	V 4.19	N/A	N/A

Note: N/A means Not applicable.

5.2. Block Diagram of Test Setup



5.3. Test Standard

EN 61000-3-2: 2014; Class D

5.4. Limits of Harmonic Current

Limits for Class D Equipment		
Harmonic order (n)	Maximum permissible harmonic current per watt (mA/W)	Maximum permissible harmonic current (A)
3	3.4	2.30
5	1.9	1.14
7	1.0	0.77
9	0.5	0.40
11	0.35	0.33
13	0.30	0.21
15 ≤ n ≤ 39 (odd harmonic only)	3.85/n	0.15 × 15/n

Remark: if the EUT Power level is below 75 Watts and therefore has no defined limits.

5.5. EUT Configuration on Test

The configurations of EUT are listed in Section 3.5.

5.6. Operating Condition of EUT

Same as Conducted Emission test that listed in Section 3.6. except the test set up replaced by Section 5.2.

5.7. Test Procedure

The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn. The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the necessary for the EUT to be exercised.

5.8. Test Results

PASS. (Test results are recorded in next page)

Harmonics – Class-D per Ed. 4.0 (2014)(Run time) incl. inter-harmonics

EUT: M245AZ

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

Test date: 2019-6-13

Test duration (min): 2.5

Comment: Running "H" Pattern And 1KHz Playing

Customer: TPV

Tested by: Kennen

Test Margin: 100

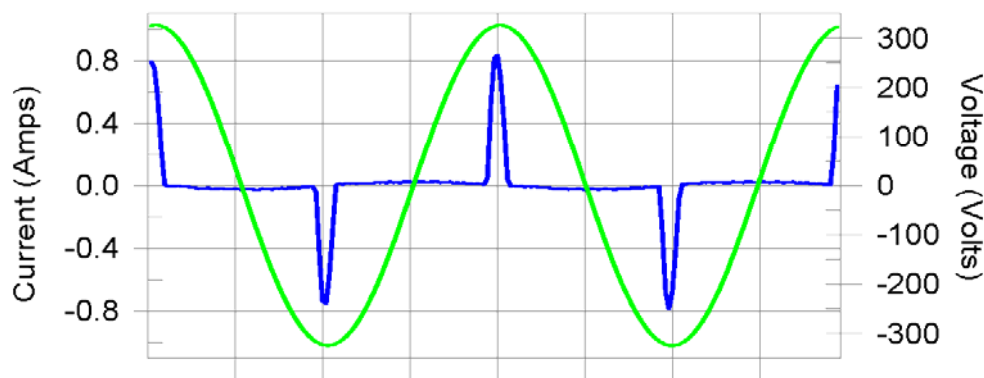
End time: 1:02:45

Start time: 1:00:04

Data file name: H-000268.cts_data

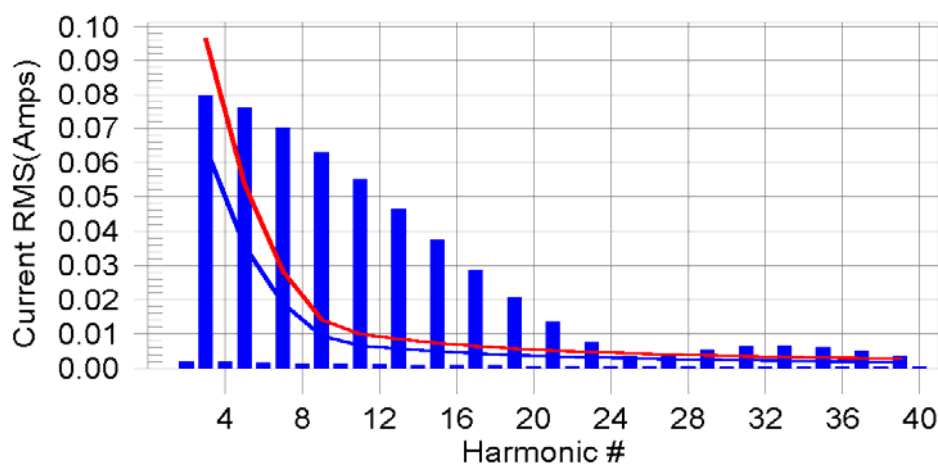
Test Result: N/L Source qualification: Normal

Current & voltage waveforms



Harmonics and Class D limit line

European Limits



Test result: N/L Worst harmonics H0-0.0% of 150% limit, H0-0% of 100% limit

Current Test Result Summary (Run time)

EUT: M245AZ **Tested by: Kennen**
Test category: Class-D per Ed. 4.0 (2014) (European limits) **Test Margin: 100**
Test date: 2019-6-13 **Start time: 1:00:04** **End time: 1:02:45**
Test duration (min): 2.5 **Data file name: H-000268.cts_data**
Comment: Running "H" Pattern And 1KHz Playing
Customer: TPV

Test Result: N/L **Source qualification: Normal**
THC(A): 0.171 **I-THD(%): 202.3** **POHC(A): 0.021** **POHC Limit(A): 0.008**

Highest parameter values during test:

V_RMS (Volts): 230.07	Frequency(Hz): 50.00
I_Peak (Amps): 0.855	I_RMS (Amps): 0.196
I_Fund (Amps): 0.085	Crest Factor: 4.478
Power (Watts): 18.9	Power Factor: 0.433

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.002	0.000	N/A	0.002	0.000	N/A	N/L
3	0.080	0.064	N/A	0.080	0.096	N/A	N/L
4	0.002	0.000	N/A	0.002	0.000	N/A	N/L
5	0.076	0.036	N/A	0.076	0.054	N/A	N/L
6	0.002	0.000	N/A	0.002	0.000	N/A	N/L
7	0.070	0.019	N/A	0.070	0.028	N/A	N/L
8	0.001	0.000	N/A	0.002	0.000	N/A	N/L
9	0.063	0.009	N/A	0.063	0.014	N/A	N/L
10	0.001	0.000	N/A	0.001	0.000	N/A	N/L
11	0.055	0.007	N/A	0.055	0.010	N/A	N/L
12	0.001	0.000	N/A	0.001	0.000	N/A	N/L
13	0.046	0.006	N/A	0.046	0.009	N/A	N/L
14	0.001	0.000	N/A	0.001	0.000	N/A	N/L
15	0.037	0.005	N/A	0.038	0.007	N/A	N/L
16	0.001	0.000	N/A	0.001	0.000	N/A	N/L
17	0.029	0.004	N/A	0.029	0.007	N/A	N/L
18	0.001	0.000	N/A	0.001	0.000	N/A	N/L
19	0.021	0.004	N/A	0.021	0.006	N/A	N/L
20	0.001	0.000	N/A	0.001	0.000	N/A	N/L
21	0.013	0.003	N/A	0.014	0.005	N/A	N/L
22	0.001	0.000	N/A	0.001	0.000	N/A	N/L
23	0.008	0.003	N/A	0.008	0.005	N/A	N/L
24	0.001	0.000	N/A	0.001	0.000	N/A	N/L
25	0.004	0.003	N/A	0.004	0.004	N/A	N/L
26	0.001	0.000	N/A	0.001	0.000	N/A	N/L
27	0.004	0.003	N/A	0.004	0.004	N/A	N/L
28	0.001	0.000	N/A	0.001	0.000	N/A	N/L
29	0.005	0.003	N/A	0.005	0.004	N/A	N/L
30	0.001	0.000	N/A	0.001	0.000	N/A	N/L
31	0.006	0.002	N/A	0.006	0.004	N/A	N/L
32	0.000	0.000	N/A	0.001	0.000	N/A	N/L
33	0.007	0.002	N/A	0.007	0.003	N/A	N/L
34	0.000	0.000	N/A	0.000	0.000	N/A	N/L
35	0.006	0.002	N/A	0.006	0.003	N/A	N/L
36	0.000	0.000	N/A	0.000	0.000	N/A	N/L
37	0.005	0.002	N/A	0.005	0.003	N/A	N/L
38	0.000	0.000	N/A	0.000	0.000	N/A	N/L
39	0.004	0.002	N/A	0.004	0.003	N/A	N/L
40	0.000	0.000	N/A	0.000	0.000	N/A	N/L

Note: The EUT power level is below 75.0 Watts and therefore has no defined limits

Voltage Source Verification Data (Run time)

EUT: M245AZ **Tested by: Kennen**
Test category: Class-D per Ed. 4.0 (2014) (European limits) **Test Margin: 100**
Test date: 2019-6-13 **Start time: 1:00:04** **End time: 1:02:45**
Test duration (min): 2.5 **Data file name: H-000268.cts_data**
Comment: Running "H" Pattern And 1KHz Playing
Customer: TPV

Test Result: N/L **Source qualification: Normal**

Highest parameter values during test:

Voltage (Vrms): 230.07	Frequency(Hz): 50.00
I_Peak (Amps): 0.855	I_RMS (Amps): 0.196
I_Fund (Amps): 0.085	Crest Factor: 4.478
Power (Watts): 18.9	Power Factor: 0.433

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.043	0.460	9.43	OK
3	0.401	2.071	19.39	OK
4	0.022	0.460	4.85	OK
5	0.022	0.920	2.42	OK
6	0.016	0.460	3.51	OK
7	0.013	0.690	1.87	OK
8	0.007	0.460	1.46	OK
9	0.029	0.460	6.33	OK
10	0.005	0.460	0.99	OK
11	0.028	0.230	12.16	OK
12	0.005	0.230	2.28	OK
13	0.032	0.230	13.75	OK
14	0.004	0.230	1.78	OK
15	0.022	0.230	9.48	OK
16	0.007	0.230	3.22	OK
17	0.024	0.230	10.22	OK
18	0.008	0.230	3.36	OK
19	0.020	0.230	8.79	OK
20	0.006	0.230	2.40	OK
21	0.016	0.230	7.03	OK
22	0.003	0.230	1.18	OK
23	0.009	0.230	4.11	OK
24	0.003	0.230	1.16	OK
25	0.006	0.230	2.43	OK
26	0.003	0.230	1.17	OK
27	0.007	0.230	2.85	OK
28	0.002	0.230	0.80	OK
29	0.007	0.230	3.02	OK
30	0.002	0.230	0.87	OK
31	0.009	0.230	3.91	OK
32	0.002	0.230	1.04	OK
33	0.010	0.230	4.22	OK
34	0.002	0.230	0.93	OK
35	0.009	0.230	4.10	OK
36	0.002	0.230	0.92	OK
37	0.007	0.230	3.24	OK
38	0.003	0.230	1.32	OK
39	0.006	0.230	2.59	OK
40	0.003	0.230	1.31	OK

Harmonics – Class-D per Ed. 4.0 (2014)(Run time) incl. inter-harmonics

EUT: M245AZ

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

Test date: 2019-6-13

Test duration (min): 2.5

Comment: Default Mode

Customer: TPV

Tested by: Kennen

Test Margin: 100

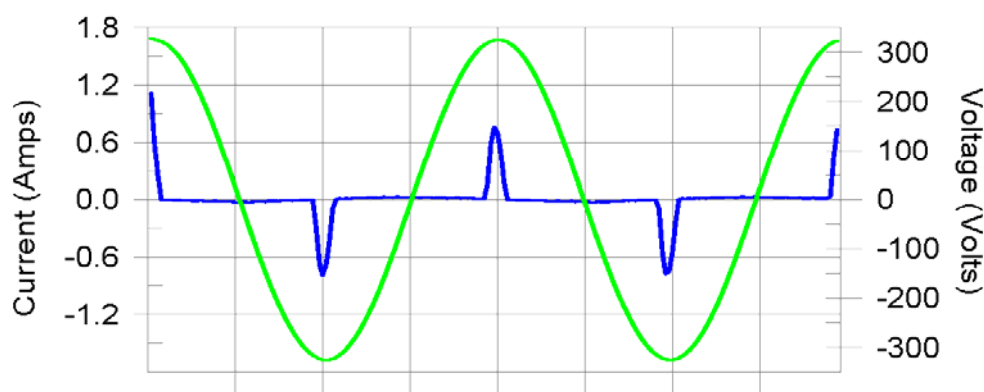
End time: 1:13:32

Start time: 1:10:50

Data file name: H-000269.cts_data

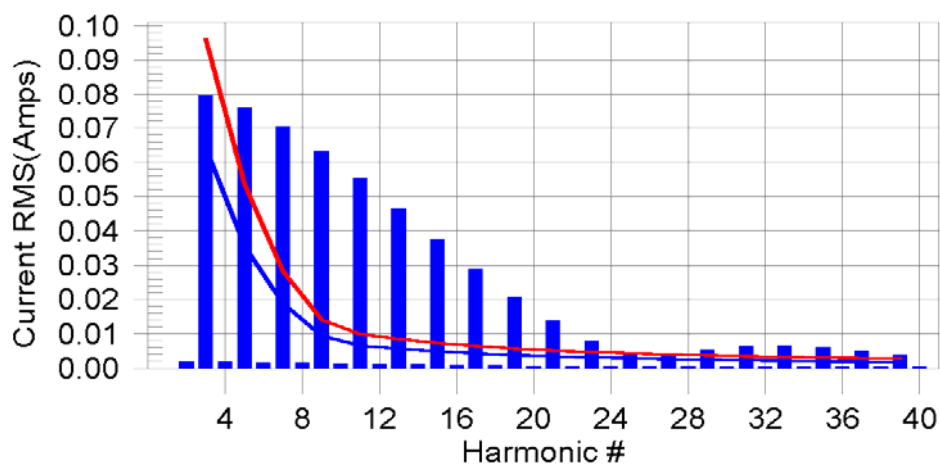
Test Result: N/L Source qualification: Normal

Current & voltage waveforms



Harmonics and Class D limit line

European Limits



Test result: N/L Worst harmonics H0-0.0% of 150% limit, H0-0% of 100% limit

Current Test Result Summary (Run time)

EUT: M245AZ **Tested by: Kennen**
Test category: Class-D per Ed. 4.0 (2014) (European limits) **Test Margin: 100**
Test date: 2019-6-13 **Start time: 1:10:50** **End time: 1:13:32**
Test duration (min): 2.5 **Data file name: H-000269.cts_data**
Comment: Default Mode
Customer: TPV

Test Result: N/L **Source qualification: Normal**
THC(A): 0.172 **I-THD(%): 203.0** **POHC(A): 0.021** **POHC Limit(A): 0.008**

Highest parameter values during test:

V_RMS (Volts): 230.08	Frequency(Hz): 50.00
I_Peak (Amps): 1.115	I_RMS (Amps): 0.195
I_Fund (Amps): 0.085	Crest Factor: 5.829
Power (Watts): 18.9	Power Factor: 0.432

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.002	0.000	N/A	0.002	0.000	N/A	N/L
3	0.080	0.064	N/A	0.080	0.096	N/A	N/L
4	0.002	0.000	N/A	0.002	0.000	N/A	N/L
5	0.076	0.036	N/A	0.076	0.054	N/A	N/L
6	0.002	0.000	N/A	0.002	0.000	N/A	N/L
7	0.070	0.019	N/A	0.070	0.028	N/A	N/L
8	0.002	0.000	N/A	0.002	0.000	N/A	N/L
9	0.063	0.009	N/A	0.063	0.014	N/A	N/L
10	0.001	0.000	N/A	0.001	0.000	N/A	N/L
11	0.055	0.007	N/A	0.055	0.010	N/A	N/L
12	0.001	0.000	N/A	0.001	0.000	N/A	N/L
13	0.046	0.006	N/A	0.047	0.008	N/A	N/L
14	0.001	0.000	N/A	0.001	0.000	N/A	N/L
15	0.038	0.005	N/A	0.038	0.007	N/A	N/L
16	0.001	0.000	N/A	0.001	0.000	N/A	N/L
17	0.029	0.004	N/A	0.029	0.007	N/A	N/L
18	0.001	0.000	N/A	0.001	0.000	N/A	N/L
19	0.021	0.004	N/A	0.021	0.006	N/A	N/L
20	0.001	0.000	N/A	0.001	0.000	N/A	N/L
21	0.014	0.003	N/A	0.014	0.005	N/A	N/L
22	0.001	0.000	N/A	0.001	0.000	N/A	N/L
23	0.008	0.003	N/A	0.008	0.005	N/A	N/L
24	0.001	0.000	N/A	0.001	0.000	N/A	N/L
25	0.004	0.003	N/A	0.004	0.004	N/A	N/L
26	0.001	0.000	N/A	0.001	0.000	N/A	N/L
27	0.004	0.003	N/A	0.004	0.004	N/A	N/L
28	0.001	0.000	N/A	0.001	0.000	N/A	N/L
29	0.005	0.003	N/A	0.005	0.004	N/A	N/L
30	0.001	0.000	N/A	0.001	0.000	N/A	N/L
31	0.006	0.002	N/A	0.006	0.004	N/A	N/L
32	0.000	0.000	N/A	0.001	0.000	N/A	N/L
33	0.007	0.002	N/A	0.007	0.003	N/A	N/L
34	0.000	0.000	N/A	0.001	0.000	N/A	N/L
35	0.006	0.002	N/A	0.006	0.003	N/A	N/L
36	0.000	0.000	N/A	0.001	0.000	N/A	N/L
37	0.005	0.002	N/A	0.005	0.003	N/A	N/L
38	0.000	0.000	N/A	0.000	0.000	N/A	N/L
39	0.004	0.002	N/A	0.004	0.003	N/A	N/L
40	0.000	0.000	N/A	0.000	0.000	N/A	N/L

Note: The EUT power level is below 75.0 Watts and therefore has no defined limits

Voltage Source Verification Data (Run time)

EUT: M245AZ **Tested by: Kennen**
Test category: Class-D per Ed. 4.0 (2014) (European limits) **Test Margin: 100**
Test date: 2019-6-13 **Start time: 1:10:50** **End time: 1:13:32**
Test duration (min): 2.5 **Data file name: H-000269.cts_data**
Comment: Default Mode
Customer: TPV

Test Result: N/L **Source qualification: Normal**

Highest parameter values during test:

Voltage (Vrms): 230.08	Frequency(Hz): 50.00
I_Peak (Amps): 1.115	I_RMS (Amps): 0.195
I_Fund (Amps): 0.085	Crest Factor: 5.829
Power (Watts): 18.9	Power Factor: 0.432

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.048	0.460	10.33	OK
3	0.402	2.071	19.42	OK
4	0.022	0.460	4.86	OK
5	0.024	0.920	2.61	OK
6	0.017	0.460	3.63	OK
7	0.012	0.690	1.77	OK
8	0.007	0.460	1.55	OK
9	0.030	0.460	6.44	OK
10	0.004	0.460	0.92	OK
11	0.028	0.230	12.30	OK
12	0.006	0.230	2.62	OK
13	0.032	0.230	13.89	OK
14	0.004	0.230	1.73	OK
15	0.022	0.230	9.53	OK
16	0.007	0.230	3.12	OK
17	0.024	0.230	10.58	OK
18	0.007	0.230	3.19	OK
19	0.020	0.230	8.90	OK
20	0.006	0.230	2.70	OK
21	0.016	0.230	7.05	OK
22	0.003	0.230	1.39	OK
23	0.010	0.230	4.45	OK
24	0.003	0.230	1.17	OK
25	0.005	0.230	2.34	OK
26	0.002	0.230	0.90	OK
27	0.006	0.230	2.65	OK
28	0.002	0.230	0.87	OK
29	0.007	0.230	3.04	OK
30	0.003	0.230	1.26	OK
31	0.009	0.230	3.88	OK
32	0.003	0.230	1.31	OK
33	0.010	0.230	4.27	OK
34	0.002	0.230	0.97	OK
35	0.009	0.230	3.99	OK
36	0.002	0.230	0.97	OK
37	0.008	0.230	3.29	OK
38	0.002	0.230	1.08	OK
39	0.006	0.230	2.74	OK
40	0.003	0.230	1.11	OK

6. VOLTAGE FLUCTUATIONS & FLICKER TEST

6.1. Test Equipment

Same as Section 5.1.

6.2. Block Diagram of Test Setup

Same as Section 5.2.

6.3. Test Standard

EN 61000-3-3: 2013

6.4. Limits of Voltage Fluctuation and Flick

Test Item	Limit	Note
P_{st}	1.0	P_{st} means Short-term flicker indicator
P_{lt}	0.65	P_{lt} means long-term flicker indicator
T_{max}	500ms	T_{max} means maximum time that $d(t)$ exceeds 3.3%
$d_{max}(\%)$	4%	d_{max} means maximum relative voltage change.
$d_c(\%)$	3.3%	d_c means relative steady-state voltage change.

6.5. EUT Configuration on Test

The configurations of EUT are listed in Section 3.5.

6.6. Operating Condition of EUT

Same as Section 5.6.

6.7. Test Procedure

The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the most unfavorable sequence of voltage changes under normal conditions During the flick measurement, the measure time shall include that part of whole operation changes. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours.

6.8. Test Results

PASS. (Test results are recorded in next page)

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

EUT: M245AZ
 Test category: All parameters (European limits)
 Test date: 2019-6-12
 Test duration (min): 10
 Comment: Running "H" Pattern And 1KHz Playing
 Customer: TPV

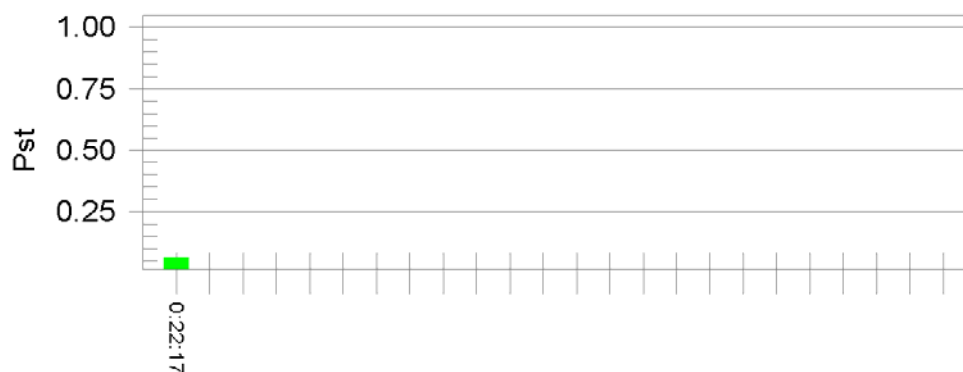
Tested by: Kennen
 Test Margin: 100
 Start time: 0:11:56
 End time: 0:22:23
 Data file name: F-000266.cts_data

Test Result: Pass

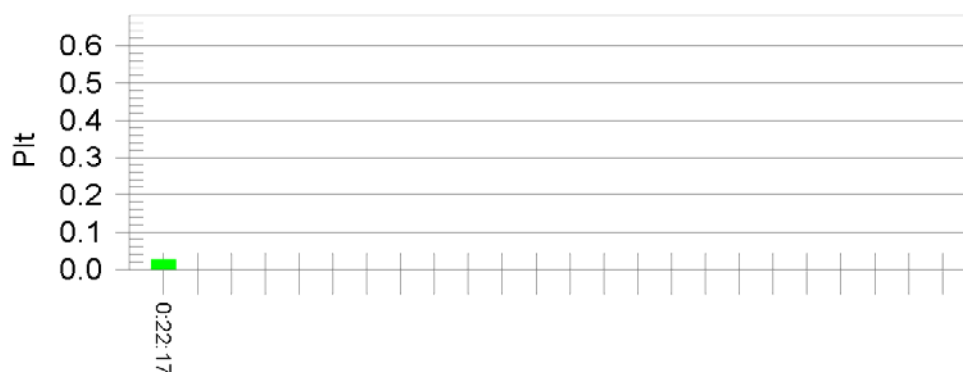
Status: Test Completed

Pst and limit line

European Limits



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt):	229.65		
T-max (mS):	0	Test limit (mS):	500.0 Pass
Highest dc (%):	0.00	Test limit (%):	3.30 Pass
Highest dmax (%):	0.00	Test limit (%):	4.00 Pass
Highest Pst (10 min. period):	0.064	Test limit:	1.000 Pass
Highest Plt (2 hr. period):	0.028	Test limit:	0.650 Pass

7. IMMUNITY PERFORMANCE CRITERIA

Performance Level

The test results shall be classified in terms of the loss of function or degradation of performance of the equipment under test, relative to a performance level by its manufacturer or the requestor of the test, or the agreed between the manufacturer and the purchaser of the product.

Definition related to the performance level:

1. Based on the used product standard
2. Based on the declaration of the manufacturer, requestor or purchaser

For EN 55024

Criterion A:

Definition: normal performance within limits specified by the manufacturer, requestor and purchaser.

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:

Definition: temporary loss of function or degradation of performance which ceases after the disturbance ceases, and from which the equipment under test recovers its normal performance, without operator intervention.

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:

Definition: temporary loss of function or degradation of performance, the correction of which requires operator intervention.

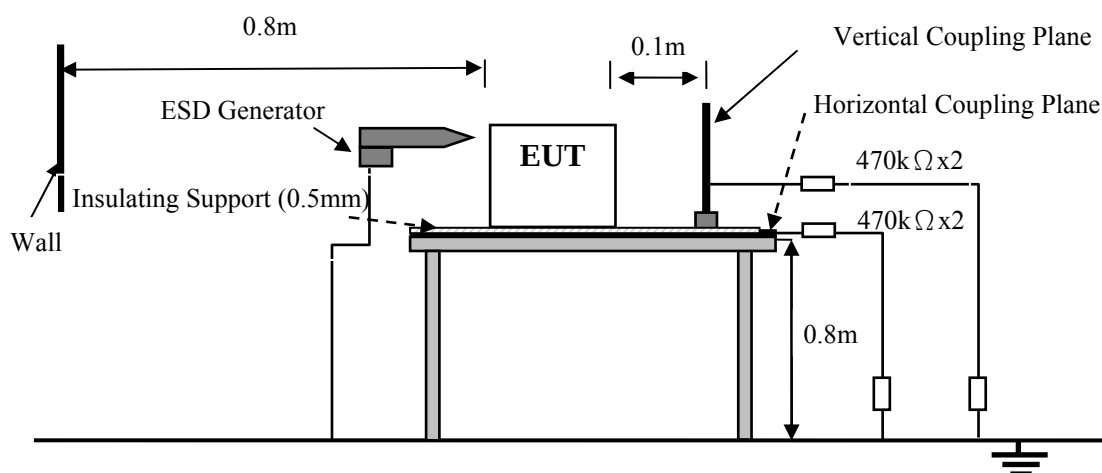
Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

8. ELECTROSTATIC DISCHARGE IMMUNITY TEST

8.1. Test Equipments

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Room	AUDIX	N/A	N/A	Apr.17,19	3 Year
2	ESD Tester	EM Test	Dito	P1723199429	Oct.24,18	1 Year

8.2. Block Diagram of Test Setup



8.3. Test Standard

IEC 61000-4-2: 2008

(Severity for Air Discharge was Level 1 at ± 2 kV & Level 2 at ± 4 kV & Level 3 at ± 8 kV, for Contact Discharge was Level 2 at ± 4 kV)

8.4. Severity Levels and Performance Criterion

Severity Level	Test Voltage Contact Discharge (kV)	Test Voltage Air Discharge (kV)	Performance criterion
1.	2	2	B
2.	4	4	
3.	6	8	
4.	8	15	
X	Special	Special	

8.5. EUT Configuration

The configurations of EUT are listed in Section 3.5.

8.6. Operating Condition of EUT

Same as Conducted Emission test that listed in Section 3.6. except the test set up replaced by Section 8.2.

8.7. Test Procedure

8.7.1. Air Discharge:

The test was applied on non-conductive surfaces of EUT. The round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT. After each discharge, the discharge electrode was removed from the EUT. The generator was re-triggered for a new single discharge and repeated 20 times for each pre-selected test point. This procedure was repeated until all the air discharge completed

8.7.2. Contact Discharge:

All the procedure was same as Section 8.7.1. except that the generator was re-triggered for a new single discharge and repeated 50 times for each pre-selected test point. The tip of the discharge electrode was touching the EUT before the discharge switch was operated.

8.7.3. Indirect discharge for horizontal coupling plane:

At least 25 single discharges were applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.

8.7.4. Indirect discharge for vertical coupling plane:

At least 25 single discharges were applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, was placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges were applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

8.8. Test Results

PASS. (Test results are recorded in next page)

Electrostatic Discharge Test Results

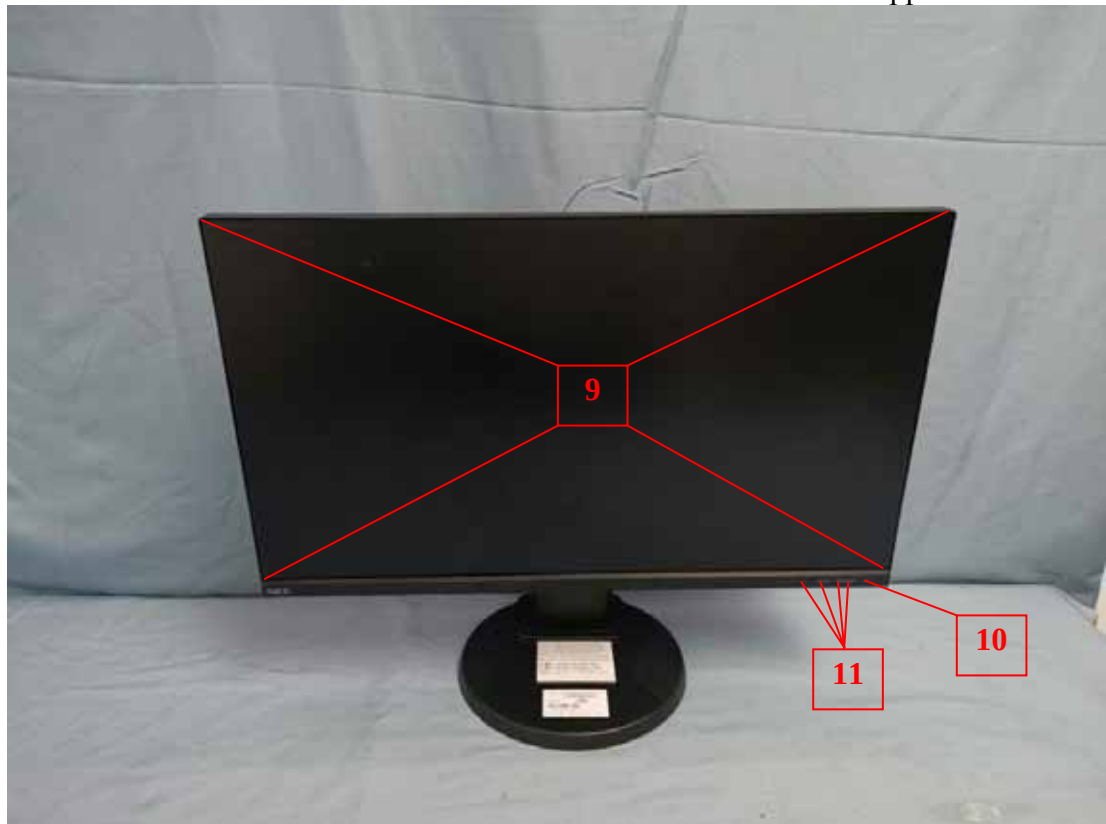
Audix Technology (Shenzhen) Co., Ltd.

EUT	LCD Monitor					Model No.	M245AZ		
Test Date	Jun.18,2019					Temperature	22.4±0.6℃		
Input Power	AC 230V/50Hz					Humidity	51%		
Test Mode	HDMI, “ H” Pattern 1920*1080@60Hz					Pressure	101.7kPa		
Tested By	Kennen					Result	Pass		
Air Discharge	Voltage Level Kv / Discharge per polarity 10 / Observation Criterion								
Test Location	+2	-2	+4	-4	+8	-8	---	---	Comments
AC In (1)	ND	ND	ND	ND	ND	ND	---	---	---
DP Port (2)	A	A	A	A	B*	B*	---	---	---
HDMI Port (3)	A	A	A	A	B*	B*	---	---	---
VGA Port (4)	A	A	A	A	B*	B*	---	---	---
USB Ports (5)	A	A	A	A	A	A	---	---	---
Headphone (6)	ND	ND	ND	ND	ND	ND	---	---	---
Audio In Port (7)	ND	ND	ND	ND	ND	ND	---	---	---
Slots(8)	ND	ND	ND	ND	ND	ND	---	---	---
Screen(9)	ND	ND	ND	ND	B*	B*	---	---	---
LED(10)	ND	ND	ND	ND	ND	ND	---	---	---
Buttons(11)	ND	ND	ND	ND	A	A	---	---	---
Keylock(12)	ND	ND	ND	ND	ND	ND	---	---	---
Contact Discharge	Voltage Level Kv / Discharge per polarity 25 / Observation Criterion								
Test Location	+4	-4	---	---	---	---	---	---	Comments
Metal (13)	B*	B*	---	---	---	---	---	---	---
Screws(14)	B*	B*	---	---	---	---	---	---	---
Indirect Contact	Voltage Level kV / Discharge per polarity 25 / Observation Criterion								
Test Location	+4	-4	---	---	---	---	---	---	Comments
VCP Front	A	A	---	---	---	---	---	---	---
VCP Right	A	A	---	---	---	---	---	---	---
VCP Left	A	A	---	---	---	---	---	---	---
VCP Back	A	A	---	---	---	---	---	---	---
HCP Bottom	A	A	---	---	---	---	---	---	---
Additional Notes									
Measurement Points	Please refer to the Photos of ESD Test Points								
ND=No Discharge; Meets criteria but unable to obtain an electrostatic discharge (ESD) at this test point. Note: The class “B*” means the screen of EUT will be twinkle during test, but it can recover by itself after test.									

After discharge to the ungrounded part of EUT, it needs the bleeder resistor to remove the charge prior to next ESD pulse.
 Discharge was considered on Contact and Air and Horizontal Coupling Plane (HCP) and Vertical Coupling Plane (VCP).

8.9. ESD TEST POINT PHOTOS

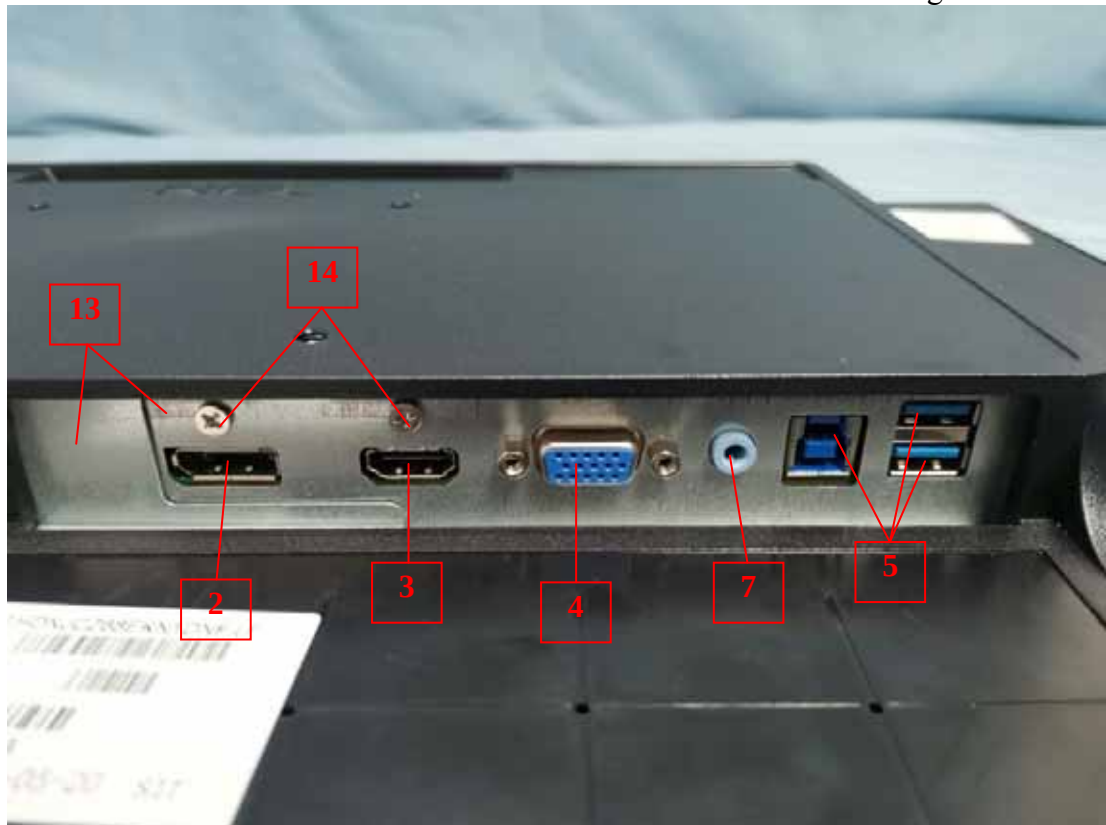
ESD Figure 1
General Appearance of the EUT



ESD Figure 2
General Appearance of the EUT



ESD Figure 3
Signal Port of the EUT



ESD Figure 4
Signal Port of the EUT



ESD Figure 5
Signal Port of the EUT



9. RF FIELD STRENGTH SUSCEPTIBILITY TEST

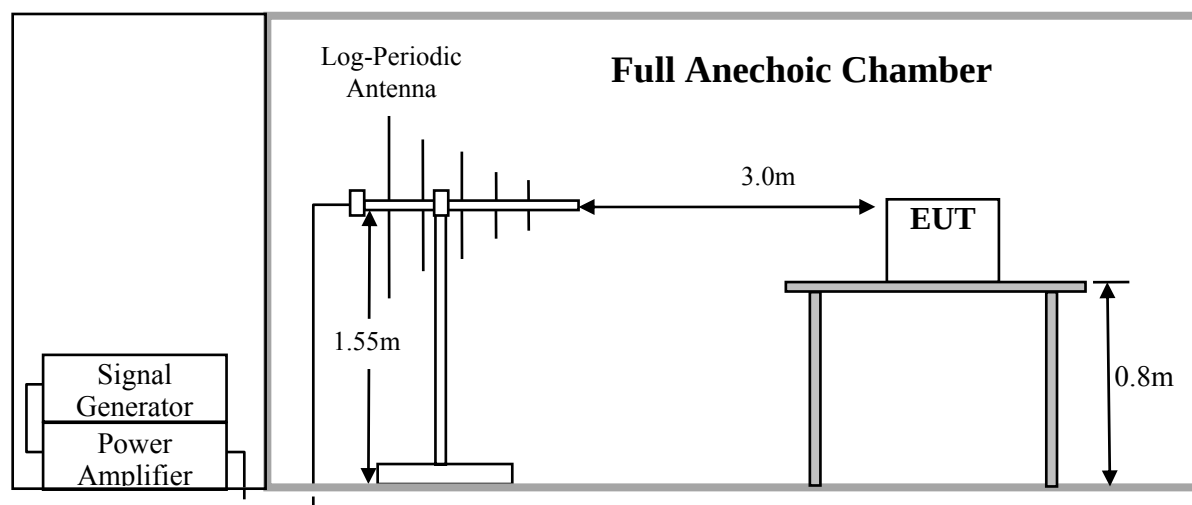
9.1. Test Equipments

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	RS Chamber	AUDIX	N/A	N/A	Apr.13,19	3 Year
2.	MXG Analog Signal Generator	Agilent	N5181A	MY49061013	Oct.13,18	1 Year
3.	Amplifier	R flight	NTWPA-00810 200E	19053131	May.20,19	1 Year
4.	Power Meter	Anritsu	ML2487A	6K00002472	Oct.14,18	1 Year
5.	Power Sensor	Anritsu	MA2491A	033005	Oct.13,18	1 Year
6.	Log-periodic Antenna	A&R	AT1080	16512	NCR	NCR
7.	RF Cable	STORM	MFR-57500	NO.1	NCR	NCR
8.	RF Cable	STORM	MFR-57500	NO.2	NCR	NCR
9.	Test Software	AUDIX	i2	3.2010-1-8	N/A	N/A

Notes: NCR means no calibration required(calibrated with system).

Notes: N/A means Not applicable.

9.2. Block Diagram of Test Setup



9.3. Test Standard

IEC 61000-4-3: 2006+A1:2007+A2:2010
(Severity Level: 2 at 3V / m)

9.4. Severity Levels and Performance Criterion

Severity Level	Test Field Strength V/m	Performance Criteria
1.	1	A
2.	3	
3.	10	
X.	Special	

9.5. EUT Configuration

The configurations of EUT are listed in Section 3.5.

9.6. Operating Condition of EUT

Same as Conducted Emission test that listed in Section 3.6. Except the test set up replaced by Section 9.2.

9.7. Test Procedure

Testing was performed in a fully anechoic chamber as recommended by IEC 61000-4-3. The EUT was placed on an 80cm high non-conductive table located in the area of field uniformity. The radiating antenna was placed 3m in front of the EUT and Support system, and dwell time of the radiated interference was controlled by an automated, computer-controlled system. The signal source was stepped through the applicable frequency range at a rate no faster than 1% of the fundamental. The signal was amplitude modulated 80% over the frequency range 80MHz to 1GHz at a level of 3V/m. The dwell time was set at 3s. Field presence was monitored during testing via a field probe placed in close proximity to the EUT. Throughout testing, the EUT was closely monitored for signs of susceptibility. The test was performed with the antennae oriented in both a horizontal and vertical polarization.

All the scanning conditions are as follows:

Test conditions	
Frequency	80MHz-1GHz
Frequency increments step	1% of momentary used
Test level	3V/m (un-modulated)
Dwell time	3s
Test signal	80% amplitude modulated by 1kHz sinusoidal audio signal

9.8. Test Results

PASS. (Test results are recorded in next page)

RF Field Strength Susceptibility Test Results

Audix Technology(Shenzhen) Co.,Ltd.

EUT	LCD Monitor	Model No.	M245AZ
Test Date	Jun.16,2019	Temperature	22.2±0.6℃
Input Power	AC 230V/50Hz	Humidity	52±3%
Test Mode	HDMI, “H” Pattern 1920*1080@60Hz	Pressure	101.6±1kPa
Tested By	Hogen	Result	Pass

Modulation: ☒ AM 1kHz 80% ☐ Pulse ☐ none

Frequency Range :80MHz -1000MHz

	Horizontal		Vertical		Result
	Required	Observation	Required	Observation	(Pass / Fail)
Front	A	A	A	A	Pass
Right	A	A	A	A	Pass
Rear	A	A	A	A	Pass
Left	A	A	A	A	Pass

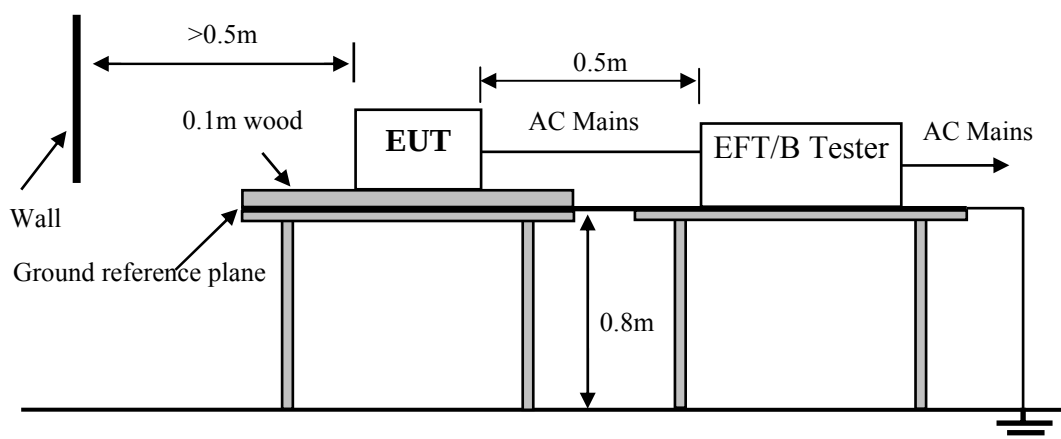
10.ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

10.1.Test Equipments

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Room	AUDIX	N/A	N/A	Apr.17,19	3 Year
2.	Burst Tester	TESEQ	NSG3025	28017	Sep.08,18	1 Year
3.	Test Software	Schaffner	Win3025	V 4.00	N/A	N/A

Note:N/A means Not applicable.

10.2.Block Diagram of Test Setup



10.3.Test Standard

IEC 61000-4-4: 2012

(Severity Level: Level 1 at 0.5kV, Level 2 at 1kV)

10.4.Severity Levels and Performance Criterion

Open Circuit Output Test Voltage $\pm 10\%$			
Severity Level	On Power Supply Lines	On I/O (Input / Output) Signal data and control lines	Performance criterion
1.	0.5 kV	0.25 kV	B
2.	1 kV	0.5 kV	
3.	2 kV	1 kV	
4.	4 kV	2 kV	
X	Special	Special	

10.5.EUT Configuration

The configurations of EUT are listed in Section 3.5.

10.6.Operating Condition of EUT

Same as Conducted Emission test that listed in Section 3.6. except the test set up replaced by Section 10.2.

10.7. Test Procedure

The EUT and its simulators were placed on the ground reference plane and were insulated from it by a wood support $0.1\text{m} \pm 0.01\text{m}$ thick. The ground reference plane was $1\text{m} \times 1\text{m}$ metallic sheet with 0.65mm minimum thickness. This reference ground plane was project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane was more than 0.5m. All cables to the EUT was placed on the wood support, cables not subject to EFT/B was routed as far as possible from the cable under test to minimize the coupling between the cables.

10.7.1. For input and AC power ports:

The EUT was connected to the power mains by using a coupling device that couples the EFT interference signal to AC power lines. Both positive transients and negative transients of test voltage were applied during compliance test and the duration of the test can't less than 1min.

10.7.2. For signal lines and control lines ports:

It's unnecessary to test.

10.7.3. For DC input and DC output power ports:

It's unnecessary to test.

10.8. Test Results

PASS. (Test results are recorded in next page)

Electrical Fast Transient/Burst Test Results

Audix Technology (Shenzhen) Co., Ltd.

EUT	LCD Monitor	Model No.	M245AZ
Test Date	Jun.18,2019	Temperature	24.1±0.6℃
Input Power	AC 230V/50Hz	Humidity	50±3%
Test Mode	HDMI, “ H” Pattern 1920*1080@60Hz	Pressure	101.6±1kPa
Tested By	Kennen	Result	Pass

Repetition Frequency : 5 kHz Burst Duration : 15ms Burst Period: 300ms

Inject Time(s): 120s

Inject Line(Inject Method): ☒ AC Mains (Direct) DC Supply ☐ Signal (Capacitive Clamp)

Line	Test Voltage	Performance			Result (Pass/Fail)
		Required	Observation(+)	Observation(-)	
L	0.5kV	B	B*	B*	Pass
	1kV	B	B*	B*	Pass
N	0.5kV	B	B*	B*	Pass
	1kV	B	B*	B*	Pass
PE	0.5kV	B	B*	B*	Pass
	1kV	B	B*	B*	Pass
L N	0.5kV	B	B*	B*	Pass
	1kV	B	B*	B*	Pass
L PE	0.5kV	B	B*	B*	Pass
	1kV	B	B*	B*	Pass
N PE	0.5kV	B	B*	B*	Pass
	1kV	B	B*	B*	Pass
L N PE	0.5kV	B	B*	B*	Pass
	1kV	B	B*	B*	Pass
Signal Line	---	---	---	---	---

Remark: The class “B*” means the screen of EUT will be twinkle, but it will recover to normal by itself.

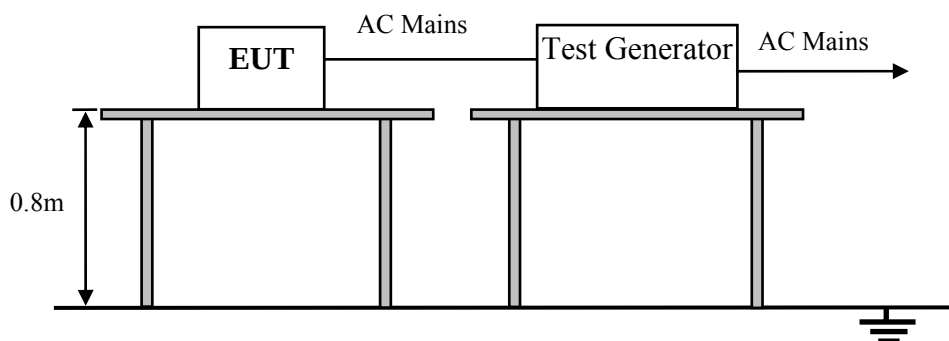
11.SURGE TEST

11.1.Test Equipments

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Room	AUDIX	N/A	N/A	Apr.17,19	3 Year
2.	Transient Test System	EMC PARTNER	TRANSIENT 2000	TRA2006 F-S-T-D-R -1500	Jul,03,18	1 Year
3.	Test Software	EMC PARTNER	Genecs	V3.25	N/A	N/A

Note:N/A means Not applicable.

11.2.Block Diagram of Test Setup



11.3.Test Standard

IEC 61000-4-5: 2014

(Severity Level: Line to Line was Level 1 at 0.5kV& Level 2 at 1kV,
Line to Ground Level 1 at 0.5kV& Level 2 at 1kV& Level 3 at 2kV)

11.4.Severity Levels and Performance Criterion

Severity Level	Open-Circuit Test Voltage kV	Performance criterion
1	0.5	B
2	1.0	
3	2.0	
4	4.0	
*	Special	

11.5.EUT Configuration

The configurations of EUT are listed in Section 3.5.

11.6.Operating Condition of EUT

Same as Conducted Emission test that listed in Section 3.6. except the test set up replaced by Section 11.2

11.7. Test Procedure

- 1) Set up the EUT and test generator as shown on Section 11.2.
- 2) For line-to-line coupling mode, provide a 1kV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points, and for active line / neutral lines to ground are same except test level is 2kV.
- 3) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are applied during test.
- 4) Different phase angles are done individually.
- 5) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

11.8. Test Results

PASS. (Test results are recorded in next page)

Surge Immunity Test Results

Audix Technology (Shenzhen) Co., Ltd.

EUT	LCD Monitor	Model No.	M245AZ
Test Date	Jun.18,2019	Temperature	22.3±0.6℃
Input Power	AC 230V/50Hz	Humidity	51.5±3%
Test Mode	HDMI, “ H” Pattern 1920*1080@60Hz	Pressure	101.7±1kPa
Tested By	Kennen	Result	Pass

Repetition: 5 times per test

Interval:60 Seconds

Line : ☒ AC Mains ☐ DC Supply ☐ Signal

Location	Volt	500V			1kV			2kV			Result
	Phase	Performance			Performance			Performance			(Pass/Fail)
		Require d	+	-	Require d	+	-	Require d	+	-	
L-N	0°	B	A	A	B	A	A	---	---	---	Pass
	90°	B	A	A	B	A	A	---	---	---	Pass
	180°	B	A	A	B	A	A	---	---	---	Pass
	270°	B	A	A	B	A	A	---	---	---	Pass
L-PE	0°	B	A	A	B	A	A	B	B*	B*	Pass
	90°	B	A	A	B	A	A	B	B*	B*	Pass
	180°	B	A	A	B	A	A	B	B*	B*	Pass
	270°	B	A	A	B	A	A	B	B*	B*	Pass
N-PE	0°	B	A	A	B	A	A	B	B*	B*	Pass
	90°	B	A	A	B	A	A	B	B*	B*	Pass
	180°	B	A	A	B	A	A	B	B*	B*	Pass
	270°	B	A	A	B	A	A	B	B*	B*	Pass
Signal Line	---	---	---	---	---	---	---	---	---	---	---

Remark: The class “B*” Means the screen of the monitor will twinkle during test, but it can recover by itself.

12. CONTINUOUS CONDUCTED DISURBANCE TEST

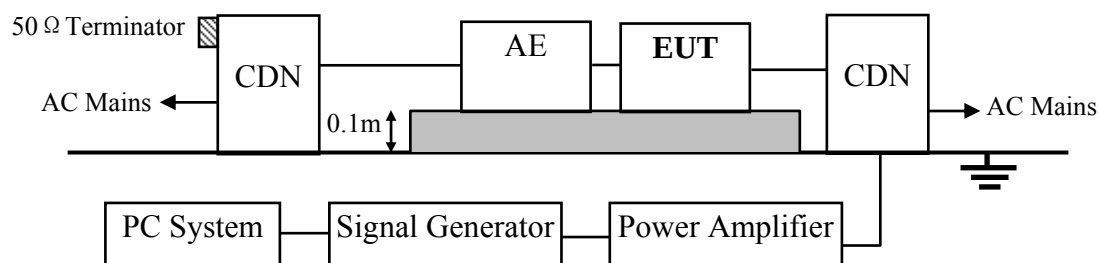
12.1. Test Equipments

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	MXG Analog Signal Generator	Agilent	N5181A	MY49061013	Oct.13,18	1 Year
2.	Amplifier	AR	100A250	19368	Dec.14,18	1 Year
3.	Power meter	HP	436A	2016A07891	Apr.13,19	1 Year
4.	Power sensor	Agilent	8482B	MY41090514	Oct.13,18	1 Year
5.	CDN	FCC	FCC-801-M 3-25A	07045	Apr.14,19	1 Year
6.	CDN	TESEQ	CDN M016	34609	Aug.06,18	1 Year
7.	Attenuator	Weinschel	40-6-34	LJ092	Apr.13,19	1 Year
8.	Terminator	Hubersuhner	50Ω	No.3	Apr.14,19	1 Year
9.	RF Cable	MICABLE	A04-07-07-7M	09111341	NCR	NCR
10.	RF Cable	STORM	MFR-57500	NO.2	NCR	NCR
11.	RF Cable	STORM	MFR-57500	NO.3	NCR	NCR
12.	Test Software	AUDIX	i2	3.2010-1-8	N/A	N/A

Notes: NCR means no calibration required (calibrated with system).

Notes: N/A means Not applicable.

12.2. Block Diagram of Test Setup



12.3. Test Standard

IEC 61000-4-6: 2013

(Severity Level 2 at 3V (r.m.s.) and frequency is from 0.15MHz to 80MHz)

12.4. Severity Levels and Performance Criterion

Severity Level	Voltage Level (e.m.f.) V	Performance criterion
1	1	A
2	3	
3	10	
X	Special	

12.5. EUT Configuration

The configurations of EUT are listed in Section 3.5.

12.6. Operating Condition of EUT

Same as Conducted Emission test that listed in Section 3.6. except the test set up replaced by Section 12.2.

12.7. Test Procedure

- 1) Set up the EUT, CDN and test generators as shown on Section 12.2.
- 2) Let the EUT work in test mode and test it.
- 3) The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 10 and 30 mm (where possible).
- 4) The disturbance signal described below is injected to EUT through CDN.
- 5) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 6) The frequency range is swept from 0.150MHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1kHz sine wave.
- 7) The rate of sweep shall not exceed 1.5×10^{-3} decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- 8) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

12.8. Test Results

PASS. (Test results are recorded in next page)

Continuous Conducted disturbance Test Results

Audix Technology (Shenzhen)Co.,Ltd.

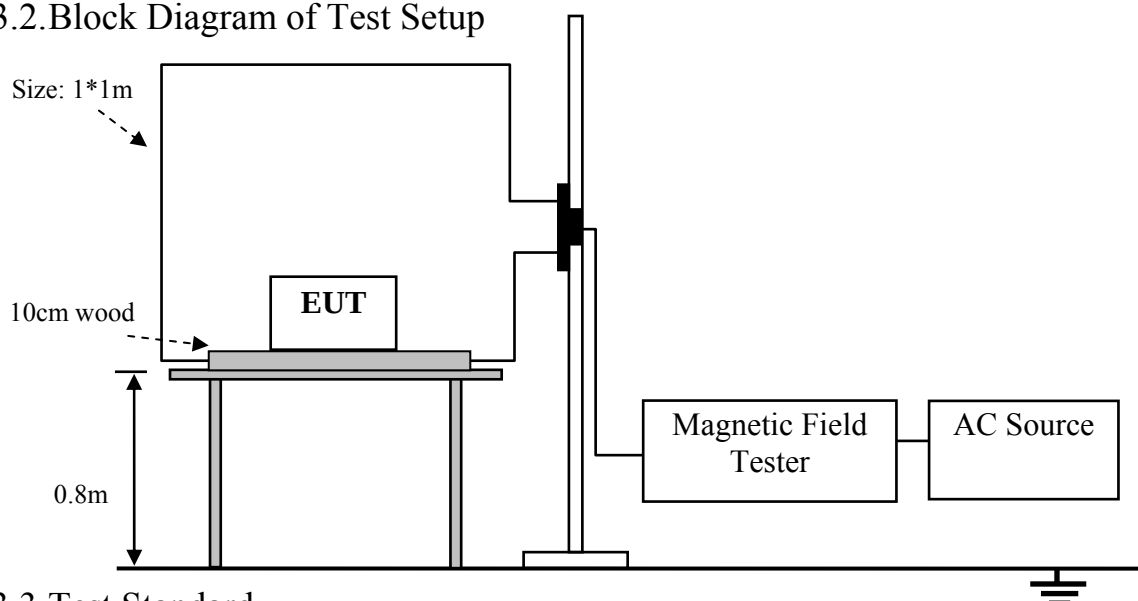
EUT	LCD Monitor		Model No.	M245AZ	
Test Date	Jun.16,2019		Temperature	22.1±0.6℃	
Input Power	AC 230V/50Hz		Humidity	50±3%	
Test Mode	HDMI, “ H” Pattern 1920*1080@60Hz		Pressure	101.6±1kPa	
Tested By	Hogen		Result	Pass	
Frequency Range (MHz)	Injected Position	Voltage Level (e.m.f.)	Required	Observation	Result (Pass / Fail)
0.15 ~ 20	Main (Input AC Power Line)	3V	A	A	PASS
20 ~ 80	Main (Input AC Power Line)	3V	A	A	PASS
Modulation Signal:1kHz 80% AM					
Dwell time:3s					

13. MAGNETIC FIELD IMMUNITY TEST

13.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	H/F Room	AUDIX	N/A	N/A	Apr.16,19	3 Year
2.	Magnetic Field Tester	HAEFELY	Mag100.1	083858-10	Apr.29,19	1 Year
3.	Line Disturbances Tester	HAEFELY	PLINE 1610	083690-05	Sep.08,18	1 Year

13.2. Block Diagram of Test Setup



13.3. Test Standard

IEC 61000-4-8: 2009
(Severity Level 1 at 1A/m)

13.4. Severity Levels and Performance Criterion

Severity Level	Magnetic Field Strength A/m	Performance criterion
1.	1	A
2.	3	
3.	10	
4.	30	
5.	100	
X.	Special	

13.5. EUT Configuration on Test

The configurations of EUT are listed in Section 3.5.

13.6. Operating Condition of EUT

Same as Conducted Emission test that listed in Section 3.6. except the test set up replaced by Section 13.2.

13.7. Test Procedure

The EUT was subjected to the test magnetic field by using the induction coil of standard dimensions (1m*1m) and shown in Section 13.2. The induction coil was then rotated by 90° in order to expose the EUT to the test field with different orientations.

13.8. Test Results

PASS. (Test results are recorded in next page)

Magnetic Field Immunity Test Results

Audix Technology (Shenzhen) Co., Ltd.

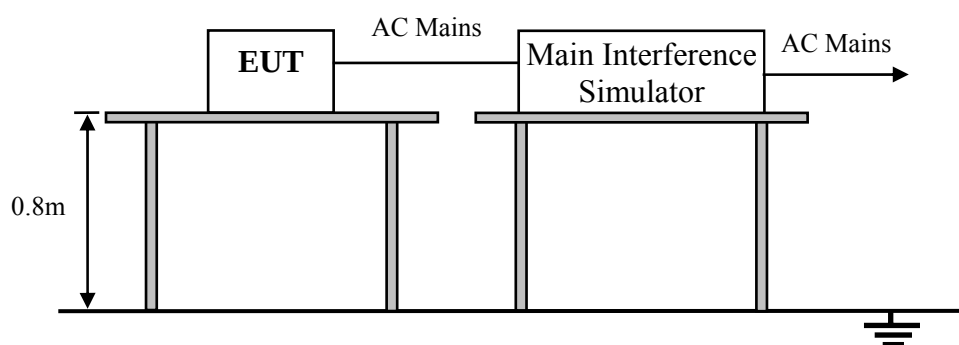
EUT	LCD Monitor		Model No.	M245AZ	
Test Date	Jun.16,2019		Temperature	22.4±0.6℃	
Input Power	AC 230V/50Hz		Humidity	51±3%	
Test Mode	HDMI, “ H” Pattern 1920*1080@60Hz		Pressure	101.6±1kPa	
Tested By	Hogen		Result	Pass	
Test Level	Testing Duration	Coil Orientation	Required	Observation	Result
					(Pass/Fail)
1A/m	5 min / coil	X-axis	A	A	PASS
1A/m	5 min / coil	Y-axis	A	A	PASS
1A/m	5 min / coil	Z-axis	A	A	PASS

14. VOLTAGE DIPS AND INTERRUPTIONS TEST

14.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	H/F Room	AUDIX	N/A	N/A	Apr.16,19	3 Year
2.	Line Disturbances Tester	HAEFELY	PLINE 1610	083690-05	Sep.08,18	1 Year

14.2. Block Diagram of Test Setup



14.3. Test Standard

IEC 61000-4-11: 2004,
IEC-61000-4-11: 2004+A1: 2017

14.4. Severity Levels and Performance Criterion

Test Level %U _T	Voltage dip and short interruptions %U _T	Duration (in period)	Performance Criterion
0	100	250/300 ^{Note}	C
0	100	0.5	B
70	30	25/30 ^{Note}	C

Note: "25/30 Cycles" means "25 cycles for 50Hz test" and "30 cycles for 60Hz test".
"250/300 Cycles" means "250 cycles for 50Hz test" and "300 cycles for 60Hz test"

14.5. EUT Configuration

The configurations of EUT are listed in Section 3.5.

14.6. Operating Condition of EUT

Same as Conducted Emission test that is listed in Section 3.6. except the test set up replaced by Section 14.2.

14.7. Test Procedure

- 1) The EUT and test generator were setup as shown on Section 14.2.
- 2) The interruption is introduced at selected phase angles with specified duration.
- 3) Record any degradation of performance.

14.8. Test Results

PASS. (Test results are recorded in next page)

Voltage Dips And Interruptions Test Results

Audix Technology (Shenzhen) Co., Ltd.

EUT	LCD Monitor	Model No.	M245AZ
Test Date	Jun.16,2019	Temperature	22.3±0.6℃
Input Power	AC 230V/50Hz & AC 100V/50Hz	Humidity	52±3%
Test Mode	HDMI, “ H” Pattern 1920*1080@60Hz	Pressure	101.6±1kPa
Tested By	Hogen	Result	Pass

AC 230V/50Hz

Test Level % U _T	Voltage Dips & Short Interruptions % U _T	Duration (in period)	Phase Angle	Required	Observation	Result
						(Pass / Fail)
0	100	0.5P	0°·90°·180°·270°	B	A	PASS
70	30	25P	0°·90°·180°·270°	C	A	PASS
0	100	250P	0°·90°·180°·270°	C	C*	PASS

AC 100V/50Hz

Test Level % U _T	Voltage Dips & Short Interruptions % U _T	Duration (in period)	Phase Angle	Required	Observation	Result
						(Pass / Fail)
0	100	0.5P	0°·90°·180°·270°	B	A	PASS
70	30	25P	0°·90°·180°·270°	C	A	PASS
0	100	250P	0°·90°·180°·270°	C	C*	PASS

Note 1: U_T is the rated voltage for the equipment.

Note 2: The frequency of the test voltage shall be within ±2% of the rated frequency, the output voltage shall be within ±5% of the rated voltage.

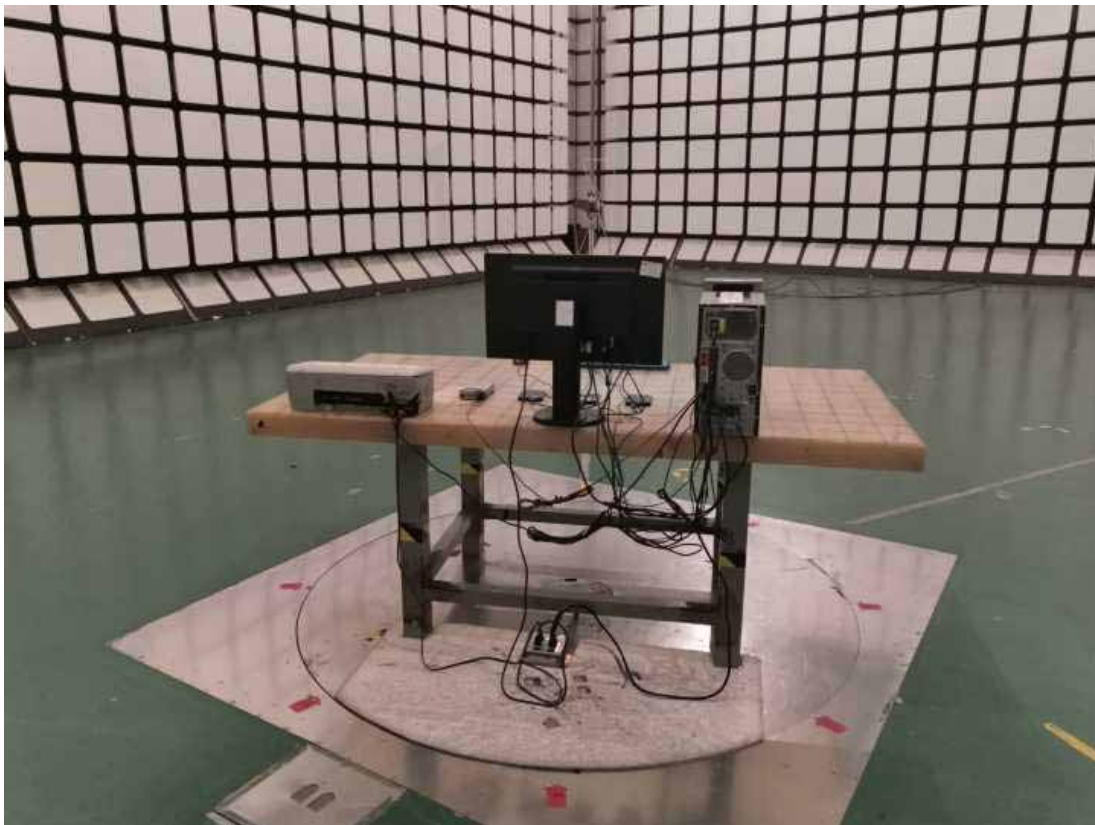
Remark: The Class “C*” means the screen of EUT will black, it need recover to normal by manual.

15. PHOTOGRAPHS

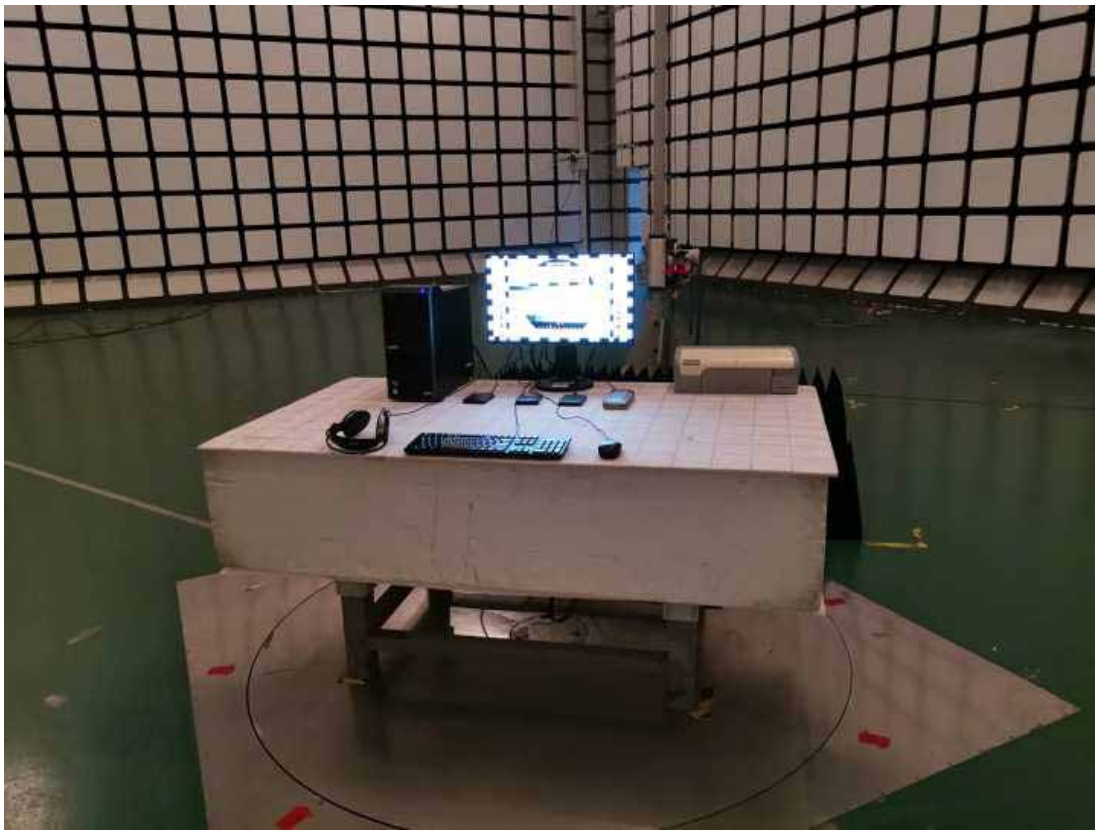
15.1. Photos of Power Line Conducted Emission Test



15.2. Photos of Radiated Emission Test (In 10m Anechoic Chamber)



In 10m Anechoic Chamber Test 1GHz – 6GHz



15.3.Photo of Harmonic / Flicker Test



15.4.Photos of Electrostatic Discharge Immunity Test



15.5.Photo of RF Strength Susceptibility Test



15.6.Photo of Electrical Fast Transient/Burst Immunity Test



15.7.Photo of Surge Test



15.8.Photo of Injected Currents Susceptibility Test



15.9. Photo of Magnetic Field Test



15.10. Photo of Voltage Dips and interruptions test



..... THE END