

TEST REPORT



Report No. : KES-EM-23T1079

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1. Client

Applicant : Hanwha Vision Co., Ltd

Applicant Address : 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do,
Republic of Korea

2. Sample Description

Product name : LED MONITOR

Model/Type No. : SMT-3215

Variant Model : -

Manufacturer : WEIHAI DAEWOO ELECTRONICS CO.,LTD

Manufacturer Address : NO.26 HONGKONG ROAD, ECONOMIC AND TECHNICAL
DEVELOPMENT ZONE, WEIHAI, SHANDONG, CHINA

3. Date of Receipt : Nov. 16, 2023

4. Test date : Dec. 01, 2023 ~ Dec. 04, 2023

5. Date of Issue : Dec. 14, 2023

6. Test Results : In Compliance

Tested by

Young Jae, Kim
EMC Test Engineer

Reviewed by

Dong Il, Lee
EMC Technical Manager

This test report is not related to KS Q ISO/IEC 17025 and KOLAS.

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Dec. 14, 2023	KES-EM-23T1079	Issued

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1.0 General Product Description

Main Specifications of EUT are:

Model		31.5" SMT-3215	Remark
Display			
Screen Size		31.5"	
Max. Resolution		1920*1080 60Hz (FHD)	
Brightness		300 cd/m² (Typ)	
Contrast Ratio		3200:1 (Min) '4000:1 (Typ)	
Aspect Ratio		16:9	
Viewing Angle (H/V)		178°/178°	
Display Color		16.7M	
Response Time		20ms(Typ)	
Panel Life		30,000 hours	
Interface			
Video	Connector	VGA (1) HDMI 1.4(1), DP 1.2(1) Ain(1) Aout (1)	
	Connector	VGA	
VGA	Available Format	640 x 480@60Hz, 800 x 600@56Hz/60Hz/72Hz/75Hz, 1024 x 768@60Hz/70Hz/75Hz, 1280 x 1024@60Hz/75Hz, 1440 x 900@60Hz, 1680 x 1050@60Hz, 1920 x 1080@50Hz/60Hz, 1280 x 800@60Hz, 1280 x 960@60Hz, 1280 x 720@60Hz,	
	Available Format	640 x 480@60Hz, 800 x 600@56Hz/60Hz/72Hz/75Hz, 1024 x 768@60Hz/70Hz/75Hz, 1280 x 1024@60Hz/75Hz, 1440 x 900@60Hz, 1680 x 1050@60Hz, 1920 x 1080@50Hz/60Hz, 720 x 480P60Hz, 1280 x 720P@50Hz, 720 x 576P@50Hz, 1920x1080P@50/60Hz, 1280 x 800@60Hz, 1280 x 960@60Hz, 1280 x 720@60Hz,	
HDMI	Connector	HDMI	
	Available Format	640 x 480@60Hz, 800 x 600@56Hz/60Hz/72Hz/75Hz, 1024 x 768@60Hz/70Hz/75Hz, 1280 x 1024@60Hz/75Hz, 1440 x 900@60Hz, 1680 x 1050@60Hz, 1920 x 1080@50Hz/60Hz, 720 x 480P60Hz, 1280 x 720P@50Hz, 720 x 576P@50Hz, 1920x1080P@50/60Hz, 1280 x 800@60Hz, 1280 x 960@60Hz, 1280 x 720@60Hz,	
DP	Connector	DP	
	Available Format	640 x 480@60Hz, 800 x 600@56Hz/60Hz/72Hz/75Hz, 1024 x 768@60Hz/70Hz/75Hz, 1280 x 1024@60Hz/75Hz, 1440 x 900@60Hz, 1680 x 1050@60Hz, 1920 x 1080@50Hz/60Hz, 720 x 480P60Hz, 1280 x 720P@50Hz, 720 x 576P@50Hz, 1920x1080P@50/60Hz, 1280 x 800@60Hz, 1280 x 960@60Hz, 1280 x 720@60Hz,	
Audio	Connector	Audio in/out	
	Output Signal	Loop-through line level(PC only), Speakers : 4Ω 2.5Wx 2	
PIP/PBP		NO	
Remocon		N/A	
On Screen Display (OSD)			
Functions		VESA™ DPM Compatible	
Language		Korean, English, Русский, Deutsch, Français, Español, Italiano, Português, Chinese (Simplified), Chinese (Traditional), Japanese, Arabic	
General			
Electrical	Input Voltage	AC 100-240V, 50/60Hz, 1.2A	
	Power Consumption	<60W	
Environmental	Operating Temperature	0 ~ +40°C (+32°F ~ +104°F)	
	Operating Humidity	10% ~ 80% (non-condensing)	
Mechanical	Dimensions with Stand	714.0*484.2*200.8mm	
	Dimensions without Stand	714.0*423.7*53.7mm	
	Bezel Size	3 Frameless Top:1.8mm Bottom:21mm Side : 1.8mm	
	Cabinet Color	Black	
VESA Mounts Interface		100*100mm	
Weight	Monitor with Stand	7.272kg	
	Monitor without Stand	5.806kg	
	Box+foam+ accessory+With Stand monitor	1.206kg+0.658kg+0.304kg+7.272kg=9.44kg	accessory:power code+HDMI code+Quick
	Box+foam+ accessory+without Stand monitor	1.206kg+0.658kg+0.304kg+5.806kg=7.974kg	
Stand		including	

1.1 Test Voltage & Frequency

Unless indicated otherwise on the individual data sheet or test results, the test voltage and frequency was as indicated below.

☒ AC 230 V, 50 Hz

1.2 Variant Model Differences

Not applicable

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
LED MONITOR	SMT-3215	-	Weihai Daewoo Electronics Co., Ltd.	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Desktop PC	-	-	-	-
Mouse	B138	-	ARESON TECHNOLOGY CPRO.	-
Earphone	-	-	-	-

1.6 External I/O Cabling

■ VGA, DisplayPort, HDMI Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
LED MONITOR (EUT)	HDMI	Desktop PC	HDMI	1.5	S
	VGA	Desktop PC	VGA	1.5	S
	DisplayPort	Desktop PC	DisplayPort	1.5	S
	3.5 mm	Desktop PC	3.5 mm	1.5	U
	3.5 mm	Earphone	3.5 mm	1.0	U
Desktop PC	USB A TYPE	Mouse	USB A TYPE	1.5	U

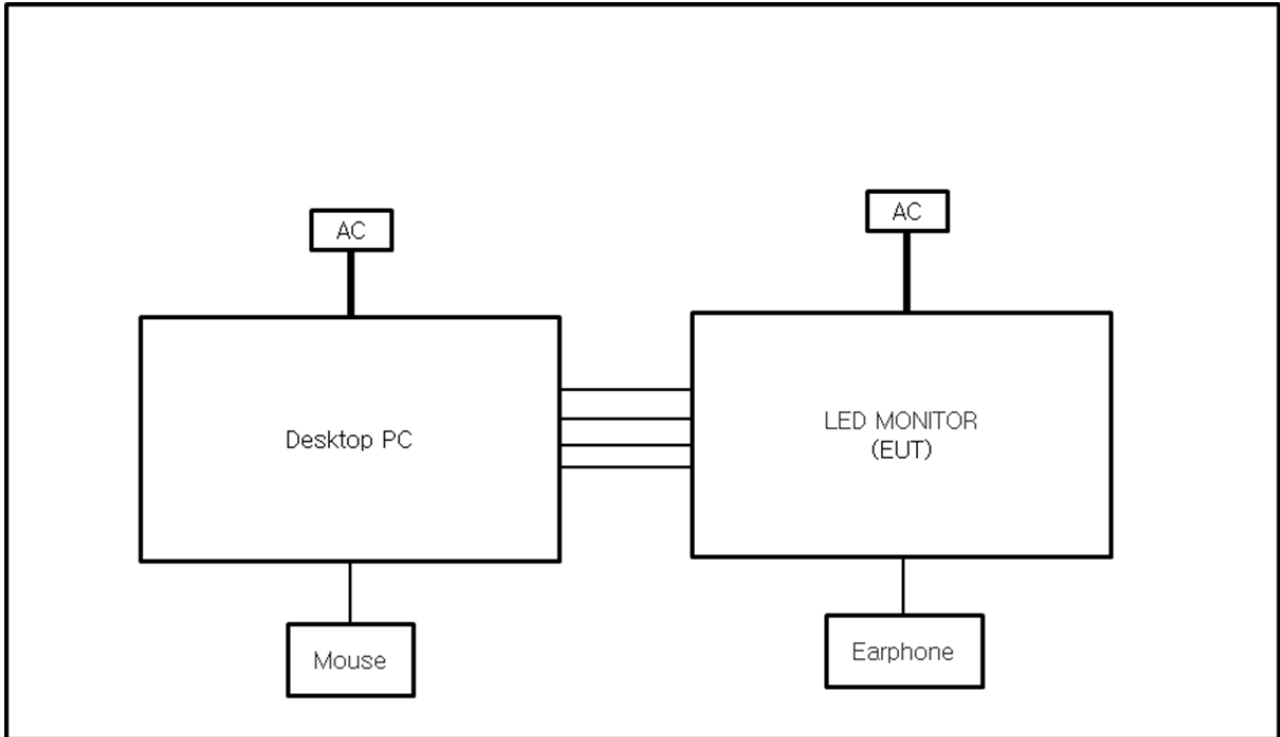
* Unshielded=U, Shielded=S

1.7 EUT Operating Mode(s)

Test mode	Normal operating
Operation (HDMI MODE, VGA MODE, DisplayPort MODE)	The test was conducted by converting the input mode of the test equipment into VGA and HDMI and DisplayPort inputs and executing the moving color bar of the laptop to check whether it was normally output to the test equipment.

EUT Test operating S/W - Vendor Support Program		
Name	Version	Manufacture Company
-	-	-

1.8 Configuration



1.9 Remarks when standards applied

N/A

1.10 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less.

1.11 Test Facility

The measurement facility is located at 473-21, Gayeo-ro, Yeosu-si, Gyeonggi-do, 12658, Korea, Republic of. The sites are constructed in conformance with the requirements of ANSI C63.4a-2017 and CISPR 16-1-4:2019

1.12 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
KOREA	RRA	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KR0100
International	KOLAS	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KT489
USA	FCC	3 m & 10 m Semi-Anechoic Chamber Conducted test site to perform FCC Part 15/18 measurements.	 KR0100
Canada	ISED	3 m & 10 m Semi-Anechoic Chamber and Conducted test site	 23298
JAPAN	VCCI	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site)	 C-20136, T-20137, R-20181, G-20176
Europe	TÜV SÜD	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 CARAT 001633 0004

2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **EMC – Directive 2014/30/EU**

☒ EN 55032:2015/A11:2020

☒ Class A

☐ Class B

☒ EN 55035:2017/A11:2020

☒ EN IEC 61000-3-2:2019

☒ EN 61000-3-3:2013/A1:2021

☒ **EMC – Regulations 2016**

☒ EN 55032:2015/A11:2020

☒ Class A

☐ Class B

☒ EN 55035:2017/A11:2020

☒ EN IEC 61000-3-2:2019

☒ EN 61000-3-3:2013/A1:2021

2.1 Conducted Emissions at Mains Power Ports

Test Date

Dec. 04, 2023

Test Location

Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EMC32	R & S	9.12.00	-
☒	EMI TEST RECEIVER	ESR3	R & S	101783	11, 08, 2024
☒	LISN	ENV216	R & S	101787	11, 08, 2024
☒	LISN	ESH2-Z5	R & S	100450	11, 08, 2024
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 08, 2024

Test Conditions

Temperature: (22,7 ± 0,1) °C

Relative Humidity: (45,3 ± 0,2) % R.H.

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

RemarksSee Appendix A for test data.

2.2 Conducted Emissions at Telecommunication Ports

Test Date

N/A

Test Location

Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☐	EMI Test S/W	EMC32	R & S	9.12.00	-
☐	EMI TEST RECEIVER	ESR3	R & S	101783	11, 08, 2024
☐	LISN	ENV216	R & S	101787	11, 08, 2024
☐	LISN	ESH2-Z5	R & S	100450	11, 08, 2024
☐	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 08, 2024
☐	8-WIRE ISN CAT3,5	ENY81	R & S	100174	11, 09, 2024
☐	8-WIRE ISN CAT6	ENY81-CAT6	R & S	101665	11, 09, 2024

Test Conditions

Temperature:

°C

Relative Humidity:

% R.H.

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Results

The requirements are:

- ☐ PASS
☐ NOT PASS
☒ NOT APPLICABLE

RemarksDoes not apply because there is no signal line ports.

2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Dec. 01, 2023

Test Location☐ OPEN AREA TEST SITE #2☒ SEMI ANECHOIC CHAMBER #4(10 m)**Test Equipment**

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESU26	R & S	100551	03, 21, 2024
☒	AMPLIFIER	SCU 01	R & S	100603	11, 08, 2024
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	11, 17, 2024
☒	ATTENUATOR	8491A	HP	32173	03, 03, 2024

Test Conditions

Temperature: (21,2 ± 0,0) °C

Relative Humidity: (45,9 ± 0,1) % R.H.

Frequency Range of Measurement

30 MHz to 1 GHz

Measurement distance

10 m

Instrument Settings

IF Band Width: 120 kHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

RemarksSee Appendix A for test data.

2.4 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Dec. 04, 2023

Test Location

SEMI ANECHOIC CHAMBER #5

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESR7	R & S	101190	03, 21, 2024
☒	PREAMPLIFIER	8449B	AGILENT	3008A01967	11, 03, 2024
☒	ATTENUATOR	8491A	HP	35496	05, 31, 2024
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 21, 2024

Test Conditions

Temperature: (21,2 ± 0,0) °C

Relative Humidity: (45,9 ± 0,1) % R.H.

Frequency Range of Measurement

1 GHz to 6 GHz

Instrument Settings

IF Band Width: 1 MHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.

2.5 Harmonic Current Emissions

Test Date

Dec. 04, 2023

Test Location

Electro wave Shieldroom #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	net.control	EM TEST	2.1.4	-
☒	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	03, 27, 2024
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: (22,6 ± 0,1) °C

Relative Humidity: (44,4 ± 0,2) % R.H.

Classification of Equipment for Harmonic Current Emissions

- ☐ Class A
- ☐ Class B
- ☐ Class C(Below 25 W)
- ☐ Class C(Above 25 W)
- ☒ Class D

Test Results

The requirements are:

- ☒ PASS
- ☐ NOT PASS
- ☐ NOT APPLICABLE

RemarksSee Appendix A for test data.

2.6 Voltage Fluctuations and Flicker

Test Date

Dec. 04, 2023

Test Location

Electro wave Shieldroom #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	net.control	EM TEST	2.1.4	-
☒	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	03, 27, 2024
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: (22,6 ± 0,1) °C

Relative Humidity: (44,4 ± 0,2) % R.H.

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

RemarksSee Appendix A for test data.

3.0 Criteria for compliance

General performance criteria

General performance criteria are defined in 8.2, 8.3 and 8.4. These criteria shall be used during the testing of primary functions where no relevant annex is applicable.

When assessing the impact of a disturbance on a function, the assessment should take into consideration the function's performance prior to the application of the disturbance and only identify as failures those changes in performance that are a result of the disturbance.

Performance criterion A

The equipment shall continue to operate as intended without operator intervention. No degradation of performance, loss of function or change of operating state 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.

Performance criterion B

During the application of the disturbance, degradation of performance is allowed. However, no unintended change of actual operating state or stored data is allowed to persist after the test.

After the test, 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), or recovery time, 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.

Performance 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. A reboot or re-start operation is allowed.

Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

3.1 Electrostatic Discharge

Reference Standard

EN 61000-4-2:2009

Test Date

Dec. 01, 2023

Test Location

EMS-ESD: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	ESD SIMULATOR	ESS-2000	Noise Ken	ESS01Z0454	01, 31, 2024
☒	HCP	-	KES	-	-
☒	VCP	-	Noise Ken	-	-

Test Conditions

Temperature: (22,2 ± 0,2) °C
 Relative Humidity: (45,9 ± 0,1) % R.H.
 Atmospheric Pressure: (101,0 ± 0,0) kPa

Test Specifications

Discharge Factor: ≥ 1 s

Discharge Impedance: 330 ohm / 150 pF

Kind of Discharge: Air, Contact (direct and indirect)

Polarity: Positive and Negative

Number of Discharge: 10 at all locations for Air discharge
 10 at all locations for Contact discharge

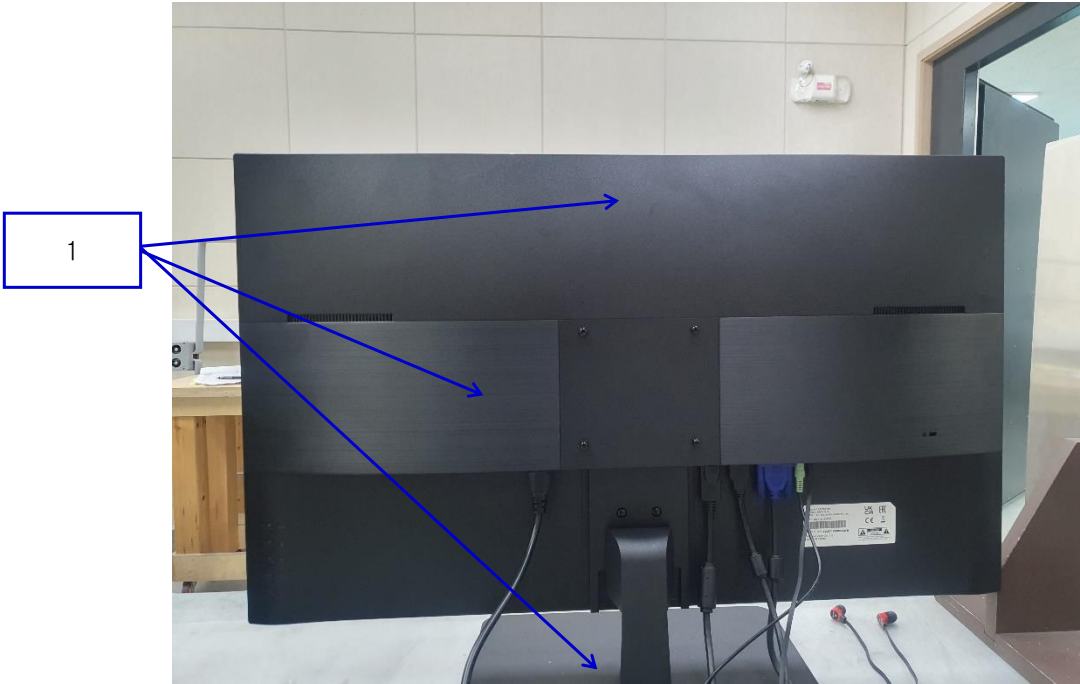
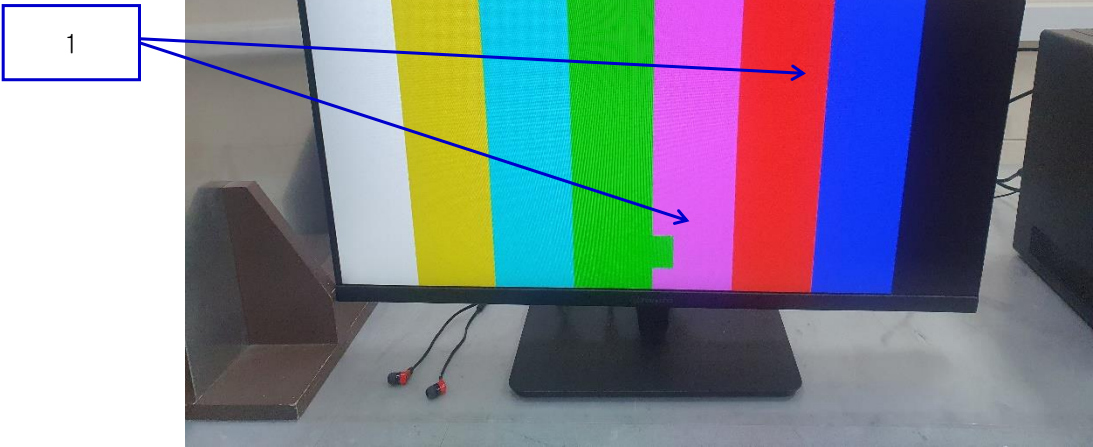
Discharge Voltage:	Contact ☐ 2 kV ☒ 4 kV ☐ 6 kV ☐ 8 kV ☐ 15 kV	Air ☒ 2 kV ☒ 4 kV ☐ 6 kV ☒ 8 kV ☐ 15 kV	HCP ☐ 2 kV ☒ 4 kV ☐ 6 kV ☐ 8 kV ☐ 15 kV	VCP ☐ 2 kV ☒ 4 kV ☐ 6 kV ☐ 8 kV ☐ 15 kV
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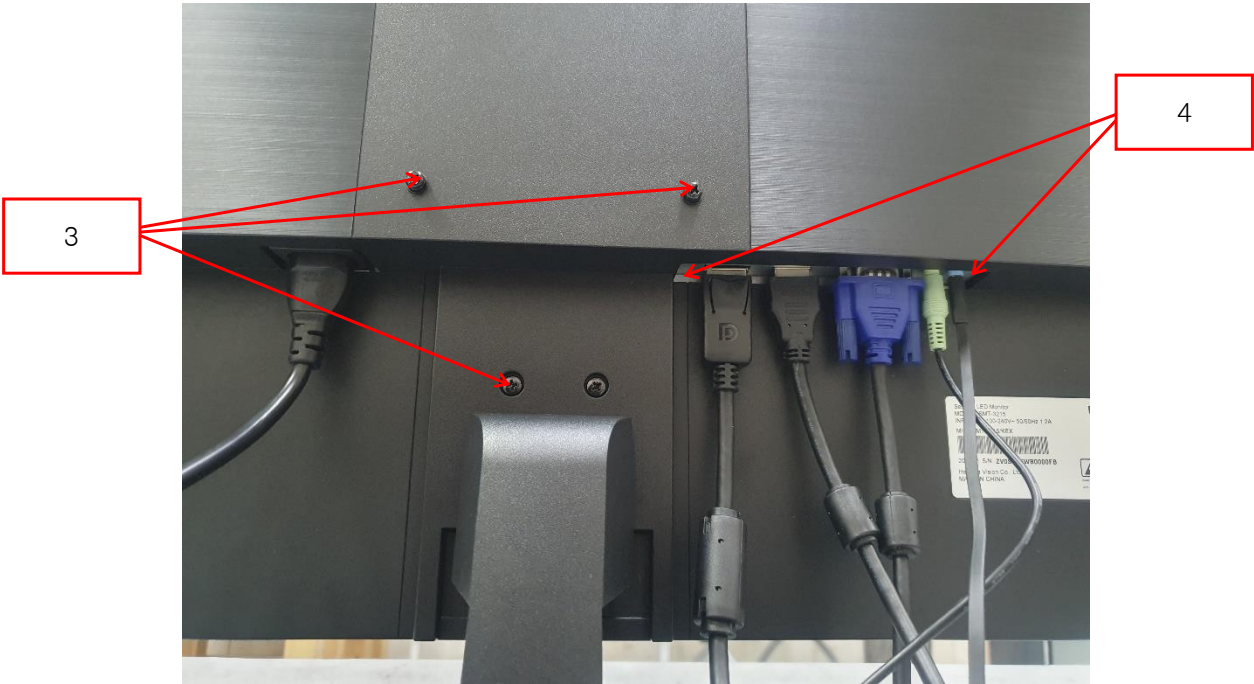
Notes: HCP: Horizontal coupling plane

VCP: Vertical coupling plane

Required Performance Criteria: ☒ B

Location of Discharge:





Test Data

■ VGA Mode

No.	Test Point	Discharge Method	Performance		Remarks
			Criteria	Results	
1	HCP Contact	Contact Discharge	B	A	-
2	VCP Contact	Contact Discharge	B	A	-

Direct Discharge

No.	Test Point	Discharge Method	Performance		Remarks
			Criteria	Results	
1	Display, Enclosure	Air Discharge	B	A	-
2	Button	Air Discharge	B	A	-
3	Screw	Contact Discharge	B	A	-
4	Around Port	Contact Discharge	B	A	-

■ DisplayPort Mode

No.	Test Point	Discharge Method	Performance		Remarks
			Criteria	Results	
1	HCP Contact	Contact Discharge	B	A	-
2	VCP Contact	Contact Discharge	B	A	-

Direct Discharge

No.	Test Point	Discharge Method	Performance		Remarks
			Criteria	Results	
1	Display, Enclosure	Air Discharge	B	A	-
2	Button	Air Discharge	B	A	-
3	Screw	Contact Discharge	B	A	-
4	Around Port	Contact Discharge	B	A	-

■ HDMI Mode

No.	Test Point	Discharge Method	Performance		Remarks
			Criteria	Results	
1	HCP Contact	Contact Discharge	B	A	-
2	VCP Contact	Contact Discharge	B	A	-

Direct Discharge

No.	Test Point	Discharge Method	Performance		Remarks
			Criteria	Results	
1	Display, Enclosure	Air Discharge	B	A	-
2	Button	Air Discharge	B	A	-
3	Screw	Contact Discharge	B	A	-
4	Around Port	Contact Discharge	B	A	-

Note: "Blank" = Not performed

Results:

A – No degradation of function

B – Distortion/Error of function (self-recoverable)

C – Loss of function

Test Results

☒ PASS Required Performance Criteria

☐ NOT PASS Required Performance Criteria

Remarks

Any degradations of performance was not observed during in the test.

3.2 Radiated Electric Field Immunity

Reference Standard

EN IEC 61000-4-3:2020

Test Date

Dec. 03, 2023

Test Location

EMS-RS: ☒ SEMI ANECHOIC CHAMBER #1☐ SEMI ANECHOIC CHAMBER #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	EMC32	R & S	9.12.00	-
☒	CONTROLLER	OSP 120	Rohde & Schwarz	101221	-
☒	SIGNAL GENERATOR	SMB 100A	R & S	177586	07, 31, 2024
☒	BROADBAND AMPLIFIER	BBA100	R & S	101239	-
☒	BROADBAND AMPLIFIER	100S1G6M1	AR	579931	-
☒	POWER METER	NRP2	R & S	103475	07, 31, 2024
☒	AVG POWER SENSOR	NRP-Z91	R & S	102526	07, 31, 2024
☒	AVG POWER SENSOR	NRP-Z91	R & S	102527	07, 31, 2024
☒	DIRECTIONAL COUPLER	DC7205A	AR	0359033	03, 06, 2024
☒	STACKED LOG-PER. ANTENNA	STPL 9129 SPECIAL	SCHWARZBECK	021	
☒	SOUND ACOUSTIC TESTER	TST-1000	TESTEK	150045	10, 26, 2024
☒	MICROPHONE	MP201	BSWA	551675	10, 26, 2024

Test Conditions

Temperature: (22,7 ± 0,1) °C
 Relative Humidity: (43,5 ± 0,2) % R.H.
 Atmospheric Pressure: (100,3 ± 0,1) kPa

Test Specifications

Antenna Polarization: Horizontal & vertical unless indicated otherwise

Antenna Distance: ☒ 3 m

Field Strength: ☐ 1 V/m ☒ 3 V/m
☐ 10 V/m

Frequency Range: ☒ 80 MHz to 1 GHz (swept test) ☐ 1,4 GHz to 2,7 GHz
☒ 1.8 GHz , 2.6 GHz , 3.5 GHz , 5 GHz ($\pm 1\%$)(spot test)

Modulation: ☒ AM, 80 %, 1 kHz sine wave
☐ PM, 1 Hz (0,5 s ON : 0,5 s OFF)

Frequency step: ☒ 1 % step

Dwell Time: ☒ 1 s ☐ 3 s (spot test)

of Sides Radiated: ☒ 4

Required Performance Criteria: ☒ A

Test Data**■ VGA Mode**

Side Exposed	Performance Criteria	Results	
		Horizontal	Vertical
Front	A	A	A
Right	A	A	A
Back	A	A	A
Left	A	A	A

[Audio output function]

☐ Electrical Measurements / ☒ Acoustic Measurements

Measured parts	Test method	Level (dB)		Performance criteria	Observations	
		Criteria	Measured		Horizontal	Vertical
Earphone	On-ear	75.61	Low	A	A	A
Internal Speaker	Off-ear	85.16	Low	A	A	A

* The SOUND ACOUSTIC TESTER mark characteristics indicate low if less than 50 dB.

■ DisplayPort Mode

Side Exposed	Performance Criteria	Results	
		Horizontal	Vertical
Front	A	A	A
Right	A	A	A
Back	A	A	A
Left	A	A	A

[Audio output function]

☐ Electrical Measurements / ☐ Acoustic Measurements

Measured parts	Test method	Level (dB)		Performance criteria	Observations	
		Criteria	Measured		Horizontal	Vertical
-	-	-	-	A	-	-

* The SOUND ACOUSTIC TESTER mark characteristics indicate low if less than 50 dB.

■ HDMI Mode

Side Exposed	Performance Criteria	Results	
		Horizontal	Vertical
Front	A	A	A
Right	A	A	A
Back	A	A	A
Left	A	A	A

[Audio output function]

☐ Electrical Measurements / ☐ Acoustic Measurements

Measured parts	Test method	Level (dB)		Performance criteria	Observations	
		Criteria	Measured		Horizontal	Vertical
-	-	-	-	A	-	-

* The SOUND ACOUSTIC TESTER mark characteristics indicate low if less than 50 dB.

Note: "Blank" = Not performed

Results:

A – No degradation of function

B – Distortion/Error of function (self-recoverable)

C – Loss of function

Test Results☒ PASS Required Performance Criteria☐ NOT PASS Required Performance Criteria**Remarks**- Any degradations of performance was not observed during in the test.- The acoustic disturbance ratio during/after the test is 20 db lower than the reference level, so it is suitable for the technical standard.

3.3 Electrical Fast Transients/Bursts

Reference Standard

EN 61000-4-4:2012

Test Date

Dec. 01, 2023

Test Location

EMS-EFT: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	EM TEST	5.4.8	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	11, 09, 2024
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 09, 2024
☐	CAPACITIVE COUPLING CLAMP	HFK	EM TEST	P1633183115	11, 10, 2024

Test Conditions

Temperature: (22,2 ± 0,2) °C
 Relative Humidity: (45,9 ± 0,1) % R.H.
 Atmospheric Pressure: (101,1 ± 0,0) kPa

Test Specifications

Pulse Amplitude & Polarity:
 (Power Lines) ☒ ± 1.0 kV ☐ ± 2.0 kV
☐ ± 4.0 kV

Pulse Amplitude & Polarity:
 (Signal Lines) ☐ ± 0.5 kV ☐ ± 1.0 kV
☐ ± 2.0 kV

Burst Period: ☒ 300 ms ☐ 2 s

Repetition Rate: ☒ 5 klz ☐ 100 klz

Duration of Test Voltage: ☒ ≥ 1 min

Required Performance Criteria: ☒ B

Test Data

☒ VGA Mode

☒ Input a.c. power ports – Coupling/Decoupling Network used

Mode of Application	Performance Criteria	Results	
		(+) Burst (kV)	(-) Burst (kV)
L	B	A	A
N	B	A	A
PE	B	A	A
L – N	B	A	A
L – PE	B	A	A
N – PE	B	A	A
L – N – PE	B	A	A

☐ Input d.c. power ports – Coupling/Decoupling Network used

Mode of Application	Performance Criteria	Results	
		(+) Burst (kV)	(-) Burst (kV)
-	B	-	-

☐ Signal ports and telecommunication ports – Coupling Clamp used

Mode of Application	Performance Criteria	Results	
		(+) Burst (kV)	(-) Burst (kV)
-	B	-	-

☒ DisplayPort Mode

☒ Input a.c. power ports – Coupling/Decoupling Network used

Mode of Application	Performance Criteria	Results	
		(+) Burst (kV)	(-) Burst (kV)
L	B	A	A
N	B	A	A
PE	B	A	A
L – N	B	A	A
L – PE	B	A	A
N – PE	B	A	A
L – N – PE	B	A	A

☐ Input d.c. power ports – Coupling/Decoupling Network used

Mode of Application	Performance Criteria	Results	
		(+) Burst (kV)	(-) Burst (kV)
-	B	-	-

☐ Signal ports and telecommunication ports – Coupling Clamp used

Mode of Application	Performance Criteria	Results	
		(+) Burst (kV)	(-) Burst (kV)
-	B	-	-

■ HDMI Mode

☒ Input a.c. power ports – Coupling/Decoupling Network used

Mode of Application	Performance Criteria	Results	
		(+) Burst (kV)	(-) Burst (kV)
L	B	A	A
N	B	A	A
PE	B	A	A
L – N	B	A	A
L – PE	B	A	A
N – PE	B	A	A
L – N – PE	B	A	A

☐ Input d.c. power ports – Coupling/Decoupling Network used

Mode of Application	Performance Criteria	Results	
		(+) Burst (kV)	(-) Burst (kV)
-	B	-	-

☐ Signal ports and telecommunication ports – Coupling Clamp used

Mode of Application	Performance Criteria	Results	
		(+) Burst (kV)	(-) Burst (kV)
-	B	-	-

Note: “Blank” = Not performed

Results:

A – No degradation of function

B – Distortion/Error of function (self-recoverable)

C – Loss of function

Test Results

☒ PASS Required Performance Criteria

☐ NOT PASS Required Performance Criteria

Remarks

Any degradations of performance was not observed during in the test.

3.4 Surge

Reference Standard

EN 61000-4-5:2014+A1:2017

Test Date

Dec. 01, 2023

Test Location

EMS-Surge: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	EM TEST	5.4.8	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	11, 09, 2024
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 09, 2024

Test Conditions

Temperature: (22,2 ± 0,2) °C
Relative Humidity: (45,9 ± 0,1) % R.H.
Atmospheric Pressure: (101,1 ± 0,0) kPa

Test Specifications**AC Power Lines**

Source Impedance: 12 ohm for common mode and 2 ohm for differential mode

Surge Amplitude :
Common Mode
☒ (0,5 / 1,0 / 2,0) kV
Differential Mode
☒ (0,5 / 1,0) kVNumber of Surges: ☒ 5 surges per angleAngle: ☒ 90°, 270° (input a.c. power port)Polarity: ☒ Positive & NegativeRepetition Rate: ☐ 1 surge per min ☒ 1 surge per 30 sec.Required Performance Criteria: ☒ B**Signal Lines**

Source Impedance: 42 ohm for common mode

Surge Amplitude: Common Mode
☐ (1,0) kVNumber of Surges: ☐ 5 SurgesPolarity: ☐ Positive & NegativeRepetition Rate: ☐ 1 surge per min ☐ 1 surge per 30 sec.Required Performance Criteria: ☐ B

Test Data

■ VGA Mode

☒ Line to Line – Differential Mode

Mode of Application	Performance Criteria	Results	
		(+) Surge (kV)	(-) Surge (kV)
L - N	B	A	A

☒ Line to Earth – Common Mode

Mode of Application	Performance Criteria	Results	
		(+) Surge (kV)	(-) Surge (kV)
L – PE	B	A	A
N – PE	B	A	A

Signal Lines☐ Line to Earth – Common Mode

Mode of Application	Performance Criteria	Results	
		(+) Surge (kV)	(-) Surge (kV)
-	B	-	-

■ DisplayPort Mode

☒ Line to Line – Differential Mode

Mode of Application	Performance Criteria	Results	
		(+) Surge (kV)	(-) Surge (kV)
L - N	B	A	A

☒ Line to Earth – Common Mode

Mode of Application	Performance Criteria	Results	
		(+) Surge (kV)	(-) Surge (kV)
L – PE	B	A	A
N – PE	B	A	A

Signal Lines☐ Line to Earth – Common Mode

Mode of Application	Performance Criteria	Results	
		(+) Surge (kV)	(-) Surge (kV)
-	B	-	-

☒ HDMI Mode

☒ Line to Line – Differential Mode

Mode of Application	Performance Criteria	Results	
		(+) Surge (kV)	(-) Surge (kV)
L - N	B	A	A

☒ Line to Earth – Common Mode

Mode of Application	Performance Criteria	Results	
		(+) Surge (kV)	(-) Surge (kV)
L – PE	B	A	A
N – PE	B	A	A

Signal Lines

☐ Line to Earth – Common Mode

Mode of Application	Performance Criteria	Results	
		(+) Surge (kV)	(-) Surge (kV)
-	B	-	-

Note: “Blank” = Not performed

Results:

A – No degradation of function

B – Distortion/Error of function (self-recoverable)

C – Loss of function

Test Results

☒ PASS Required Performance Criteria

☐ NOT PASS Required Performance Criteria

Remarks

Any degradations of performance was not observed during in the test.

3.5 Conducted Disturbance

Reference Standard

EN 61000-4-6:2014

Test Date

Dec. 02, 2023

Test Location

EMS-CS: Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	icd.control	EM TEST	5.3.12	-
☒	CONTINUOUS WAVE SIMULATOR	CWS 500N1.4	EM TEST	P1602169880	11, 08, 2024
☒	ATTENUATOR	ATT 6/80	EM TEST	P1614178148	11, 08, 2024
☒	CDN	CDN M016	TESEQ	43694	11, 08, 2024
☒	CDN	CDN M016	TESEQ	43697	11, 08, 2024
☐	CDN	CDN T800	TESEQ	42800	11, 08, 2024
☒	SOUND ACOUSTIC TESTER	TST-1000	TESTEK	150045	10, 26, 2024
☒	MICROPHONE	MP201	BSWA	551675	10, 26, 2024

Test Conditions

Temperature: (21,6 ± 0,1) °C
 Relative Humidity: (46,4 ± 0,3) % R.H.
 Atmospheric Pressure: (100,3 ± 0,1) kPa

Test Specifications

Frequency range:

☐ 150 kHz to 100 MHz☒ 150 kHz to 80 MHz

Voltage Level:

☒ 3 Vrms (150 kHz to 10 MHz)☒ 3 Vrms to 1Vrms (10 MHz to 30 MHz)☒ 1 Vrms (30 MHz to 80 MHz)

Modulation:

☒ AM, 80 %, 1 kHz sine wave☐ PM, 1 Hz (0,5 s ON : 0,5 s OFF)

Frequency step:

☒ 1 % step

Dwell Time:

☒ 1 s☐ 3 s

Required Performance Criteria:

☒ A

Test Data

■ VGA Mode

☒ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Performance Criteria	Results
L – N – PE	CDN	A	A

☐ Input d.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Performance Criteria	Results
-	-	A	-

☐ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Performance Criteria	Results
-	-	A	-

[Audio output function]

☐ Electrical Measurements / ☒ Acoustic Measurements

Measured parts	Test method	Level (dB)		Performance criteria	Results
		Criteria	Measured		
Earphone	On-ear	75.63	Low	A	A
Internal Speaker	Off-ear	85.26	Low	A	A

* The SOUND ACOUSTIC TESTER mark characteristics indicate low if less than 50 dB.

■ DisplayPort Mode

☒ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Performance Criteria	Results
L – N – PE	CDN	A	A

☐ Input d.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Performance Criteria	Results
-	-	A	-

☐ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Performance Criteria	Results
-	-	A	-

[Audio output function]

☐ Electrical Measurements / ☐ Acoustic Measurements

Measured parts	Test method	Level (dB)		Performance criteria	Results
		Criteria	Measured		
-	-	-	-	A	-

* The SOUND ACOUSTIC TESTER mark characteristics indicate low if less than 50 dB.

☒ HDMI Mode

☒ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Performance Criteria	Results
L – N – PE	CDN	A	A

☐ Input d.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Performance Criteria	Results
-	-	A	-

☐ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Performance Criteria	Results
-	-	A	-

[Audio output function]

☐ Electrical Measurements / ☐ Acoustic Measurements

Measured parts	Test method	Level (dB)		Performance criteria	Results
		Criteria	Measured		
-	-	-	-	A	-

* The SOUND ACOUSTIC TESTER mark characteristics indicate low if less than 50 dB.

Notes: CDN = Coupling Decoupling Network
"blank" = Not performed

Results:

A – No degradation of function

B – Distortion/Error of function (self-recoverable)

C – Loss of function

Test Results

☒ PASS Required Performance Criteria

☐ NOT PASS Required Performance Criteria

Remarks

- Any degradations of performance was not observed during in the test.

- The acoustic disturbance ratio during/after the test is 20 db lower than the reference level, so it is suitable for the technical standard.

3.6 Power Frequency Magnetic Field Immunity

Reference Standard

EN 61000-4-8:2010

Test Date

N/A

Test Location

EMS-Magnetic: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☐	EMS Test S/W	iec.control	EM TEST	5.4.8	-
☐	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	11, 09, 2024
☐	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 09, 2024
☐	MAGNETIC FIELD COIL	MS 100N	EM TEST	P1536163691	11, 10, 2024
☐	CURRENT TRANSFORMER	MC 2630	EM TEST	P1629182219	11, 10, 2024

Test Conditions

Temperature:

°C

Relative Humidity:

% R.H.

Atmospheric Pressure:

kPa

Test Specifications

Field Strength:

☐ 1 A/m☐ 3 A/m☐ 30 A/m

Frequency:

☐ 50 Hz☐ 60 Hz

Required Performance Criteria:

☐ A

Test Data☐ Immersion method

Coil orientation	Performance Criteria	Results
X - axis	A	-
Y - axis	A	-
Z - axis	A	-

Note: "blank" = Not performed

Results:

A – No degradation of function

B – Distortion/Error of function (self-recoverable)

C – Loss of function

Test Results☐ PASS Required Performance Criteria☐ NOT PASS Required Performance Criteria☒ NOT APPLICABLE**Remarks**Not affected by magnetic fields.

3.7 Voltage Dips and Short Interruptions

Reference Standard

EN IEC 61000-4-11:2020

Test Date

Dec. 01, 2023

Test Location

EMS-Voltage dip: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	EM TEST	5.4.8	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	11, 09, 2024
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 09, 2024

Test Conditions

Temperature: (22,2 ± 0,1) °C
Relative Humidity: (45,9 ± 0,0) % R.H.
Atmospheric Pressure: (101,1 ± 0,0) kPa

Test Data

■ VGA Mode

NO	Depth	Duration	Performance		Remarks
			Criteria	Results	
1	95 %	0.5	B	A	-
2	30 %	25	C	A	-
3	95 %	250	C	C	-

■ DisplayPort Mode

NO	Depth	Duration	Performance		Remarks
			Criteria	Results	
1	95 %	0.5	B	A	-
2	30 %	25	C	A	-
3	95 %	250	C	C	-

■ HDMI Mode

NO	Depth	Duration	Performance		Remarks
			Criteria	Results	
1	95 %	0.5	B	A	-
2	30 %	25	C	A	-
3	95 %	250	C	C	-

Results:

- A – No response observed from EUT
 B – Unit shuts down then automatically restarts when full voltage is restored.
 C – Unit shuts down then manually restarts when full voltage is restored or Loss of function.

Test Results

- ☒ PASS Required Performance Criteria
☐ NOT PASS Required Performance Criteria

Remarks

Any degradations of performance was not observed during in the test.

C: During the interruption (0%, 250 cycle, 300 cycle), EUT was turned off but after the test, it was recovered by operator's intervention.

APPENDIX A – TEST DATA

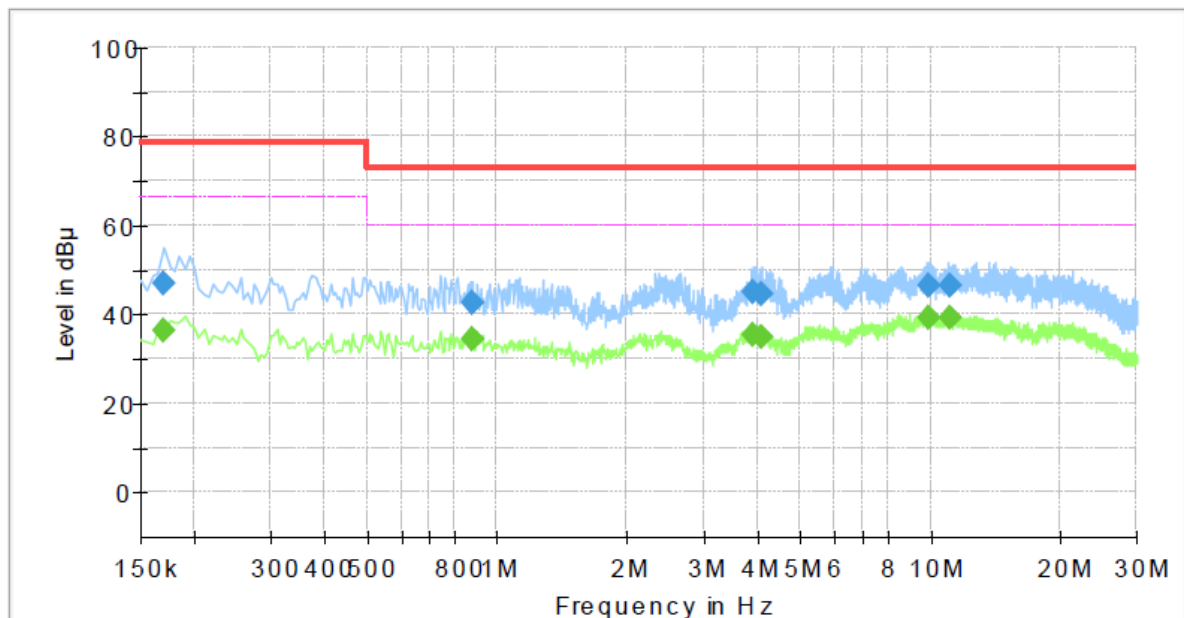
Conducted Emissions at Mains Power Ports

■ VGA Mode

[HOT]

Common Information

Test Description:	Conducted Emission
Model No.:	SMT-3215
Phase:	L1
Mode:	VGA
Operator Name:	KES



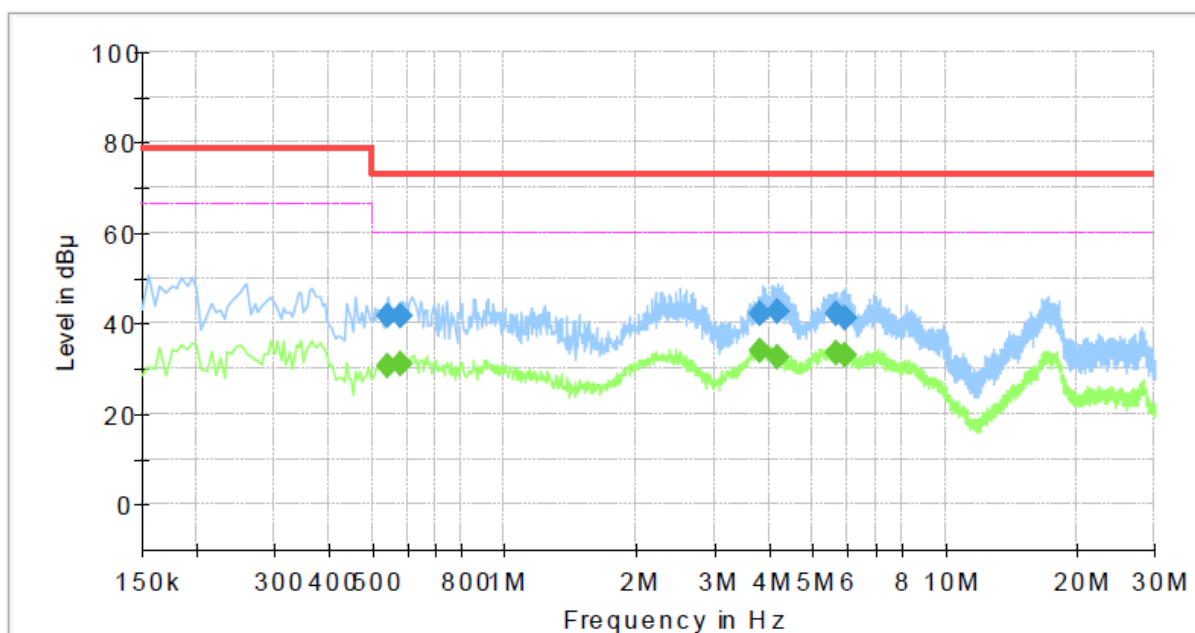
Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.170000	---	36.51	66.00	29.49	1000.0	9.000	L1	19.4
0.170000	47.09	---	79.00	31.91	1000.0	9.000	L1	19.4
0.875000	---	34.29	60.00	25.71	1000.0	9.000	L1	19.5
0.875000	42.64	---	73.00	30.36	1000.0	9.000	L1	19.5
3.905000	---	35.58	60.00	24.42	1000.0	9.000	L1	19.7
3.905000	44.81	---	73.00	28.19	1000.0	9.000	L1	19.7
4.085000	---	34.97	60.00	25.03	1000.0	9.000	L1	19.7
4.085000	44.35	---	73.00	28.65	1000.0	9.000	L1	19.7
9.980000	---	39.06	60.00	20.94	1000.0	9.000	L1	20.0
9.980000	46.64	---	73.00	26.36	1000.0	9.000	L1	20.0
11.125000	---	39.27	60.00	20.73	1000.0	9.000	L1	20.0
11.125000	46.68	---	73.00	26.32	1000.0	9.000	L1	20.0

[NEUTRAL]

Common Information

Test Description: Conducted Emission
 Model No.: SMT-3215
 Phase: N
 Mode: VGA
 Operator Name: KES



Final Result

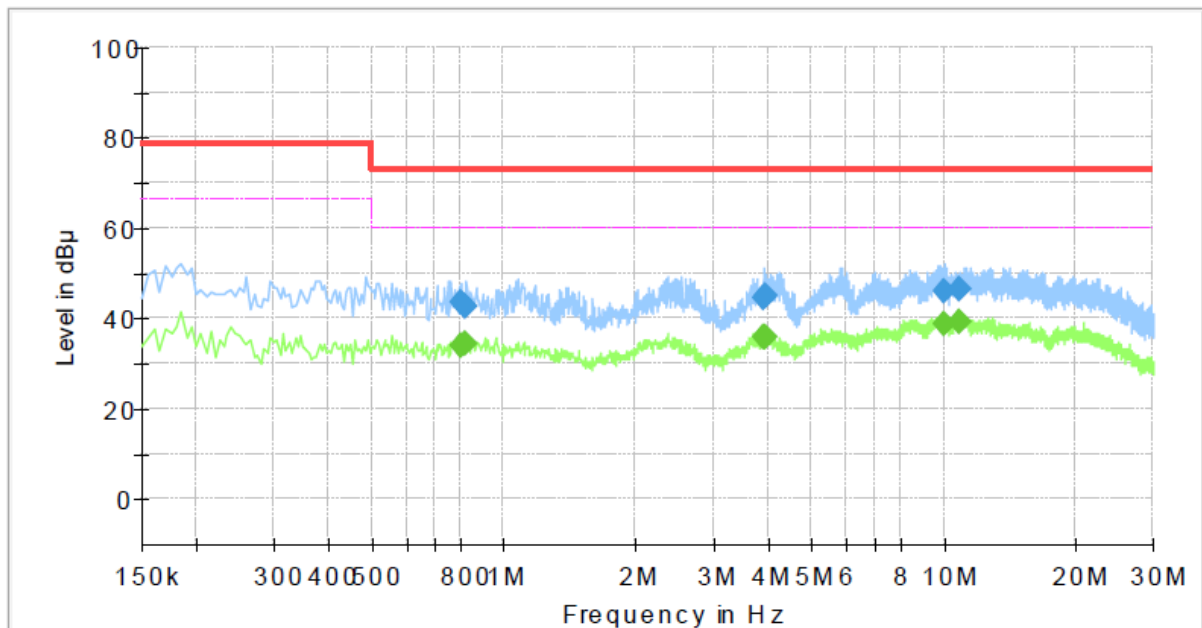
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.545000	---	30.70	60.00	29.30	1000.0	9.000	N	19.4
0.545000	41.71	---	73.00	31.29	1000.0	9.000	N	19.4
0.580000	---	31.14	60.00	28.86	1000.0	9.000	N	19.4
0.580000	41.60	---	73.00	31.40	1000.0	9.000	N	19.4
3.820000	---	33.94	60.00	26.06	1000.0	9.000	N	19.7
3.820000	42.22	---	73.00	30.78	1000.0	9.000	N	19.7
4.185000	---	32.29	60.00	27.71	1000.0	9.000	N	19.7
4.185000	42.57	---	73.00	30.43	1000.0	9.000	N	19.7
5.675000	---	33.65	60.00	26.35	1000.0	9.000	N	19.8
5.675000	42.10	---	73.00	30.90	1000.0	9.000	N	19.8
5.950000	---	32.99	60.00	27.01	1000.0	9.000	N	19.8
5.950000	41.35	---	73.00	31.65	1000.0	9.000	N	19.8

■ DisplayPort Mode

[HOT]

Common Information

Test Description: Conducted Emission
 Model No.: SMT-3215
 Phase: L1
 Mode: DisplayPort
 Operator Name: KES



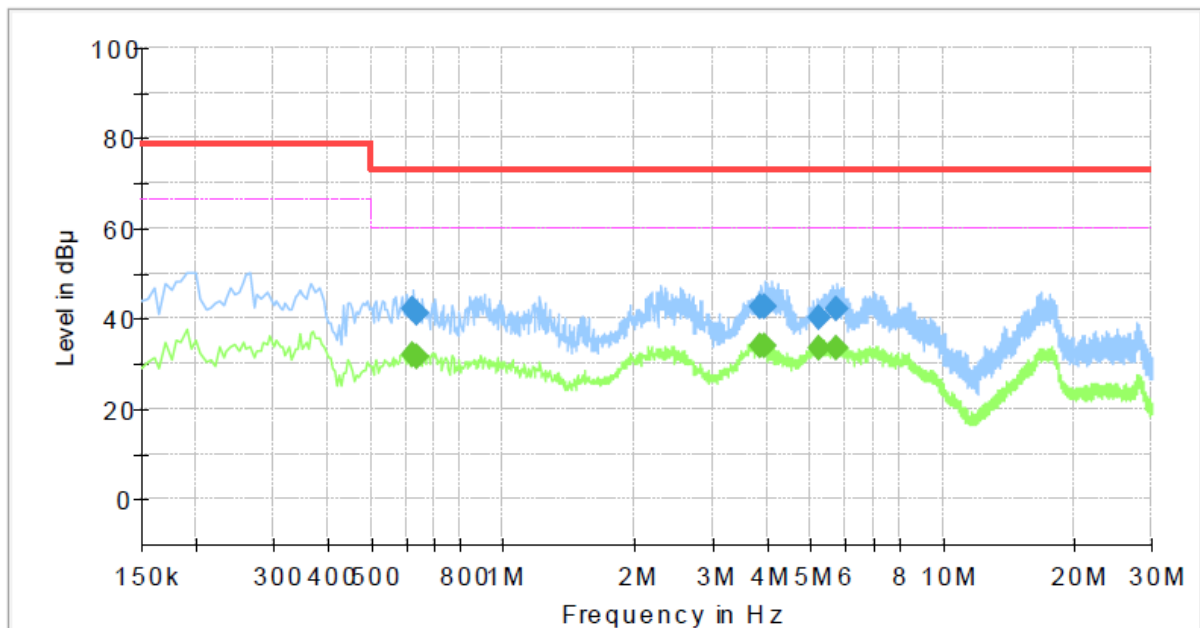
Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.800000	---	34.09	60.00	25.91	1000.0	9.000	L1	19.5
0.800000	43.54	---	73.00	29.46	1000.0	9.000	L1	19.5
0.820000	---	34.20	60.00	25.80	1000.0	9.000	L1	19.5
0.820000	42.78	---	73.00	30.22	1000.0	9.000	L1	19.5
3.890000	---	35.65	60.00	24.35	1000.0	9.000	L1	19.7
3.890000	44.47	---	73.00	28.53	1000.0	9.000	L1	19.7
3.960000	---	35.60	60.00	24.40	1000.0	9.000	L1	19.7
3.960000	45.05	---	73.00	27.95	1000.0	9.000	L1	19.7
10.025000	---	38.88	60.00	21.12	1000.0	9.000	L1	20.0
10.025000	46.10	---	73.00	26.90	1000.0	9.000	L1	20.0
10.865000	---	39.40	60.00	20.60	1000.0	9.000	L1	20.0
10.865000	46.26	---	73.00	26.74	1000.0	9.000	L1	20.0

[NEUTRAL]

Common Information

Test Description:	Conducted Emission
Model No.:	SMT-3215
Phase:	N
Mode:	DisplayPort
Operator Name:	KES



Final Result

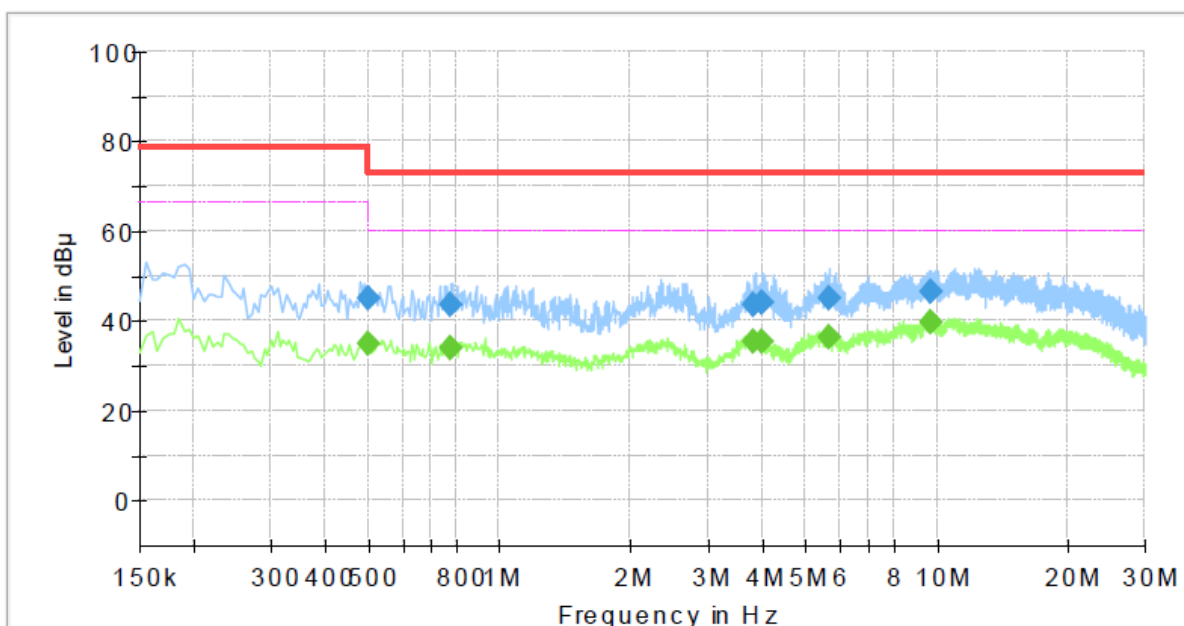
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.625000	---	31.75	60.00	28.25	1000.0	9.000	N	19.5
0.625000	41.89	---	73.00	31.11	1000.0	9.000	N	19.5
0.635000	---	31.70	60.00	28.30	1000.0	9.000	N	19.5
0.635000	41.20	---	73.00	31.80	1000.0	9.000	N	19.5
3.860000	---	34.00	60.00	26.00	1000.0	9.000	N	19.7
3.860000	42.57	---	73.00	30.43	1000.0	9.000	N	19.7
3.940000	---	33.98	60.00	26.02	1000.0	9.000	N	19.7
3.940000	42.76	---	73.00	30.24	1000.0	9.000	N	19.7
5.265000	---	33.57	60.00	26.43	1000.0	9.000	N	19.8
5.265000	40.37	---	73.00	32.63	1000.0	9.000	N	19.8
5.770000	---	33.41	60.00	26.59	1000.0	9.000	N	19.8
5.770000	41.96	---	73.00	31.04	1000.0	9.000	N	19.8

■ HDMI Mode

[HOT]

Common Information

Test Description:	Conducted Emission
Model No.:	SMT-3215
Phase:	L1
Mode:	HDMI
Operator Name:	KES

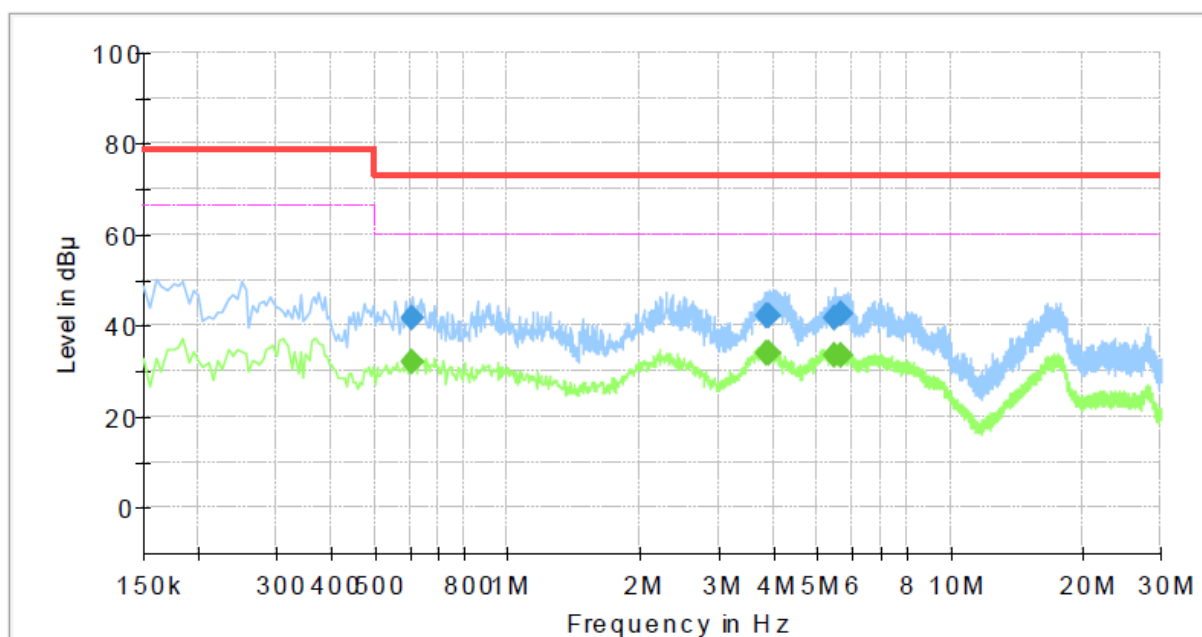
**Final Result**

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.500000	---	34.84	60.00	25.16	1000.0	9.000	L1	19.5
0.500000	45.11	---	79.00	27.89	1000.0	9.000	L1	19.5
0.775000	---	34.12	60.00	25.88	1000.0	9.000	L1	19.5
0.775000	43.55	---	73.00	29.45	1000.0	9.000	L1	19.5
3.835000	---	35.47	60.00	24.53	1000.0	9.000	L1	19.7
3.835000	43.74	---	73.00	29.26	1000.0	9.000	L1	19.7
3.985000	---	35.35	60.00	24.65	1000.0	9.000	L1	19.7
3.985000	44.27	---	73.00	28.73	1000.0	9.000	L1	19.7
5.670000	---	36.09	60.00	23.91	1000.0	9.000	L1	19.8
5.670000	44.81	---	73.00	28.19	1000.0	9.000	L1	19.8
9.680000	---	39.49	60.00	20.51	1000.0	9.000	L1	20.0
9.680000	46.63	---	73.00	26.37	1000.0	9.000	L1	20.0

[NEUTRAL]

Common Information

Test Description: Conducted Emission
 Model No.: SMT-3215
 Phase: N
 Mode: HDMI
 Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.610000	---	31.96	60.00	28.04	1000.0	9.000	N	19.5
0.610000	41.68	---	73.00	31.32	1000.0	9.000	N	19.5
3.850000	---	34.04	60.00	25.96	1000.0	9.000	N	19.7
3.850000	42.14	---	73.00	30.86	1000.0	9.000	N	19.7
3.910000	---	33.88	60.00	26.12	1000.0	9.000	N	19.7
3.910000	42.24	---	73.00	30.76	1000.0	9.000	N	19.7
5.475000	---	33.66	60.00	26.34	1000.0	9.000	N	19.8
5.475000	41.79	---	73.00	31.21	1000.0	9.000	N	19.8
5.695000	---	33.53	60.00	26.47	1000.0	9.000	N	19.8
5.695000	42.38	---	73.00	30.62	1000.0	9.000	N	19.8

◆ Calculation

QuasiPeak[dBuV] / CAverage [dBuV] = Reading Value[dBuV] + Corr. [dB]

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

Corr. : Correction values (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

Conducted Emissions at Telecommunication Ports
[1 000 Mbps]

N/A

◆ Calculation

$\text{QuasiPeak[dBuV]} / \text{CAverage [dBuV]} = \text{Reading Value[dBuV]} + \text{Corr. [dB]}$

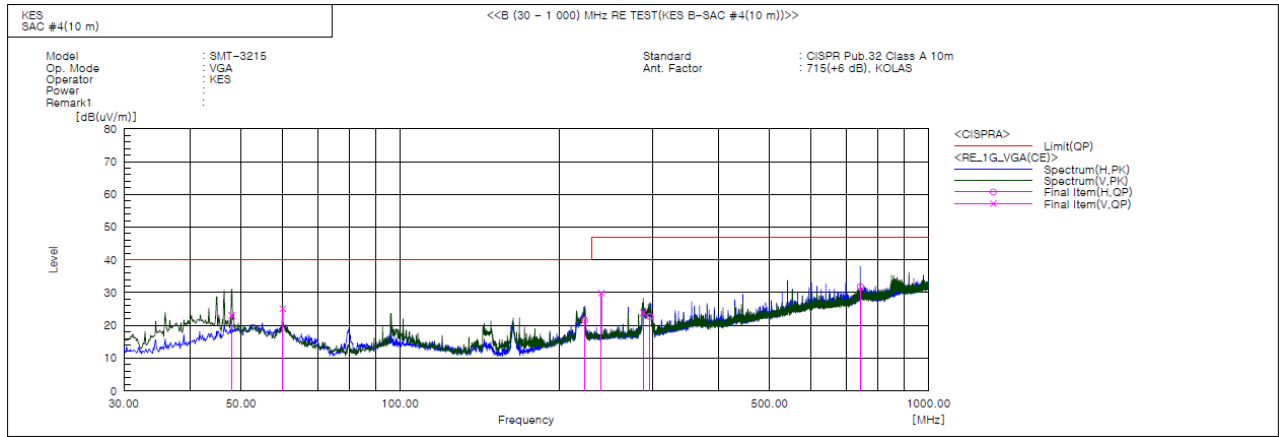
QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

Corr. : Correction values (ISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

Radiated Electric Field Emissions(Below 1 GHz)

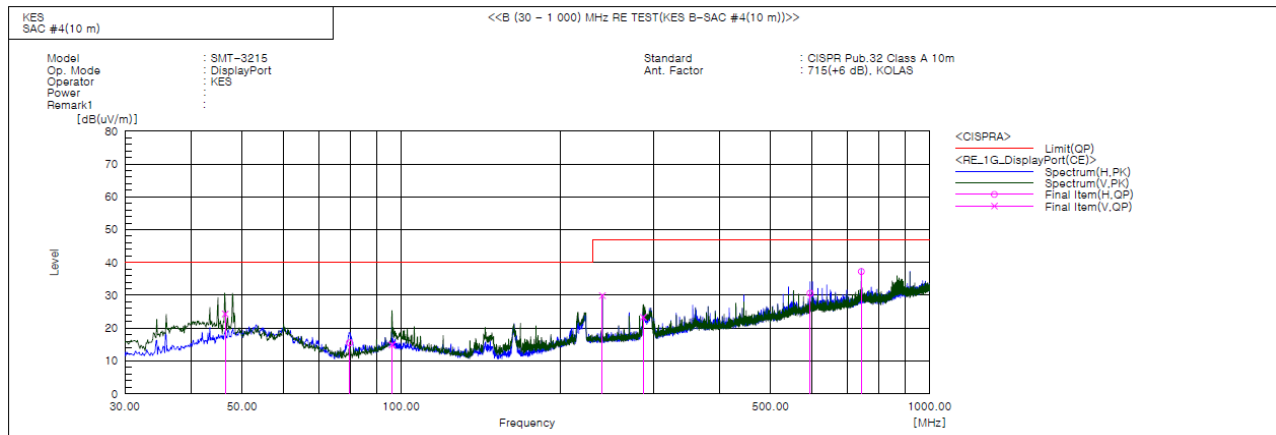
VGA Mode



Final Result

No.	Frequency (P)	Reading	c.f	Result	Limit	Margin	Height	Angle	Remark
	[MHz]	QP [dB(uV)]	[dB(1/m)]	QP [dB(uV/m)]	QP [dB(uV/m)]	QP [dB]	[cm]	[deg]	
1	48.017	V 44.2	-21.1	23.1	40.0	16.9	103.0	235.0	
2	59.981	V 47.2	-22.1	25.1	40.0	14.9	107.0	54.0	
3	223.620	H 40.9	-19.3	21.6	40.0	18.4	394.0	15.0	
4	240.321	V 48.8	-18.9	29.9	47.0	17.1	113.0	200.0	
5	288.433	V 41.8	-17.9	23.9	47.0	23.1	106.0	54.0	
6	296.977	H 40.3	-17.6	22.7	47.0	24.3	392.0	102.0	
7	742.495	H 37.0	-5.2	31.8	47.0	15.2	387.0	329.0	

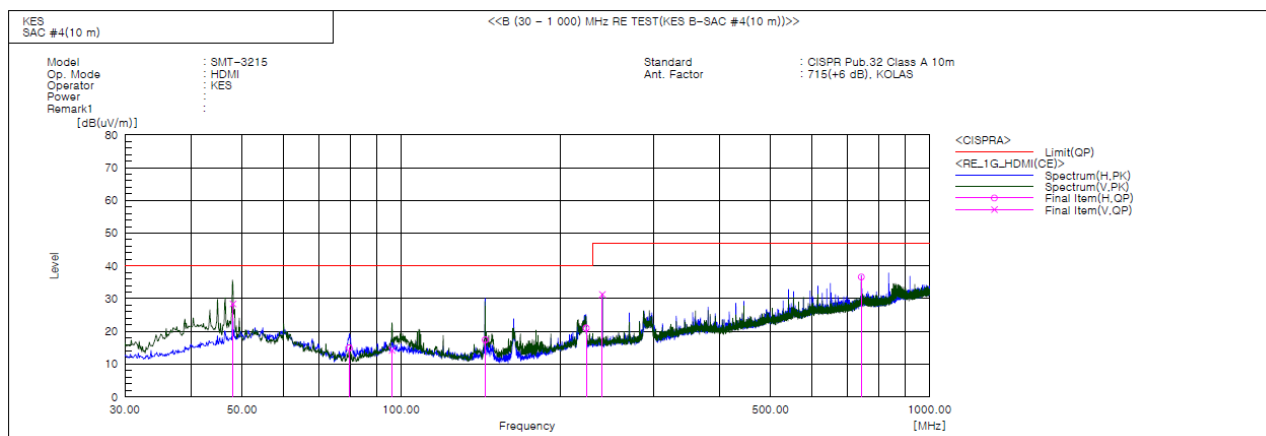
DisplayPort Mode



Final Result

No.	Frequency	(P)	Reading	c.f	Result	Limit	Margin	Height	Angle	Remark
	[MHz]		QP [dB(uV)]	[dB(1/m)]	QP [dB(uV/m)]	QP [dB(uV/m)]	QP [dB]	[cm]	[deg]	
1	46.483	V	45.6	-21.3	24.3	40.0	15.7	108.0	278.0	
2	79.866	H	43.1	-27.6	15.5	40.0	24.5	386.0	349.0	
3	96.195	V	37.5	-22.6	14.9	40.0	25.1	114.0	248.0	
4	240.344	V	48.8	-18.9	29.9	47.0	17.1	103.0	213.0	
5	287.043	V	41.2	-17.9	23.3	47.0	23.7	107.0	41.0	
6	593.987	H	38.7	-8.1	30.6	47.0	16.4	394.0	357.0	
7	742.506	H	42.4	-5.2	37.2	47.0	9.8	396.0	307.0	

HDMI



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	48.080	V	49.5	-21.1	28.4	40.0	11.6	108.0	288.0	
2	79.765	H	42.6	-27.6	15.0	40.0	25.0	393.0	15.0	
3	96.095	V	36.8	-22.6	14.2	40.0	25.8	105.0	304.0	
4	144.270	H	42.6	-25.2	17.4	40.0	22.6	391.0	247.0	
5	223.905	H	40.3	-19.3	21.0	40.0	19.0	386.0	183.0	
6	240.339	V	50.2	-18.9	31.3	47.0	15.7	102.0	200.0	
7	742.496	H	41.8	-5.2	36.6	47.0	10.4	384.0	319.0	

◆ Calculation

Result(QP) [dB(μV/m)] = (Reading(QP)[dB(μV)] + c.f[dB(1/m)])

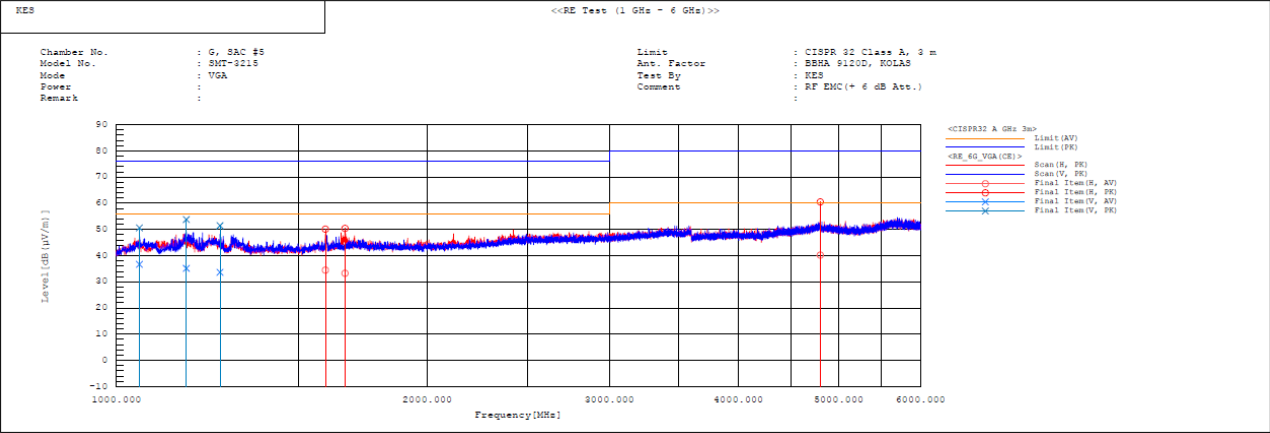
Margin(QP)[dB] = Limit[dB(μV/m)] - Result(QP) [dB(μV/m)]

Reading(QP) : Reading value, Result(QP) : Reading value + Factor value

Limit(QP) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value

Radiated Electric Field Emissions(Above 1 GHz)

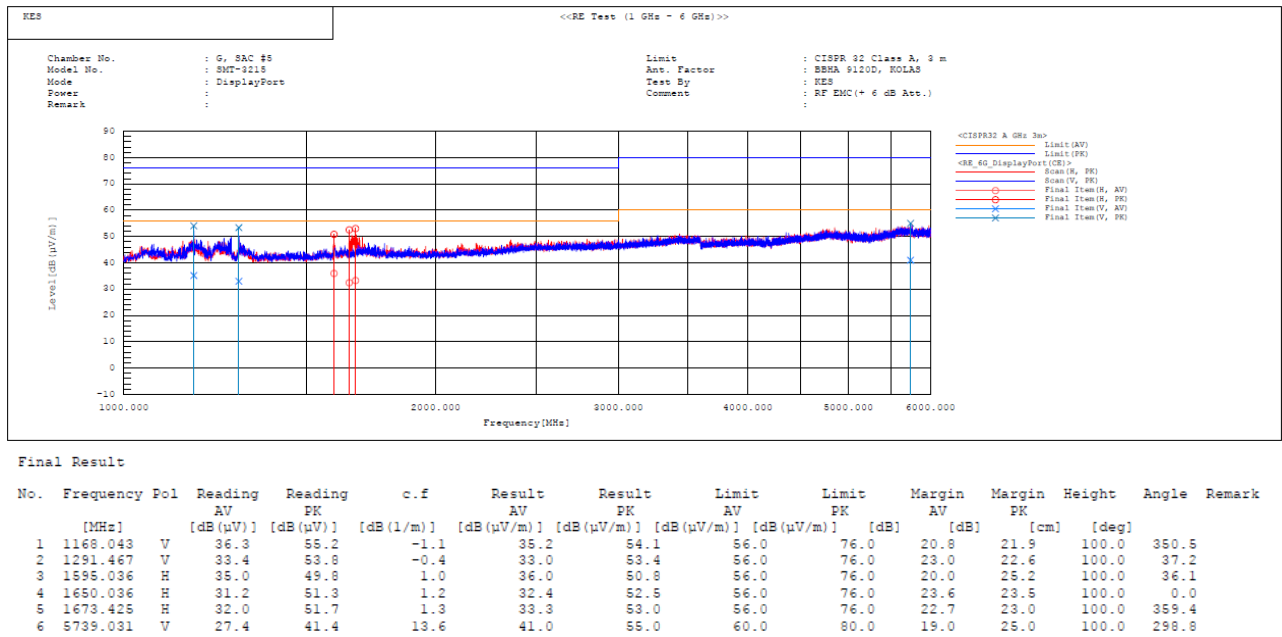
■ VGA Mode



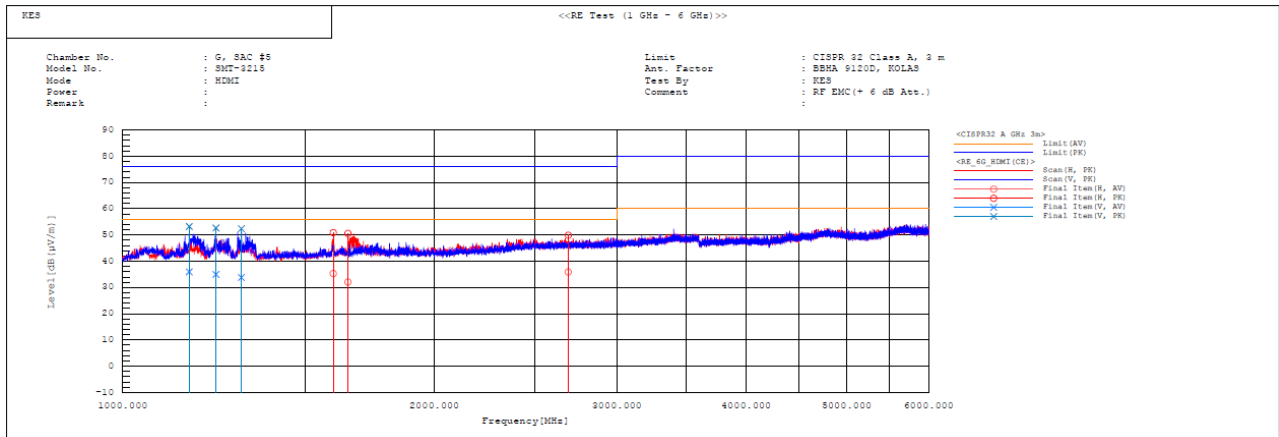
Final Result

No.	Frequency [MHz]	Pol	Reading AV [dB(μV)]	Reading PK [dB(μV)]	c.f. [dB(1/m)]	Result AV [dB(μV/m)]	Result PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Limit PK [dB(μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Remark
1	1052.469	V	38.5	52.4	-1.8	36.7	50.6	56.0	76.0	19.3	25.4	100.0	343.4	
2	1168.523	V	36.2	54.9	-1.1	35.1	53.8	56.0	76.0	20.9	22.2	100.0	350.7	
3	1259.567	V	34.2	52.1	-0.6	33.6	51.5	56.0	76.0	22.4	24.5	100.0	30.6	
4	1592.927	H	33.5	49.1	1.0	34.5	50.1	56.0	76.0	21.5	25.9	100.0	45.5	
5	1664.134	H	32.0	49.1	1.3	33.3	50.4	56.0	76.0	22.7	25.6	100.0	0.4	
6	4799.490	H	28.6	48.9	11.6	40.2	60.5	60.0	80.0	19.8	19.5	100.0	145.6	

DisplayPort Mode



■ HDMI



Final Result

No.	Frequency	Pol	Reading AV	Reading PK	c.f	Result AV	Result PK	Limit AV	Limit PK	Margin AV	Margin PK	Height	Angle	Remark
	[MHz]		[dB(μV)]	[dB(μV)]	[dB(1/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB]	[dB]	[cm]	[deg]	
1	1159.578	V	37.1	54.3	-1.1	36.0	53.2	56.0	76.0	20.0	22.8	100.0	344.8	
2	1230.594	V	35.7	53.4	-0.7	35.0	52.7	56.0	76.0	21.0	23.3	100.0	31.1	
3	1302.014	V	34.2	52.8	-0.4	33.8	52.4	56.0	76.0	22.2	23.6	100.0	32.3	
4	1597.017	H	34.3	49.9	1.0	35.3	50.9	56.0	76.0	20.7	25.1	100.0	40.5	
5	1649.631	H	30.9	49.4	1.2	32.1	50.6	56.0	76.0	23.9	25.4	100.0	0.6	
6	2692.420	H	30.6	44.6	5.3	35.9	49.9	56.0	76.0	20.1	26.1	100.0	36.9	

◆ Calculation
Result(PK/CAV) [dB(μV/m)] = (Reading(PK/CAV)[dB(μV)] + c.f[dB(1/m)]
Margin(PK/CAV)[dB] = Limit[dB(μV/m)] - Result(PK/CAV) [dB(μV/m)]
Reading(PK/CAV) : Reading value, Result(PK/CAV) : Reading value + Factor value
Limit(QP) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value

Harmonic Current Emissions and Voltage Fluctuations and Flicker

■ VGA Mode

Average harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	0.121			
2	0.002			
3	0.111	4.841	2.300	PASS
4	0.003			
5	0.106	9.273	1.140	PASS
6	0.003			
7	0.099	12.853	0.770	PASS
8	0.002			
9	0.090	22.471	0.400	PASS
10	0.002			
11	0.079	23.819	0.330	PASS
12	0.002			
13	0.068	32.162	0.210	PASS
14	0.002			
15	0.056	37.605	0.150	PASS
16	0.002			
17	0.045	33.877	0.132	PASS
18	0.001			
19	0.033	28.108	0.118	PASS
20	0.001			
21	0.023	14.094	0.161	PASS
22	0.001			
23	0.014	9.543	0.147	PASS
24	0.001			
25	0.007	5.331	0.135	PASS
26	0.001			
27	0.004	3.160	0.125	n/a
28	0.001			
29	0.005	4.530	0.117	PASS
30	0.001			
31	0.007	6.785	0.110	PASS
32	0.001			
33	0.008	8.278	0.102	PASS
34	0.001			
35	0.008	8.836	0.096	PASS
36	0.001			
37	0.008	8.580	0.092	PASS
38	0.001			
39	0.006	7.262	0.087	PASS
40	0.001			

Note: Harmonic currents less than 0.6 % of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.

* Application of limits for average is 100% except for odd harmonics from 21 to 39, where 150% applies.

Test Data - Harmonics (continued)

Maximum harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	0.121			
2	0.003			
3	0.112	3.234	3.450	PASS
4	0.003			
5	0.106	6.197	1.710	PASS
6	0.003			
7	0.099	8.594	1.155	PASS
8	0.002			
9	0.090	15.017	0.600	PASS
10	0.003			
11	0.079	15.992	0.495	PASS
12	0.003			
13	0.068	21.522	0.315	PASS
14	0.002			
15	0.057	25.174	0.225	PASS
16	0.002			
17	0.045	22.689	0.198	PASS
18	0.002			
19	0.034	18.939	0.177	PASS
20	0.001			
21	0.023	14.261	0.161	PASS
22	0.001			
23	0.014	9.668	0.147	PASS
24	0.001			
25	0.007	5.437	0.135	PASS
26	0.001			
27	0.004	3.265	0.125	n/a
28	0.001			
29	0.005	4.659	0.117	PASS
30	0.001			
31	0.008	6.981	0.110	PASS
32	0.001			
33	0.009	8.449	0.102	PASS
34	0.001			
35	0.009	8.951	0.096	PASS
36	0.001			
37	0.008	8.704	0.092	PASS
38	0.001			
39	0.006	7.420	0.087	PASS
40	0.001			

Note: Harmonic currents less than 0.6 % of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.

* Application of limits for average is 100% except for odd harmonics from 21 to 39, where 150% applies.

■ DisplayPort Mode

Average harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	0.121			
2	0.002			
3	0.111	4.840	2.300	PASS
4	0.003			
5	0.106	9.271	1.140	PASS
6	0.003			
7	0.099	12.865	0.770	PASS
8	0.002			
9	0.090	22.505	0.400	PASS
10	0.002			
11	0.079	23.882	0.330	PASS
12	0.002			
13	0.068	32.302	0.210	PASS
14	0.002			
15	0.057	37.852	0.150	PASS
16	0.002			
17	0.045	34.201	0.132	PASS
18	0.001			
19	0.034	28.488	0.118	PASS
20	0.001			
21	0.023	14.379	0.161	PASS
22	0.001			
23	0.014	9.844	0.147	PASS
24	0.001			
25	0.008	5.585	0.135	PASS
26	0.001			
27	0.004	3.187	0.125	n/a
28	0.001			
29	0.005	4.363	0.117	PASS
30	0.001			
31	0.007	6.627	0.110	PASS
32	0.001			
33	0.008	8.209	0.102	PASS
34	0.001			
35	0.008	8.841	0.096	PASS
36	0.001			
37	0.008	8.661	0.092	PASS
38	0.001			
39	0.006	7.394	0.087	PASS
40	0.001			

Note: Harmonic currents less than 0.6 % of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.

* Application of limits for average is 100% except for odd harmonics from 21 to 39, where 150% applies.

Test Data - Harmonics (continued)

Maximum harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	0.188			
2	0.008	0.468	1.620	PASS
3	0.178	5.166	3.450	PASS
4	0.011	1.639	0.645	PASS
5	0.169	9.908	1.710	PASS
6	0.011	2.334	0.450	PASS
7	0.156	13.487	1.155	PASS
8	0.010	3.032	0.345	PASS
9	0.138	23.014	0.600	PASS
10	0.010	3.766	0.276	PASS
11	0.120	24.162	0.495	PASS
12	0.011	4.588	0.230	PASS
13	0.101	32.145	0.315	PASS
14	0.011	5.493	0.197	PASS
15	0.084	37.510	0.225	PASS
16	0.011	6.382	0.173	PASS
17	0.070	35.291	0.199	PASS
18	0.011	7.436	0.153	PASS
19	0.060	33.694	0.178	PASS
20	0.012	8.484	0.138	PASS
21	0.054	33.633	0.161	PASS
22	0.012	9.447	0.125	PASS
23	0.051	34.759	0.147	PASS
24	0.012	10.333	0.115	PASS
25	0.049	36.444	0.135	PASS
26	0.012	10.975	0.106	PASS
27	0.047	37.791	0.125	PASS
28	0.011	11.559	0.099	PASS
29	0.044	38.174	0.116	PASS
30	0.011	11.866	0.092	PASS
31	0.040	37.062	0.109	PASS
32	0.010	11.839	0.086	PASS
33	0.036	34.787	0.102	PASS
34	0.009	11.551	0.081	PASS
35	0.030	31.127	0.096	PASS
36	0.008	11.016	0.077	PASS
37	0.025	27.069	0.091	PASS
38	0.007	10.212	0.073	PASS
39	0.019	22.529	0.087	PASS
40	0.007	9.482	0.069	PASS

Note: Harmonic currents less than 0.6 % of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.

* Application of limits for average is 100% except for odd harmonics from 21 to 39, where 150% applies.

■ HDMI Mode

Average harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	0.121			
2	0.002			
3	0.111	4.846	2.300	PASS
4	0.003			
5	0.106	9.274	1.140	PASS
6	0.003			
7	0.099	12.848	0.770	PASS
8	0.002			
9	0.090	22.417	0.400	PASS
10	0.002			
11	0.078	23.704	0.330	PASS
12	0.002			
13	0.067	31.930	0.210	PASS
14	0.002			
15	0.056	37.196	0.150	PASS
16	0.002			
17	0.044	33.349	0.132	PASS
18	0.001			
19	0.032	27.448	0.118	PASS
20	0.001			
21	0.022	13.605	0.161	PASS
22	0.001			
23	0.013	9.045	0.147	PASS
24	0.001			
25	0.007	4.889	0.135	PASS
26	0.001			
27	0.004	3.126	0.125	n/a
28	0.001			
29	0.006	4.792	0.117	PASS
30	0.001			
31	0.008	7.004	0.110	PASS
32	0.001			
33	0.009	8.393	0.102	PASS
34	0.001			
35	0.008	8.816	0.096	PASS
36	0.001			
37	0.008	8.431	0.092	PASS
38	0.001			
39	0.006	6.986	0.087	PASS
40	0.001			

Note: Harmonic currents less than 0.6 % of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.

* Application of limits for average is 100% except for odd harmonics from 21 to 39, where 150% applies.

Test Data - Harmonics (continued)

Maximum harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	0.122			
2	0.003			
3	0.112	3.237	3.450	PASS
4	0.003			
5	0.106	6.204	1.710	PASS
6	0.003			
7	0.099	8.584	1.155	PASS
8	0.002			
9	0.090	14.983	0.600	PASS
10	0.003			
11	0.079	15.939	0.495	PASS
12	0.002			
13	0.067	21.385	0.315	PASS
14	0.002			
15	0.056	24.897	0.225	PASS
16	0.002			
17	0.044	22.350	0.198	PASS
18	0.001			
19	0.033	18.436	0.177	PASS
20	0.001			
21	0.022	13.750	0.161	PASS
22	0.001			
23	0.013	9.182	0.147	PASS
24	0.001			
25	0.007	5.022	0.135	PASS
26	0.001			
27	0.004	3.245	0.125	n/a
28	0.001			
29	0.006	4.932	0.117	PASS
30	0.001			
31	0.008	7.207	0.110	PASS
32	0.001			
33	0.009	8.529	0.102	PASS
34	0.001			
35	0.009	8.938	0.096	PASS
36	0.001			
37	0.008	8.557	0.092	PASS
38	0.001			
39	0.006	7.110	0.087	PASS
40	0.001			

Note: Harmonic currents less than 0.6 % of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.

* Application of limits for average is 100% except for odd harmonics from 21 to 39, where 150% applies.

Test Data - Voltage Fluctuations

■ VGA Mode

Flicker Measurements					
	P_{lt}	Max P_{st}	Max D_c	Max D_{max}	Max T_{max}
Line 1:	0.028	0.028	0	< 0.2	0
Limits:	0.65	1	3.3	4	0.5
Results:	PASS	PASS	PASS	PASS	PASS

■ DisplayPort Mode

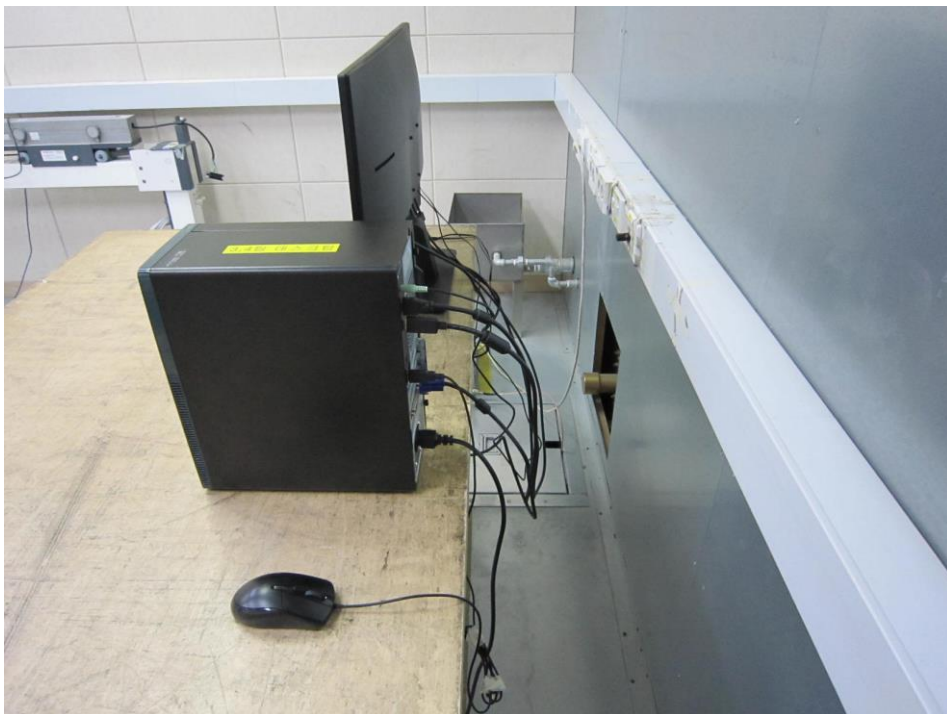
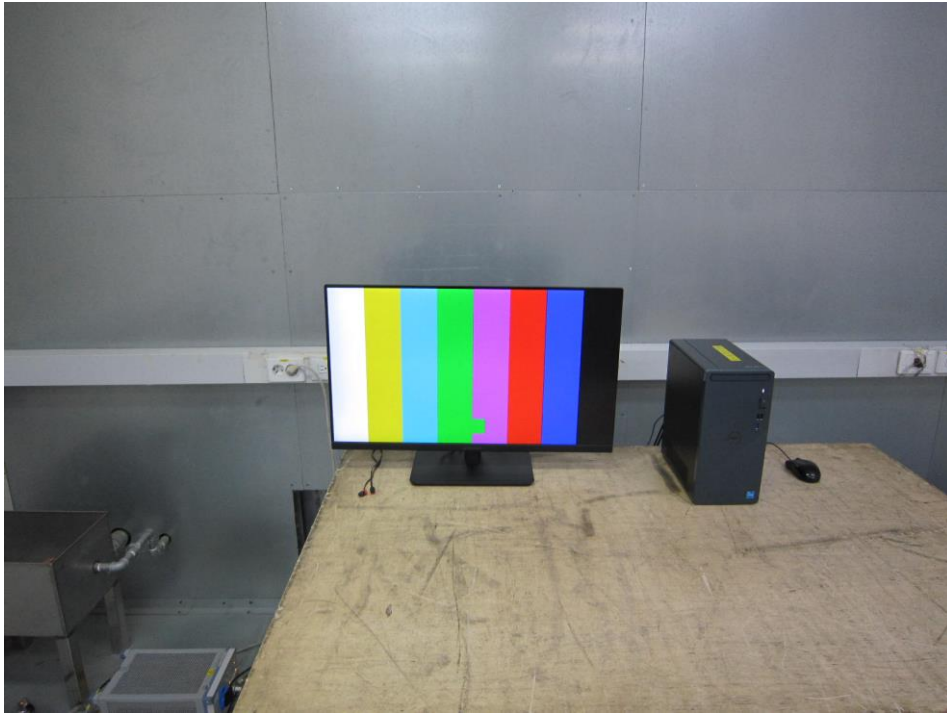
Flicker Measurements					
	P_{lt}	Max P_{st}	Max D_c	Max D_{max}	Max T_{max}
Line 1:	0.028	0.028	0	< 0.2	0
Limits:	0.65	1	3.3	4	0.5
Results:	PASS	PASS	PASS	PASS	PASS

■ HDMI Mode

Flicker Measurements					
	P_{lt}	Max P_{st}	Max D_c	Max D_{max}	Max T_{max}
Line 1:	0.028	0.028	0	< 0.2	0
Limits:	0.65	1	3.3	4	0.5
Results:	PASS	PASS	PASS	PASS	PASS

APPENDIX B – Test Setup Photos and Configuration

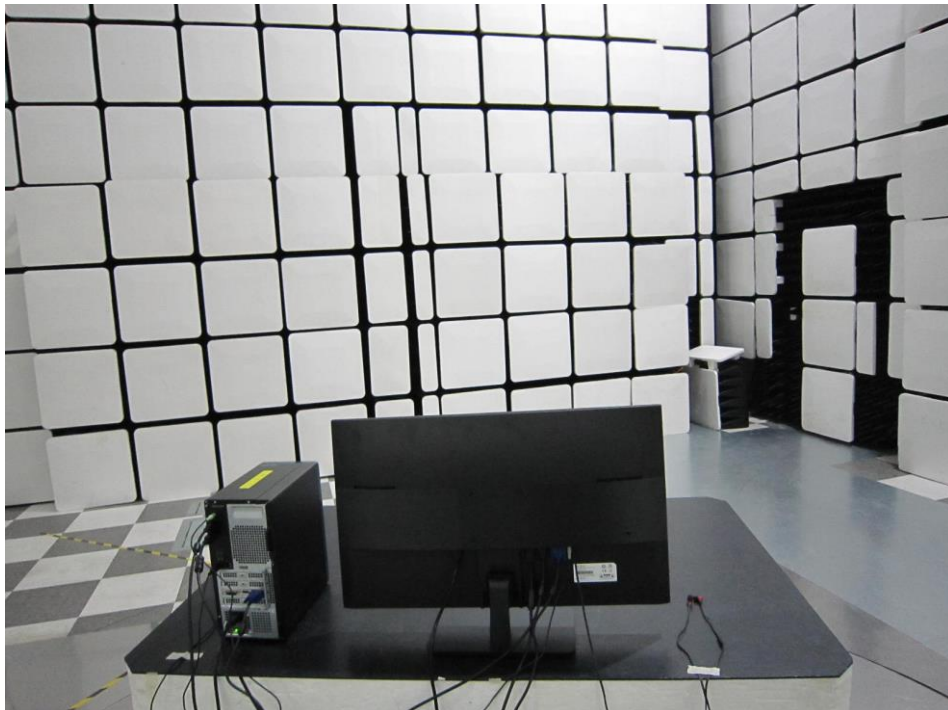
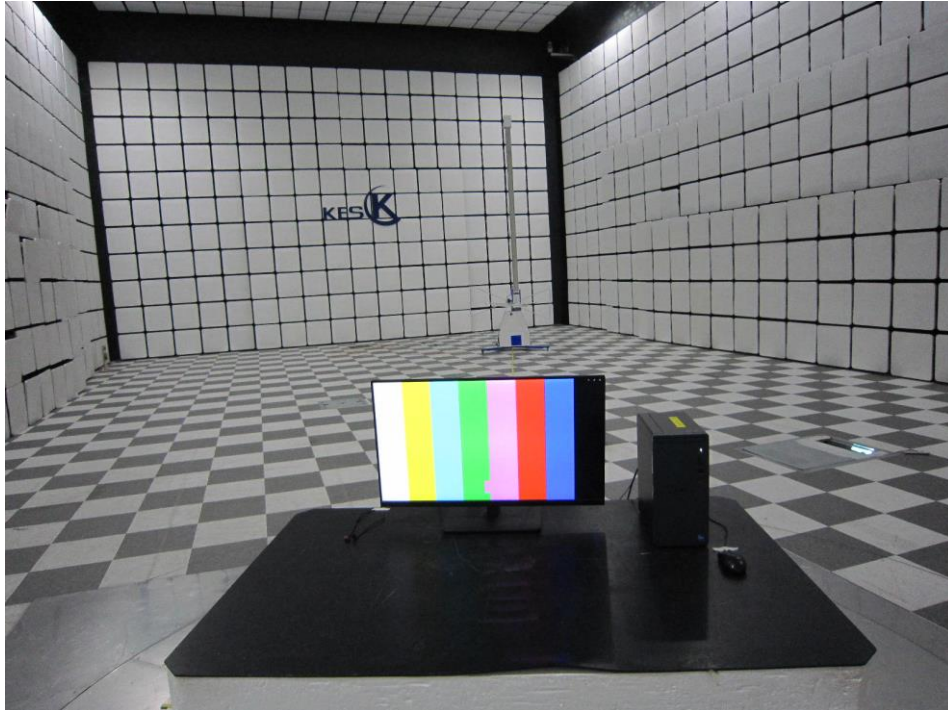
Conducted Emissions at Mains Power Ports



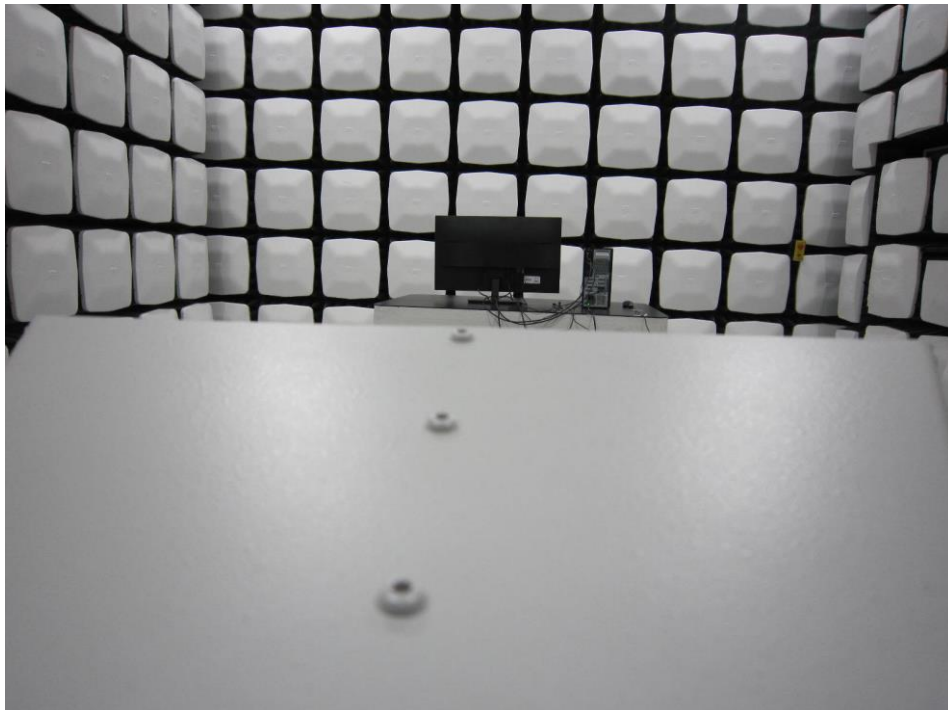
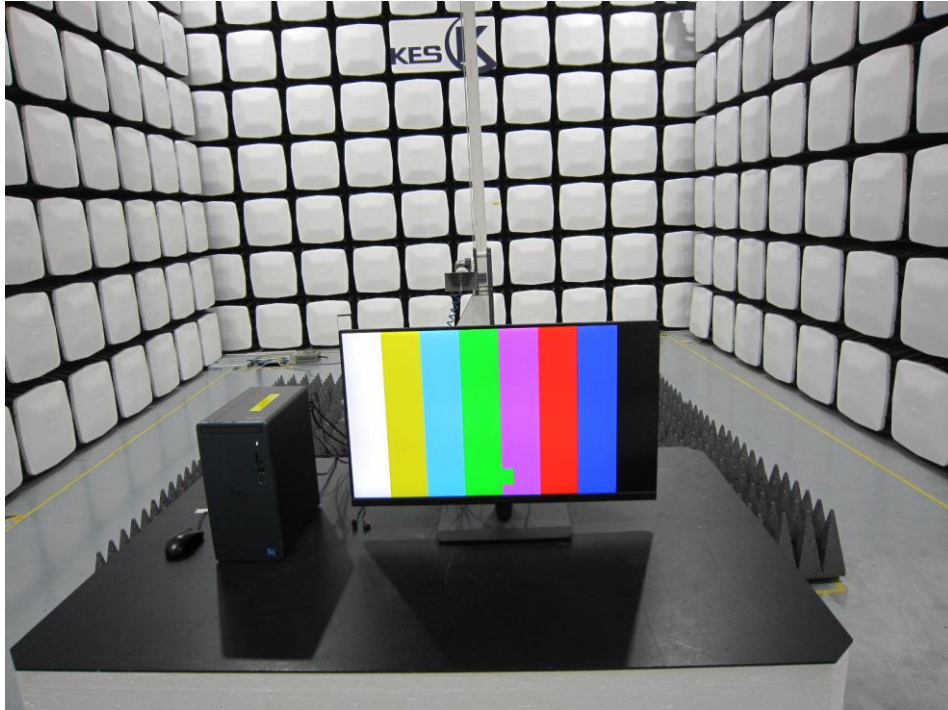
Conducted Telecommunication Emissions

N/A

Radiated Electric Field Emissions(Below 1 GHz)



Radiated Electric Field Emissions(Above 1 GHz)



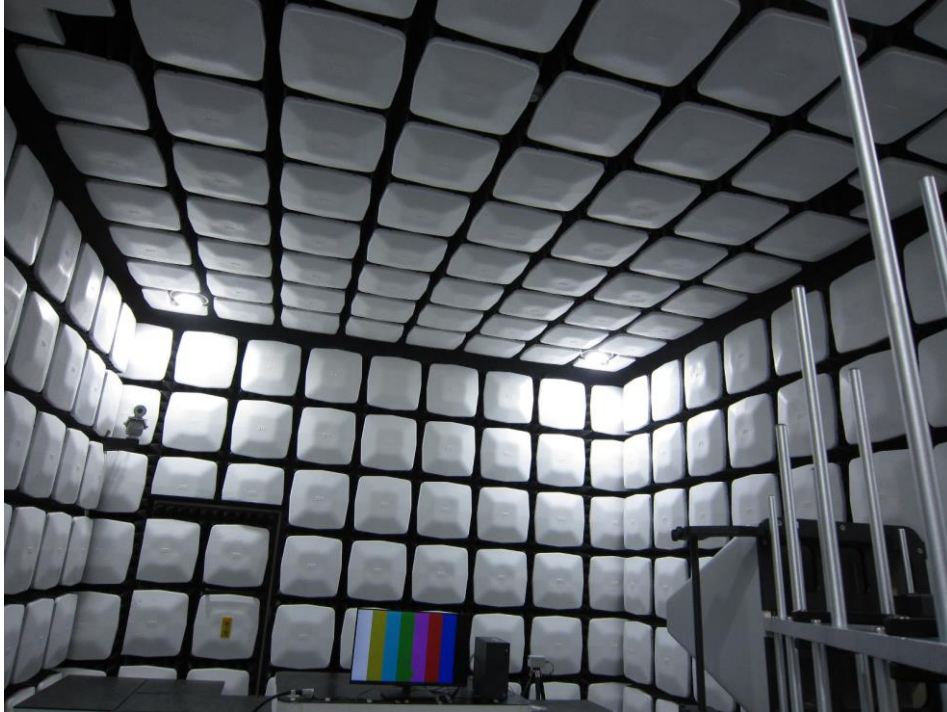
Harmonic Current Emissions and Voltage Fluctuations and Flicker



Electrostatic Discharge



Radiated Electric Field Immunity



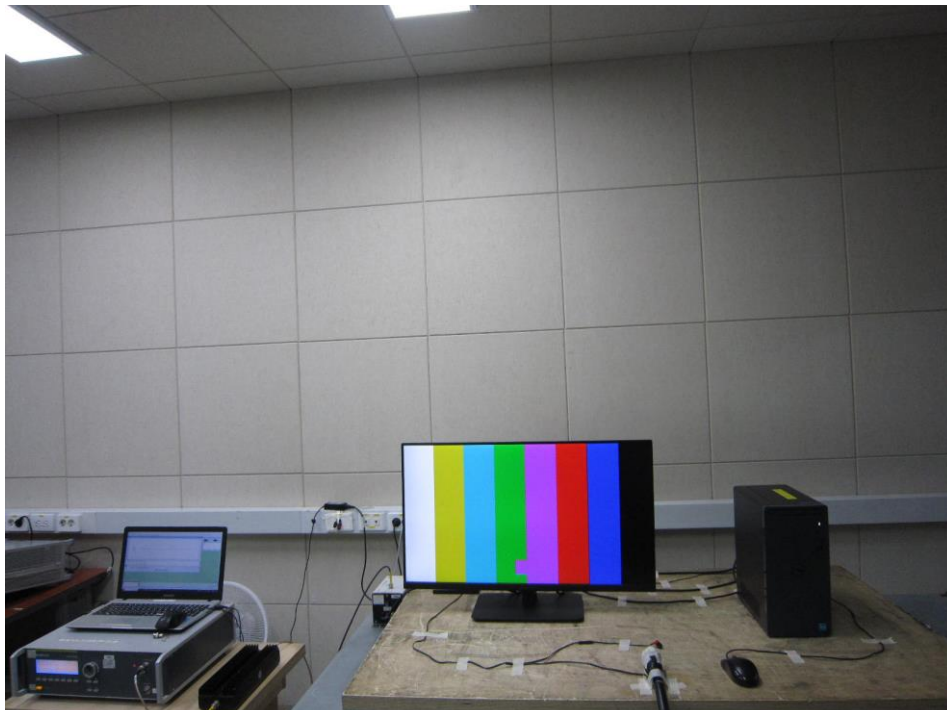
Electrical Fast Transients/Bursts



Surge Transients



Conducted Disturbance



Power Frequency Magnetic Field Immunity

N/A

Voltage Dips and Short Interruptions



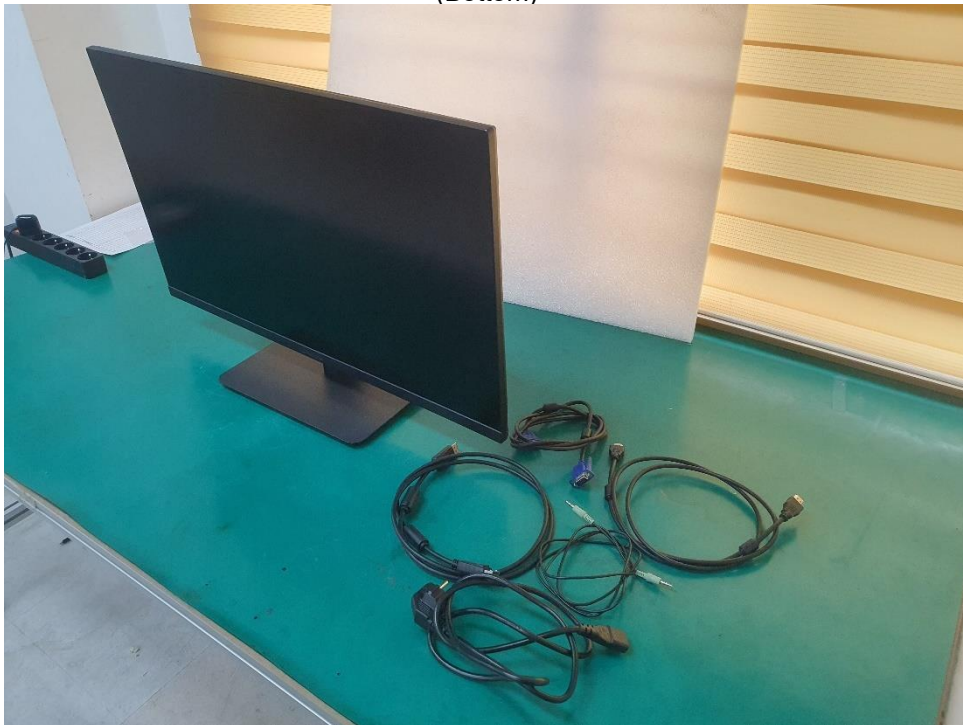
APPENDIX C – EUT Photographs

EUT External Photographs

(Top)



(Bottom)



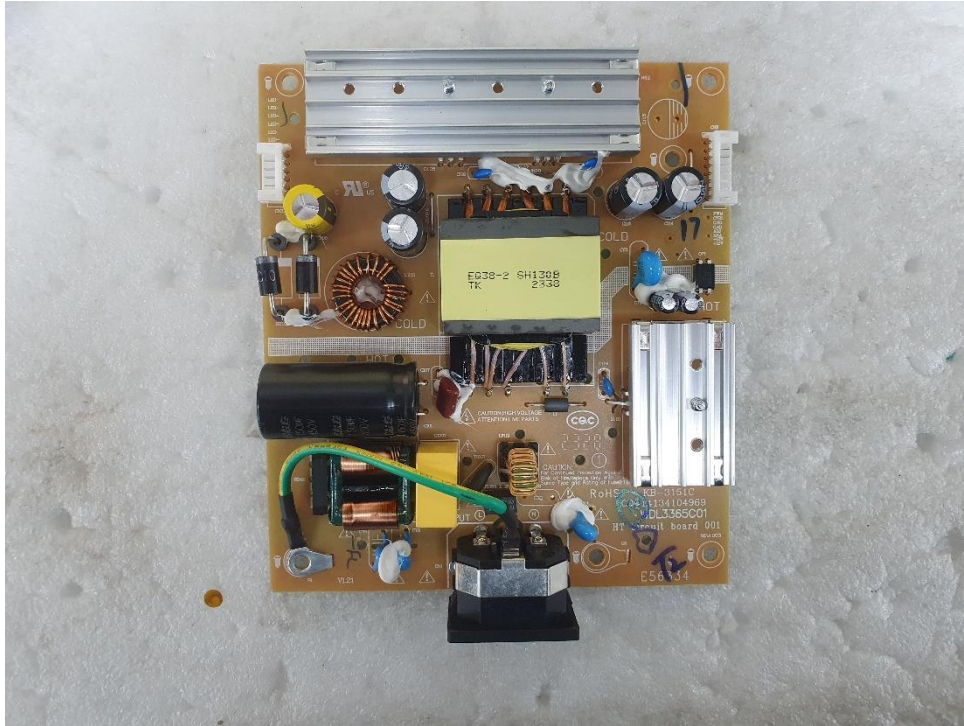
EUT Internal Photographs

(Internal View)

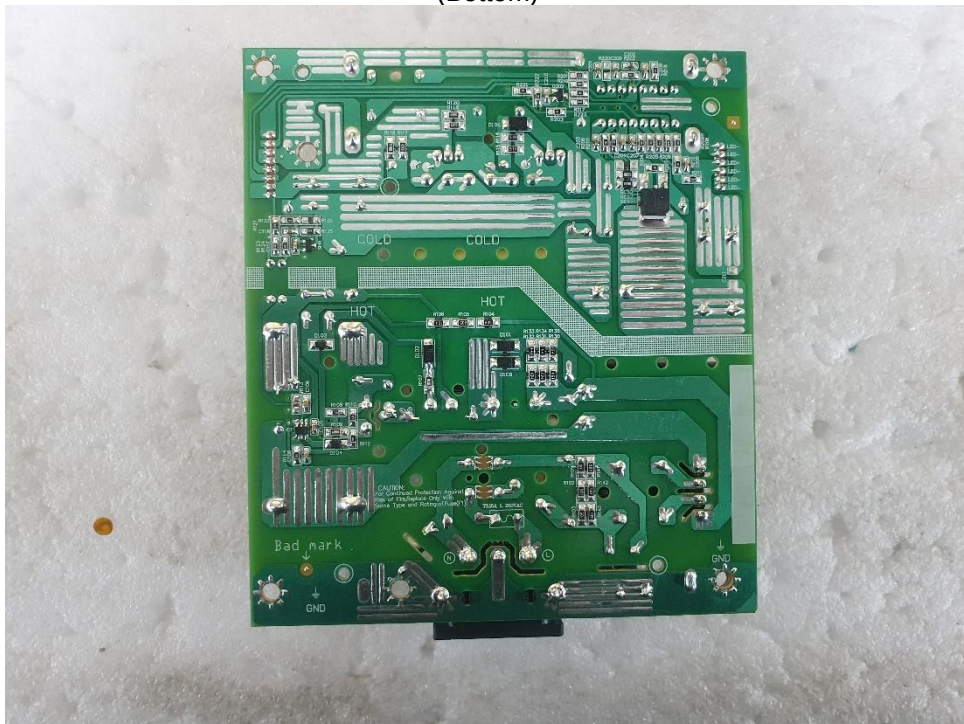


EUT Internal View – Main Board

(Top)



(Bottom)



EUT Internal View – Serves Board 1

(Top)

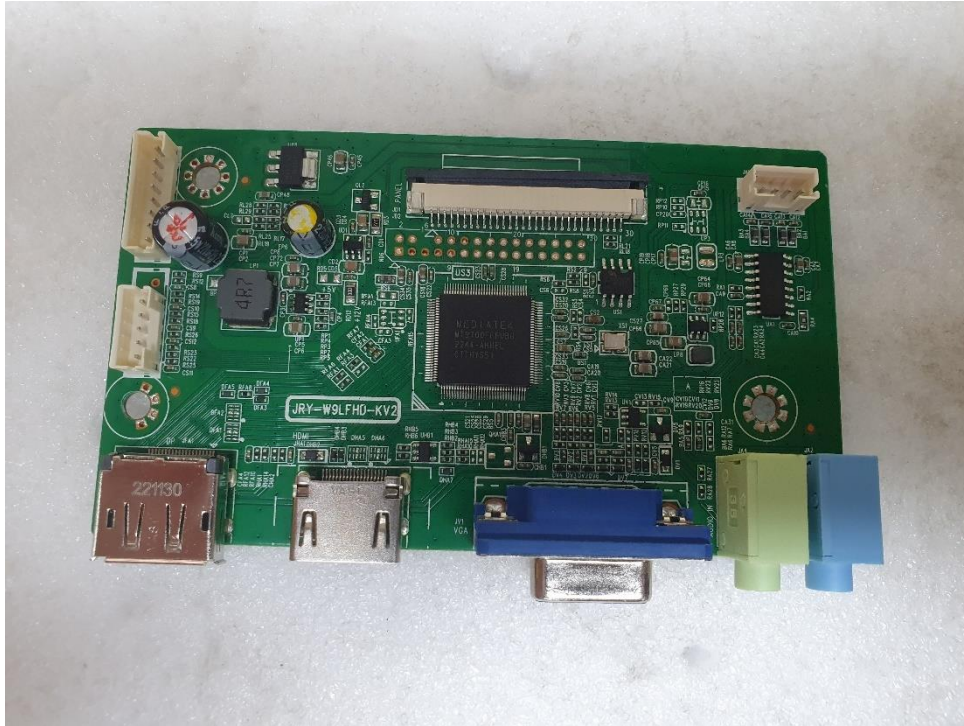


(Bottom)

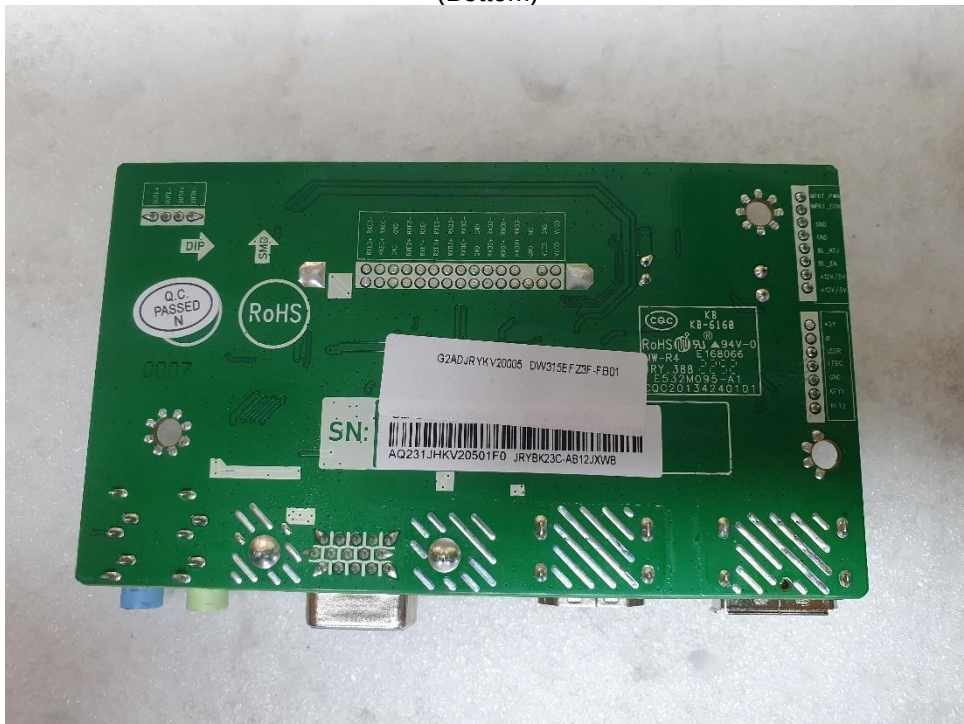


EUT Internal View – Serves Board 2

(Top)



(Bottom)



EUT Internal View – Serves Board 3

(Top)

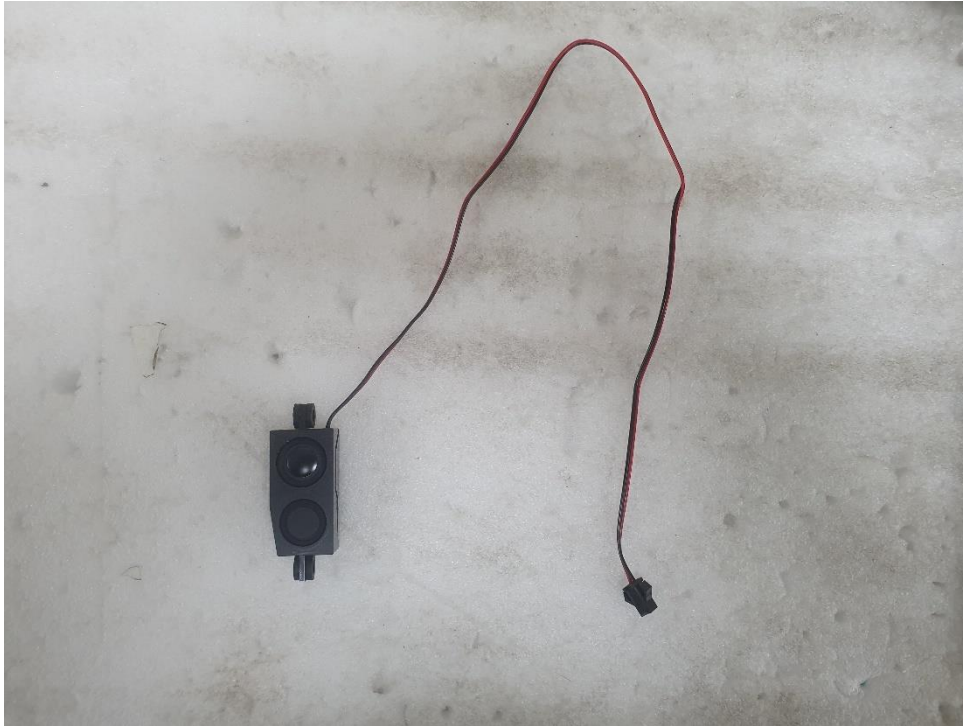


(Bottom)

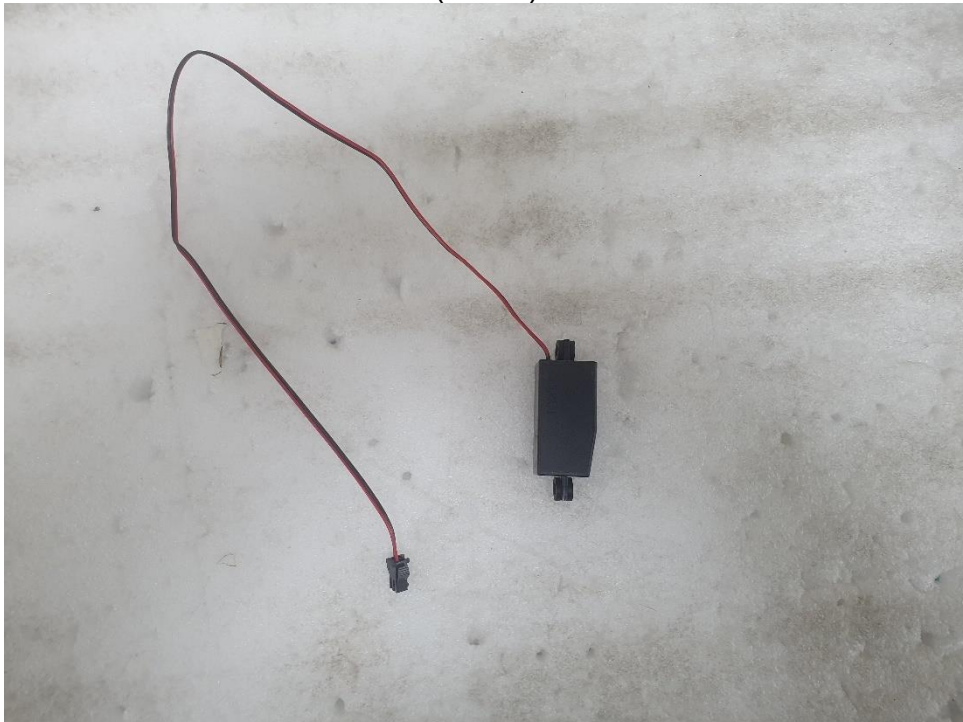


EUT Internal View – Speaker 1

(Top)



(Bottom)



EUT Internal View – Speaker 2

(Top)



(Bottom)



EUT Internal View – Panel

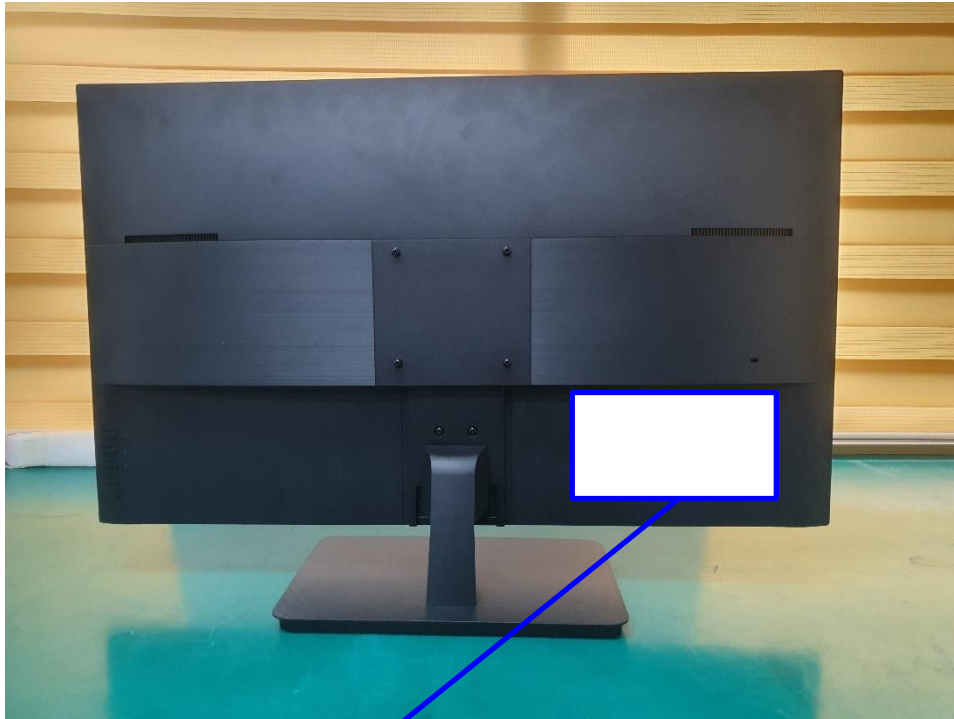
(Top)



(Bottom)



Label and Location



LED MONITOR

Model No : SMT-3215

Manufacturer : WEIHAI DAEWOO ELECTRONICS CO.,LTD

Made in CHINA

