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Report No.:

KES-EM-22T0818-R1

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EMC TEST REPORT For CE

Test Report No. : KES-EM-22T0818-R1
Date of Issue : Feb. 24, 2023
Product name : LED MONITOR
Model/Type No. : SMT-2212
Variant Model : -
Applicant : Hanwha Vision Co., Ltd
Applicant Address : 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si,
Gyeonggi-do, Republic of Korea
Manufacturer : Weihai Daewoo Electronics Co., Ltd.
Manufacturer Address : No.26, Hongkong Road, Economic & Technical Development
Zone, 264205 Weihai City, Shandong Province, China
Date of Receipt : Sep. 14, 2022
Test date : Sep. 14, 2022 ~ Jun. 18, 2022
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Dae Soo, Kim
EMC Test Engineer

Reviewed by

Dong Hun, Jang
EMC Technical Manager

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

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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Sep. 29, 2022	KES-EM-22T0818	Issued
Feb. 24, 2023	KES-EM-22T0818-R1	Change the Applicant at the request of the customer

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1.0 General Product Description

Main Specifications of EUT are:

Model		SMT-2212
Display		
Screen Size		21.45"
Max. Resolution		1920*1080 60Hz (FHD)
Brightness		250cd/m2 (Typ)
Contrast Ratio		2000 : 1(min) 3000:1 (Typical)
Aspect Ratio		16:9
Viewing Angle (H/V)		178°/178°
Display Color		1.07B Colors(Typ)
Response Time		6.5ms (Typical)
Panel Life		30,000 hours
Interface		
Video	Connector	VGA (1) HDMI (1)
VGA	Connector	VGA
	Available Format	640 × 480@60Hz/72Hz/75Hz;800 × 600@60Hz/72Hz/75Hz;1024 × 768@60Hz/75Hz;1280 × 1024@60Hz/75Hz;1440× 900@60Hz;1680× 1050@60Hz ; 1920× 1080@60Hz
HDMI	Connector	HDMI
	Available Format	640 × 480@60Hz/72Hz/75Hz;800 × 600@60Hz/72Hz/75Hz;1024 × 768@60Hz/75Hz;1280 × 1024@60Hz/75Hz;1440× 900@60Hz;1680× 1050@60Hz ; 1920× 1080@60Hz
Remocon		NA
On Screen Display (OSD)		
Functions		VESA™ DPM Compatible
Language		12 (English, French, German, Italian, Simplified Chinese, Traditional Chinese, Korean, Japanese, Espanola, Portuguese, Russian, Arabic)
Electrical	Adapter	DC 12V 2.5A, Adapter included
	Power Consumption	<30W
Environmental	Operating Temperature	0 ~ +40°C (+32°F ~ +104°F)
	Operating Humidity	10% ~ 80% (non-condensing)
Mechanical	Dimensions with Stand	491.8*327.7*167.2mm
	Dimensions without Stand	491.8*289.5*35.9mm
	Bezel Size	3 Frameless Top:1.8mm Bottom:21.3mm Side : 1.8mm
	Cabinet Color	Black
VESA Mounts Interface		100*100mm
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-2212	-	Weihai Daewoo Electronics Co., Ltd.	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
AC/DC ADAPTOR	FSP060-DHAN3	EP06-004404A	Zhonghan Electronics(Shenzhen) Co., Ltd.	EUT
Notebook	HSN-Q07C	5CD8367KND	HP	-
Notebook Adaptor	HSTNN-CA40	WFTKU0ERLB4QCH	HP	-

1.6 External I/O Cabling

■ HDMI, VGA MODE

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
LED MONITOR (EUT)	DC JACK	AC/DC ADAPTOR (EUT)	DC JACK	1.5	U
	HDMI	Notebook	HDMI	1.5	S
	VGA	Notebook	VGA	1.6	S

* Unshielded = U, Shielded = S

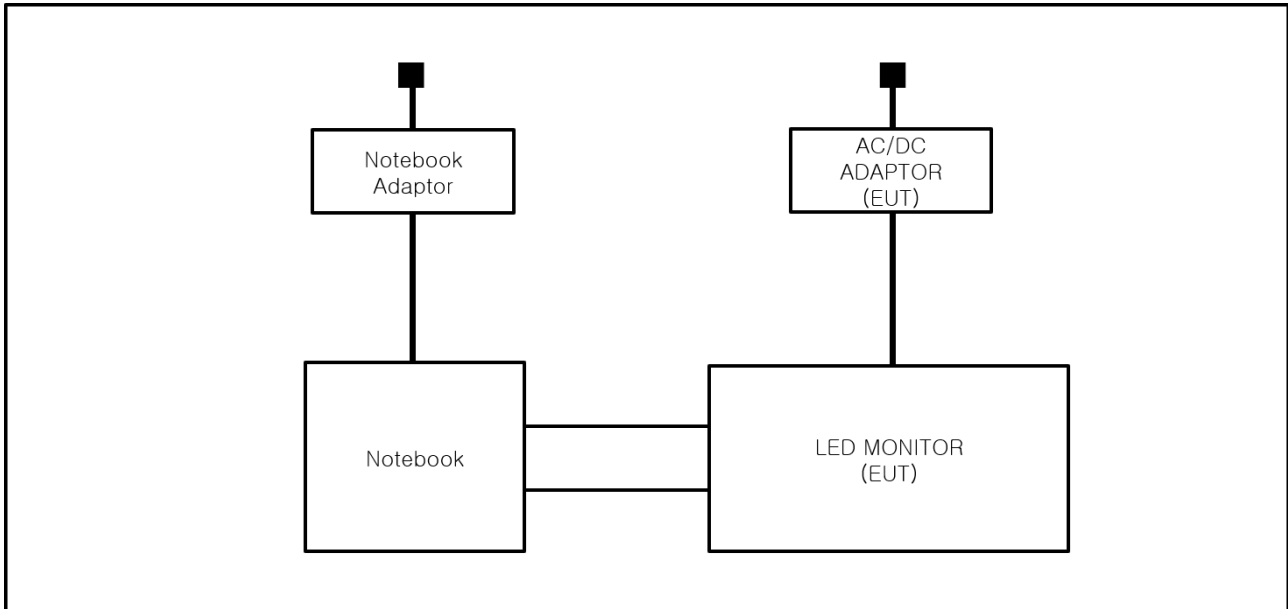
1.7 EUT Operating Mode(s)

Test Mode	operating
Operation (HDMI MODE, VGA MDE)	The test was conducted by converting the input mode of the test equipment into VGA and HDMI 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		
Name	Version	Manufacture Company
-	-	-

1.8 Configuration

■ AC Main
□ DC Main



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 61000-3-2:2014

☒ EN 61000-3-3:2013

☒ **EMC – Regulations 2016**

☒ **EMC – Directive 2014/30/EU**

☒ EN 55032:2015/A11:2020

☒ Class A

☐ Class B

☒ EN 55035:2017/A11:2020

☒ EN 61000-3-2:2014

☒ EN 61000-3-3:2013



2.1 Conducted Emissions at Mains Power Ports

Test Date

Sep. 14, 2022

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	12, 28, 2022
☒	LISN	ENV216	R & S	101787	12, 27, 2022
☒	LISN	ESH2-Z5	R & S	100450	12, 27, 2022
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 27, 2022

Test Conditions

Temperature: (24,8 ± 0,0) °C

Relative Humidity: (45,7 ± 0,0) % 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

Remarks

See 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	12, 28, 2022
☐	LISN	ENV216	R & S	101787	12, 27, 2022
☐	LISN	ESH2-Z5	R & S	100450	12, 27, 2022
☐	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 27, 2022
☐	8-WIRE ISN CAT3,5	ENY81	R & S	100174	12, 28, 2022
☐	8-WIRE ISN CAT6	ENY81-CAT6	R & S	101665	12, 28, 2022
☐	ISN	ISN S8	SCHWARZBECK	ISN-S8-0019	03, 07, 2023

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

Remarks

Does not apply because no IP is assigned.



2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Sep. 14, 2022

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, 31, 2023
☒	AMPLIFIER	SCU 01	R & S	100603	11, 24, 2022
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	12, 08, 2022
☒	ATTENUATOR	8491A	HP	32173	03, 08, 2023

Test Conditions

Temperature: (25,4 ± 0,1) °C
Relative Humidity: (46,7 ± 0,1) % R.H.

Frequency Range of Measurement

30 MHz to 1 GHz

Instrument Settings

IF Band Width: 120 kHz

Test Results

The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.

2.4 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Sep. 15, 2022

Test Location

SEMI ANECHOIC CHAMBER #3

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	08, 01, 2023
☒	PREAMPLIFIER	8449B	AGILENT	3008A01967	04, 01, 2023
☐	ATTENUATOR	8491A	HP	35496	03, 08, 2023
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 03, 2023

Test Conditions

Temperature: (24,6 ± 0,1) °C

Relative Humidity: (45,1 ± 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

Sep. 15, 2022

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	04, 06, 2023
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: (22,8 ± 0,2) °C
Relative Humidity: (52,2 ± 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

Remarks

See Appendix A for test data.



2.6 Voltage Fluctuations and Flicker

Test Date

Sep. 15, 2022

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	04, 06, 2023
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: (22,8 ± 0,2) °C
Relative Humidity: (52,2 ± 0,2) % R.H

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See 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

Sep. 18, 2022

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	02, 24, 2023
☒	HCP	-	KES	-	-
☒	VCP	-	Noise Ken	-	-

Test Conditions

Temperature: (26,6 ± 0,0) °C
Relative Humidity: (47,4 ± 0,0) % R.H.
Atmospheric Pressure: (99,7 ± 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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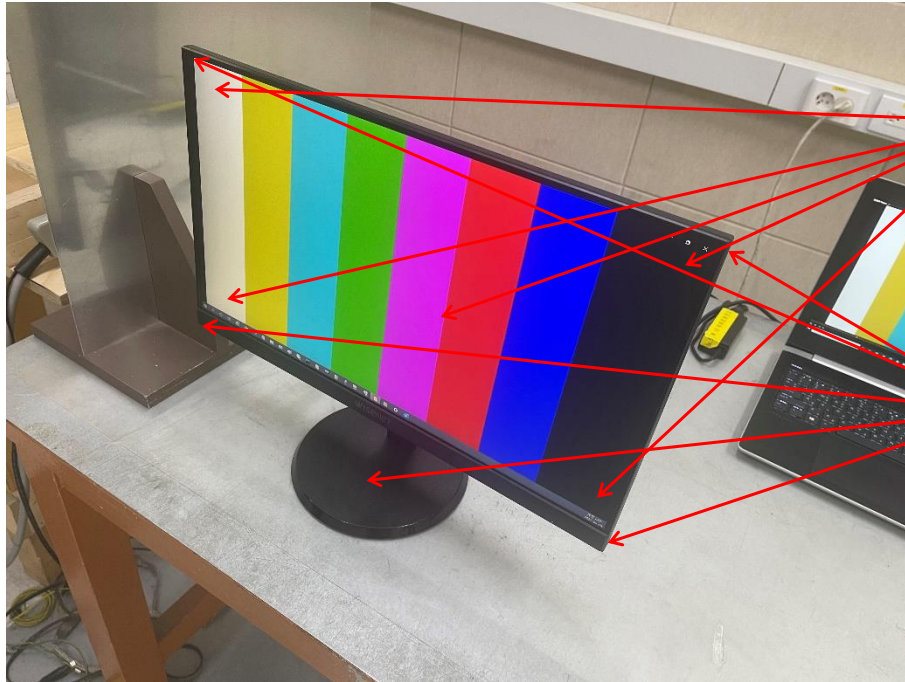
Notes: HCP: Horizontal coupling plane

VCP: Vertical coupling plane

Required Performance Criteria: ☒ B

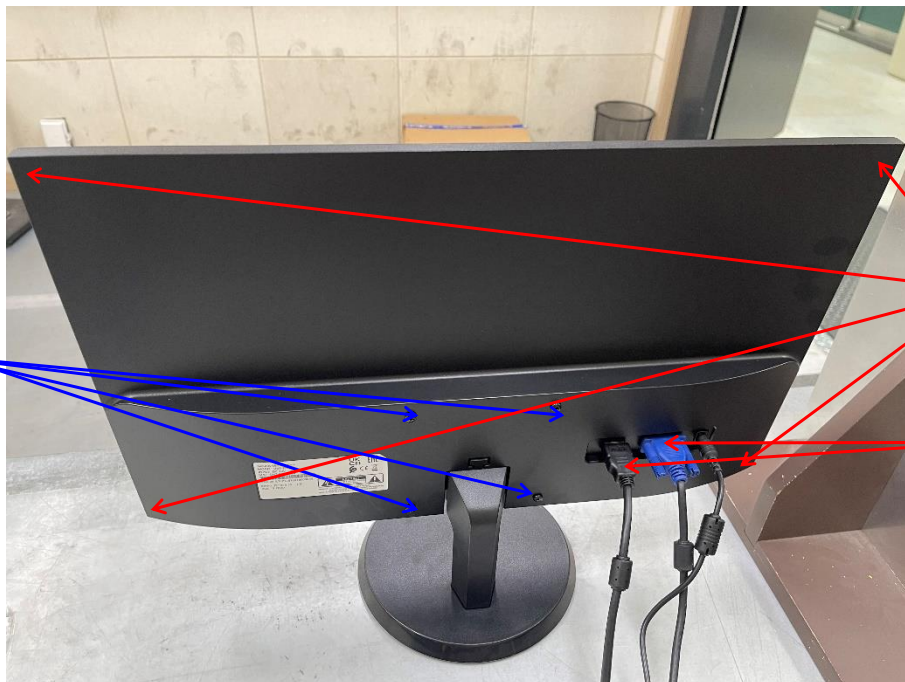
Location of Discharge:

Air
Contact



2

1



1

3

4

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Test Data

■ 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	Enclosure	Air Discharge	B	A	-
2	LED Panel	Air Discharge	B	A	-
3	Port	Air Discharge	B	A	-
4	screw	Contact Discharge	B	A	-
5	AC/DC ADAPTOR Enclosure	Air Discharge	B	A	-

■ 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	Enclosure	Air Discharge	B	A	-
2	LED Panel	Air Discharge	B	A	-
3	Port	Air Discharge	B	A	-
4	screw	Contact Discharge	B	A	-
5	AC/DC ADAPTOR Enclosure	Air 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

Sep. 15, 2022

Test Location

EMS-RS: ☐ SEMI ANECHOIC CHAMBER #2

☒ SEMI ANECHOIC CHAMBER #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	EMC32	R & S	10.10.02	-
☒	SIGNAL GENERATOR	SMB 100A	Rohde & Schwarz	108252	08, 01, 2023
☒	HIGH POWER DUAL AMP	SSA532	SUNGSAN	SSA532-001	-
☒	POWER METER	E4419B	Agilent	GB40203000	03, 31, 2023
☒	AVERAGE POWER SENSOR	E9301A	Agilent	MY52170007	04, 04, 2023
☒	AVERAGE POWER SENSOR	E9301A	Agilent	MY41498669	04, 04, 2023
☒	STACKED DOUBLE LOG-PER- ANTENNA	STPL9128 E	Schwarzbeck	9128ES-121	-
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 03, 2023



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Test Conditions

Temperature: (24,3 ± 0,2) °C
Relative Humidity: (45,9 ± 0,2) % R.H.
Atmospheric Pressure: (100,2 ± 0,2) 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 (± 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

of Sides Radiated: ☒ 4

Required Performance Criteria: ☒ A

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Test Data

■ 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.

■ 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
-	-	-	-	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.

3.3 Electrical Fast Transients/Bursts

Reference Standard

EN 61000-4-4:2012

Test Date

Sep. 17, 2022

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	12, 03, 2022
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	03, 31, 2023
☐	CAPACITIVE COUPLING CLAMP	HFK	EM TEST	P1633183115	12, 03, 2022

Test Conditions

Temperature: (26,4 ± 0,1) °C
Relative Humidity: (48,1 ± 0,1) % R.H.
Atmospheric Pressure: (99,1 ± 0,0) kPa

Test Specifications

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

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

Burst Period: ☒ 300 ms ☐ 2 s

Repetition Rate: ☒ 5 kHz ☐ 100 kHz

Duration of Test Voltage: ☒ ≥ 1 min

Required Performance Criteria: ☒ B

Test Data

■ 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	-	-

■ 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	-	-

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.

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3.4 Surge

Reference Standard

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

Test Date

Sep. 17, 2022

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	12, 03, 2022
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	03, 31, 2023

Test Conditions

Temperature: (26,4 ± 0,2) °C
Relative Humidity: (48,1 ± 0,2) % R.H.
Atmospheric Pressure: (99,1 ± 0,0) kPa

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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) kV

Number of Surges:

☒ 5 surges per angle

Angle:

☒ 90°, 270° (input a.c. power port)

Polarity:

☒ Positive & Negative

Repetition 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) kV

Number of Surges:

☐ 5 Surges

Polarity:

☐ Positive & Negative

Repetition Rate:

☐ 1 surge per min ☐ 1 surge per 30 sec.

Required Performance Criteria: ☐ B

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Test Data

■ 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	-	-

■ 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	-	-

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

Sep. 18, 2022

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, 24, 2022
☒	ATTENUATOR	ATT 6/80	EM TEST	P1614178148	11, 24, 2022
☒	CDN	CDN M016	TESEQ	43694	11, 24, 2022
☒	CDN	CDN M016	TESEQ	43697	11, 24, 2022

Test Conditions

Temperature: (24,6 ± 0,2) °C
Relative Humidity: (46,0 ± 0,0) % R.H.
Atmospheric Pressure: (100,1 ± 0,0) kPa



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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

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Test Data

■ 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	-

■ 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		
-	-	-	-	A	-

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.

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

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	12, 03, 2022
☐	MOTOR VARIAC	MV2616	EM TEST	P1552169719	03, 31, 2023
☐	MAGNETIC FIELD COIL	MS 100N	EM TEST	P1536163691	12, 07, 2022
☐	CURRENT TRANSFORMER	MC 2630	EM TEST	P1629182219	12, 07, 2022

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



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Test Data

☐ Immersion method

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

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
Sep. 18, 2022

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	03, 31, 2023
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	03, 31, 2023

Test Conditions

Temperature: (26,6 ± 0,0) °C
Relative Humidity: (47,4 ± 0,0) % R.H.
Atmospheric Pressure: (99,7 ± 0,0) kPa

Test Data

■ 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	-

■ 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	-

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

During the interruption test, EUT was turned off but after the test, it was recovered by operator's intervention.(RESTART)

APPENDIX A – TEST DATA

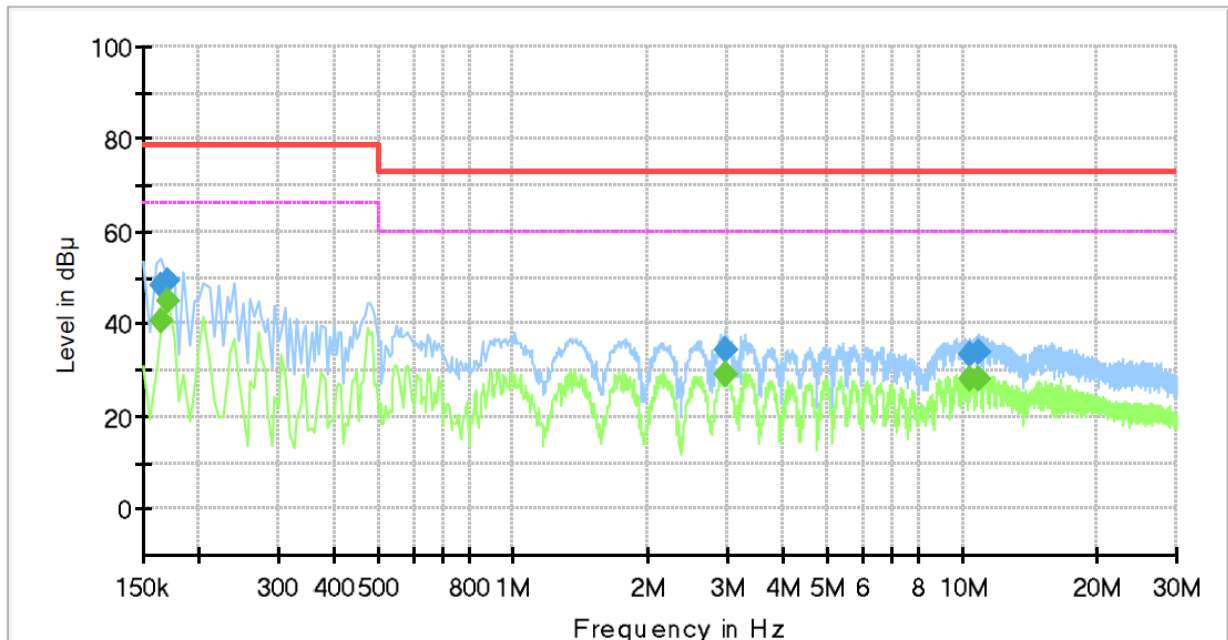
Conducted Emissions at Mains Power Ports

■ HDMI MODE

[HOT]

Common Information

Test Description:	Conducted Emission
Model No.:	SMT-2212
Phase:	H
Mode:	HDMI
Operator Name:	KES



Final Result

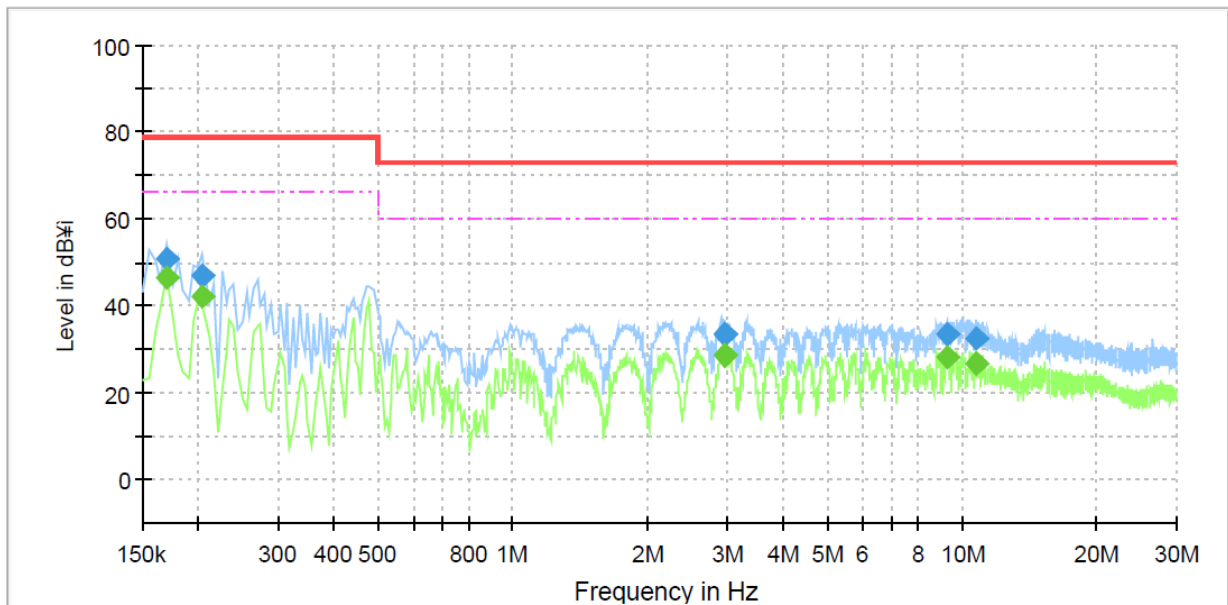
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.165000	---	40.63	66.00	25.37	1000.0	9.000	L1	19.4
0.165000	48.48	---	79.00	30.52	1000.0	9.000	L1	19.4
0.170000	---	45.07	66.00	20.93	1000.0	9.000	L1	19.4
0.170000	49.18	---	79.00	29.82	1000.0	9.000	L1	19.4
2.960000	---	29.20	60.00	30.80	1000.0	9.000	L1	20.2
2.960000	34.35	---	73.00	38.65	1000.0	9.000	L1	20.2
2.975000	---	29.03	60.00	30.97	1000.0	9.000	L1	20.2
2.975000	34.36	---	73.00	38.64	1000.0	9.000	L1	20.2
10.450000	---	27.92	60.00	32.08	1000.0	9.000	L1	19.9
10.450000	33.42	---	73.00	39.58	1000.0	9.000	L1	19.9
10.880000	---	28.22	60.00	31.78	1000.0	9.000	L1	19.9
10.880000	33.72	---	73.00	39.28	1000.0	9.000	L1	19.9

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[NEUTRAL]

Common Information

Test Description: Conducted Emission
 Model No.: SMT-2212
 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)
0.170000	50.96	---	79.00	28.04	1000.0	9.000	N	19.4
0.170000	---	46.33	66.00	19.67	1000.0	9.000	N	19.4
0.205000	---	41.91	66.00	24.09	1000.0	9.000	N	19.4
0.205000	46.84	---	79.00	32.16	1000.0	9.000	N	19.4
2.960000	---	28.54	60.00	31.46	1000.0	9.000	N	20.2
2.960000	33.59	---	73.00	39.41	1000.0	9.000	N	20.2
2.975000	---	28.48	60.00	31.52	1000.0	9.000	N	20.2
2.975000	33.64	---	73.00	39.36	1000.0	9.000	N	20.2
9.285000	---	27.94	60.00	32.06	1000.0	9.000	N	19.8
9.285000	33.25	---	73.00	39.75	1000.0	9.000	N	19.8
10.795000	---	26.78	60.00	33.22	1000.0	9.000	N	19.9
10.795000	32.42	---	73.00	40.58	1000.0	9.000	N	19.9

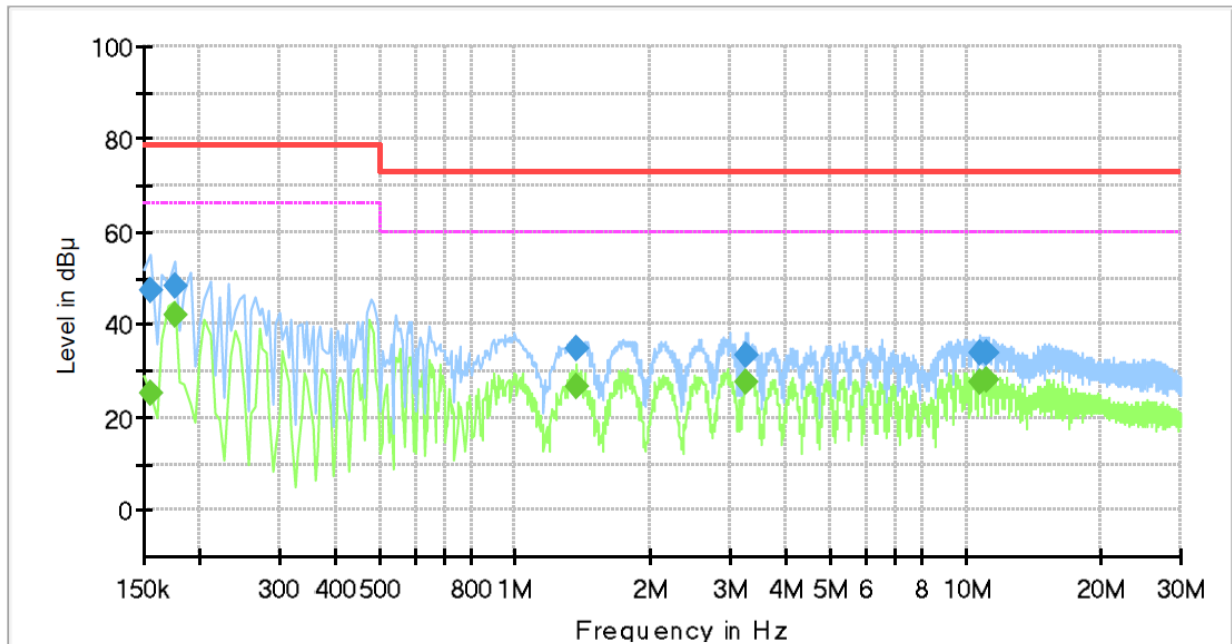
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■ VGA MODE

[HOT]

Common Information

Test Description:	Conducted Emission
Model No.:	SMT-2212
Phase:	H
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)
0.155000	---	24.98	66.00	41.02	1000.0	9.000	L1	19.4
0.155000	47.51	---	79.00	31.49	1000.0	9.000	L1	19.4
0.175000	---	42.13	66.00	23.87	1000.0	9.000	L1	19.4
0.175000	48.37	---	79.00	30.63	1000.0	9.000	L1	19.4
1.370000	---	26.66	60.00	33.34	1000.0	9.000	L1	20.2
1.370000	34.69	---	73.00	38.31	1000.0	9.000	L1	20.2
3.260000	---	27.75	60.00	32.25	1000.0	9.000	L1	20.1
3.260000	33.48	---	73.00	39.52	1000.0	9.000	L1	20.1
10.715000	---	27.49	60.00	32.51	1000.0	9.000	L1	19.9
10.715000	33.79	---	73.00	39.21	1000.0	9.000	L1	19.9
11.125000	---	28.01	60.00	31.99	1000.0	9.000	L1	20.0
11.125000	33.73	---	73.00	39.27	1000.0	9.000	L1	20.0

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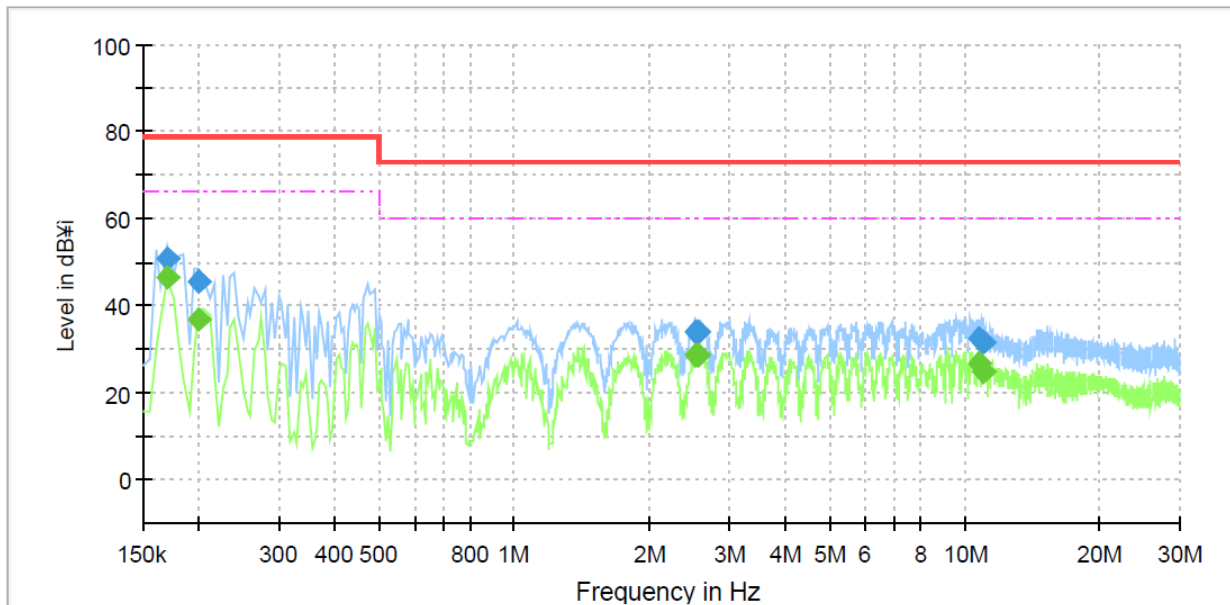
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[NEUTRAL]

Common Information

Test Description: Conducted Emission
 Model No.: SMT-2212
 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)
0.170000	50.98	---	79.00	28.02	1000.0	9.000	N	19.4
0.170000	---	46.39	66.00	19.61	1000.0	9.000	N	19.4
0.200000	---	36.79	66.00	29.21	1000.0	9.000	N	19.4
0.200000	45.43	---	79.00	33.57	1000.0	9.000	N	19.4
2.545000	---	28.44	60.00	31.56	1000.0	9.000	N	20.2
2.545000	33.76	---	73.00	39.24	1000.0	9.000	N	20.2
2.565000	---	28.80	60.00	31.20	1000.0	9.000	N	20.2
2.565000	34.12	---	73.00	38.88	1000.0	9.000	N	20.2
10.810000	---	26.85	60.00	33.15	1000.0	9.000	N	19.9
10.810000	32.48	---	73.00	40.52	1000.0	9.000	N	19.9
11.020000	---	24.69	60.00	35.31	1000.0	9.000	N	20.0
11.020000	31.52	---	73.00	41.48	1000.0	9.000	N	20.0

◆ 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))

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Report No.:

KES-EM-22T0818-R1

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**Conducted Emissions at Telecommunication Ports
[100 Mbps]**

N/A

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

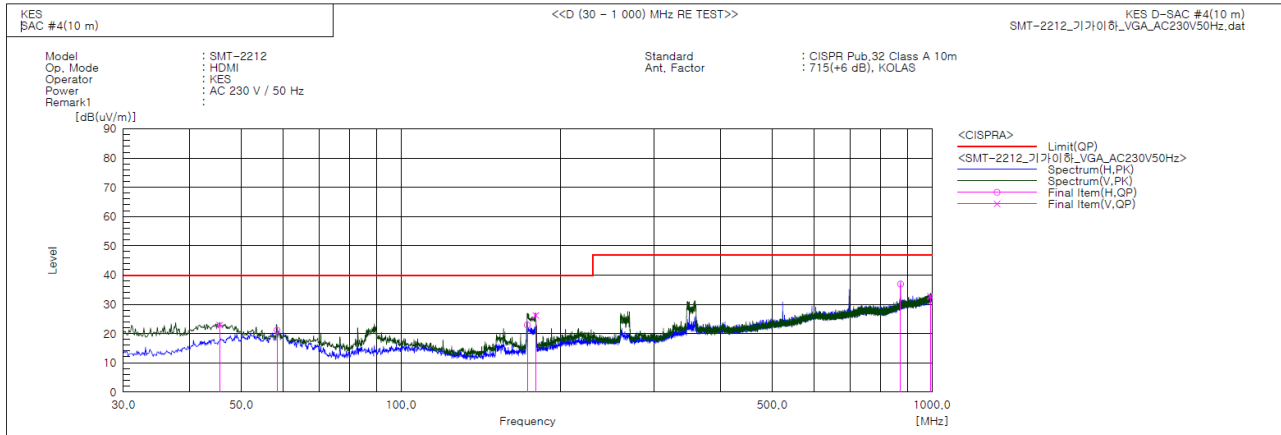
Corr. : Correction values (ISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

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Radiated Electric Field Emissions(Below 1 GHz)

■ HDMI MODE



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	45.520	V	44.1	-21.2	22.9	40.0	17.1	114.0	216.0	
2	58.373	H	42.7	-21.6	21.1	40.0	18.9	313.0	341.0	
3	172.954	H	46.8	-23.9	22.9	40.0	17.1	369.0	78.0	
4	179.259	V	49.6	-23.4	26.2	40.0	13.8	125.0	7.0	
5	872.566	H	41.1	-4.2	36.9	47.0	10.1	296.0	288.0	
6	992.846	V	34.8	-2.0	32.8	47.0	14.2	107.0	239.0	

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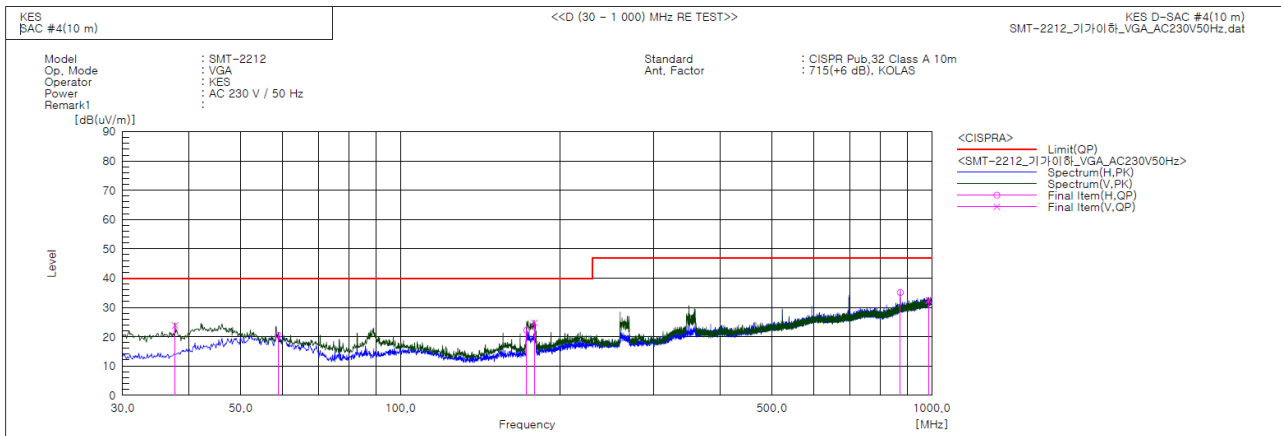
3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-EM-22T0818-R1

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VGA MODE



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	37.639	V	47.5	-23.7	23.8	40.0	16.2	117.0	87.0	
2	58.858	H	42.1	-21.6	20.5	40.0	19.5	373.0	297.0	
3	172.833	H	46.1	-23.9	22.2	40.0	17.8	312.0	96.0	
4	178.531	V	48.2	-23.5	24.7	40.0	15.3	104.0	11.0	
5	872.566	H	39.3	-4.2	35.1	47.0	11.9	399.0	349.0	
6	986.905	V	34.6	-2.2	32.4	47.0	14.6	110.0	82.0	

◆ Calculation - SAC #4(10 m)

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

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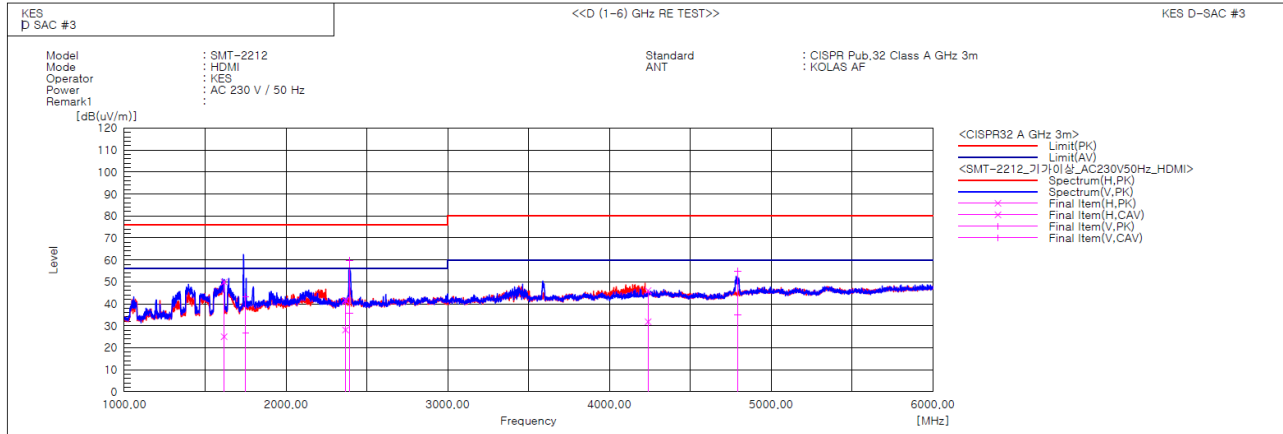
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Radiated Electric Field Emissions(Above 1 GHz)

HDMI MODE



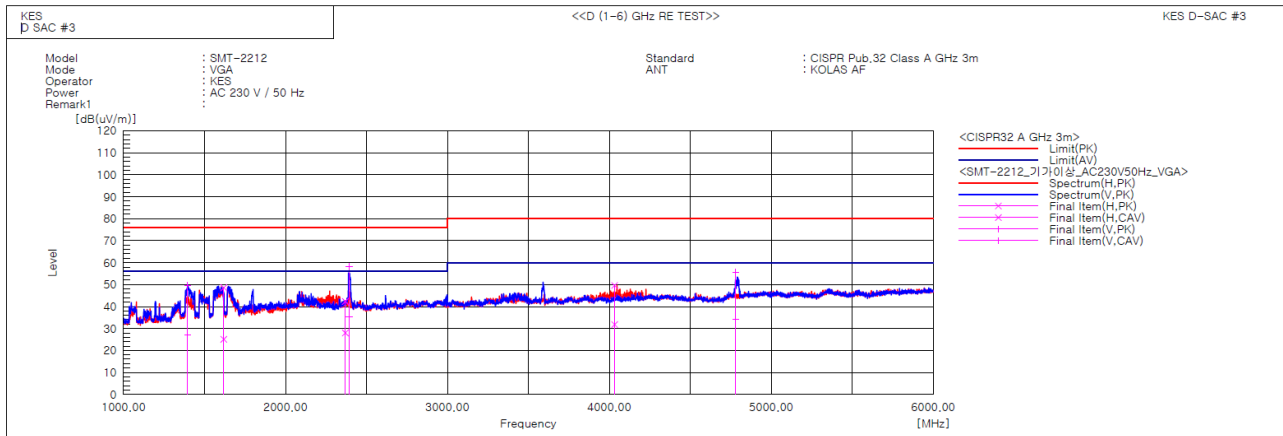
Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Result CAV [dB(μV/m)]	Limit PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1616.919	H	55.1	30.3	-5.2	49.9	25.1	76.0	56.0	26.1	30.9	100.0	67.8	
2	1750.077	V	46.7	29.9	-3.3	43.4	26.6	76.0	56.0	32.6	29.4	100.0	19.9	
3	2368.345	H	41.4	27.9	0.2	41.6	28.1	76.0	56.0	34.4	27.9	100.0	67.2	
4	2392.000	V	59.4	35.3	0.3	59.7	35.6	76.0	56.0	16.3	20.4	100.0	208.8	
5	4238.936	H	40.1	25.9	5.9	46.0	31.8	80.0	60.0	34.0	28.2	100.0	287.3	
6	4792.648	V	47.8	27.9	7.0	54.8	34.9	80.0	60.0	25.2	25.1	100.0	173.8	

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VGA MODE



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result CAV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1395.100	V	56.3	33.6	-6.6	49.7	27.0	76.0	56.0	26.3	29.0	100.0	5.8	
2	1618.057	H	53.8	30.3	-5.2	48.6	25.1	76.0	56.0	27.4	30.9	100.0	72.5	
3	2392.539	V	57.9	35.1	0.3	58.2	35.4	76.0	56.0	17.8	20.6	100.0	208.9	
4	2369.005	H	42.1	27.8	0.2	42.3	28.0	76.0	56.0	33.7	28.0	100.0	169.1	
5	4031.713	H	44.8	27.0	4.8	49.6	31.8	80.0	60.0	30.4	28.2	100.0	297.9	
6	4779.122	V	48.8	27.3	6.8	55.6	34.1	80.0	60.0	24.4	25.9	100.0	174.5	

◆ Calculation

Result(PK/CAV) [dB(μ V/m)] = (Reading(PK/CAV)[dB(μ V)] + c.f[dB(1/m)])

Margin(PK/CAV)[dB] = Limit[dB(μ V/m)] - Result(PK/CAV) [dB(μ V/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

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Harmonic Current Emissions and Voltage Fluctuations and Flicker

■ HDMI MODE

Average harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	0.082			n/a
2	0.003	0.288	1.080	n/a
3	0.076	3.305	2.300	PASS
4	0.003	0.597	0.430	n/a
5	0.074	6.484	1.140	PASS
6	0.004	1.266	0.300	n/a
7	0.072	9.351	0.770	PASS
8	0.003	1.257	0.230	n/a
9	0.071	17.625	0.400	PASS
10	0.003	1.513	0.184	n/a
11	0.068	20.556	0.330	PASS
12	0.003	1.919	0.153	n/a
13	0.064	30.595	0.210	PASS
14	0.003	2.093	0.131	n/a
15	0.060	40.106	0.150	PASS
16	0.002	2.126	0.115	n/a
17	0.056	42.503	0.132	PASS
18	0.002	2.309	0.102	n/a
19	0.052	44.105	0.118	PASS
20	0.002	2.447	0.092	n/a
21	0.048	29.760	0.161	PASS
22	0.002	2.857	0.084	n/a
23	0.043	29.640	0.147	PASS
24	0.002	2.727	0.077	n/a
25	0.039	28.740	0.135	PASS
26	0.002	2.669	0.071	n/a
27	0.034	27.457	0.125	PASS
28	0.002	2.751	0.066	n/a
29	0.030	25.649	0.116	PASS
30	0.002	2.660	0.061	n/a
31	0.025	23.356	0.109	PASS
32	0.002	2.757	0.058	n/a
33	0.021	20.900	0.102	PASS
34	0.001	2.542	0.054	n/a
35	0.017	18.045	0.096	PASS
36	0.001	2.448	0.051	n/a
37	0.014	15.135	0.091	PASS
38	0.001	2.423	0.048	n/a
39	0.011	12.247	0.087	PASS
40	0.001	2.331	0.046	n/a

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	0.082			
2	0.004	0.231	1.620	n/a
3	0.076	2.208	3.450	PASS
4	0.003	0.499	0.645	n/a
5	0.074	4.342	1.710	PASS
6	0.004	0.999	0.450	n/a
7	0.073	6.278	1.155	PASS
8	0.004	1.018	0.345	n/a
9	0.071	11.776	0.600	PASS
10	0.003	1.228	0.276	n/a
11	0.068	13.738	0.495	PASS
12	0.004	1.579	0.230	n/a
13	0.064	20.451	0.315	PASS
14	0.003	1.712	0.197	n/a
15	0.060	26.870	0.225	PASS
16	0.003	1.792	0.173	n/a
17	0.057	28.585	0.199	PASS
18	0.003	1.946	0.153	n/a
19	0.052	29.528	0.178	PASS
20	0.003	2.131	0.138	n/a
21	0.048	29.859	0.161	PASS
22	0.003	2.394	0.125	n/a
23	0.044	29.819	0.147	PASS
24	0.003	2.359	0.115	n/a
25	0.039	28.841	0.135	PASS
26	0.002	2.355	0.106	n/a
27	0.034	27.582	0.125	PASS
28	0.002	2.418	0.099	n/a
29	0.030	25.787	0.116	PASS
30	0.002	2.291	0.092	n/a
31	0.026	23.499	0.109	PASS
32	0.002	2.425	0.086	n/a
33	0.022	21.042	0.102	PASS
34	0.002	2.176	0.081	n/a
35	0.018	18.234	0.096	PASS
36	0.002	2.055	0.077	n/a
37	0.014	15.355	0.091	PASS
38	0.002	2.076	0.073	n/a
39	0.011	12.412	0.087	PASS
40	0.001	1.882	0.069	n/a

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.



■ VGA MODE

Average harmonic current results

Hn	Ieff [A]	% of Limit	Limit [A]	Result
1	0.082			
2	0.003	0.291	1.080	n/a
3	0.077	3.339	2.300	PASS
4	0.003	0.609	0.430	n/a
5	0.075	6.552	1.140	PASS
6	0.004	1.279	0.300	n/a
7	0.073	9.449	0.770	PASS
8	0.003	1.276	0.230	n/a
9	0.071	17.804	0.400	PASS
10	0.003	1.534	0.184	n/a
11	0.069	20.766	0.330	PASS
12	0.003	1.938	0.153	n/a
13	0.065	30.907	0.210	PASS
14	0.003	2.118	0.131	n/a
15	0.061	40.518	0.150	PASS
16	0.002	2.138	0.115	n/a
17	0.057	42.951	0.132	PASS
18	0.002	2.297	0.102	n/a
19	0.053	44.562	0.118	PASS
20	0.002	2.427	0.092	n/a
21	0.048	30.075	0.161	PASS
22	0.002	2.836	0.084	n/a
23	0.044	29.943	0.147	PASS
24	0.002	2.692	0.077	n/a
25	0.039	29.039	0.135	PASS
26	0.002	2.632	0.071	n/a
27	0.035	27.731	0.125	PASS
28	0.002	2.685	0.066	n/a
29	0.030	25.897	0.116	PASS
30	0.002	2.614	0.061	n/a
31	0.026	23.573	0.109	PASS
32	0.002	2.670	0.058	n/a
33	0.022	21.071	0.102	PASS
34	0.001	2.451	0.054	n/a
35	0.018	18.178	0.096	PASS
36	0.001	2.382	0.051	n/a
37	0.014	15.240	0.091	PASS
38	0.001	2.306	0.048	n/a
39	0.011	12.288	0.087	PASS
40	0.001	2.299	0.046	n/a

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	0.083			
2	0.004	0.229	1.620	n/a
3	0.077	2.230	3.450	PASS
4	0.003	0.486	0.645	n/a
5	0.075	4.389	1.710	PASS
6	0.004	0.992	0.450	n/a
7	0.073	6.351	1.155	PASS
8	0.003	0.990	0.345	n/a
9	0.071	11.896	0.600	PASS
10	0.003	1.190	0.276	n/a
11	0.069	13.867	0.495	PASS
12	0.003	1.509	0.230	n/a
13	0.065	20.651	0.315	PASS
14	0.003	1.647	0.197	n/a
15	0.061	27.160	0.225	PASS
16	0.003	1.801	0.173	n/a
17	0.057	28.883	0.199	PASS
18	0.003	1.897	0.153	n/a
19	0.053	29.779	0.178	PASS
20	0.003	2.003	0.138	n/a
21	0.048	30.145	0.161	PASS
22	0.003	2.282	0.125	n/a
23	0.044	30.035	0.147	PASS
24	0.003	2.216	0.115	n/a
25	0.039	29.102	0.135	PASS
26	0.002	2.173	0.106	n/a
27	0.035	27.814	0.125	PASS
28	0.002	2.302	0.099	n/a
29	0.030	26.049	0.116	PASS
30	0.002	2.173	0.092	n/a
31	0.026	23.665	0.109	PASS
32	0.002	2.211	0.086	n/a
33	0.022	21.176	0.102	PASS
34	0.002	2.105	0.081	n/a
35	0.018	18.282	0.096	PASS
36	0.002	1.987	0.077	n/a
37	0.014	15.371	0.091	PASS
38	0.001	1.892	0.073	n/a
39	0.011	12.405	0.087	PASS
40	0.001	1.797	0.069	n/a

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.

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Report No.:

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Test Data - Voltage Fluctuations**■ HDMI MODE**

Flicker Measurements					
	P_{It}	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

■ VGA MODE

Flicker Measurements					
	P_{It}	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

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APPENDIX B – Test Setup Photos and Configuration

Conducted Emissions at Mains Power Ports



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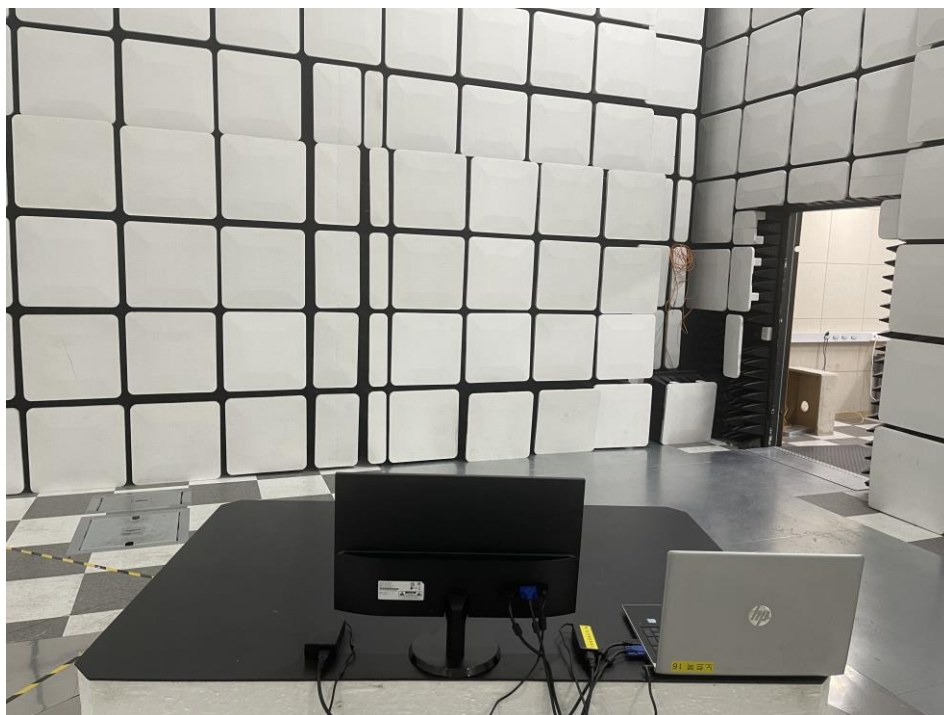
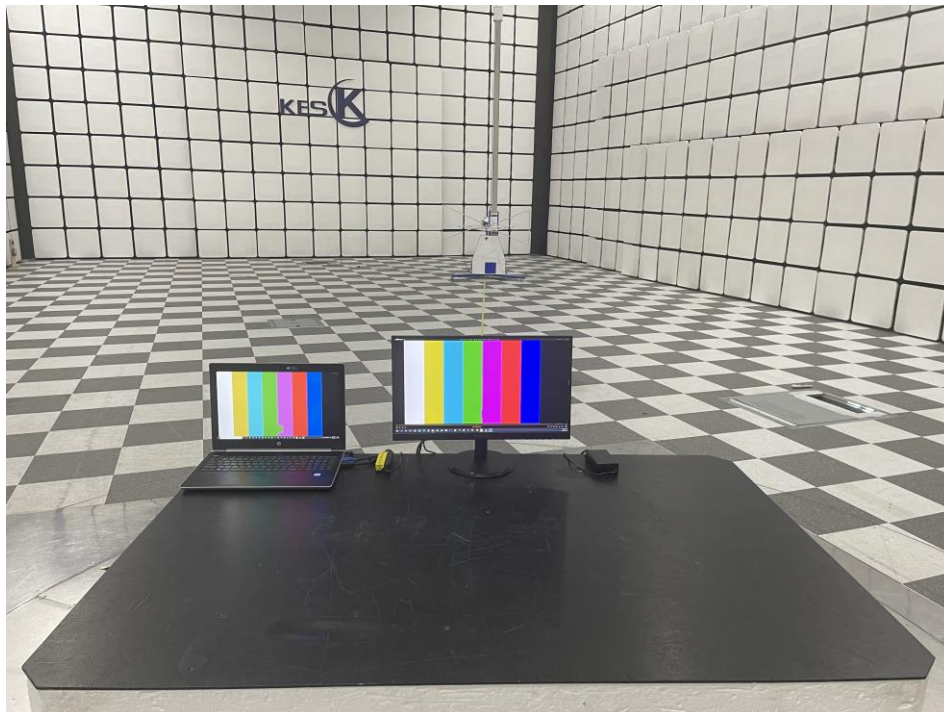
Conducted Telecommunication Emissions

N/A

N/A

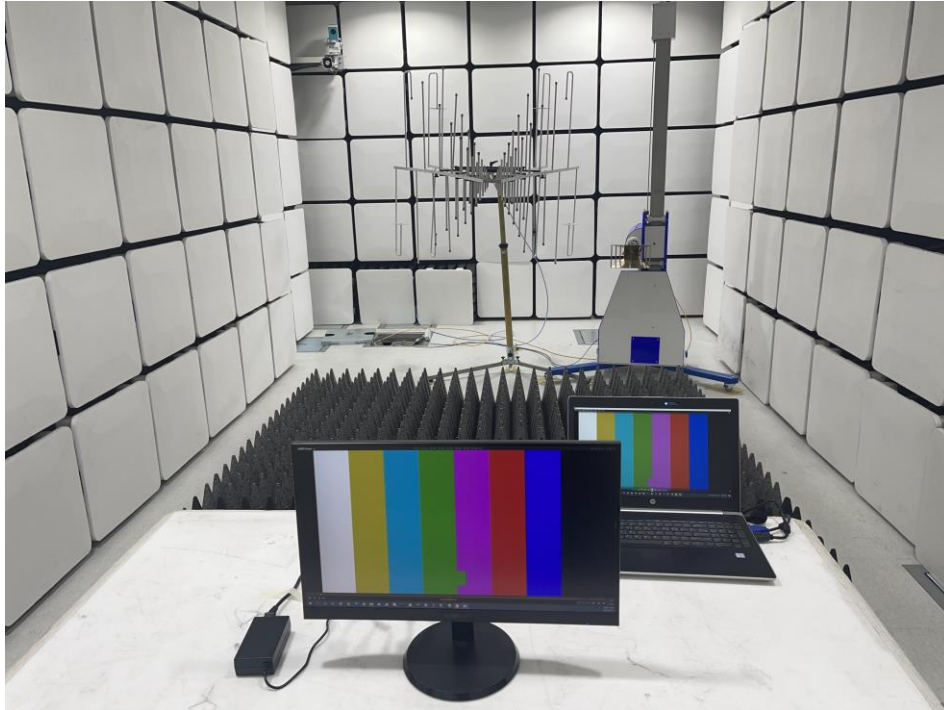
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Radiated Electric Field Emissions(Below 1 GHz)



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Radiated Electric Field Emissions(Above 1 GHz)

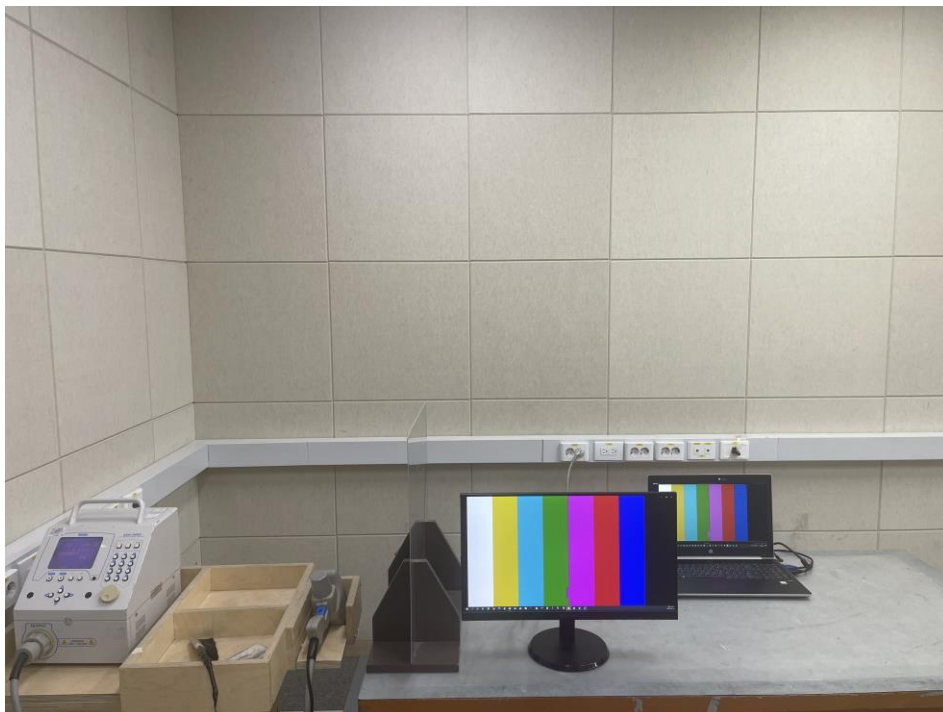


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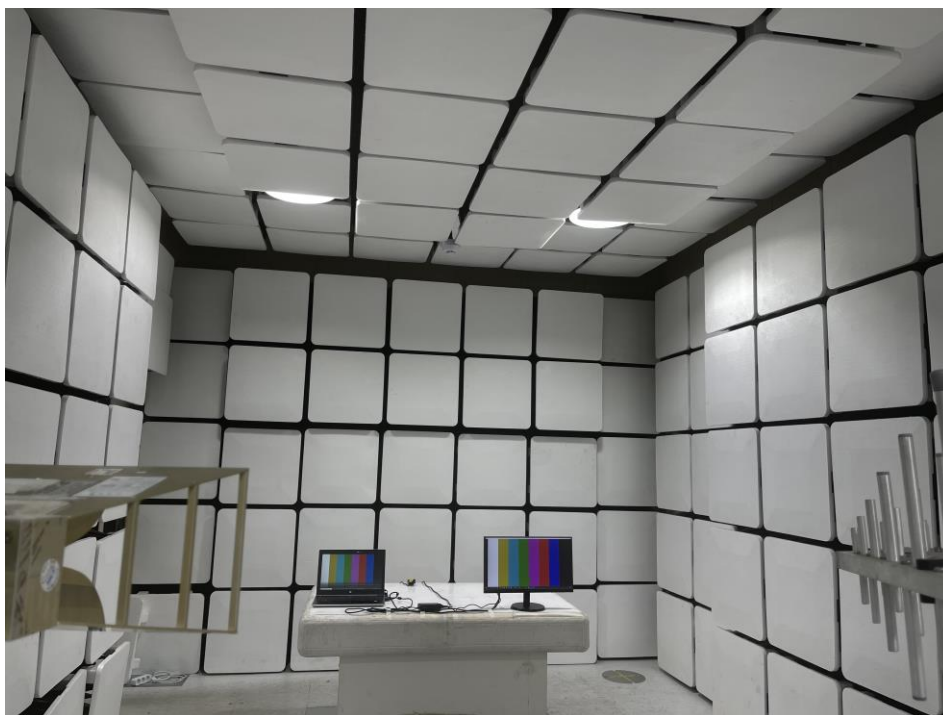
Harmonic Current Emissions and Voltage Fluctuations and Flicker



Electrostatic Discharge



Radiated Electric Field Immunity



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Electrical Fast Transients/Bursts



Surge Transients



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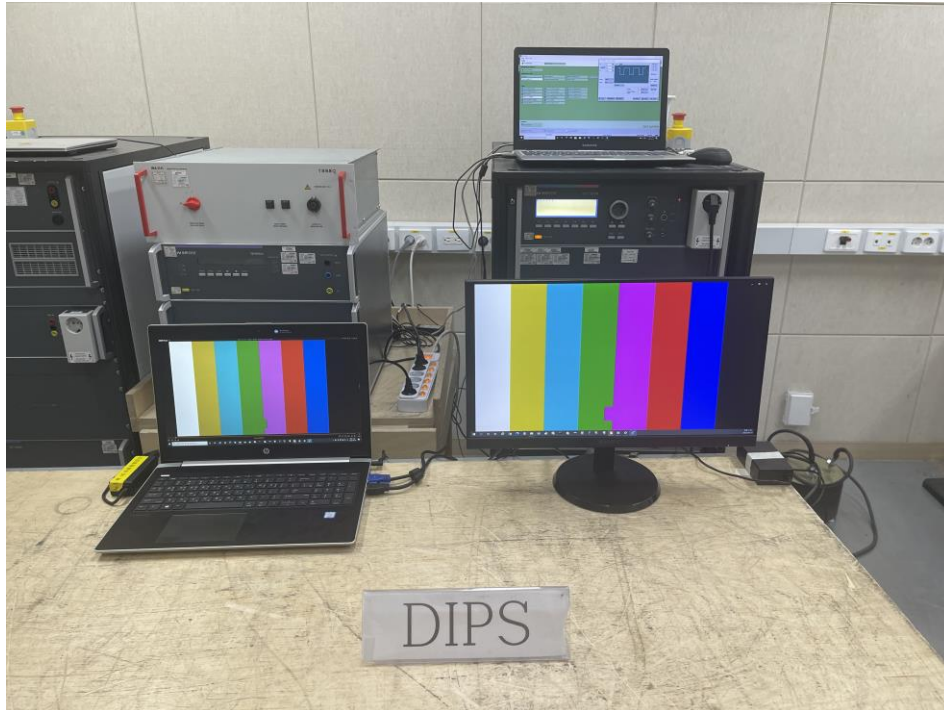
Conducted Disturbance



Power Frequency Magnetic Field Immunity

N/A

Voltage Dips and Short Interruptions



APPENDIX C – EUT Photographs EUT External Photographs

(Top)



(Bottom)



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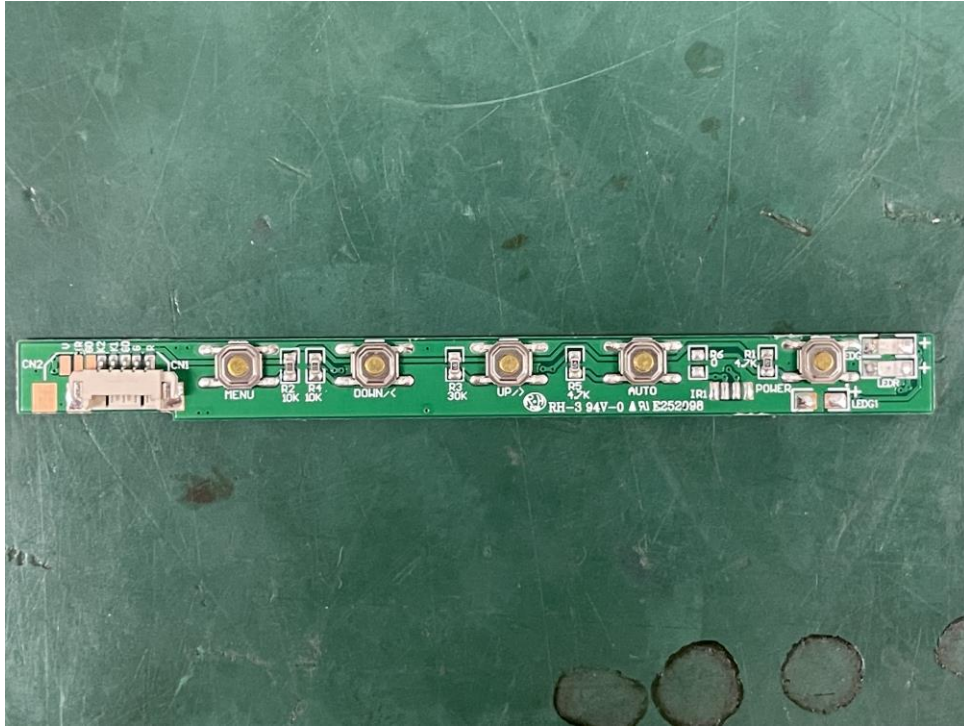
EUT Internal Photographs

(Internal View)



EUT Internal View –Board 1

(Top)



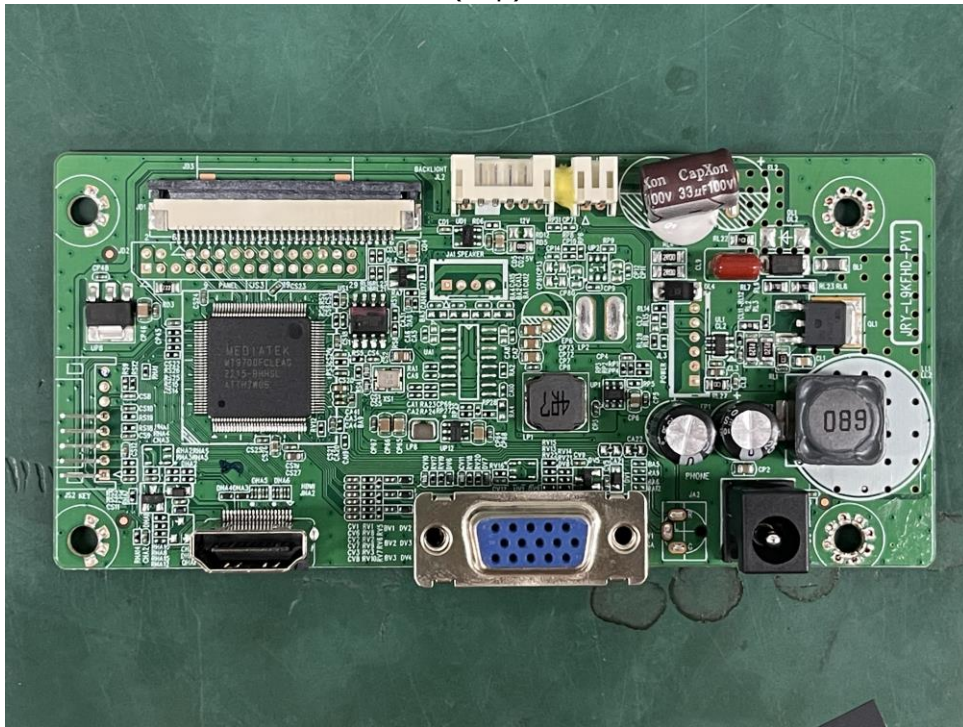
(Bottom)



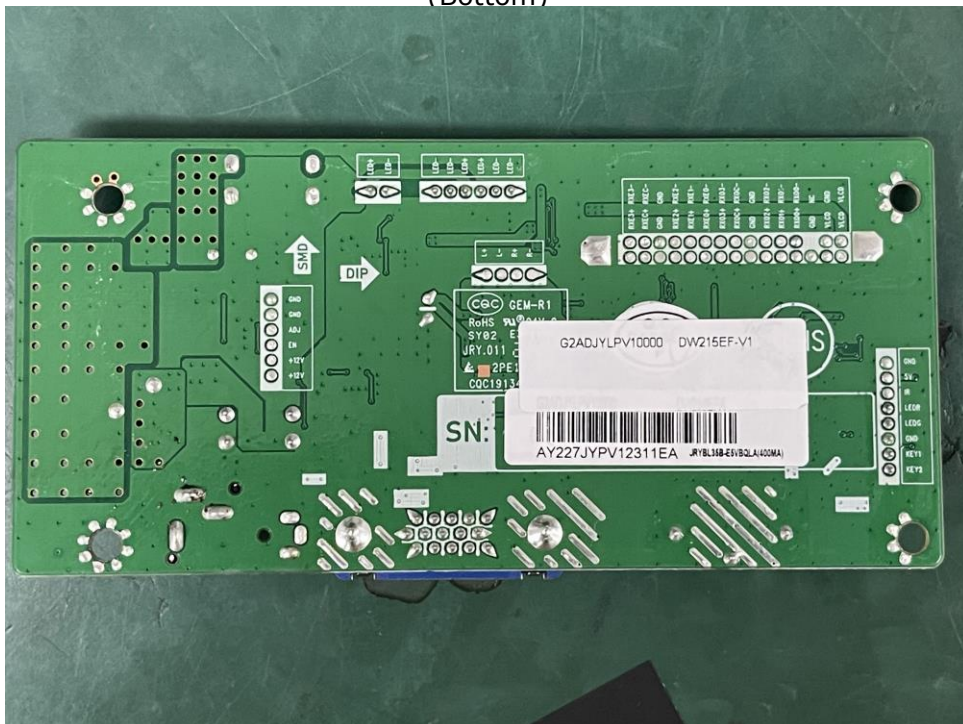
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EUT Internal View –Board 2

(Top)



(Bottom)



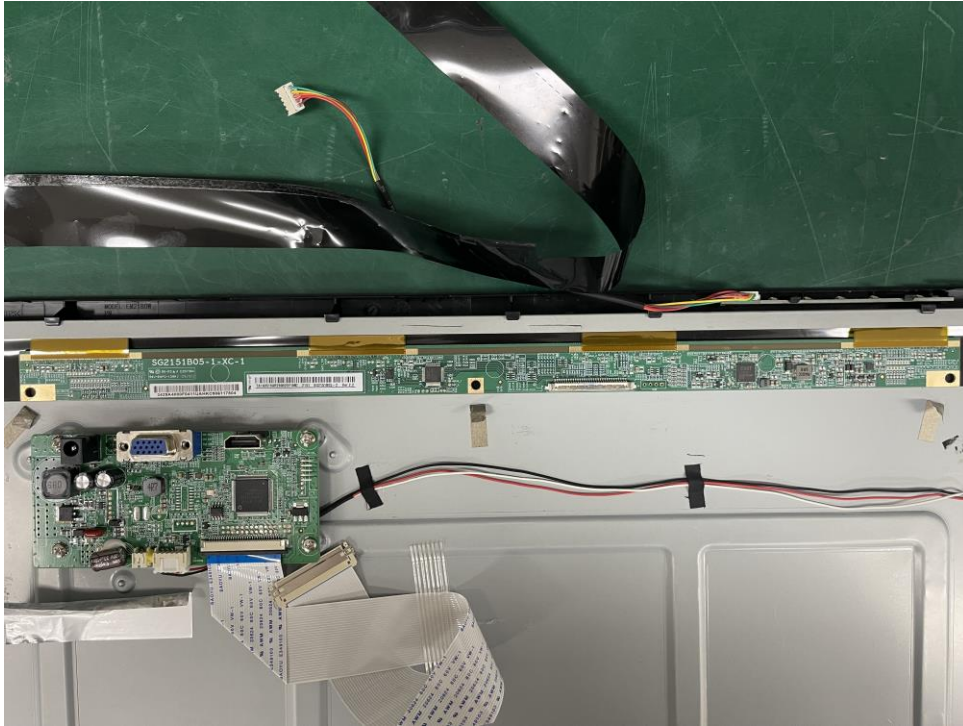
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EUT Internal View – Board 3

(Top)



(Bottom)



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EUT Internal View – Adaptor

[\(Top\)](#)



(Bottom)



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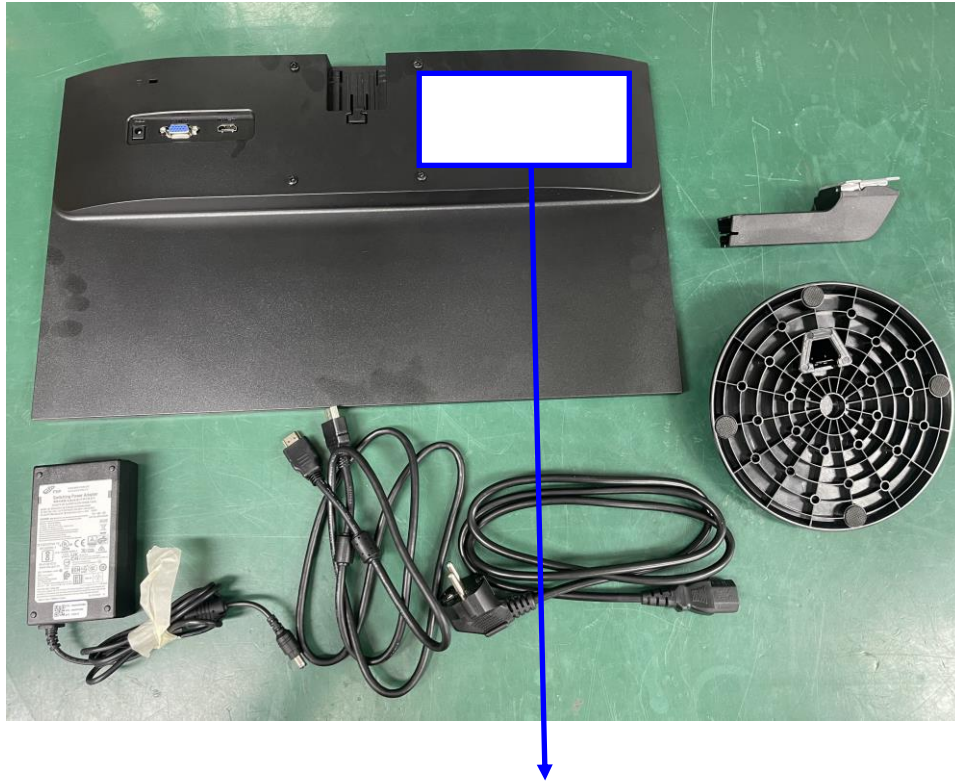
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EUT Internal View – Panel

(Label)



Label and Location



LED MONITOR

Model No : SMT-2212

Manufacturer : Weihai Daewoo Electronics Co., Ltd.

Made in China

