EMC TEST REPORT For CE

Test Report No.	:	KES-EM-22T0182-R1
Date of Issue	:	Feb. 24, 2023
Product name	:	LED MONITOR
Model/Type No.	:	SMT-2431
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	:	Jan. 25, 2022
Test date	:	Jan. 27, 2022 ~ Jan. 29, 2022
Test Results	:	☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Dae Hyun, 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.

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Feb. 09, 2022	KES-EM-22T0182	Issued
Feb. 24, 2023	KES-EM-22T0182-R1	Change the Applicant at the request of the customer

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1.0 General Product Description

Main Specifications of EUT are:

DESIGN		SMT-2431	Remark
Screen Size		23.8"	
Max. Resolution		1920*1080	
Brightness		250cd/m2	
Contrast Ratio		4000:1 (Typical)	
Aspect Ratio		16:9	
Viewing Angle (H/V)		178°/178°	
Display Color		16.7M (6bit+FRC)	
Response Time		14ms(G to G) (TYP)	
Panel Life		30,000 hours	
Interface			
Video	Connector	VGA(1) HDMI (1)	
VGA	Connector	VGA	
	Available Format	640 × 480@60Hz/72Hz/75Hz/;720 × 400@70Hz ; 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/;720 × 400@70Hz ; 800 × 600@60Hz/72Hz/75Hz;1024 × 768@60Hz/75Hz;1280 × 1024@60Hz/75Hz;1440× 900@60Hz;1680× 1050@60Hz ; 1920× 1080@60Hz	
On Screen Display (OSD)			
Functions		VESA™ DPM Compatible	
Language		12 (English, French, German, Italian, Simplified Chinese, Traditional Chinese, Korean, Japanese, Espanola, Portuguese, Russian, Arabic)	
General			
Electrical	Input Voltage	AC 100 ~ 240V(50/60Hz)	
	Power Consumption	<30W	
Environmental	Operating Temperature	0 ~ +40°C (+32°F ~ +104°F)	
	Operating Humidity	10% ~ 80% (non-condensing)	
Mechanical	Product Dimension (Without Stand, W*H*D)	540*324*46mm	
	Product Dimension (With Stand, W*H*D)	540*420*224mm	
	Carton Dimension (W*H*D)	618*491*112mm	
	Bezel Size	3 Frameless Top:2.2mm Bottom:21mm Side : 2.2mm	
Weight	Net Weight	3.5kg	
	Gross Weight	4.7kg	

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-2431	-	Weihai Daewoo Electronics Co., Ltd.	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Notebook	HSN-Q07C	5CD8367KND	HP	-
Notebook Adapter	HSTNN-CA40	WFTKU0ERLB4QCH	HP	-

1.6 External I/O Cabling

■ D-Sub / HDMI Mode

Start		END		Cable Spec.	
Description	**I/O Port**	**Description**	**I/O Port**	**Length**	**Shield**
LED MONITOR (EUT)	D-Sub	Notebook	D-Sub	1.8	S
	HDMI	Notebook	HDMI	1.5	S
Notebook	DC Jack	Notebook Adapter	DC Jack	1.8	U

* Unshielded = U, Shielded = S

1.7 EUT Operating Mode(s)

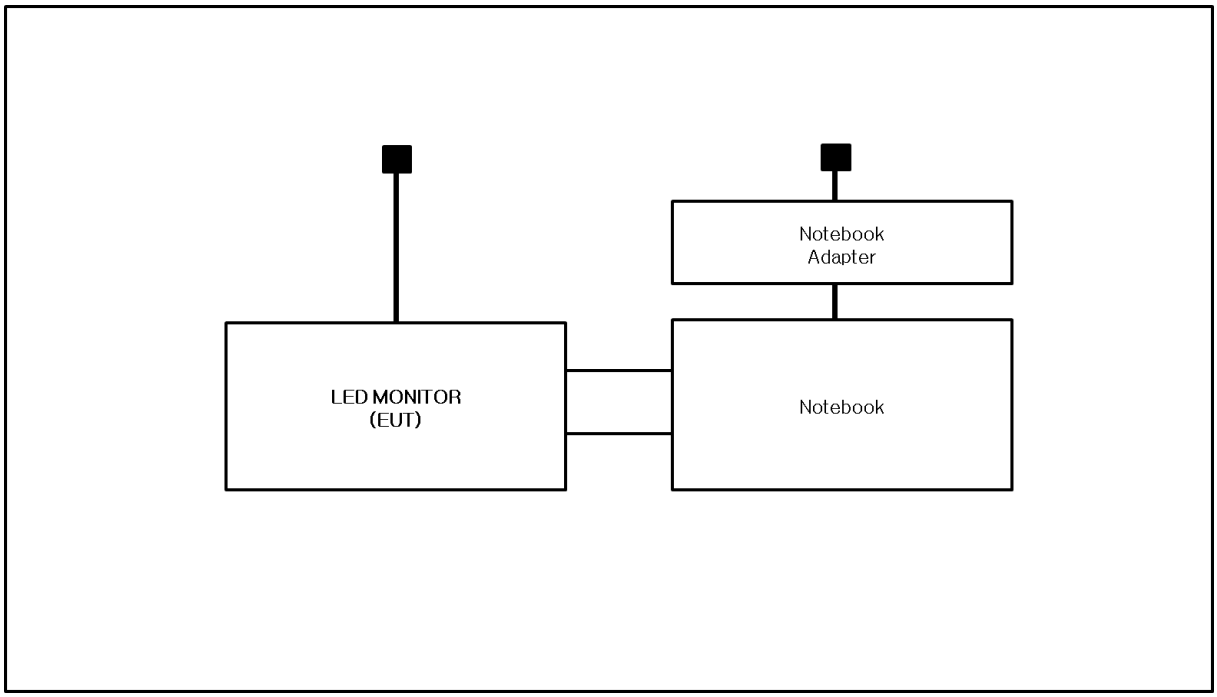
Test mode	operating
D-Sub, HDMI	Play the color bar video during the test.

EUT Test operating S/W		
Name	**Version**	**Manufacture Company**
-	-	-

1.8 Configuration

■ AC Main
□ DC Main

■ D-Sub / HDMI Mode



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, Yeoju-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 2016/1091**

☒ BS EN 55032:2015/A11:2020 ☒ Class A ☐ Class B

☒ BS EN 55035:2017/A11:2020

☒ BS EN 61000-3-2:2014

☒ BS EN 61000-3-3:2013

2.1 Conducted Emissions at Mains Power Ports

Test Date
Jan. 29, 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: (23,1 ± 0,1) ℃
Relative Humidity: (43,3 ± 0,2) % R.H.

Frequency Range of Measurement
150 ㎑ to 30 ㎒

Instrument Settings
IF Band Width: 9 ㎑

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

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, 10, 2022
☐	CDN	CDNS502A	TESEQ	40431	12, 27, 2022

Test Conditions
Temperature: ℃
Relative Humidity: % R.H.

Frequency Range of Measurement
150 ㎑ to 30 ㎒

Instrument Settings
IF Band Width: 9 ㎑

Test Results
The requirements are:

☐ PASS
☐ NOT PASS
☒ NOT APPLICABLE

Remarks
Does not apply because there is no signal line ports.

2.3 Radiated Electric Field Emissions(Below 1 ㎓)

Test Date
Jan. 28, 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	04, 01, 2022
☒	AMPLIFIER	SCU 01	R & S	100603	11, 24, 2022
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	12, 08, 2022
☒	ATTENUATOR	8491A	HP	32173	03, 10, 2022

Test Conditions
Temperature: (23,2 ± 0,3) ℃
Relative Humidity: (43,2 ± 0,2) % R.H.

Frequency Range of Measurement
30 ㎒ to 1 ㎓

Instrument Settings
IF Band Width: 120 ㎑

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 ㎓)

Test Date
Jan. 28, 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, 03, 2022
☒	PREAMPLIFIER	8449B	AGILENT	3008A01967	04, 07, 2022
☐	ATTENUATOR	8491A	HP	35496	03, 10, 2022
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 11, 2022

Test Conditions
Temperature: (23,3 ± 0,2) ℃
Relative Humidity: (42,9 ± 0,2) % R.H.

Frequency Range of Measurement
1 ㎓ to 6 ㎓

Instrument Settings
IF Band Width: 1 ㎒

Test Results
The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks
See Appendix A for test data.

2.5 Harmonic Current Emissions

Test Date
Jan. 27, 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, 2022
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions
Temperature: (23,0 ± 0,2) ℃
Relative Humidity: (42,8 ± 0,1) % 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
Jan. 27, 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, 2022
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions
Temperature: (23,0 ± 0,2) ℃
Relative Humidity: (42,8 ± 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
BS EN 61000-4-2:2009

Test Date
Jan. 27, 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, 01, 2022
☒	HCP	-	KES	-	-
☒	VCP	-	Noise Ken	-	-

Test Conditions
Temperature: (23,3 ± 0,2) ℃
Relative Humidity: (43,3 ± 0,3) % R.H.
Atmospheric Pressure: (100,9 ± 0,1) 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

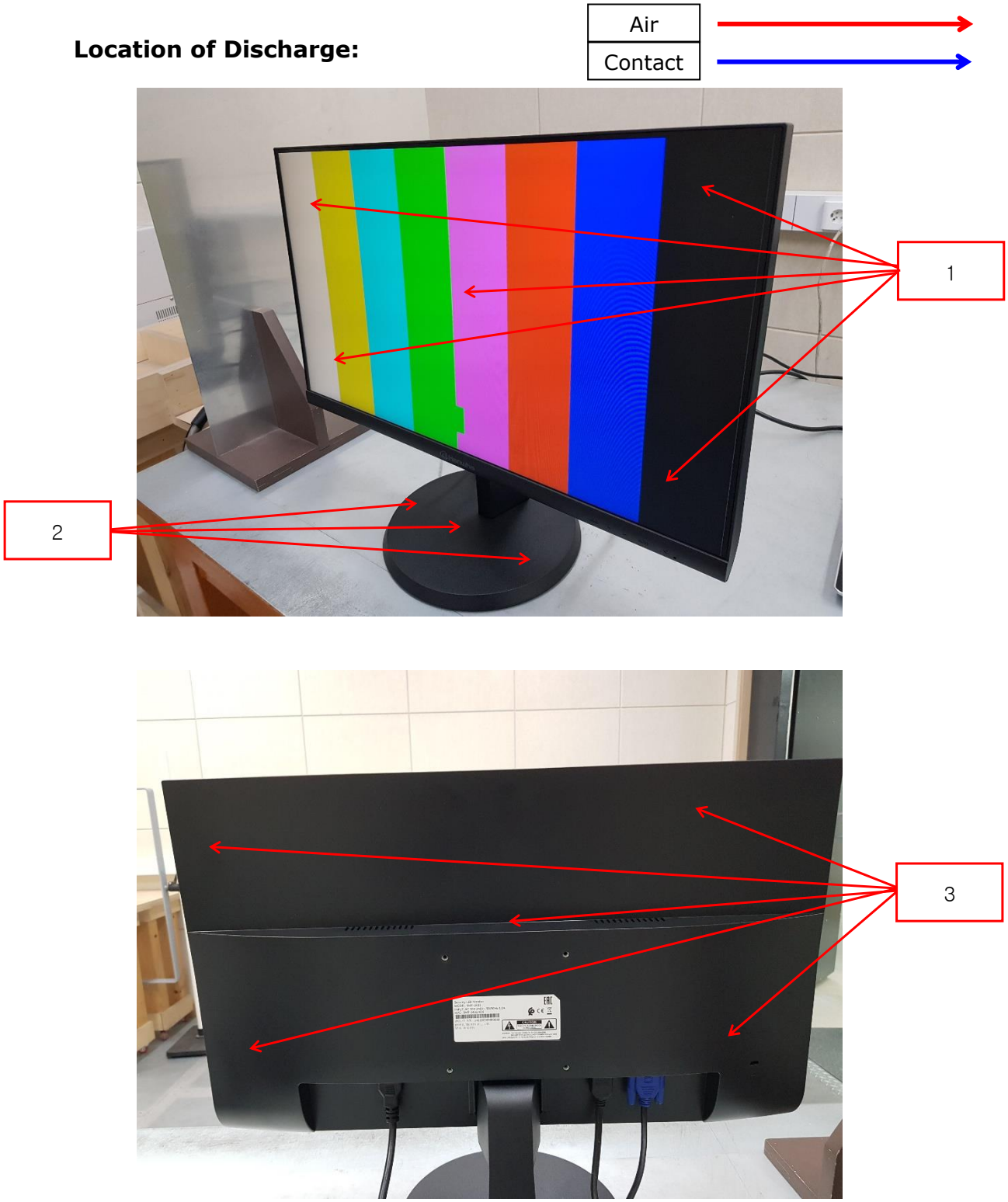
Discharge Voltage:

Contact	Air	HCP	VCP
☐ 2 kV	☒ 2 kV	☐ 2 kV	☐ 2 kV
☒ 4 kV	☒ 4 kV	☒ 4 kV	☒ 4 kV
☐ 6 kV	☐ 6 kV	☐ 6 kV	☐ 6 kV
☐ 8 kV	☒ 8 kV	☐ 8 kV	☐ 8 kV
☐ 15 kV	☐ 15 kV	☐ 15 kV	☐ 15 kV

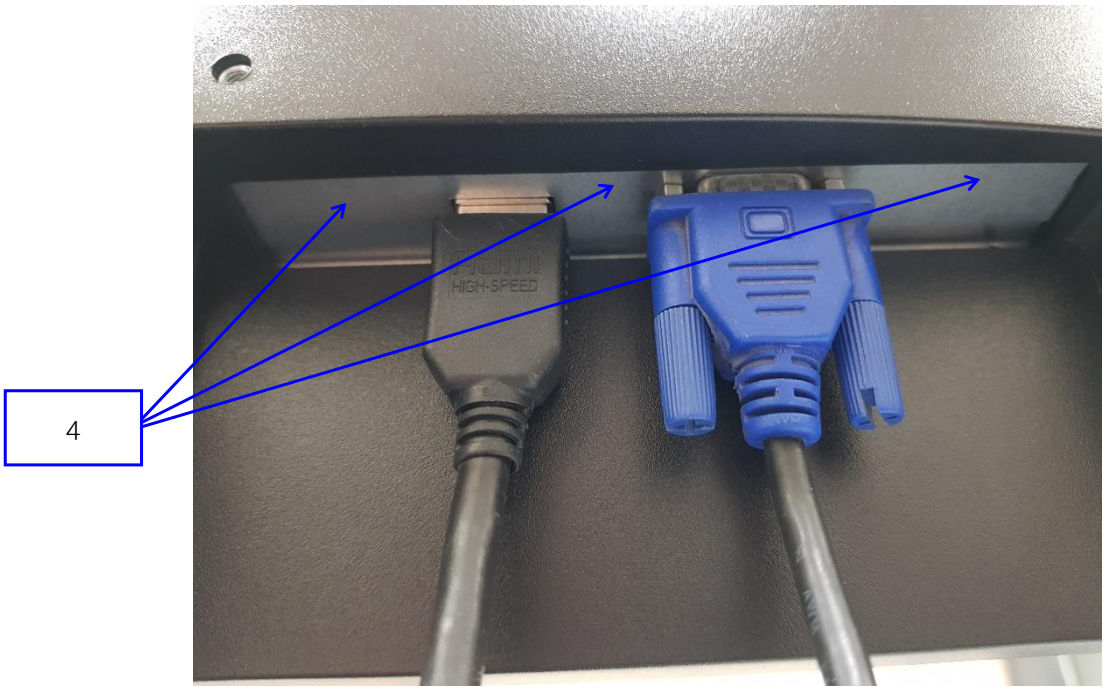
Notes: HCP: Horizontal coupling plane
VCP: Vertical coupling plane

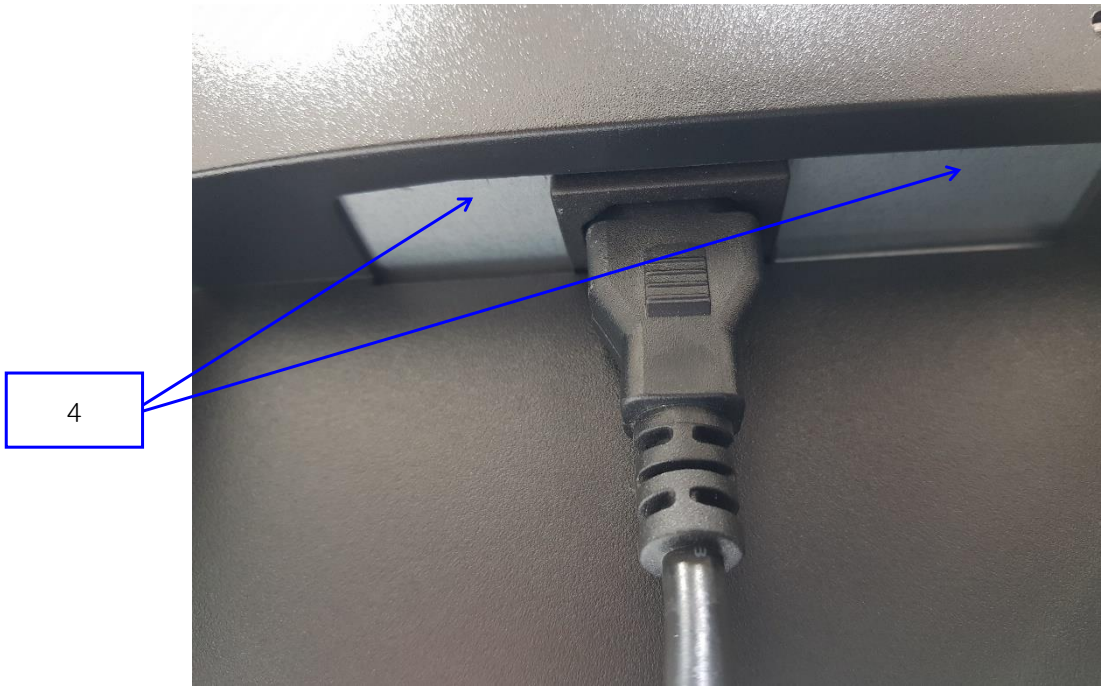
Required Performance Criteria: ☒ B

Location of Discharge:



[시험기자재]





Test Data

■ D-Sub 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	Panel	Air Discharge	B	A	-
2	Enclosure 1	Air Discharge	B	A	-
3	Enclosure 2	Air Discharge	B	A	-
4	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	Panel	Air Discharge	B	A	-
2	Enclosure 1	Air Discharge	B	A	-
3	Enclosure 2	Air Discharge	B	A	-
4	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 61000-4-3:2006 +A2:2010
BS EN 61000-4-3:2006 +A2:2010

Test Date
Jan. 28, 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, 03, 2022
☒	HIGH POWER DUAL AMP	SSA532	SUNGSAN	SSA532-001	-
☒	POWER METER	E4419B	Agilent	GB40203000	04, 01, 2022
☒	CW POWER SENSOR	E4412A	Agilent	US38488240	04, 01, 2022
☒	CW POWER SENSOR	E4412A	Agilent	MY41501662	04, 01, 2022
☒	STACKED DOUBLE LOG-PER- ANTENNA	STPL9128 E	Schwarzbeck	9128ES-121	-
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 11, 2022

Test Conditions
Temperature: (23,3 ± 0,4) ℃
Relative Humidity: (42,9 ± 0,6) % R.H.
Atmospheric Pressure: (100,8 ± 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

Test Data

■ D-Sub 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
-	-	-	-	-	-	-

* 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
-	-	-	-	-	-	-

* 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
BS EN 61000-4-4:2012

Test Date
Jan. 27, 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	04, 01, 2022
☐	CAPACITIVE COUPLING CLAMP	HFK	EM TEST	P1633183115	12, 03, 2022

Test Conditions
Temperature: (23,3 ± 0,2) ℃
Relative Humidity: (43,3 ± 0,2) % R.H.
Atmospheric Pressure: (100,9 ± 0,2) ㎪

Test Specifications

Pulse Amplitude & Polarity: (Power Lines)	☒ ± 1.0 ㎸ ☐ ± 4.0 ㎸	☐ ± 2.0 ㎸
Pulse Amplitude & Polarity: (Signal Lines)	☐ ± 0.5 ㎸ ☐ ± 2.0 ㎸	☐ ± 1.0 ㎸
Burst Period:	☒ 300 ㎳	☐ 2 s
Repetition Rate:	☒ 5 ㎑	☐ 100 ㎑
Duration of Test Voltage:	☒ ≥ 1 min	
Required Performance Criteria:	☒ B	

Test Data

■ D-Sub Mode

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

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

☐ Signal ports and telecommunication ports – Coupling Clamp used

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

■ HDMI Mode

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

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

☐ Signal ports and telecommunication ports – Coupling Clamp used

Mode of Application	Performance Criteria	Results	
		(+) Burst (㎸)	(-) Burst (㎸)
-	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
BS EN 61000-4-5:2014+A1:2017

Test Date
Jan. 27, 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	04, 01, 2022

Test Conditions
Temperature: (23,3 ± 0,3) ℃
Relative Humidity: (43,3 ± 0,4) % R.H.
Atmospheric Pressure: (100,9 ± 0,1) ㎪

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

Test Data

■ D-Sub Mode

☒ Line to Line – Differential Mode

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

☒ Line to Earth – Common Mode

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

Signal Lines

☐ Line to Earth – Common Mode

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

■ HDMI Mode

☒ Line to Line – Differential Mode

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

☒ Line to Earth – Common Mode

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

Signal Lines

☐ Line to Earth – Common Mode

Mode of Application	Performance Criteria	Results	
		(+) Surge (㎸)	(-) Surge (㎸)
-	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
BS EN 61000-4-6:2014

Test Date
Jan. 29, 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
☐	CDN	CDN T800	TESEQ	42800	11, 24, 2022
☐	EM CLAMP	KEMZ 801A	TESEQ	44099	11, 25, 2022

Test Conditions
Temperature: (23,1 ± 0,4) ℃
Relative Humidity: (43,3 ± 0,2) % R.H.
Atmospheric Pressure: (100,8 ± 0,2) kPa

Test Specifications

Frequency range:	☐ 150 ㎑ to 100 ㎒	☒ 150 ㎑ to 80 ㎒
Voltage Level:	☒ 3 Vrms	(150 ㎑ to 10 ㎒)
	☒ 3 Vrms to 1Vms	(10 ㎒ to 30 ㎒)
	☒ 1 Vrms	(30 ㎒ to 80 ㎒)
Modulation:	☒ AM, 80 %, 1 ㎑ sine wave	
	☐ PM, 1 ㎐ (0,5 s ON : 0,5 s OFF)	
Frequency step:	☒ 1 % step	
Dwell Time:	☒ 1 s	☐ 3 s
Required Performance Criteria:	☒ A	

Test Data

■ D-Sub 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
-	CDN	A	-

☐ Signal ports and telecommunication ports

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

[Audio output function]

☐ Electrical Measurements / ☐ Acoustic Measurements

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

***** 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
-	CDN	A	-

☐ Signal ports and telecommunication ports

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

[Audio output function]

☐ Electrical Measurements / ☐ Acoustic Measurements

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

***** 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.

3.6 Power Frequency Magnetic Field Immunity

Reference Standard
EN 61000-4-8:2010
BS 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	04, 01, 2022
☐	MAGNETIC FIELD COIL	MS 100N	EM TEST	P1536163691	12, 07, 2022
☐	CURRENT TRANSFORMER	MC 2630	EM TEST	P1629182219	12, 07, 2022

Test Conditions
Temperature: ℃
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	-	-
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 61000-4-11:2004+A1:2017
BS EN 61000-4-11:2004+A1:2017

Test Date
Jan. 27, 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	04, 01, 2022
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	04, 01, 2022

Test Conditions
Temperature: (23,3 ± 0,1) ℃
Relative Humidity: (43,3 ± 0,1) % R.H.
Atmospheric Pressure: (100,9 ± 0,0) kPa

Test Data

■ D-Sub Mode

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

■ HDMI Mode

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

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 interruptions test, EUT was turned off but after the test, it was recovered without by operator's intervention.

APPENDIX A – TEST DATA

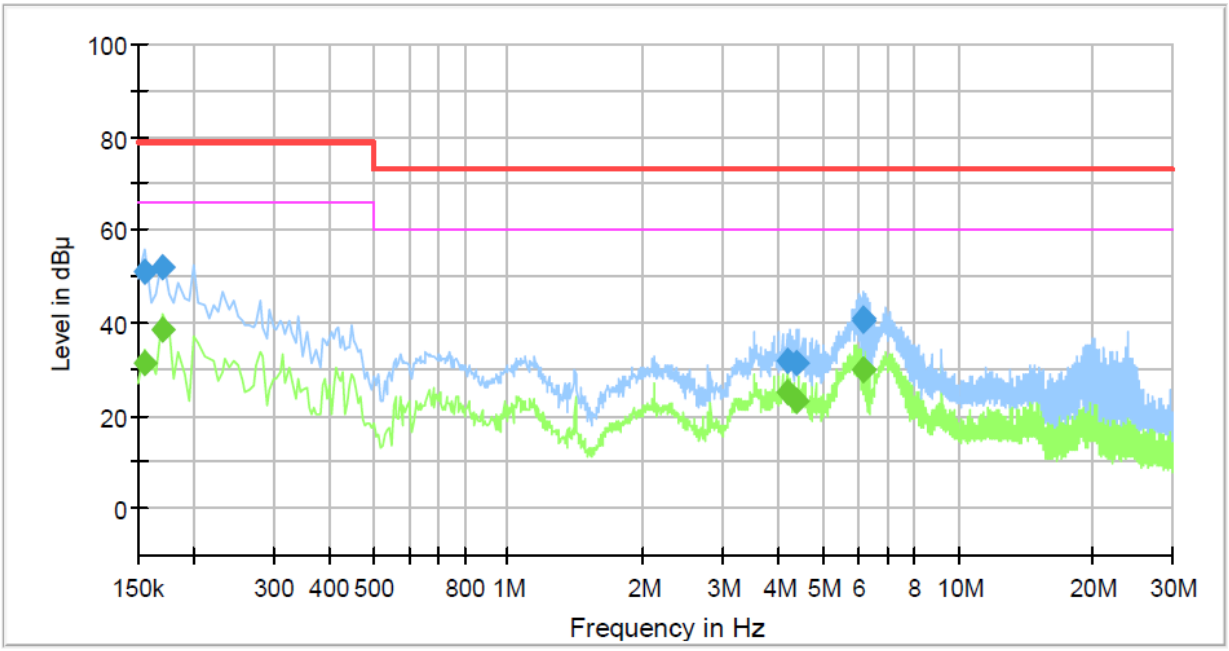
Conducted Emissions at Mains Power Ports

■ D-Sub Mode

[HOT]

Common Information

Test Description:	Conducted Emission
Model No.:	SMT-2431
Phase:	
Mode:	D-Sub / CE
Operator Name:	KES



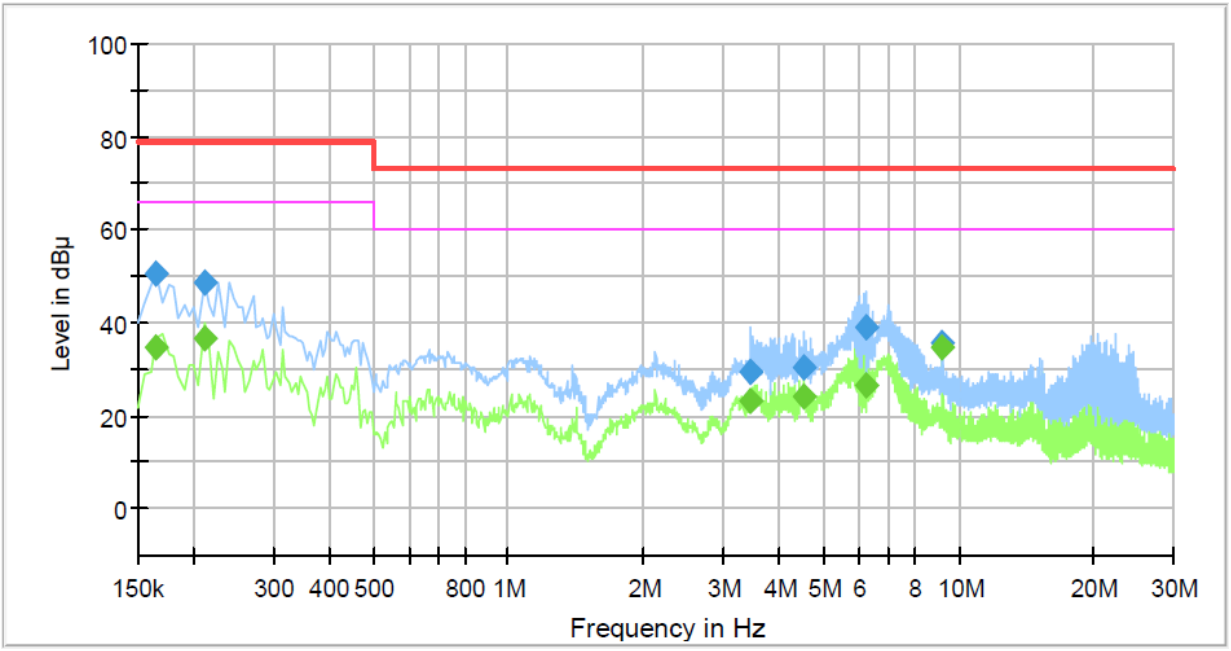
Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	31.23	66.00	34.77	1000.0	9.000	L1	19.5
0.155000	51.03	---	79.00	27.97	1000.0	9.000	L1	19.5
0.170000	---	38.37	66.00	27.63	1000.0	9.000	L1	19.5
0.170000	51.90	---	79.00	27.10	1000.0	9.000	L1	19.5
4.155000	---	24.93	60.00	35.07	1000.0	9.000	L1	19.9
4.155000	32.01	---	73.00	40.99	1000.0	9.000	L1	19.9
4.360000	---	23.27	60.00	36.73	1000.0	9.000	L1	19.8
4.360000	31.21	---	73.00	41.79	1000.0	9.000	L1	19.8
6.140000	---	29.88	60.00	30.12	1000.0	9.000	L1	19.5
6.140000	40.90	---	73.00	32.10	1000.0	9.000	L1	19.5
6.150000	---	29.72	60.00	30.28	1000.0	9.000	L1	19.5
6.150000	40.66	---	73.00	32.34	1000.0	9.000	L1	19.5

[NEUTRAL]

Common Information

Test Description:	Conducted Emission
Model No.:	SMT-2431
Phase:	
Mode:	D-Sub / CE
Operator Name:	KES



Final_Result

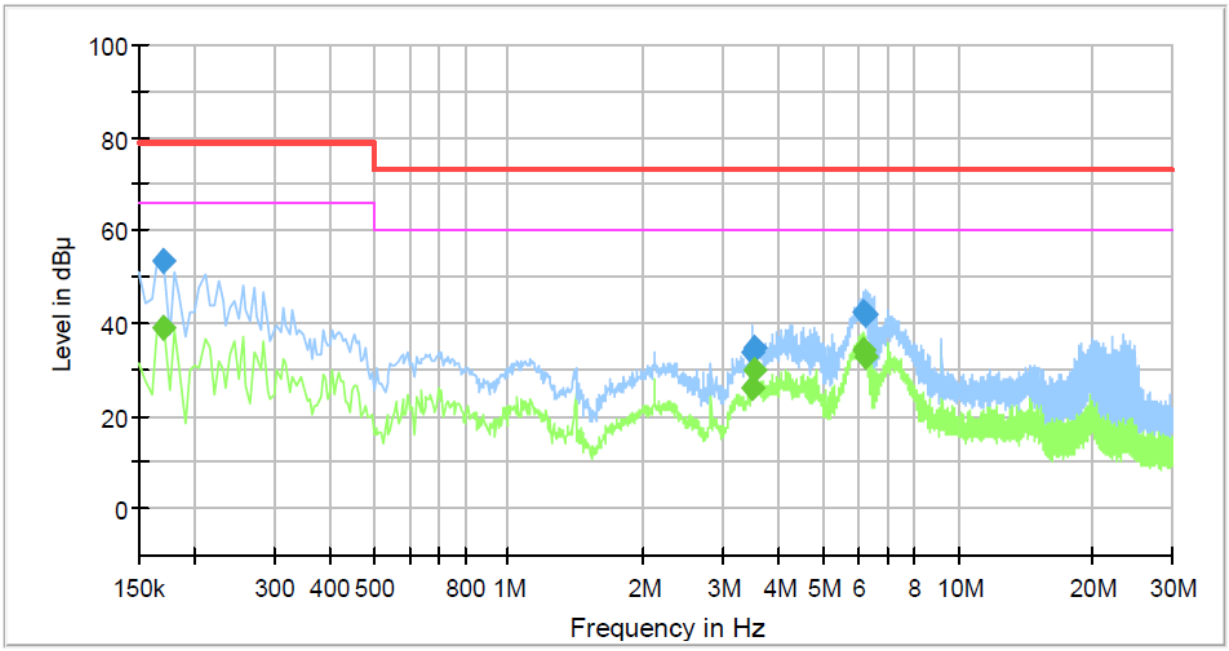
Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.165000	---	34.82	66.00	31.18	1000.0	9.000	N	19.4
0.165000	50.39	---	79.00	28.61	1000.0	9.000	N	19.4
0.210000	---	36.53	66.00	29.47	1000.0	9.000	N	19.5
0.210000	48.62	---	79.00	30.38	1000.0	9.000	N	19.5
3.455000	---	23.20	60.00	36.80	1000.0	9.000	N	20.1
3.455000	29.53	---	73.00	43.47	1000.0	9.000	N	20.1
4.545000	---	24.09	60.00	35.91	1000.0	9.000	N	19.8
4.545000	30.31	---	73.00	42.69	1000.0	9.000	N	19.8
6.235000	---	26.57	60.00	33.43	1000.0	9.000	N	19.5
6.235000	38.99	---	73.00	34.01	1000.0	9.000	N	19.5
9.215000	---	34.71	60.00	25.29	1000.0	9.000	N	19.8
9.215000	35.60	---	73.00	37.40	1000.0	9.000	N	19.8

■ HDMI Mode

[HOT]

Common Information

Test Description:	Conducted Emission
Model No.:	SMT-2431
Phase:	
Mode:	HDMI / CE
Operator Name:	KES



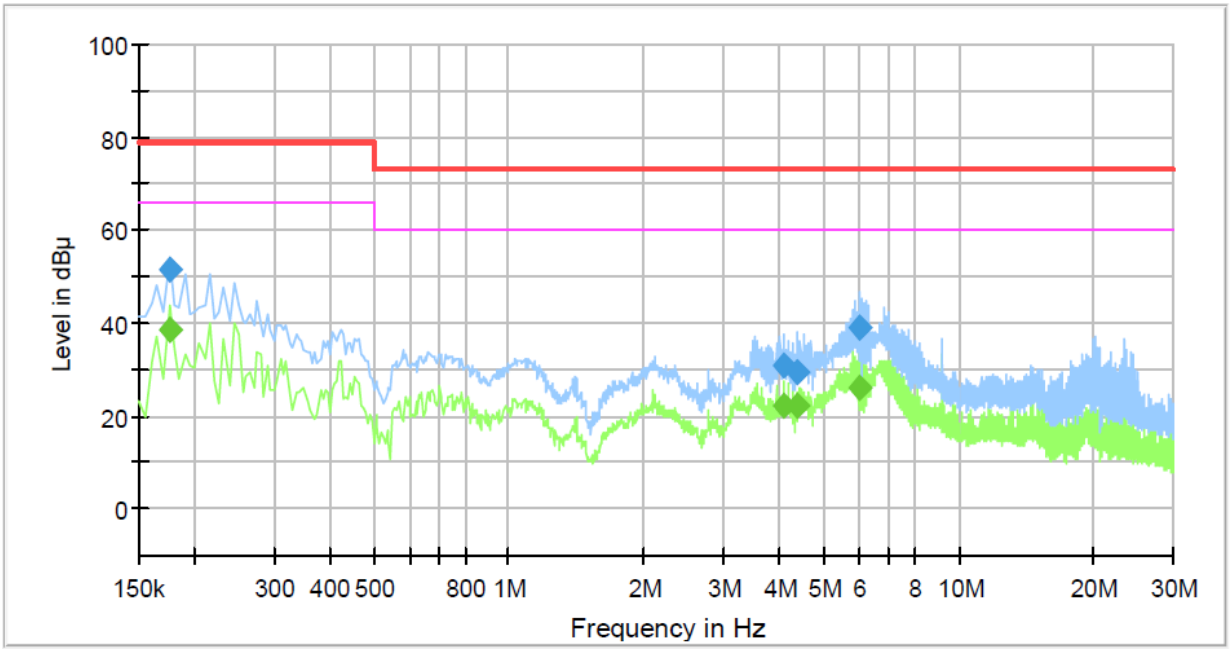
Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.170000	---	39.18	66.00	26.82	1000.0	9.000	L1	19.5
0.170000	53.41	---	79.00	25.59	1000.0	9.000	L1	19.5
3.475000	---	25.81	60.00	34.19	1000.0	9.000	L1	20.1
3.475000	33.53	---	73.00	39.47	1000.0	9.000	L1	20.1
3.525000	---	30.05	60.00	29.95	1000.0	9.000	L1	20.0
3.525000	34.67	---	73.00	38.33	1000.0	9.000	L1	20.0
6.190000	---	34.18	60.00	25.82	1000.0	9.000	L1	19.5
6.190000	42.40	---	73.00	30.60	1000.0	9.000	L1	19.5
6.220000	---	32.97	60.00	27.03	1000.0	9.000	L1	19.5
6.220000	41.69	---	73.00	31.31	1000.0	9.000	L1	19.5

[NEUTRAL]

Common Information

Test Description:	Conducted Emission
Model No.:	SMT-2431
Phase:	
Mode:	HDMI / CE
Operator Name:	KES



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.175000	---	38.31	66.00	27.69	1000.0	9.000	N	19.5
0.175000	51.37	---	79.00	27.63	1000.0	9.000	N	19.5
4.100000	---	22.28	60.00	37.72	1000.0	9.000	N	19.9
4.100000	30.88	---	73.00	42.12	1000.0	9.000	N	19.9
4.360000	---	21.96	60.00	38.04	1000.0	9.000	N	19.8
4.360000	29.40	---	73.00	43.60	1000.0	9.000	N	19.8
6.020000	---	26.04	60.00	33.96	1000.0	9.000	N	19.5
6.020000	38.90	---	73.00	34.10	1000.0	9.000	N	19.5

◆ Calculation
QuasiPeak[㏈uV] / CAverage [㏈uV] = Reading Value[㏈uV] + Corr. [㏈]
QuasiPeak / CAverage : The Final Value
Reading Value : Not shown in the table.
Corr. : Correction values (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

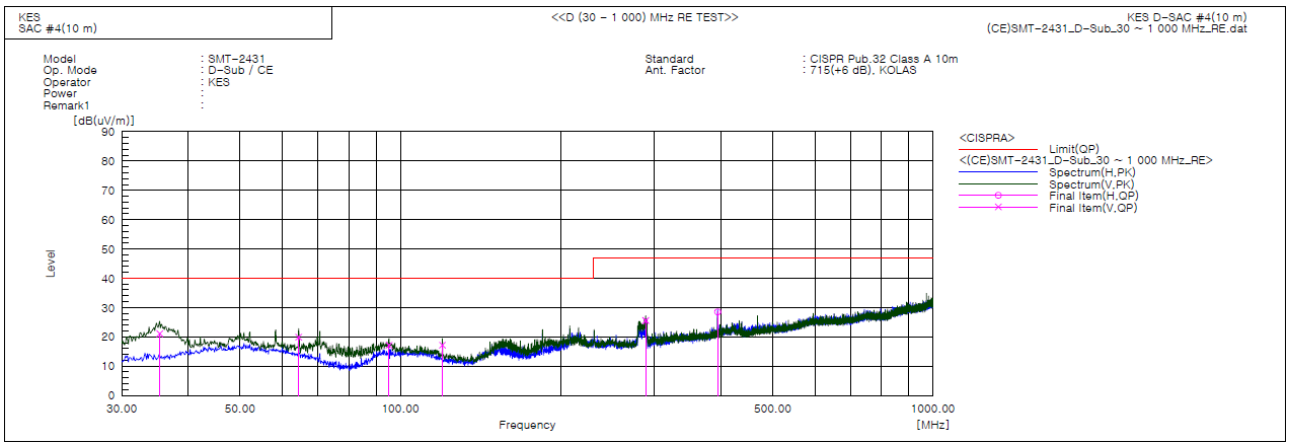
Conducted Emissions at Telecommunication Ports
[100 Mbps]

N/A

◆ Calculation
QuasiPeak[㏈uV] / CAverage [㏈uV] = Reading Value[㏈uV] + Corr. [㏈]
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 ㎓)

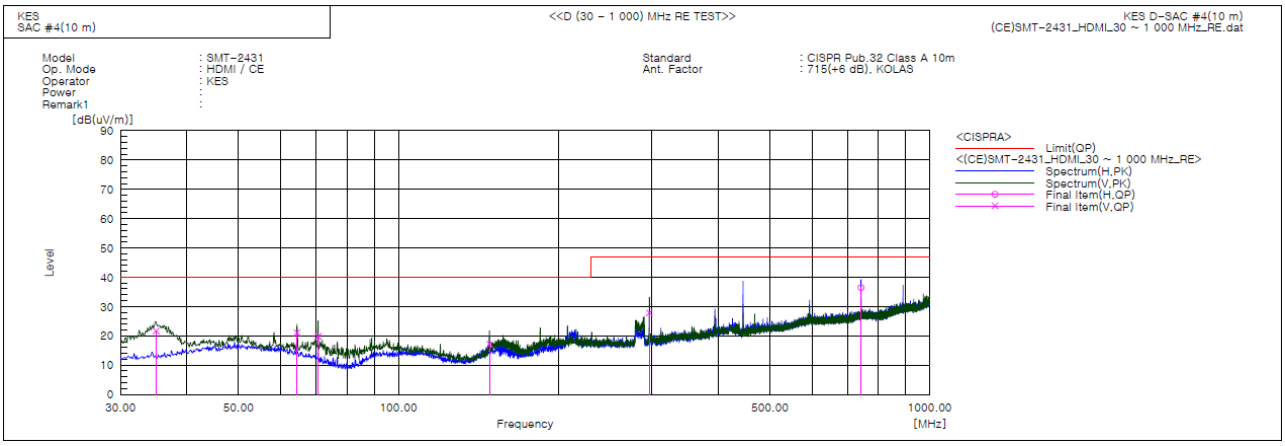
■ D-Sub Mode



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	35.335	V	45.5	-24.4	21.1	40.0	18.9	119.0	255.0	
2	64.435	V	42.9	-23.0	19.9	40.0	20.1	100.0	59.0	
3	95.233	V	40.5	-23.3	17.2	40.0	22.8	137.0	225.0	
4	119.968	V	41.2	-24.0	17.2	40.0	22.8	105.0	40.0	
5	288.748	V	43.9	-18.3	25.6	47.0	21.4	170.0	194.0	
6	393.990	H	42.7	-14.2	28.5	47.0	18.5	400.0	237.0	

■ HDMI Mode



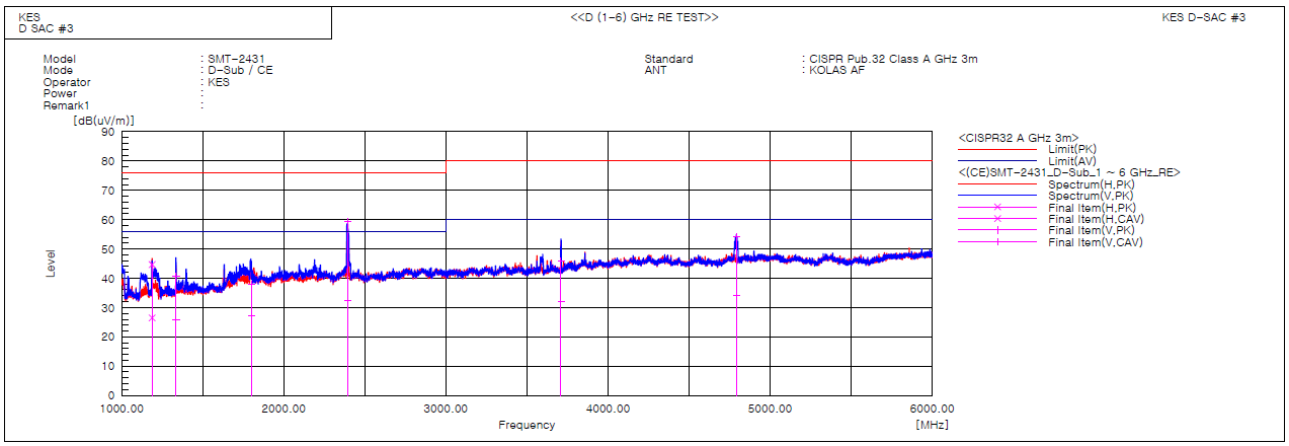
Final Result

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	34.989	V	46.2	-24.5	21.7	40.0	18.3	110.0	289.0	
2	64.435	V	44.1	-23.0	21.1	40.0	18.9	100.0	111.0	
3	70.631	V	44.8	-25.0	19.8	40.0	20.2	102.0	103.0	
4	148.340	V	42.4	-25.2	17.2	40.0	22.8	137.0	187.0	
5	296.636	V	45.9	-18.0	27.9	47.0	19.1	150.0	38.0	
6	741.861	H	42.8	-6.3	36.5	47.0	10.5	295.0	70.0	

◆ Calculation – SAC #4(10 m)
Result(QP) [dB(㎶/m)] = (Reading(QP)[dB(㎶)] + c.f[dB(1/m)]
Margin(QP)[dB] = Limit[dB(㎶/m)] - Result(QP) [dB(㎶/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 ㎓)

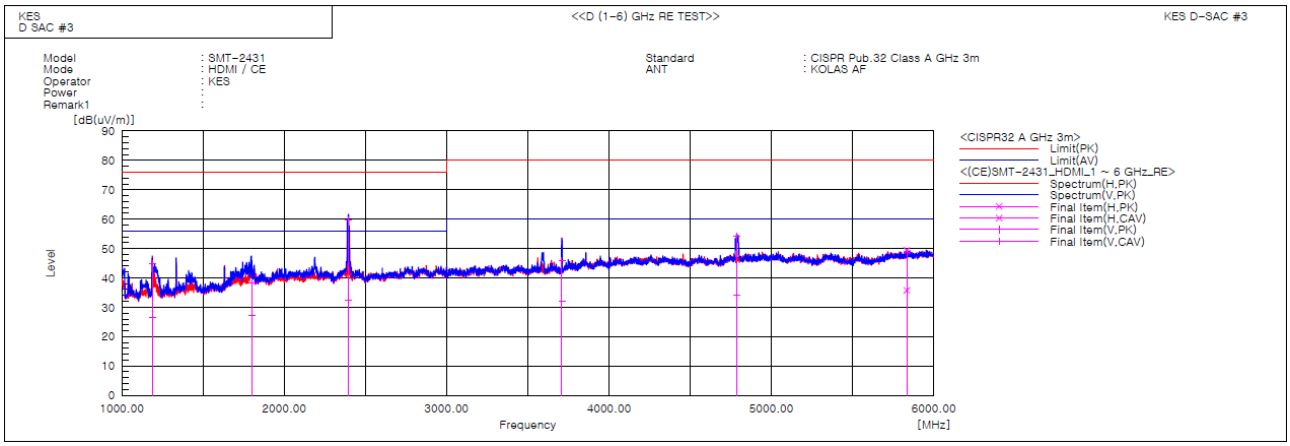
■ D-Sub Mode



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	1187.102	H	53.3	35.1	-8.6	44.7	26.5	76.0	56.0	31.3	29.5	100.0	17.4	
2	1335.762	V	47.8	33.1	-7.2	40.6	25.9	76.0	56.0	35.4	30.1	100.0	350.4	
3	1799.031	V	41.1	30.2	-3.1	38.0	27.1	76.0	56.0	38.0	28.9	100.0	205.6	
4	2393.881	V	59.3	32.2	0.2	59.5	32.4	76.0	56.0	16.5	23.6	100.0	48.1	
5	3709.550	V	42.0	28.3	3.9	45.9	32.2	80.0	60.0	34.1	27.8	100.0	146.1	
6	4792.863	V	46.2	26.2	7.9	54.1	34.1	80.0	60.0	25.9	25.9	100.0	16.9	

■ HDMI 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	1187.099	V	53.4	35.2	-8.6	44.8	26.6	76.0	56.0	31.2	29.4	100.0	6.0	
2	1798.945	V	41.2	30.3	-3.1	38.1	27.2	76.0	56.0	37.9	28.8	100.0	219.4	
3	2395.468	V	59.4	32.3	0.2	59.6	32.5	76.0	56.0	16.4	23.5	100.0	219.4	
4	3709.517	V	42.1	28.2	3.9	46.0	32.1	80.0	60.0	34.0	27.9	100.0	144.6	
5	4785.768	V	46.3	26.1	7.9	54.2	34.0	80.0	60.0	25.8	26.0	100.0	186.1	
6	5832.777	H	39.3	25.7	10.1	49.4	35.8	80.0	60.0	30.6	24.2	100.0	214.2	

♦ Calculation
Result(PK/CAV) [dB(㎶/m)] = (Reading(PK/CAV)[dB(㎶)] + c.f[dB(1/m)]
Margin(PK/CAV)[dB] = Limit[dB(㎶/m)] - Result(PK/CAV) [dB(㎶/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: Marjin value

Harmonic Current Emissions and Voltage Fluctuations and Flicker

■ D-Sub Mode

Average harmonic current results

Hn	Ieff [A]	% of Limit	Limit [A]	Result
1	0.107			
2	0.003			
3	0.103	4.474	2.300	PASS
4	0.003			
5	0.102	8.922	1.140	PASS
6	0.003			
7	0.097	12.580	0.770	PASS
8	0.003			
9	0.091	22.761	0.400	PASS
10	0.003			
11	0.085	25.856	0.330	PASS
12	0.003			
13	0.079	37.437	0.210	PASS
14	0.003			
15	0.072	47.678	0.150	PASS
16	0.003			
17	0.064	48.798	0.132	PASS
18	0.003			
19	0.057	48.423	0.118	PASS
20	0.003			
21	0.051	31.470	0.161	PASS
22	0.003			
23	0.044	29.768	0.147	PASS
24	0.003			
25	0.038	28.140	0.135	PASS
26	0.003			
27	0.033	26.467	0.125	PASS
28	0.003			
29	0.028	24.345	0.117	PASS
30	0.003			
31	0.025	22.775	0.110	PASS
32	0.003			
33	0.022	21.305	0.102	PASS
34	0.003			
35	0.019	20.293	0.096	PASS
36	0.002			
37	0.017	18.545	0.092	PASS
38	0.002			
39	0.015	17.289	0.087	PASS
40	0.002			

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	Ieff [A]	% of Limit	Limit [A]	Result
1	0.137			
2	0.004			
3	0.131	3.809	3.450	PASS
4	0.004			
5	0.128	7.499	1.710	PASS
6	0.004			
7	0.120	10.402	1.155	PASS
8	0.004			
9	0.111	18.449	0.600	PASS
10	0.004			
11	0.101	20.403	0.495	PASS
12	0.004			
13	0.090	28.681	0.315	PASS
14	0.005			
15	0.080	35.447	0.225	PASS
16	0.005			
17	0.070	35.158	0.198	PASS
18	0.005			
19	0.060	34.058	0.177	PASS
20	0.005			
21	0.053	32.847	0.161	PASS
22	0.005			
23	0.046	31.339	0.147	PASS
24	0.005			
25	0.041	30.377	0.135	PASS
26	0.005			
27	0.037	29.766	0.125	PASS
28	0.005			
29	0.034	29.012	0.117	PASS
30	0.005			
31	0.031	28.216	0.110	PASS
32	0.004			
33	0.028	27.121	0.102	PASS
34	0.004			
35	0.025	25.698	0.096	PASS
36	0.004			
37	0.021	23.078	0.092	PASS
38	0.003			
39	0.018	20.409	0.087	PASS
40	0.003			

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	Ieff [A]	% of Limit	Limit [A]	Result
1	0.097			
2	0.003			
3	0.093	4.045	2.300	PASS
4	0.003			
5	0.092	8.108	1.140	PASS
6	0.003			
7	0.088	11.482	0.770	PASS
8	0.003			
9	0.084	20.891	0.400	PASS
10	0.003			
11	0.079	23.927	0.330	PASS
12	0.003			
13	0.073	34.956	0.210	PASS
14	0.003			
15	0.067	44.929	0.150	PASS
16	0.003			
17	0.061	46.524	0.132	PASS
18	0.003			
19	0.055	46.695	0.118	PASS
20	0.003			
21	0.049	30.645	0.161	PASS
22	0.003			
23	0.043	29.233	0.147	PASS
24	0.003			
25	0.037	27.741	0.135	PASS
26	0.003			
27	0.032	26.075	0.125	PASS
28	0.003			
29	0.028	23.681	0.117	PASS
30	0.003			
31	0.024	21.792	0.110	PASS
32	0.003			
33	0.020	19.954	0.102	PASS
34	0.003			
35	0.018	18.518	0.096	PASS
36	0.002			
37	0.015	16.674	0.092	PASS
38	0.002			
39	0.013	15.316	0.087	PASS
40	0.002			

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	Ieff [A]	% of Limit	Limit [A]	Result
1	0.099			
2	0.004			
3	0.094	2.738	3.450	PASS
4	0.004			
5	0.094	5.493	1.710	PASS
6	0.004			
7	0.090	7.763	1.155	PASS
8	0.004			
9	0.085	14.118	0.600	PASS
10	0.004			
11	0.080	16.149	0.495	PASS
12	0.004			
13	0.074	23.569	0.315	PASS
14	0.004			
15	0.068	30.237	0.225	PASS
16	0.004			
17	0.062	31.281	0.198	PASS
18	0.004			
19	0.055	31.353	0.177	PASS
20	0.004			
21	0.049	30.818	0.161	PASS
22	0.004			
23	0.043	29.378	0.147	PASS
24	0.004			
25	0.038	27.848	0.135	PASS
26	0.004			
27	0.033	26.234	0.125	PASS
28	0.004			
29	0.028	23.928	0.117	PASS
30	0.004			
31	0.024	22.021	0.110	PASS
32	0.004			
33	0.021	20.158	0.102	PASS
34	0.003			
35	0.018	18.781	0.096	PASS
36	0.003			
37	0.016	16.946	0.092	PASS
38	0.003			
39	0.014	15.631	0.087	PASS
40	0.002			

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

■ D-Sub 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

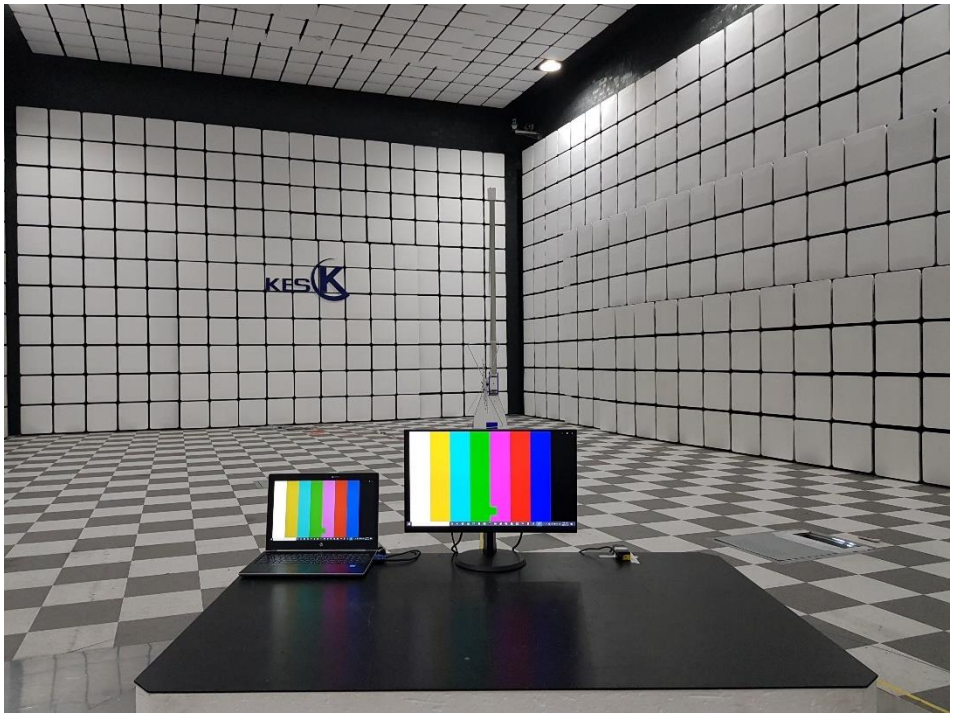
APPENDIX B – Test Setup Photos and Configuration

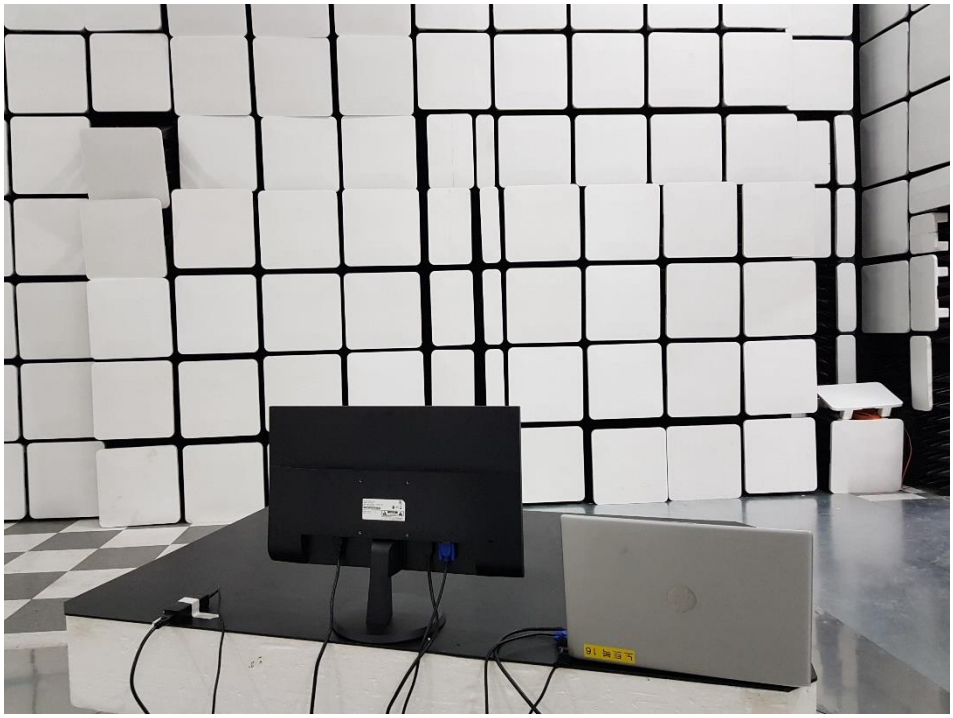
Conducted Voltage Emissions

Conducted Telecommunication Emissions

N/A

Radiated Electric Field Emissions(Below 1 ㎓)

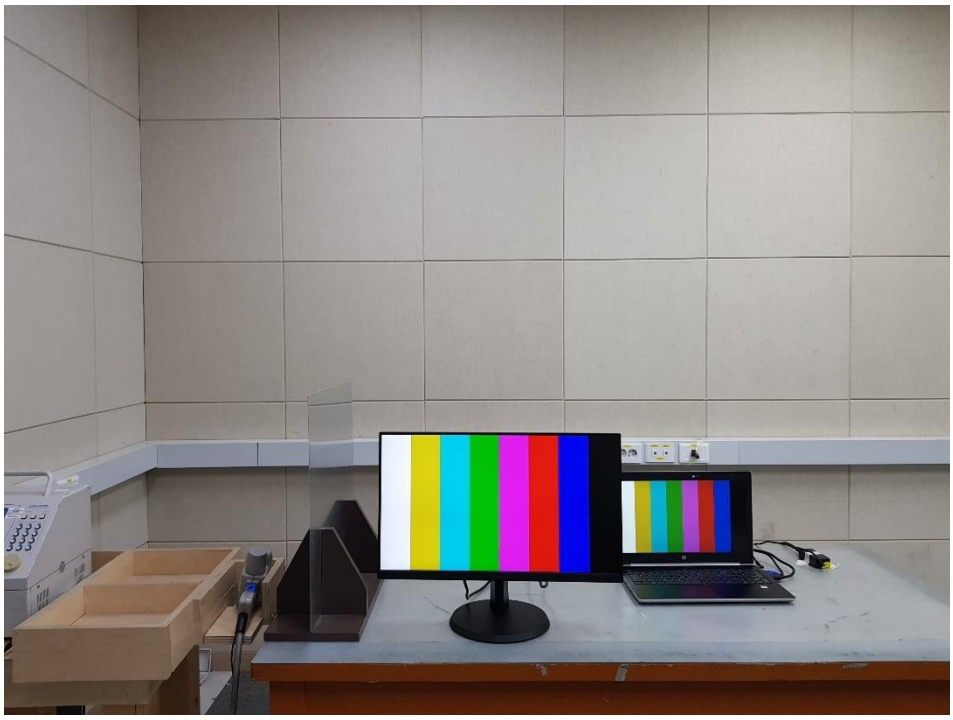




Radiated Electric Field Emissions(Above 1 ㎓)

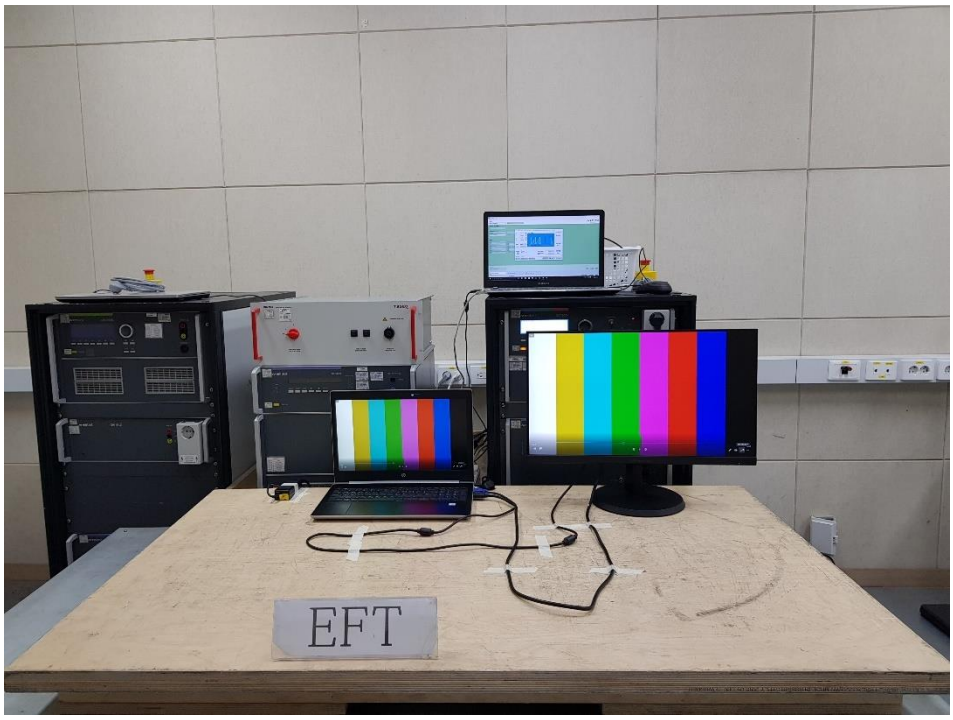
Harmonic Current Emissions and Voltage Fluctuations and Flicker

Electrostatic Discharge



Radiated Electric Field Immunity

Electrical Fast Transients/Bursts



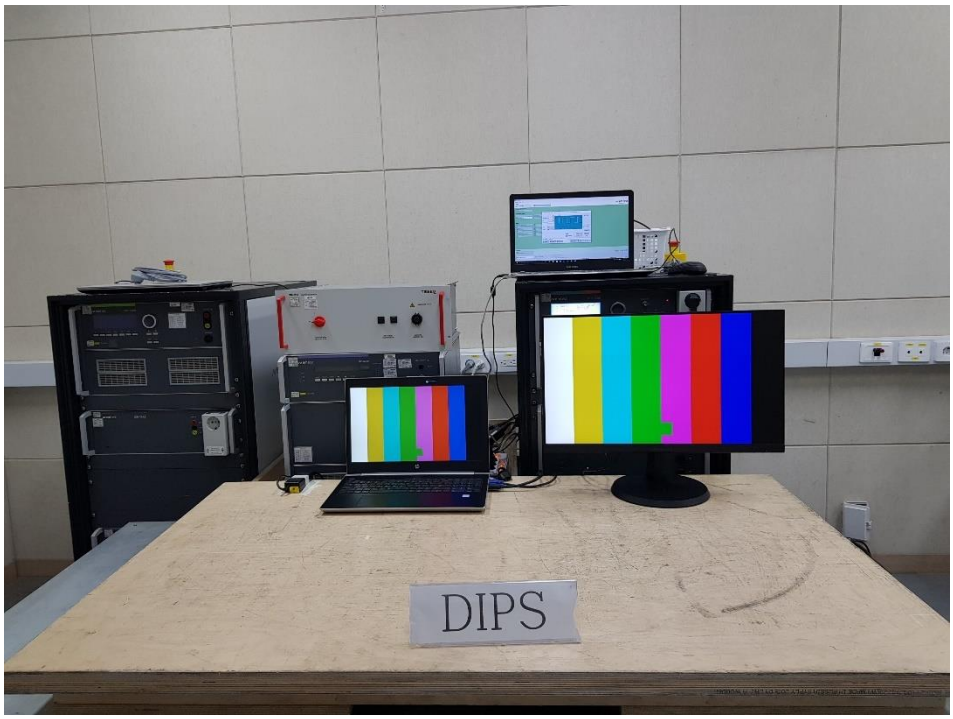
Surge Transients

Conducted Disturbance

Power Frequency Magnetic Field Immunity

N/A

Voltage Dips and Short Interruptions



APPENDIX C – EUT Photographs

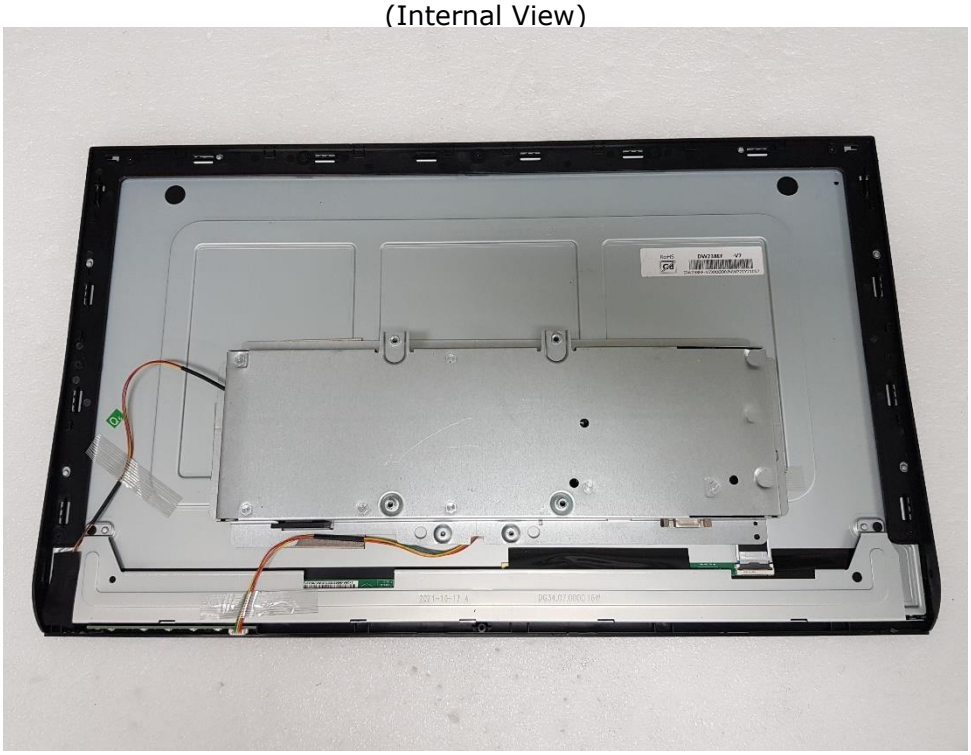
EUT External Photographs

(Top)

(Bottom)

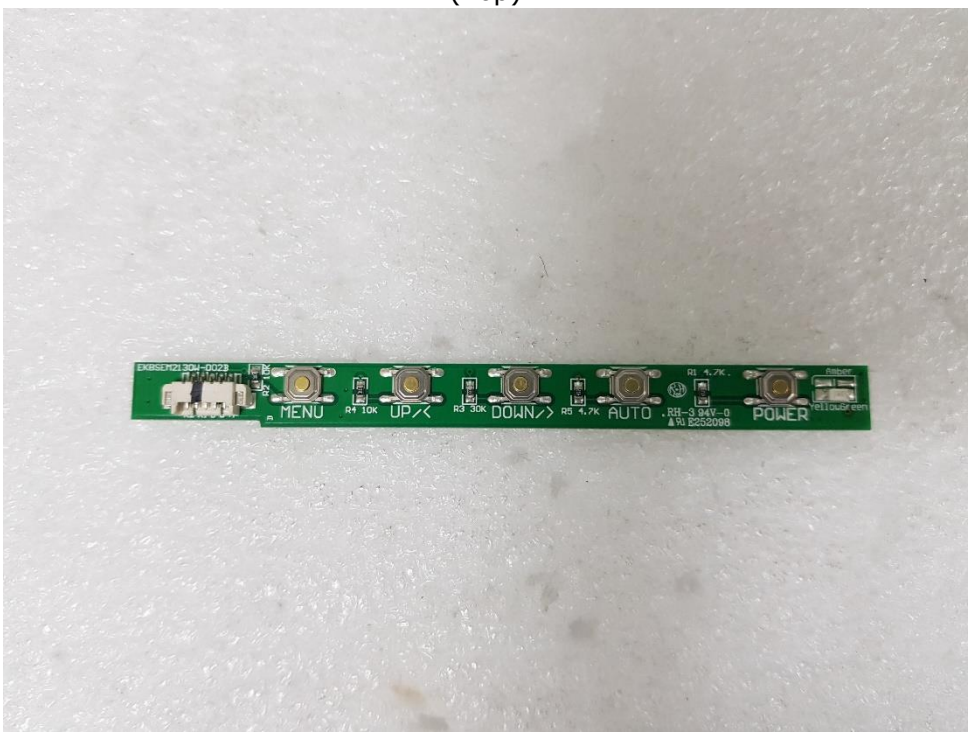
EUT Internal Photographs

(Internal View)



EUT Internal View – Board 1

(Top)

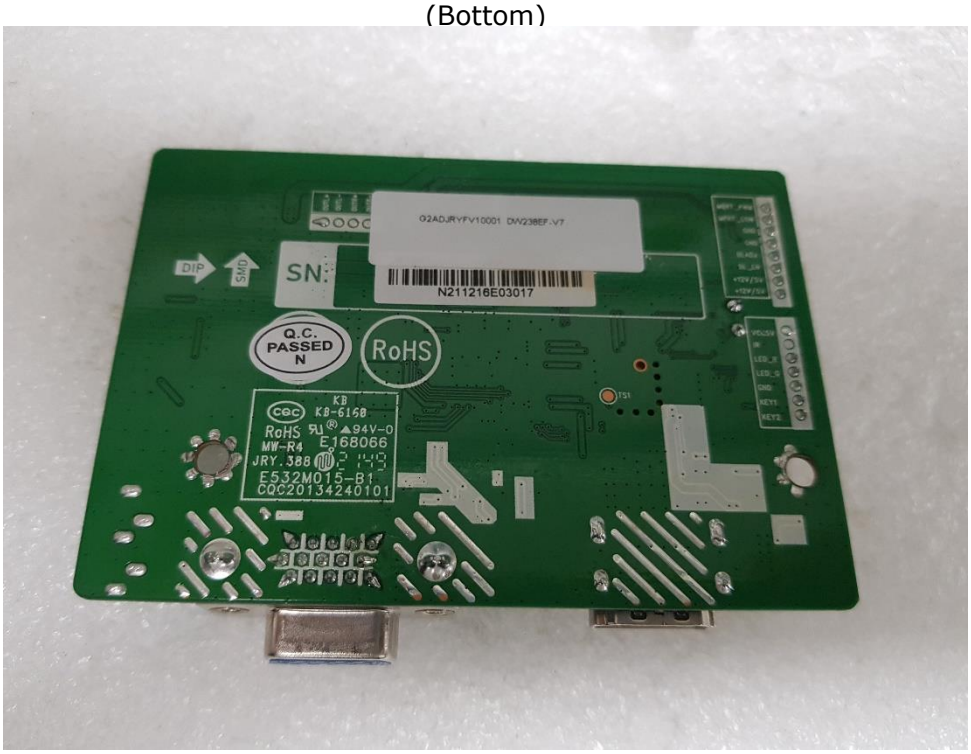


(Bottom)

EUT Internal View – Board 2

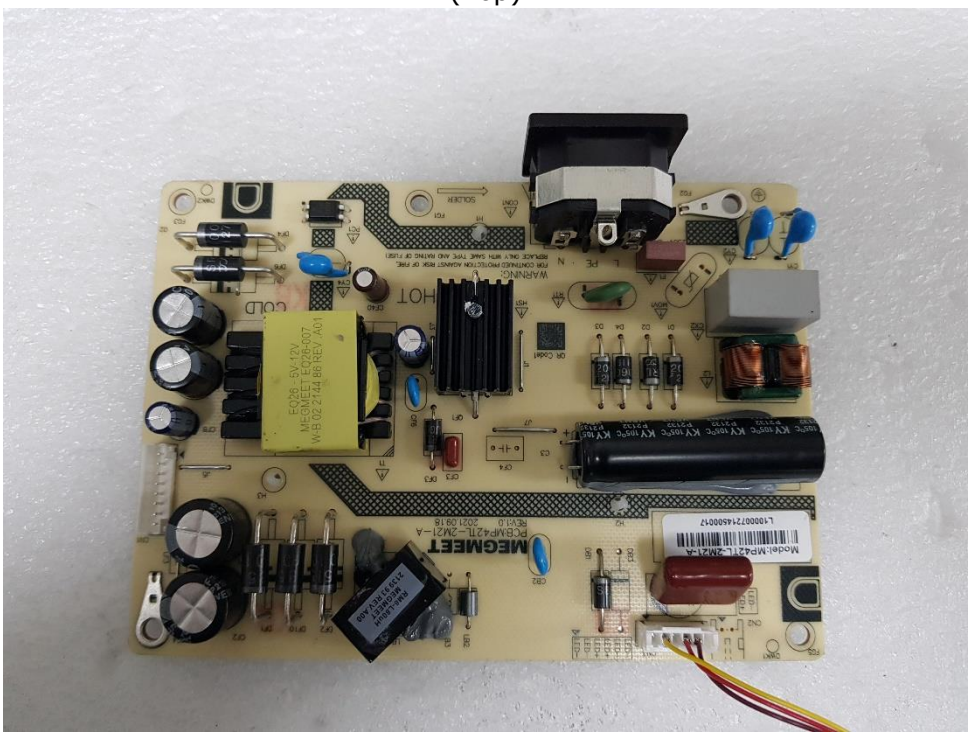
(Top)

(Bottom)

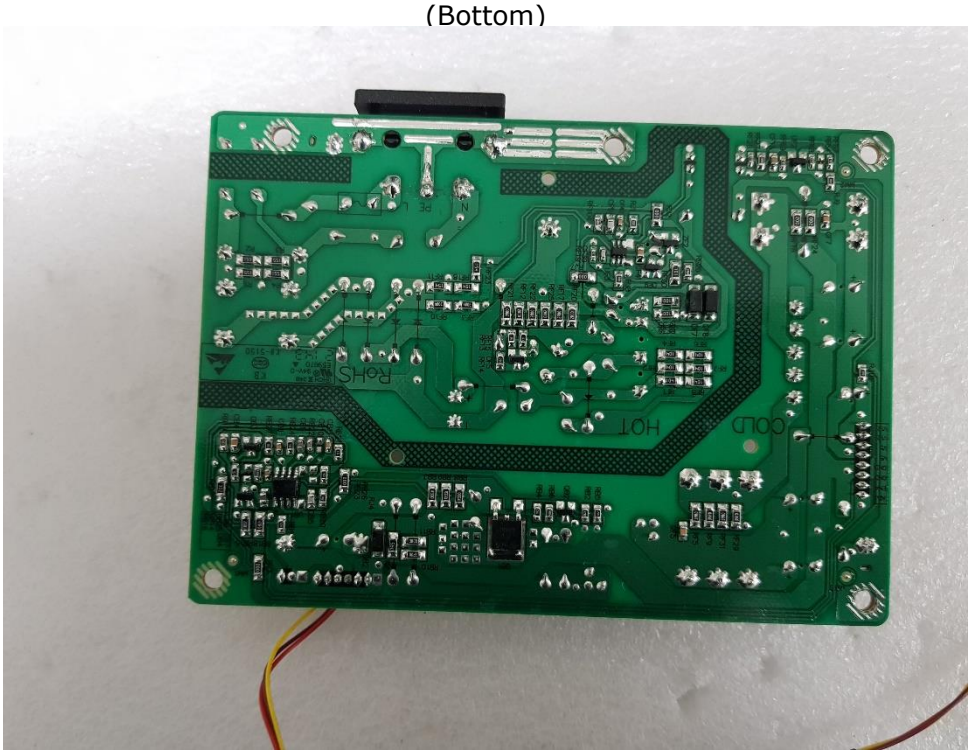


EUT Internal View – Board 3

(Top)



(Bottom)

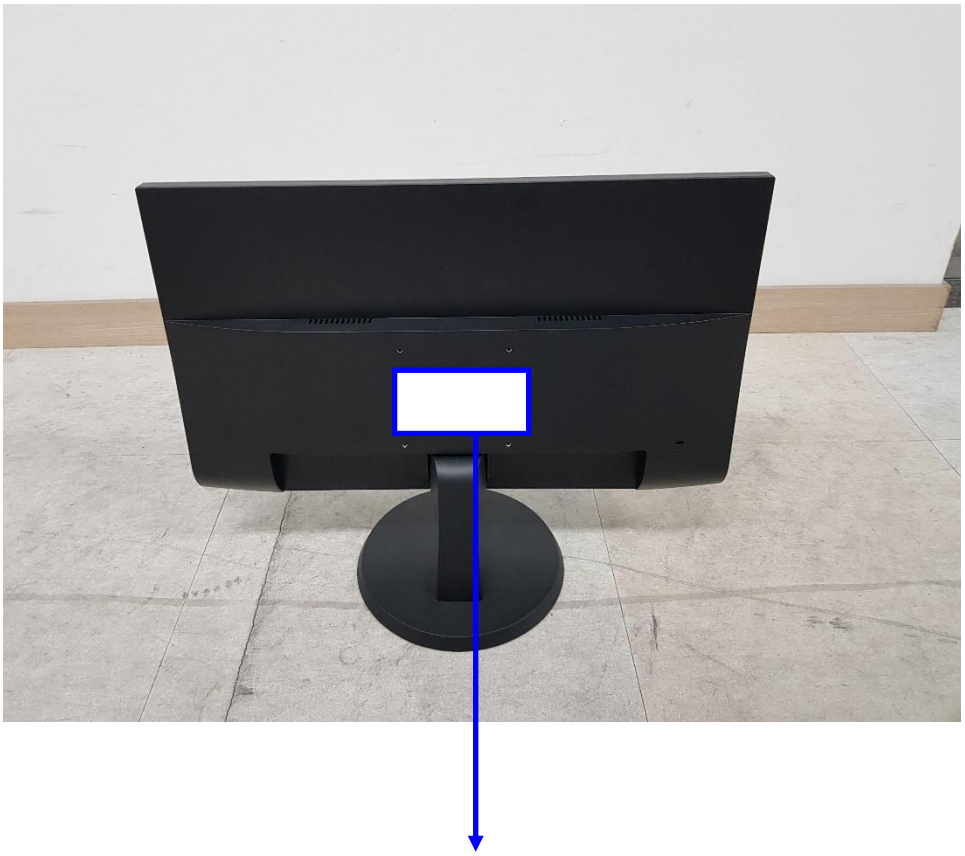


EUT Internal View – Panel

(Top)

(Bottom)

Label and Location



LED MONITOR

Model No : SMT-2431

Manufacturer : Weihai Daewoo Electronics Co., Ltd.

Made in China