

**KES Co., Ltd.**

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Report No.:

KES-EM-22T0565-R1

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EMC TEST REPORT For CE

Test Report No. : KES-EM-22T0565-R1
Date of Issue : Feb. 24, 2023
Product name : LED MONITOR
Model/Type No. : SMT-3240
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 : Jun. 21, 2022
Test date : Jun. 22, 2022 ~ Jun. 27, 2022
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Tae-Yeon, 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
Jul. 07, 2022	KES-EM-22T0565	Issued
Feb. 24, 2023	KES-EM-22T0565-R1	Change the Applicant and Applicant Address at the request of the customer

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1.0 General Product Description

Main Specifications of EUT are:

Display		
Screen Size		31.5"
Max. Resolution		3840*2160 60Hz (UHD)
Brightness		300 cd/m ² (Typ)
Contrast Ratio		700:1 (Min) '1000:1 (Typ)
Aspect Ratio		16:9
Viewing Angle (H/V)		178°/178°
Display Color		1.07B Colors(Typ)
Response Time		14ms(Typ)
Panel Life		30,000 hours
Interface		
Video	Connector	HDMI 2.0(1), DP1.2(1)
	Connector	HDMI
HDMI	Available Format	640 x 480@60Hz, 800 x 600@56Hz/60Hz, 1024 x 768@60Hz, 1280 x 720@60Hz, 1280 x 800@60Hz, 1280 x 960@60Hz, 1280 x 1024@60Hz, 1360 x 768@60Hz, 1440 x 900@60Hz, 1680 x 1050@60Hz, 1920 x 1080@60Hz, 2560 x 1440@60Hz, 3840x2160@60Hz, 640 x 480P@60Hz, 720 x 480P60Hz, 1280 x 720@60Hz, 720 x 576P@50Hz, 1280 x 720P@50Hz, 1920 x 60Hz, 1920x1080P@50/60Hz, 3840 x 2160P@30/50/60Hz, 1440x480P@60Hz, 1440 x 576P@50Hz, 1440 x 576P@50Hz
	Format	
DP	Connector	DP
	Available Format	640 x 480@60Hz, 800 x 600@56Hz/60Hz, 1024 x 768@60Hz, 1280 x 720@60Hz, 1280 x 800@60Hz, 1280 x 960@60Hz, 1280 x 1024@60Hz, 1360 x 768@60Hz, 1440 x 900@60Hz, 1680 x 1050@60Hz, 1920 x 1080@60Hz, 2560 x 1440@60Hz, 3840x2160@60Hz, 640 x 480P@60Hz, 720 x 480P60Hz, 1280 x 720@60Hz, 720 x 576P@50Hz, 1280 x 720P@50Hz, 1920 x 60Hz, 1920x1080P@50/60Hz, 3840 x 2160P@30/50/60Hz, 1440x480P@60Hz, 1440 x 576P@50Hz, 1440 x 576P@50Hz
Audio	Connector	Audio Out
	Output Signal	Loop-through line level(PC only), Speakers : 6Ω 2Wx 2
On Screen Display (OSD)		
Functions		VESA™ DPM Compatible

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Language		Korean, English, Русский, Deutsch, Français, Español, Italiano, Português, Chinese (Simplified), Chinese (Traditional), Japanese, Arabic
General		
Electrical	Input Voltage	AC 100-240V, 50/60HZ, 1.2A
	Power Consumption	<55W
Environmental	Operating Temperature	0 ~ +40°C (+32°F ~ +104°F)
	Operating Humidity	10% ~ 80% (non-condensing)
Mechanical	Dimensions with Stand	714.6*484.3*201.4mm
	Dimensions without Stand	714.6*484.3*53.7mm
	Bezel Size	3 Frameless Top:1.8mm Bottom:21mm Side : 1.8mm
	Cabinet Color	Black
	VESA Mounts Interface	100*100mm
Weight	With Stand	8.0Kg
	Without Stand	6.5Kg
	Carton+foam+Accessory+monitor	9.7Kg
Stand		including

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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-3240	-	Weihai Daewoo Electronics Co., Ltd	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Desktop PC	DM500T6Z	-	Samsung Electronics Co., Ltd.	-
Keyboard	Y-S0002	-	Logitech	-
Mouse	AA-SM7PCP	-	Acrox Technologies Co.,Ltd.	-
Earphone	-	-	BEXEL	-



1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
LED MONITOR (EUT)	DP	Desktop PC	DP	1.5	S
	HDMI	Desktop PC	HDMI	1.5	S
	Audio out	Earphone	3.5 mm	1.1	U
Desktop PC	PS/2	Keyboard	PS/2	1.5	U
	USB	Mouse	USB	1.9	U

* Unshielded = U, Shielded = S

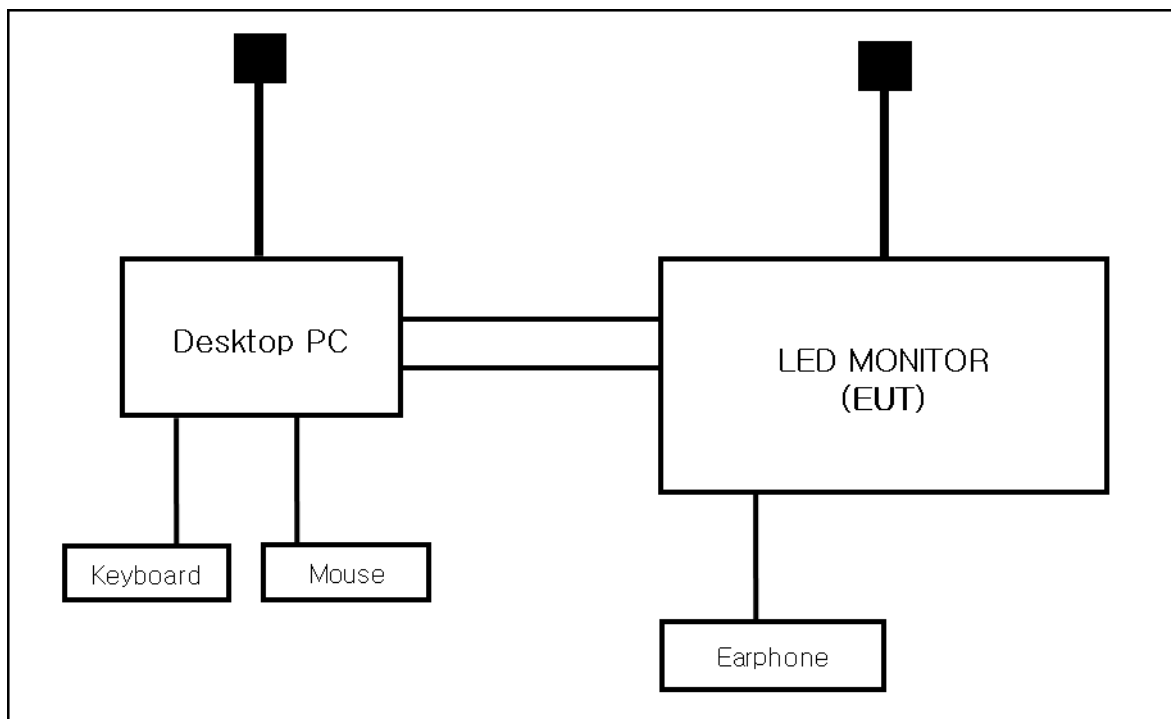
1.7 EUT Operating Mode(s)

Test mode	Test Power	Test No.	operating
DP input	AC POWER (AC 230 V, 50 Hz,	Test #1	Connecting the desktop PC to the EUT through the DP port. Play the color bar video file and output it to the EUT.
HDMI input		Test #2	Connecting the desktop PC to the EUT through the HDMI port. Play the color bar video file and output it to the EUT.

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

1.8 Configuration

■ AC Main
□ DC Main



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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+A1:2020

☒ Class A

☐ Class B

☒ EN 55035:2017+A11:2020

☒ EN 61000-3-2:2014

☒ EN 61000-3-3:2013

☒ **EMC – Regulations 2016**

☒ 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

Jun. 22, 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: (24,3 ± 0,2) °C

Relative Humidity: (44,5 ± 0,1) % 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.

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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

N/A

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2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Jun. 23, 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: (24,7 ± 0,2) °C

Relative Humidity: (44,9 ± 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

RemarksSee Appendix A for test data.

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2.4 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Jun. 23, 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, 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: (24,7 ± 0,2) °C

Relative Humidity: (44,7 ± 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

Jun. 24, 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: (23,4 ± 0,3) °C
Relative Humidity: (45,4 ± 0,2) % R.H.

Classification of Equipment for Harmonic Current Emissions

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

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.



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2.6 Voltage Fluctuations and Flicker

Test Date

Jun. 24, 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: (23,4 ± 0,3) °C

Relative Humidity: (45,4 ± 0,2) % R.H.

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.

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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

Jun. 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, 24, 2023
☒	HCP	-	KES	-	-
☒	VCP	-	Noise Ken	-	-

Test Conditions

Temperature: (24,4 ± 0,1) °C
Relative Humidity: (44,8 ± 0,0) % R.H.
Atmospheric Pressure: (99,5 ± 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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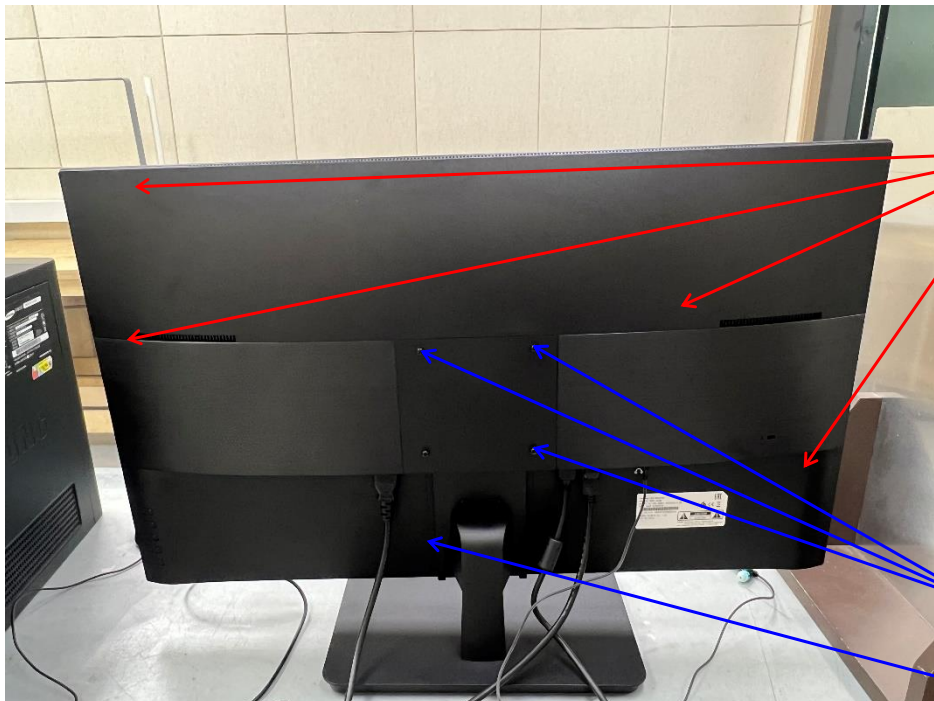
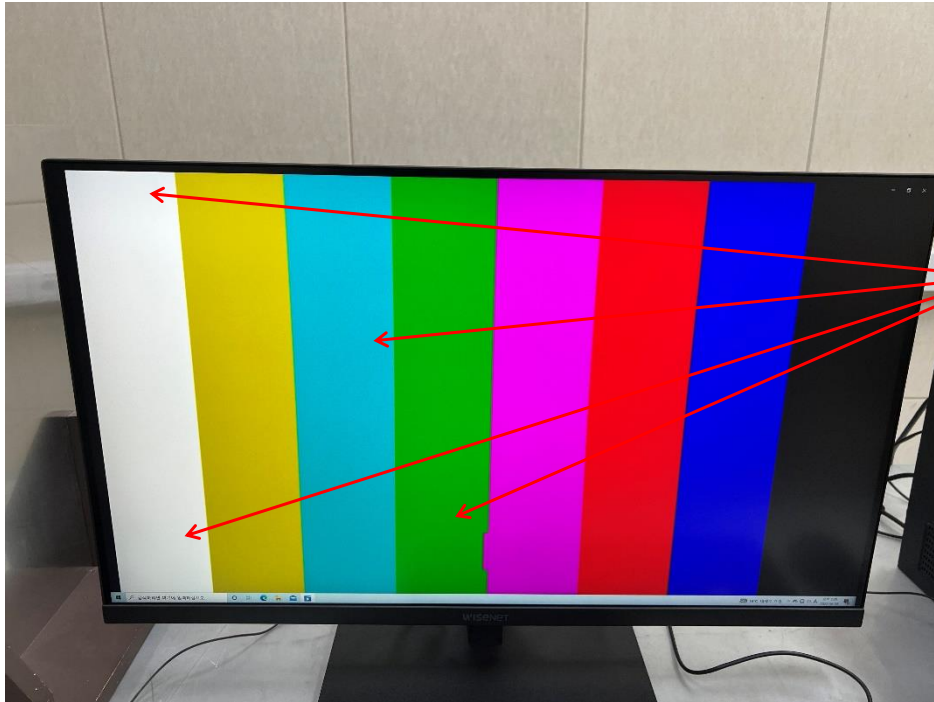
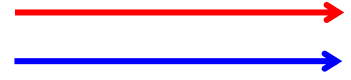
Notes: HCP: Horizontal coupling plane

VCP: Vertical coupling plane

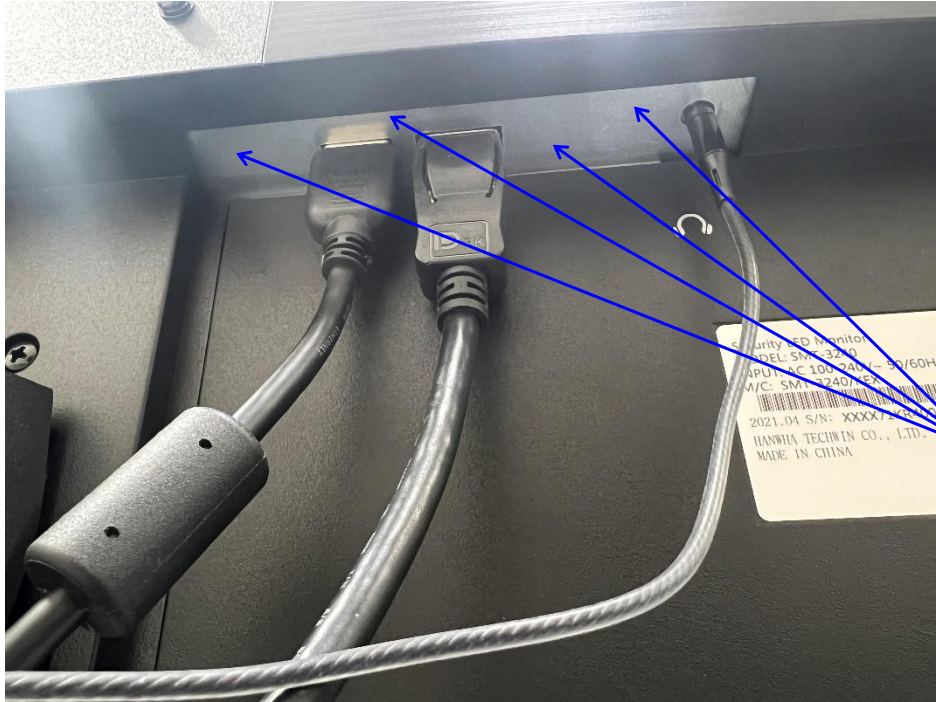
Required Performance Criteria: ☒ B

Location of Discharge:

Air
Contact



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Test Data

■ Test #1

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	LCD	Air Discharge	B	A	-
2	Enclosure	Air Discharge	B	A	-
3	Screws	Contact Discharge	B	A	-
4	Port Around	Contact Discharge	B	A	-

■ Test #2

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	LCD	Air Discharge	B	A	-
2	Enclosure	Air Discharge	B	A	-
3	Screws	Contact Discharge	B	A	-
4	Port Around	Contact Discharge	B	A	-

Note: "Blank" = Not performed

Results:

- A – No degradation of function
- B – Distortion/Error of function (self-recoverable)
- C – Loss of function

Test Results

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

Remarks

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



3.2 Radiated Electric Field Immunity

Reference Standard

EN IEC 61000-4-3:2020

Test Date

Jun. 25, 2022

Test LocationEMS-RS: ☐ SEMI ANECHOIC CHAMBER #2☒ SEMI ANECHOIC CHAMBER #3**Test Equipment**

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	KTI_RS2012	KTI	2.1.1	-
☒	POWER METER	E4419B	Agilent	GB40201439	02, 03, 2023
☒	AVERAGE POWER SENSOR	E9301A	Agilent	MY41495698	02, 03, 2023
☒	CW POWER SENSOR	E4412A	Agilent	MY41501662	03, 31, 2023
☒	AMPLIFIER	ITA0300-200	Infinitech	-	-
☒	AMPLIFIER	ITA0750-200	Infinitech	-	-
☒	AMPLIFIER	ITA1500-100	Infinitech	-	-
☒	AMPLIFIER	ITA2500-100	Infinitech	-	-
☒	GPIB INTERFACE CONTROL	SYSTEM CONTROL UNIT	Infinitech	-	-
☒	POWER SUPPLY	SYSTEM POWER SUPPLY	Infinitech	-	-
☒	SIGNAL GENERATOR	SMIQ06B	Rohde & Schwarz	100236	02, 03, 2023
☒	HIGH POWER AMPLIFIER	ITA-4500KL-50	Infinitech	4500KL-22030002	-
☒	HYBRID LOG-PERIODIC ANTENNA	HLP-2603	TDK	100400	-
☒	LOG-PERIODIC ANTENNA	STLP 9149	SCHWARZBECK	9149-255	-
☒	SOUND ACOUSTIC TESTER	TST-1000	TESTEK	150045	11, 02, 2022
☒	MICROPHONE	MP201	BSWA	551675	11, 04, 2022

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Test Conditions

Temperature: (23,8 ± 0,4) °C
Relative Humidity: (45,1 ± 0,3) % R.H.
Atmospheric Pressure: (100,3 ± 0,0) 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

■ Test #1

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.

■ Test #2

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

[Audio output function]

☐ Electrical Measurements / ☒ Acoustic Measurements

Measured parts	Test method	Level (dB)		Performance criteria	Observations	
		Criteria	Measured		Horizontal	Vertical
Earphone	On-ear	74.60	Low	A	A	A
Speaker	Loud Speaker	92.37	Low	A	A	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.

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3.3 Electrical Fast Transients/Bursts

Reference Standard

EN 61000-4-4:2012

Test Date

Jun. 24, 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: (24,2 ± 0,2) °C
Relative Humidity: (44,6 ± 0,1) % R.H.
Atmospheric Pressure: (99,6 ± 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

■ Test #1

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

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

☐ 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	-	-

■ Test #2
☒ Input a.c. power ports – Coupling/Decoupling Network used

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

☐ 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

Audio output mixed with noise during the test.

Normal operation after the test.

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3.4 Surge

Reference Standard

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

Test Date

Jun. 23, 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: (24,7 ± 0,1) °C
Relative Humidity: (44,9 ± 0,1) % R.H.
Atmospheric Pressure: (99,2 ± 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

■ Test #1

☒ 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	-	-

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■ Test #2

☒ 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

Jun. 22, 2022

Test Location

EMS-CS: Electro wave Shieldroom #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	icd.control	EM TEST	5.3.7	-
☒	CONTINUOUS WAVE SIMULATOR	CWS 500N1	EM TEST	V0936105119	08, 03, 2022
☒	ATTENUATOR	ATT6	EM TEST	1208-34	08, 03, 2022
☒	CDN	CDN-M2/M3N	EM TEST	0909-06	08, 03, 2022
☒	CDN	CDN T8RJ45	EM TEST	0909-09	08, 03, 2022
☒	EM INJECTION CLAMP	EM 101	Liithi	35943	08, 03, 2022
☒	SOUND ACOUSTIC TESTER	TST-1000	TESTEK	150045	11, 02, 2022
☒	MICROPHONE	MP201	BSWA	551675	11, 04, 2022

Test Conditions

Temperature: (24,7 ± 0,3) °C
Relative Humidity: (45,0 ± 0,2) % R.H.
Atmospheric Pressure: (100,0 ± 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

■ Test #1

☒ 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	-

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■ Test #2
☒ Input a.c. power ports

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

☐ Input d.c. power ports

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

☐ Signal ports and telecommunication ports

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

[Audio output function]

☐ Electrical Measurements / ☒ Acoustic Measurements

Measured parts	Test method	Level (dB)		Performance criteria	Results
		Criteria	Measured		
Earphone	On-ear	75.10	Low	A	A
Speaker	Loud Speaker	91.45	Low	A	A

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

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

Results:

A - No degradation of function

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

C - Loss of function

Test Results
☒ PASS Required Performance Criteria

☐ NOT PASS Required Performance Criteria

Remarks

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



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

RemarksNot affected by magnetic fields.



3.7 Voltage Dips and Short Interruptions

Reference Standard
EN IEC 61000-4-11:2020

Test Date
Jun. 24, 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: (24,4 ± 0,0) °C
Relative Humidity: (44,7 ± 0,0) % R.H.
Atmospheric Pressure: (99,6 ± 0,0) kPa

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Test Data

■ Test #1

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

■ Test #2

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

The EUT was turned off during the test, but after the test was completed, it operated normally due to the intervention of the tester.



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APPENDIX A – TEST DATA

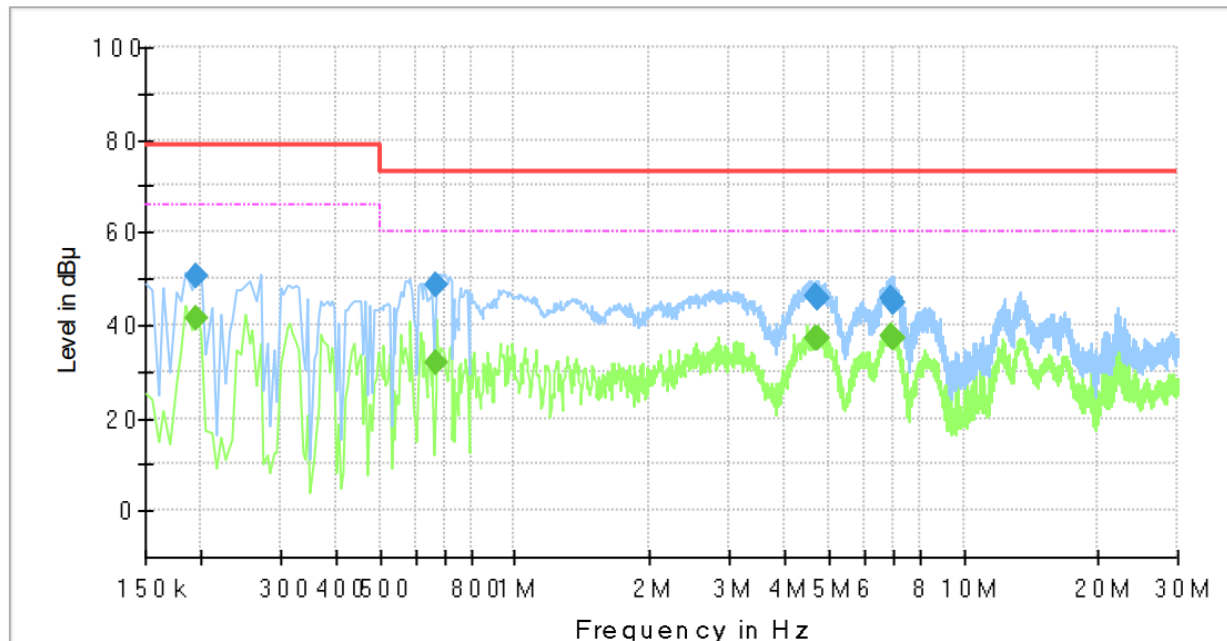
Conducted Emissions at Mains Power Ports

■ Test #1

[HOT]

Common Information

Test Description:	Conducted Emission
Model No.:	SMT-3240
Phase:	L1
Mode:	DP, AC 230 V 50 Hz
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.195000	50.58	---	79.00	28.42	1000.0	9.000	L1	19.4
0.195000	---	41.54	66.00	24.46	1000.0	9.000	L1	19.4
0.670000	---	31.81	60.00	28.19	1000.0	9.000	L1	19.9
0.670000	48.50	---	73.00	24.50	1000.0	9.000	L1	19.9
4.695000	---	37.24	60.00	22.76	1000.0	9.000	L1	19.7
4.695000	46.09	---	73.00	26.91	1000.0	9.000	L1	19.7
4.730000	---	37.09	60.00	22.91	1000.0	9.000	L1	19.7
4.730000	45.86	---	73.00	27.14	1000.0	9.000	L1	19.7
6.895000	---	37.73	60.00	22.27	1000.0	9.000	L1	19.5
6.895000	45.64	---	73.00	27.36	1000.0	9.000	L1	19.5
6.985000	---	36.90	60.00	23.10	1000.0	9.000	L1	19.5
6.985000	44.74	---	73.00	28.26	1000.0	9.000	L1	19.5

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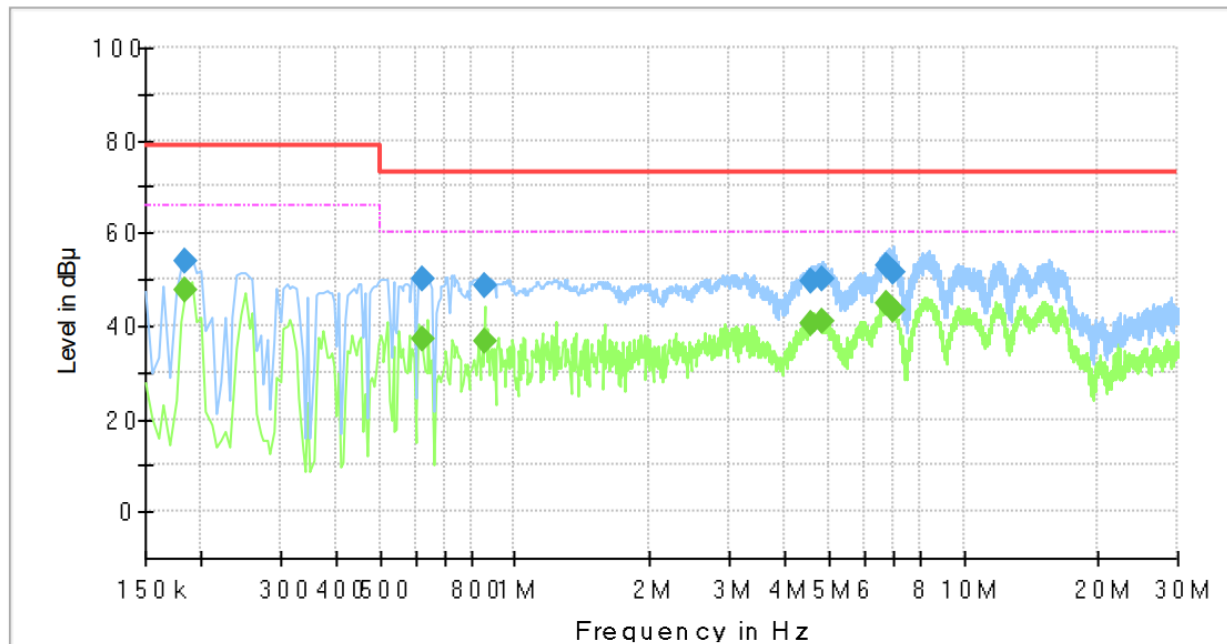
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[NEUTRAL]

Common Information

Test Description:	Conducted Emission
Model No.:	SMT-3240
Phase:	N
Mode:	DP, AC 230 V 50 Hz
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.185000	53.85	---	79.00	25.15	1000.0	9.000	N	19.4
0.185000	---	47.46	66.00	18.54	1000.0	9.000	N	19.4
0.625000	---	36.96	60.00	23.04	1000.0	9.000	N	19.8
0.625000	49.82	---	73.00	23.18	1000.0	9.000	N	19.8
0.855000	48.75	---	73.00	24.25	1000.0	9.000	N	20.0
0.855000	---	36.47	60.00	23.53	1000.0	9.000	N	20.0
4.580000	---	40.65	60.00	19.35	1000.0	9.000	N	19.7
4.580000	49.63	---	73.00	23.37	1000.0	9.000	N	19.7
4.840000	---	40.68	60.00	19.32	1000.0	9.000	N	19.7
4.840000	49.92	---	73.00	23.08	1000.0	9.000	N	19.7
6.740000	---	44.98	60.00	15.02	1000.0	9.000	N	19.5
6.740000	52.78	---	73.00	20.22	1000.0	9.000	N	19.5
6.990000	---	43.40	60.00	16.60	1000.0	9.000	N	19.5
6.990000	51.45	---	73.00	21.55	1000.0	9.000	N	19.5

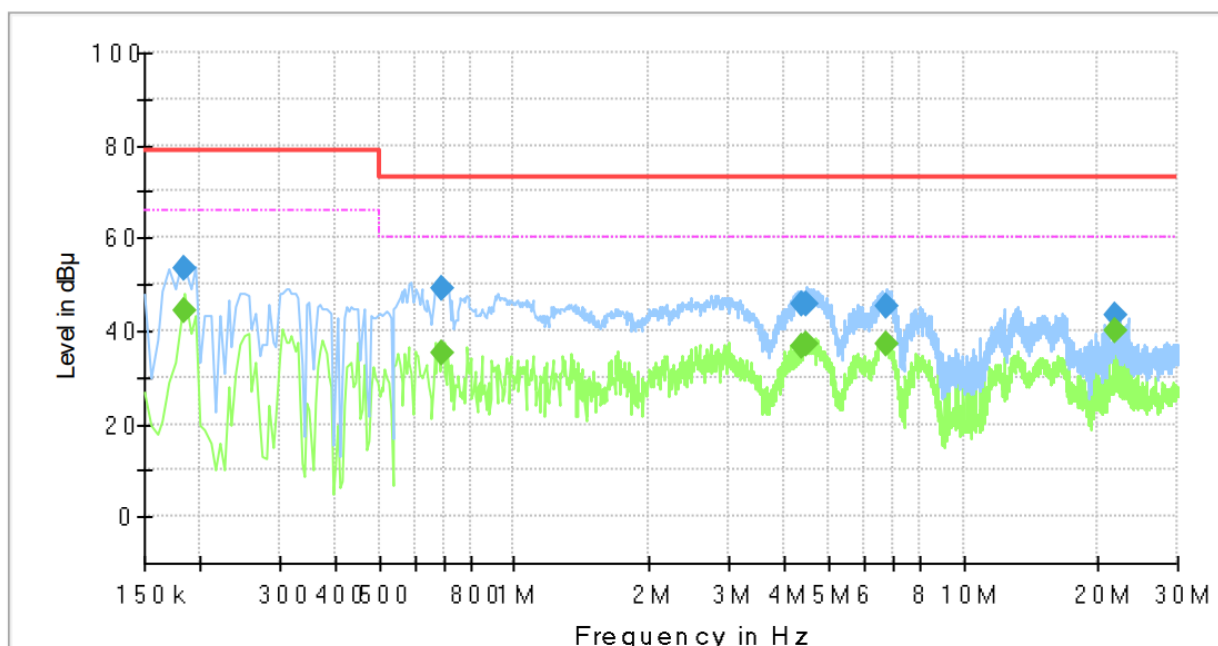
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Test #2
[HOT]
Common Information

Test Description:	Conducted Emission
Model No.:	SMT-3240
Phase:	L1
Mode:	HDMI, AC 230 V 50 Hz
Operator Name:	KES


Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.185000	---	44.17	66.00	21.83	1000.0	9.000	L1	19.4
0.185000	53.17	---	79.00	25.83	1000.0	9.000	L1	19.4
0.690000	---	34.99	60.00	25.01	1000.0	9.000	L1	19.9
0.690000	49.28	---	73.00	23.72	1000.0	9.000	L1	19.9
4.395000	---	36.62	60.00	23.38	1000.0	9.000	L1	19.8
4.395000	45.62	---	73.00	27.38	1000.0	9.000	L1	19.8
4.480000	---	36.91	60.00	23.09	1000.0	9.000	L1	19.8
4.480000	45.92	---	73.00	27.08	1000.0	9.000	L1	19.8
6.765000	---	37.04	60.00	22.96	1000.0	9.000	L1	19.5
6.765000	45.11	---	73.00	27.89	1000.0	9.000	L1	19.5
21.870000	---	40.15	60.00	19.85	1000.0	9.000	L1	20.1
21.870000	43.39	---	73.00	29.61	1000.0	9.000	L1	20.1

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[NEUTRAL]**Common Information**

Test Description:

Model No.:

Phase:

Mode:

Operator Name:

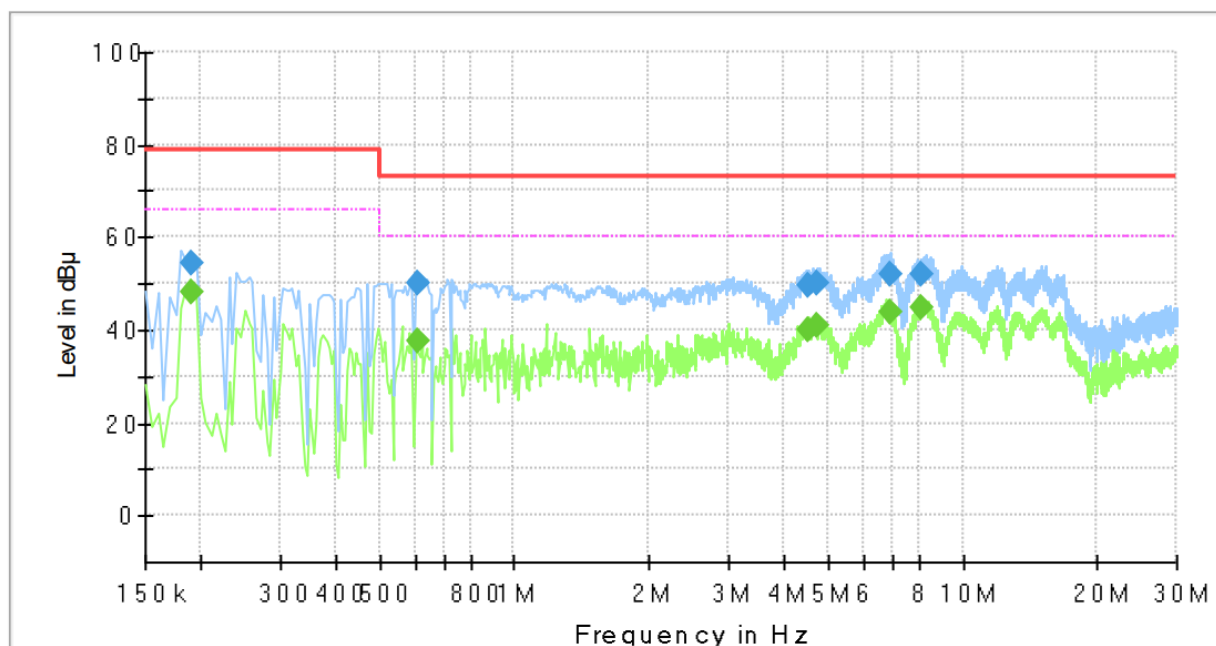
Conducted Emission

SMT-3240

N

HDMI, AC 230 V 50 Hz

KES



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Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.190000	---	48.14	66.00	17.86	1000.0	9.000	N	19.4
0.190000	54.22	---	79.00	24.78	1000.0	9.000	N	19.4
0.610000	---	37.66	60.00	22.34	1000.0	9.000	N	19.8
0.610000	49.98	---	73.00	23.02	1000.0	9.000	N	19.8
4.510000	---	40.19	60.00	19.81	1000.0	9.000	N	19.8
4.510000	49.48	---	73.00	23.52	1000.0	9.000	N	19.8
4.750000	---	40.77	60.00	19.23	1000.0	9.000	N	19.7
4.750000	49.92	---	73.00	23.08	1000.0	9.000	N	19.7
6.875000	---	43.89	60.00	16.11	1000.0	9.000	N	19.5
6.875000	51.97	---	73.00	21.03	1000.0	9.000	N	19.5
8.070000	---	44.80	60.00	15.20	1000.0	9.000	N	19.6
8.070000	51.96	---	73.00	21.04	1000.0	9.000	N	19.6

◆ 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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**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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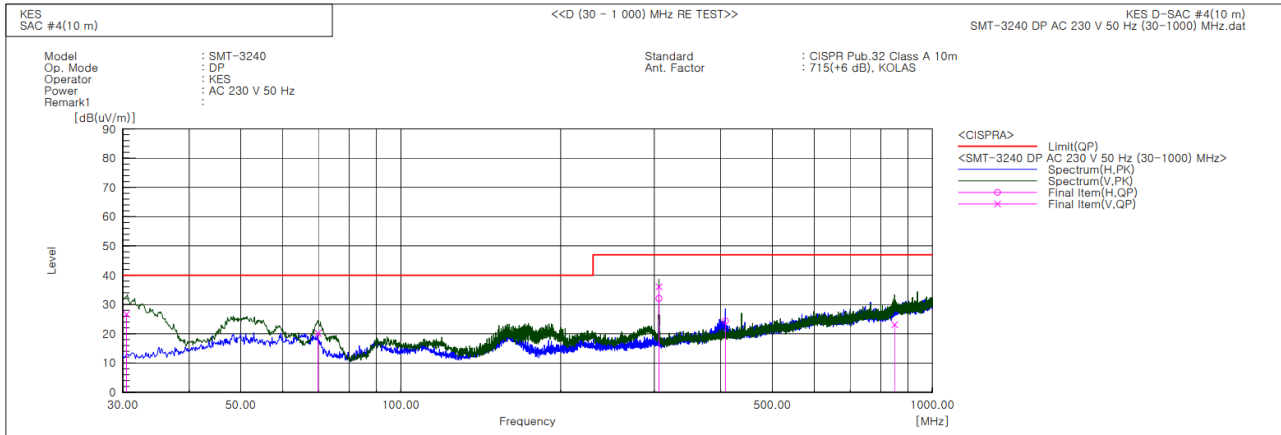
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Radiated Electric Field Emissions(Below 1 GHz)

Test #1



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	30.485	V	51.9	-25.2	26.7	40.0	13.3	101.0	160.0	
2	69.891	V	45.0	-24.8	20.2	40.0	19.8	120.0	324.6	
3	306.002	H	49.8	-17.7	32.1	47.0	14.9	251.0	231.8	
4	306.005	V	53.7	-17.7	36.0	47.0	11.0	100.0	270.7	
5	408.058	H	38.4	-14.0	24.4	47.0	22.6	226.0	305.6	
6	849.286	V	28.7	-5.6	23.1	47.0	23.9	150.0	158.9	

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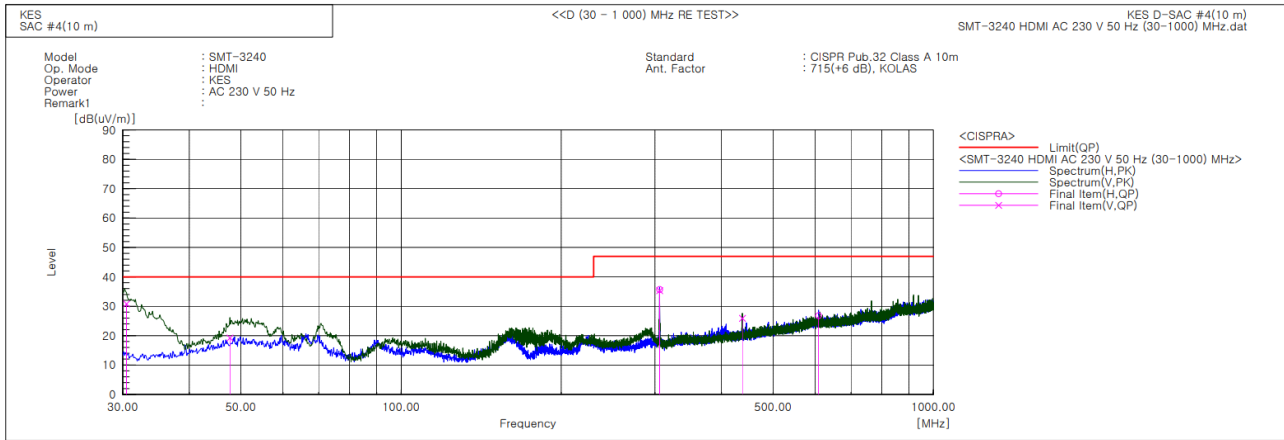
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Test #2



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	30.485	V	56.0	-25.2	30.8	40.0	9.2	147.0	180.7	
2	47.703	V	40.4	-21.2	19.2	40.0	20.8	144.0	356.0	
3	306.000	V	53.0	-17.7	35.3	47.0	11.7	100.0	199.3	
4	306.006	H	53.4	-17.7	35.7	47.0	11.3	216.0	53.3	
5	437.521	V	39.3	-13.4	25.9	47.0	21.1	400.0	319.1	
6	608.605	H	35.3	-8.5	26.8	47.0	20.2	200.0	145.4	

◆ 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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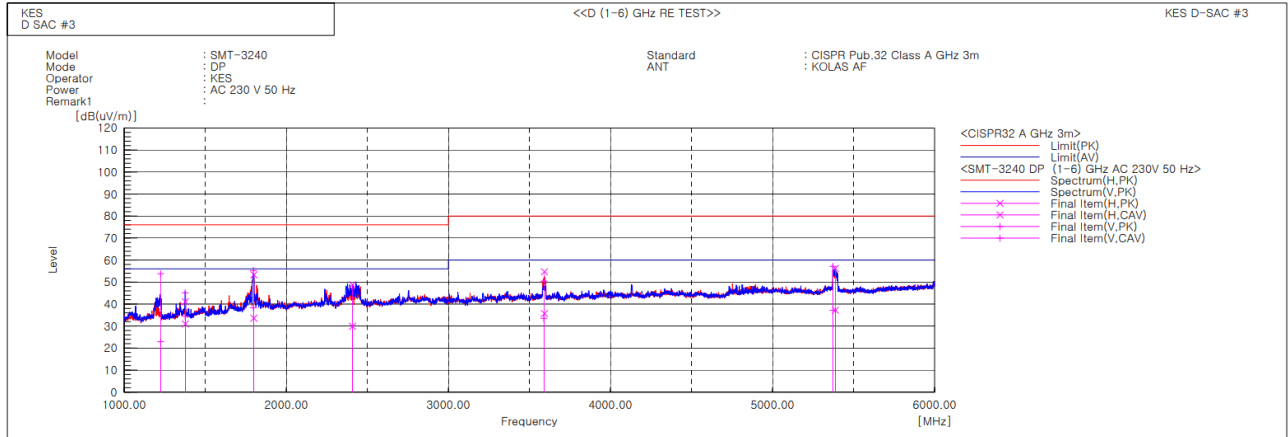
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Radiated Electric Field Emissions(Above 1 GHz)

Test #1



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	1225.000	V	61.9	31.0	-8.1	53.8	22.9	76.0	56.0	22.2	33.1	100.0	324.9	
2	1376.000	V	51.7	41.0	-6.6	45.1	34.4	76.0	56.0	30.9	21.6	100.0	60.0	
3	1377.000	H	47.7	37.6	-6.6	41.1	31.0	76.0	56.0	34.9	25.0	100.0	252.6	
4	1797.000	V	57.4	40.5	-2.2	55.2	38.3	76.0	56.0	20.8	17.7	100.0	250.4	
5	1800.000	H	55.5	35.8	-2.2	53.3	33.6	76.0	56.0	22.7	22.4	100.0	49.4	
6	2409.000	H	47.6	28.7	1.2	48.8	29.9	76.0	56.0	27.2	26.1	100.0	64.7	
7	3589.000	V	46.3	29.4	4.1	50.4	33.5	80.0	60.0	29.6	26.5	100.0	42.6	
8	3593.000	H	50.6	31.6	4.1	54.7	35.7	80.0	60.0	25.3	24.3	100.0	327.4	
9	5373.000	V	47.7	27.8	9.4	57.1	37.2	80.0	60.0	22.9	22.8	100.0	173.6	
10	5387.000	H	46.7	27.7	9.5	56.2	37.2	80.0	60.0	23.8	22.8	100.0	338.3	



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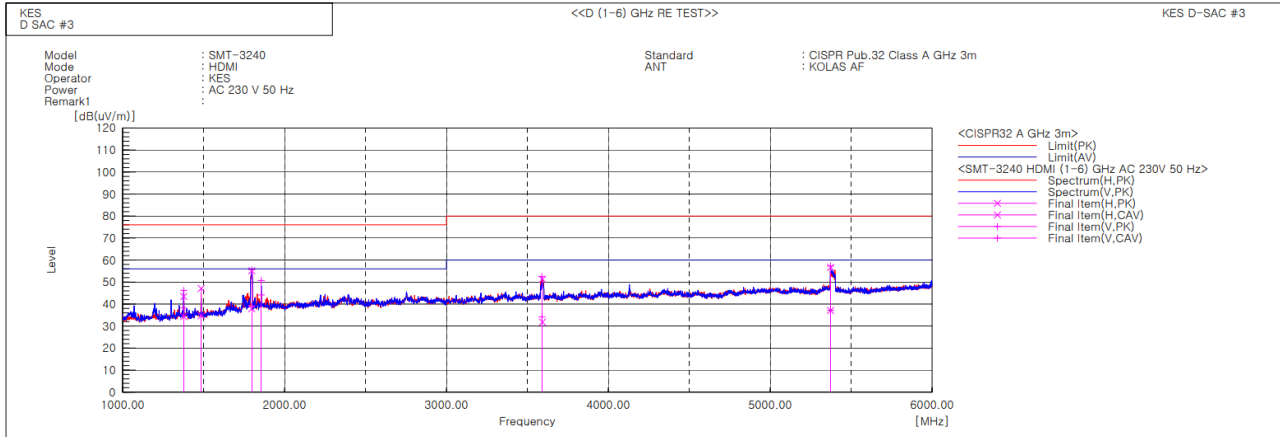
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Test #2



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	1377.000	H	50.1	40.9	-6.6	43.5	34.3	76.0	56.0	32.5	21.7	100.0	1.0	
2	1377.000	V	52.8	44.8	-6.6	46.2	38.2	76.0	56.0	29.8	17.8	100.0	349.9	
3	1485.000	H	53.0	40.6	-5.9	47.1	34.7	76.0	56.0	28.9	21.3	100.0	46.7	
4	1797.000	H	57.3	40.1	-2.2	55.1	37.9	76.0	56.0	20.9	18.1	100.0	8.2	
5	1798.000	V	57.8	41.2	-2.2	55.6	39.0	76.0	56.0	20.4	17.0	100.0	256.0	
6	1856.000	V	52.5	45.9	-1.8	50.7	44.1	76.0	56.0	25.3	11.9	100.0	13.1	
7	3590.000	V	48.4	30.1	4.1	52.5	34.2	80.0	60.0	27.5	25.8	100.0	22.2	
8	3593.000	H	47.2	27.7	4.1	51.3	31.8	80.0	60.0	28.7	28.2	100.0	327.6	
9	5373.000	V	47.9	27.8	9.4	57.3	37.2	80.0	60.0	22.7	22.8	100.0	171.3	
10	5373.000	H	47.3	27.7	9.4	56.7	37.1	80.0	60.0	23.3	22.9	100.0	332.6	

Calculation

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

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

■ Test #1

Average harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	0.190			
2	0.002			
3	0.177	7.717	2.300	PASS
4	0.002			
5	0.167	14.692	1.140	PASS
6	0.002			
7	0.156	20.235	0.770	PASS
8	0.002			
9	0.139	34.653	0.400	PASS
10	0.002			
11	0.120	36.342	0.330	PASS
12	0.002			
13	0.102	48.493	0.210	PASS
14	0.002			
15	0.083	55.047	0.150	PASS
16	0.002			
17	0.064	48.248	0.132	PASS
18	0.002			
19	0.048	40.533	0.118	PASS
20	0.002			
21	0.035	22.079	0.161	PASS
22	0.001			
23	0.027	18.384	0.147	PASS
24	0.002			
25	0.023	16.802	0.135	PASS
26	0.001			
27	0.021	16.774	0.125	PASS
28	0.001			
29	0.020	17.272	0.117	PASS
30	0.001			
31	0.019	17.434	0.110	PASS
32	0.001			
33	0.017	16.664	0.102	PASS
34	0.001			
35	0.014	14.660	0.096	PASS
36	0.001			
37	0.011	11.899	0.092	PASS
38	0.001			
39	0.008	9.206	0.087	PASS
40	0.001			

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

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

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Test Data - Harmonics (continued)

Maximum harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	0.191			
2	0.002			
3	0.178	5.148	3.450	PASS
4	0.003			
5	0.168	9.820	1.710	PASS
6	0.002			
7	0.156	13.501	1.155	PASS
8	0.002			
9	0.139	23.122	0.600	PASS
10	0.002			
11	0.121	24.377	0.495	PASS
12	0.002			
13	0.102	32.393	0.315	PASS
14	0.003			
15	0.083	36.800	0.225	PASS
16	0.002			
17	0.064	32.319	0.198	PASS
18	0.002			
19	0.048	27.162	0.177	PASS
20	0.002			
21	0.036	22.274	0.161	PASS
22	0.002			
23	0.027	18.457	0.147	PASS
24	0.002			
25	0.023	16.876	0.135	PASS
26	0.002			
27	0.021	16.887	0.125	PASS
28	0.001			
29	0.021	17.547	0.117	PASS
30	0.001			
31	0.019	17.534	0.110	PASS
32	0.001			
33	0.017	16.764	0.102	PASS
34	0.001			
35	0.014	14.778	0.096	PASS
36	0.001			
37	0.011	11.988	0.092	PASS
38	0.001			
39	0.008	9.315	0.087	PASS
40	0.001			

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

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

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■ Test #2

Average harmonic current results

Hn	Ieff [A]	% of Limit	Limit [A]	Result
1	0.189			
2	0.002			
3	0.176	7.664	2.300	PASS
4	0.002			
5	0.166	14.604	1.140	PASS
6	0.002			
7	0.155	20.146	0.770	PASS
8	0.002			
9	0.138	34.565	0.400	PASS
10	0.002			
11	0.120	36.335	0.330	PASS
12	0.002			
13	0.102	48.642	0.210	PASS
14	0.002			
15	0.083	55.443	0.150	PASS
16	0.002			
17	0.064	48.828	0.132	PASS
18	0.002			
19	0.049	41.222	0.118	PASS
20	0.002			
21	0.036	22.502	0.161	PASS
22	0.001			
23	0.027	18.651	0.147	PASS
24	0.002			
25	0.023	16.891	0.135	PASS
26	0.001			
27	0.021	16.732	0.125	PASS
28	0.001			
29	0.020	17.216	0.117	PASS
30	0.001			
31	0.019	17.453	0.110	PASS
32	0.001			
33	0.017	16.789	0.102	PASS
34	0.001			
35	0.014	14.878	0.096	PASS
36	0.001			
37	0.011	12.164	0.092	PASS
38	0.001			
39	0.008	9.423	0.087	PASS
40	0.001			

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

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

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Test Data - Harmonics (continued)

Maximum harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	0.189			
2	0.002			
3	0.176	5.113	3.450	PASS
4	0.003			
5	0.167	9.761	1.710	PASS
6	0.003			
7	0.155	13.449	1.155	PASS
8	0.003			
9	0.138	23.075	0.600	PASS
10	0.002			
11	0.121	24.346	0.495	PASS
12	0.002			
13	0.102	32.506	0.315	PASS
14	0.003			
15	0.083	37.091	0.225	PASS
16	0.002			
17	0.065	32.702	0.198	PASS
18	0.002			
19	0.049	27.617	0.177	PASS
20	0.002			
21	0.036	22.667	0.161	PASS
22	0.002			
23	0.028	18.730	0.147	PASS
24	0.002			
25	0.023	16.986	0.135	PASS
26	0.002			
27	0.021	16.855	0.125	PASS
28	0.001			
29	0.020	17.488	0.117	PASS
30	0.001			
31	0.019	17.538	0.110	PASS
32	0.001			
33	0.017	16.914	0.102	PASS
34	0.001			
35	0.014	15.006	0.096	PASS
36	0.001			
37	0.011	12.259	0.092	PASS
38	0.001			
39	0.008	9.547	0.087	PASS
40	0.001			

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

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

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**KES Co., Ltd.**

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www.kes.co.kr

Report No.:

KES-EM-22T0565-R1

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Test Data - Voltage Fluctuations

■ Test #1

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

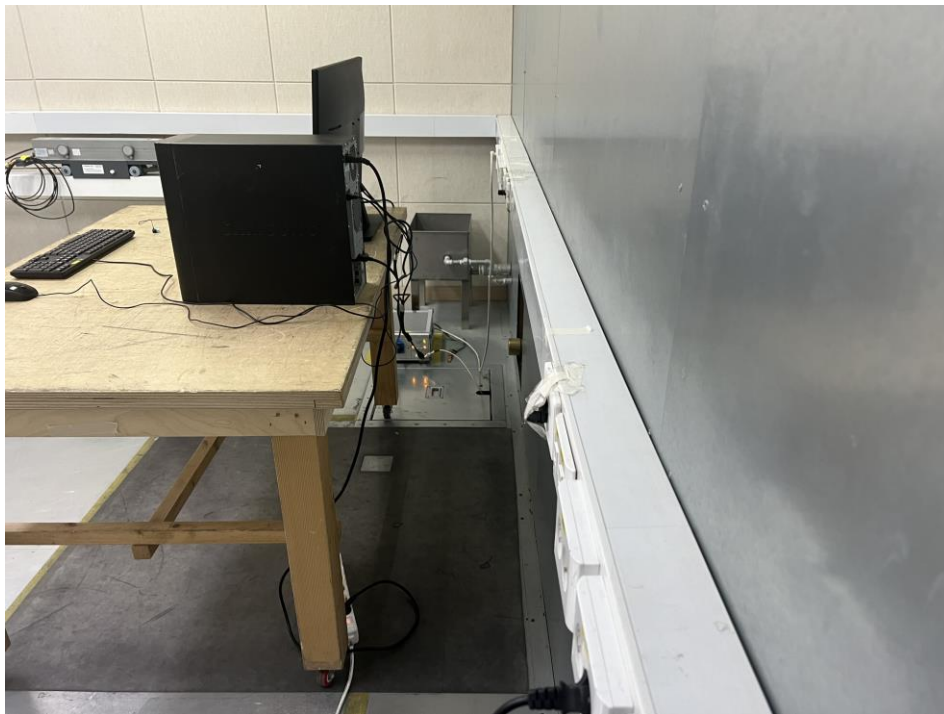
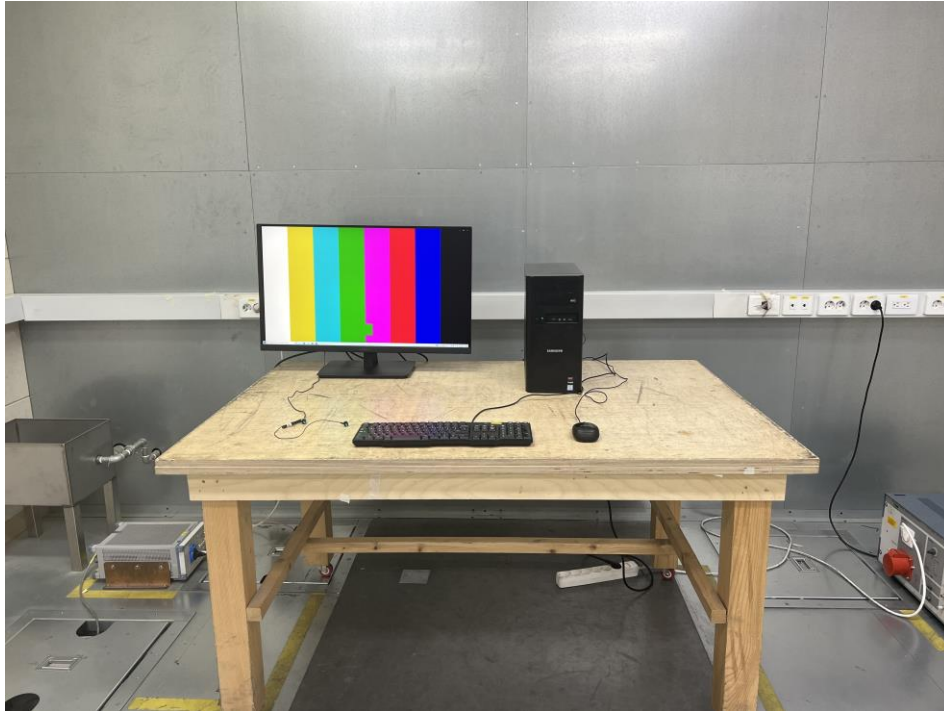
■ Test #2

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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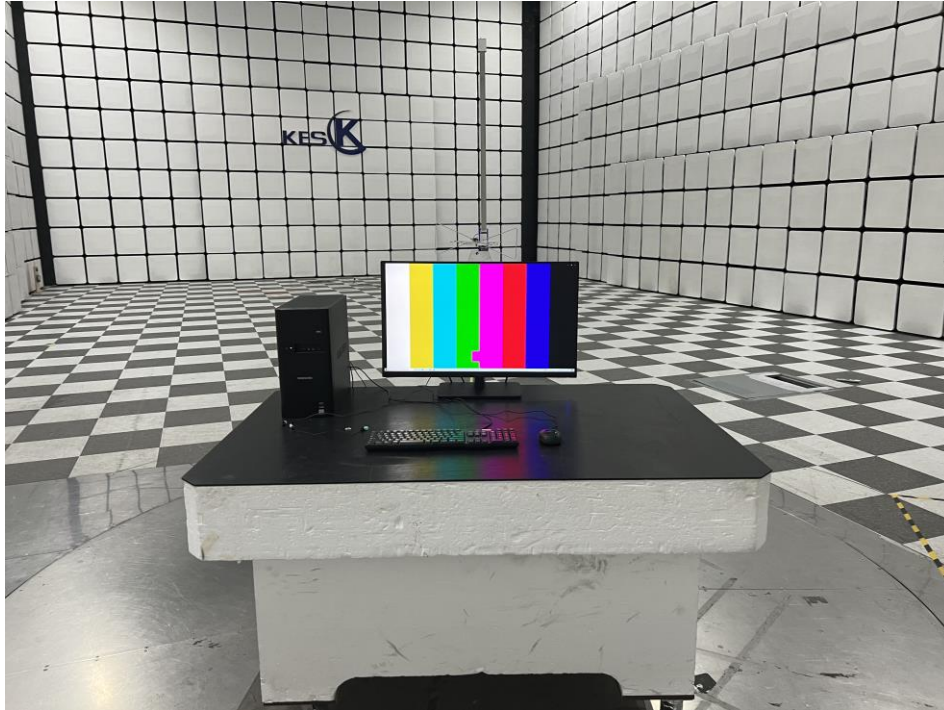
Conducted Telecommunication Emissions

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)



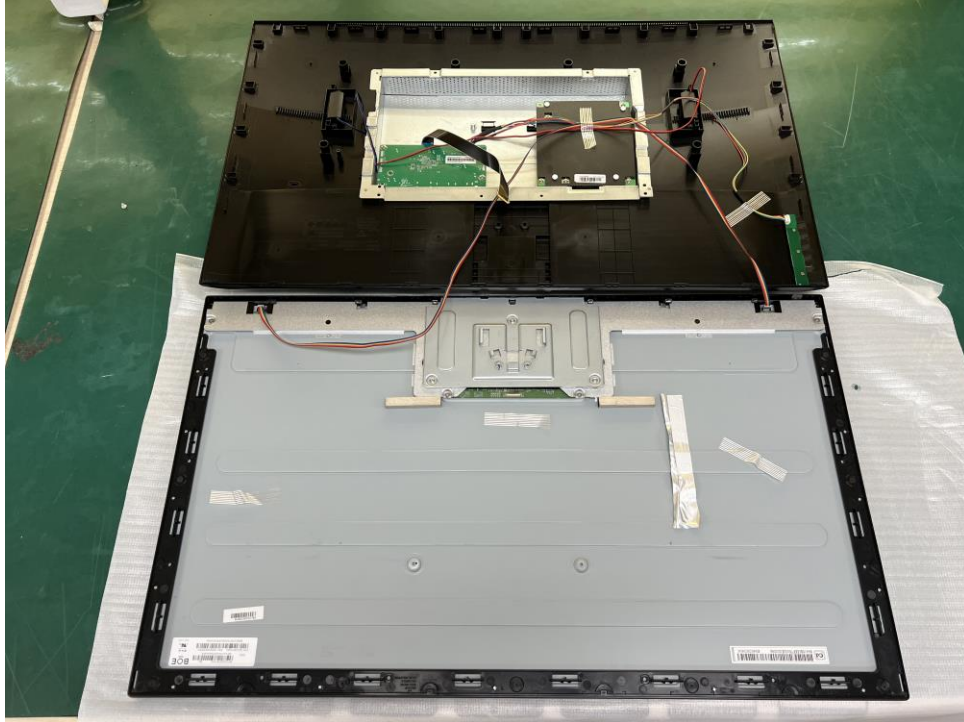
(Bottom)



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EUT Internal Photographs

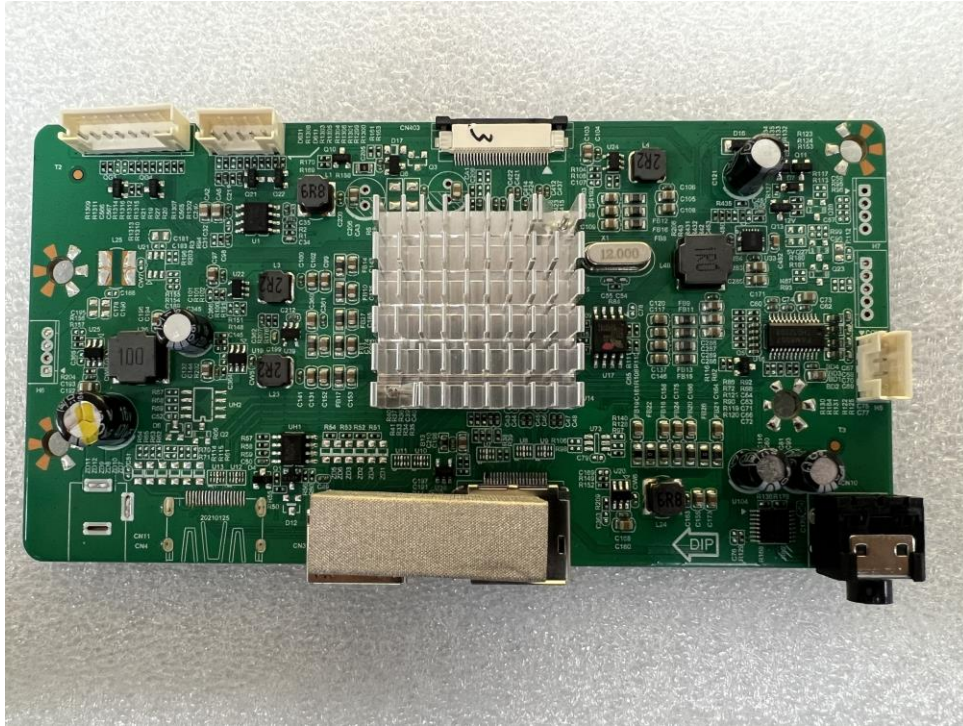
(Internal View)



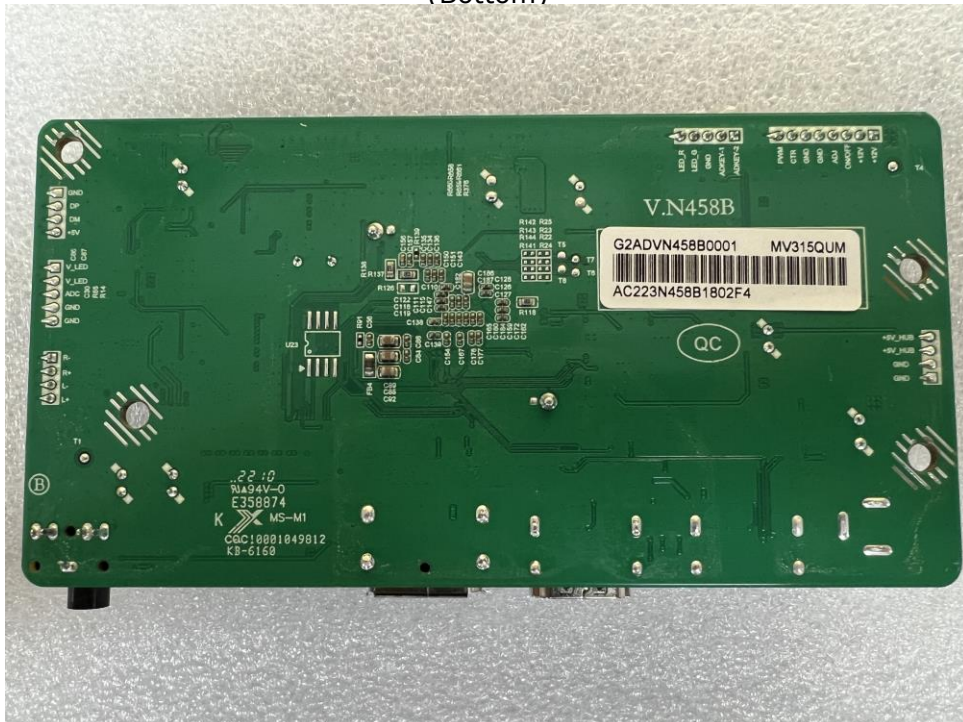
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EUT Internal View – Main Board

(Top)



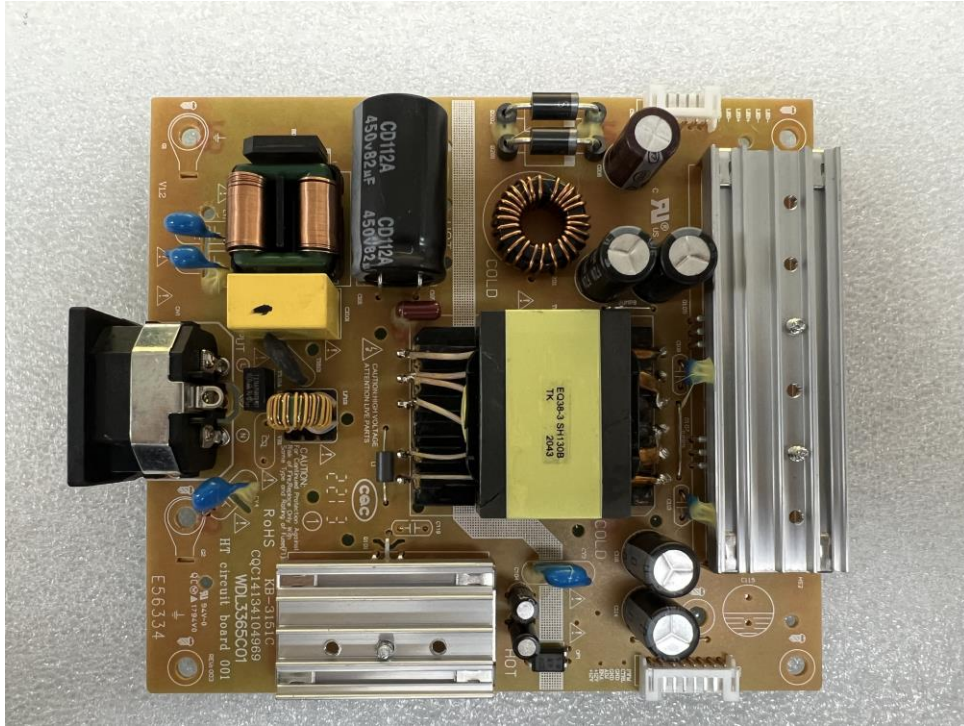
(Bottom)



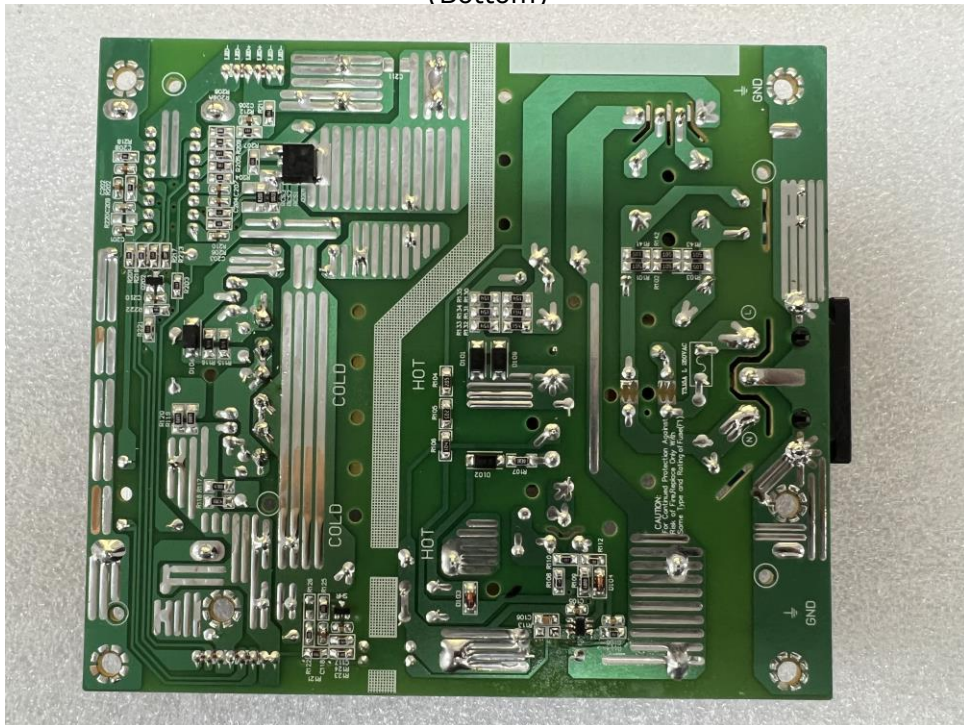
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EUT Internal View – SMPS Board

(Top)



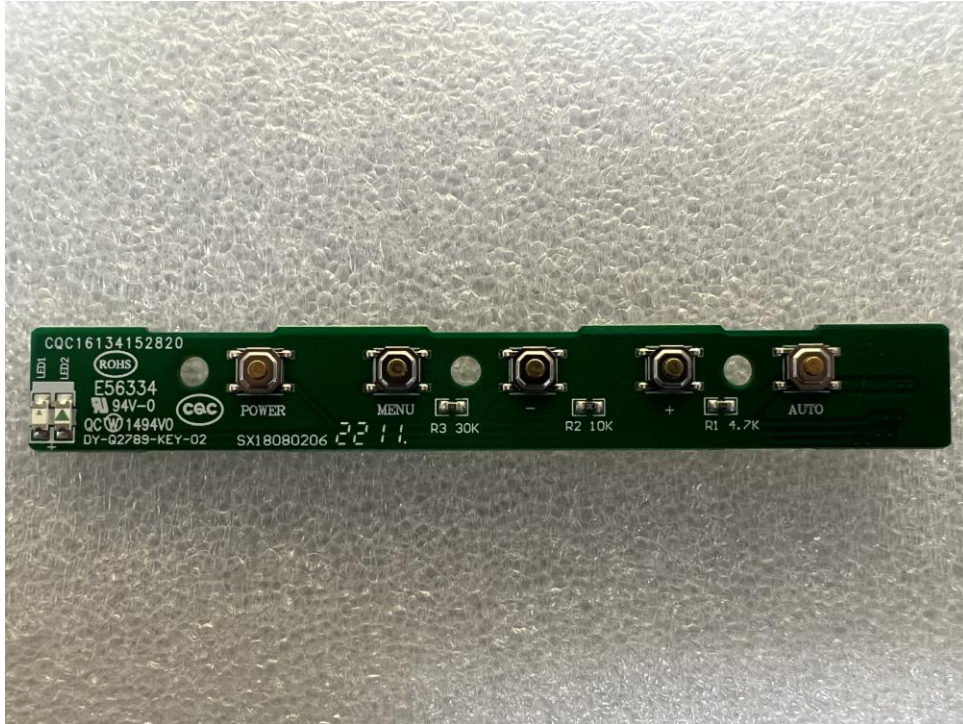
(Bottom)



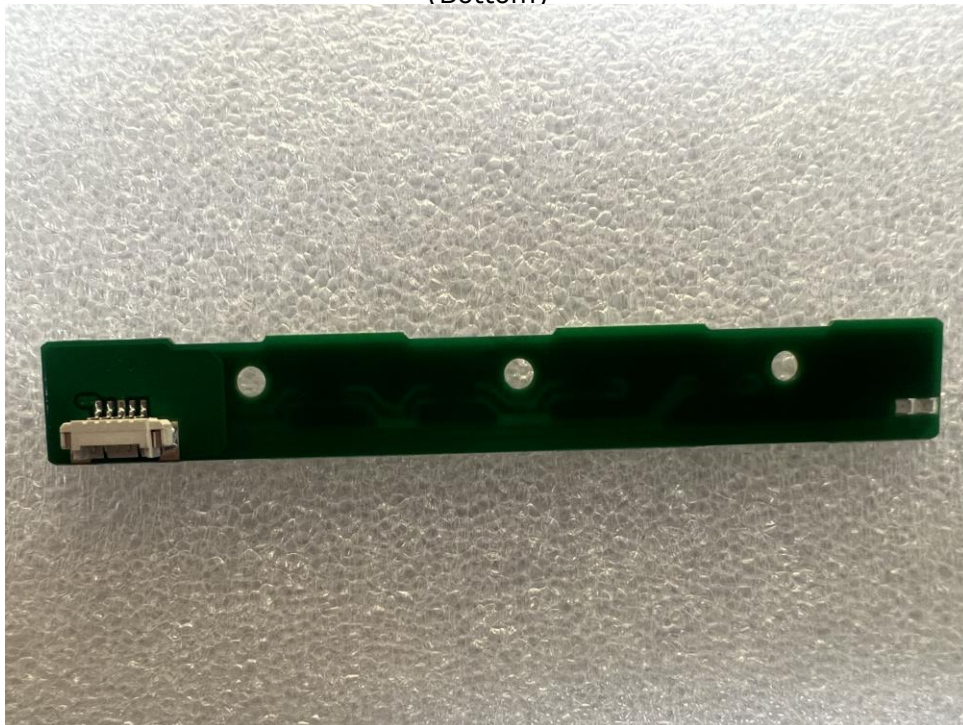
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EUT Internal View – Switch Board

(Top)



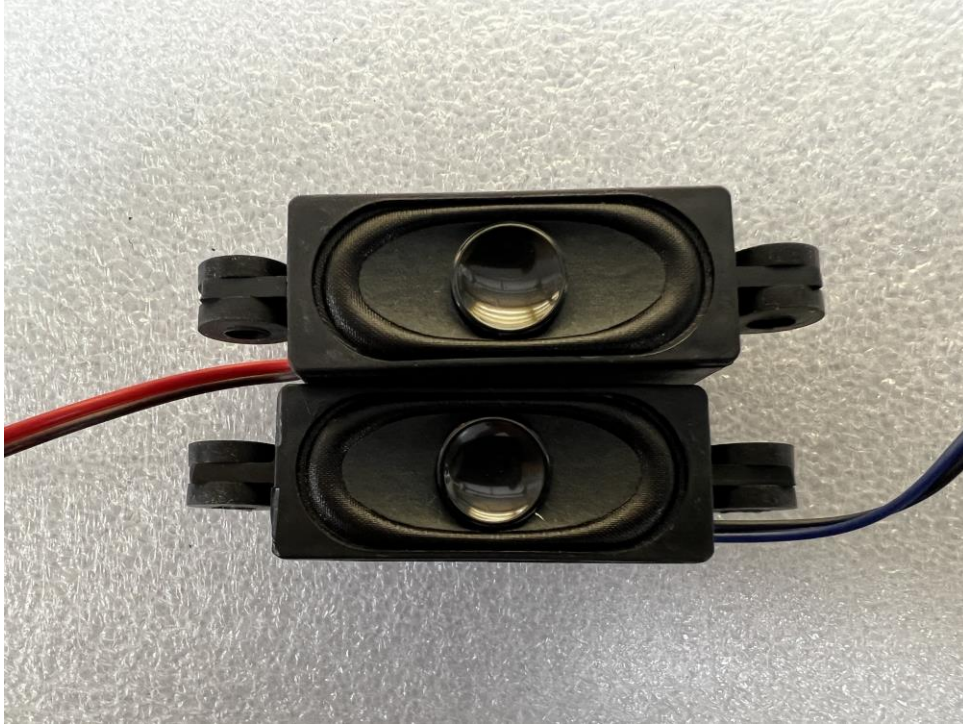
(Bottom)



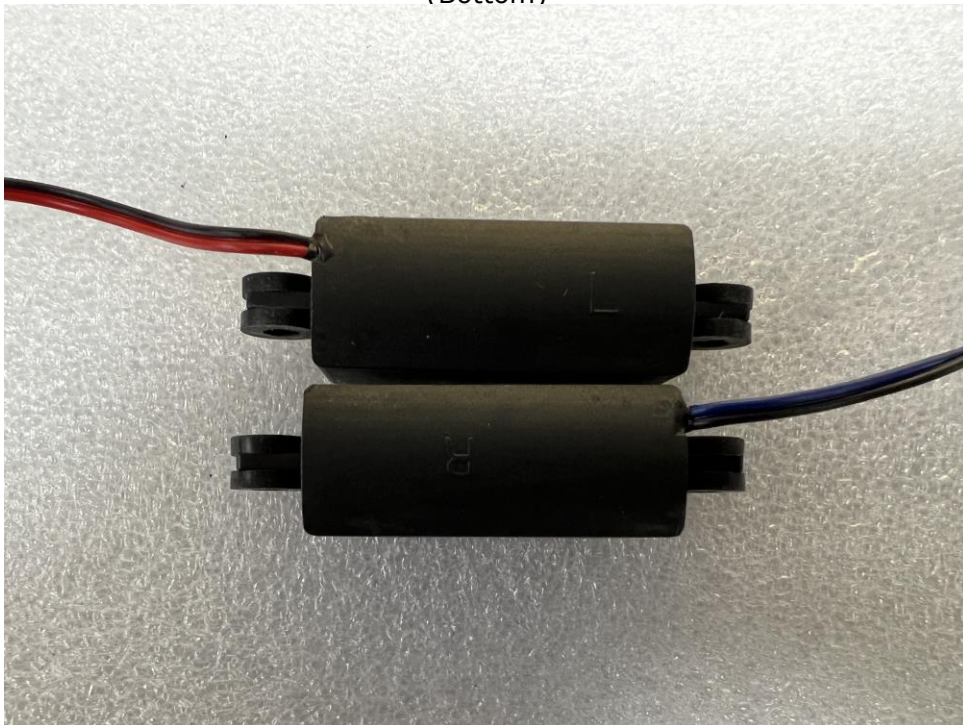
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EUT Internal View – Speaker

(Top)



(Bottom)



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EUT Internal View – LCD

(Top)



(Bottom)

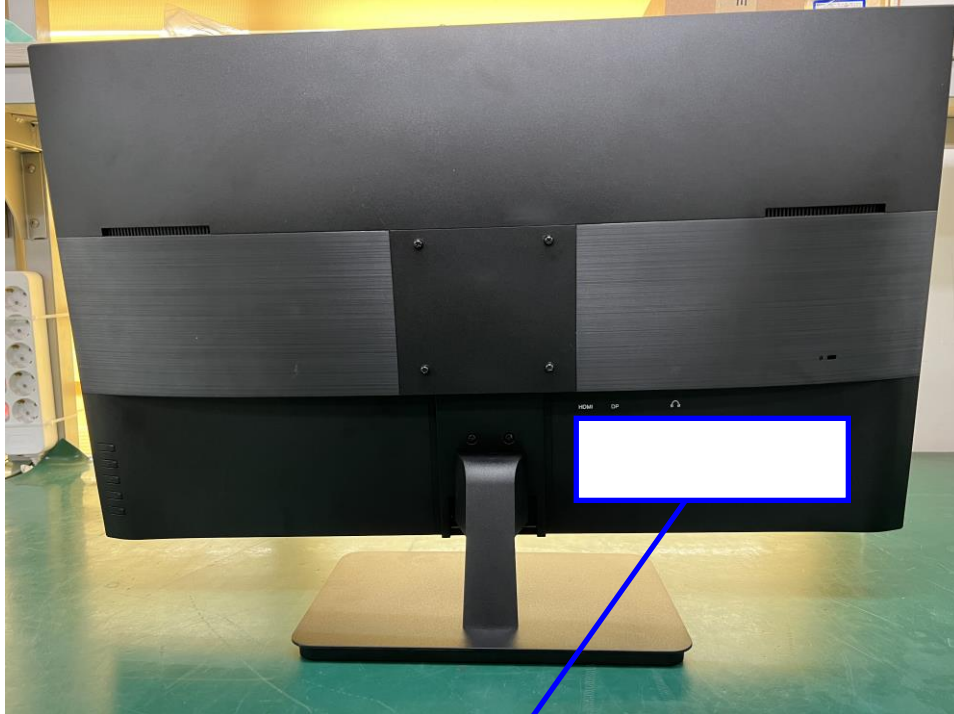


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(Label)



Label and Location

**LED MONITOR**

Model No : SMT-3240

Manufacturer : Weihai Daewoo Electronics Co., Ltd.

Made in China

