



TEST REPORT



Report No. : KES-EM-23T0942-R2
Page 1 / 52

KES Co., Ltd.
#3002, #3503, #3701, 40, Simin-daero
365beon-gil, Dongan-gu, Anyang-si,
Gyeonggi-do, 14057, Republic of Korea
Tel : +82-31-425-6200, Fax : +82-31-341-3838

1. Client

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

2. Sample Description

Product name : Public view monitor
Model/Type No. : SMT-2731PV
Variant Model : SMT-2721PV, SMT-2721PVW
Manufacturer : OIC KOREA Co., Ltd.
Manufacturer Address : 5F, 12, Annam-ro 369beon-gil, Bupyeong-gu, Incheon, 21312, Korea

3. Equipment authorization : Supplier's Declaration of Conformity

4. Date of Receipt : Sep. 30, 2025

5. Test date : Oct. 06, 2023 ~ Oct. 20, 2023

6. Date of Issue : Sep. 30, 2025

7. Test Results : In Compliance

Tested by

Reviewed by

Dae Soo Kim
EMC Test Engineer

Seong Min Choi
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
Nov. 06, 2023	KES-EM-23T0942	Issued
Mar. 12, 2024	KES-EM-23T0942-R1	Reissuance due to the addition of a derivative
Sep. 30, 2025	KES-EM-23T0942-R2	Reissuance due to the addition of a derivative

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd. This document may be altered or revised by KES Co., Ltd. personnel only, and shall be noted in the revision section of the document. Any alteration of this document not carried out by KES Co., Ltd. will constitute fraud and shall nullify the document.



TABLE OF CONTENTS

1.0	General Product Description.....	4
1.1	Test Voltage & Frequency	6
1.2	Variant Model Differences	6
1.3	Device Modifications	6
1.4	Equipment Under Test	6
1.5	Support Equipments	6
1.6	External I/O Cabling.....	7
1.7	EUT Operating Mode(s).....	8
1.8	Configuration.....	9
1.9	Remarks when standards applied	10
1.10	Calibration Details of Equipment Used for Measurement	10
1.11	Test Facility	10
1.12	Laboratory Accreditations and Listings	10
2.0	Test Regulations	11
2.1	Conducted Emissions at Mains Power Ports.....	12
2.2	Radiated Electric Field Emissions(Below 1 GHz).....	14
2.3	Radiated Electric Field Emissions(Above 1 GHz)	16
APPENDIX A – TEST DATA		18
Conducted Emissions at Mains Power Ports		18
Radiated Electric Field Emissions(Below 1 GHz)		26
Radiated Electric Field Emissions(Above 1 GHz).....		34
Test Setup Photos and Configuration.....		38
Conducted Emissions at Mains Power Ports		38
Radiated Electric Field Emissions(Below 1 GHz)		40
Radiated Electric Field Emissions(Above 1 GHz).....		42
EUT External Photographs.....		44
EUT Internal Photographs.....		45



1.0 General Product Description

Main Specifications of EUT are:

Display		
Type		LED Monitor
Screen Size		27"
Max. Resolution		1920*1080 60Hz (FHD)
Brightness		300 cd/m²
Contrast Ratio		1000:1
Aspect Ratio		16:9
Viewing Angle (H/V)		178°/178°
Display Color		16.7M Colors
Response Time		14ms
Video System		None
Panel Life		30,000 hours
Filter Type		None
Interface		
Video	Connectors	Camera(Internal, PIP/PBP), HDMI#1(PIP/PBP), HDMI#2 * two windows PIP/PBP : Internal Camera and HDMI#1
Composite Video	Input	None
VGA	Connector	None
	Input Signal	None
	Available Format	None
HDMI	Connector	HDMI 1.4 x 2
	Available Format	- 640×480@60Hz/72Hz/75Hz - 800×600@60Hz/72Hz/75Hz - 1024×768@60Hz/75Hz, - 1280x720p@50Hz/60Hz - 1280x1024@60Hz/75Hz - 1440x900@60Hz - 1680x1050@60Hz - 1920×1080@60Hz
DP	Connector	None
	Available Format	None
Audio	Connector	None
	Output Signal	Speakers : 8Ω 2Wx 2
Alarm	Alarm I/O	Input 1ea / Output 1ea
Network	Ethernet	1 RJ-45 10/100BASE-T,
General	Edge Storage	Micro SD/SDHC/SDXC 1slot 256GB
Application Support		None
On Screen Display		
Functions		VESA™ DPM Compatible
Language		English, Spanish, French
General		
Electrical	Input Voltage	DC24V, HPOE 802.3bt
	Power Consumption	31W
Environmental	Operating Temperature	0 ~ +40°C (+32°F ~ +104°F)
	Operating Humidity	10% ~ 80% (non-condensing)
Mechanical	Dimensions with Stand (WxHxD)	None
	Dimensions without Stand (WxHxD)	619mm(W) x 405mm(H) x 58mm(D)
	Weight with Packing	11Kg
	Weight without Packing	8.5kg
	Protection Glass	None
	Cabinet Color	Black
	Wall Mounts	None
	VESA Mounts Interface	VESA 100 x 100mm, 200 x 100mm, 200 x 200mm



Camera		
Video	Imaging Device	1/2.8" 2MP CMOS
	Max. Framerate	H.265/H.264: Max. 30fps/25fps(60Hz/50Hz) MJPEG: Max. 15fps/12fps(60Hz/50Hz)
	Min. Illumination	Color: 0.03Lux (F1.6, 1/30sec) (TBD)
Lens	Focal Length (Zoom Ratio)	3.06mm fixed focal
	Max. Aperture Ratio	F1.6
	Angular Field of View	H: 107.7° / V: 59.0° / D: 126.7°
Operational	Backlight Compensation	BLC, WDR, SDR
	Wide Dynamic Range	120dB
	Digital Noise Reduction	SSNR V, WiseNR II (Based on AI engine)
	Motion Detection	8ea, 8point Polygonal zones
	Privacy Masking	32ea, 4point Quadrangle zones
	Gain Control	Low / Middle / High
	White Balance	ATW / AWC / Manual / Indoor / Outdoor
	LDC	Support
	Electronic Shutter Speed	Minimum / Maximum / Anti flicker (1/5~1/12,000sec)
	Digital PTZ	Support
	Video Rotation	Flip, Mirror, Hallway view(90°/270°)
	Analytics	Classified object type: Person/Face Attributes: Not support Support DetectionShot Analytics events based on AI engine - Motion detection, Object detection, Virtual line(Crossing/Direction), Virtual area(Loitering/Intrusion/Enter/Exit) Analytics events - Defocus detection, Tampering, Virtual area(Appear/Disappear)
	Business Intelligence	People counting, Queue management, Heatmap based on AI engine
	Alarm Triggers	Analytics, Network disconnect, Alarm input
	Alarm Events	When alarm trigger occurred - File upload(image) : e-mail/FTP - Notification : e-mail - Recording : SD/SDHC/SDXC or NAS recording at event triggers - Alarm output - Handover(PTZ preset, Send message by HTTP/HTTPS/TCP)
	Smart Codec	WiseStream III
	Security	HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access Log 802.1X Authentication(EAP-TLS, EAP-LEAP) Device Certificate(Hanwha Techwin Root CA, pre-installed)
	Application Programming Interface	ONVIF Profile S/G/T/M SUNAPI(HTTP API)
	Memory	2GB RAM, 1GB Flash



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 120 V / 60 Hz(AC/DC ADAPTOR) ☒ PoE

1.2 Variant Model Differences

- SMT-2721PV: Add derivation model due to SW difference. (Delete PIP and PBP features)
- SMT-2721PVW : Add derivative due to SW difference and color change.
(Delete PIP and PBP features)

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
Public view monitor	SMT-2731PV	-	OIC KOREA Co., Ltd.	EUT
AC/DC ADAPTOR	FSP060-DAAN3	-	FSP	-
IR REMOCON	-	-	-	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Micro SD Card	-	-	SanDisk	-
Laptop 1	LG15N54	506NZGK000615	LG ELECTRONICS NANJING NEW TECHNOLOGY CO., LTD	-
Laptop 1 Adapter	PA-1650-43(65W)	OF58U63849302Y6 09	LITE-ON TECHNOLOGY (CHANGZHOU)CO., LTD	-
Laptop 2	LG15N54	411NZJV044052	LG ELECTRONICS NANJING NEW TECHNOLOGY CO., LTD	-
Laptop 2 Adapter	PA-1900-14	-	LITE-ON TECHNOLOGY (CHANGZHOU)CO., LTD	-
PoE Injector	PT-PSE109GBRO-AH	-	Dongguan PROCET Network Technology Co., Ltd	-
LED Alarm	PRO-SL	-	SENSOR PRO	-
Button Alarm	-	-	-	-



1.6 External I/O Cabling

■ DC-HDMI, DC-CAMERA MODE

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
Public view monitor (EUT)	Micro SD Slot	Micro SD Card	Micro SD Slot	-	-
	DC JACK	AC/DC ADAPTOR	DC JACK	1.0	U
	ALARM IN	Button Alarm	Alarm Out	3.1	U
	ALARM OUT	LED Alarm	Alarm In	3.1	U
	PoE	Laptop 1	RJ-45	3.1	S
	HDMI 1		HDMI	1.6	S
	HDMI 2	Laptop 2	HDMI	1.6	S
	IR	IR REMOCON	IR	-	-
Laptop 1	DC jack	Laptop Adapter 1	DC jack	1.5	U
Laptop 2	DC jack	Laptop Adapter 2	DC jack	1.5	U

* Unshielded=U, Shielded=S

■ PoE-HDMI, PoE-CAMERA MODE

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
Public view monitor (EUT)	Micro SD Slot	Micro SD Card	Micro SD Slot	-	-
	PoE	PoE Injector	RJ-45 (PoE)	3.1	S
	ALARM IN	Button Alarm	Alarm Out	3.1	U
	ALARM OUT	LED Alarm	Alarm In	3.1	U
	HDMI 1	Laptop 1	HDMI	1.6	S
	HDMI 2	Laptop 2	HDMI	1.6	S
	IR	IR REMOCON	IR	-	-
PoE Injector	RJ-45 (DATA)	Laptop	RJ-45	2.5	U
Laptop 1	DC jack	Laptop Adapter 1	DC jack	1.5	U
Laptop 2	DC jack	Laptop Adapter 2	DC jack	1.5	U

* Unshielded=U, Shielded=S



1.7 EUT Operating Mode(s)

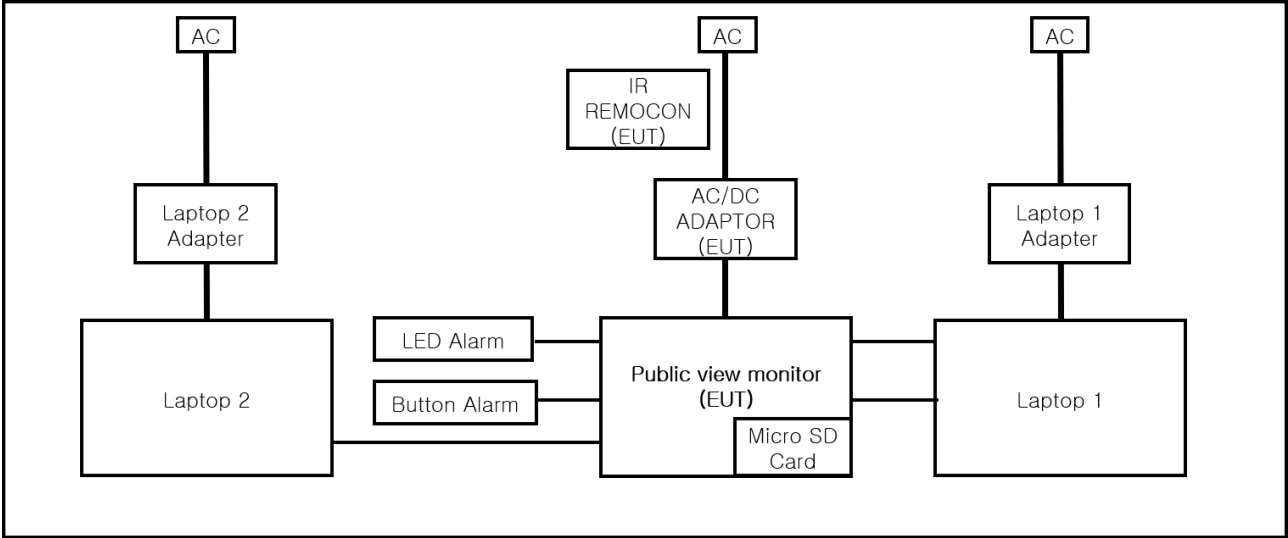
Test mode	operating
Operation MODE (DC-HDMI, DC-CAMERA MODE PoE-HDMI, PoE-CAMERA MODE)	Monitoring EUT Using Web Viewer, Ping Test HDMI : The screen of the laptop is output on the EUT as HDMI. CAMERA : The camera screen is output on the EUT. SD CARD : After the test, check if the EUT video has been recorded normally.

EUT Test operating S/W		
Name	Version	Manufacture Company
Web Viewer	-	Hanwha Vision Co., Ltd.

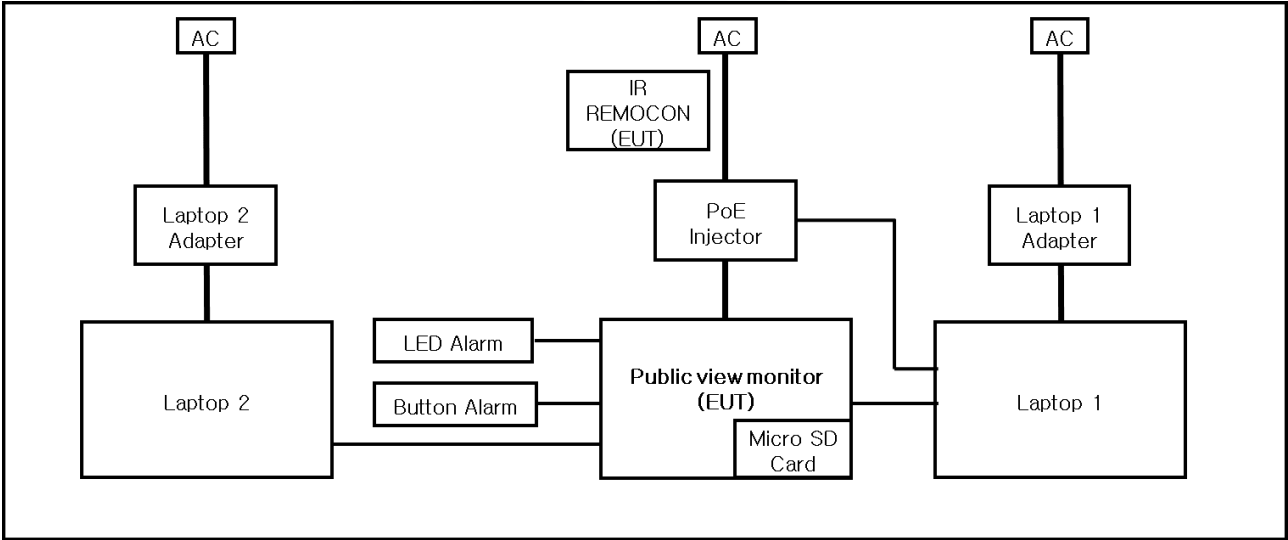


1.8 Configuration

■ DC-HDMI, DC-CAMERA MODE



■ PoE-HDMI, PoE-CAMERA MODE





1.9 Remarks when standards applied

- The USB port was excluded from the test because it was for administrators.
- The PoE mode of this test equipment receives PoE power, and the PoE port is considered a wired network port, so the test items related to the power port are not applicable.

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:

☒ **47 CFR Part 15, Subpart B**

☐ CISPR 22:2009 +A1:2010

☐ Class A

☐ Class B

☒ ANSI C63.4a-2017

☒ Class A

☐ Class B

☒ **IC Regulation ICES-003 Issue 7**

☐ CAN/CSA-CISPR 32:17

☐ Class A

☐ Class B

☒ ANSI C63.4a-2017

☒ Class A

☐ Class B





2.1 Conducted Emissions at Mains Power Ports

Test Date

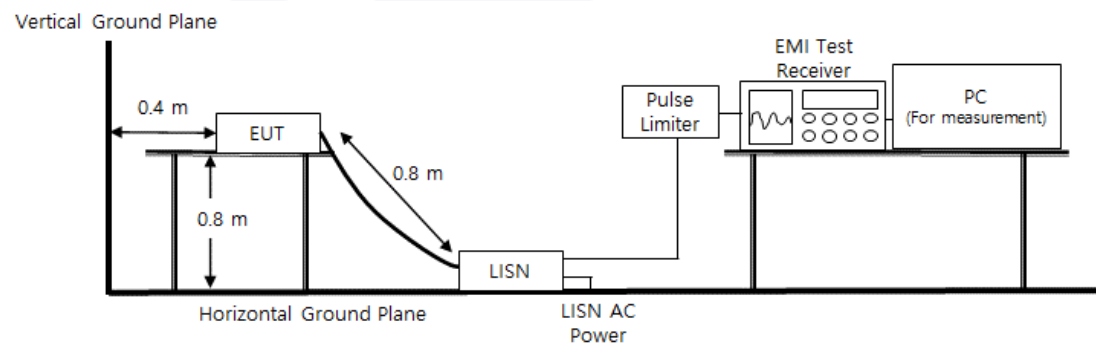
Oct. 20, 2023

Test Location

Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test SW	EMC32	R & S	9.12.00	-
☒	EMI TEST RECEIVER	ESR3	R & S	101783	11, 11, 2023
☒	LISN	ENV216	R & S	101787	11, 10, 2023
☒	LISN	ESH2-Z5	R & S	100450	11, 10, 2023
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 10, 2023

Diagram of test setup



Test Conditions

Temperature: (22,9 ± 0,1) °C
Relative Humidity: (47,3 ± 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.





2.2 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Oct. 20, 2023

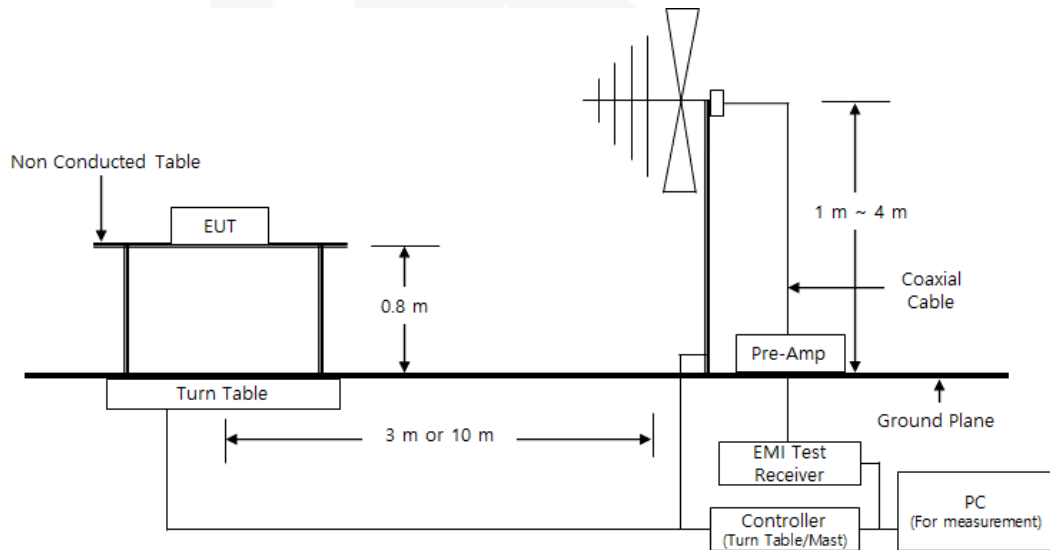
Test Location

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

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESU26	R & S	100551	03, 21, 2024
☒	AMPLIFIER	SCU 01	R & S	100603	11, 10, 2023
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	11, 17, 2024
☒	ATTENUATOR	8491A	HP	32173	03, 03, 2024

Diagram of test setup





Test Conditions

Temperature: (22,6 ± 0,1) °C
Relative Humidity: (45,3 ± 0,1) % R.H.

Frequency Range of Measurement

30 MHz to 1 GHz

Instrument Settings

IF Band Width: 120 kHz

Test Results

The requirements are:

- ☒ PASS
- ☐ NOT PASS
- ☐ NOT APPLICABLE

Remarks

See Appendix A for test data.





2.3 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Oct. 06, 2023

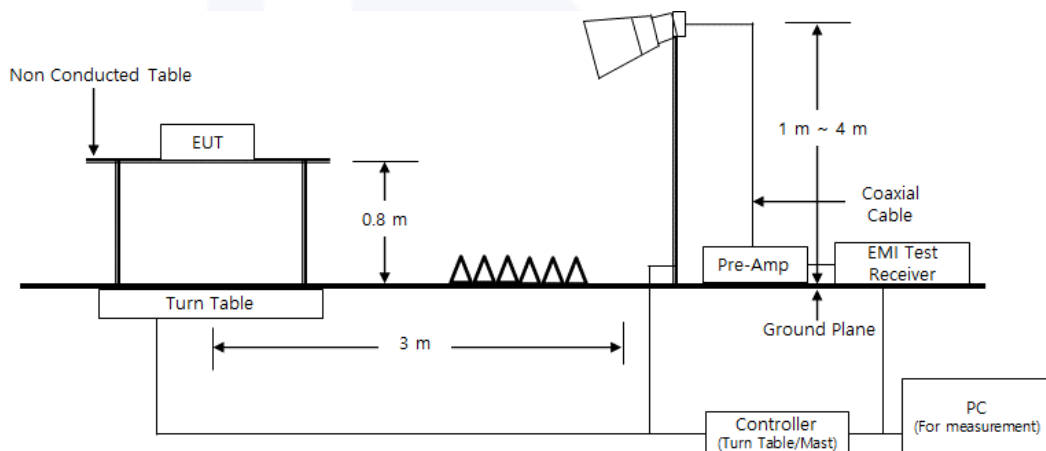
Test Location

SEMI ANECHOIC CHAMBER #5

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test SW	ES10/RE	TOYO Corporation	2022.01.000	-
☒	EMI TEST RECEIVER	ESU26	Rohde & Schwarz	100552	03, 21, 2024
☒	HORN ANTENNA	BBHA 9120D	SCHWARZBECK	9120D-1802	11, 08, 2023
☒	PREAMPLIFIER	8449B	HP	3008A00538	05, 31, 2024
☒	ATTENUATOR	8491B	HP	23094	03, 21, 2024

Diagram of test setup





Test Conditions

Temperature: (23,3 ± 0,2) °C
Relative Humidity: (47,5 ± 0,2) % 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.
- The Average of the test data is the cispr average result.



APPENDIX A – TEST DATA

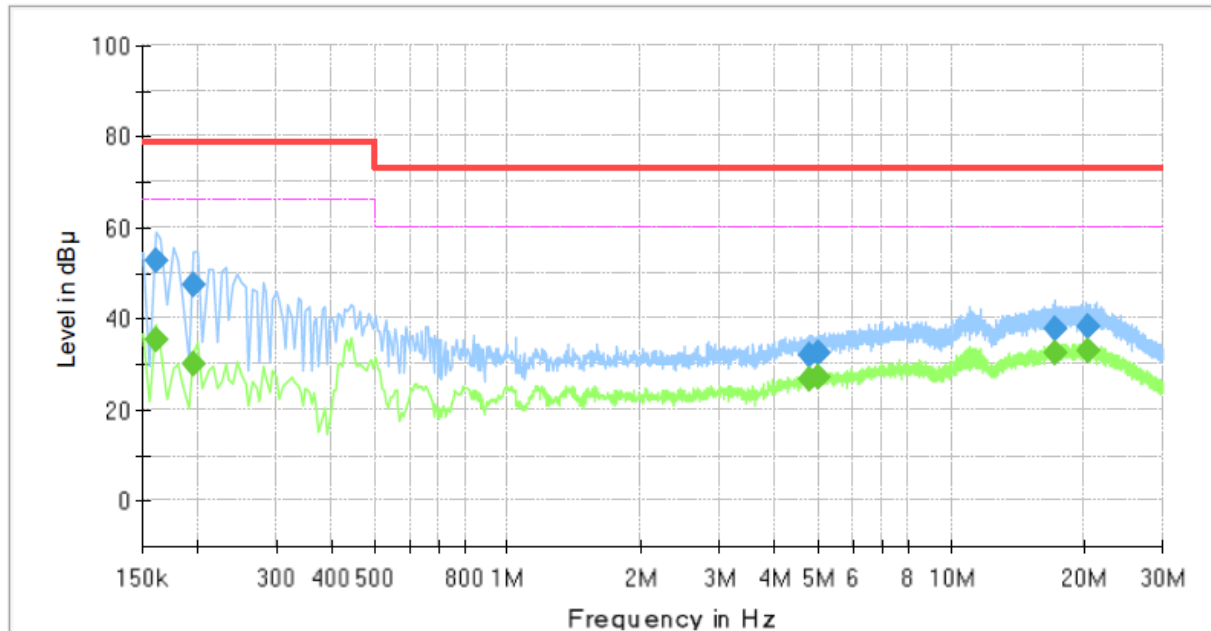
Conducted Emissions at Mains Power Ports

■ DC-HDMI MODE

HOT LINE

Common Information

Test Description:	Conducted Emission
Model No.:	SMT-2731PV
Phase:	H
Mode:	DC-HDMI
Operator Name:	KES



Final Result

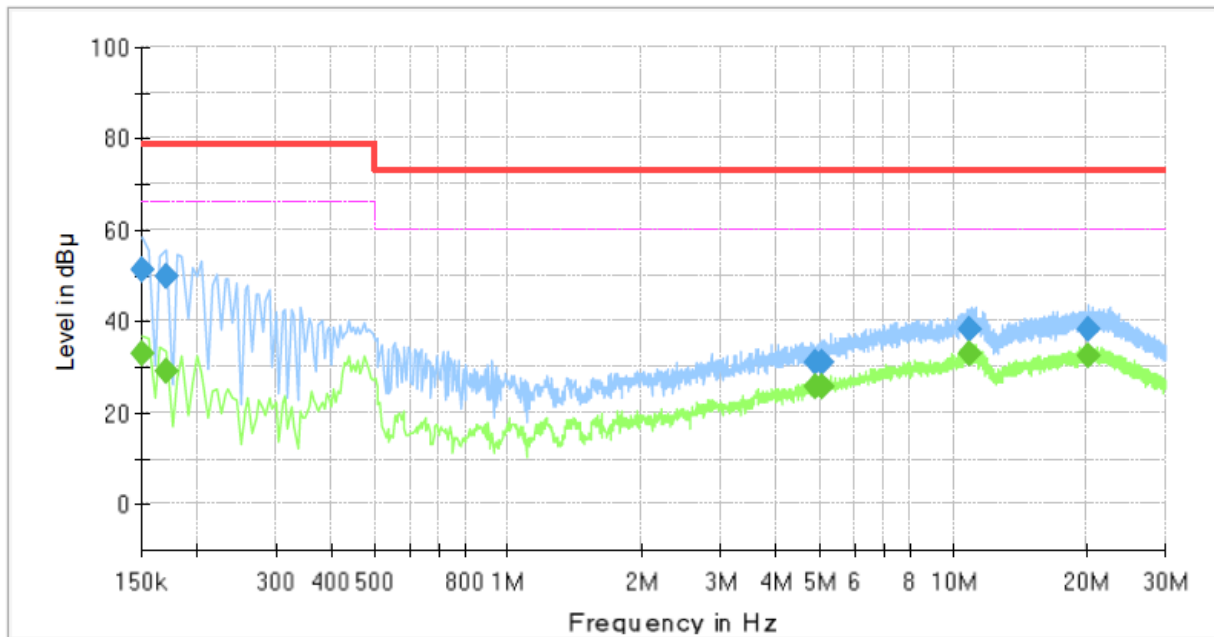
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.160000	52.79	---	79.00	26.21	1000.0	9.000	L1	19.4
0.160000	---	35.23	66.00	30.77	1000.0	9.000	L1	19.4
0.195000	---	29.92	66.00	36.08	1000.0	9.000	L1	19.4
0.195000	47.22	---	79.00	31.78	1000.0	9.000	L1	19.4
4.790000	---	26.51	60.00	33.49	1000.0	9.000	L1	19.7
4.790000	31.95	---	73.00	41.05	1000.0	9.000	L1	19.7
5.000000	---	26.94	60.00	33.06	1000.0	9.000	L1	19.7
5.000000	32.29	---	73.00	40.71	1000.0	9.000	L1	19.7
17.140000	---	32.48	60.00	27.52	1000.0	9.000	L1	20.1
17.140000	37.98	---	73.00	35.02	1000.0	9.000	L1	20.1
20.395000	---	32.84	60.00	27.16	1000.0	9.000	L1	20.2
20.395000	38.26	---	73.00	34.74	1000.0	9.000	L1	20.2



NEUTRAL LINE

Common Information

Test Description: Conducted Emission
Model No.: SMT-2731PV
Phase: N
Mode: DC-HDMI
Operator Name: KES

**Final Result**

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.150000	51.08	---	79.00	27.92	1000.0	9.000	N	19.4
0.150000	---	33.01	66.00	32.99	1000.0	9.000	N	19.4
0.170000	---	28.96	66.00	37.04	1000.0	9.000	N	19.4
0.170000	49.60	---	79.00	29.40	1000.0	9.000	N	19.4
4.890000	---	25.60	60.00	34.40	1000.0	9.000	N	19.7
4.890000	31.09	---	73.00	41.91	1000.0	9.000	N	19.7
5.075000	---	25.75	60.00	34.25	1000.0	9.000	N	19.7
5.075000	31.24	---	73.00	41.76	1000.0	9.000	N	19.7
10.930000	---	32.87	60.00	27.13	1000.0	9.000	N	19.9
10.930000	38.46	---	73.00	34.54	1000.0	9.000	N	19.9
20.175000	---	32.69	60.00	27.31	1000.0	9.000	N	20.2
20.175000	38.10	---	73.00	34.90	1000.0	9.000	N	20.2

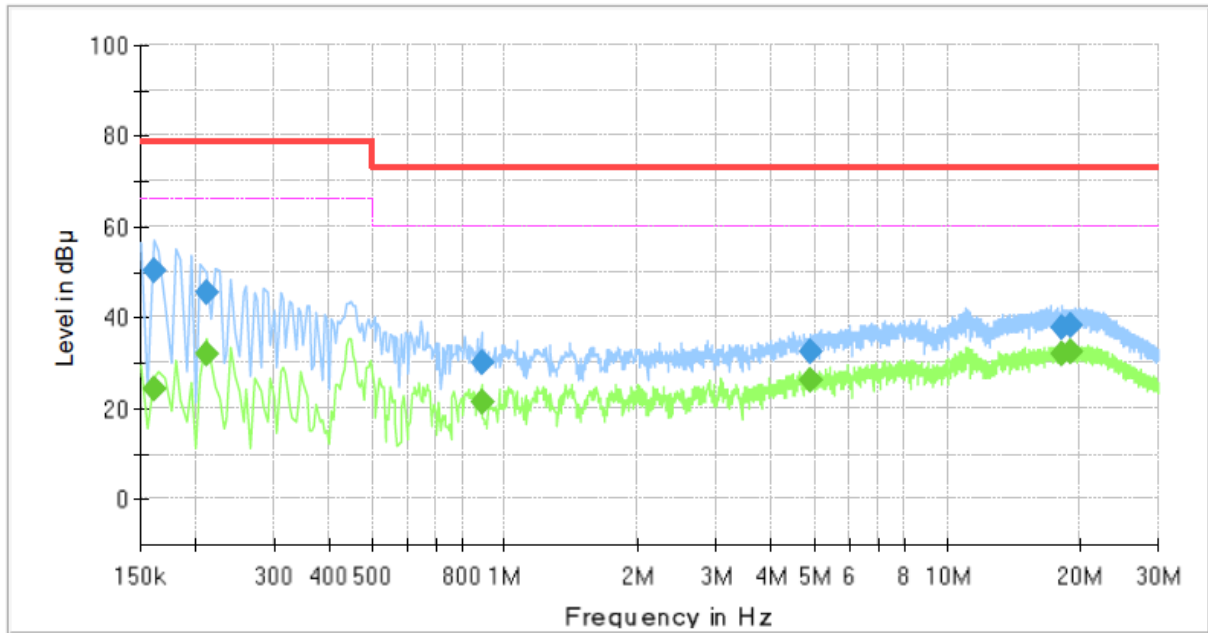


■ DC-CAMERA MODE

HOT LINE

Common Information

Test Description: Conducted Emission
Model No.: SMT-2731PV
Phase: H
Mode: DC-CAMERA
Operator Name: KES



Final Result

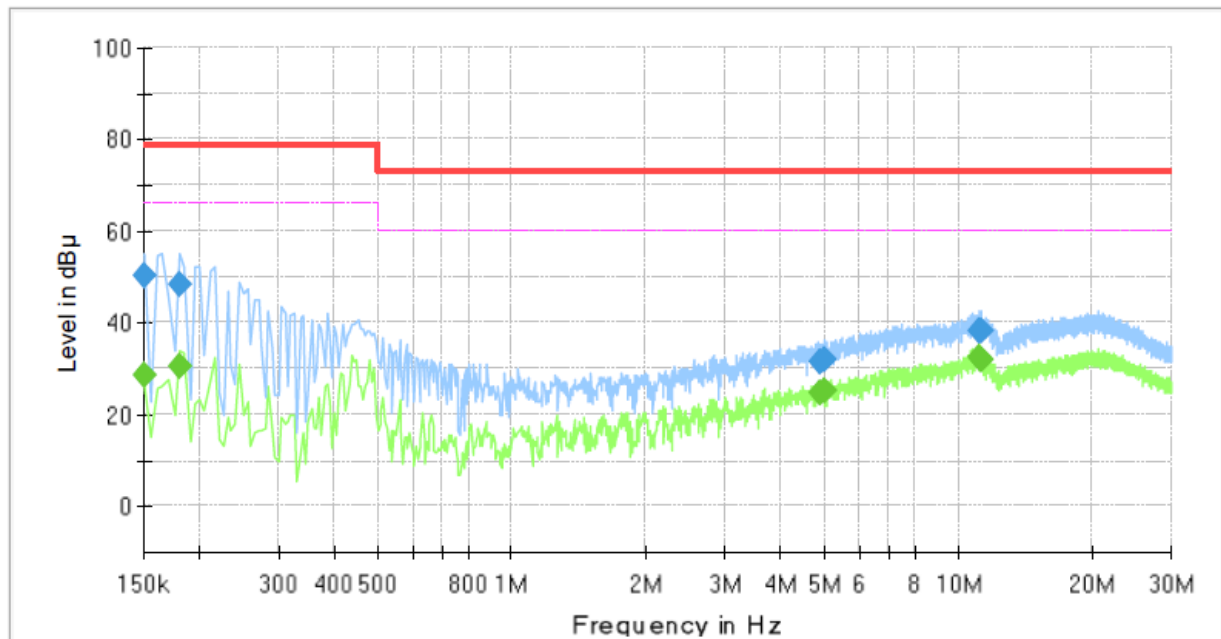
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.160000	---	24.21	66.00	41.79	1000.0	9.000	L1	19.4
0.160000	50.34	---	79.00	28.66	1000.0	9.000	L1	19.4
0.210000	---	32.09	66.00	33.91	1000.0	9.000	L1	19.4
0.210000	45.51	---	79.00	33.49	1000.0	9.000	L1	19.4
0.885000	---	21.27	60.00	38.73	1000.0	9.000	L1	19.5
0.885000	30.21	---	73.00	42.79	1000.0	9.000	L1	19.5
4.895000	---	26.17	60.00	33.83	1000.0	9.000	L1	19.7
4.895000	32.55	---	73.00	40.45	1000.0	9.000	L1	19.7
18.270000	---	32.13	60.00	27.87	1000.0	9.000	L1	20.2
18.270000	37.78	---	73.00	35.22	1000.0	9.000	L1	20.2
19.035000	---	32.30	60.00	27.70	1000.0	9.000	L1	20.2
19.035000	38.03	---	73.00	34.97	1000.0	9.000	L1	20.2



NEUTRAL LINE

Common Information

Test Description: Conducted Emission
Model No.: SMT-2731PV
Phase: N
Mode: DC-CAMERA
Operator Name: KES

**Final Result**

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.150000	---	28.70	66.00	37.30	1000.0	9.000	N	19.4
0.150000	50.18	---	79.00	28.82	1000.0	9.000	N	19.4
0.180000	---	30.64	66.00	35.36	1000.0	9.000	N	19.4
0.180000	48.25	---	79.00	30.75	1000.0	9.000	N	19.4
4.885000	---	24.95	60.00	35.05	1000.0	9.000	N	19.7
4.885000	31.60	---	73.00	41.40	1000.0	9.000	N	19.7
5.005000	---	25.46	60.00	34.54	1000.0	9.000	N	19.7
5.005000	31.83	---	73.00	41.17	1000.0	9.000	N	19.7
11.160000	---	32.31	60.00	27.69	1000.0	9.000	N	20.0
11.160000	38.15	---	73.00	34.85	1000.0	9.000	N	20.0
11.230000	---	32.21	60.00	27.79	1000.0	9.000	N	20.0
11.230000	38.03	---	73.00	34.97	1000.0	9.000	N	20.0



■ PoE-HDMI MODE

HOT LINE

Common Information

Test Description:

Model No.:

Phase:

Mode:

Operator Name:

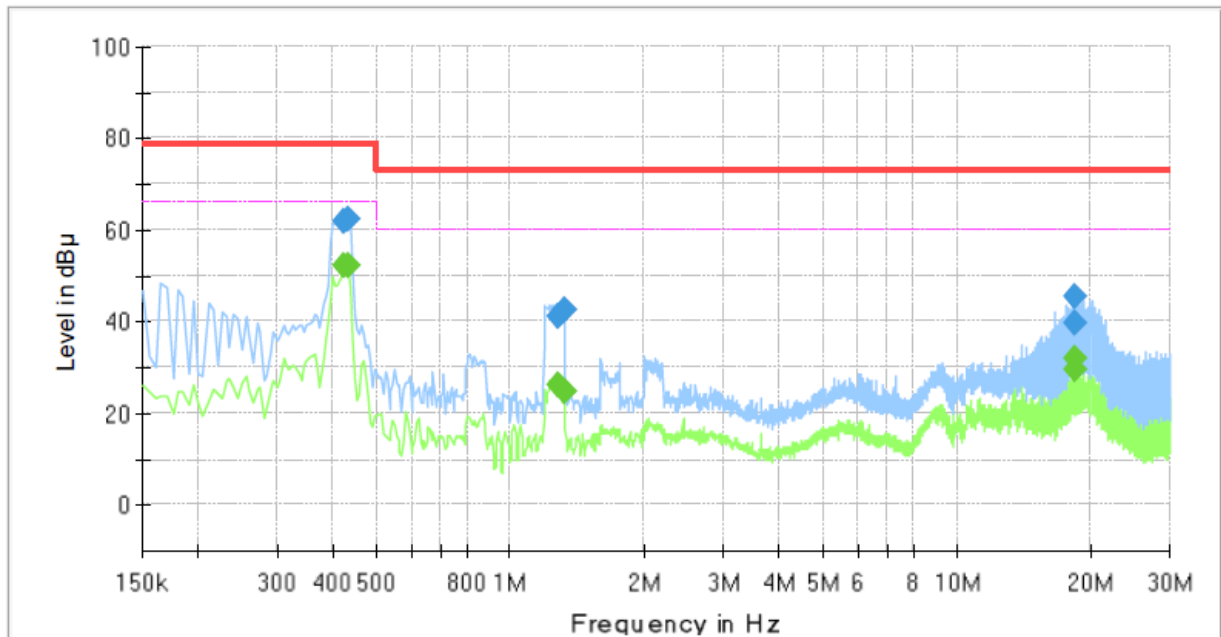
Conducted Emission

SMT-2731PV

H

PoE-HDMI

KES



Final Result

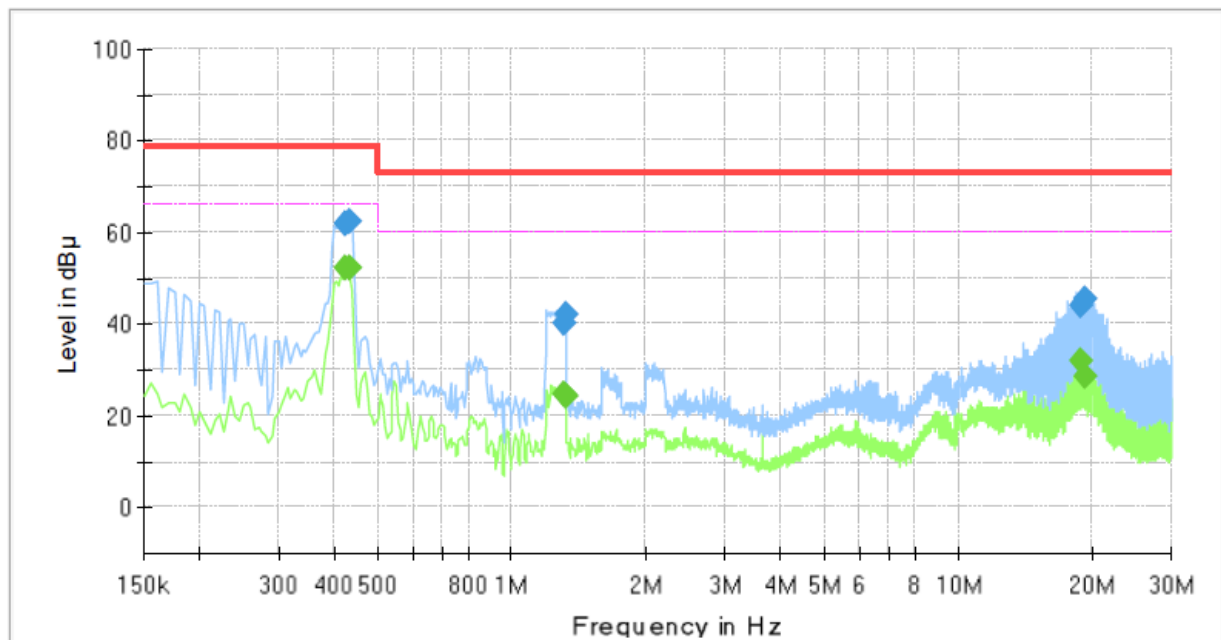
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.425000	62.04	---	79.00	16.96	1000.0	9.000	L1	19.4
0.425000	---	52.24	66.00	13.76	1000.0	9.000	L1	19.4
0.435000	---	52.36	66.00	13.64	1000.0	9.000	L1	19.4
0.435000	62.52	---	79.00	16.48	1000.0	9.000	L1	19.4
1.280000	---	25.95	60.00	34.05	1000.0	9.000	L1	19.5
1.280000	40.92	---	73.00	32.08	1000.0	9.000	L1	19.5
1.315000	---	24.68	60.00	35.32	1000.0	9.000	L1	19.5
1.315000	42.75	---	73.00	30.25	1000.0	9.000	L1	19.5
18.305000	---	31.83	60.00	28.17	1000.0	9.000	L1	20.2
18.305000	39.69	---	73.00	33.31	1000.0	9.000	L1	20.2
18.410000	---	29.48	60.00	30.52	1000.0	9.000	L1	20.2
18.410000	45.39	---	73.00	27.61	1000.0	9.000	L1	20.2



NEUTRAL LINE

Common Information

Test Description: Conducted Emission
Model No.: SMT-2731PV
Phase: N
Mode: PoE-HDMI
Operator Name: KES

**Final Result**

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.425000	---	52.00	66.00	14.00	1000.0	9.000	N	19.4
0.425000	61.83	---	79.00	17.17	1000.0	9.000	N	19.4
0.435000	---	52.17	66.00	13.83	1000.0	9.000	N	19.4
0.435000	62.42	---	79.00	16.58	1000.0	9.000	N	19.4
1.305000	---	24.73	60.00	35.27	1000.0	9.000	N	19.5
1.305000	40.32	---	73.00	32.68	1000.0	9.000	N	19.5
1.315000	---	24.03	60.00	35.97	1000.0	9.000	N	19.5
1.315000	41.99	---	73.00	31.01	1000.0	9.000	N	19.5
18.820000	---	31.97	60.00	28.03	1000.0	9.000	N	20.2
18.820000	43.80	---	73.00	29.20	1000.0	9.000	N	20.2
19.285000	---	28.46	60.00	31.54	1000.0	9.000	N	20.2
19.285000	45.64	---	73.00	27.36	1000.0	9.000	N	20.2



■ PoE-CAMERA MODE

HOT LINE

Common Information

Test Description:

Model No.:

Phase:

Mode:

Operator Name:

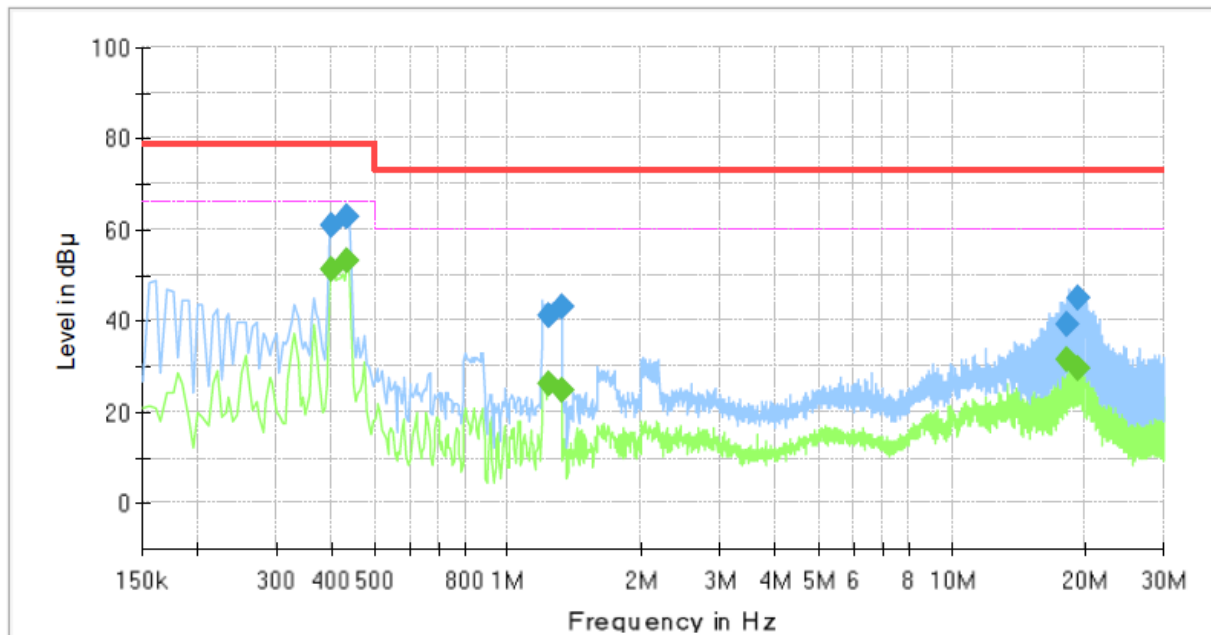
Conducted Emission

SMT-2731PV

H

PoE-CAMERA

KES



Final Result

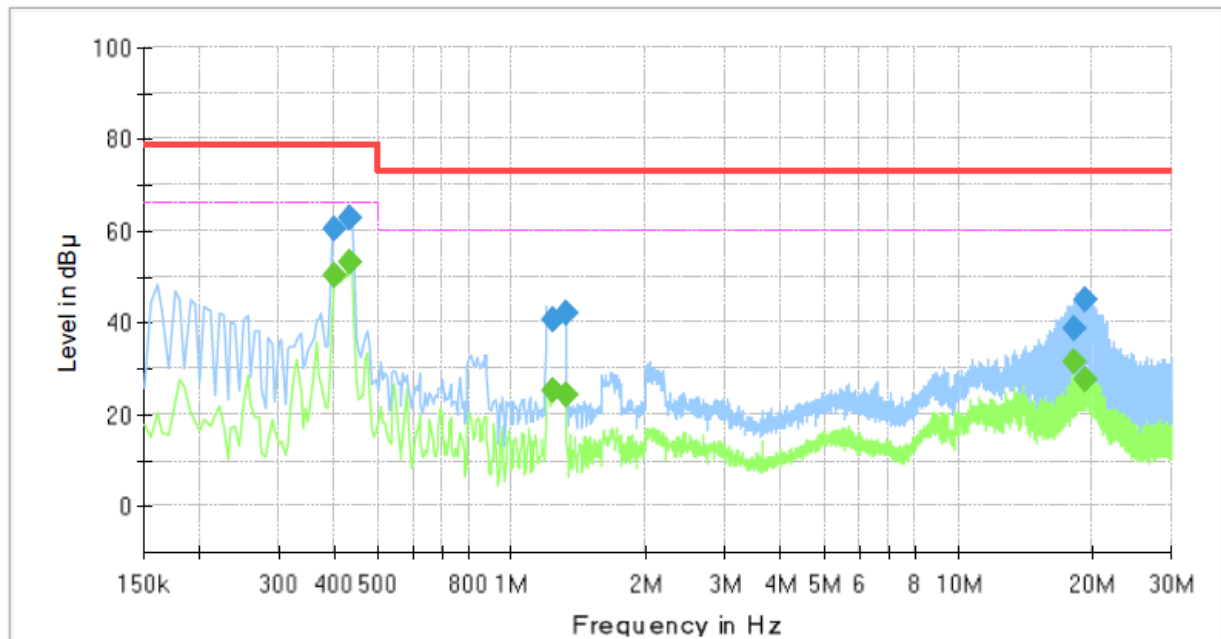
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.400000	---	51.25	66.00	14.75	1000.0	9.000	L1	19.4
0.400000	60.74	---	79.00	18.26	1000.0	9.000	L1	19.4
0.435000	---	53.35	66.00	12.65	1000.0	9.000	L1	19.4
0.435000	62.86	---	79.00	16.14	1000.0	9.000	L1	19.4
1.240000	---	26.37	60.00	33.63	1000.0	9.000	L1	19.5
1.240000	41.20	---	73.00	31.80	1000.0	9.000	L1	19.5
1.315000	---	24.85	60.00	35.15	1000.0	9.000	L1	19.5
1.315000	42.85	---	73.00	30.15	1000.0	9.000	L1	19.5
18.245000	---	31.72	60.00	28.28	1000.0	9.000	L1	20.2
18.245000	39.10	---	73.00	33.90	1000.0	9.000	L1	20.2
19.135000	---	29.54	60.00	30.46	1000.0	9.000	L1	20.2
19.135000	45.05	---	73.00	27.95	1000.0	9.000	L1	20.2



NEUTRAL LINE

Common Information

Test Description: Conducted Emission
Model No.: SMT-2731PV
Phase: N
Mode: PoE-CAMERA
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.400000	60.52	---	79.00	18.48	1000.0	9.000	N	19.4
0.400000	---	50.54	66.00	15.46	1000.0	9.000	N	19.4
0.435000	---	53.06	66.00	12.94	1000.0	9.000	N	19.4
0.435000	62.74	---	79.00	16.26	1000.0	9.000	N	19.4
1.235000	---	25.03	60.00	34.97	1000.0	9.000	N	19.5
1.235000	40.46	---	73.00	32.54	1000.0	9.000	N	19.5
1.315000	---	24.11	60.00	35.89	1000.0	9.000	N	19.5
1.315000	41.93	---	73.00	31.07	1000.0	9.000	N	19.5
18.245000	---	31.69	60.00	28.31	1000.0	9.000	N	20.2
18.245000	38.86	---	73.00	34.14	1000.0	9.000	N	20.2
19.285000	---	27.83	60.00	32.17	1000.0	9.000	N	20.2
19.285000	44.92	---	73.00	28.08	1000.0	9.000	N	20.2

◆ Calculation

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

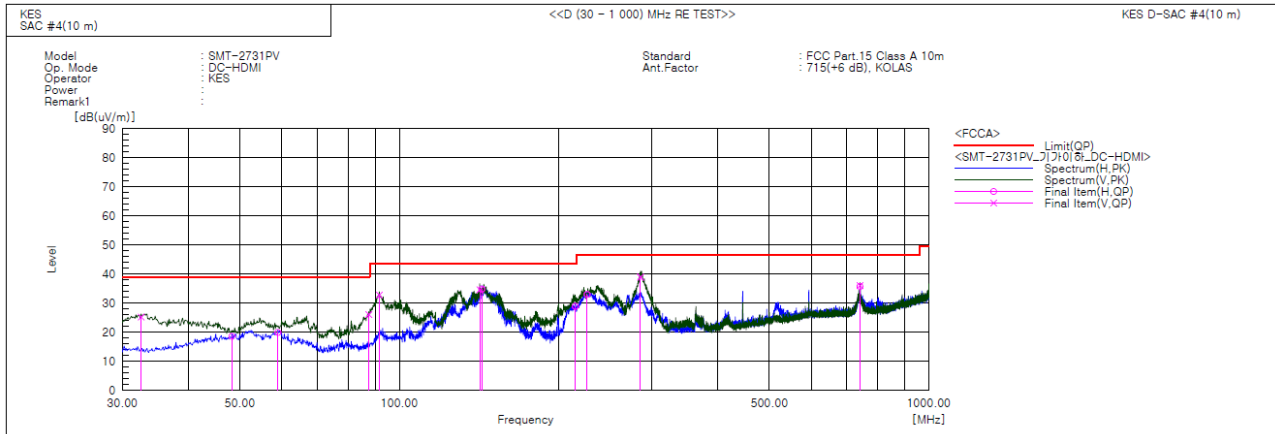
QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

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

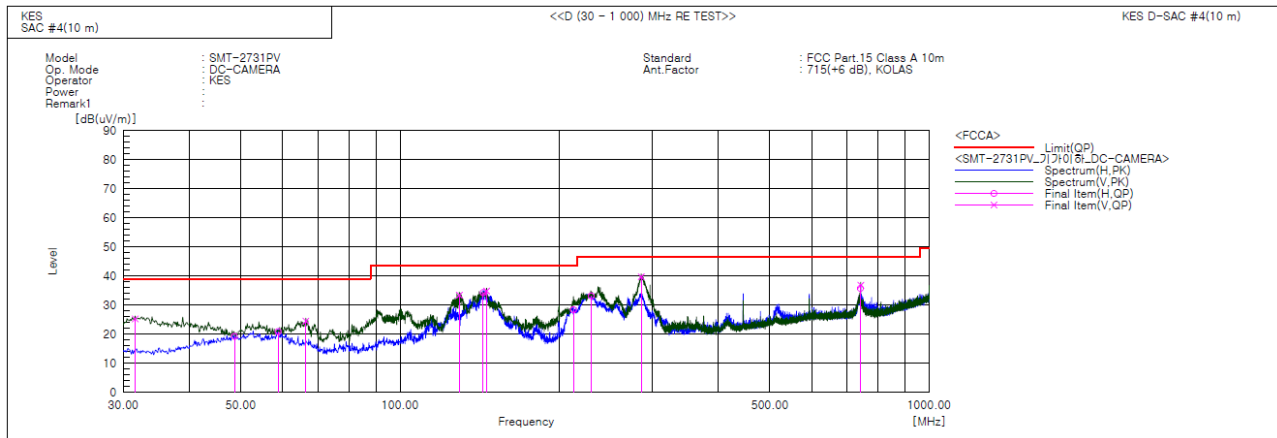
- 47 CFR Part 15, Subpart B

DC-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	32.546	V	49.7	-24.5	25.2	39.0	13.8	108.0	277.0	
2	48.309	H	39.1	-20.5	18.6	39.0	20.4	389.0	22.0	
3	58.979	H	41.2	-21.3	19.9	39.0	19.1	313.0	270.0	
4	87.594	V	50.9	-24.8	26.1	39.0	12.9	114.0	293.0	
5	91.716	V	56.0	-23.2	32.8	43.5	10.7	166.0	210.0	
6	141.914	V	59.6	-25.0	34.6	43.5	8.9	100.0	186.0	
7	143.248	H	59.8	-25.0	34.8	43.5	8.7	332.0	184.0	
8	215.028	H	48.8	-19.9	28.9	43.5	14.6	316.0	285.0	
9	226.425	H	52.3	-19.3	33.0	46.5	13.5	229.0	302.0	
10	285.595	V	56.9	-18.0	38.9	46.5	7.6	122.0	193.0	
11	741.738	H	41.8	-6.1	35.7	46.5	10.8	284.0	250.0	
12	741.738	V	42.1	-6.1	36.0	46.5	10.5	178.0	334.0	



■ DC-CAMERA MODE

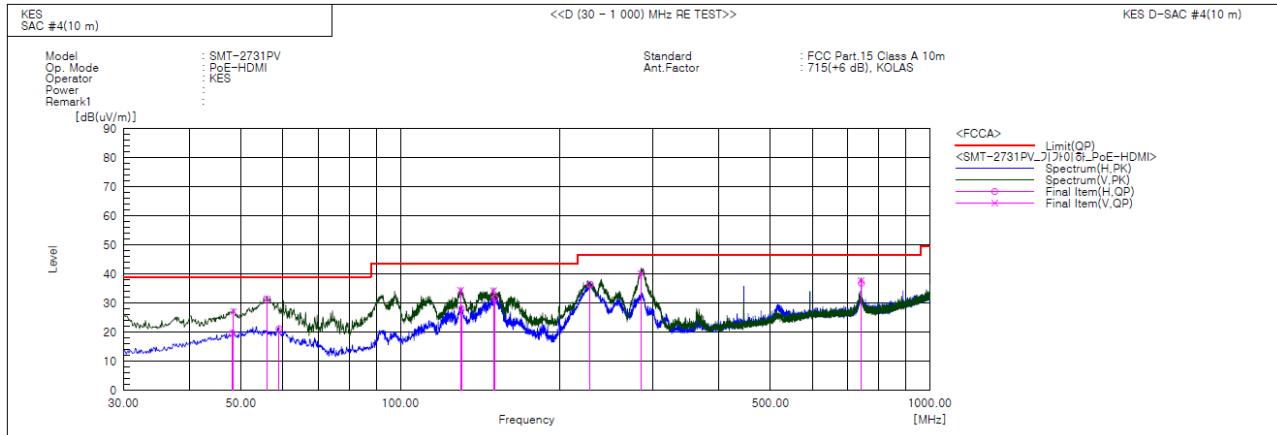


Final Result

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	31.576	V	49.9	-24.6	25.3	39.0	13.7	113.0	315.0	
2	48.673	H	39.7	-20.5	19.2	39.0	19.8	289.0	163.0	
3	58.858	H	42.2	-21.3	20.9	39.0	18.1	378.0	250.0	
4	66.375	V	47.7	-23.2	24.5	39.0	14.5	121.0	66.0	
5	129.425	V	58.1	-24.7	33.4	43.5	10.1	128.0	203.0	
6	143.611	H	59.3	-25.0	34.3	43.5	9.2	400.0	182.0	
7	145.794	V	59.8	-25.0	34.8	43.5	8.7	100.0	94.0	
8	212.724	H	48.4	-20.0	28.4	43.5	15.1	354.0	276.0	
9	229.820	H	52.3	-19.2	33.1	46.5	13.4	291.0	311.0	
10	285.716	V	57.7	-18.0	39.7	46.5	6.8	107.0	199.0	
11	741.738	H	41.8	-6.1	35.7	46.5	10.8	355.0	318.0	
12	742.586	V	42.9	-6.1	36.8	46.5	9.7	162.0	14.0	



■ PoE-HDMI MODE

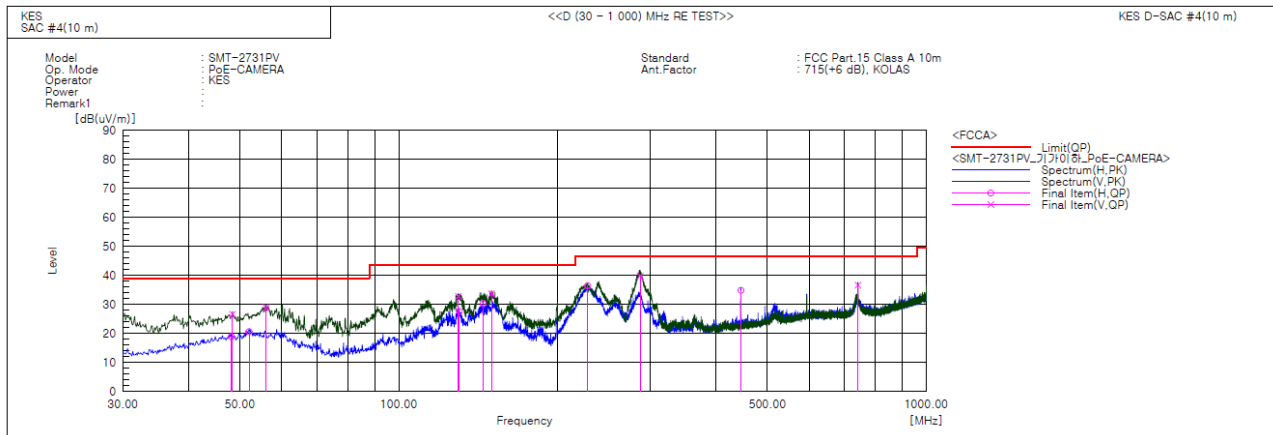


Final Result

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	48.188	H	40.2	-20.5	19.7	39.0	19.3	361.0	125.0	
2	48.430	V	47.6	-20.5	27.1	39.0	11.9	142.0	183.0	
3	55.948	V	52.3	-20.8	31.5	39.0	7.5	118.0	95.0	
4	58.979	H	42.5	-21.3	21.2	39.0	17.8	375.0	119.0	
5	129.910	V	59.1	-24.7	34.4	43.5	9.1	116.0	168.0	
6	130.395	H	52.9	-24.8	28.1	43.5	15.4	328.0	238.0	
7	149.916	V	59.3	-25.0	34.3	43.5	9.2	174.0	261.0	
8	150.765	H	56.6	-24.9	31.7	43.5	11.8	321.0	238.0	
9	228.365	H	55.7	-19.3	36.4	46.5	10.1	361.0	329.0	
10	285.110	V	58.1	-18.0	40.1	46.5	6.4	124.0	183.0	
11	741.738	V	43.8	-6.1	37.7	46.5	8.8	178.0	330.0	
12	742.586	H	42.9	-6.1	36.8	46.5	9.7	324.0	329.0	



■ PoE-CAMERA MODE



Final Result

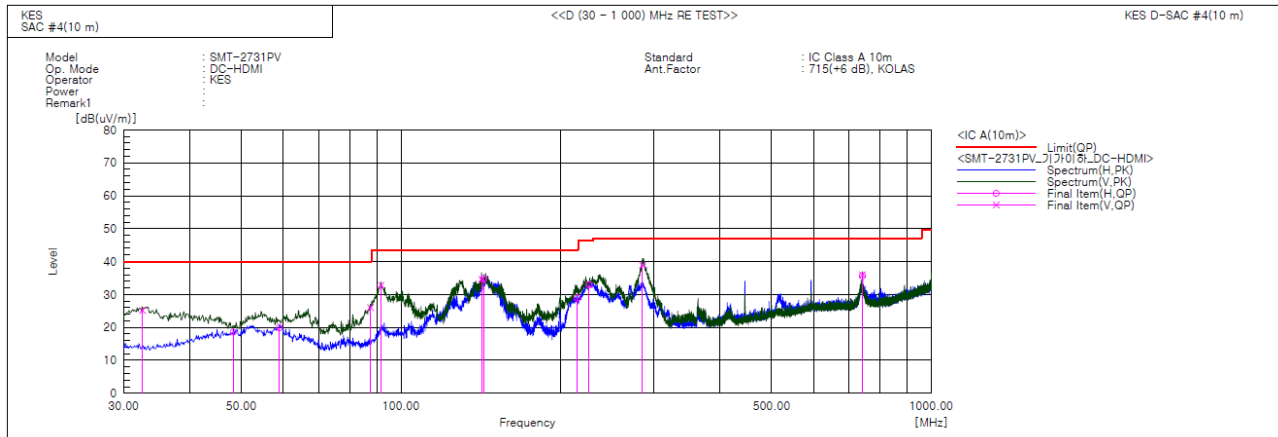
No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	48.188	H	39.4	-20.5	18.9	39.0	20.1	295.0	7.0	
2	48.430	V	47.1	-20.5	26.6	39.0	12.4	163.0	106.0	
3	52.068	H	41.0	-20.4	20.6	39.0	18.4	392.0	270.0	
4	56.069	V	49.7	-20.8	28.9	39.0	10.1	148.0	159.0	
5	129.789	V	57.5	-24.7	32.8	43.5	10.7	121.0	129.0	
6	130.274	H	52.3	-24.7	27.6	43.5	15.9	367.0	222.0	
7	144.581	H	55.3	-25.0	30.3	43.5	13.2	331.0	226.0	
8	149.916	V	58.7	-25.0	33.7	43.5	9.8	100.0	277.0	
9	228.244	H	55.7	-19.3	36.4	46.5	10.1	374.0	339.0	
10	286.929	V	57.8	-18.0	39.8	46.5	6.7	112.0	208.0	
11	445.524	H	47.3	-12.5	34.8	46.5	11.7	317.0	199.0	
12	741.859	V	42.7	-6.1	36.6	46.5	9.9	158.0	349.0	



Report No. : KES-EM-23T0942-R2

- IC Regulation ICES-003 Issue 7

■ DC-HDMI MODE

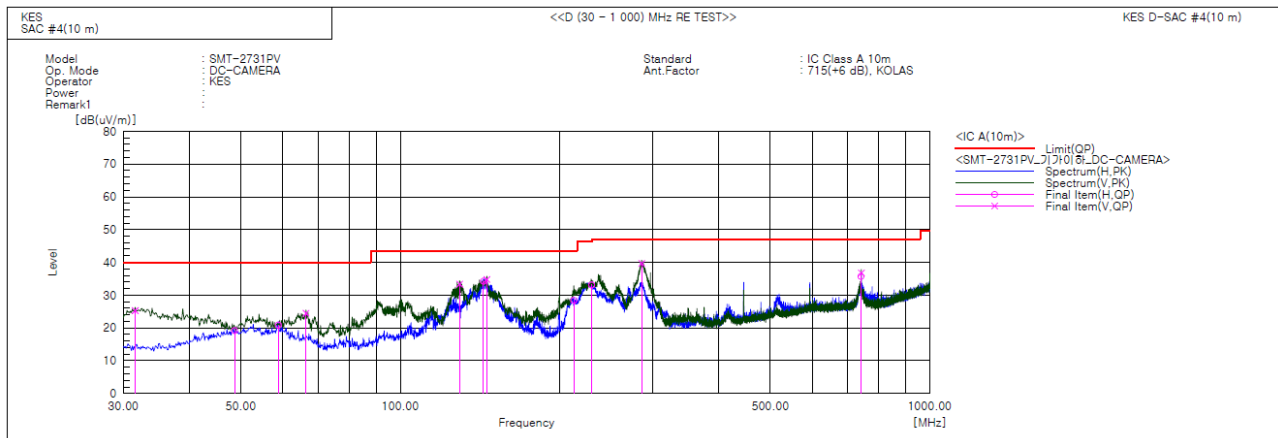


Final Result

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	32.546	V	49.7	-24.5	25.2	40.0	14.8	108.0	277.0	
2	48.309	H	39.1	-20.5	18.6	40.0	21.4	389.0	22.0	
3	58.979	H	41.2	-21.3	19.9	40.0	20.1	313.0	270.0	
4	87.594	V	50.9	-24.8	26.1	40.0	13.9	114.0	293.0	
5	91.716	V	56.0	-23.2	32.8	43.5	10.7	166.0	210.0	
6	141.914	V	59.6	-25.0	34.6	43.5	8.9	100.0	186.0	
7	143.248	H	59.8	-25.0	34.8	43.5	8.7	332.0	184.0	
8	215.028	H	48.8	-19.9	28.9	43.5	14.6	316.0	285.0	
9	226.425	H	52.3	-19.3	33.0	46.4	13.4	229.0	302.0	
10	285.595	V	56.9	-18.0	38.9	47.0	8.1	122.0	193.0	
11	741.738	H	41.8	-6.1	35.7	47.0	11.3	284.0	250.0	
12	741.738	V	42.1	-6.1	36.0	47.0	11.0	178.0	334.0	



■ DC-CAMERA MODE



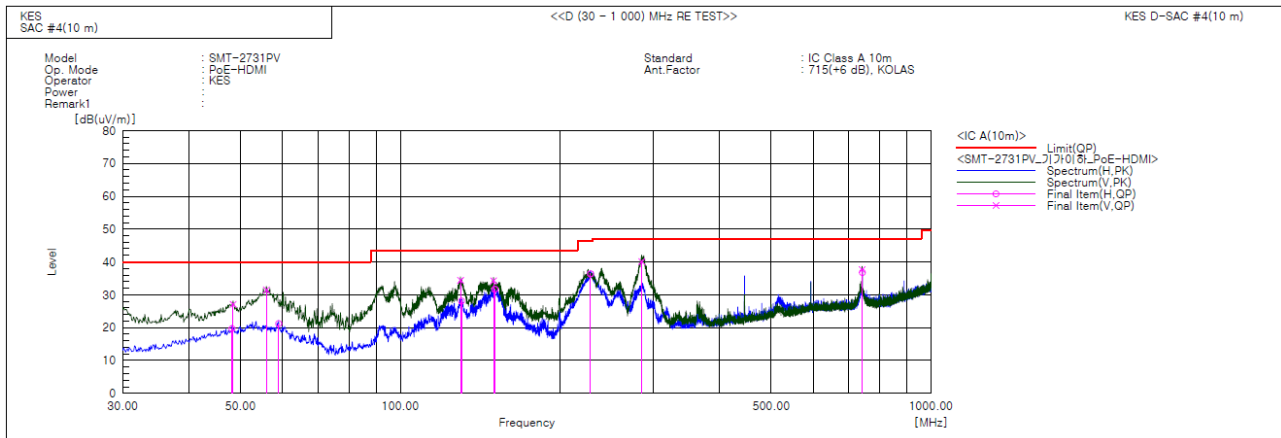
Final Result

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	31.576	V	49.9	-24.6	25.3	40.0	14.7	113.0	315.0	
2	48.673	H	39.7	-20.5	19.2	40.0	20.8	289.0	163.0	
3	58.858	H	42.2	-21.3	20.9	40.0	19.1	378.0	250.0	
4	66.375	V	47.7	-23.2	24.5	40.0	15.5	121.0	66.0	
5	129.425	V	58.1	-24.7	33.4	43.5	10.1	128.0	203.0	
6	143.611	H	59.3	-25.0	34.3	43.5	9.2	400.0	182.0	
7	145.794	V	59.8	-25.0	34.8	43.5	8.7	100.0	94.0	
8	212.724	H	48.4	-20.0	28.4	43.5	15.1	354.0	276.0	
9	229.820	H	52.3	-19.2	33.1	46.4	13.3	291.0	311.0	
10	285.716	V	57.7	-18.0	39.7	47.0	7.3	107.0	199.0	
11	741.738	H	41.8	-6.1	35.7	47.0	11.3	355.0	318.0	
12	742.586	V	42.9	-6.1	36.8	47.0	10.2	162.0	14.0	



Report No. : KES-EM-23T0942-R2

■ PoE-HDMI MODE

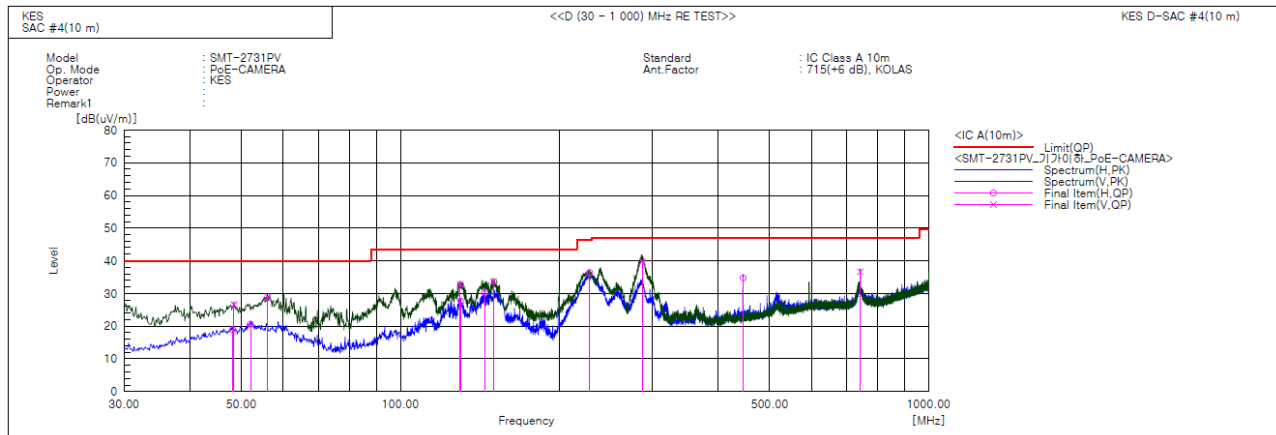


Final Result

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	48.188	H	40.2	-20.5	19.7	40.0	20.3	361.0	125.0	
2	48.430	V	47.6	-20.5	27.1	40.0	12.9	142.0	183.0	
3	55.948	V	52.3	-20.8	31.5	40.0	8.5	118.0	95.0	
4	58.979	H	42.5	-21.3	21.2	40.0	18.8	375.0	119.0	
5	129.910	V	59.1	-24.7	34.4	43.5	9.1	116.0	168.0	
6	130.395	H	52.9	-24.8	28.1	43.5	15.4	328.0	238.0	
7	149.916	V	59.3	-25.0	34.3	43.5	9.2	174.0	261.0	
8	150.765	H	56.6	-24.9	31.7	43.5	11.8	321.0	238.0	
9	228.365	H	55.7	-19.3	36.4	46.4	10.0	361.0	329.0	
10	285.110	V	58.1	-18.0	40.1	47.0	6.9	124.0	183.0	
11	741.738	V	43.8	-6.1	37.7	47.0	9.3	178.0	330.0	
12	742.586	H	42.9	-6.1	36.8	47.0	10.2	324.0	329.0	



■ PoE-CAMERA MODE



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c.f [dB(1/m)]	Result QP [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	48.188	H	39.4	-20.5	18.9	40.0	21.1	295.0	7.0	
2	48.430	V	47.1	-20.5	26.6	40.0	13.4	163.0	106.0	
3	52.068	H	41.0	-20.4	20.6	40.0	19.4	392.0	270.0	
4	56.069	V	49.7	-20.8	28.9	40.0	11.1	148.0	159.0	
5	129.789	V	57.5	-24.7	32.8	43.5	10.7	121.0	129.0	
6	130.274	H	52.3	-24.7	27.6	43.5	15.9	367.0	222.0	
7	144.581	H	55.3	-25.0	30.3	43.5	13.2	331.0	226.0	
8	149.916	V	58.7	-25.0	33.7	43.5	9.8	100.0	277.0	
9	228.244	H	55.7	-19.3	36.4	46.4	10.0	374.0	339.0	
10	286.929	V	57.8	-18.0	39.8	47.0	7.2	112.0	208.0	
11	445.524	H	47.3	-12.5	34.8	47.0	12.2	317.0	199.0	
12	741.859	V	42.7	-6.1	36.6	47.0	10.4	158.0	349.0	

◆ Calculation – SAC #4(10 m)

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

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

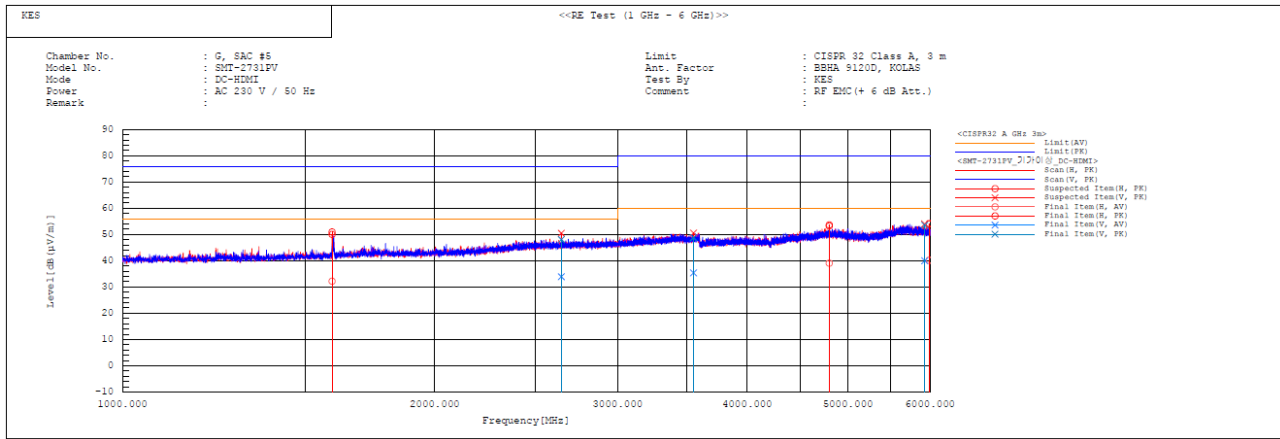
Reading(QP) : Reading value, Result(QP) : Reading value + Factor value

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



Radiated Electric Field Emissions(Above 1 GHz)

DC-HDMI MODE

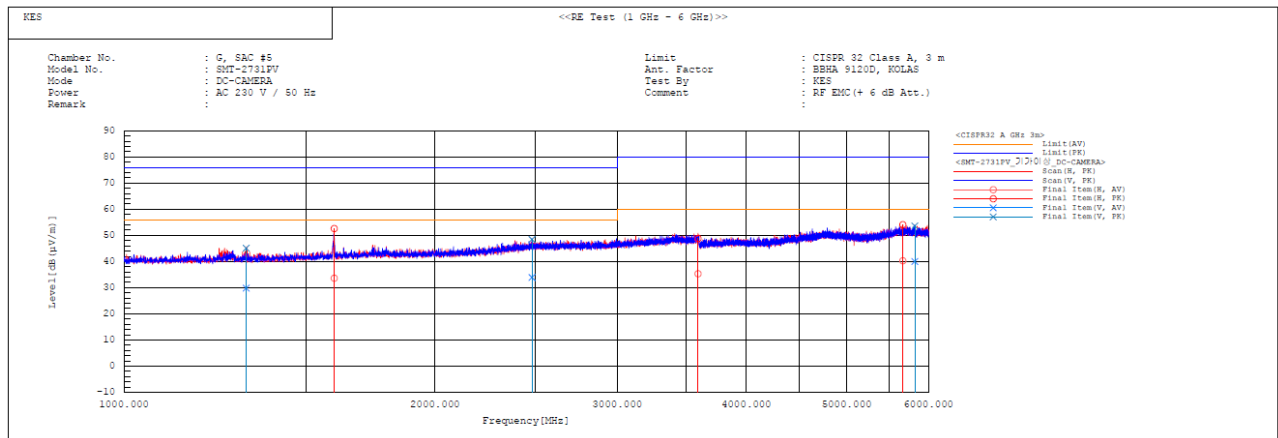


Final Result

No.	Frequency [MHz]	Pol	Reading AV [dB(μV)]	Reading PK [dB(μV)]	c.f [dB(1/m)]	Result AV [dB(μV/m)]	Result PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Limit PK [dB(μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Remark
1	1592.500	H	31.1	49.9	1.1	32.2	51.0	56.0	76.0	23.8	25.0	100.0	24.8	
2	2648.500	V	28.7	42.9	5.2	33.9	48.1	56.0	76.0	22.1	27.9	100.0	23.4	
3	3551.500	V	28.5	41.9	6.9	35.4	48.8	60.0	80.0	24.6	31.2	100.0	359.0	
4	4799.000	H	27.7	41.8	11.4	39.1	53.2	60.0	80.0	20.9	26.8	100.0	358.9	
5	5929.500	V	26.3	39.8	13.7	40.0	53.5	60.0	80.0	20.0	26.5	100.0	0.3	
6	5989.500	H	26.3	40.1	13.9	40.2	54.0	60.0	80.0	19.8	26.0	100.0	298.5	



DC-CAMERA MODE

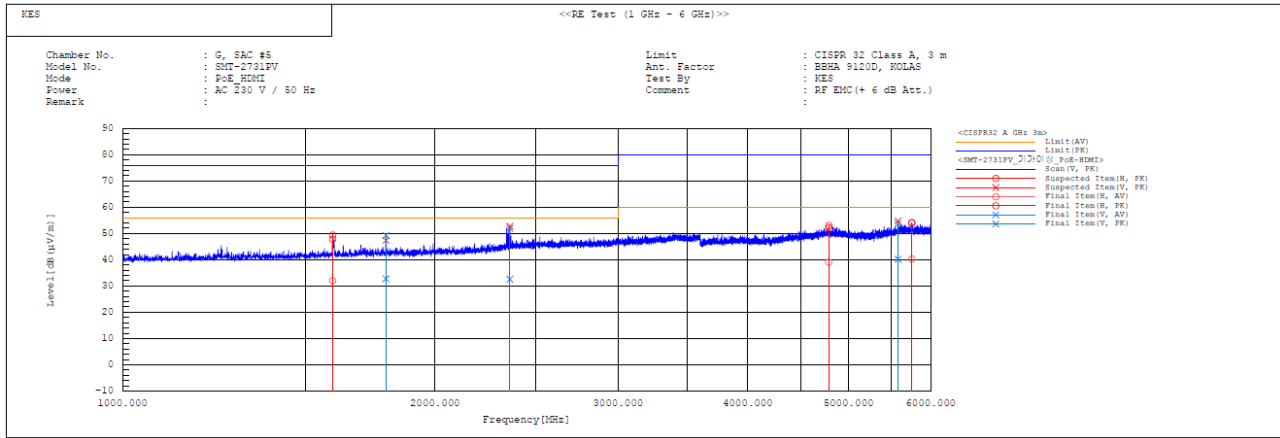


Final Result

No.	Frequency	Pol	Reading AV	Reading PK	c.f	Result AV	Result PK	Limit AV	Limit PK	Margin AV	Margin PK	Height	Angle	Remark
	[MHz]		[dB (μV)]	[dB (μV)]	[dB (1/m)]	[dB (μV/m)]	[dB (μV/m)]	[dB (μV/m)]	[dB (μV/m)]	[dB]	[dB]	[cm]	[deg]	
1	1313.000	V	30.0	45.3	-0.2	29.8	45.1	56.0	76.0	26.2	30.9	100.0	18.9	
2	1597.500	H	32.5	51.5	1.1	33.6	52.6	56.0	76.0	22.4	23.4	100.0	25.8	
3	2481.500	V	29.3	43.8	4.6	33.9	48.4	56.0	76.0	22.1	27.6	100.0	78.1	
4	3592.000	H	28.3	41.8	7.0	35.3	48.8	60.0	80.0	24.7	31.2	100.0	359.7	
5	5667.000	H	27.1	40.9	13.2	40.3	54.1	60.0	80.0	19.7	25.9	100.0	0.0	
6	5822.000	V	26.5	40.1	13.5	40.0	53.6	60.0	80.0	20.0	26.4	100.0	83.0	



■ PoE-HDMI MODE

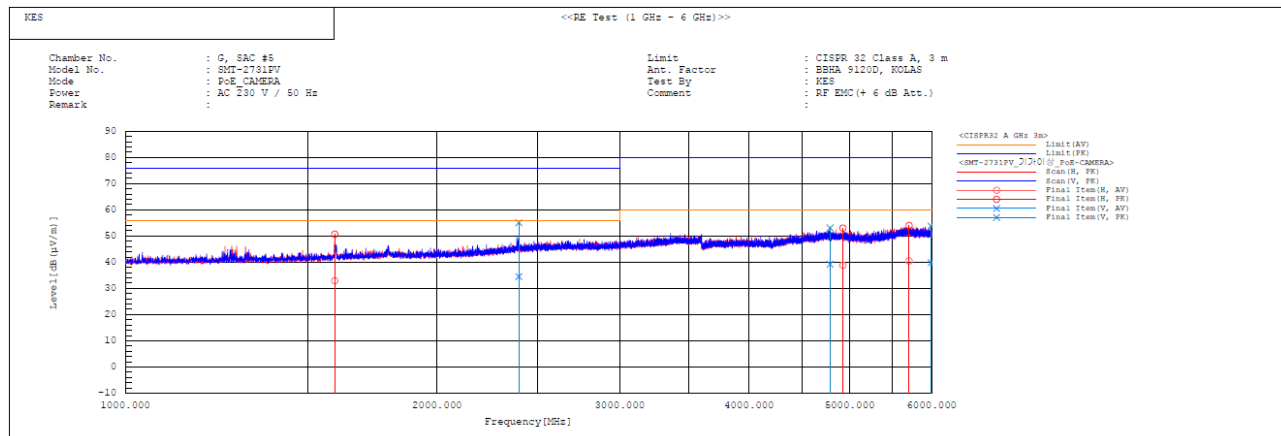


Final Result

No.	Frequency	Pol	Reading	Reading	c.f	Result	Result	Limit	Limit	Margin	Margin	Height	Angle	Remark
	[MHz]		AV	PK		AV	PK	AV	PK	AV	PK	[cm]	[deg]	
			[dB(μV)]	[dB(μV)]	[dB(1/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB]	[dB]			
1	1593.500	H	31.0	48.3	1.1	32.1	49.4	56.0	76.0	23.9	26.6	100.0	53.4	
2	1793.500	V	30.9	47.3	1.9	32.8	49.2	56.0	76.0	23.2	26.8	100.0	198.7	
3	2360.500	V	28.5	47.8	4.1	32.6	51.9	56.0	76.0	23.4	24.1	100.0	218.9	
4	4787.500	H	27.7	41.6	11.4	39.1	53.0	60.0	80.0	20.9	27.0	100.0	190.9	
5	5581.500	V	27.1	40.6	13.1	40.2	53.7	60.0	80.0	19.8	26.3	100.0	0.2	
6	5755.000	H	26.9	40.6	13.4	40.3	54.0	60.0	80.0	19.7	26.0	100.0	319.4	



■ PoE-CAMERA MODE



Final Result

No.	Frequency [MHz]	Pol	Reading AV [dB(μV)]	Reading PK [dB(μV)]	c.f [dB(1/m)]	Result AV [dB(μV/m)]	Result PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Limit PK [dB(μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Remark
1	1593.000	H	31.8	49.6	1.1	32.9	50.7	56.0	76.0	23.1	25.3	100.0	36.7	
2	2398.500	V	30.2	50.8	4.3	34.5	55.1	56.0	76.0	21.5	20.9	100.0	179.6	
3	4788.000	V	27.8	41.7	11.4	39.2	53.1	60.0	80.0	20.8	26.9	100.0	0.0	
4	4927.000	H	26.8	41.0	12.0	38.8	53.0	60.0	80.0	21.2	27.0	100.0	88.4	
5	5706.000	H	27.2	40.7	13.3	40.5	54.0	60.0	80.0	19.5	26.0	100.0	106.8	
6	5950.500	V	25.9	39.9	13.9	39.8	53.8	60.0	80.0	20.2	26.2	100.0	84.2	

◆ Calculation

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

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

Reading(PK/CAV) : Reading value, Result(PK/CAV) : Reading value + Factor value

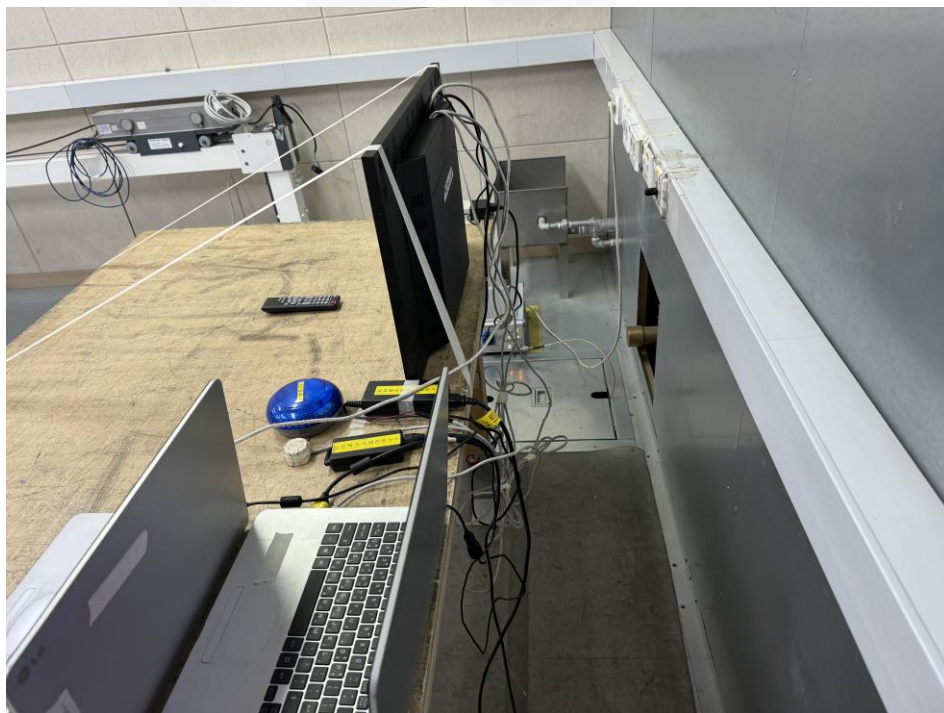
Limit(QP) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value



Test Setup Photos and Configuration

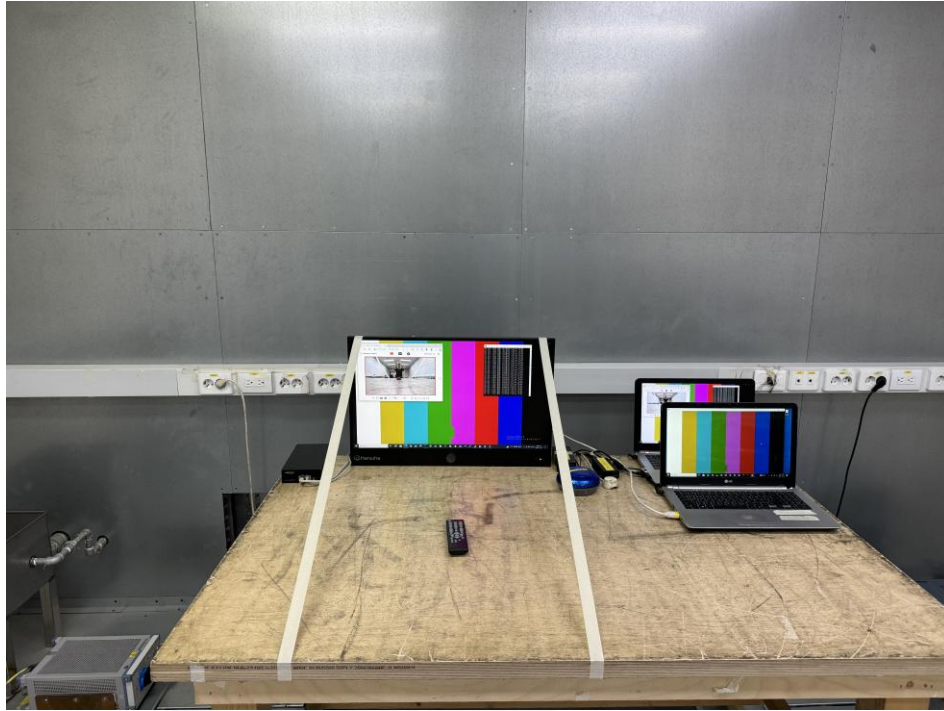
Conducted Emissions at Mains Power Ports

■ DC-HDMI, DC-CAMERA MODE





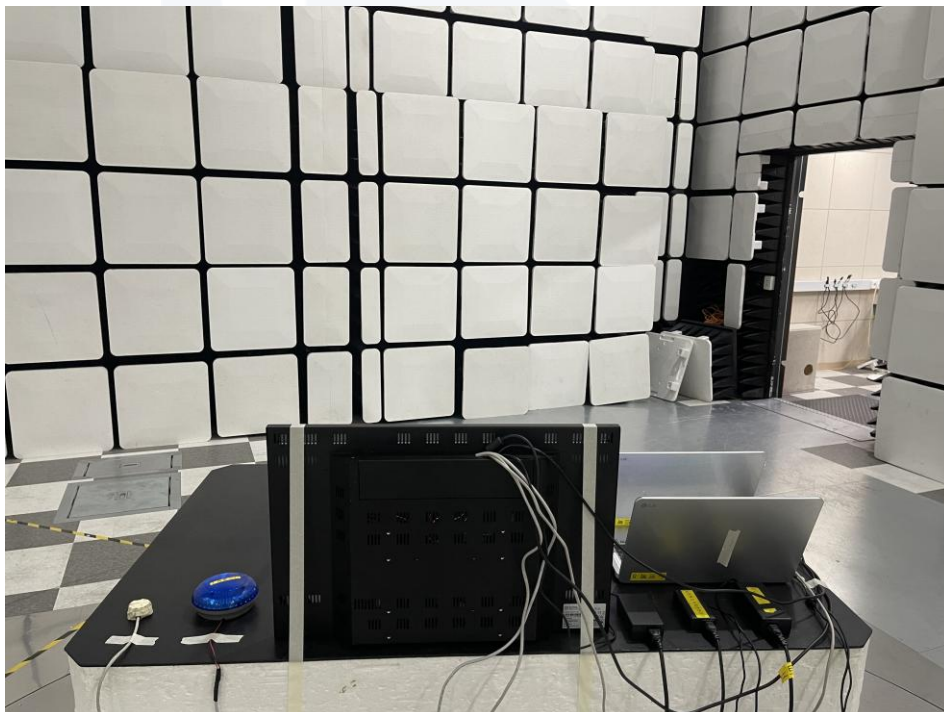
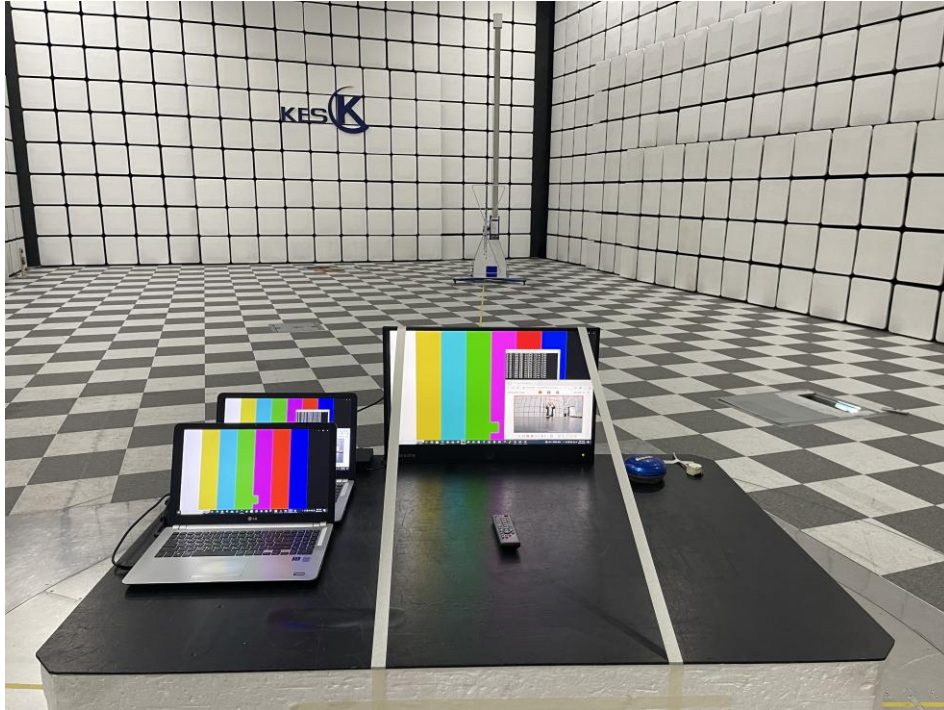
■ PoE-HDMI, PoE-CAMERA MODE





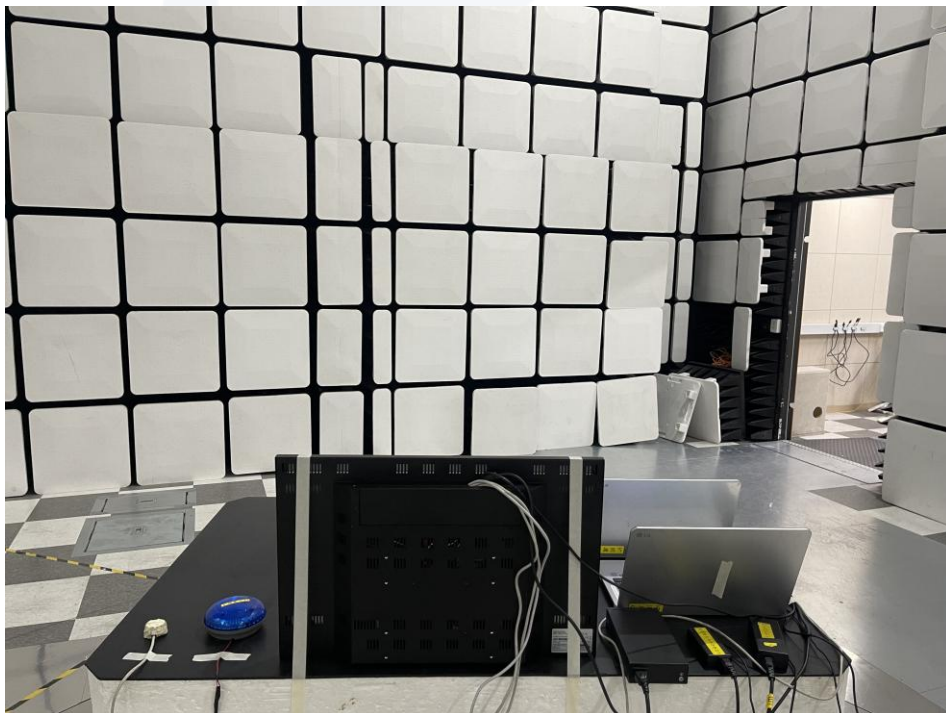
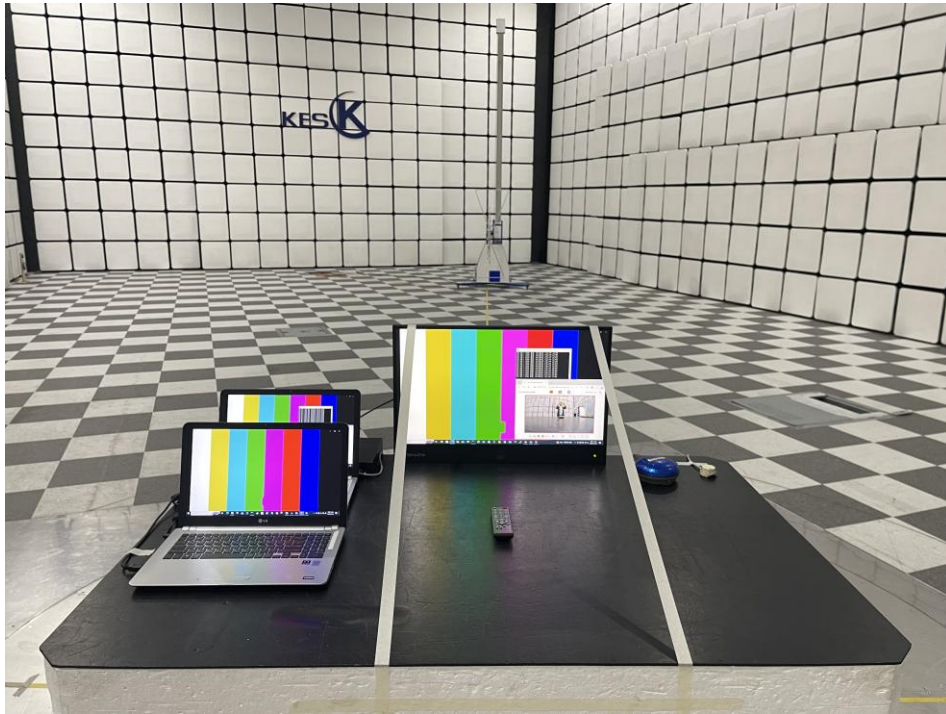
Radiated Electric Field Emissions(Below 1 GHz)

■ DC-HDMI, DC-CAMERA MODE





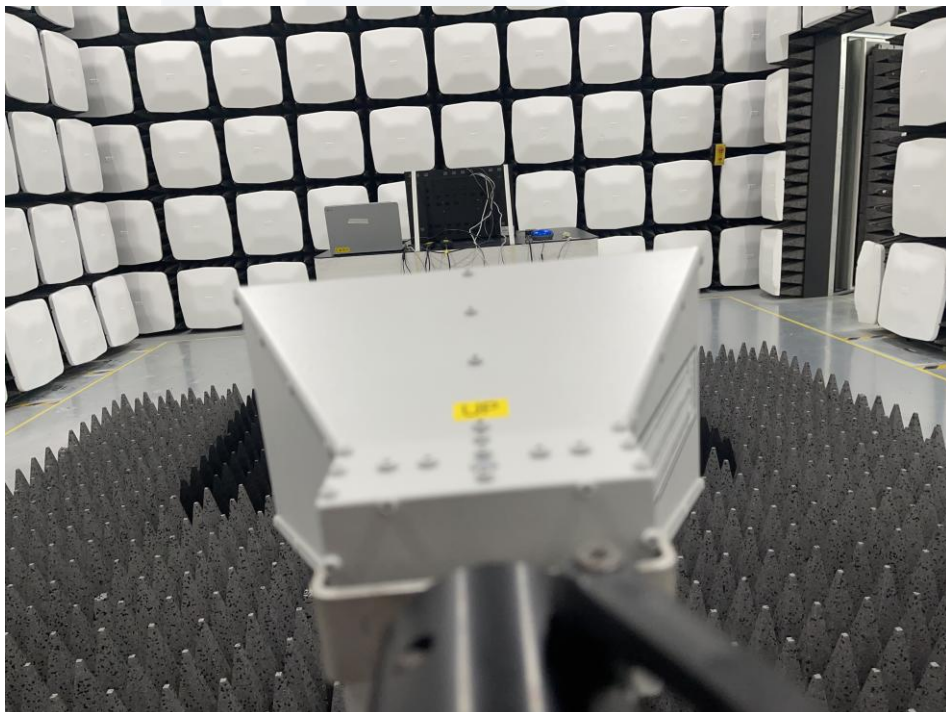
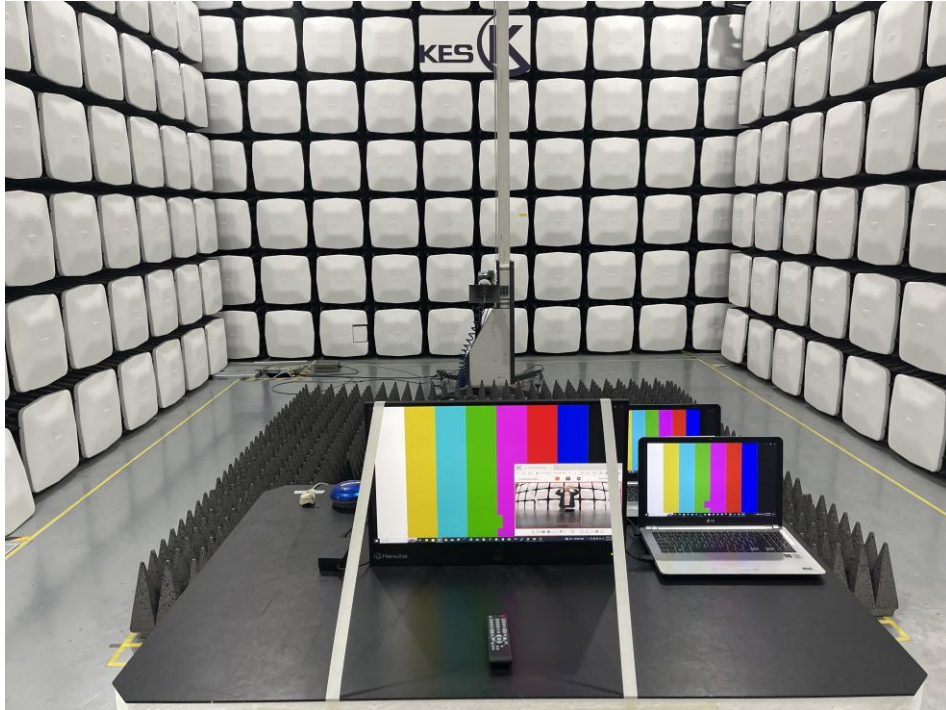
■ PoE-HDMI, PoE-CAMERA MODE





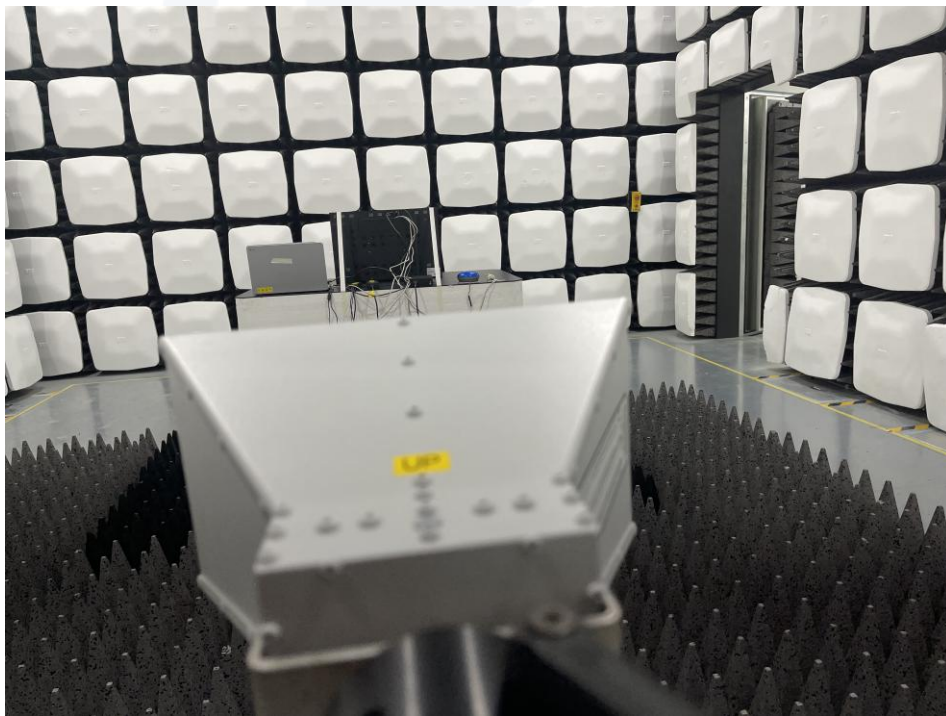
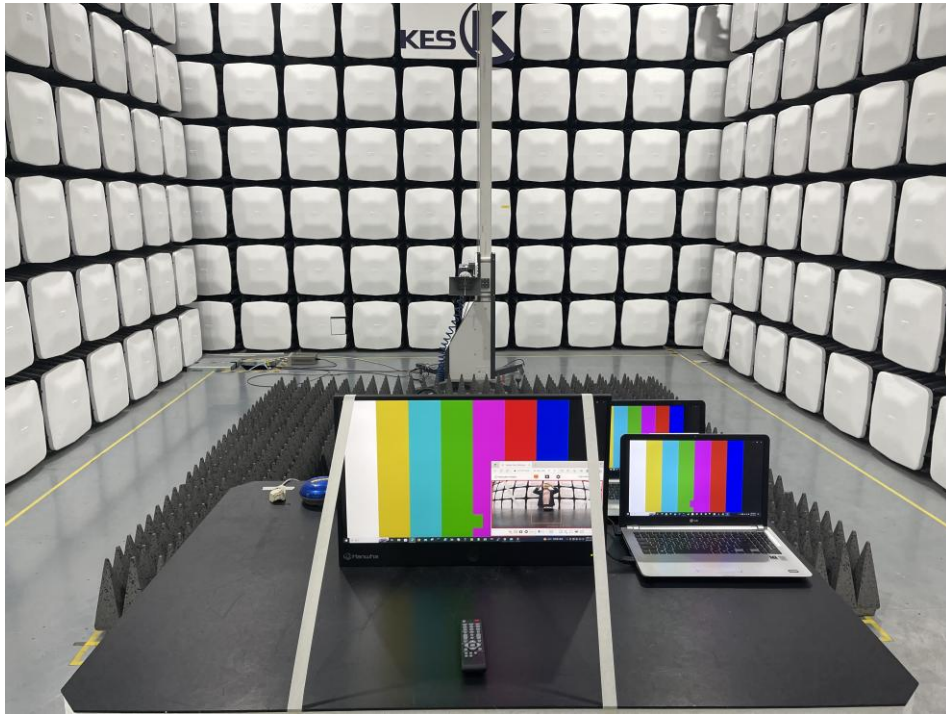
Radiated Electric Field Emissions(Above 1 GHz)

■ DC-HDMI, DC-CAMERA MODE





■ PoE-HDMI, PoE-CAMERA MODE





EUT External Photographs

(Top)



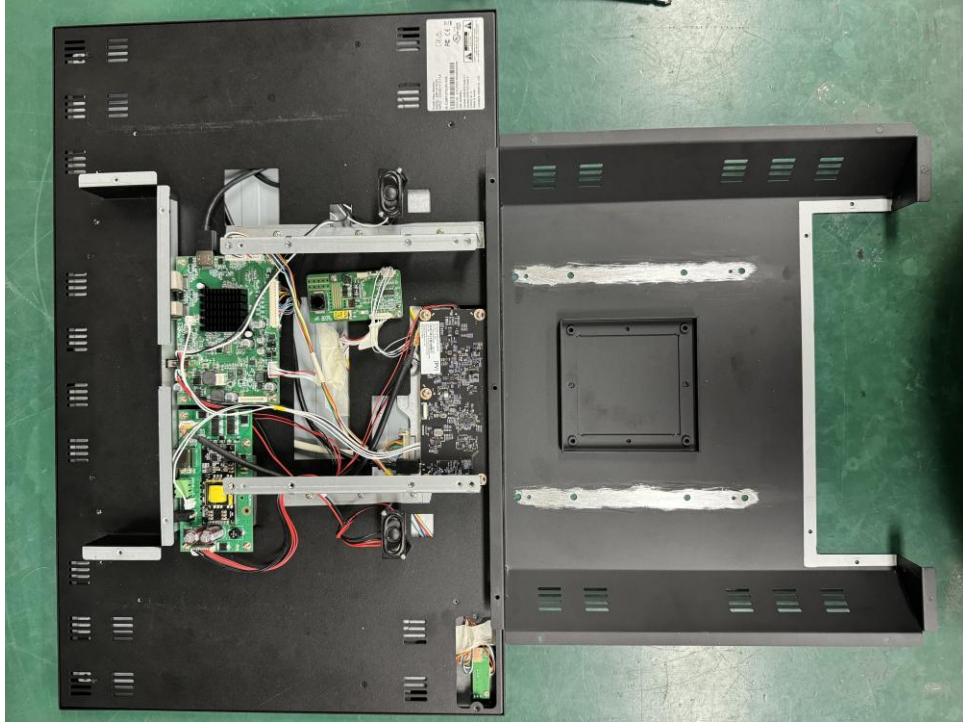
(Bottom)





EUT Internal Photographs

(Internal View)

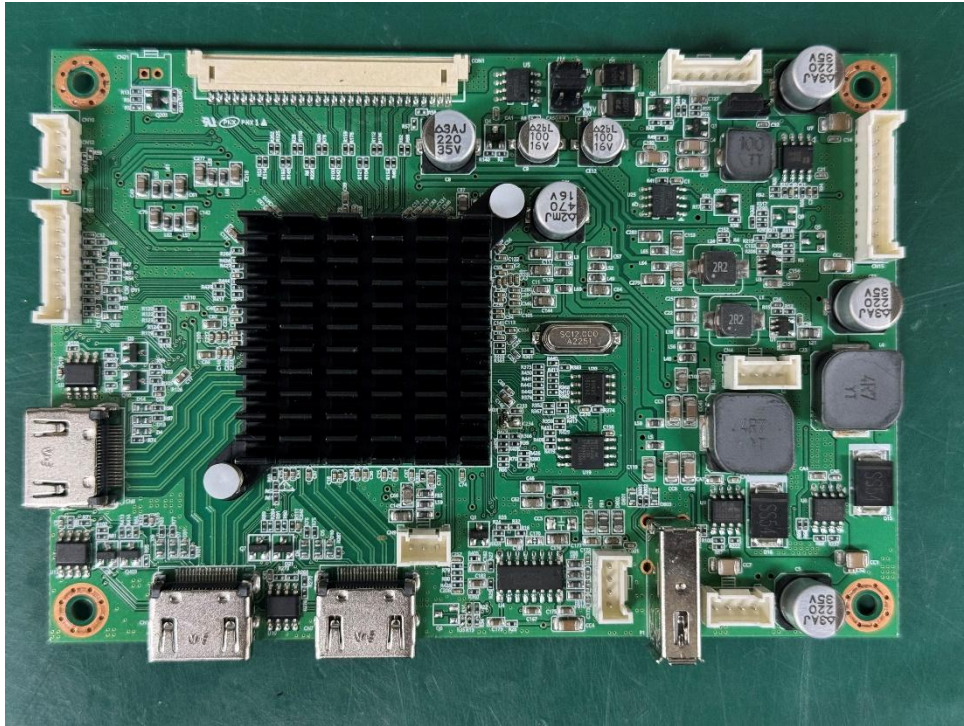


Page 46 / 52

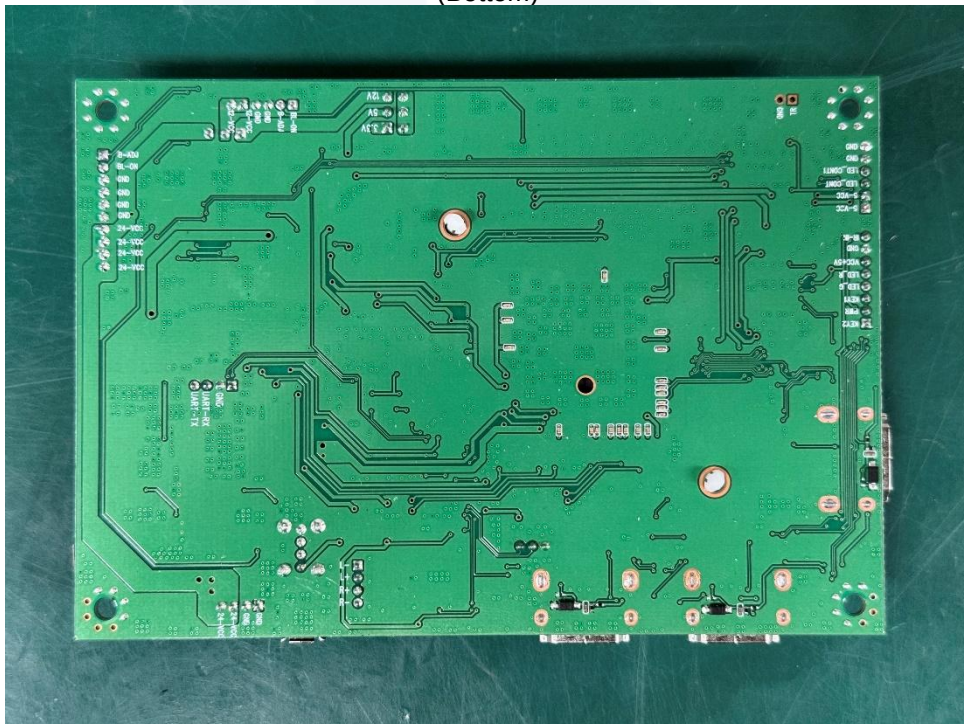


EUT Internal View – Board 2

(Top)



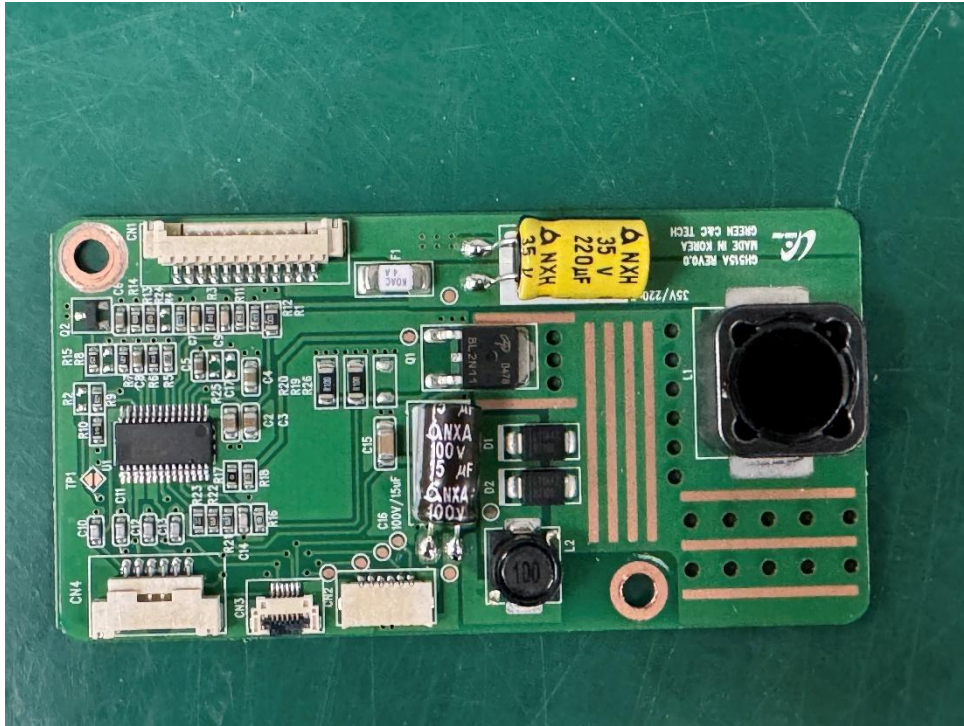
(Bottom)



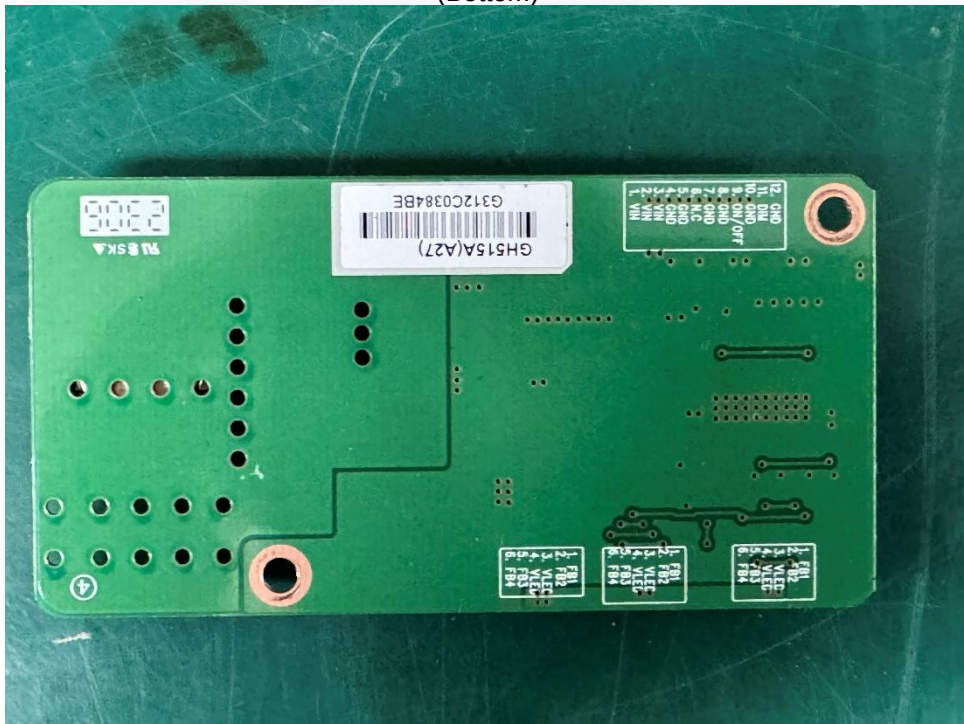


EUT Internal View – Board 3

(Top)



(Bottom)



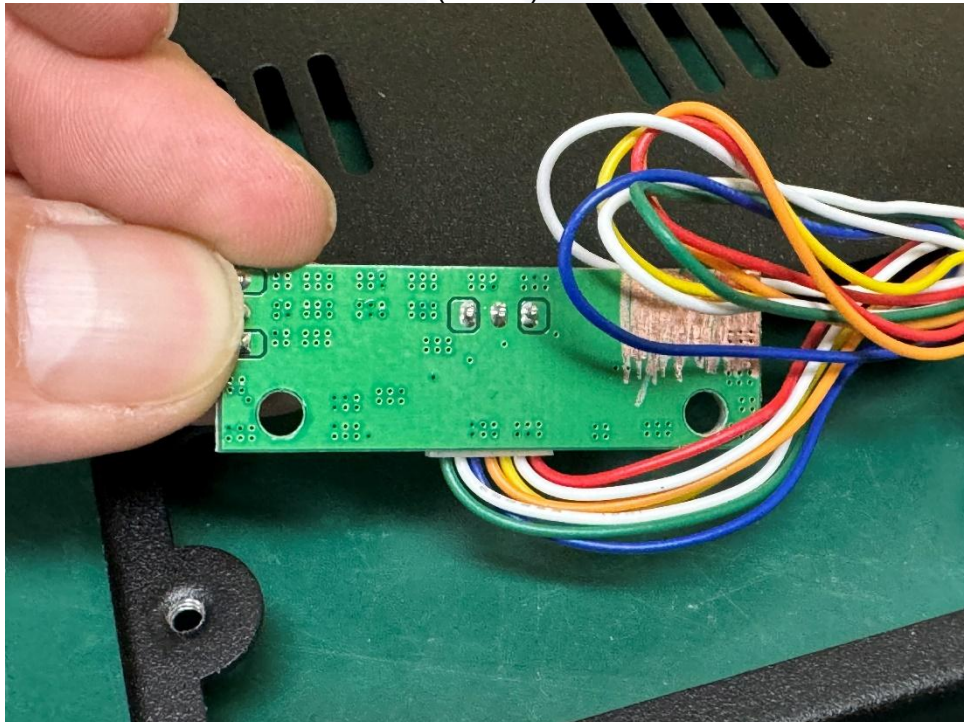


EUT Internal View – Board 4

(Top)



(Bottom)





EUT Internal View – Board 5

(Top)



(Bottom)



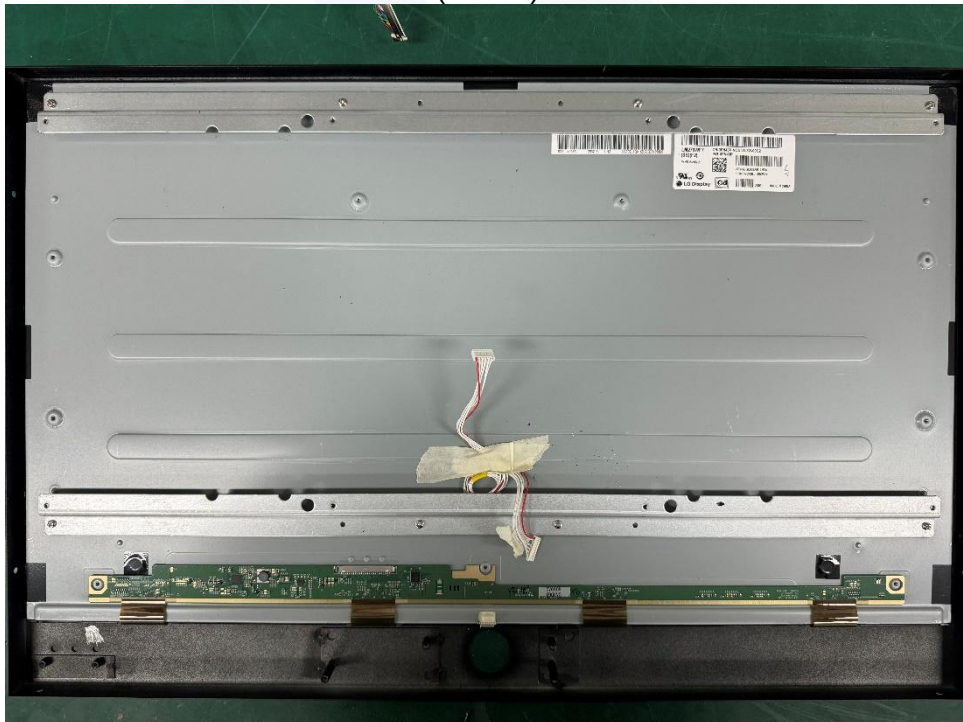


EUT Internal View – Panel

(Top)



(Bottom)





Label Photographs

FCC Label



Public view monitor

SMT-2731PV

IC Label

CAN ICES-003(A) / NMB-003(A)

This device complies with ICES-003 Canada Rules Operation is subject to the following two conditions:
(1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

The End.