

EMC TEST REPORT For VCCI

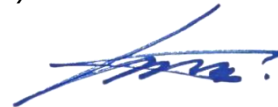
Test Report No. : KES-EM-22T0970
Date of Issue : Dec. 08, 2022
Product name : Decorder
Model/Type No. : SPD-152
Variant Model : -
Applicant : Hanwha Techwin Co., Ltd.
Applicant Address : 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si,
Gyeonggi-do, Republic of Korea
Manufacturer : 1. HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.
2. D-TECH CO.,LTD.
Manufacturer Address : 1. Lot O-2, Que Vo Industrial Zone extended area,
Nam Son commune, Bac Ninh city, Bac Ninh province, Vietnam
2. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi- do,
Korea (Suwon Industrial Complex)
Date of Receipt : Nov. 23, 2022
Test date : Nov. 29, 2022
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

김 세 헌

Se Heon, 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.



KES Co., Ltd.

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

Report No.:
KES-EM-22T0970
Page (2) of (35)

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Dec. 08, 2022	KES-EM-22T0970	Issued

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.

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr



TABLE OF CONTENTS

1.0	General Product Description.....	4
1.1	Test Voltage & Frequency	5
1.2	Variant Model Differences	5
1.3	Device Modifications	5
1.4	Equipment Under Test.....	5
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 Mains Power Ports.....	12
2.2	Conducted Emissions at Telecommunication Ports.....	13
2.3	Radiated Electric Field Emissions(Below 1 GHz)	14
2.4	Radiated Electric Field Emissions(Above 1 GHz)	15
APPENDIX A – TEST DATA.....		16
Conducted Emissions at Mains Power Ports.....		16
Conducted Emissions at Telecommunication Ports		18
Radiated Electric Field Emissions(Below 1 GHz)		20
Radiated Electric Field Emissions(Above 1 GHz).....		22
Test Setup Photos and Configuration		24
Conducted Emissions at Mains Power Ports.....		24
Conducted Emissions at Telecommunication Ports		25
Radiated Electric Field Emissions(Below 1 GHz)		27
Radiated Electric Field Emissions(Above 1 GHz).....		29
EUT External Photographs		31
EUT Internal Photographs		32

1.0 General Product Description

Main Specifications of EUT are:

CPU		Embedded CPU
Operating System		Embedded Linux
Video Output	HDMI#1	1EA (up-to 4K), Audio support
	HDMI#2	1EA (up-to 1080p), Audio not support
	VGA	None
	CVBS	None
	Video-out Format	3840 X 2160@30Hz (HDMI#1) 2560 X 1440@30Hz (HDMI#1) 1920 X 1080@60Hz (HDMI#1, HDMI#2) 1280 X 1024@60Hz (HDMI#1, HDMI#2) 1280 X 720@60Hz (HDMI#1, HDMI#2)
External	Ethernet	1EA (10/100/1000BASE-T)
	USB	2EA(USB 2.0)
	Audio Out	None
	LED	Power, Network
Network	Bandwidth	Max. 150Mbps
Environmental		
Operating Temperature		0°C to +40°C (32°F to 104°F)
Operating Humidity		20% ~ 85% RH
Electrical		
Power Input		12VDC, PoE (IEEE802.3af)
Power Consumption		None
Mechanical		
Color / Material		Black / Metal&Plastic
Dimension (WxHxD)		140 x 29.5 x 115.4mm
Weight		260g
Software		
Video	Codec	H.265 / H.264 / MJPEG
	Max. Decoding Performance	8M@60fps, 2M@360fps
	Division (/Monitor)	■ Clone mode (HDMI#1) Max. 64 ■ Expand mode (HDMI#1) Max. 36 (HDMI#2) Max. 25
	Layout	Up to 20, Sequence support
Audio	Codec	G.711 / G.726 / AAC
Merge	Monitor Merge	None
	Tile Merge	None
Management		Local UI, Web-Viewer
Time Setting		NTP/Manual
Export/Import		Configuration Export/Import
Log		Max. 10000 (System log)
Protocol		RTP, RTSP, HTTP, CGI (SUNAPI), ONVIF
Remote Connect		None
Security		IP address filtering, User access Log, 802.1x, Encryption, Device certificate(Hanwha
ETC	P2P	None

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 100 V, 60 Hz ☒ PoE

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
Decorder	SPD-152	-	HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.	EUT
Mouse	MOKJUO	-	Primax Electronics Ltd.	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Adapter	FJ-SW1205000	-	Shenzhen Fujia Appliance Co, LTD.	-
PoE Injector 1	MA-INJ-4	-	Changzhou Wujin Hong Guang radio Factory Co.,LTD	-
PoE Injector 2	GS728TPP	-	NETGEAR	-
Notebook	LG15N54	507NZET040180	LG Electronics	-
Notebook Adapter	PA-1900-14	OF4A263348701J247	LITE-ON TECHNOLOGY COPORATION	-
Monitor 1	SMT-2233	ZC6U67VH500194D	Weihai Daewoo Electronics Co., Ltd.	-
Monitor 2	DELL E2222H DVT	8221TCM10D00103X	DELL INC.	-
Camera	LND-6070R	-	HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.	-
Router	IpTIME A2004MU	-	ipTIME	-
Router Adapter	DCP024B121000K	-	ZIONCOM ELECTRONICS (SHENZHEN) LTD.	-
USB Memory	-	-	Sandisk	-

1.6 External I/O Cabling

■ DC Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
Decorder (EUT)	DC 12V	Adapter	DC 12V	1.5	U
	HDMI 1	Monitor 1	HDMI 1	1.3	S
	HDMI 2	Monitor 2	HDMI 2	1.2	S
	NETWORK	Router	NETWORK	3.0	U
	USB	Mouse (EUT)	USB	1.4	U
	USB	USB Memory	USB	-	-
	GROUND	GROUND	GROUND	2.0	-
Router	DC Jack	Router Adapter	DC Jack	1.5	U
	RJ-45	Notebook	RJ-45	2.0	U
	RJ-45	PoE Injector 1	RJ-45	2.0	U
Notebook	DC Jack	Notebook Adapter	DC Jack	1.4	U
PoE Injector 1	RJ-45	Camera	RJ-45	1.0	U

* Unshielded=U, Shielded=S

■ PoE Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
Decorder (EUT)	NETWORK	PoE Injector 2	NETWORK	3.0	U
	HDMI 1	Monitor 1	HDMI 1	1.3	U
	HDMI 2	Monitor 2	HDMI 2	1.2	-
	USB	Mouse (EUT)	USB	1.4	S
	USB	USB Memory	USB	-	U
	GROUND	GROUND	GROUND	2.0	S
PoE Injector 2	RJ-45	Notebook	RJ-45	2.0	U
	RJ-45	Camera	RJ-45	1.0	U
Notebook	DC Jack	Notebook Adapter	DC Jack	1.4	U

* Unshielded=U, Shielded=S



1.7 EUT Operating Mode(s)

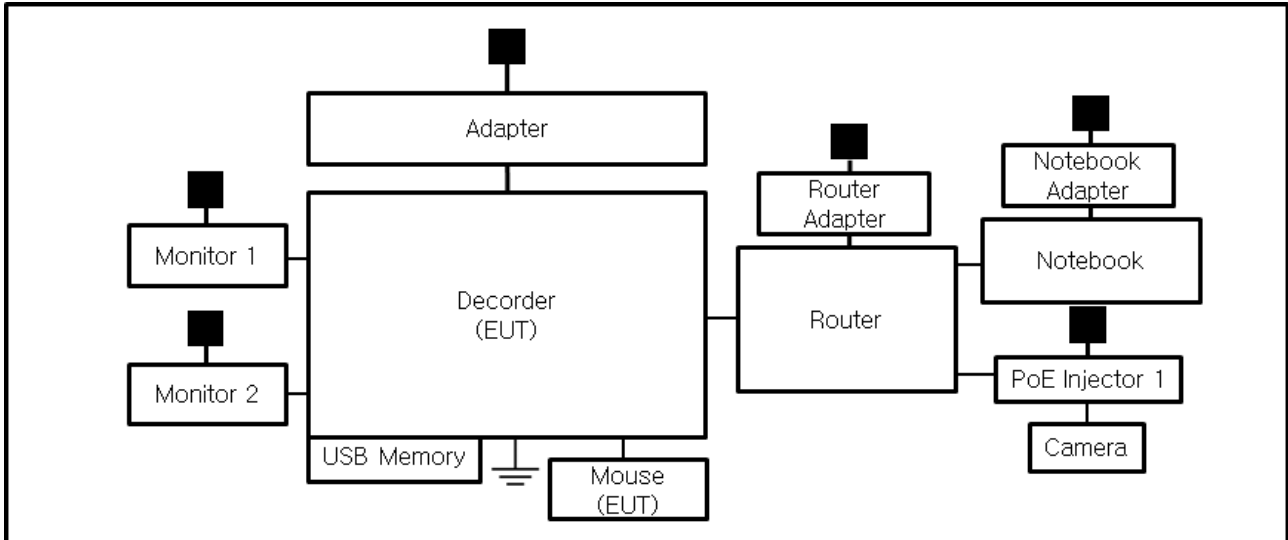
Test Mode	operating
DC, PoE Mode	- Check the image output of the camera on the monitor, and check the normal operation of the network function through the laptop ping test. - After testing, check if the recording is normally done on the USB Memory

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

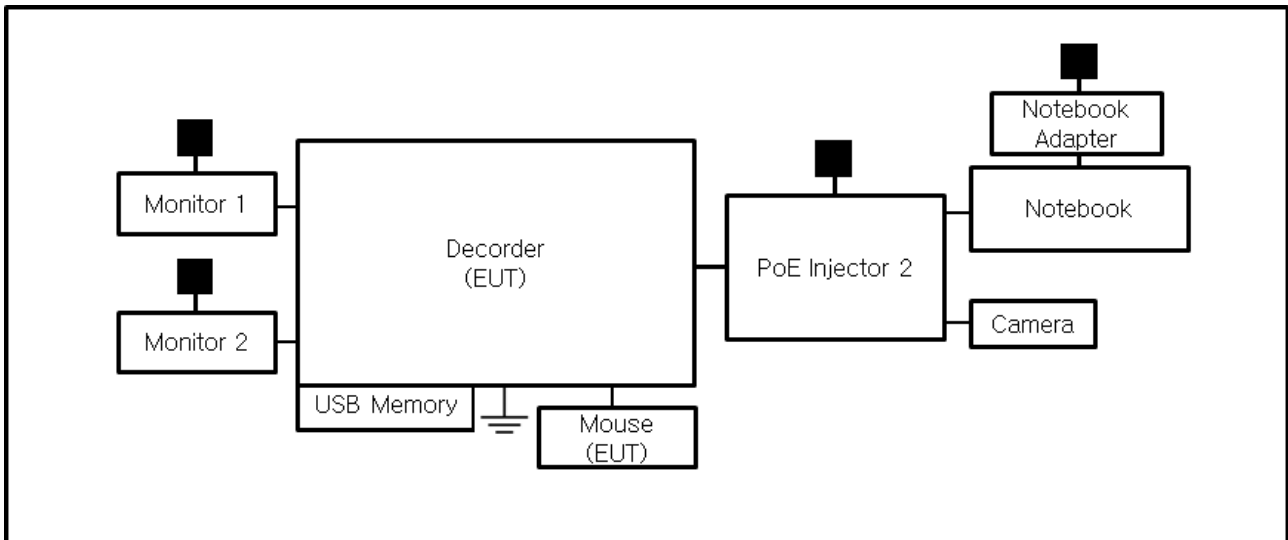
1.8 Configuration

■ AC Main
 □ DC Main

■ DC Mode



■ PoE Mode



1.9 Remarks when standards applied

PoE port is considered to be wired network port, so power-related test items are excluded.

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 , 10 m Open Area 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, 10 m Open Area and 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	Mains Ports Conducted Interference Measurement, Telecommunication Ports Conducted Disturbance Measurement and Radiation 10 meter site, Facility for measuring radiated disturbance above 1 GHz	 R-20056, C-20036, T-20040, G-20057
Europe	TÜV SÜD	EMI (3 m & 10 m Semi-Anechoic Chamber , 10 m Open Area and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 CARAT 001633 0004



KES Co., Ltd.

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

Report No.:
KES-EM-22T0970
Page (11) of (35)

2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **VCCI-CISPR 32:2016**

☒ Class A

☐ Class B

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

2.1 Conducted Emissions Mains Power Ports

Test Date

Nov. 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	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

Test Conditions

Temperature: (22,9 ± 0,0) °C

Relative Humidity: (45,9 ± 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

RemarksSee Appendix A for test data.

2.2 Conducted Emissions at Telecommunication Ports

Test Date

Nov. 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	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
☒	8-WIRE ISN CAT6	NTFM 8158	SCHWARZBECK	8158-0029	03, 09, 2023

Test Conditions

Temperature: (22,8 ± 0,1) °C

Relative Humidity: (46,0 ± 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.
- For Ethernet interfaces, measurements are required at the highest data rate supported by the interface.

2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Nov. 29, 2022

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, 31, 2023
☒	AMPLIFIER	SCU 01	R & S	100603	11, 10, 2023
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	11, 17, 2024
☒	ATTENUATOR	8491A	HP	32173	03, 08, 2023

Test Conditions

Temperature: (22,5 ± 0,1) °C

Relative Humidity: (46,1 ± 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.

2.4 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Nov. 29, 2022

Test Location

SEMI ANECHOIC CHAMBER #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESR7	R & S	101190	08, 01, 2023
☒	PREAMPLIFIER	8449B	AGILENT	3008A01967	04, 01, 2023
☒	ATTENUATOR	8491A	HP	35496	03, 08, 2023
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 03, 2023

Test Conditions

Temperature: (23,3 ± 0,1) °C

Relative Humidity: (49,7 ± 0,0) % 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

RemarksSee Appendix A for test data.

APPENDIX A – TEST DATA

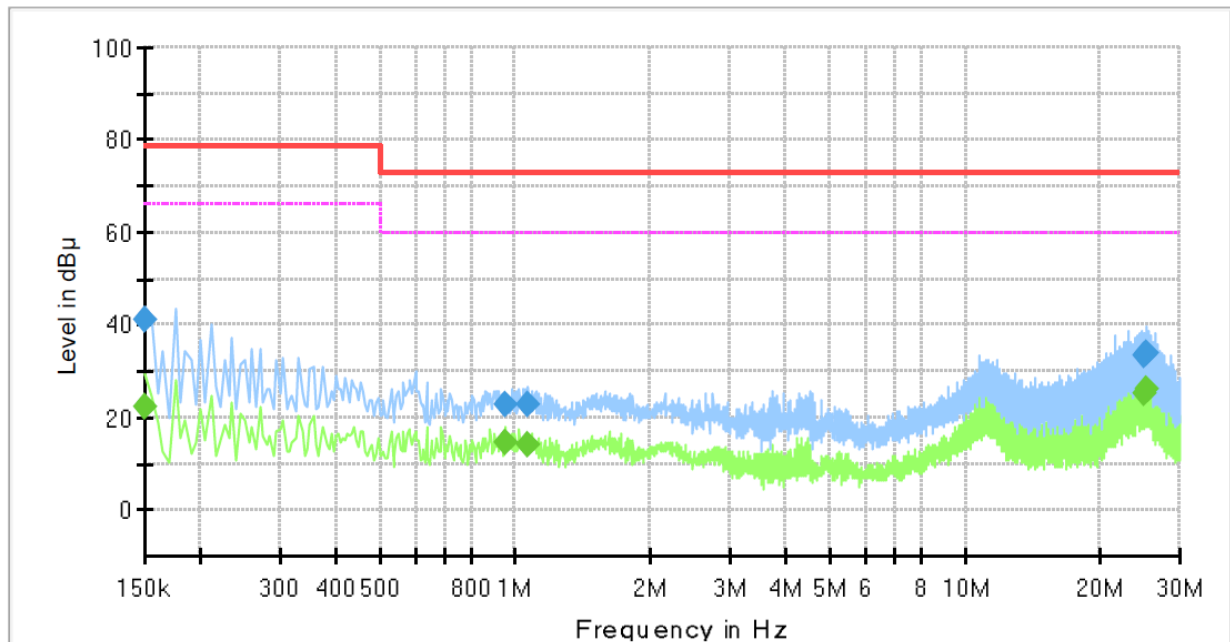
Conducted Emissions at Mains Power Ports

■ DC Mode

HOT LINE

Common Information

Test Description:	Conducted Emission
Model No.:	SPD-152
Phase:	L1
Mode:	DC
Operator Name:	KES



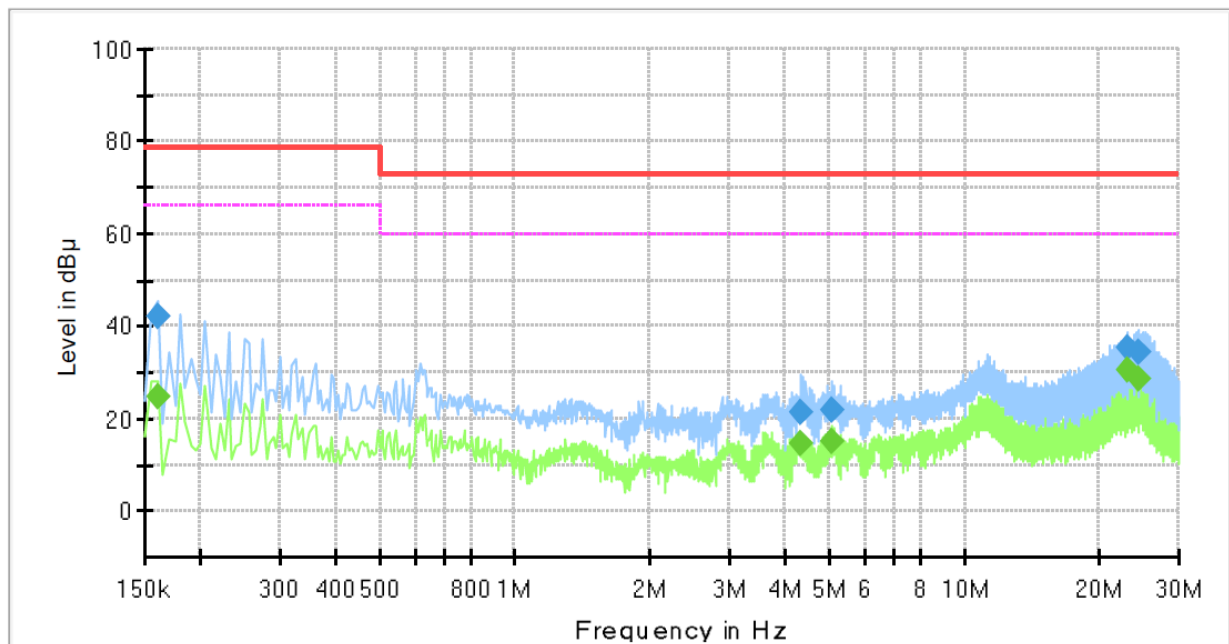
Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.150000	---	22.09	66.00	43.91	1000.0	9.000	L1	19.5
0.150000	41.00	---	79.00	38.00	1000.0	9.000	L1	19.5
0.950000	---	14.51	60.00	45.49	1000.0	9.000	L1	20.1
0.950000	22.71	---	73.00	50.29	1000.0	9.000	L1	20.1
1.070000	---	14.22	60.00	45.78	1000.0	9.000	L1	20.1
1.070000	22.87	---	73.00	50.13	1000.0	9.000	L1	20.1
24.965000	---	25.25	60.00	34.75	1000.0	9.000	L1	20.2
24.965000	33.45	---	73.00	39.55	1000.0	9.000	L1	20.2
25.420000	---	26.11	60.00	33.89	1000.0	9.000	L1	20.2
25.420000	33.93	---	73.00	39.07	1000.0	9.000	L1	20.2

NEUTRAL LINE

Common Information

Test Description:	Conducted Emission
Model No.:	SPD-152
Phase:	N
Mode:	DC
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	---	24.59	66.00	41.41	1000.0	9.000	N	19.4
0.160000	41.98	---	79.00	37.02	1000.0	9.000	N	19.4
4.305000	---	14.68	60.00	45.32	1000.0	9.000	N	19.8
4.305000	21.44	---	73.00	51.56	1000.0	9.000	N	19.8
5.095000	---	15.00	60.00	45.00	1000.0	9.000	N	19.7
5.095000	21.85	---	73.00	51.15	1000.0	9.000	N	19.7
23.130000	---	30.56	60.00	29.44	1000.0	9.000	N	20.2
23.130000	35.30	---	73.00	37.70	1000.0	9.000	N	20.2
24.350000	---	28.38	60.00	31.62	1000.0	9.000	N	20.2
24.350000	34.62	---	73.00	38.38	1000.0	9.000	N	20.2

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

The authenticity of the test report, contact kes@kes.co.kr

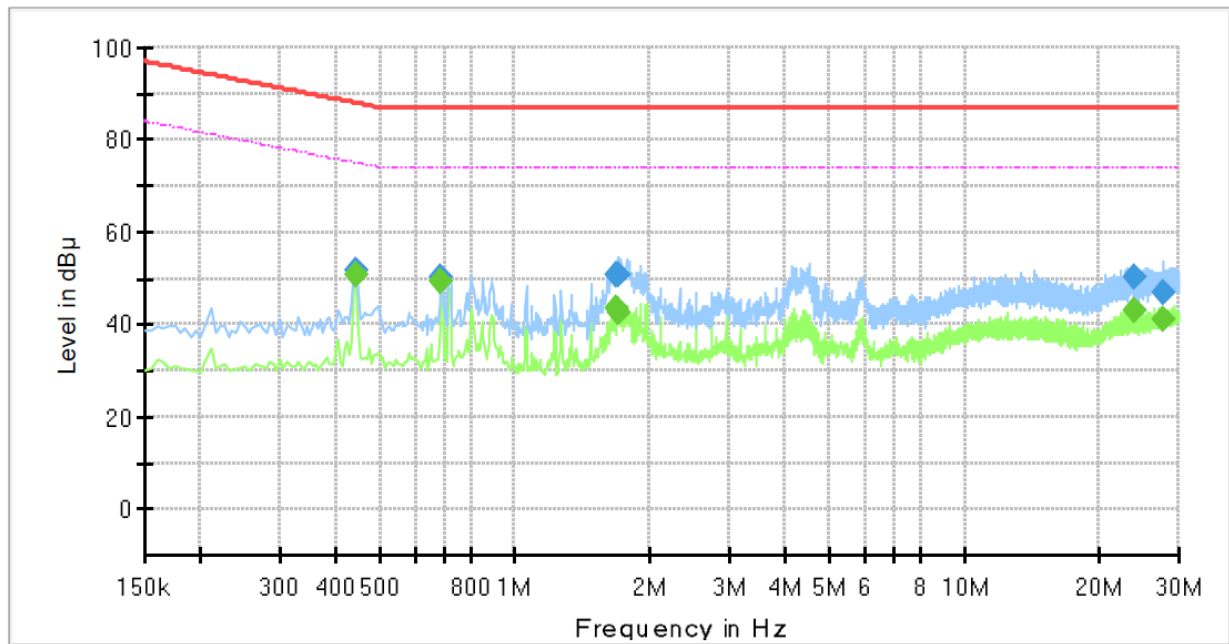
Conducted Emissions at Telecommunication Ports

■ DC Mode

[1 000 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	SPD-152
Mode :	DC
Speed :	1 000 Mbps
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.445000	---	50.80	74.97	24.17	1000.0	9.000	Single Line	19.4
0.445000	51.84	---	87.97	36.13	1000.0	9.000	Single Line	19.4
0.685000	---	49.41	74.00	24.59	1000.0	9.000	Single Line	19.6
0.685000	50.34	---	87.00	36.66	1000.0	9.000	Single Line	19.6
1.685000	---	43.69	74.00	30.31	1000.0	9.000	Single Line	19.8
1.685000	50.88	---	87.00	36.12	1000.0	9.000	Single Line	19.8
1.700000	---	42.63	74.00	31.37	1000.0	9.000	Single Line	19.8
1.700000	50.77	---	87.00	36.23	1000.0	9.000	Single Line	19.8
23.985000	---	43.01	74.00	30.99	1000.0	9.000	Single Line	19.6
23.985000	50.34	---	87.00	36.66	1000.0	9.000	Single Line	19.6
27.805000	---	41.22	74.00	32.78	1000.0	9.000	Single Line	19.7
27.805000	46.86	---	87.00	40.14	1000.0	9.000	Single Line	19.7

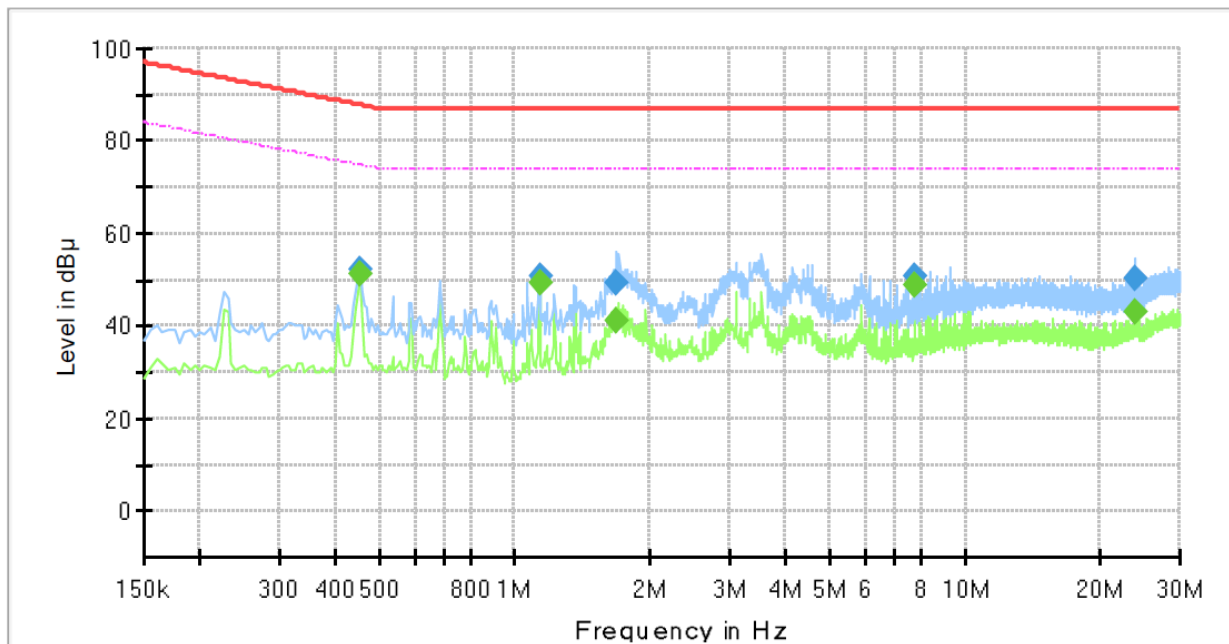
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

The authenticity of the test report, contact kes@kes.co.kr

PoE Mode
[1 000 Mbps]
Common Information

Test Description:	Telecommunication Emission
Model No.:	SPD-152
Mode :	PoE
Speed :	1 000 Mbps
Operator Name:	KES


Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.455000	---	51.22	74.78	23.56	1000.0	9.000	Single Line	19.5
0.455000	52.04	---	87.78	35.74	1000.0	9.000	Single Line	19.5
1.135000	---	49.57	74.00	24.43	1000.0	9.000	Single Line	19.7
1.135000	50.72	---	87.00	36.28	1000.0	9.000	Single Line	19.7
1.680000	---	41.17	74.00	32.83	1000.0	9.000	Single Line	19.8
1.680000	49.42	---	87.00	37.58	1000.0	9.000	Single Line	19.8
7.720000	---	48.94	74.00	25.06	1000.0	9.000	Single Line	19.0
7.720000	50.71	---	87.00	36.29	1000.0	9.000	Single Line	19.0
23.985000	---	42.94	74.00	31.06	1000.0	9.000	Single Line	19.6
23.985000	50.09	---	87.00	36.91	1000.0	9.000	Single Line	19.6

◆ Calculation

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

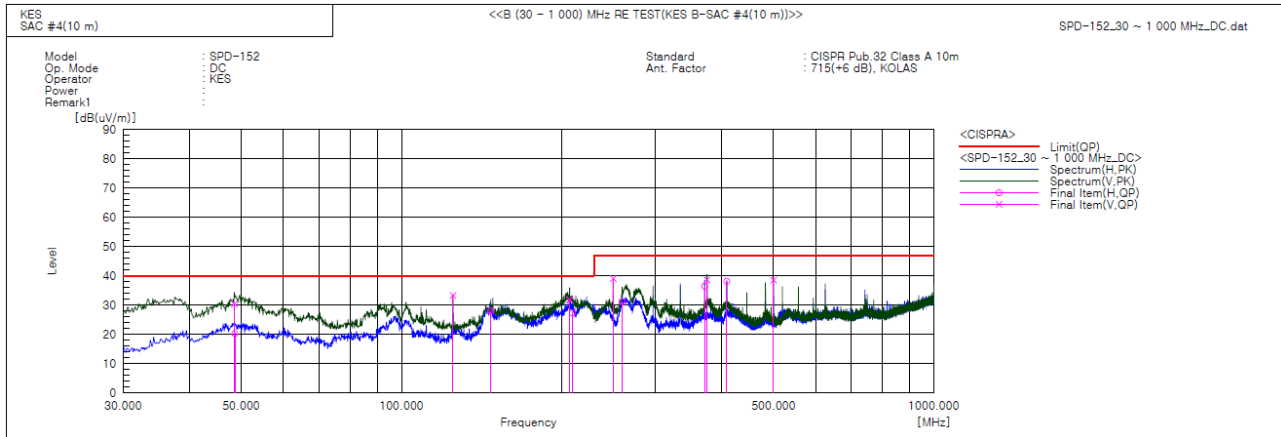
QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

Radiated Electric Field Emissions(Below 1 GHz)

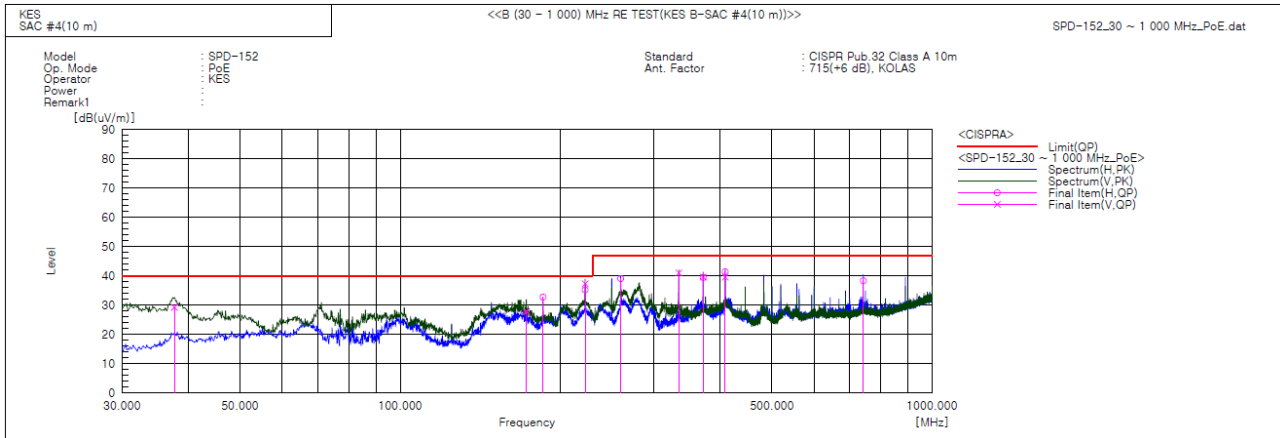
■ DC Mode



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	48.551	V	50.9	-20.5	30.4	40.0	9.6	127.0	279.0	
2	48.673	H	40.8	-20.5	20.3	40.0	19.7	394.0	142.0	
3	124.939	V	57.6	-24.3	33.3	40.0	6.7	144.0	64.0	
4	147.128	H	53.0	-25.0	28.0	40.0	12.0	385.0	191.0	
5	207.025	V	52.2	-20.4	31.8	40.0	8.2	125.0	358.0	
6	209.450	H	47.5	-20.2	27.3	40.0	12.7	369.0	16.0	
7	249.948	V	57.8	-18.8	39.0	47.0	8.0	103.0	316.0	
8	259.769	H	49.8	-18.6	31.2	47.0	15.8	357.0	285.0	
9	371.198	H	50.4	-14.0	36.4	47.0	10.6	381.0	341.0	
10	374.956	V	52.6	-14.0	38.6	47.0	8.4	142.0	268.0	
11	408.300	H	51.4	-13.3	38.1	47.0	8.9	396.0	188.0	
12	500.086	V	49.2	-10.7	38.5	47.0	8.5	110.0	30.0	

■ PoE Mode



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	37.639	V	52.4	-23.2	29.2	40.0	10.8	129.0	352.0	
2	172.711	V	51.7	-23.9	27.8	40.0	12.2	143.0	290.0	
3	185.564	H	55.3	-22.6	32.7	40.0	7.3	358.0	46.0	
4	222.666	H	54.7	-19.5	35.2	40.0	4.8	359.0	288.0	
5	222.666	V	56.8	-19.5	37.3	40.0	2.7	118.0	215.0	
6	259.769	H	57.6	-18.6	39.0	47.0	8.0	395.0	191.0	
7	334.095	V	56.6	-15.6	41.0	47.0	6.0	140.0	151.0	
8	371.198	V	53.6	-14.0	39.6	47.0	7.4	106.0	219.0	
9	371.198	H	53.4	-14.0	39.4	47.0	7.6	396.0	77.0	
10	408.300	V	52.8	-13.3	39.5	47.0	7.5	140.0	184.0	
11	408.300	H	54.7	-13.3	41.4	47.0	5.6	367.0	267.0	
12	742.465	H	44.4	-6.1	38.3	47.0	8.7	376.0	352.0	

◆ Calculation

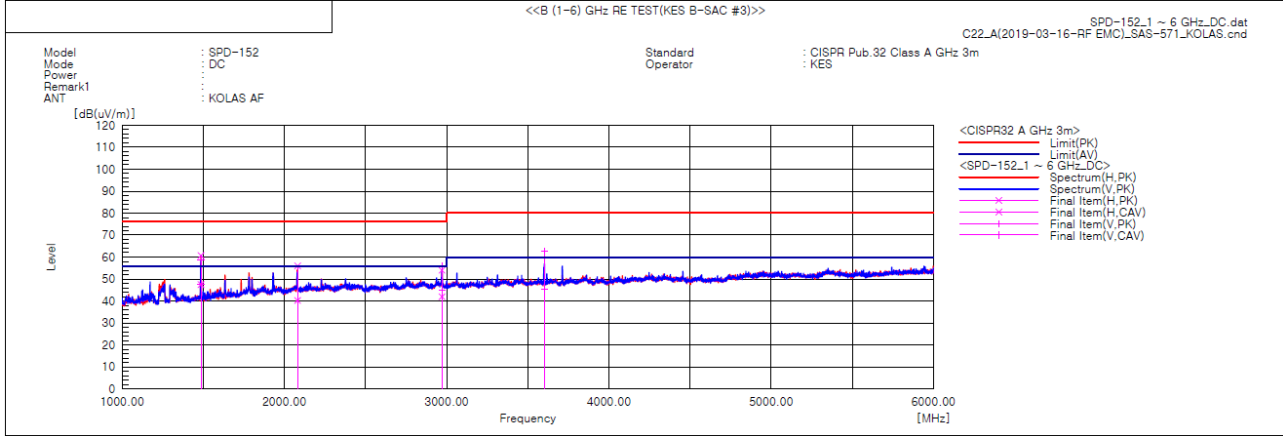
Corrected Amplitude [dBuV] = Amplitude[dBuV] + Correction Factor [dB]

Corrected Amplitude : The Final Value, Amplitude : Reading Value,

Correction Factor : ANT FACTOR + Cable loss

Radiated Electric Field Emissions(Above 1 GHz)

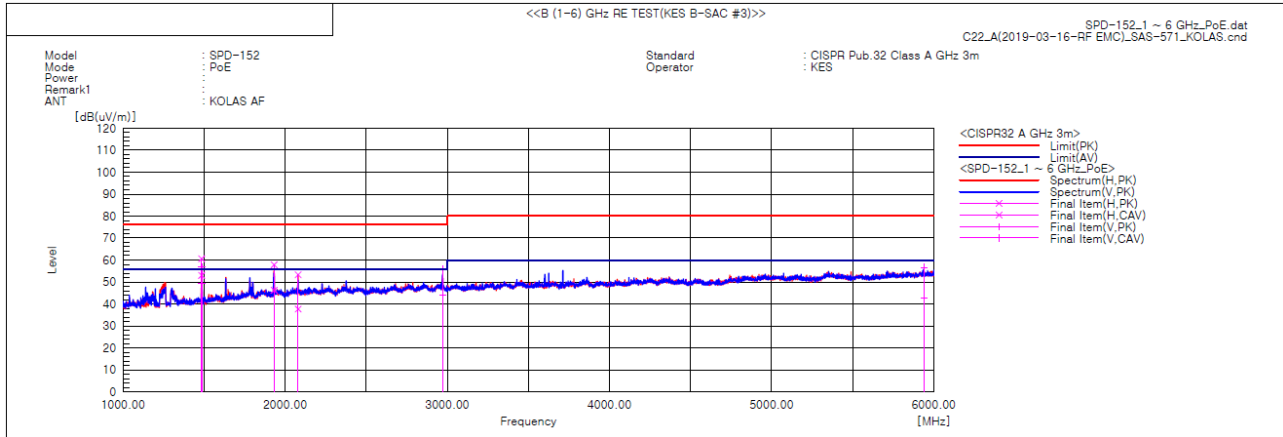
■ DC Mode



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	1485.095	H	60.9	47.6	-0.1	60.8	47.5	76.0	56.0	15.2	8.5	100.0	58.0	
2	1485.158	V	59.0	47.9	-0.1	58.9	47.8	76.0	56.0	17.1	8.2	100.0	65.9	
3	2080.946	H	51.0	35.3	5.0	56.0	40.3	76.0	56.0	20.0	15.7	100.0	63.1	
4	2970.144	H	46.2	34.1	7.9	54.1	42.0	76.0	56.0	21.9	14.0	100.0	50.8	
5	2970.150	V	48.1	36.9	7.9	56.0	44.8	76.0	56.0	20.0	11.2	100.0	84.1	
6	3602.941	V	53.1	35.8	9.7	62.8	45.5	80.0	60.0	17.2	14.5	100.0	150.9	

PoE 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	1484.070	H	60.7	53.1	-0.1	60.6	53.0	76.0	56.0	15.4	3.0	100.0	58.2	
2	1485.021	V	56.9	49.3	-0.1	56.8	49.2	76.0	56.0	19.2	6.8	100.0	99.2	
3	1930.540	H	53.6	42.0	4.3	57.9	46.3	76.0	56.0	18.1	9.7	100.0	343.6	
4	2079.433	H	48.4	32.8	5.0	53.4	37.8	76.0	56.0	22.6	18.2	100.0	66.1	
5	2970.157	V	48.0	36.2	7.9	55.9	44.1	76.0	56.0	20.1	11.9	100.0	117.3	
6	5937.939	V	40.5	26.6	16.2	56.7	42.8	80.0	60.0	23.3	17.2	100.0	226.2	

Calculation

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

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

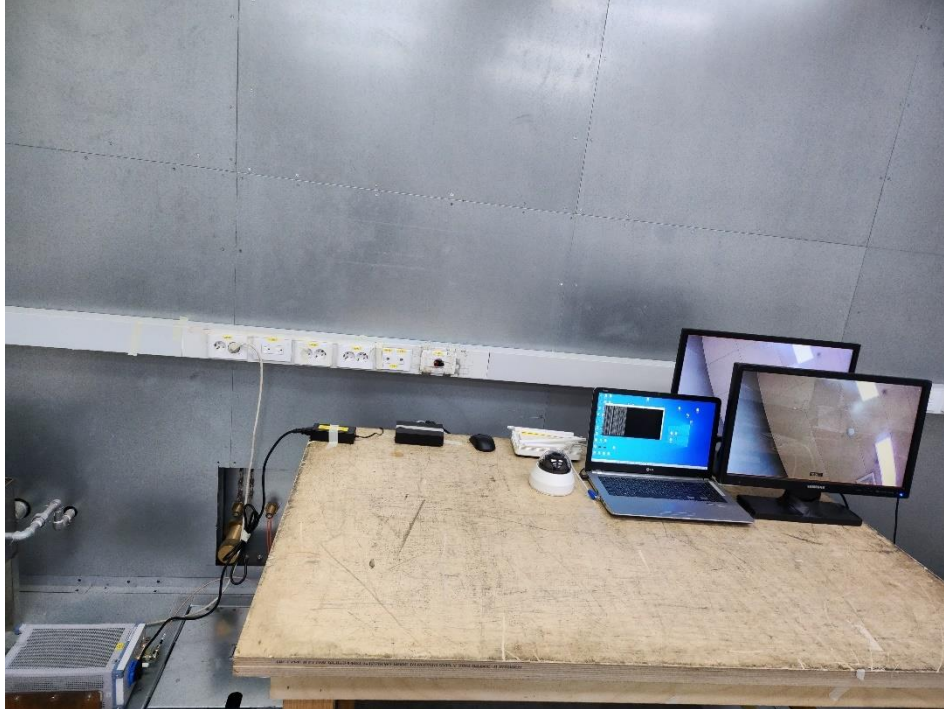
Reading(PK/CAV) : Reading value, Result(PK/CAV) : Reading value + Factor value

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

Test Setup Photos and Configuration

Conducted Emissions at Mains Power Ports

■ DC Mode



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

Conducted Emissions at Telecommunication Ports

■ DC Mode



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

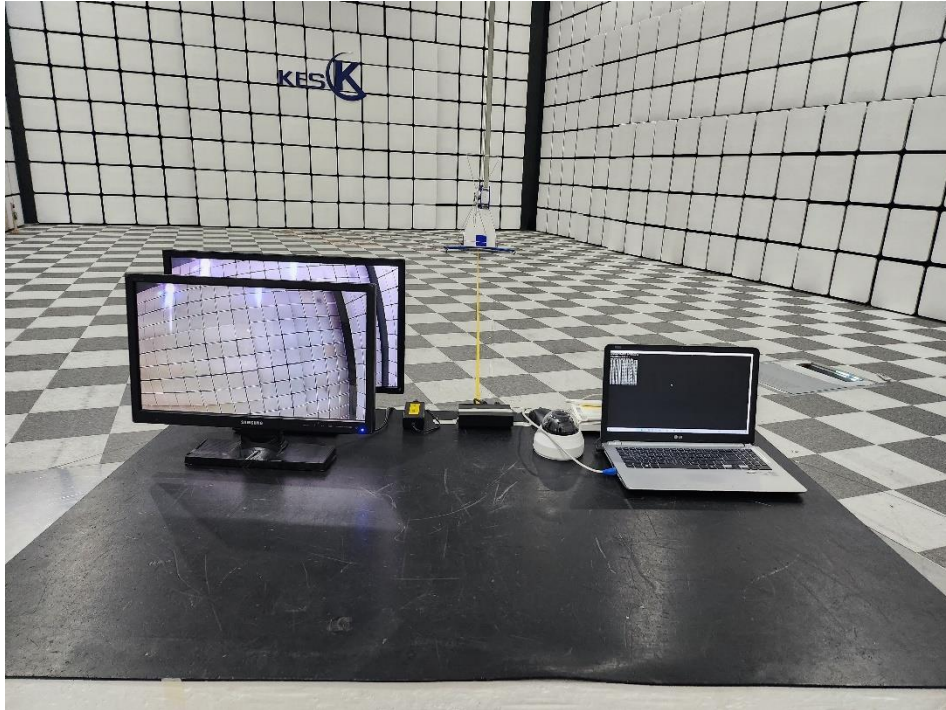
■ PoE Mode



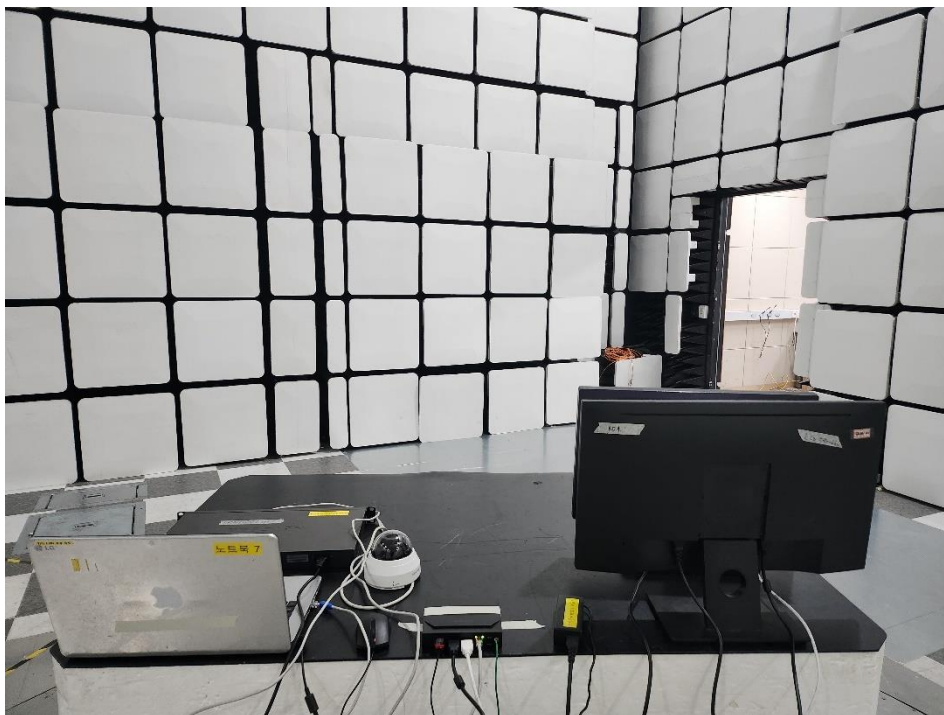
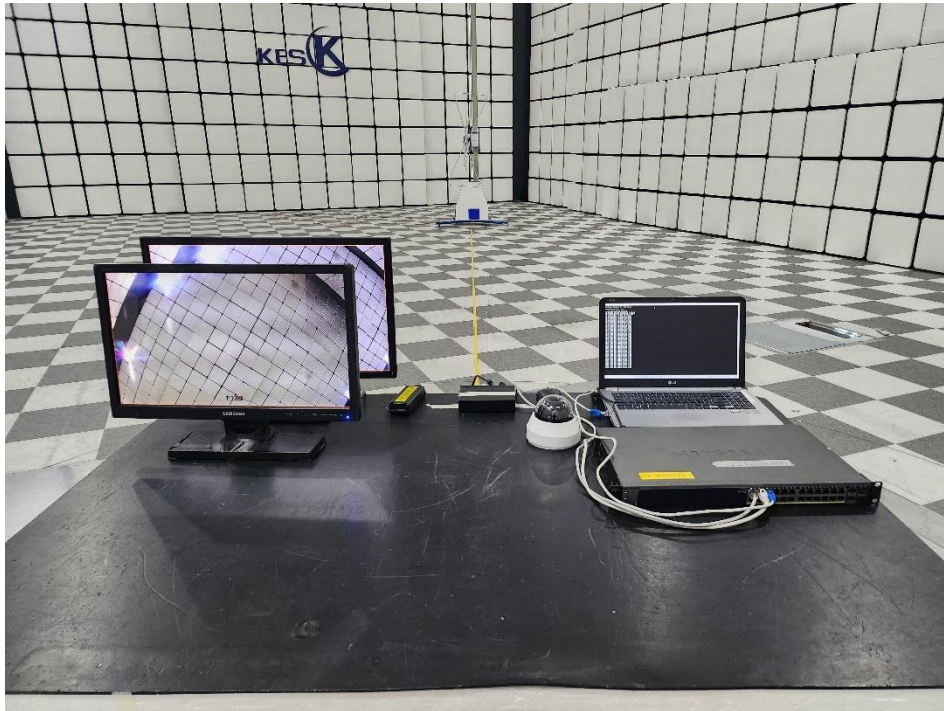
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

Radiated Electric Field Emissions(Below 1 GHz)

■ DC Mode



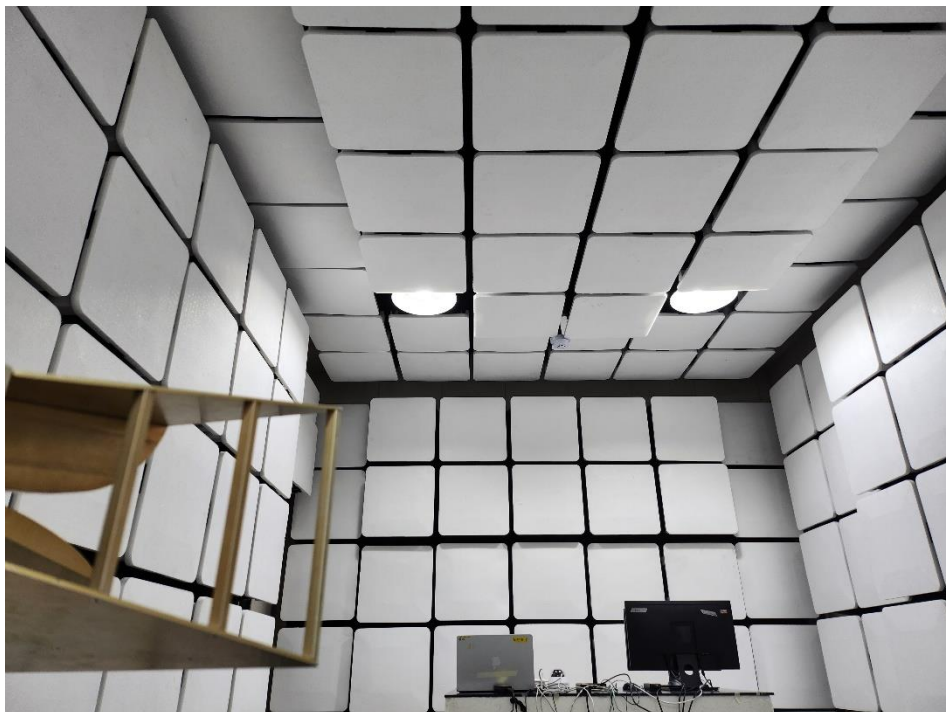
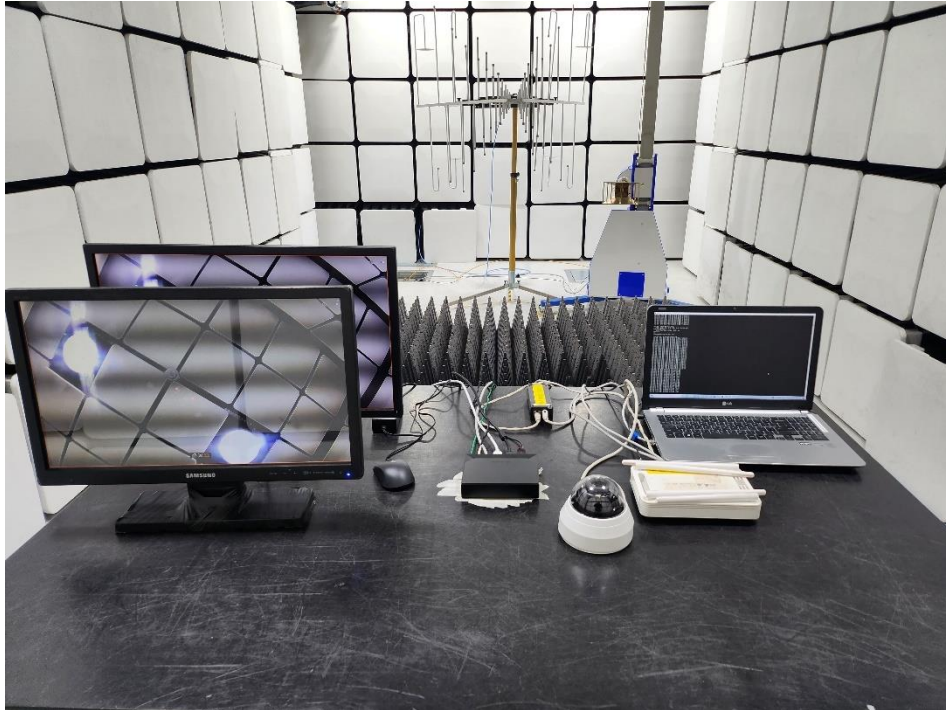
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

■ PoE Mode

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

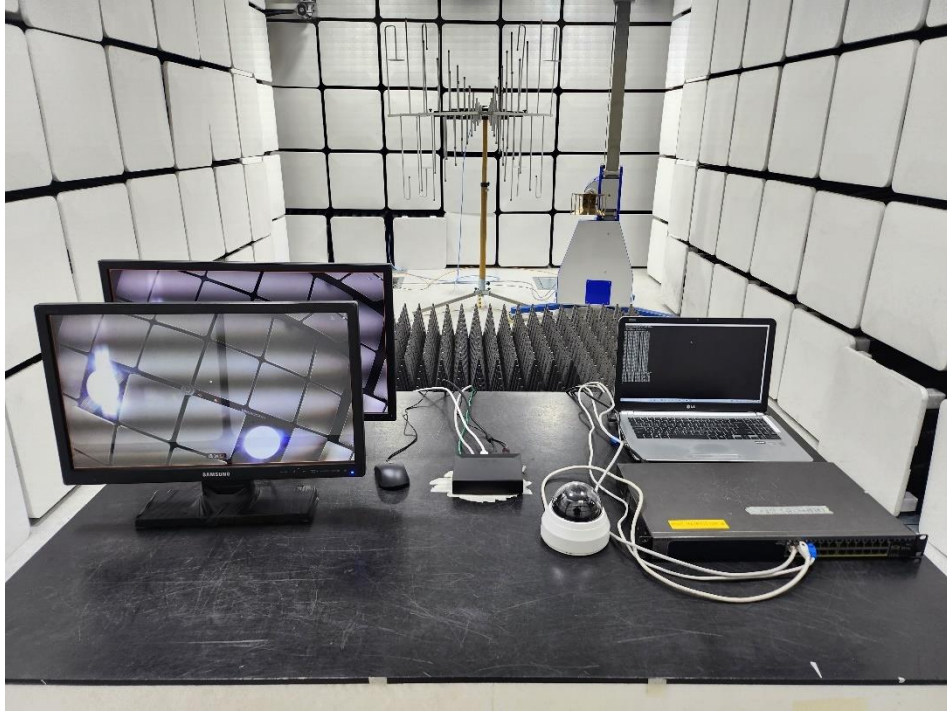
Radiated Electric Field Emissions(Above 1 GHz)

■ DC Mode



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

■ PoE Mode



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT External Photographs

(Top)



(Bottom)



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

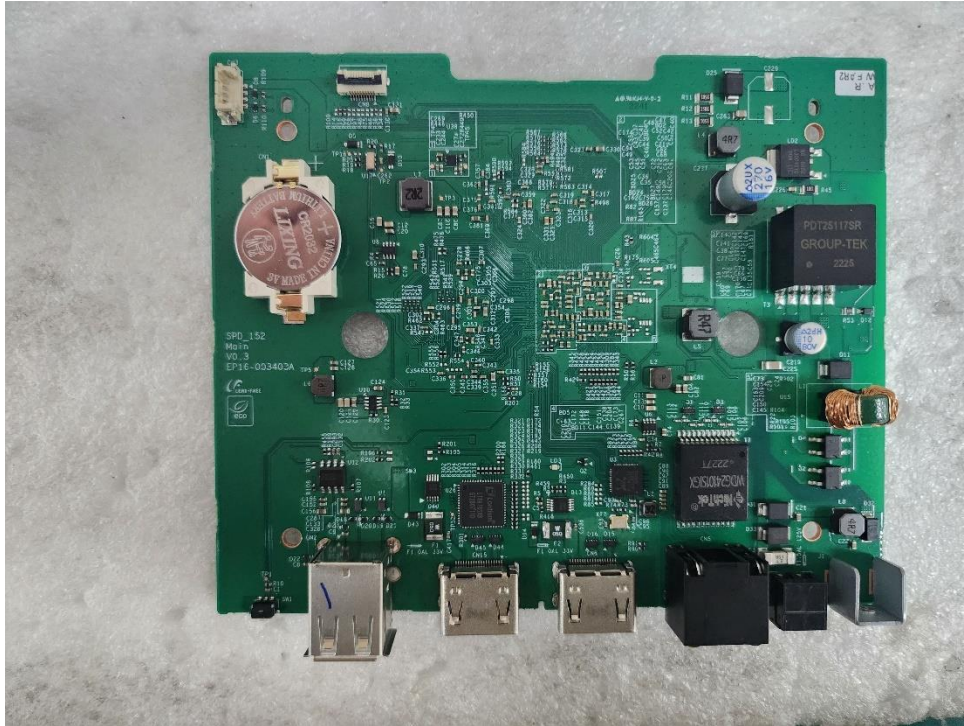
EUT Internal Photographs

(Internal View)

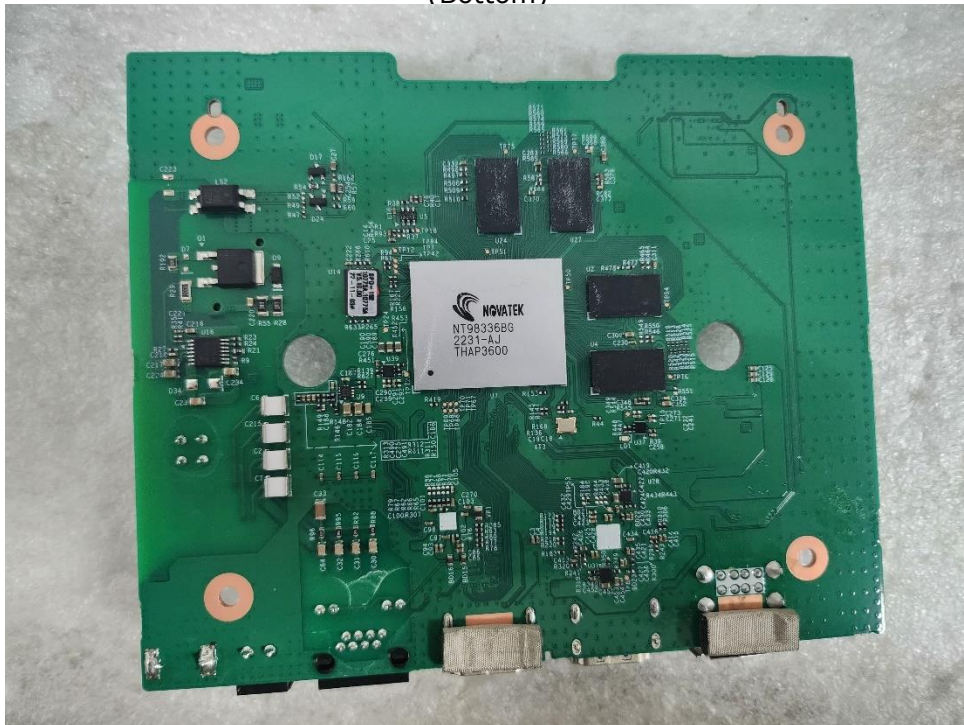


EUT Internal View – Board

(Top)



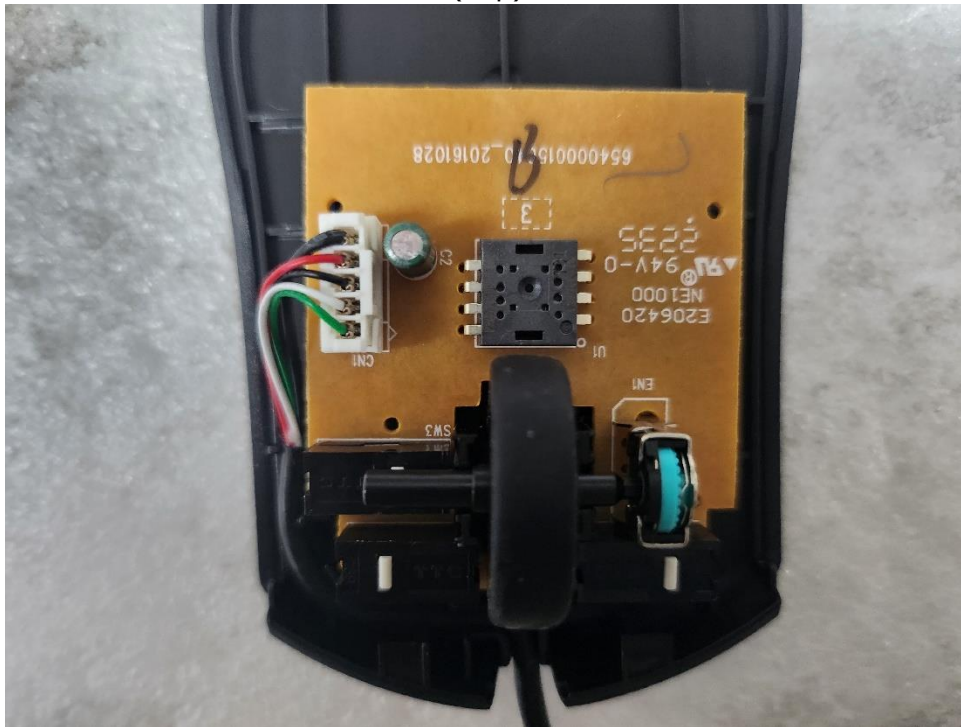
(Bottom)



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – Mouse Board

(Top)

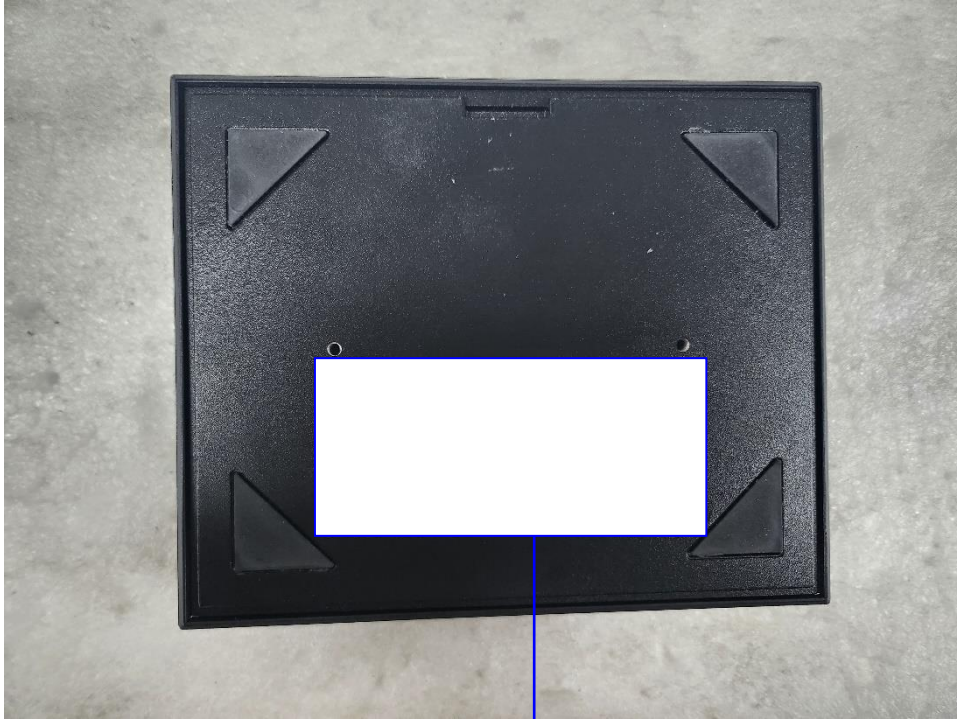


(Bottom)



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

Label Photographs



この装置は、クラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

VCCI-A