

**KES Co., Ltd.**

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Report No.:

KES-EM-22T0054-R1

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EMC TEST REPORT For RCM

Test Report No. : KES-EM-22T0054-R1

Date of Issue : Feb. 24, 2023

Product name : LENS MODULE

Model/Type No. : SLA-T4680V

Variant Model : -

Applicant : Hanwha Vision Co., Ltd

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

Manufacturer : 1. HANWHA VISION VIETNAM COMPANY LIMITED
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 : Dec. 09, 2021

Test date : Dec. 30, 2021 ~ Dec. 31, 2021

Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Dong Yun, Lee
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
Jan. 12, 2022	KES-EM-22T0054	Issued
Feb. 24, 2023	KES-EM-22T0054-R1	Change the Applicant and manufacturer at the request of the customer

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1.0 General Product Description

Main Specifications of EUT are:

Imaging Device	1/2.8" 2M CMOS
Total Pixels	1,945(H) x 1,109(V) 2.16M
Effective Pixels	1,945(H) x 1,097(V) 2.13M
Scanning System	Progressive Scan
Min. Illumination	Color : 0.45Lux (F2.0) B/W : 0.45Lux (F2.0)
S / N Ratio	50dB
Wide Dynamic Range	120dB
Day & Night	Electrical
Focal Length (Zoom Ratio)	2.4mm
Max. Aperture Ratio	F2.0
Angular Field of View	H : 138° / V : 73° / D : 168°
Min. Object Distance	0.3m (0.98ft)
Lens Type	Fixed focal
Mount Type	RJ12 connected with main unit
Operating Temperature / Humidity	-10°C ~ +55°C (+14°F ~ +131°F) / Less than 90% RH
Storage Temperature / Humidity	-50°C ~ +60°C (-58°F ~ +140°F) / Less than 90% RH
Color / Material	Lens : Black / Plastic Cable : Black
Dimensions (WxHxD)	Lens : 30 x 20.2 x 45mm (1.18" x 0.80" x 1.77") Cable : 8m (314.96")
Weight	321g (0.71 lb)

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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 240 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
LENS MODULE	SLA-T4680V	-	HANWHA VISION VIETNAM COMPANY LIMITED	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
NETWORK CAMERA	XNB-6001	-	HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.	-
Notebook	P95G001	9JM8HT2	DELL INC.	-
Notebook Adapter	LA65NS2-01	-	LITE-ON TECHNOLOGY (CHANGZHOU)CO.,LTD.	-
Adapter	APL-12015	-	APOWER	-

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1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
LENS MODULE (EUT)	RJ-45	NETWORK CAMERA	RJ-12	8.0	U
NETWORK CAMERA	DC JACK	Adapter	DC JACK	1.4	U
	RJ-45	Notebook	RJ-45	3.0	U
Notebook	DC JACK	Notebook Adapter	DC JACK	1.6	U

* Unshielded=U, Shielded=S

1.7 EUT Operating Mode(s)

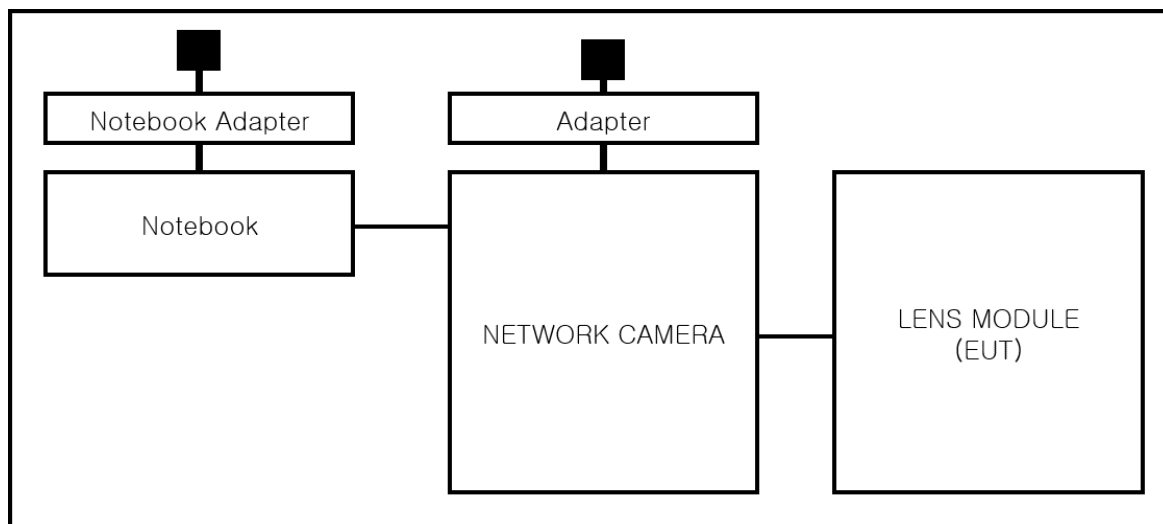
operating
EUT Monitoring

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

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1.8 Configuration

■ AC Main
 □ DC Main



1.9 Remarks when standards applied

The RJ-12 port is not tested because it is a normal signal line, not IP communication. Tests for Conductive Emissions at Telecommunication Ports were 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 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



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2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **AS/NZS CISPR32:2015**

☒ Class A

☐ Class B

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2.1 Conducted Emissions at Mains Power Ports

Test Date

Dec. 30, 2021

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: (22,5 ± 0,3) °C

Relative Humidity: (43,1 ± 0,3) % 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, 10, 2022

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

Dec. 31, 2021

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

Test Conditions

Temperature: (22,5 ± 0,1) °C

Relative Humidity: (43,6 ± 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

Dec. 30, 2021

Test Location

SEMI ANECHOIC CHAMBER #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESR7	R & S	101190	08, 03, 2022
☒	PREAMPLIFIER	8449B	AGILENT	3008A01967	04, 07, 2022
☐	ATTENUATOR	8491A	HP	35496	03, 10, 2022
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 11, 2022

Test Conditions

Temperature: (22,0 ± 0,2) °C

Relative Humidity: (43,5 ± 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

RemarksSee Appendix A for test data.

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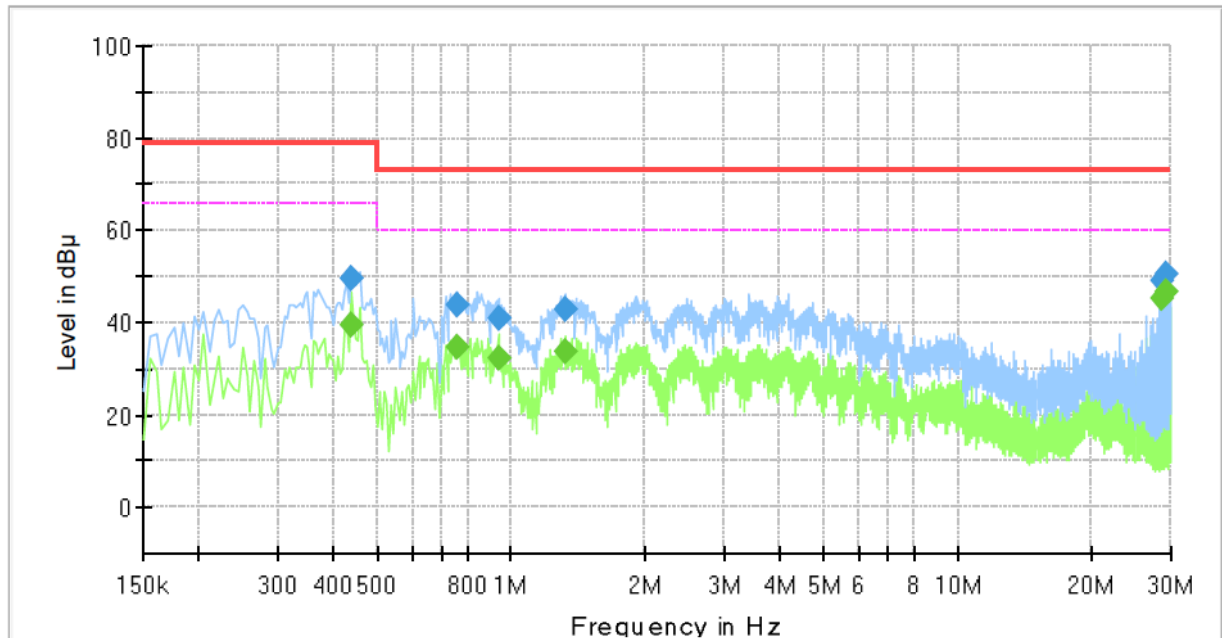
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

HOT LINE

Common Information

Test Description: Conducted Emission
Model No.: SLA-T4680V
Phase: L1
Mode:
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.440000	---	39.26	66.00	26.74	1000.0	9.000	L1	19.7
0.440000	49.43	---	79.00	29.57	1000.0	9.000	L1	19.7
0.760000	---	34.85	60.00	25.15	1000.0	9.000	L1	20.0
0.760000	43.60	---	73.00	29.40	1000.0	9.000	L1	20.0
0.935000	---	32.06	60.00	27.94	1000.0	9.000	L1	20.1
0.935000	41.09	---	73.00	31.91	1000.0	9.000	L1	20.1
1.315000	---	33.90	60.00	26.10	1000.0	9.000	L1	20.2
1.315000	42.89	---	73.00	30.11	1000.0	9.000	L1	20.2
28.685000	---	45.35	60.00	14.65	1000.0	9.000	L1	20.3
28.685000	49.23	---	73.00	23.77	1000.0	9.000	L1	20.3
29.235000	---	46.84	60.00	13.16	1000.0	9.000	L1	20.4
29.235000	50.48	---	73.00	22.52	1000.0	9.000	L1	20.4

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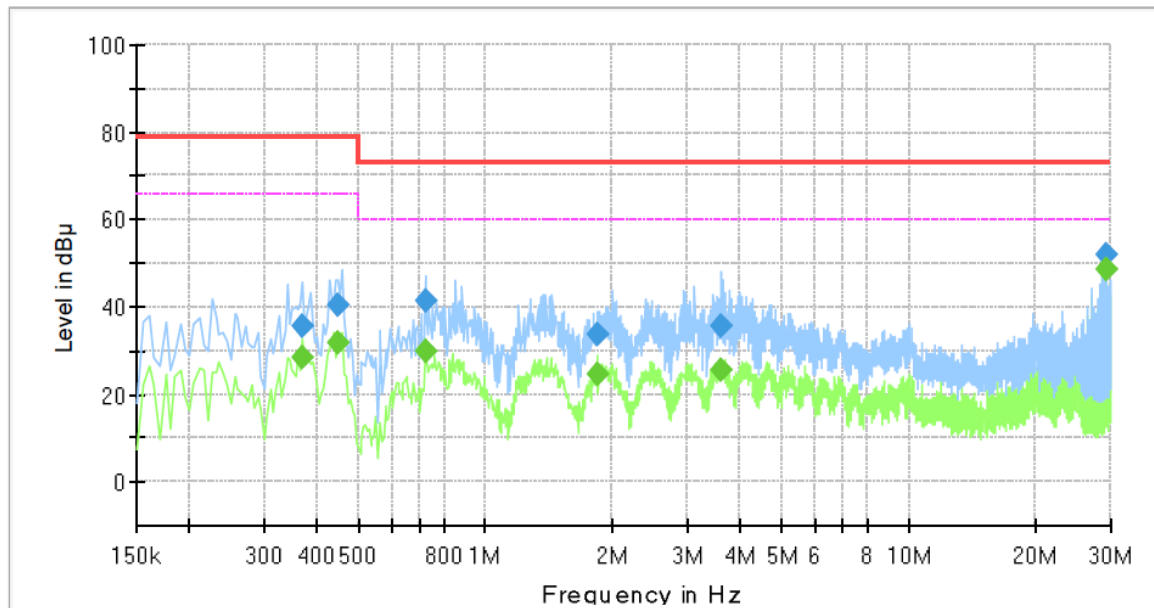
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NEUTRAL LINE

Common Information

Test Description: Conducted Emission
Model No.: SLA-T4680V
Phase: N
Mode:
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.370000	35.72	---	79.00	43.28	1000.0	9.000	N	19.6
0.370000	---	28.27	66.00	37.73	1000.0	9.000	N	19.6
0.450000	---	31.57	66.00	34.43	1000.0	9.000	N	19.7
0.450000	40.53	---	79.00	38.47	1000.0	9.000	N	19.7
0.720000	41.60	---	73.00	31.40	1000.0	9.000	N	20.0
0.720000	---	30.02	60.00	29.98	1000.0	9.000	N	20.0
1.840000	---	24.42	60.00	35.58	1000.0	9.000	N	20.3
1.840000	33.89	---	73.00	39.11	1000.0	9.000	N	20.3
3.620000	35.86	---	73.00	37.14	1000.0	9.000	N	20.0
3.620000	---	25.71	60.00	34.29	1000.0	9.000	N	20.0
29.235000	52.02	---	73.00	20.98	1000.0	9.000	N	20.4
29.235000	---	48.49	60.00	11.51	1000.0	9.000	N	20.4

◆ 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

[1 000 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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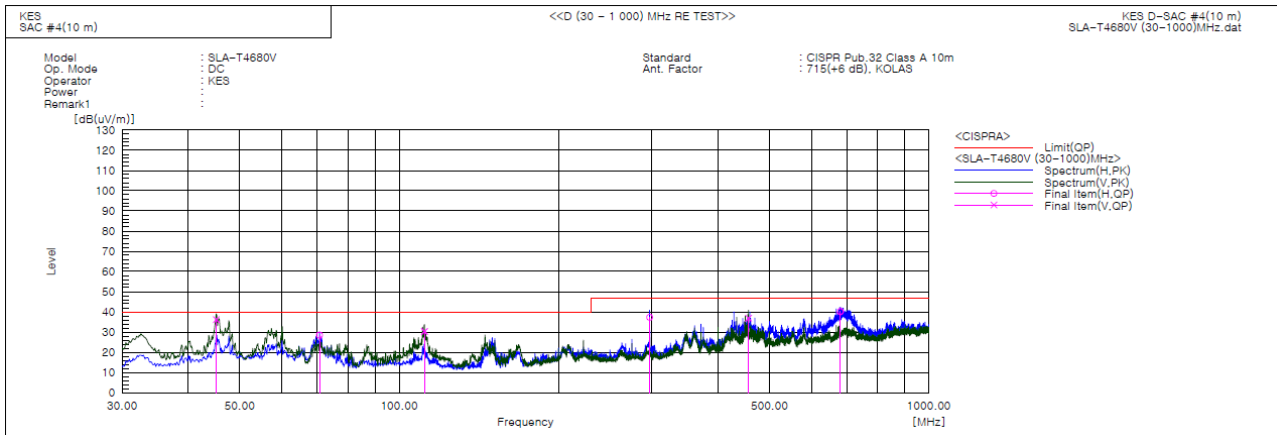
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Radiated Electric Field Emissions(Below 1 GHz)



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	45.156	V	57.5	-21.3	36.2	40.0	3.8	391.0	283.0	
2	70.740	H	53.5	-25.0	28.5	40.0	11.5	210.0	180.0	
3	111.601	V	52.6	-22.3	30.3	40.0	9.7	400.0	290.0	
4	296.993	H	55.3	-18.0	37.3	47.0	9.7	202.0	252.0	
5	456.315	V	49.6	-12.7	36.9	47.0	10.1	400.0	53.0	
6	680.021	H	47.9	-7.7	40.2	47.0	6.8	192.0	191.0	

◆ Calculation

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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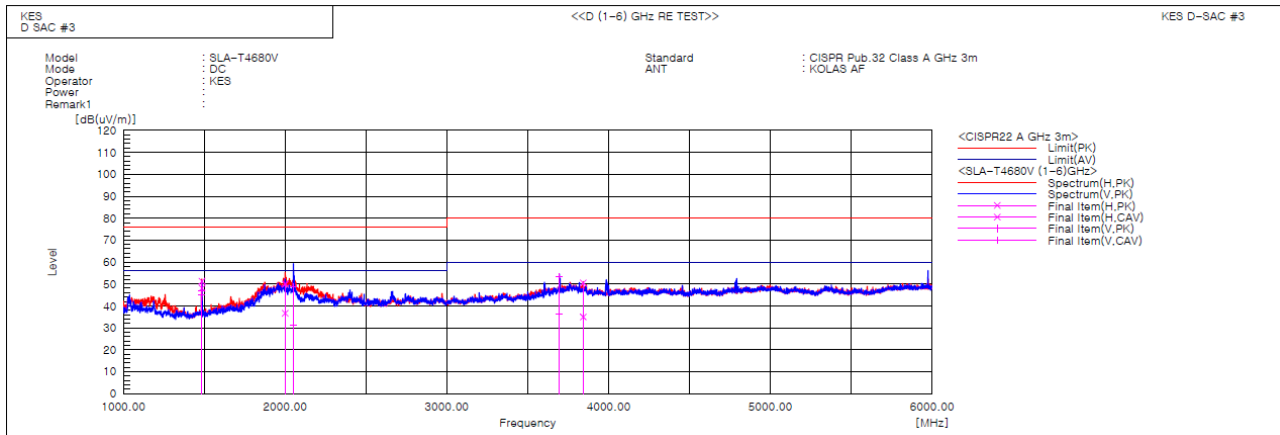
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Radiated Electric Field Emissions(Above 1 GHz)



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	1485.410	H	57.5	54.3	-6.2	51.3	48.1	76.0	56.0	24.7	7.9	100.0	40.4	
2	1485.010	V	53.1	51.2	-6.2	46.9	45.0	76.0	56.0	29.1	11.0	100.0	62.8	
3	2000.490	H	51.0	37.7	-1.0	50.0	36.7	76.0	56.0	26.0	19.3	100.0	235.2	
4	2051.937	V	49.7	31.9	-0.8	48.9	31.1	76.0	56.0	27.1	24.9	100.0	317.5	
5	3695.668	V	49.5	32.7	3.8	53.3	36.5	80.0	60.0	26.7	23.5	100.0	1.6	
6	3842.220	H	45.4	29.9	5.1	50.5	35.0	80.0	60.0	29.5	25.0	100.0	173.6	

◆ 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

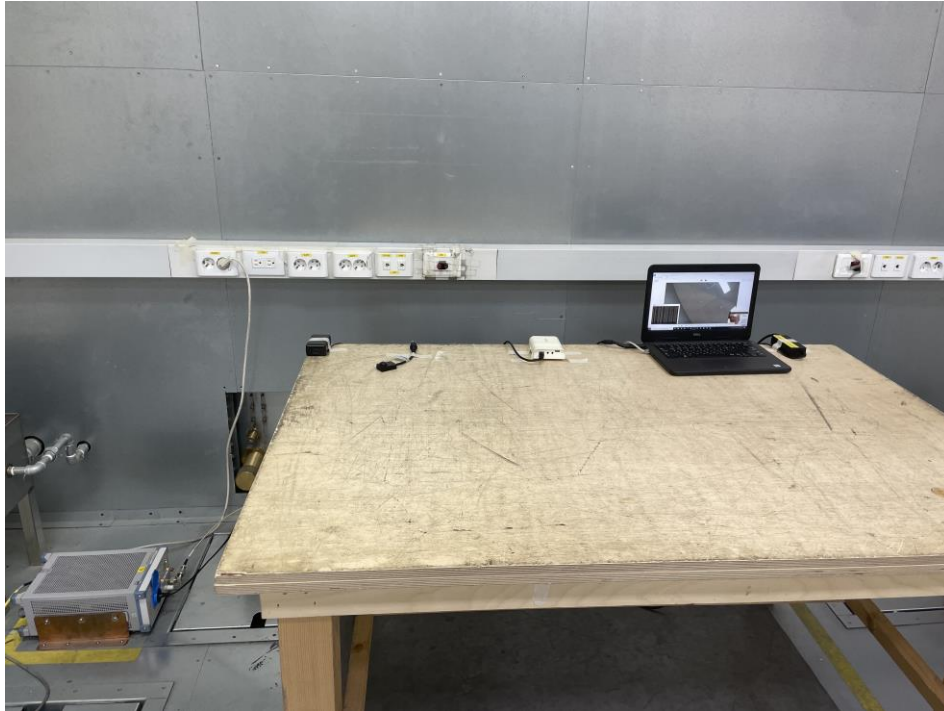
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Test Setup Photos and Configuration

Conducted Emissions at Mains Power Ports



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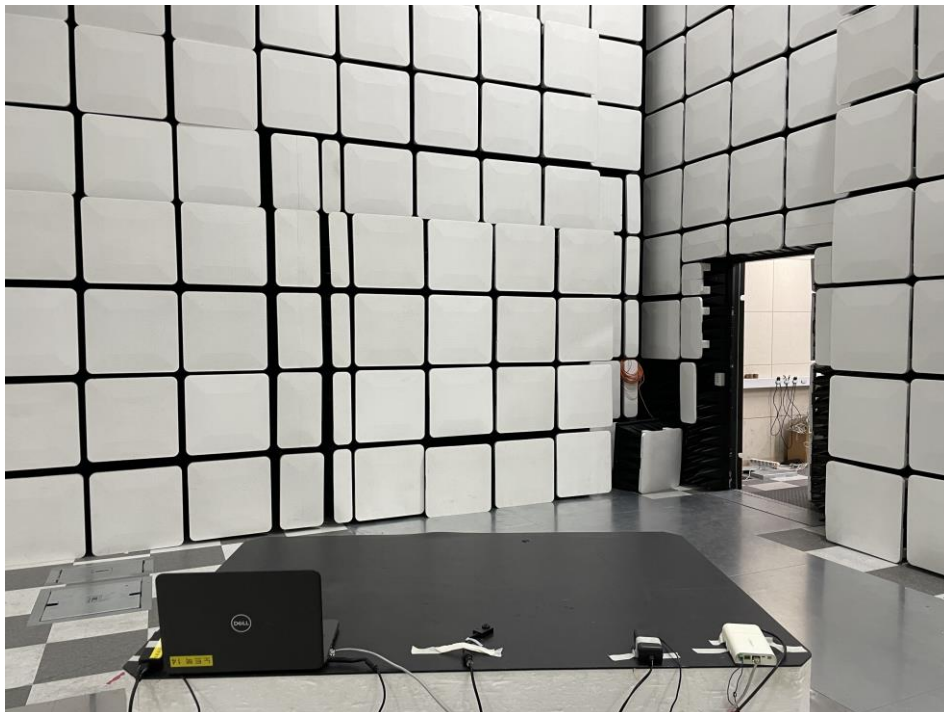
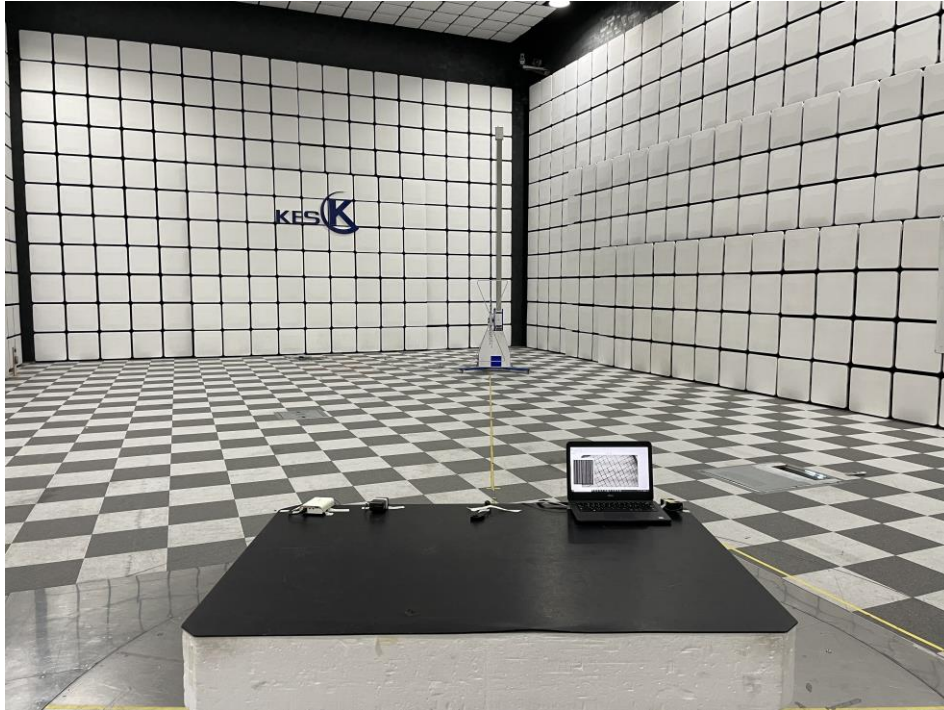
Report No.:
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Conducted Emissions at Telecommunication Ports

N/A

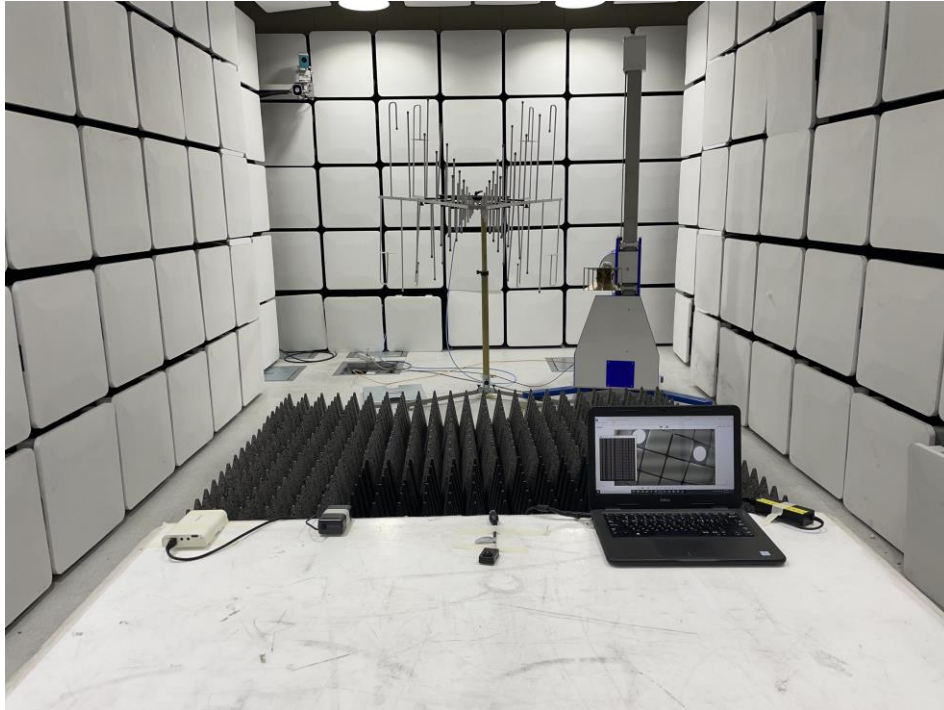
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Radiated Electric Field Emissions(Below 1 GHz)



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Radiated Electric Field Emissions(Above 1 GHz)



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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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