



EMC TEST REPORT

Test Report No. : KES-EM-22T0716-R1
Date of Issue : Feb. 24, 2023
Product name : LENS MODULE
Model/Type No. : SLA-T4680DA
Variant Model : SLA-T4680DSA
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 : Aug. 11, 2022
Test date : Aug. 13, 2022 ~ Aug. 15, 2022
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

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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 No.:
KES-EM-22T0716-R1
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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Aug. 23, 2022	KES-EM-22T0716	Issued
Feb. 24, 2023	KES-EM-22T0716-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:

SLA-T4680DA		Network	
Video		Ethernet	None
Imaging Device	1/2.8" 2M CMOS	Video Compression	None
Resolution	None	Audio Compression	None
Max. Framerate	None	Smart Codec	None
NETD	None	Video Quality Adjustment	None
Pixel Size	None	Bitrate Control	None
Min. Illumination	Color: 0.06Lux(F2.5) BW: 0.06Lux(F2.5) * with PNM-9000QB, XNB-6002	Streaming	None
Video Out	None	Protocol	None
Video Transmission Distance	None	SIP support (VoIP, Peer-to-peer, SIP/P	None
		Security	None
		Application Programming Interface	None
Lens		General	
Focal Length (Zoom Ratio)	4.6mm fixed focal	Webpage Language	None
Max. Aperture Ratio	F2.5	Web Viewer	None
Angular Field of View	H : 73° / V : 39° / D : 85°	Edge Storage	None
Min. Object Distance	0.3m(0.98ft)	Memory	None
Focus Control	Fixed	Environmental & Electrical	
Lens Type	None	Operating Temperature / Humidity	-10°C ~ +55°C (+14°F ~ +131°F) / 0 ~ 90% RH
Mount Type	R12 connected with main unit	Storage Temperature / Humidity	-50°C ~ +60°C (-58°F ~ +140°F) / 0 ~ 90% RH
Optional Lens	None	Certification	None
Pan / Tilt / Rotate		Input Voltage	None
Pan / Tilt / Rotate Range	Flexible panning -30°~30°	Power Consumption	None
Pan Range	None	Mechanical	
Pan Speed	None	Color / Material	Housing : Black / Plastic Lens : Black / Plastic, Aluminum
Tilt Range	None	RAL Code	None
Tilt Speed	None		(TBD)
Rotate Range	None	Product Dimensions / Weight	Housing : 42.9(W)x33.0(H)x170.0(D)mm(1.69"x1.30"x6.69"), 77g(??lb) Lens : 30(W)x27.9(H)x45(D)mm(1.18"x1.10"x1.77"), 321g(0.71lb) Cable : 8m(26ft)
Sequence	None		
Preset Accuracy	None	Compatible Conduit hole / Gangbox	None
Operational		Hanging Mount (Dome)	None
Camera Title	None	Skin Cover	None
Direction Indicator	None	Skin Cover (Dome)	None
Day & Night	None	Weather Cap (Dome)	None
Backlight Compensation	None	Power Module	None
Wide Dynamic Range	None	Backbox	None
Digital Noise Reduction	None	Certifications & Standards	
Digital Image Stabilization	None	Network	None
Defog	None	EMC	None
Motion Detection	None	Safety	None
Privacy Masking	None	Environment	None
Gain Control	None	Video	None
White Balance	None	DORI (EN62676-4 standard)	
LDC	None	Detect (25PPM/ 8PPF)	None
Electronic Shutter Speed	None	Observe (63PPM/ 19PPF)	None
Digital PTZ	None	Recognize (125PPM/ 38PPF)	None
Video Rotation	None	Identify (250PPM/ 76PPF)	None
Analytics	None		
Business Intelligence	None		
Serial Interface	None		
Alarm I/O	None		
Alarm Triggers	None		
Alarm Events	None		
Audio Streaming	None		
Audio In	None		
Audio Out	None		
IR Viewable Length	None		
IR Illuminator (Optional)	None		
IR Radiation angle	None		
IR LED	None		
IR Wavelength	None		
IR Operation	None		
Water Removal	None		
Auto Tracking	None		
Coaxial Protocol	None		
Color Palettes	None		
Radiometry			
Temperature Detect Range	None		
Temperature Accuracy	None		
Temperature Detection	None		
Additional	None		

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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

Add a derivative model due to instrument color differences.

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
LENS MODULE	SLA-T4680DA	-	HANWHA VISION VIETNAM COMPANY LIMITED	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
NETWORK CAMERA	PNM-9000QB	-	HANWHA VISION VIETNAM COMPANY LIMITED	-
AC/DC Adapter	2ACB022F	-	Channel Well Technology (Guangzhou) Co., Ltd.	-
Monitor	DELL E2222H DVT	8221TCM10D001 03X	DELL INC.	-

1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
LENS MODULE (EUT)	RJ-12	NETWORK CAMERA	RJ-12	8.0	S
NETWORK CAMERA	HDMI	Monitor	HDMI	1.5	S
NETWORK CAMERA	DC Jack (2 Pin)	AC/DC Adapter	DC Jack (2 Pin)	0.8	U

* Unshielded=U, Shielded=S

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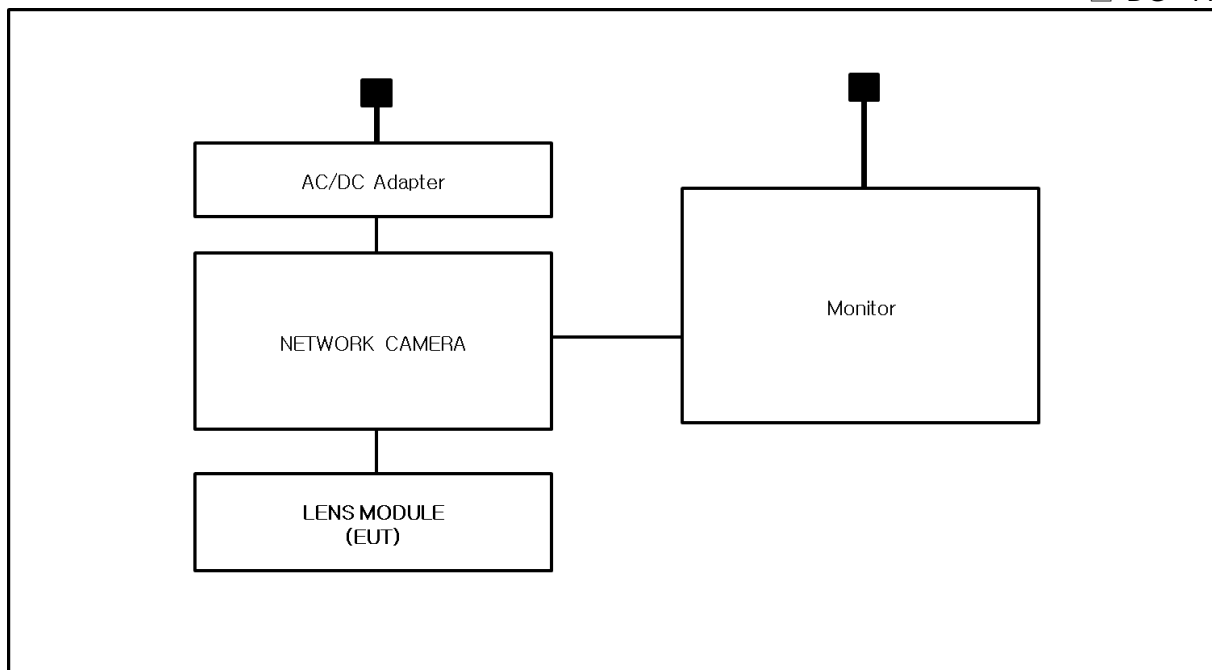
1.7 EUT Operating Mode(s)

Test Mode	operating
Operating	The normal operating state of Monitor was confirmed through EUT.

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

1.8 Configuration

■ AC Main
 □ DC Main



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/A11:2020

☒ Class A

☐ Class B

☒ EN 50130-4:2011

☒ EN 61000-3-2:2014

☒ EN 61000-3-3:2013

☒ **EMC – Regulations 2016**

☒ EN 55032:2015/A11:2020

☒ Class A

☐ Class B

☒ EN 50130-4:2011

☒ EN 61000-3-2:2014

☒ EN 61000-3-3:2013



2.1 Conducted Emissions at Mains Power Ports

Test Date

Aug. 13, 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: (24,4 ± 0,1) °C

Relative Humidity: (47,6 ± 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 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
☐	ISN	ISN S8	SCHWARZBECK	ISN-S8-0019	03, 07, 2023
☐	CDN	CDNS502A	TESEQ	40431	12, 27, 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



2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Aug. 14, 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, 24, 2022
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	12, 08, 2022
☒	ATTENUATOR	8491A	HP	32173	03, 08, 2023

Test Conditions

Temperature: (24,9 ± 0,1) °C
Relative Humidity: (45,1 ± 0,2) % 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.



2.4 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Aug. 14, 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
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 03, 2023

Test Conditions

Temperature: (24,6 ± 0,1) °C

Relative Humidity: (45,4 ± 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.



2.5 Harmonic Current Emissions

Test Date

Aug. 15, 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: (24,3 ± 0,1) °C
Relative Humidity: (48,2 ± 0,1) % R.H.

Classification of Equipment for Harmonic Current Emissions

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

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.



2.6 Voltage Fluctuations and Flicker

Test Date

Aug. 15, 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: (24,3 ± 0,1) °C
Relative Humidity: (48,2 ± 0,1) % R.H.

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.

3.0 Criteria for compliance

Criteria for compliance was based on the following guidelines:
EN 50130-4:2011 Alarm systems-Part 4: Electromagnetic compatibility Product family
standard: Immunity requirements for components of fire, intruder and social alarm systems

The variety and the diversity of the apparatus within the scope of this document makes it difficult to define precise criteria for the evaluation of the immunity test results.

If as a result of the application of the tests defined in this standard, the apparatus becomes dangerous or unsafe then the apparatus shall be deemed to have failed the test.

A functional description and a definition of performance by the manufacture and noted in the test report, based on the following criteria:

Electrostatic discharge

There shall be no damage, malfunction or change of status due to the conditioning.
Flickering of an indicator during the application of discharge is permissible, providing that is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change.

Radiated electromagnetic fields

There shall be no damage, malfunction or change of status due to the conditioning.
Flickering of an indicator during the application of discharge is permissible, providing which could be interpreted by associated equipment as a change, and no such
Flickering of indicators occurs at a field strength of 3 V/m.

For components of CCTV systems, where the picture is allowed at 10 V/m, providing.

- (a) there is no permanent damage or change to EUT
(e.g. no corruption of memory or changes to programmable setting etc.)
- (b) at 3 V/m, any deterioration of the picture is so minor that the system could still be used;
and
- (c) there is no observable deterioration of the picture at 1 V/m.

Fast transient burst / slow high energy voltage surge

There shall be no damage, malfunction or change of status due to the conditioning.
Flickering of an indicator during the application of discharge is permissible, providing
That there is no residual is permissible, providing that there is no residual change in the EUT or
any
change in outputs, which could be interpreted by associated equipment as a change.

Conducted RF immunity

There shall be no damage, malfunction or change of status due to the conditioning.
Flickering of an indicator during the application of discharge is permissible, providing
That there is no residual is permissible, providing that there is no residual change in the EUT or
any
change in outputs, which could be interpreted by associated equipment as a change,
and no such flickering of indicators oeuvres at $U = 130 \text{ dB}\mu\text{V}$.
For component of CCTV systems, where the status is monitored by observing the TV picture,
then deterioration of the picture is allowed at $U = 140 \text{ dB}\mu\text{V}$, providing:
(a) there is no permanent damage or change to the EUT
(e.g. no corruption of memory or changes to programmable settings etc.)
(b) at $U = 130 \text{ dB}\mu\text{V}$, any deterioration of the picture is so minor that the system could
still be used; and
(c) there in no observable deterioration of the picture at $U = 120 \text{ dB}\mu\text{V}$.

Voltage dip/interruption / Voltage variation

There shall be no damage, malfunction or change of status due to the conditioning.
Flickering of an indicator during the conditioning is permissible, providing that there is no
residual
change in the EUT or any change in outputs, which could be interpreted by associated
equipment
as a change. The EUT shall meet the acceptance criteria for the functional test, after the
conditioning.



3.1 Electrostatic Discharge

Reference Standard

EN 61000-4-2:2009

Test Date

Aug. 15, 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: (24,2 ± 0,1) °C
Relative Humidity: (48,2 ± 0,2) % R.H.
Atmospheric Pressure: (99,6 ± 0,1) kPa

Test Specifications

Discharge Factor: ≥ 1 s

Discharge Impedance: 330 ohm / 150 pF

Kind of Discharge: Air, Contact (direct and indirect)

Polarity: Positive and Negative

Number of Discharge: 10 at all locations for Air discharge
10 at all locations for Contact discharge

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

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

Required Performance Criteria: ☒ Complied

Location of Discharge:

Air
Contact



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Test Data

No.	Test Point	Discharge Method	Observations	Remarks
1	HCP Contact	Contact Discharge	Complied	-
2	VCP Contact	Contact Discharge	Complied	-

Direct Discharge

No.	Test Point	Discharge Method	Observations	Remarks
1	Enclosure	Air Discharge	Complied	-
2	Lens	Contact Discharge	Complied	-

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

Test Results

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

Remarks

PASS Required Performance Criteria

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3.2 Radiated Electric Field Immunity

Reference Standard

EN IEC 61000-4-3:2020

Test Date

Aug. 14, 2022

Test Location

EMS-RS: ☐ SEMI ANECHOIC CHAMBER #2 ☒ SEMI ANECHOIC CHAMBER #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	EMC32	R & S	10.10.02	-
☒	SIGNAL GENERATOR	SMB 100A	Rohde & Schwarz	108252	08, 01, 2023
☒	HIGH POWER DUAL AMP	SSA532	SUNGSAN	SSA532-001	-
☒	POWER METER	E4419B	Agilent	GB40203000	03, 31, 2023
☒	AVERAGE POWER SENSOR	E9301A	Agilent	MY52170007	04, 04, 2023
☒	AVERAGE POWER SENSOR	E9301A	Agilent	MY41498669	04, 04, 2023
☒	STACKED DOUBLE LOG-PER- ANTENNA	STPL9128 E	Schwarzbeck	9128ES-121	-
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 03, 2023
☒	STACKED DOUBLE LOG-PER- ANTENNA	STPL9128 D	SCHWARZBECK	9128D038	-
☒	LOG-PERIODIC ANTENNA	STLP 9149	SCHWARZBECK	9149-255	-

Test Conditions

Temperature: (24,6 ± 0,2) °C
Relative Humidity: (45,4 ± 0,2) % R.H.
Atmospheric Pressure: (100,1 ± 0,1) kPa



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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 ☐ 1,4 GHz to 2,7 GHz
☒ 80 MHz to 2,7 GHz

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: ☒ Complied

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Test Data

Side Exposed	Observations	
	Horizontal	Vertical
Front	Complied	Complied
Right	Complied	Complied
Back	Complied	Complied
Left	Complied	Complied

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

Test Results

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

Remarks

PASS Required Performance Criteria

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3.3 Electrical Fast Transients/Bursts

Reference Standard

EN 61000-4-4:2012

Test Date

Aug. 15, 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 ± 0,1) °C
Relative Humidity: (48,2 ± 0,1) % R.H.
Atmospheric Pressure: (99,6 ± 0,1) kPa

Test Specifications

Pulse Amplitude & Polarity:
(AC Power Lines) ☐ ± 1.0 kV ☒ ± 2.0 kV
☐ ± 4.0 kV

Pulse Amplitude & Polarity:
(Other supply / Signal Lines) ☐ ± 0.5 kV ☒ ± 1.0 kV
☐ ± 2.0 kV

Burst Period: ☒ 300 ms ☐ 2 s

Repetition Rate: ☐ 5 kHz ☒ 100 kHz

Duration of Test Voltage: ☒ ≥ 1 min

Required Performance Criteria: ☒ Complied

Test Data

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

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
L	Complied	Complied
N	Complied	Complied
PE	-	-
L – N	Complied	Complied
L – PE	-	-
N – PE	-	-
L – N – PE	-	-

☐ Input d.c. power ports – Coupling/Decoupling Network used

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
-	-	-

☒ Signal ports and telecommunication ports – Coupling Clamp used

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
RJ-12	Complied	Complied

Note: “Blank” = Not performed

Observations:

Complied – No degradation of function

Test Results

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

Remarks

PASS Required Performance Criteria

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3.4 Surge Transients

Reference Standard

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

Test Date

Aug. 15, 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
☐	CDN	CNV 508N1	EM TEST	P1610176296	12, 03, 2022

Test Conditions

Temperature: (24,2 ± 0,1) °C
Relative Humidity: (48,2 ± 0,2) % R.H.
Atmospheric Pressure: (99,6 ± 0,1) 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:

☒ 0°, 90°, 180°, 270° (input a.c. power port)

Polarity:

☒ Positive & Negative

Repetition Rate:

☐ 1 surge per min ☒ 1 surge per 30 sec.

Required Performance Criteria: ☒ Complied

Other supply / Signal Lines

Source Impedance:

42 ohm for common Mode

Surge Amplitude:

Common Mode

☐ (0,5 / 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: ☐ Complied

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Test Data☒ Line to Line – Differential Mode

Mode of Application	Observations	
	(+) Surge (kV)	(-) Surge (kV)
L – N	Complied	Complied

☐ Line to Earth – Common Mode

Mode of Application	Observations	
	(+) Surge (kV)	(-) Surge (kV)
L – PE	-	-
N – PE	-	-

Signal Lines☐ Line to Earth – Common Mode

Mode of Application	Coupling Method	Observations	
		(+) Surge (kV)	(-) Surge (kV)
-	CDN	-	-
	LINE	-	-

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

Test Results☒ PASS Required Performance Criteria☐ NOT PASS Required Performance Criteria**Remarks**PASS Required Performance Criteria

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3.5 Conducted Disturbance

Reference Standard

EN 61000-4-6:2014

Test Date

Aug. 13, 2022

Test Location

EMS-CS: Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	icd.control	EM TEST	5.3.12	-
☒	CONTINUOUS WAVE SIMULATOR	CWS 500N1.4	EM TEST	P1602169880	11, 24, 2022
☒	ATTENUATOR	ATT 6/80	EM TEST	P1614178148	11, 24, 2022
☒	CDN	CDN M016	TESEQ	43694	11, 24, 2022
☒	CDN	CDN M016	TESEQ	43697	11, 24, 2022
☐	CDN	CDN ST08A	TESEQ	43886	11, 24, 2022
☒	EM CLAMP	KEMZ 801A	TESEQ	44099	11, 25, 2022

Test Conditions

Temperature: (24,4 ± 0,2) °C
Relative Humidity: (47,6 ± 0,1) % R.H.
Atmospheric Pressure: (100,2 ± 0,1) kPa



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Test Specifications

Frequency range:

☒ 150 kHz to 100 MHz

☐ 150 kHz to 80 MHz

Voltage Level:

☐ 1 Vrms

☐ 3 Vrms

☒ 10 Vrms

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: ☒ Complied

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Test Data

☒ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
L – N	CDN	Complied

☐ Input d.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
-	-	-

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
RJ-12	CDN	Complied

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

Observations:

Complied – No degradation of function

Test Results

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

Remarks

PASS Required Performance Criteria



3.6 Voltage Dips and Short Interruptions

Reference Standard
EN IEC 61000-4-11:2020

Test Date
Aug. 15, 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: (24,2 ± 0,1) °C
Relative Humidity: (48,2 ± 0,1) % R.H.
Atmospheric Pressure: (99,6 ± 0,0) kPa

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Test Specifications & Observations/Remarks**- Voltage Dips and Short Interruptions**

<u>Test Level</u>	<u>Duration [in period/ms (50 Hz)]</u>	<u>Results</u>
☒ 20 % dip	☒ 250 / 5 000	<u>Complied</u>
☒ 30 % dip	☒ 25 / 500	<u>Complied</u>
☒ 60 % dip	☒ 10 / 200	<u>Complied</u>
☒ 100 % dip	☒ 250 / 5 000	<u>Degradation</u>

- Voltage variations

☒ Unom + 10 %	☒ 253.0 V (ac)	<u>Complied</u>
☒ Unom - 15 %	☒ 195.5 V (ac)	<u>Complied</u>

Observations:

Complied – No degradation of function

Degradation - See "Remarks "

Test Results

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

Remarks

During the test(100%, 250cycle), EUT was turned off but after the test, it was recovered by no operator's intervention.

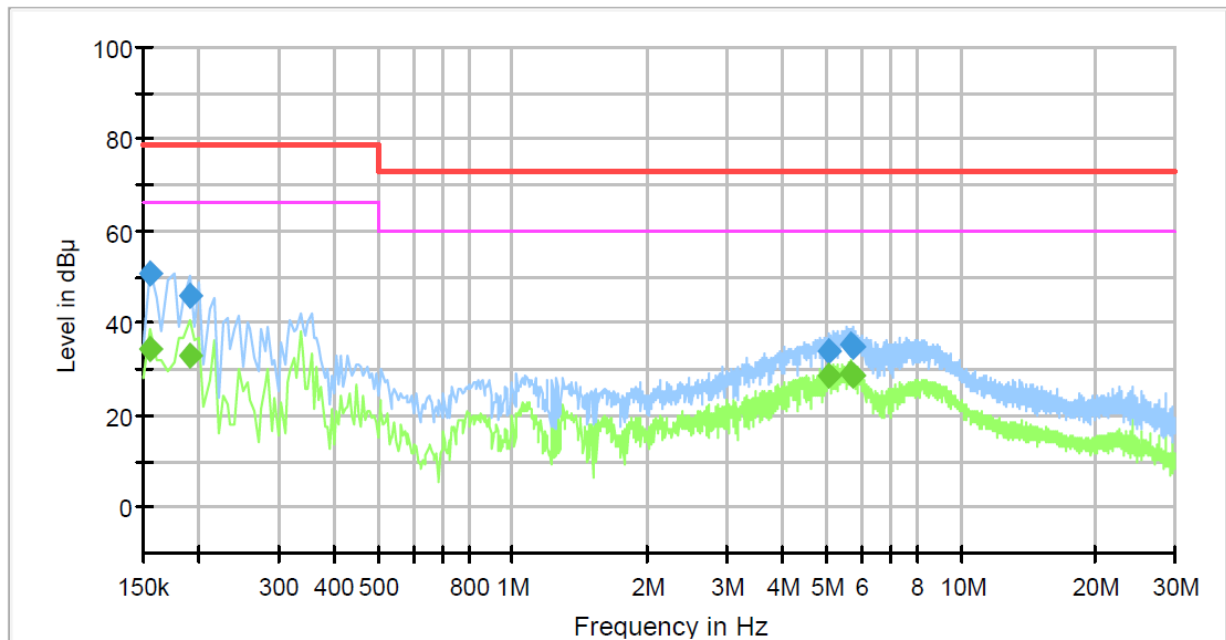
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

[HOT]

Common Information

Test Description: Conducted Emission
 Model No.: SLA-T4680DA
 Phase:
 Mode:
 Operator Name: KES



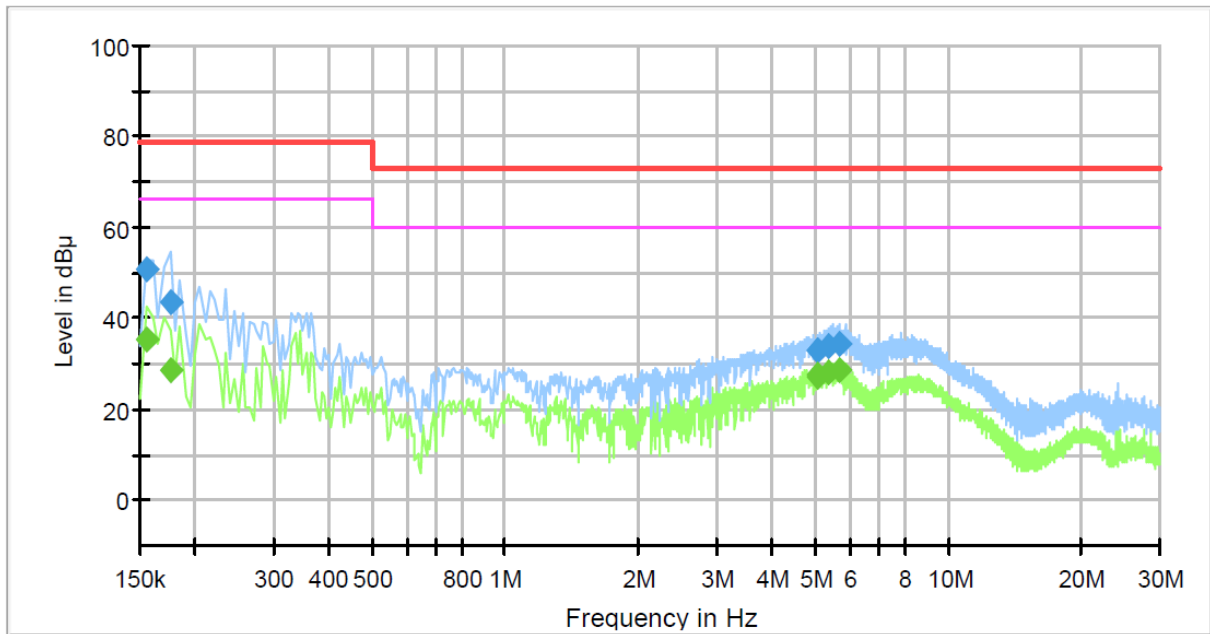
Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	34.54	66.00	31.46	1000.0	9.000	L1	19.4
0.155000	50.86	---	79.00	28.14	1000.0	9.000	L1	19.4
0.190000	---	32.94	66.00	33.06	1000.0	9.000	L1	19.4
0.190000	46.03	---	79.00	32.97	1000.0	9.000	L1	19.4
5.080000	---	28.46	60.00	31.54	1000.0	9.000	L1	19.6
5.080000	34.12	---	73.00	38.88	1000.0	9.000	L1	19.6
5.665000	---	29.27	60.00	30.73	1000.0	9.000	L1	19.5
5.665000	35.12	---	73.00	37.88	1000.0	9.000	L1	19.5
5.730000	---	28.65	60.00	31.35	1000.0	9.000	L1	19.5
5.730000	34.63	---	73.00	38.37	1000.0	9.000	L1	19.5

[NEUTRAL]

Common Information

Test Description: Conducted Emission
 Model No.: SLA-T4680DA
 Phase:
 Mode:
 Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	35.11	66.00	30.89	1000.0	9.000	N	19.4
0.155000	50.94	---	79.00	28.06	1000.0	9.000	N	19.4
0.175000	---	28.48	66.00	37.52	1000.0	9.000	N	19.4
0.175000	43.64	---	79.00	35.36	1000.0	9.000	N	19.4
5.050000	---	27.37	60.00	32.63	1000.0	9.000	N	19.6
5.050000	32.91	---	73.00	40.09	1000.0	9.000	N	19.6
5.100000	---	27.52	60.00	32.48	1000.0	9.000	N	19.6
5.100000	33.05	---	73.00	39.95	1000.0	9.000	N	19.6
5.375000	---	28.13	60.00	31.87	1000.0	9.000	N	19.6
5.375000	33.84	---	73.00	39.16	1000.0	9.000	N	19.6
5.665000	---	28.43	60.00	31.57	1000.0	9.000	N	19.5
5.665000	34.53	---	73.00	38.47	1000.0	9.000	N	19.5

◆ 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

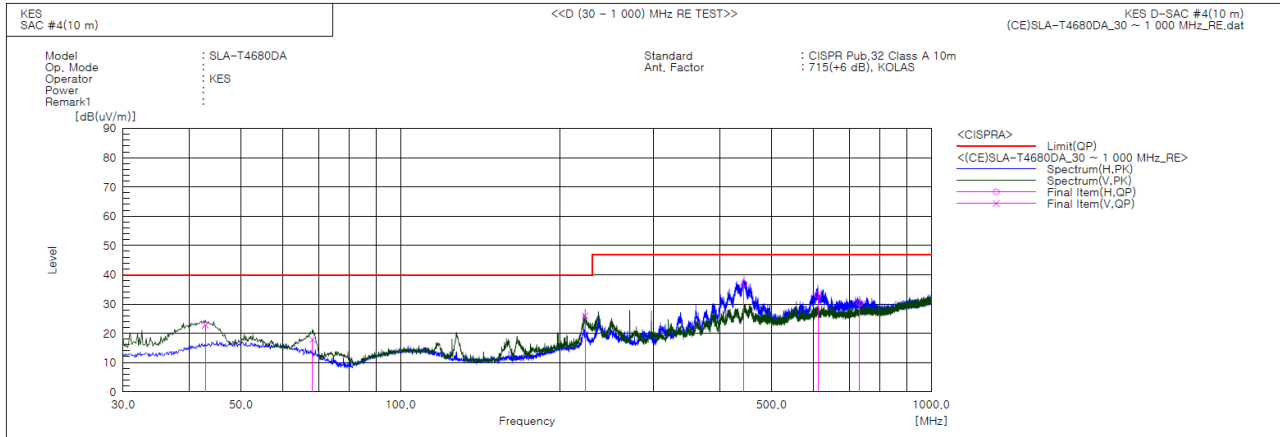
Reading Value : Not shown in the table.

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

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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	42.853	V	44.5	-21.7	22.8	40.0	17.2	105.0	304.0	
2	68.194	V	42.0	-24.2	17.8	40.0	22.2	100.0	312.0	
3	222.788	V	46.3	-20.3	26.0	40.0	14.0	125.0	125.0	
4	443.705	H	50.2	-13.2	37.0	47.0	10.0	400.0	255.0	
5	611.758	H	41.5	-8.4	33.1	47.0	13.9	400.0	206.0	
6	733.250	H	37.0	-6.6	30.4	47.0	16.6	400.0	310.0	

◆ Calculation – SEMI ANECHOIC CHAMBER #4(10 m)

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

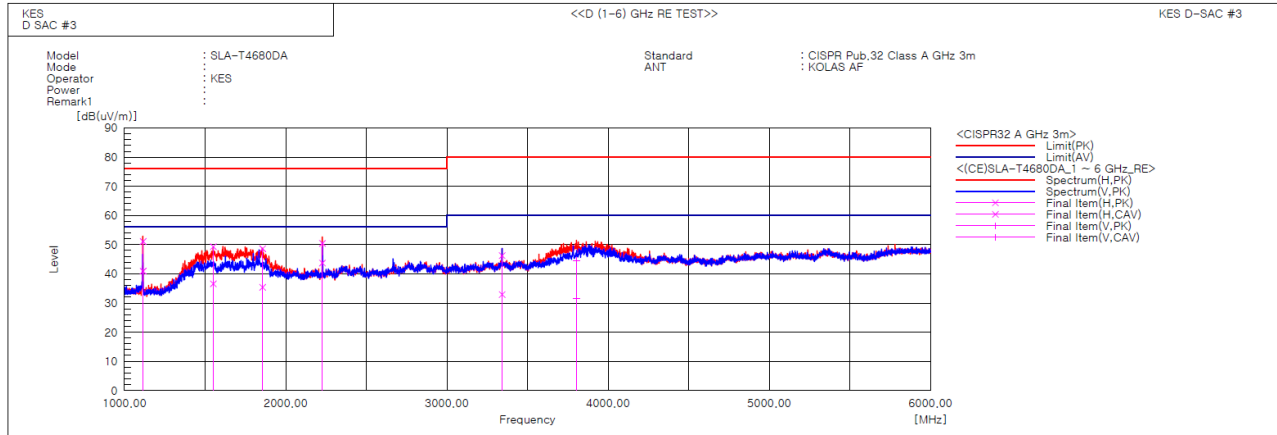
Margin(QP)[dB] = Limit[dB(μV/m)] - Result(QP) [dB(μV/m)]

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)



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	1114.465	H	60.0	49.8	-8.9	51.1	40.9	76.0	56.0	24.9	15.1	100.0	46.1	
2	1550.009	H	54.7	42.0	-5.4	49.3	36.6	76.0	56.0	26.7	19.4	100.0	357.0	
3	1856.116	H	50.4	37.2	-1.8	48.6	35.4	76.0	56.0	27.4	20.6	100.0	5.7	
4	2227.954	H	50.7	43.9	-0.2	50.5	43.7	76.0	56.0	25.5	12.3	100.0	38.1	
5	3342.550	H	42.2	28.8	4.1	46.3	32.9	80.0	60.0	33.7	27.1	100.0	152.6	
6	3804.032	V	39.5	26.6	5.0	44.5	31.6	80.0	60.0	35.5	28.4	100.0	152.6	

◆ 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



Harmonic Current Emissions and Voltage Fluctuations and Flicker

Average harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	0.047			
2	0.002	0.144	1.080	n/a
3	0.041	1.768	2.300	PASS
4	0.002	0.502	0.430	n/a
5	0.040	3.539	1.140	PASS
6	0.002	0.616	0.300	n/a
7	0.040	5.182	0.770	PASS
8	0.002	0.792	0.230	n/a
9	0.038	9.430	0.400	PASS
10	0.002	0.914	0.184	n/a
11	0.036	10.794	0.330	PASS
12	0.002	1.054	0.153	n/a
13	0.034	15.966	0.210	PASS
14	0.002	1.249	0.131	n/a
15	0.031	20.798	0.150	PASS
16	0.002	1.376	0.115	n/a
17	0.029	21.736	0.132	PASS
18	0.002	1.516	0.102	n/a
19	0.026	22.160	0.118	PASS
20	0.002	1.666	0.092	n/a
21	0.024	14.751	0.161	PASS
22	0.002	1.862	0.084	n/a
23	0.021	14.300	0.147	PASS
24	0.002	2.015	0.077	n/a
25	0.019	13.743	0.135	PASS
26	0.002	2.161	0.071	n/a
27	0.016	12.978	0.125	PASS
28	0.002	2.378	0.066	n/a
29	0.014	11.910	0.116	PASS
30	0.002	2.462	0.061	n/a
31	0.012	11.007	0.109	PASS
32	0.002	2.659	0.058	n/a
33	0.010	9.937	0.102	PASS
34	0.001	2.728	0.054	n/a
35	0.009	9.137	0.096	PASS
36	0.001	2.844	0.051	n/a
37	0.008	8.435	0.091	PASS
38	0.001	2.940	0.048	n/a
39	0.007	7.964	0.087	PASS
40	0.001	2.885	0.046	n/a

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

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



Test Data - Harmonics (continued)

Maximum harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	0.048			
2	0.002	0.118	1.620	n/a
3	0.042	1.226	3.450	PASS
4	0.003	0.439	0.645	n/a
5	0.041	2.369	1.710	PASS
6	0.003	0.562	0.450	n/a
7	0.041	3.513	1.155	PASS
8	0.002	0.621	0.345	n/a
9	0.038	6.327	0.600	PASS
10	0.002	0.711	0.276	n/a
11	0.036	7.293	0.495	PASS
12	0.002	0.827	0.230	n/a
13	0.034	10.805	0.315	PASS
14	0.002	0.970	0.197	n/a
15	0.032	14.047	0.225	PASS
16	0.002	1.061	0.173	n/a
17	0.029	14.572	0.199	PASS
18	0.002	1.135	0.153	n/a
19	0.026	14.855	0.178	PASS
20	0.002	1.248	0.138	n/a
21	0.024	14.823	0.161	PASS
22	0.002	1.437	0.125	n/a
23	0.021	14.385	0.147	PASS
24	0.002	1.519	0.115	n/a
25	0.019	13.851	0.135	PASS
26	0.002	1.665	0.106	n/a
27	0.016	13.105	0.125	PASS
28	0.002	1.870	0.099	n/a
29	0.014	12.042	0.116	PASS
30	0.002	1.876	0.092	n/a
31	0.012	11.129	0.109	PASS
32	0.002	2.032	0.086	n/a
33	0.010	10.124	0.102	PASS
34	0.002	2.139	0.081	n/a
35	0.009	9.335	0.096	PASS
36	0.002	2.167	0.077	n/a
37	0.008	8.725	0.091	PASS
38	0.002	2.229	0.073	n/a
39	0.007	8.239	0.087	PASS
40	0.002	2.217	0.069	n/a

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 - Voltage Fluctuations
Maximum Flicker results

Flicker Measurements					
	Plt	Max Pst	Max Dc	Max Dmax	Max Tmax
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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Test Setup Photos and Configuration

Conducted Emissions at Mains Power Ports



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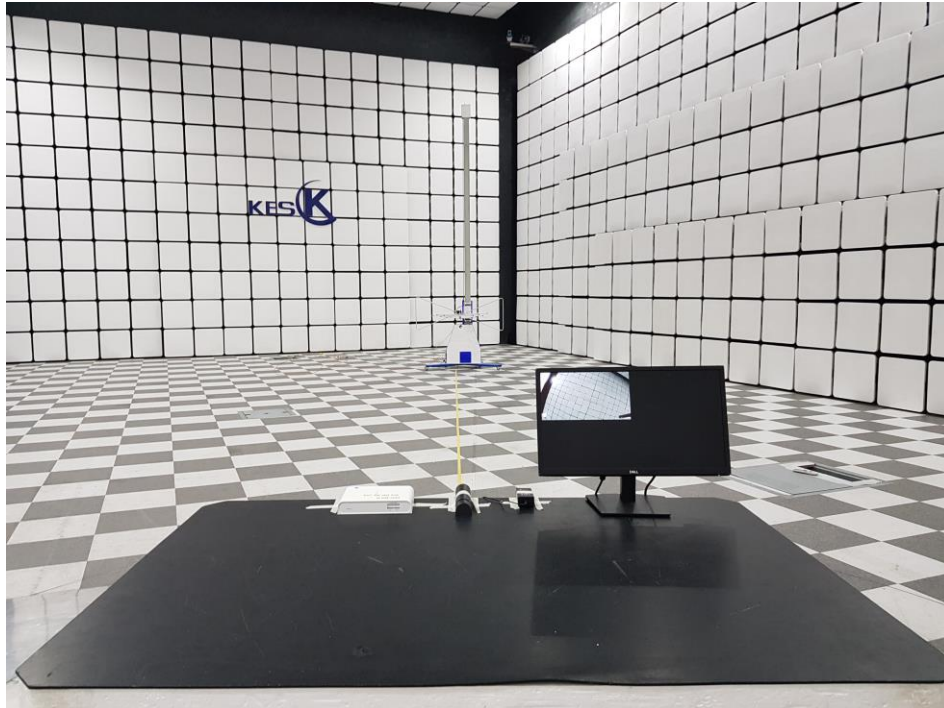
Conducted Emissions at Telecommunication Ports

N/A

N/A

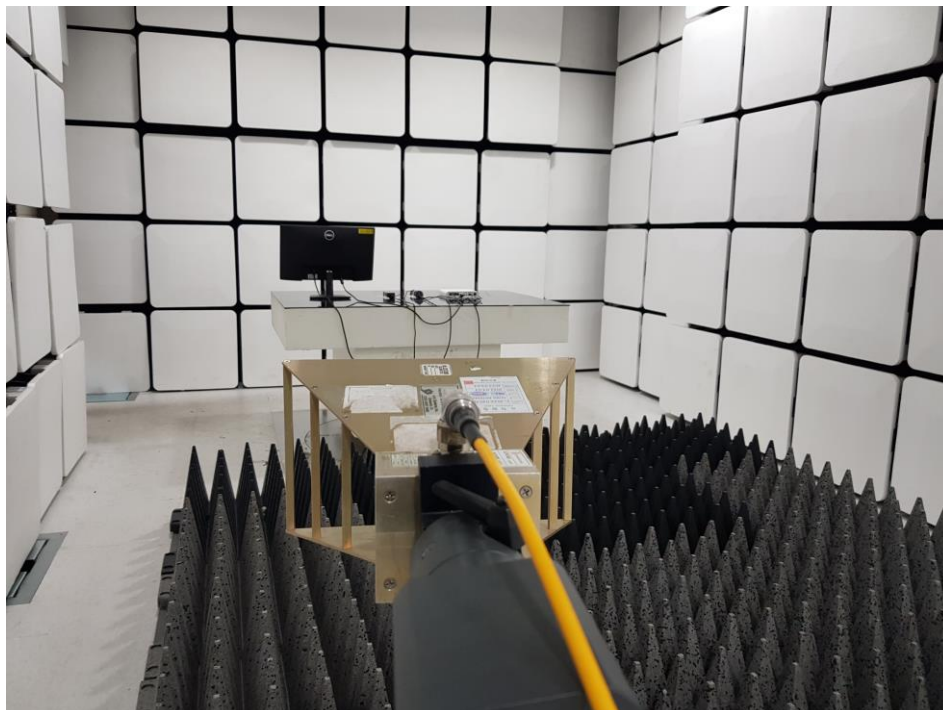
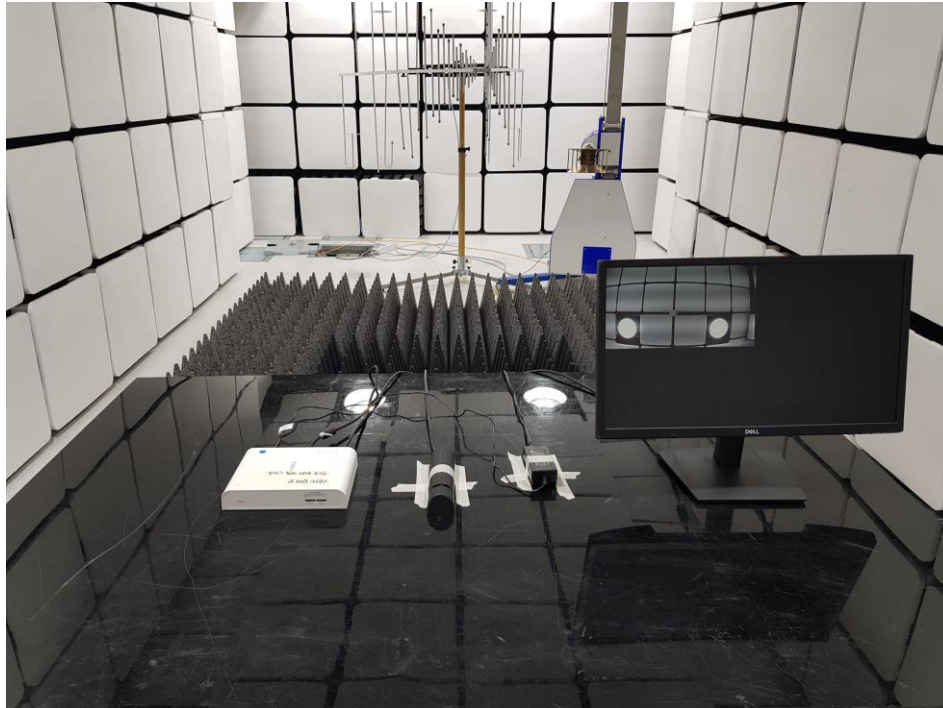
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Radiated Electric Field Emissions(Below 1 GHz)



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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



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Radiated Electric Field Immunity



Electrical Fast Transients/Bursts



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Surge Transients



Conducted Disturbance



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Voltage Dips and Short Interruptions



EUT External Photographs

(Top)



(Bottom)



EUT Internal Photographs

(Internal View)



EUT Internal View – Main Board

(Top)



(Bottom)



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EUT Internal View – Cable

(Top)



(Bottom)



Label and Location

**LENS MODULE**

Model No : SLA-T4680DA

Manufacturer : HANWHA VISION VIETNAM COMPANY LIMITED

Made in Vietnam

