



EMC TEST REPORT For RCM

Test Report No. : KES-EM-20T0368-R1
Date of Issue : Jun. 24, 2020
Product name : CAMERA HOUSING
Model/Type No. : SHB-9000H
Variant Model : SHB-9000
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 (TIANJIN) CO.,LTD.
2. HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.
3. D-TECH CO.,LTD.
Manufacturer Address : 1. No.11 Weiliu Rd, Micro-Electronic Industrial Park, TEDA, Tianjin,
300385, People's Republic of China
2. Lot O-2, Que Vo Industrial Zone extended area,
Nam Son commune, Bac Ninh city, Bac Ninh province, Vietnam
3. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi-do,
Korea (Suwon Industrial Complex)
Date of Receipt : May. 22, 2020
Test date : Jun. 09, 2020 ~ Jun. 10, 2020
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Min Seong, Kim
EMC Test Engineer

Reviewed by

Dong-Hun, Jang
EMC Technical Manager

This test report is not related to KS Q ISO/IEC 17025 and KOLAS.

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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Jun. 18, 2020	KES-EM-20T0368	Issued
Jun. 24, 2020	KES-EM-20T0368-R1	Reissue due to the addition of a derived model

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1.0 General Product Description

Main Specifications of EUT are:

	SHB-9000H
Environmental	
Operating Temperature / Humidity	-50°C ~ +60°C(+°F ~ +°F) / 10-100% RH (condensing) Heating & Cooling Are Independently Thermostat Controlled (FAN 45°C ON/35°C OFF, HEATER 5°C ON/ 15°C OFF)
Storage Temperature / Humidity	-50°C ~ +60°C(-58°F ~ +140°F) / Less than 90% RH
Certification	Safety(UL, NOM), IP66, EMC(FCC, CE, RCM, KC)
Electrical	
Input Voltage	220 VAC
Power Consumption	AC FAN(10W) : 5W * 2EA , AC HEATER(50W) : 3.7W[MAX 25W] * 2EA
Mechanical	
Color / Material	White / Aluminum (Body, Sun Shield) , FRONT&REAR END CAP (ABS)
RAL Code	None
Product dimensions (HxWxL) / weight	External Dimension : 300(W) X 184(H) X 700(L)mm Weight : 6,2 Kg
Accessories	
Included	- SCREW 1/4-20 X 1/2 HEX HD SUS (QTY : 3) - SCREW 1/4-20 X 3/8 HEX HD SUS (QTY : 1) - SCREW 1/4-20 X 5/8 HEX HD SUS (QTY : 1) - WASHER SPRING M6 (QTY : 5) - WASHER FLAT M6 (QTY : 3) - Custom alignment clip & spacer(Aluminum) (QTY : 1) - Manual

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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.

Voltage ☒ 240 Vac ☐ 100 Vac ☐ 24 Vac ☐ 12 Vdc ☐ PoE

Frequency ☒ 50 Hz ☐ 60 Hz ☐ Hz

1.2 Variant Model Differences

Add derivative model for vendor management

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
CAMERA HOUSING	SHB-9000H	-	HANWHA TECHWIN (TIANJIN) CO., LTD	EUT
Switching Power Adapter	FSP060-DIBAN2	-	Zhonghan Electronics (Shenzhen) Co., Ltd.	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Camera	TNB-9000	-	HANWHA TECHWIN (TIANJIN) CO., LTD	-
Notebook	LG15N54	410NZGK015231	LG Electronics Co., Ltd.	-
Notebook Adapter	ADP-90WH B	84ZW19F1663	DELTA ELECTRONIC S(JIANGSU) LTD.	-



1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
Camera	LAN	Notebook	RJ-45	3.0	U

* Unshielded=U, Shielded=S

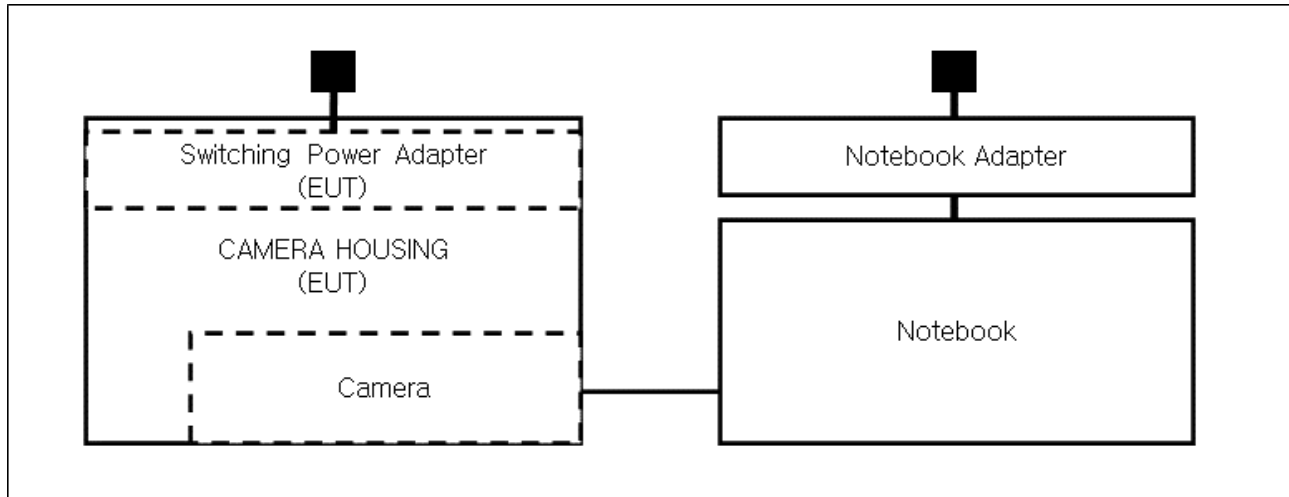
1.7 EUT Operating Mode(s)

Test mode	operating
Operation mode	checked that the camera video output was working properly in the web viewer and used the ping test to verify that the network behavior was working properly.

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

1.8 Configuration

■ AC Main
 □ DC Main



1.9 Remarks when standards applied

Conducted Emissions at Telecommunication Ports test is not applied because the EUT is equipped with an analog or network camera inside.

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. The sites are constructed in conformance with the requirements of ANSI C63.4:2014 and CISPR 16-1-4:2012

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	 23298-1
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 0003

2.0 Test Regulations

The emissions tests were performed according to following regulations:

☐ **EMC – Directive 2014/30/EU**

☐ EN 61000-6-3:2011

☐ EN 61000-6-1:2007

☐ EN 61000-6-4:2007 +A1:2011

☐ EN 61000-6-2:2005

☐ EN 55011:2007 +A1:2010

☐ Group 1
☐ Class A

☐ Group 2
☐ Class B

☐ EN 55014-1:2006 +A2:2011

☐ EN 55014-2:1997 +A2:2008

☐ EN 55015:2013

☐ EN 55032:2015

☐ Class A

☐ Class B

☐ EN 55024:2010

☐ EN 50130-4:2011 +A1:2014

☐ EN 61000-3-2:2014

☐ EN 61000-3-3:2013

☐ EN 61326-1:2013



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- | | | |
|---|---|----------------------------------|
| ☐ VCCI-CISPR 32:2016 | ☐ Class A | ☐ Class B |
| ☒ AS/NZS CISPR32:2015 | ☒ Class A | ☐ Class B |
|
☐ 47 CFR Part 15, Subpart B | | |
| ☐ CISPR 22:2009 +A1:2010 | ☐ Class A | ☐ Class B |
| ☐ ANSI C63.4-2009 | | |
|
☐ IC Regulation ICES-003 : 2016 | | |
| ☐ CAN/CSA CISPR 22-10 | ☐ Class A | ☐ Class B |
| ☐ ANSI C63.4-2014 | | |
|
☐ RE- Directive 2014/53/EU | | |
|
☐ EN 301 489-1 V1.9.2 | | |
| ☐ Equipment for fixed use | | |
| ☐ Equipment for vehicular use | | |
| ☐ Equipment for portable use | | |
|
☐ EN 301 489-3 V1.6.1 | | |
| ☐ EN 301 489-17 V2.2.1 | | |
| ☐ EN 60945:2002 | | |

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2.1 Conducted Emissions at Mains Power Ports

Test Date

Jun. 09, 2020

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	01, 20, 2021
☒	LISN	ENV216	R & S	101787	01, 02, 2021
☒	LISN	ESH2-Z5	R & S	100450	01, 02, 2021
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	01, 02, 2021

Test Conditions

Temperature: 25,0 °C
Relative Humidity: 48,6 % 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.

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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	01, 20, 2021
☐	LISN	ENV216	R & S	101787	01, 02, 2021
☐	LISN	ESH2-Z5	R & S	100450	01, 02, 2021
☐	PULSE LIMITER	ESH3-Z2	R & S	101915	01, 02, 2021
☐	8-WIRE ISN CAT3,5	ENY81	R & S	100174	01, 07, 2021
☐	8-WIRE ISN CAT6	ENY81-CAT6	R & S	101665	01, 07, 2021
☐	CDN	CDNS502A	TESEQ	40431	01, 02, 2021

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

RemarksDoes not apply because no IP is assigned

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2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Jun. 09, 2020

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

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESU26	R & S	100551	04, 01, 2021
☒	AMPLIFIER	SCU 01	R & S	100603	11, 25, 2020
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	11, 29, 2020
☒	ATTENUATOR	8491A	HP	32173	03, 10, 2021

Test Conditions

Temperature: 25,1 °C
Relative Humidity: 48,7 % R.H.

Frequency Range of Measurement

30 MHz to 1 GHz

Instrument Settings

IF Band Width: 120 kHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

RemarksSee Appendix A for test data.

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2.4 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Jun. 10, 2020

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, 06, 2020
☒	PREAMPLIFIER	8449B	AGILENT	3008A01967	04, 20, 2021
☐	ATTENUATOR	8491A	HP	35496	03, 10, 2021
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 11, 2021

Test Conditions

Temperature: 24,5 °C
Relative Humidity: 48,3 % 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.



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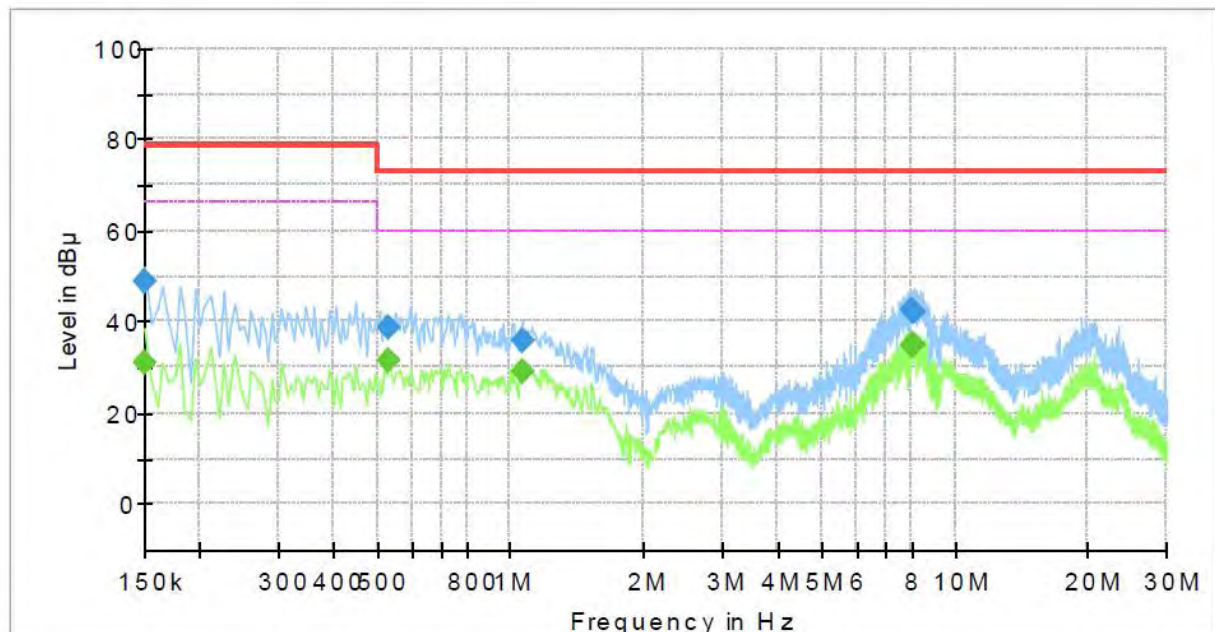
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

HOT LINE

Common Information

Test Description: Conducted Emission
Model No.: SHB-9000H
Phase: -
Mode: H
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	---	31.16	66.00	34.84	1000.0	9.000	L1	19.5
0.150000	49.10	---	79.00	29.90	1000.0	9.000	L1	19.5
0.530000	---	31.40	60.00	28.60	1000.0	9.000	L1	19.6
0.530000	38.69	---	73.00	34.31	1000.0	9.000	L1	19.6
1.060000	---	28.84	60.00	31.16	1000.0	9.000	L1	19.7
1.060000	35.97	---	73.00	37.03	1000.0	9.000	L1	19.7
8.015000	---	34.95	60.00	25.05	1000.0	9.000	L1	19.9
8.015000	42.80	---	73.00	30.20	1000.0	9.000	L1	19.9
8.080000	---	34.95	60.00	25.05	1000.0	9.000	L1	19.9
8.080000	42.27	---	73.00	30.73	1000.0	9.000	L1	19.9

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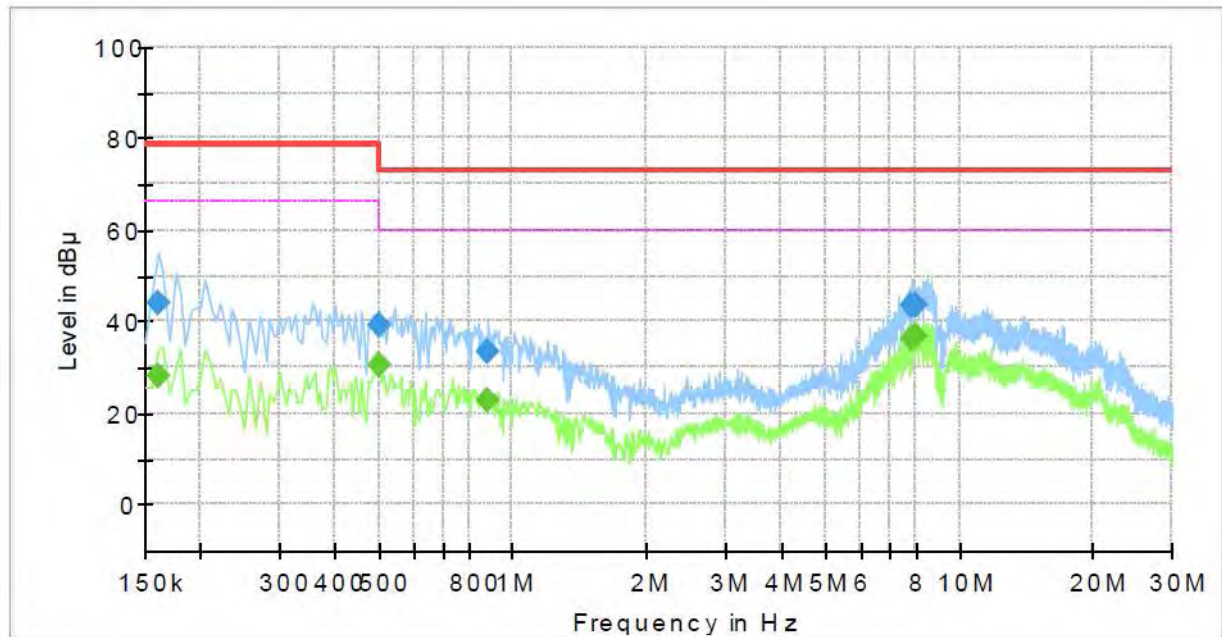
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NEUTRAL LINE

Common Information

Test Description: Conducted Emission
Model No.: SHB-9000H
Phase: -
Mode: N
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	---	27.99	66.00	38.01	1000.0	9.000	N	19.5
0.160000	44.12	---	79.00	34.88	1000.0	9.000	N	19.5
0.500000	---	30.72	66.00	35.28	1000.0	9.000	N	19.6
0.500000	39.00	---	73.00	34.00	1000.0	9.000	N	19.6
0.880000	---	23.01	60.00	36.99	1000.0	9.000	N	19.6
0.880000	33.55	---	73.00	39.45	1000.0	9.000	N	19.6
7.800000	---	36.39	60.00	23.61	1000.0	9.000	N	19.9
7.800000	43.36	---	73.00	29.64	1000.0	9.000	N	19.9
7.975000	---	36.62	60.00	23.38	1000.0	9.000	N	19.9
7.975000	43.79	---	73.00	29.21	1000.0	9.000	N	19.9

◆ 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

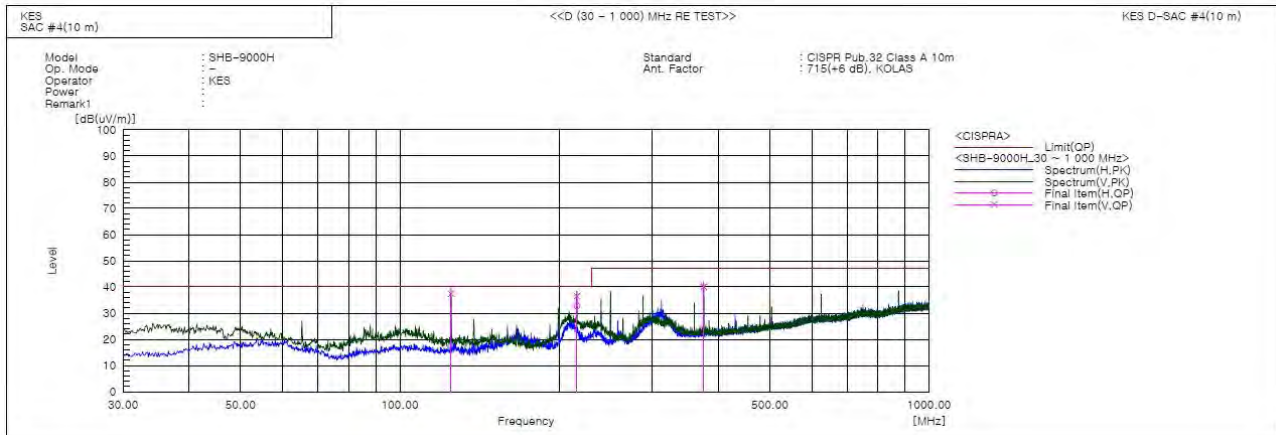
Reading Value : Not shown in the table.

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	124.939	V	62.4	-25.0	37.4	40.0	2.6	100.0	70.0	
2	215.998	H	53.7	-20.9	32.8	40.0	7.2	391.0	217.0	
3	216.102	V	57.4	-20.9	36.5	40.0	3.5	124.0	97.0	
4	374.956	V	56.0	-15.9	40.1	47.0	6.9	100.0	331.0	

◆ 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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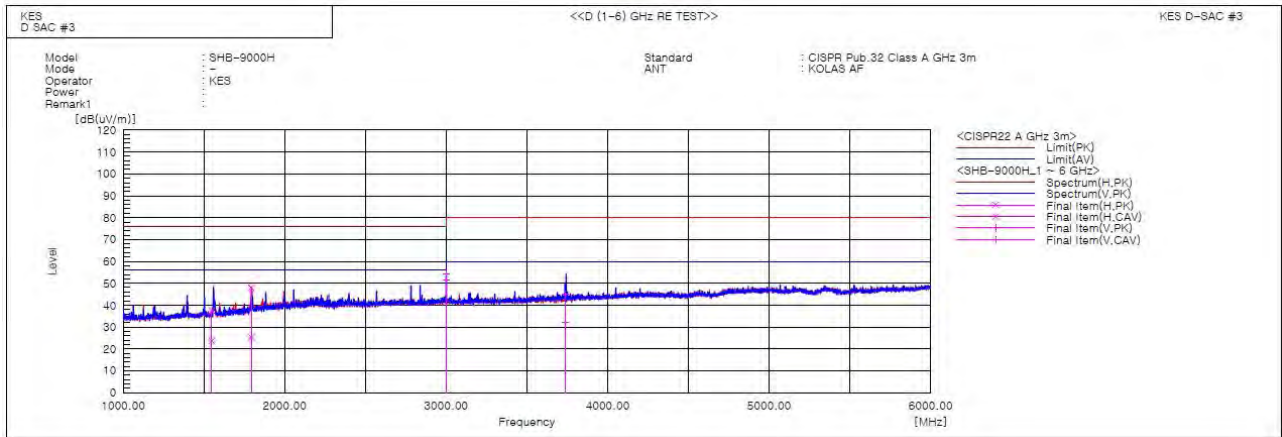
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Radiated Electric Field Emissions(Above 1 GHz)



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	1547.443	H	43.6	29.9	-6.1	37.5	23.8	76.0	56.0	38.5	32.2	100.0	51.0	
2	1792.950	H	51.6	29.1	-3.7	47.9	25.4	76.0	56.0	28.1	30.6	100.0	105.5	
3	3000.190	V	53.0	50.0	1.3	54.3	51.3	80.0	60.0	25.7	8.7	100.0	155.2	
4	3734.252	V	41.7	28.8	3.5	45.2	32.3	80.0	60.0	34.8	27.7	100.0	79.8	

◆ 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

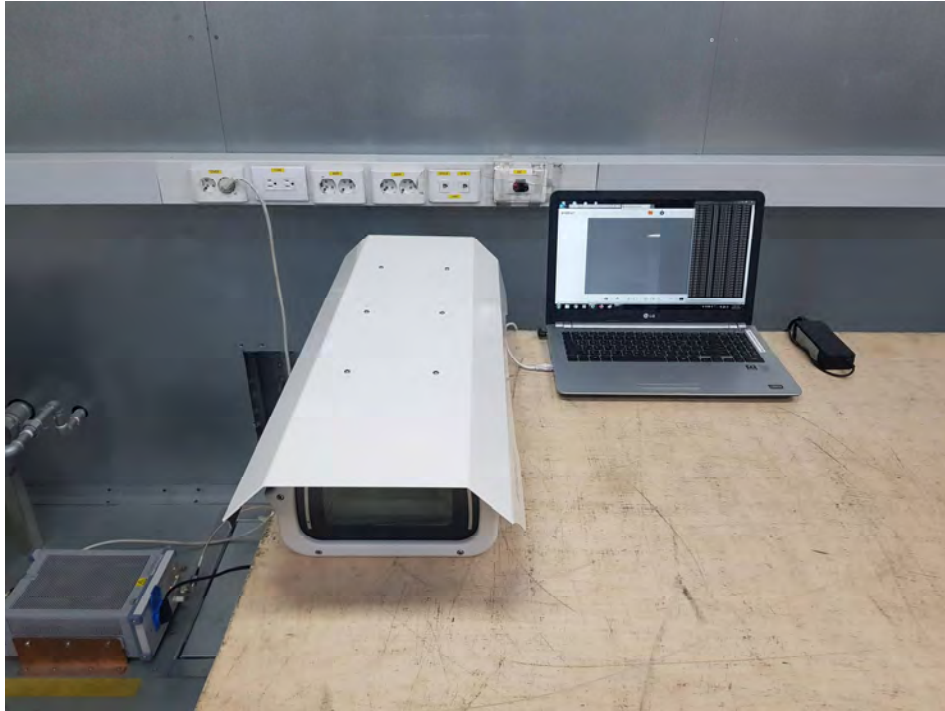
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Test Setup Photos and Configuration

Conducted Emissions at Mains Power Ports



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Conducted Emissions at Telecommunication Ports

N/A

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Radiated Electric Field Emissions(Below 1 GHz)



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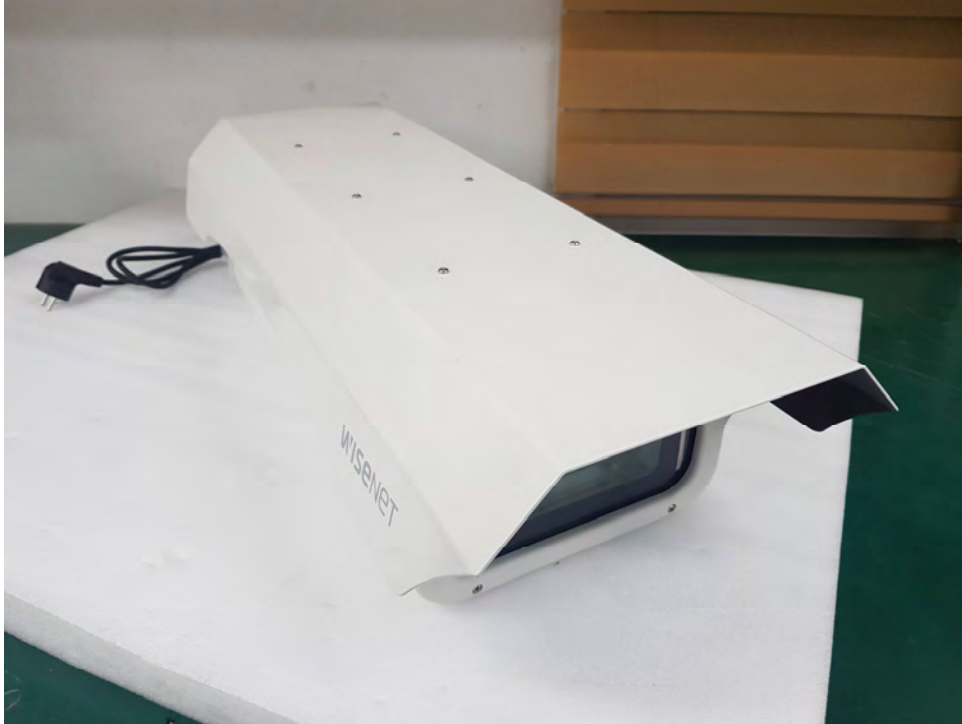
Radiated Electric Field Emissions(Above 1 GHz)



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EUT External Photographs

(Top)



(Bottom)



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EUT Internal Photographs

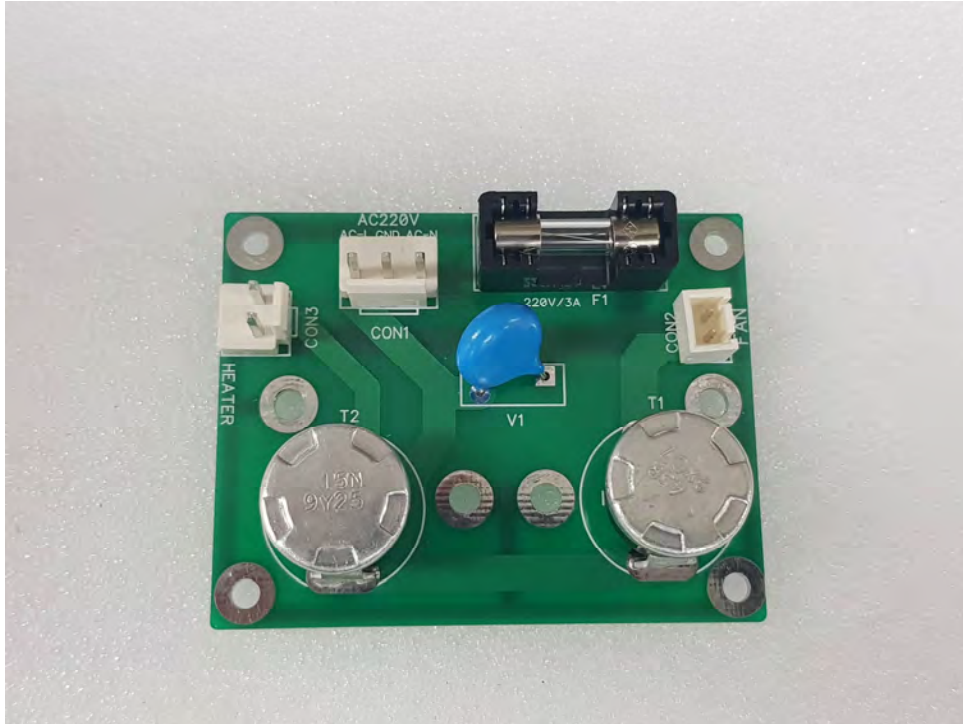
(Internal View)



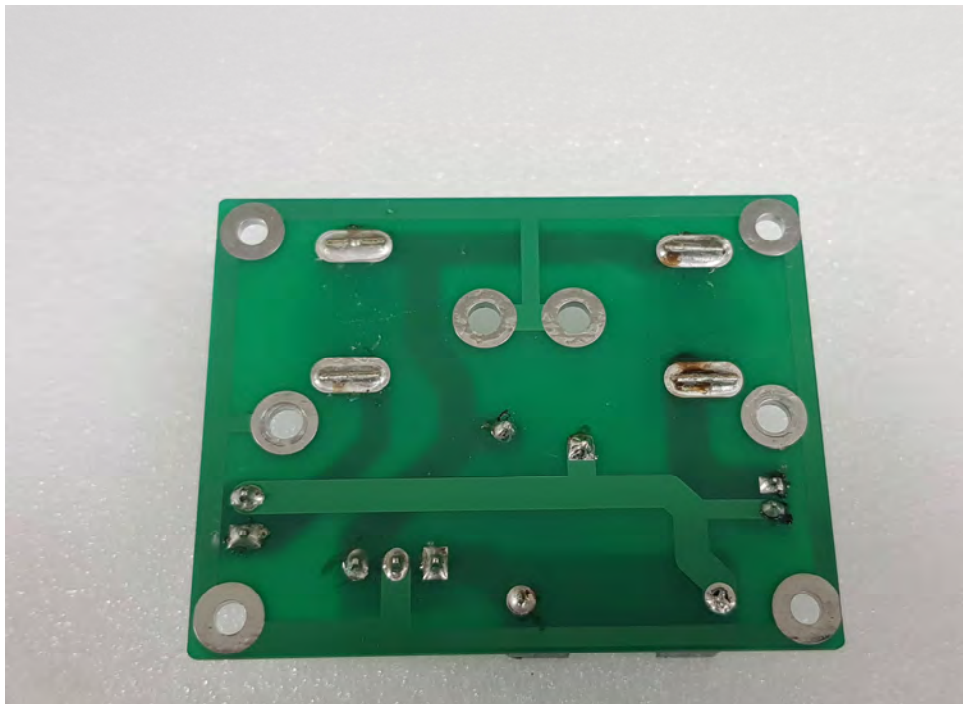
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EUT Internal View – Power Board

(Top)



(Bottom)



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