



EMC TEST REPORT For RCM

Test Report No. : KES-E1-19T0047-R1
Date of Issue : Feb. 24, 2023
Product name : Analog Camera
Model/Type No. : HCD-6020R
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 : Jan. 10, 2019
Test date : Jan. 16, 2019 ~ Jan. 17, 2019
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Dong Hyun, Won
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. 18, 2019	KES-E1-19T0047	Issued
Feb. 24, 2023	KES-E1-19T0047-R1	Change the Applicant and manufacturer at the request of the customer Factory deletion at the request of the customer

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1.0 General Product Description

Main Specifications of EUT are:

	HCD-6020R
Video	
Imaging Device	1/2.8" 2M CMOS
Total Pixels	1,945(H) x 1,109(V) 2.16M pixels
Effective Pixels	1,945(H) x 1,097(V) 2.13M pixels
Scanning System	Progressive Scan
Min. Illumination	Color : 0.17Lux (F1.6, 1/30sec) B/W : 0Lux(IR LED on)
S / N Ratio	52dB (AGC off, Weight on)
Video Output	BNC(AHD / TVI / CVI / CVBS Selectable)
Resolution	1920 x 1080
Max. Framerate	30fps @1080p(N)
Pan / Tilt / Rotate	
Pan / Tilt / Rotate Range	0° ~ 350° / 0° ~ 67° / 0° ~ 355°
Lens Type	
Focal Length (Zoom Ratio)	4mm fixed
Max. Aperture Ratio	F1.6
Angular Field of View	H:87.6 V:46.4 D:104.5
Min. Object Distance	-
Focus Control	Manual
Lens Type	Fixed
Mount Type	Board-in type
Auto Back Focus(ABF)	-
Operational	
On Screen Display	Multi-language Support(16) English, Japanese, Spanish, French, Portuguese, Korean, German, Italian, Russian, Polish, Czech, Romanian, Serbian, Swedish, Danish, Turkish
Camera Title	Off / On (Displayed 15 characters)
Day & Night	Auto (ICR) / Color / B/W
Backlight Compensation	Off / User BLC / HLC / WDR
Wide Dynamic Range	120dB
Contrast Enhancement	-
Digital Noise Reduction	SSNR4 (Off / On)
Defog	AUTO / MANUAL / OFF
Digital Image Stabilization	-
Motion Detection	Off / On(4 zones)
Privacy Masking	Off / On (8 zones rectangle)

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Gain Control	Off / Low / Middle / High / Very High
White Balance	ATW / Outdoor / Indoor(4,500K° ~ 8,500K°) / Manual / AWC (1,800K° ~ 10,500K°)
LDC (Lens Distortion Correction)	-
Electronic Shutter Speed	1sec~ 1/12,000sec
Digital Zoom	-
Reverse	Off / H-Rev / V-Rev / HV-Rev
Profile	Basic, Day & Night, Backlight, ITS, Indoor, User
Alarm	-
Remote control interface	Coaxial
Protocol	AHD : ACP (AHD Coax Protocol), CVBS : Pelco-C (Coaxitron) CCP (CVI Coax Protocol), TCP (TVI Coax Protocol)
Viewable length	20m (TBD)
Video Transmission Distance	500m(5C2V Coaxial Cable)
Environmental	
Operating Temperature / Humidity	-10°C ~ +55°C (+14°F ~ +131°F) / Less than 90% RH
Ingress Protection	-
Vandal Resistance	-
Electrical	
Input Voltage/Current	12VDC(±10%)
Power Consumption	5.4W
Mechanical	
Color / Material	Ivory / Plastic
Dimension (WxHxD)	Ø110 x 86mm
Weight	320g

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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

Not applicable

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
Analog Camera	HCD-6020R	-	HANWHA VISION VIETNAM COMPANY LIMITED	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Monitor	24M47VQ	702NTQDA3604	LG Electronics Co., Ltd.	-
Monitor Adaptor	ADS-40FSG-19 19025GPG-1	EAY62768621	Shenzhen Honor Electronic Co., Ltd.	
DVR	HRD-442	-	HANWHA VISION VIETNAM COMPANY LIMITED	-
DVR Adaptor	DH1230	-	Doo Hyun Electronics Co., Ltd.	-



1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
Analog Camera (EUT)	BNC	DVR	BNC	3.0	U
DVR	D - SUB	Monitor	D - SUB	1.8	S

* Unshielded=U, Shielded=S

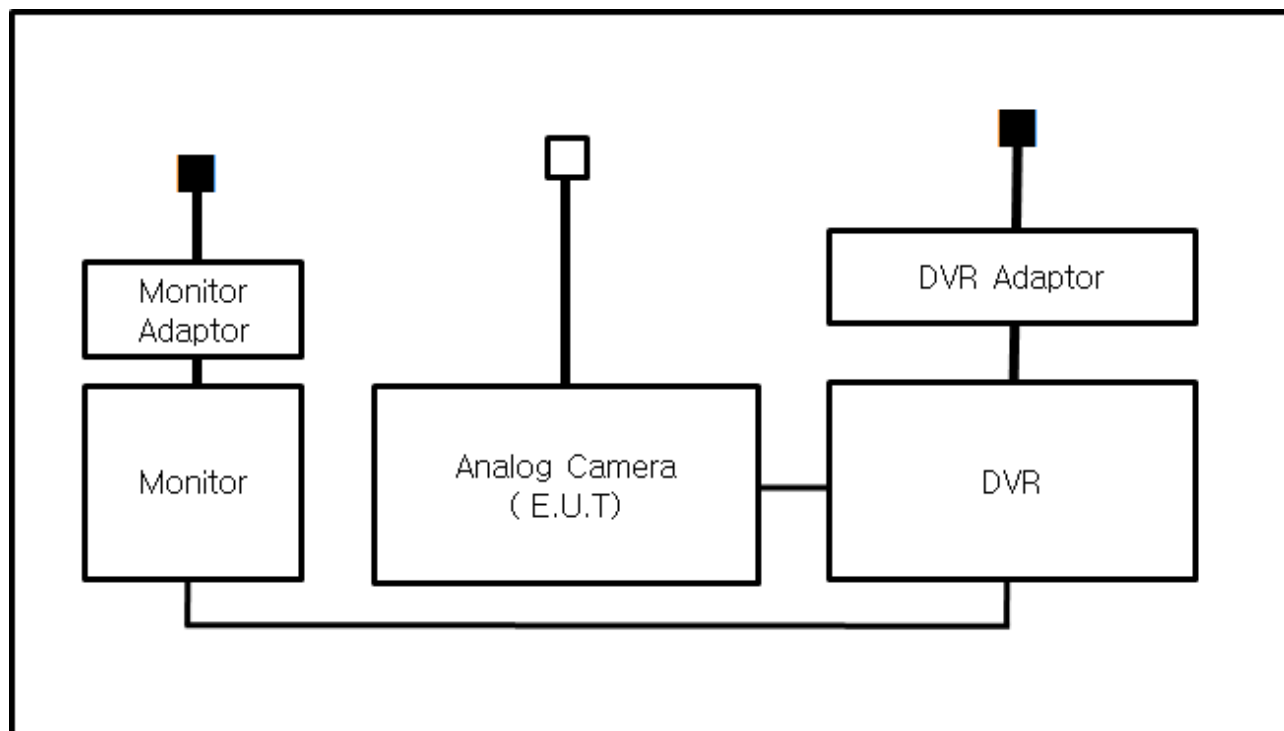
1.7 EUT Operating Mode(s)

Test mode	operating
DC 12 V	EUT Monitoring

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 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

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	101781	04, 25, 2019
☐	LISN	ENV216	R & S	101787	01, 04, 2020
☐	LISN	ESH2-Z5	R & S	100450	04, 25, 2019
☐	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 26, 2019

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

It is not tested apply because it is powered by DC



2.2 Conducted Emissions at Telecommunication Ports

Test Date

N/A

Test Location

Electro wave Shieldroom #3

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	04, 25, 2019
☐	LISN	ENV216	R & S	101137	01, 31, 2019
☐	LISN	ENV216	R & S	101786	04, 25, 2019
☐	8-WIRE ISN CAT3	CAT3 8158	SCHWARZBECK	8158-0019	03, 22, 2019
☐	8-WIRE ISN CAT5	CAT5 8158	SCHWARZBECK	8158-0030	03, 22, 2019

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

Jan. 16, 2019

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, 11, 2019
☒	AMPLIFIER	SCU 01	R & S	100603	11, 26, 2019
☒	ATTENUATOR	8491A	HP	32173	03, 21, 2019
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	11, 29, 2020

Test Conditions

Temperature: 24,2 °C
Relative Humidity: 52,1 % R.H.

Frequency Range of Measurement

30 MHz to 1 GHz

Instrument Settings

IF Band Width: 120 kHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.

2.4 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Jan. 17, 2019

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, 2019
☒	PREAMPLIFIER	8449B	AGILENT	3008A01967	05, 31, 2019
☐	ATTENUATOR	8491A	HP	35496	03, 21, 2019
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	05, 02, 2019

Test Conditions

Temperature: 23,7 °C
Relative Humidity: 54,0 % 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

Remarks

See Appendix A for test data.



APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

HOT LINE

N/A



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NEUTRAL LINE

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 (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

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Conducted Emissions at Telecommunication Ports

[10 Mbps]

N/A

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[100 Mbps]

N/A

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

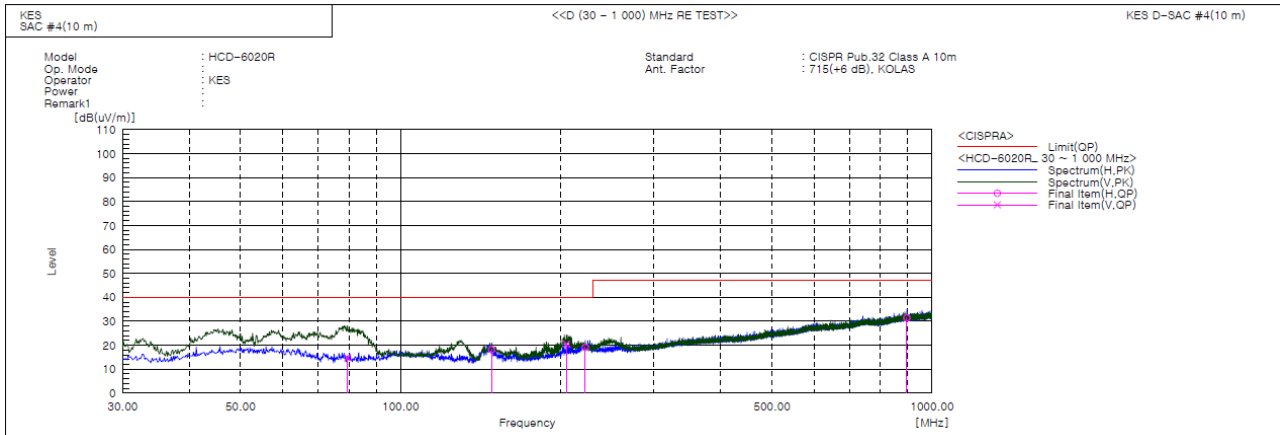
Reading Value : Not shown in the table.

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	79.470	V	42.6	-27.8	14.8	40.0	25.2	134.0	130.0	
2	148.461	H	44.3	-26.1	18.2	40.0	21.8	382.0	86.0	
3	205.206	V	42.1	-21.6	20.5	40.0	19.5	130.0	246.0	
4	222.666	H	39.8	-20.7	19.1	40.0	20.9	295.0	114.0	
5	896.453	H	37.4	-6.0	31.4	47.0	15.6	316.0	359.0	

◆ 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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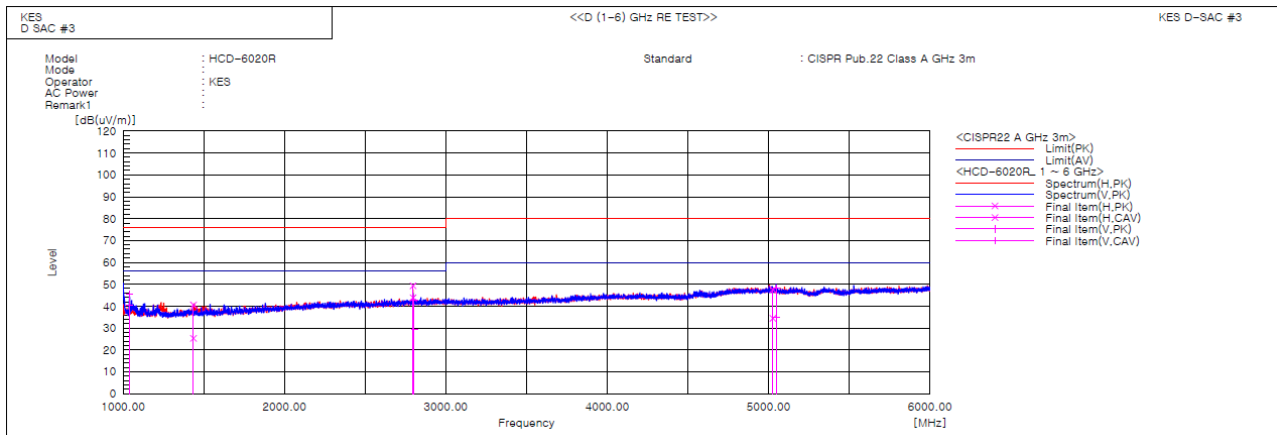
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Radiated Electric Field Emissions(Above 1 GHz)



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	1039.620	V	53.5	48.2	-7.8	45.7	40.4	76.0	56.0	30.3	15.6	100.0	193.4	
2	1435.691	H	46.5	31.3	-6.0	40.5	25.3	76.0	56.0	35.5	30.7	100.0	8.3	
3	2803.908	V	41.5	28.2	1.1	42.6	29.3	76.0	56.0	33.4	26.7	100.0	193.2	
4	2796.220	H	48.2	42.8	1.1	49.3	43.9	76.0	56.0	26.7	12.1	100.0	313.0	
5	5026.426	H	39.1	26.1	8.4	47.5	34.5	80.0	60.0	32.5	25.5	100.0	151.5	
6	5049.210	V	39.8	26.4	8.4	48.2	34.8	80.0	60.0	31.8	25.2	100.0	305.4	

◆ 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

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Test Setup Photos and Configuration

Conducted Voltage Emissions

N/A

N/A

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Conducted Telecommunication Emissions

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)



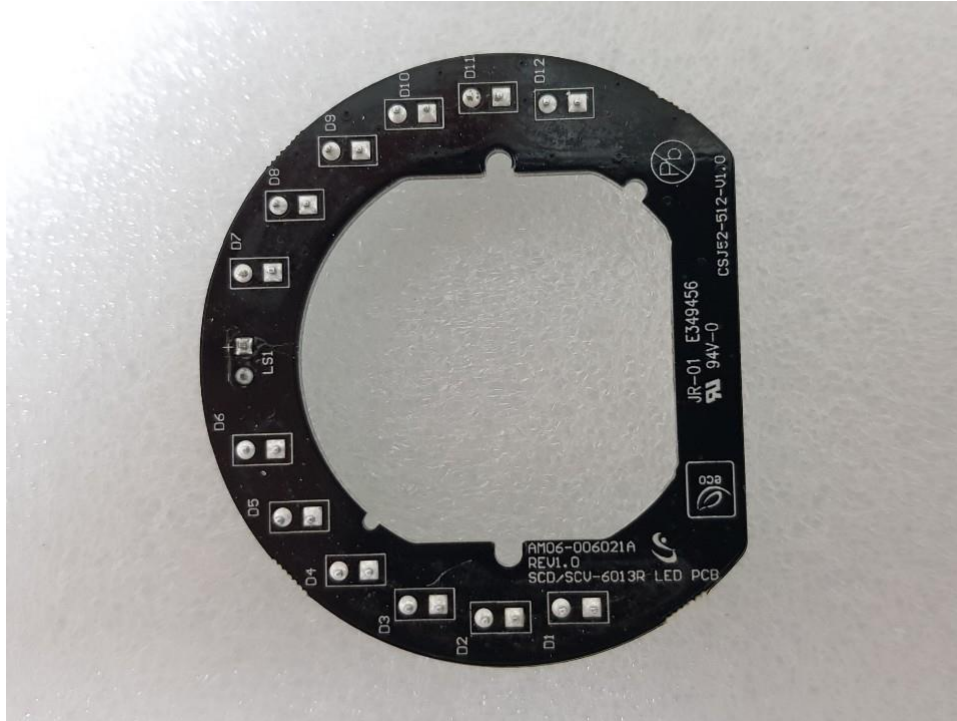
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EUT Internal Photographs

(Internal View)



EUT Internal View – LCD Board (Top)



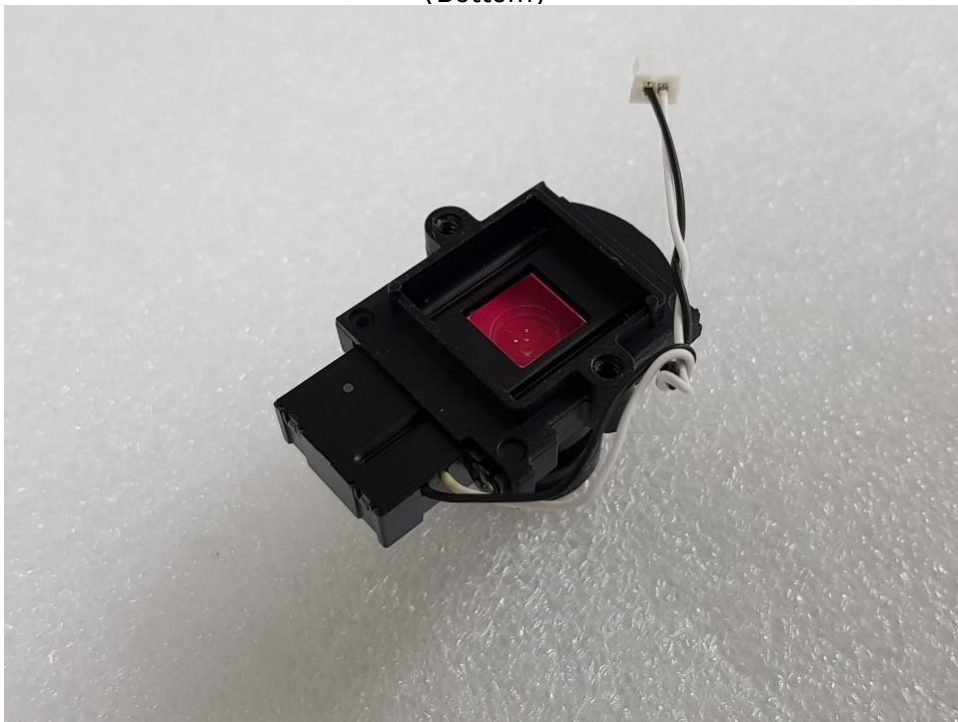
(Bottom)



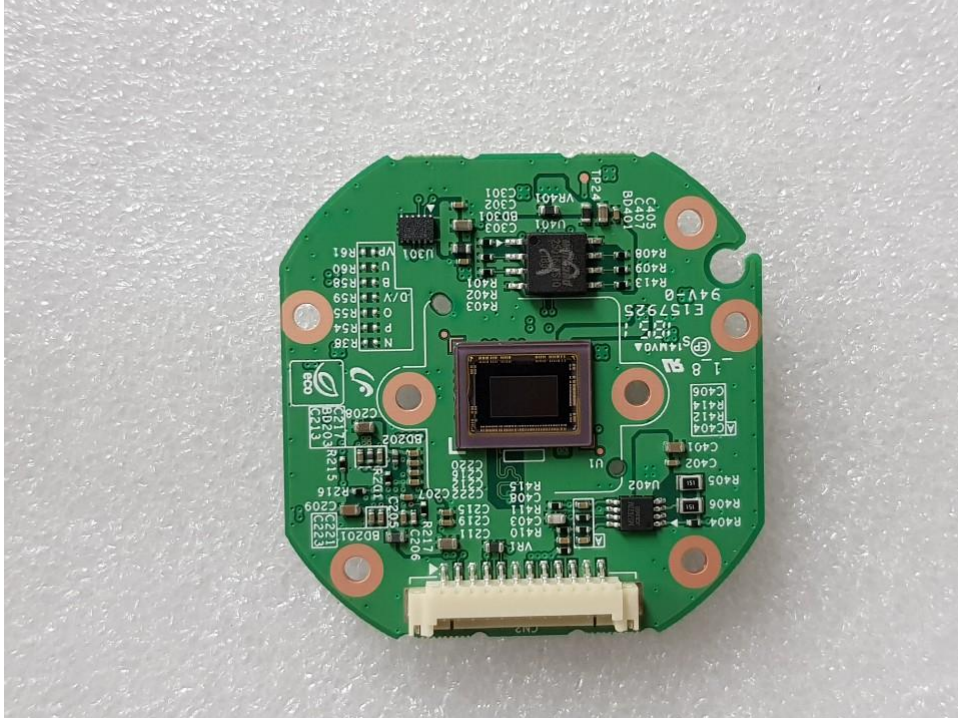
EUT Internal View – Lens (Top)



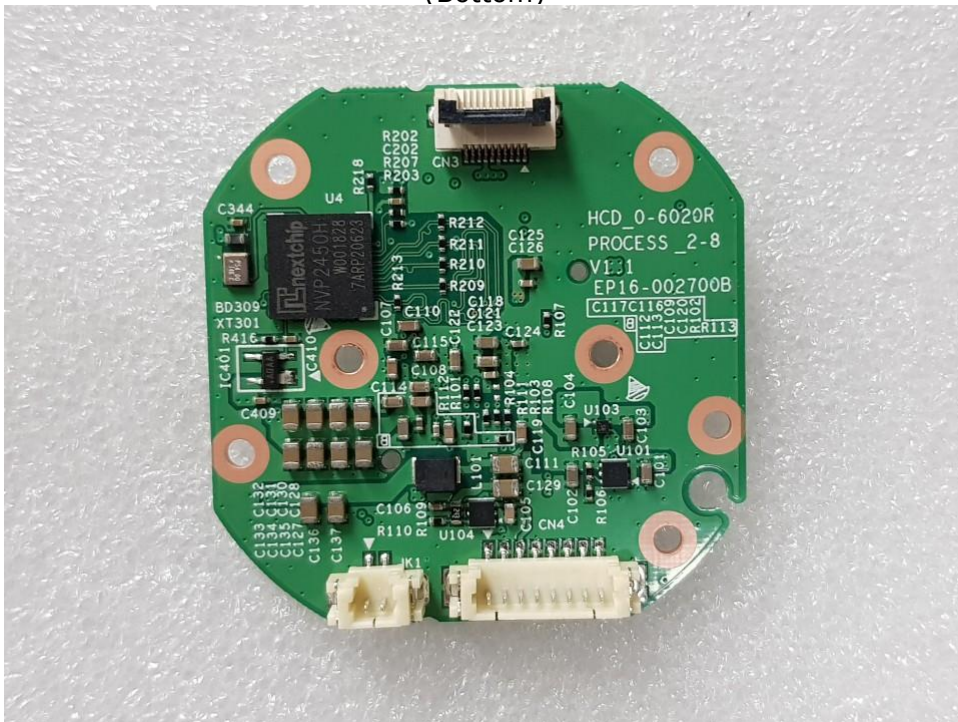
(Bottom)



EUT Internal View – Lens Board (Top)

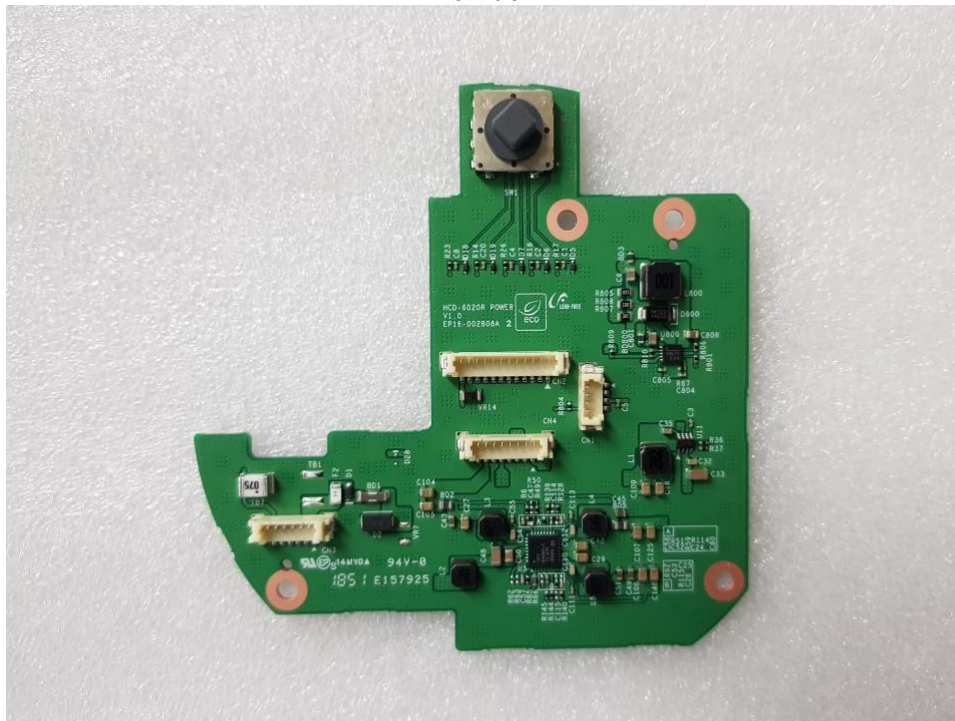


(Bottom)

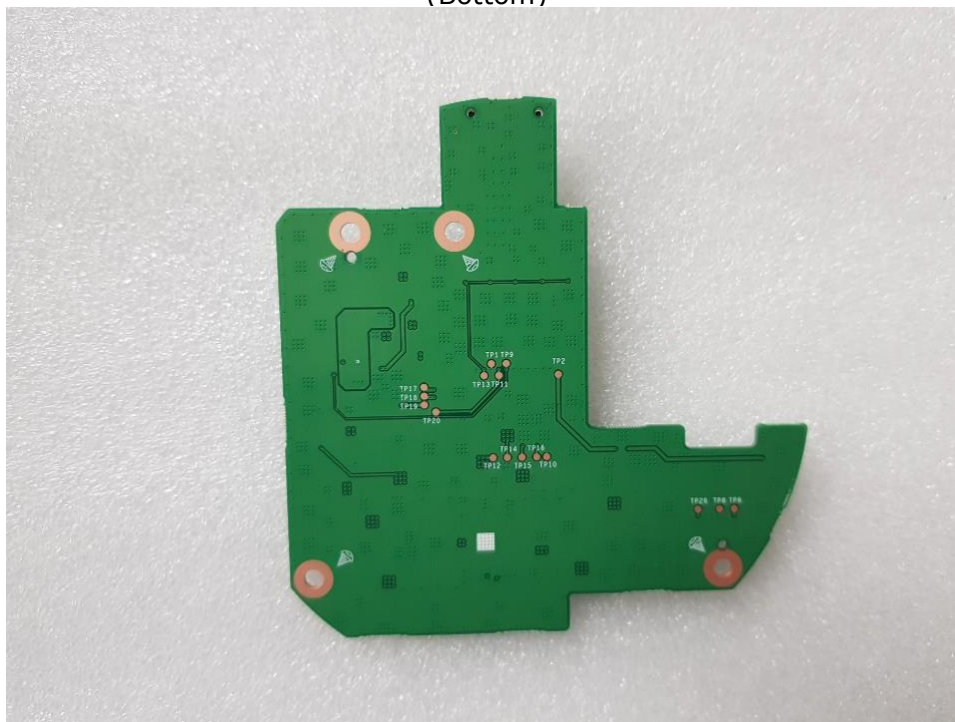


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EUT Internal View – Board (Top)



(Bottom)



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