



EMC TEST REPORT

Test Report No. : KES-E1-19T0683
Date of Issue : Oct. 25, 2019
Product name : ANALOG CAMERA
Model/Type No. : HCD-7010RA
Variant Mode : HCD-7020RA, HCD-7030RA
Applicant : Hanwha Techwin Co., Ltd.
Applicant Address : 6, Pangyo-ro 319 Beon-gil, Bundang-gu, Seongnam-si,
Gyeonggi-do, 13488, 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)
Equipment authorization : **Supplier's Declaration of Conformity**
Date of Receipt : Oct. 16, 2019
Test date : Oct. 17, 2019 ~ Oct. 18, 2019
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Dae Jung, Choi
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
Oct. 25, 2019	KES-E1-19T0683	Issued

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1.0 General Product Description

Main Specifications of EUT are:

Video	
Imaging Device	1/3" 4M CMOS
Total Pixels	2720(H) x 1538(V)
Effective Pixels	2688(H) x 1520(V)
Scanning System	Progressive Scan
Min. Illumination	Color : 0.26Lux (F1.8, 1/30sec) B/W : 0Lux(IR LED on)
S / N Ratio	52dB (AGC off, Weight on)
Video Output	BNC(AHD), additional CVBS for installation(2Pin connector type)
Resolution	2560x1440
Max. Framerate	30fps @ 4M
Pan / Tilt / Rotate	
Pan / Tilt / Rotate Range	0°~350° / 0°~67° / 0°~355°
Lens Type	
Focal Length (Zoom Ratio)	2.8mm fixed
Max. Aperture Ratio	F1.8
Angular Field of View	H : 107.48° / V : 59.67° / D : 122.01°
Min. Object Distance	0.5m (1.64ft)
Focus Control	-
Lens Type	Fixed Lens
Mount Type	Board-in type
Operational	
Viewable length	20m (65.62ft)
On Screen Display	Multi-language Support(14) English, Spanish, French, Portuguese, German, Italian, Russian, Polish, Czech, Romanian, Serbian, Swedish, Danish, Turkish
Camera Title	-
Day & Night	Auto (ICR) / Color / B/W
Backlight Compensation	Off / User BLC / HLC
Wide Dynamic Range	D-WDR (Off/On)
Contrast Enhancement	-
Digital Noise Reduction	2D DNR
Defog	-
Digital Image Stabilization	-
Motion Detection	Off / On(4 zones)
Privacy Masking	Off / On (2 zones rectangle)
Gain Control	Off / Low / Middle / High / Very High
White Balance	ATW / Outdoor / Indoor / Manual / AWC (1,800K ~ 10,500K)
LDC (Lens Distortion Correction)	-
Electronic Shutter Speed	1/30sec~ 1/12,000sec
Digital Zoom	-
Reverse	Off / H-Rev / V-Rev
Profile	-
Alarm	-
Remote control interface	Cosial
Protocol	AHD : ACP (AHD Coax Protocol), CVBS : Pelco-C (Coaxitron)
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	12V DC ±10%/410mA
Power Consumption	MAX.5W
Mechanical	
Color / Material	Ivory / Plastic
Dimension (WxHxD)	Ø110.1 x 86.1mm
Weight	240g

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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 ☐ 230 Vac ☐ 120 Vac ☐ 24 Vac ☒ 12 Vdc ☐ PoE

Frequency ☐ 50 Hz ☐ 60 Hz ☐ Hz

1.2 Variant Model Differences

Added simple derivative model based on management purpose by company

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
ANALOG CAMERA	HCD-7010RA	-	HANWHA TECHWIN (TIANJIN) CO., LTD	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
DIGITAL VIDEO RECORDER	SDH-C84085BF	-	Zhuhai RaySharp Technology Co., Ltd.	-
AC/DC Adaptor	FSP040-RHAN2	-	Zhonghan Electronics (Shenzhen) Co., Ltd.	-
Monitor	EM23TS	NC26HIKZ401026J	Samsung Electronics Co., Ltd.	-
Mouse	1113	-	Microsoft	-



1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
ANALOG CAMERA (EUT)	BNC	DIGITAL VIDEO RECORDER	BNC	3.0	S
DIGITAL VIDEO RECORDER	D-SUB	Monitor	D-SUB	1.5	S
DIGITAL VIDEO RECORDER	USB	Mouse	USB	1.2	U

* Unshielded=U, Shielded=S

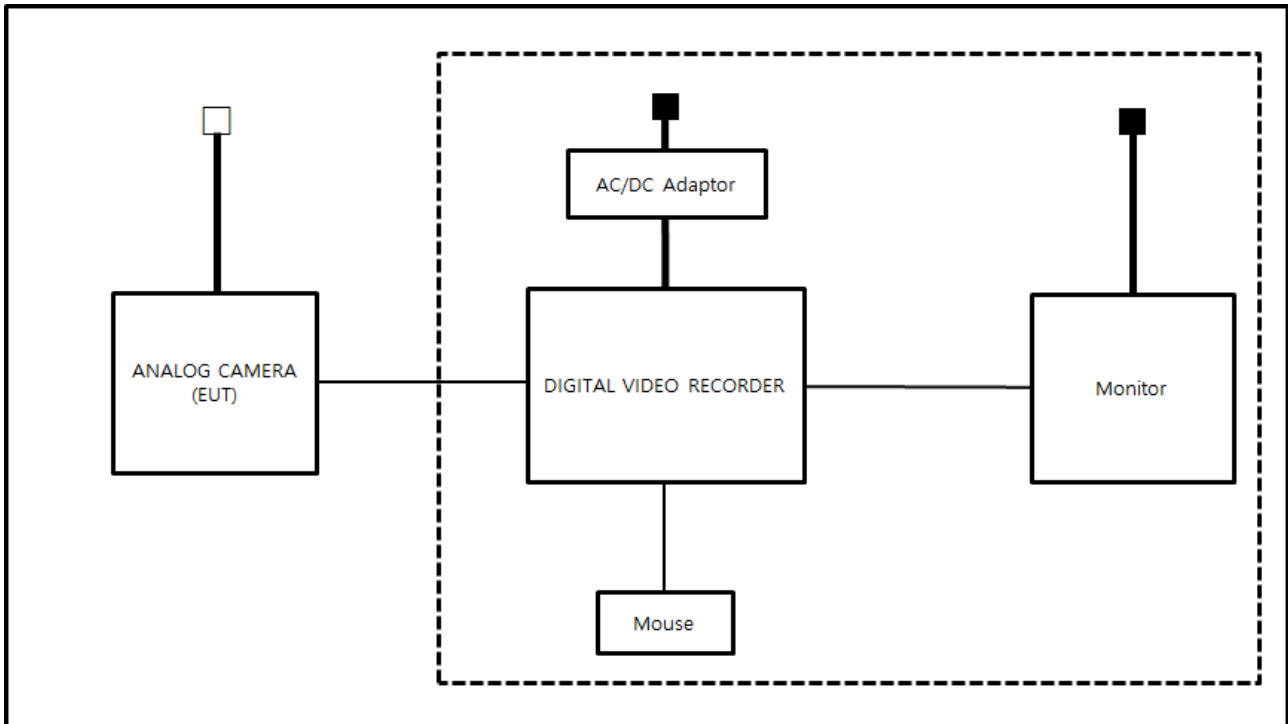
1.7 EUT Operating Mode(s)

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

In the radiated Electric Field Emissions (Below 1 GHz), the radiated Electric Field Emissions(Above 1 GHz), peripheral devices were tested outside the test site.

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, Yeoju-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 C63.4-2014 | ☒ Class A | ☐ Class B |
| ☒ IC Regulation ICES-003 : 2016 | | |
| ☐ CAN/CSA CISPR 22-10 | ☐ Class A | ☐ Class B |
| ☒ ANSI C63.4-2014 | ☒ Class A | ☐ Class B |
| ☐ 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

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, 22, 2020
☐	LISN	ENV216	R & S	101787	01, 04, 2020
☐	LISN	ESH2-Z5	R & S	100450	04, 22, 2020
☐	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 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Oct. 17, 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, 09, 2020
☒	AMPLIFIER	SCU 01	R & S	100603	11, 26, 2019
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	11, 29, 2020
☒	ATTENUATOR	8491A	HP	32173	03, 11, 2020

Test Conditions

Temperature: 24,9 °C
Relative Humidity: 53,8 % 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.

2.3 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Oct. 18, 2019

Test Location

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, 09, 2020
☒	PREAMPLIFIER	8449B	AGILENT	3008A01742	01, 08, 2020
☐	ATTENUATOR	8491A	HP	35496	03, 11, 2020
☒	HORN ANTENNA	BBHA 9120D	SCHWARZBECK	9120D-1802	03, 12, 2020

Test Conditions

Temperature: 24,6 °C
Relative Humidity: 53,8 % R.H.

Frequency Range of Measurement

1 GHz to 5 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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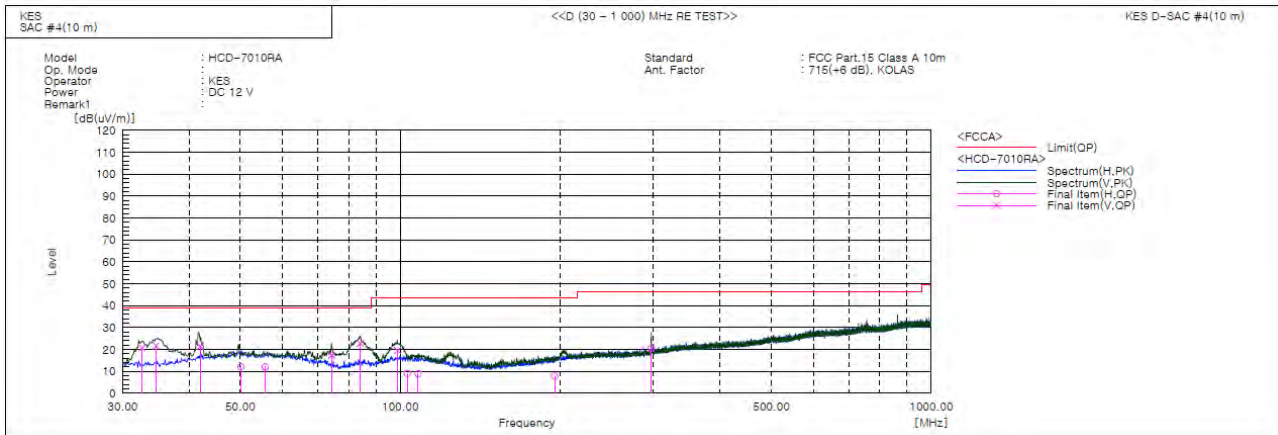


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Radiated Electric Field Emissions(Below 1 GHz)



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	32.668	V	45.7	-25.0	20.7	39.0	18.3	100.0	334.0	
2	34.701	V	46.7	-24.9	21.8	39.0	17.2	100.0	199.0	
3	42.012	V	43.8	-22.3	21.5	39.0	17.5	142.0	125.0	
4	50.128	H	33.4	-21.3	12.1	39.0	26.9	186.0	95.0	
5	55.705	H	33.8	-21.8	12.0	39.0	27.0	198.0	330.0	
6	74.256	V	43.9	-26.5	17.4	39.0	21.6	167.0	158.0	
7	84.078	V	49.4	-26.6	22.8	39.0	16.2	146.0	249.0	
8	98.749	V	42.2	-22.6	19.6	43.5	23.9	100.0	175.0	
9	103.114	H	31.5	-22.4	9.1	43.5	34.4	400.0	177.0	
10	108.085	H	31.4	-22.5	8.9	43.5	34.6	397.0	38.0	
11	195.385	H	30.1	-22.2	7.9	43.5	35.6	400.0	98.0	
12	296.993	H	39.2	-18.7	20.5	46.5	26.0	325.0	304.0	

◆ Calculation – SAC #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

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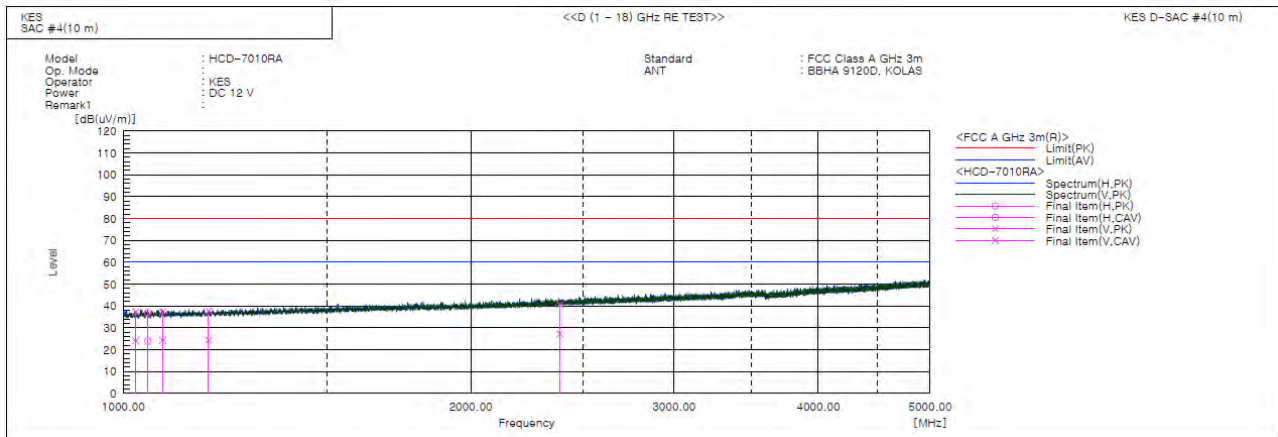
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Radiated Electric Field Emissions(Above 1 GHz)



Final Result

No.	Frequency	(P)	Reading	Reading	c.f	Result	Result	Limit	Limit	Margin	Margin	Height	Angle	Remark
	[MHz]		PK	CAV		PK	CAV	PK	AV	PK	CAV	[cm]	[deg]	
			[dB(uV)]	[dB(uV)]	[dB(1/m)]	[dB(uV/m)]	[dB(uV/m)]	[dB(uV/m)]	[dB(uV/m)]	[dB]	[dB]			
1	1025.015	V	43.5	30.3	-6.2	37.3	24.1	80.0	60.0	42.7	35.9	107.0	57.0	
2	1050.075	H	43.0	29.9	-6.0	37.0	23.9	80.0	60.0	43.0	36.1	100.0	143.0	
3	1082.060	V	43.2	30.1	-5.8	37.4	24.3	80.0	60.0	42.6	35.7	143.0	77.0	
4	1185.500	V	42.7	29.4	-5.0	37.7	24.4	80.0	60.0	42.3	35.6	100.0	326.0	
5	2389.510	V	39.3	26.0	1.3	40.6	27.3	80.0	60.0	39.4	32.7	213.0	61.0	

◆ 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 Voltage Emissions

N/A

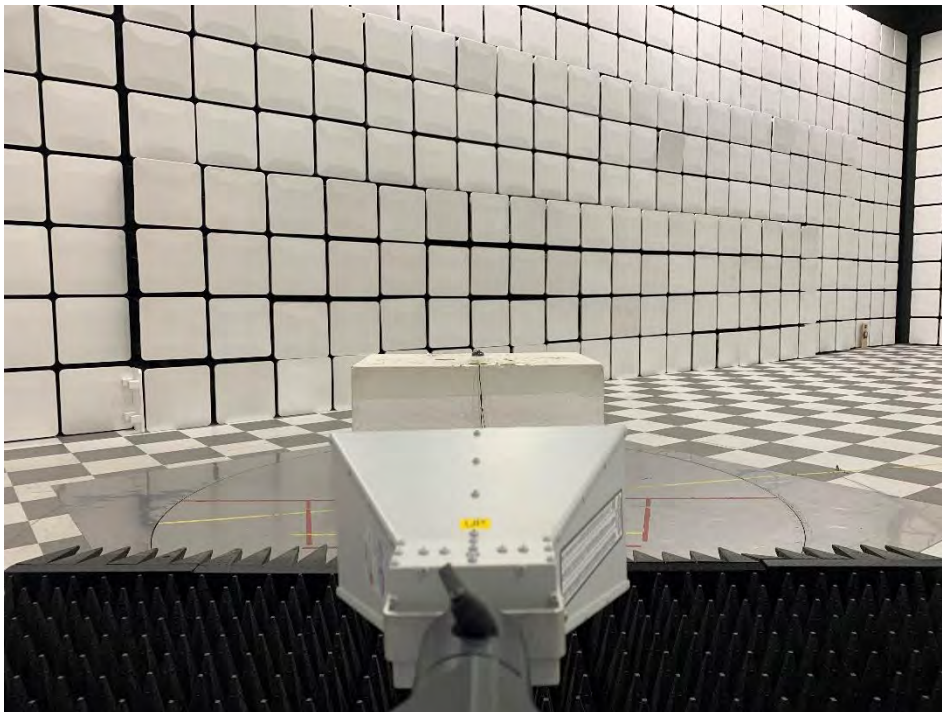
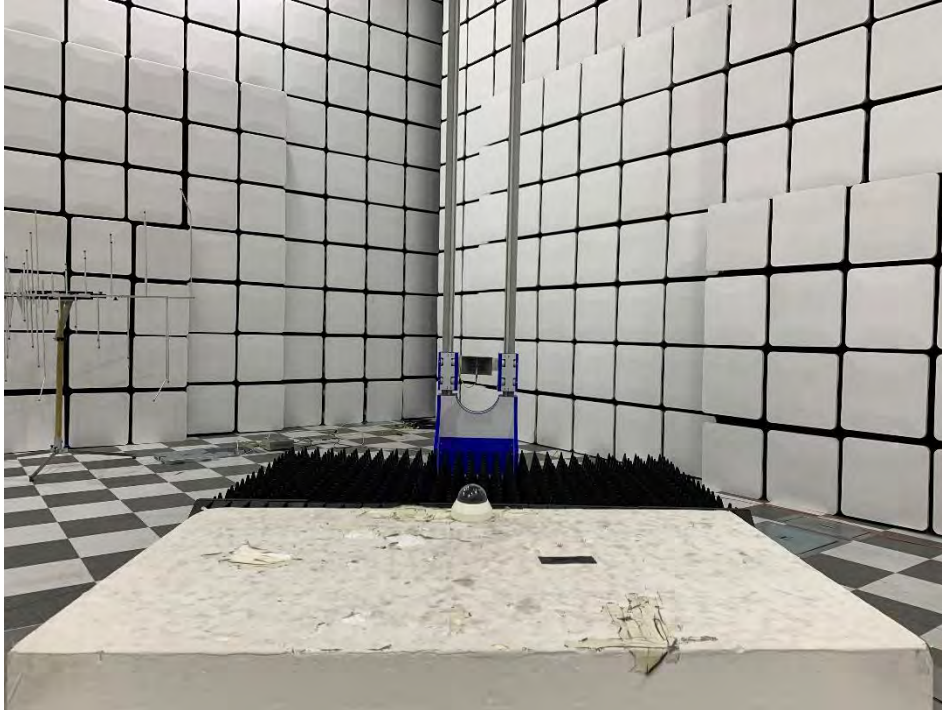
N/A

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)

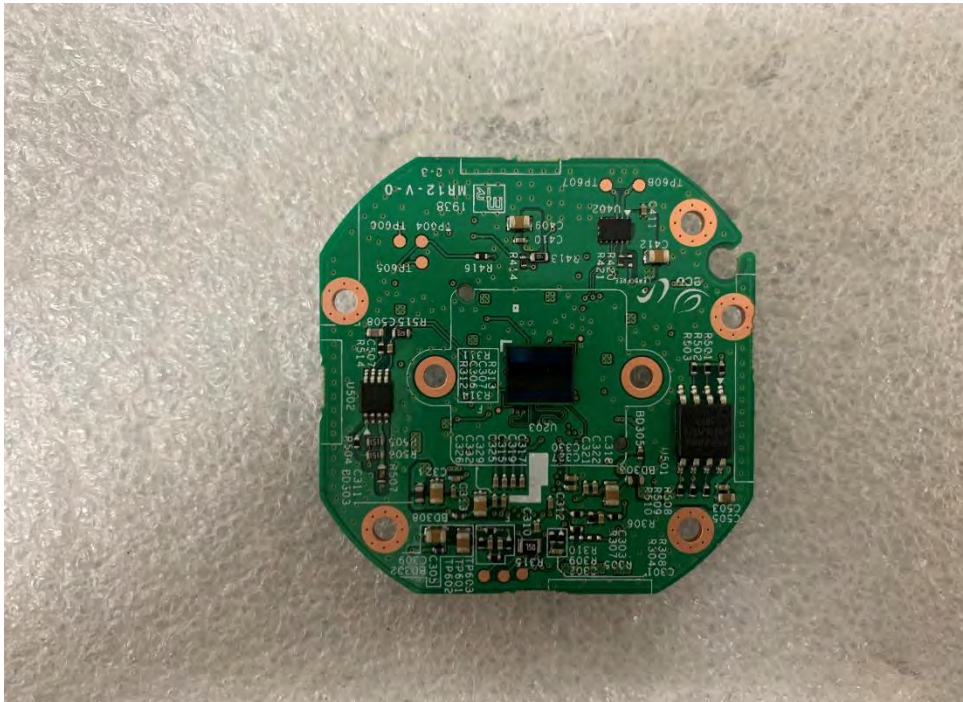


EUT Internal View – Main Board

(Top)



(Bottom)



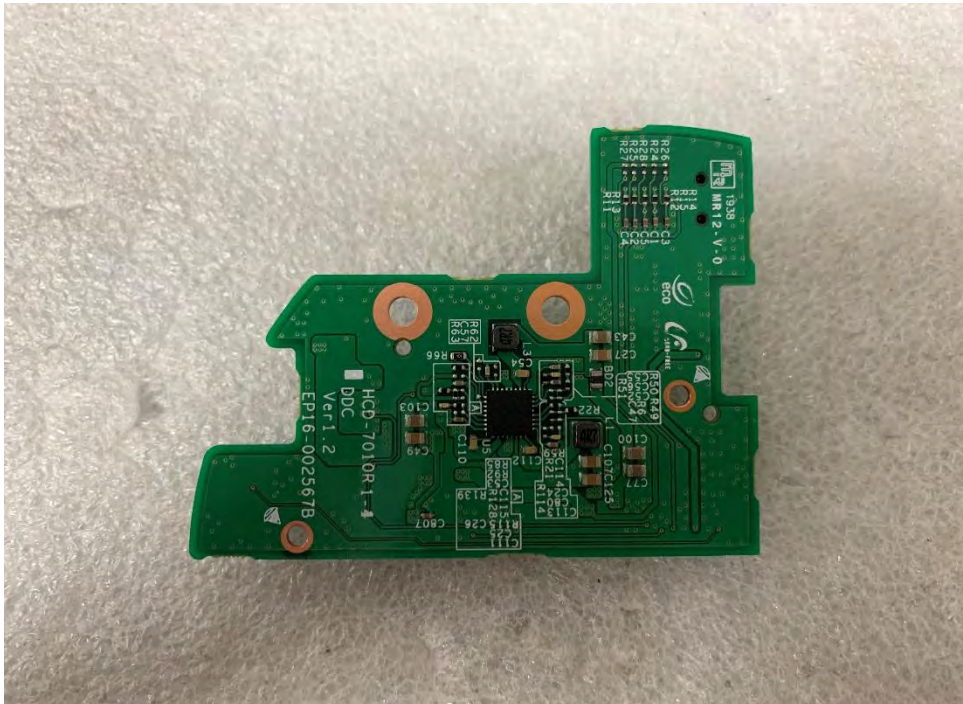
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EUT Internal View – Sub Board

(Top)



(Bottom)



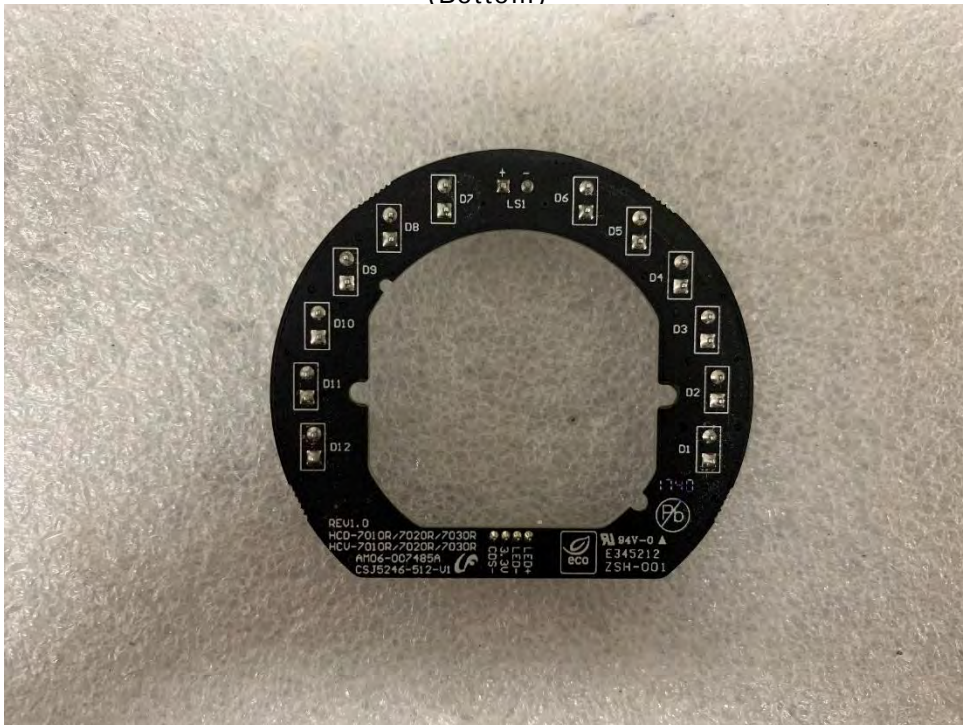
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EUT Internal View – IR Board

(Top)



(Bottom)



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EUT Internal View – Lens

(Top)

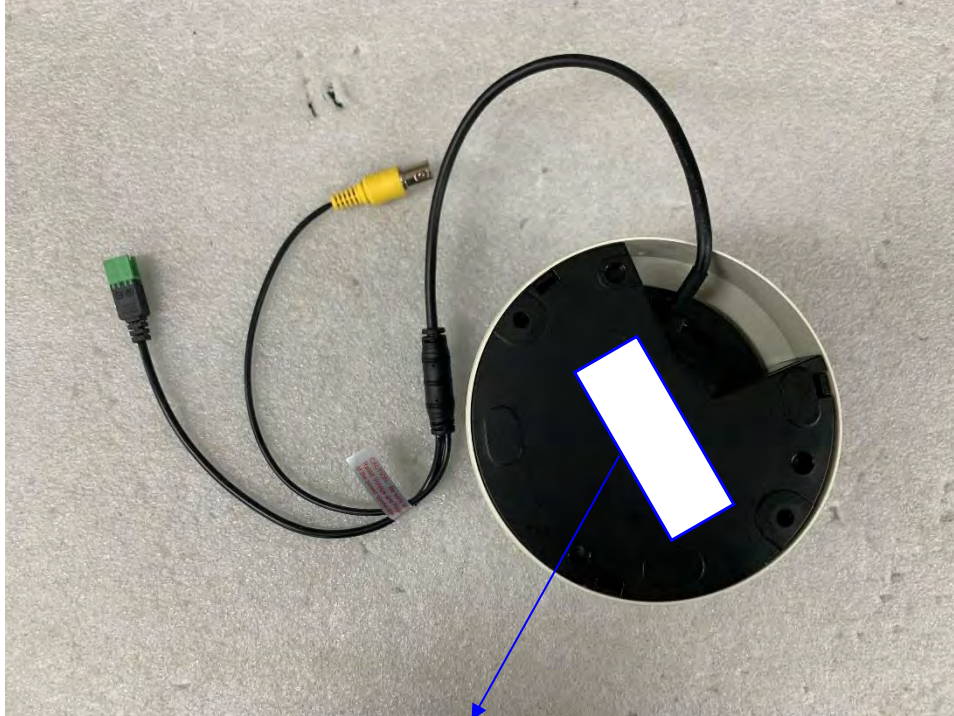


(Bottom)



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Label Photographs



CAN ICES-3(A) / NMB-3(A)

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

(1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.