



EMC TEST REPORT For RCM

Test Report No. : KES-EM-22T0265
Date of Issue : Mar. 24, 2022
Product name : CCTV CAMERA
Model/Type No. : PNM-7082RVD
Variant Model : -
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 SECURITY VIETNAM CO.,LTD.
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 : Feb. 23, 2022
Test date : Mar. 02, 2022 ~ Mar. 04, 2022
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
Mar. 24, 2022	KES-EM-22T0265	Issued

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1.0 General Product Description

Main Specifications of EUT are :

Video	
Imaging Device	1/2.8" CMOS x 2CH
Resolution	1920x1080, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360, 320x240
Max. Framerate	H.265/H.264: 2MP Max. 30fps/25fps(60Hz/50Hz) MJPEG: Max. 30fps/25fps(60Hz/50Hz)
NETD	None
Pixel Size	None
Min. Illumination	Color: 0.035lux(F2.2, 1/30sec, 30IRE) BW: 0.0035lux(F2.2, 1/30sec, 30IRE), 0lux(IR LED on)
Video Out	USB: micro USB Type B, 1280x720 for installation
Video Transmission Distance	None
Lens	
Focal Length (Zoom Ratio)	3~6mm(2x) motorized varifocal per CH
Max. Aperture Ratio	F2.2(Wide)~F3.1(Tele)
Angular Field of View	H: 107°(Wide)~56.3°(Tele) V: 57°(Wide)~31.5°(Tele) D: 126°(Wide)~64.3°(Tele)
Min. Object Distance	0.5m(1.64ft)
Focus Control	Simple focus
Lens Type	Fixed IRIS
Mount Type	None
Optional Lens	None
Pan / Tilt / Rotate	
Pan / Tilt / Rotate Range	0~355°/0~75°/0~180°
Pan Range	None
Pan Speed	None
Tilt Range	None
Tilt Speed	None
Rotate Range	None
Sequence	None
Preset Accuracy	None
Operational	
Camera Title	Displayed up to 85 characters
Direction Indicator	None
Day & Night	Auto(ICR)
Backlight Compensation	BLC, HLC, WDR, SDDR
Wide Dynamic Range	extremeWDR(150dB)
Digital Noise Reduction	WiseNR, SSNRV
Digital Image Stabilization	None
Defog	Support
Motion Detection	8ea, 8point Polygonal zones
Privacy Masking	32ea, Quadrangle zones - Color: Grey/Green/Red/Blue/Black/White - Mosaic
Gain Control	Low / Middle / High
White Balance	ATW / AWC / Manual / Indoor / Outdoor
LDC	Support

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Electronic Shutter Speed	Minimum / Maximum / Anti flicker (2 ~1/12,000sec)
Digital PTZ	None
Video Rotation	Flip, Mirror, Hallway view (90°/270°)
Analytics	Analytics events* - Defocus detection, Motion detection, Tampering, Virtual line(Crossing/Direction), Virtual area(Loitering/Enter/Exit) * Support Audio detection, Sound classification via optional SPM-4210 I/O box
Business Intelligence	None
Serial Interface	None
Alarm I/O	* Support Alarm via optional SPM-4210 I/O box
Alarm Triggers	Analytics, Network disconnect, Alarm input via optional SPM-4210 I/O box
Alarm Events	When alarm trigger occurred - File upload(image) : e-mail/FTP - Notification : e-mail - Recording : SD/SDHC/SDXC or NAS recording at event triggers - Handover(PTZ preset, Send message by HTTP/HTTPS/TCP) - * Alarm output via optional SPM-4210 I/O box
Audio Streaming	None

Audio In	* Audio in via optional SPM-4210 I/O box
Audio Out	* Audio out via optional SPM-4210 I/O box
IR Viewable Length	WiseIR 15m(49.21ft)
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
Network	
Ethernet	Metal shielded RJ-45 (10/100/1000BASE-T)
Video Compression	H.265/H.264: Main/Baseline/High, MJPEG
Audio Compression	None
Smart Codec	Manual(Sea area), WiseStreamII
Video Quality Adjustment	H.264/H.265: Target bitrate level control MJPEG: Target bitrate level control
Bitrate Control	H.264/H.265: CBR or VBR MJPEG: VBR
Streaming	Unicast(20 users) / Multicast Multiple streaming(Up to 10 profiles)
Protocol	IPv4, IPv6, TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP,RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, UPnP, Bonjour, LLDP, SRTP (TCP, UDP Unicast)
SIP support (VoIP, Peer-to-peer, SIP/P)	None
Security	TPM 2.0 (FIPS 140-2 level 2) HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access log 802.1X Authentication(EAP-TLS, EAP-LEAP, EAP-PEAP MSCHAPv2) Device Certificate(Hanwha Techwin Root CA, pre-installed) Secure by default certificate Secure OS/Boot/Storage, Verify firmware forgery
Application Programming Interface	ONVIF Profile S/T SUNAPI(HTTP API) Open platform

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General	
Webpage Language	English, Korean, Chinese, French, Italian, Spanish, German, Japanese, Russian, Swedish, Portuguese, Czech, Polish, Turkish, Dutch, Greek, Hungarian
Web Viewer	None
Edge Storage	Micro SD/SDHC/SDXC 1slot Max. 512GB
Memory	4GB RAM, 512MB Flash
Environmental & Electrical	
Operating Temperature / Humidity	-40°C~+55°C(-40°F ~ +131°F) / Less than 95% RH(Non-condensing) * Start up should be above at -35°C
Storage Temperature / Humidity	-50°C~+60°C (-58°F~+140°F) / Less than 95% RH(Non-condensing)
Certification	IP66, IK10, NEMA4X
Input Voltage	PoE+(IEEE802.3at, Class4)
Power Consumption	PoE+: Max 19W, typical 14.2W
Mechanical	
Color / Material	White / Aluminum Hard-coated dome bubble
RAL Code	RAL9003
Product Dimensions / Weight	215(W)x135(D)x93.2(H)mm(8.46"x5.31"x3.67") / 1330g
Compatible Conduit hole / Gangbox	3/4" (M25) single, double, 4" octagon, 4" square
Hanging Mount (Dome)	None
Skin Cover (Dome)	None
Weather Cap (Dome)	None
Power Module	None
Backbox	None
Certifications & Standards	
Network	None
EMC	None
Safety	None
Environment	None
Video	None
DORI (EN62676-4 standard)	
Detect (25PPM/ 8PPF)	Wide: 28.4m(93.22ft) / Tele: 71.8m(235.45ft)
Observe (63PPM/ 19PPF)	Wide: 11.4m(37.29ft) / Tele: 28.7m(94.18ft)
Recognize (125PPM/ 38PPF)	Wide: 5.7m(18.64ft) / Tele: 14.4m(47.09ft)
Identify (250PPM/ 76PPF)	Wide: 2.8m(9.32ft) / Tele: 7.2m(23.55ft)

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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.

☒ PoE

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
CCTV CAMERA	PNM-7082RVD	-	HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
PoE Adapter	PT-PSE109GBRO-AH	-	Dongguan PROCET Network Technology Co.,Ltd	-
Notebook	P95G001	9JM8HT2	Wistron Corporation	-
Notebook Adapter	LA65NS2-01	-	LITE-ON TECHNOLOGY (CHANGZHOU)CO.,LTD.	-
Micro SD Card	-	-	DASHCAM7	32 GB



1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
CCTV CAMERA (EUT)	RJ-45	PoE Adapter	RJ-45	4.0	S
	Micro SD Card Slot	Micro SD Card	Micro SD Card Slot	-	-
Notebook	RJ-45	PoE Adapter	RJ-45	2.5	U
	DC Jack	Notebook Adapter	DC Jack	2.0	S

* Unshielded=U, Shielded=S

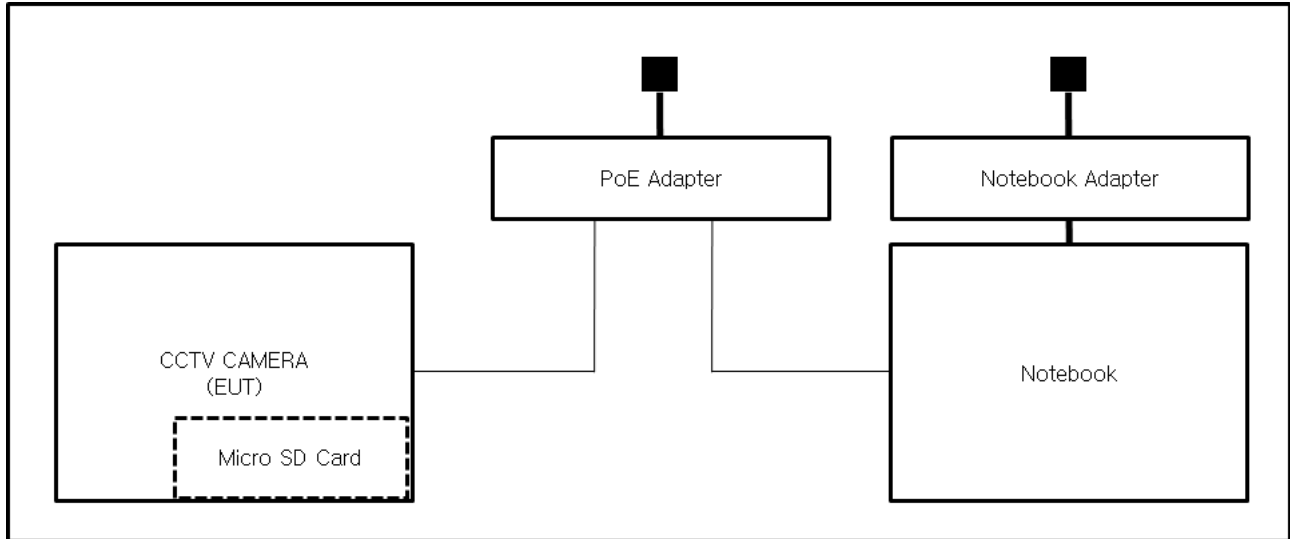
1.7 EUT Operating Mode(s)

Test mode	operating
Operating Mode	EUT Monitoring, Ping Test

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

1.8 Configuration

■ AC Main
□ DC Main



1.9 Remarks when standards applied

Micro 5 Pin port was excluded from the test as it is an unused port.







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 C63.4a-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 , 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 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

N/A

Test Location

Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input type="checkbox"/>	EMI Test S/W	EMC32	R & S	9.12.00	-
<input type="checkbox"/>	EMI TEST RECEIVER	ESR3	R & S	101783	12, 28, 2022
<input type="checkbox"/>	LISN	ENV216	R & S	101787	12, 27, 2022
<input type="checkbox"/>	LISN	ESH2-Z5	R & S	100450	12, 27, 2022
<input type="checkbox"/>	PULSE LIMITER	ESH3-Z2	R & S	101915	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

It is not tested apply because it is powered by PoE.

2.2 Conducted Emissions at Telecommunication Ports

Test Date

Mar. 02, 2022

Test Location

Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test S/W	EMC32	R & S	9.12.00	-
<input checked="" type="checkbox"/>	EMI TEST RECEIVER	ESR3	R & S	101783	12, 28, 2022
<input checked="" type="checkbox"/>	LISN	ENV216	R & S	101787	12, 27, 2022
<input checked="" type="checkbox"/>	LISN	ESH2-Z5	R & S	100450	12, 27, 2022
<input checked="" type="checkbox"/>	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 27, 2022
<input type="checkbox"/>	8-WIRE ISN CAT3,5	ENY81	R & S	100174	12, 28, 2022
<input type="checkbox"/>	8-WIRE ISN CAT6	ENY81-CAT6	R & S	101665	12, 28, 2022
<input checked="" type="checkbox"/>	ISN	ISN S8	SCHWARZBECK	ISN-S8-0019	03, 07, 2023

Test Conditions

Temperature: (23,3 ± 0,1) °C
Relative Humidity: (43,2 ± 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.
- For Ethernet interfaces, measurements are required at the highest data rate supported by the interface.

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2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Mar. 02, 2022

Test Location

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

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
<input checked="" type="checkbox"/>	EMI TEST RECEIVER	ESU26	R & S	100551	04, 01, 2022
<input checked="" type="checkbox"/>	AMPLIFIER	SCU 01	R & S	100603	11, 24, 2022
<input checked="" type="checkbox"/>	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	12, 08, 2022
<input checked="" type="checkbox"/>	ATTENUATOR	8491A	HP	32173	03, 08, 2023

Test Conditions

Temperature: (23,2 ± 0,2) °C
Relative Humidity: (43,4 ± 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

Remarks

See Appendix A for test data.

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2.4 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Mar. 04, 2022

Test Location

SEMI ANECHOIC CHAMBER #5

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.120	-
<input checked="" type="checkbox"/>	EMI TEST RECEIVER	ESU26	Rohde & Schwarz	100552	04, 01, 2022
<input checked="" type="checkbox"/>	HORN ANTENNA	BBHA 9120D	SCHWARZBECK	9120D-1802	12, 16, 2022
<input checked="" type="checkbox"/>	PREAMPLIFIER	8449B	HP	3008A00538	06, 21, 2022

Test Conditions

Temperature: (22,9 ± 0,1) °C

Relative Humidity: (43,2 ± 0,1) % 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

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))

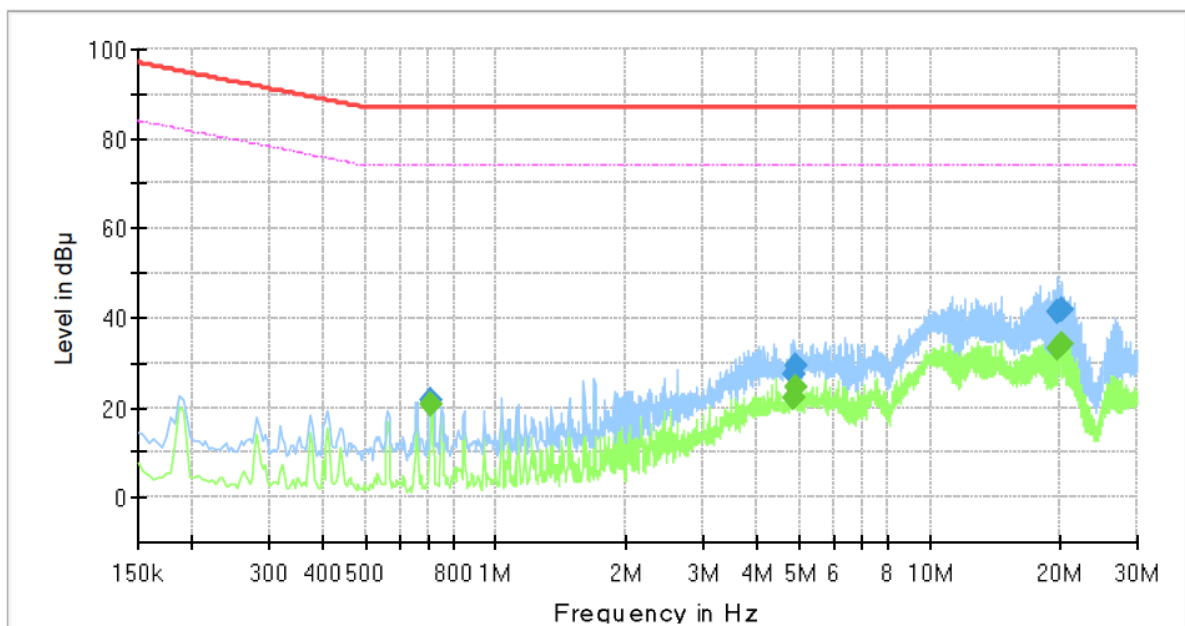
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Conducted Emissions at Telecommunication Ports

[1 000 Mbps]

Common Information

Test Description: Telecommunication Emission
 Model No.: PNM-7082RVD
 Mode :
 Speed : 1 000 Mbps
 Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.710000	---	20.88	74.00	53.12	1000.0	9.000	Single Line	19.8
0.710000	21.90	---	87.00	65.10	1000.0	9.000	Single Line	19.8
4.870000	---	22.30	74.00	51.70	1000.0	9.000	Single Line	19.5
4.870000	27.69	---	87.00	59.31	1000.0	9.000	Single Line	19.5
4.874000	---	24.41	74.00	49.59	1000.0	9.000	Single Line	19.5
4.874000	29.61	---	87.00	57.39	1000.0	9.000	Single Line	19.5
19.786000	---	33.36	74.00	40.64	1000.0	9.000	Single Line	20.2
19.786000	41.40	---	87.00	45.60	1000.0	9.000	Single Line	20.2
20.054000	---	34.01	74.00	39.99	1000.0	9.000	Single Line	20.2
20.054000	41.85	---	87.00	45.15	1000.0	9.000	Single Line	20.2

◆ Calculation

QuasiPeak [dBμV] / CAverage [dBμV] = Reading Value [dBμV] + 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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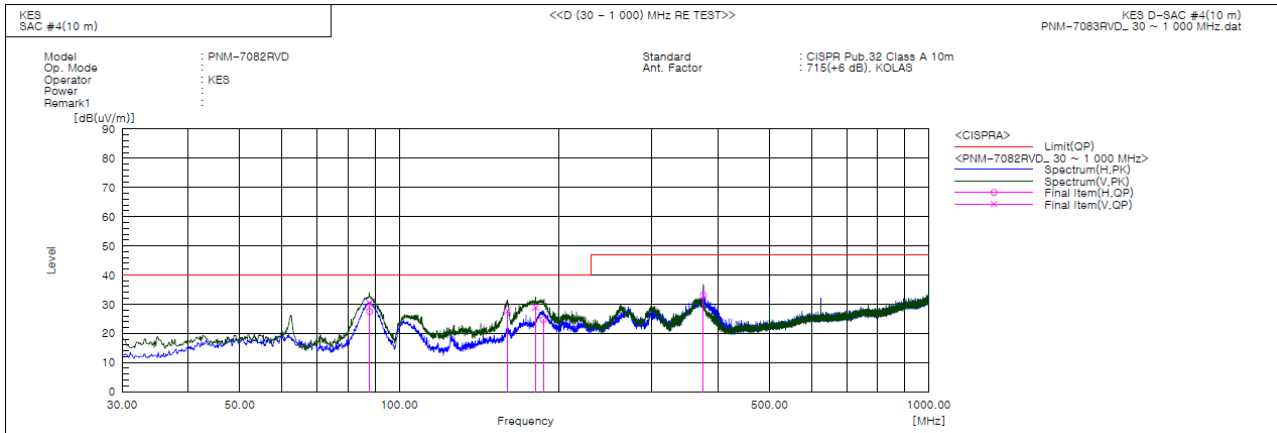
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Radiated Electric Field Emissions(Below 1 GHz)



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	87.836	V	55.3	-24.9	30.4	40.0	9.6	150.0	274.0	
2	87.958	H	52.3	-24.8	27.5	40.0	12.5	392.0	335.0	
3	160.101	V	52.4	-24.7	27.7	40.0	12.3	146.0	146.0	
4	180.956	V	52.3	-23.4	28.9	40.0	11.1	119.0	266.0	
5	187.140	H	47.3	-22.6	24.7	40.0	15.3	400.0	331.0	
6	374.956	H	48.0	-14.8	33.2	47.0	13.8	358.0	37.0	

◆ 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

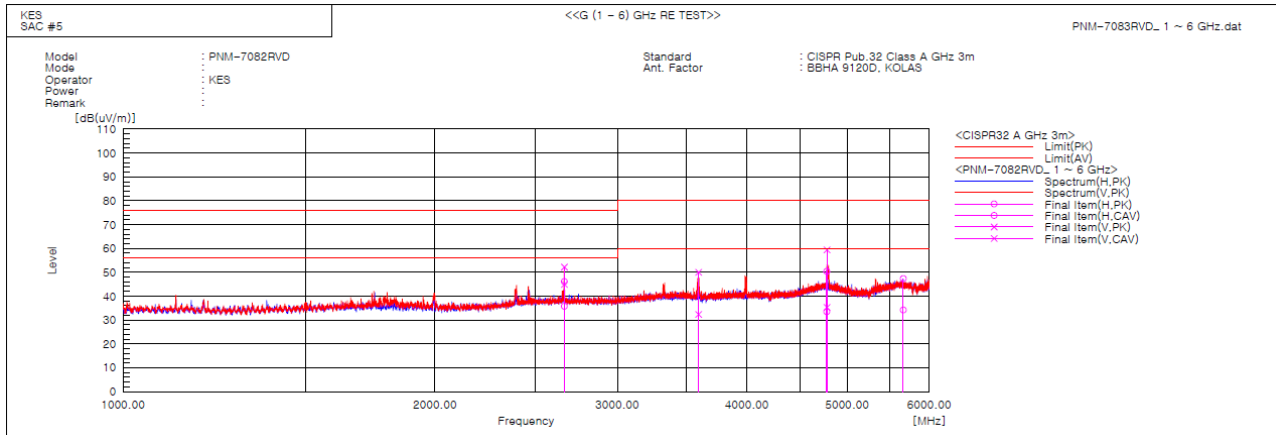


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KES-EM-22T0265
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Radiated Electric Field Emissions(Above 1 GHz)



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Result CAV [dB(μV/m)]	Limit PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	2665.873	V	52.4	45.2	-0.2	52.2	45.0	76.0	56.0	23.8	11.0	100.0	198.8	
2	2666.076	H	46.3	36.0	-0.2	46.1	35.8	76.0	56.0	29.9	20.2	100.0	261.5	
3	3592.151	V	48.1	30.5	1.9	50.0	32.4	80.0	60.0	30.0	27.6	100.0	168.9	
4	4777.879	H	43.9	27.0	6.5	50.4	33.5	80.0	60.0	29.6	26.5	100.0	320.8	
5	4779.917	V	52.9	28.8	6.5	59.4	35.3	80.0	60.0	20.6	24.7	100.0	168.9	
6	5664.691	H	39.3	26.1	8.1	47.4	34.2	80.0	60.0	32.6	25.8	100.0	1.0	

◆ 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 Emissions at Mains Power Ports

N/A

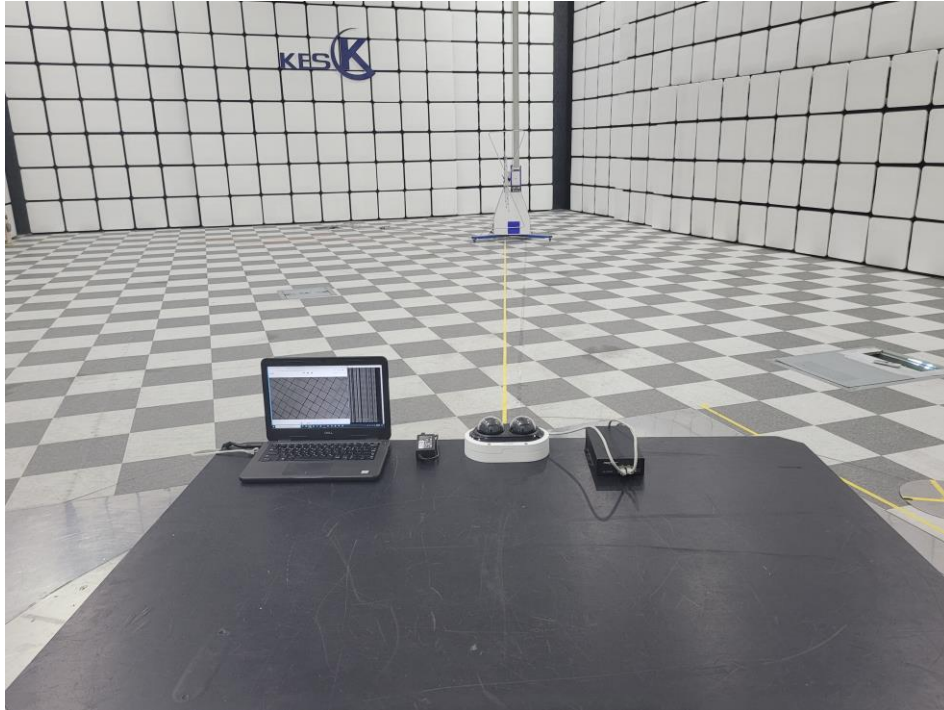
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Conducted Emissions at Telecommunication Ports



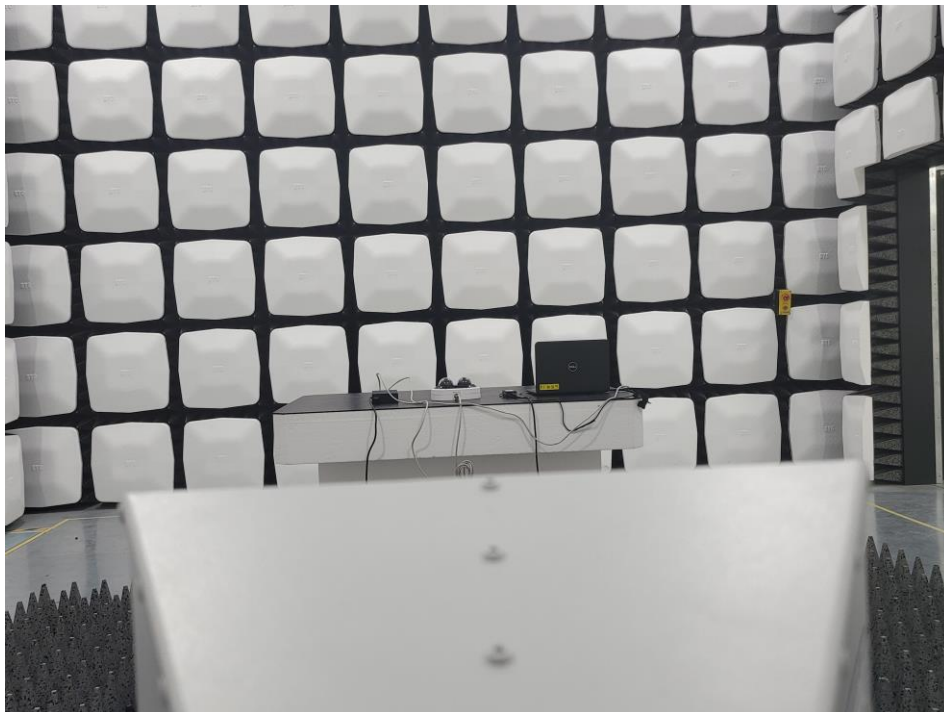
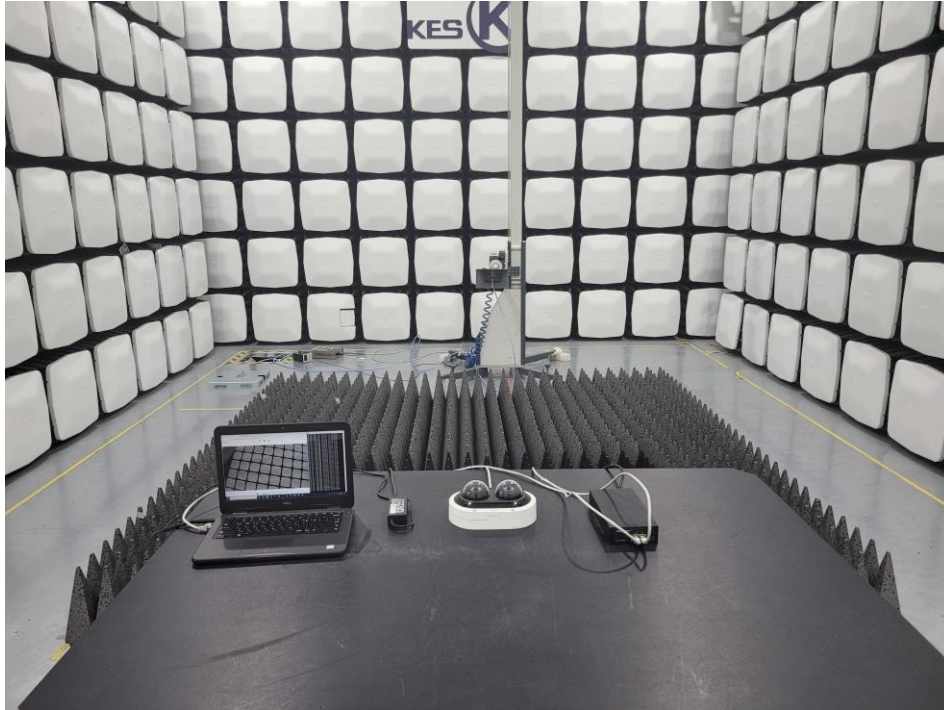
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Radiated Electric Field Emissions(Below 1 GHz)



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Radiated Electric Field Emissions(Above 1 GHz)



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EUT External Photographs

(Top)



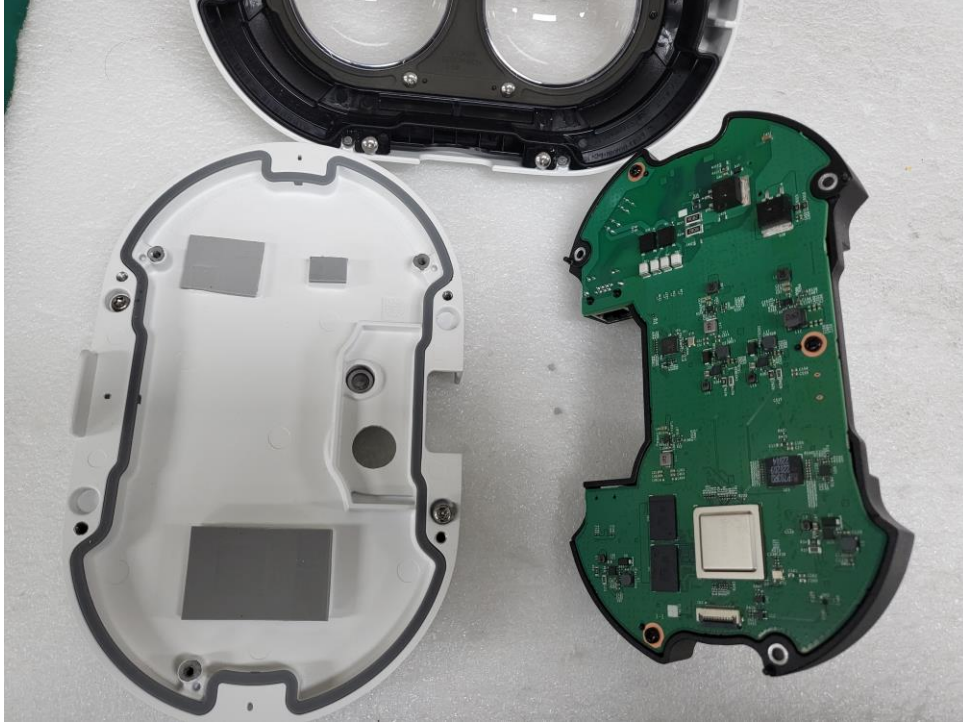
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EUT Internal Photographs

(Internal View)



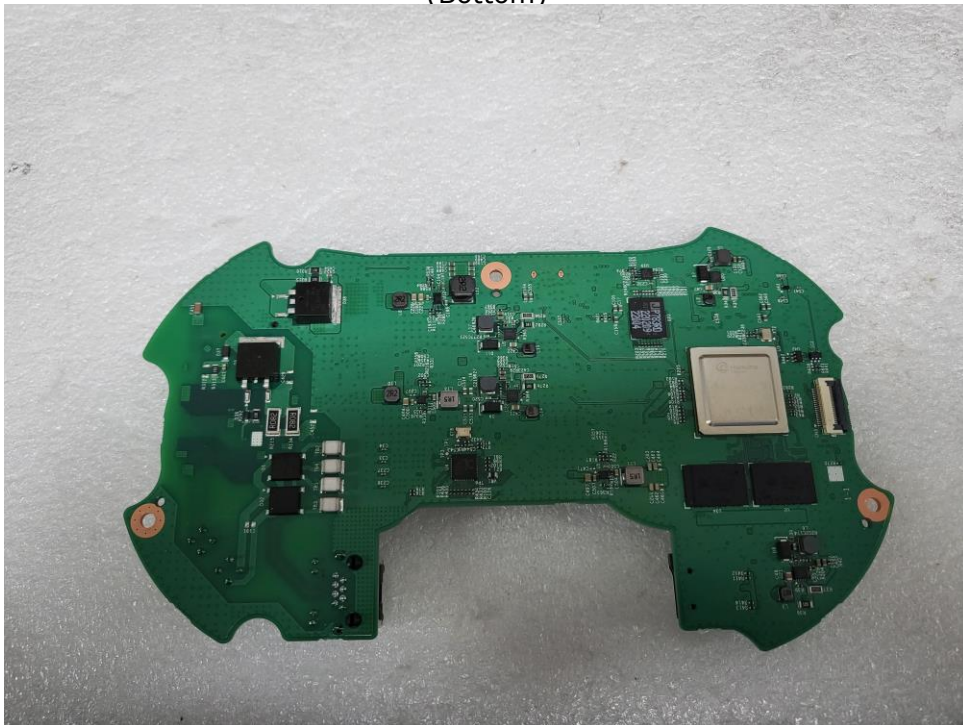
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EUT Internal View – Board 1

(Top)



(Bottom)



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EUT Internal View – Board 2

(Top)



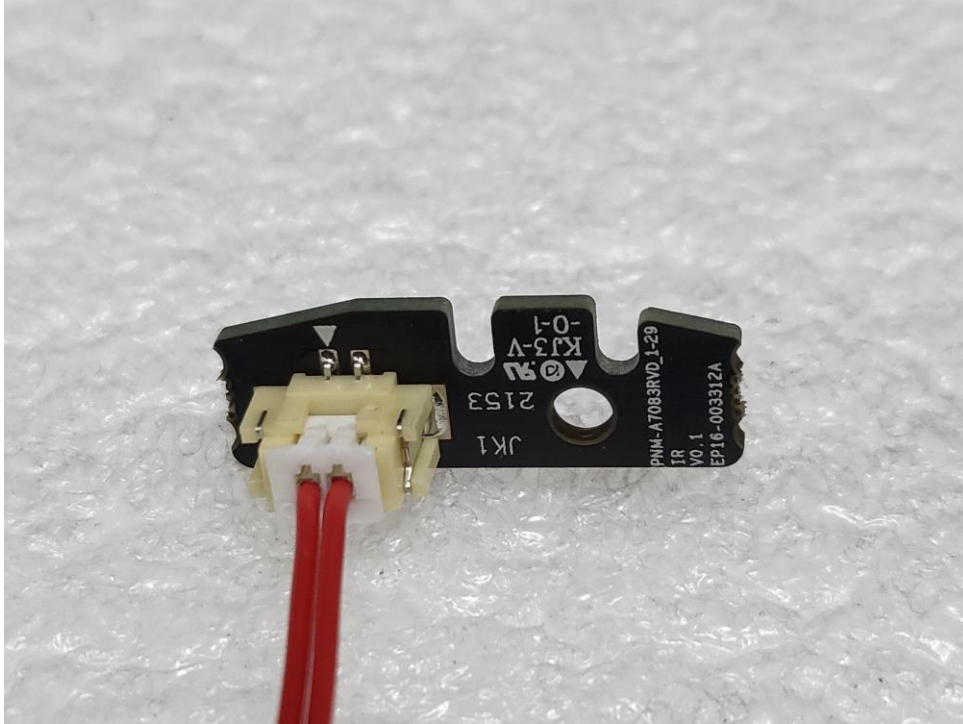
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EUT Internal View – Board 3

(Top)



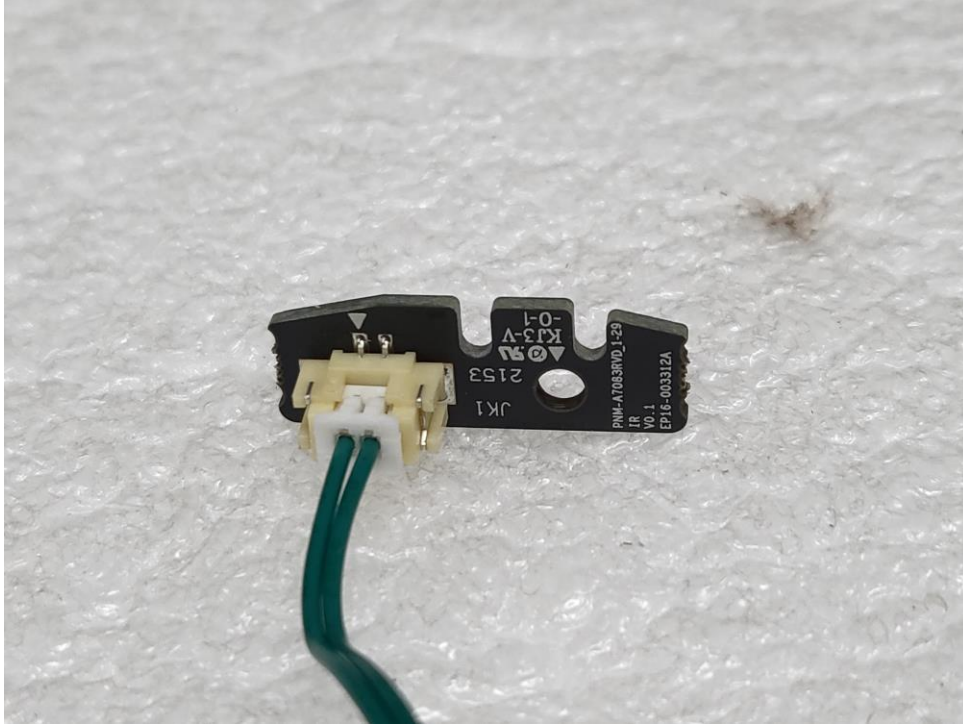
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EUT Internal View – Board 4

(Top)



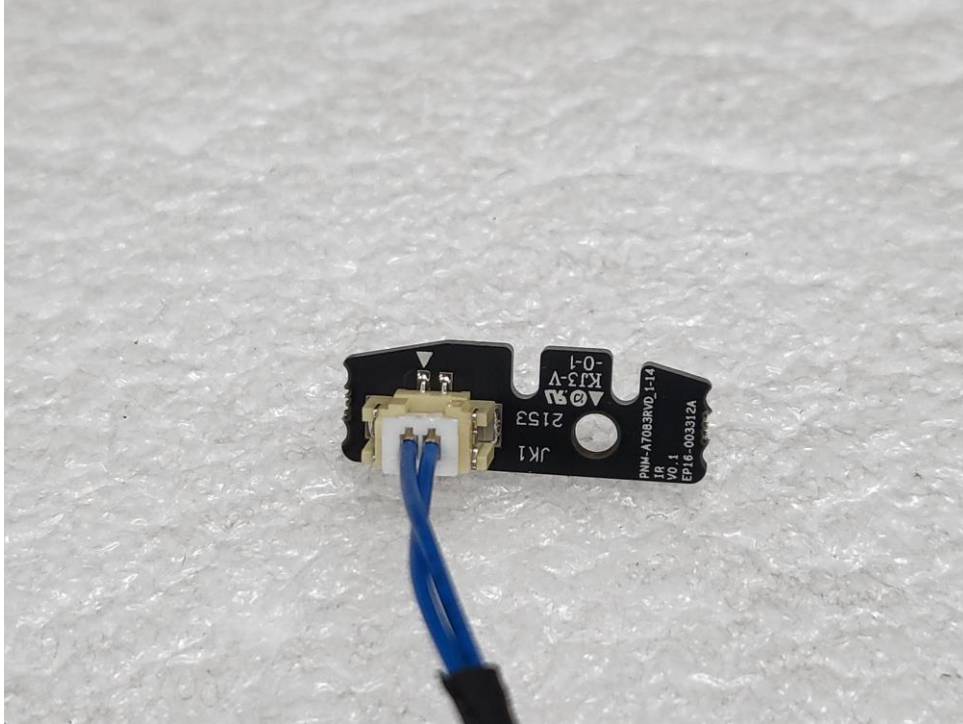
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EUT Internal View – Board 5

(Top)



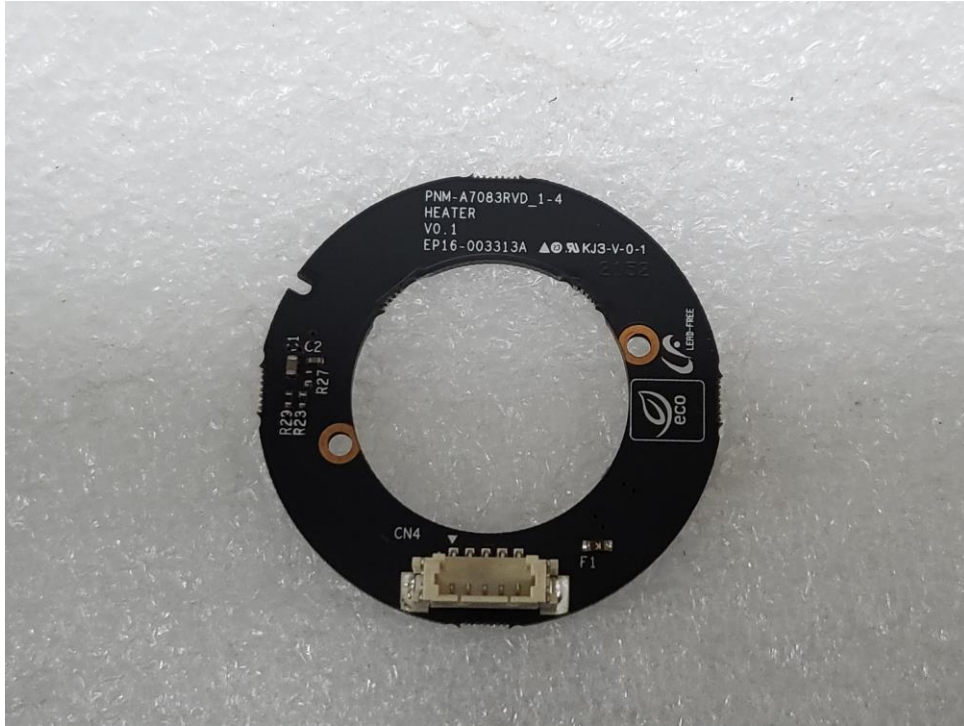
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EUT Internal View – Board 6

(Top)



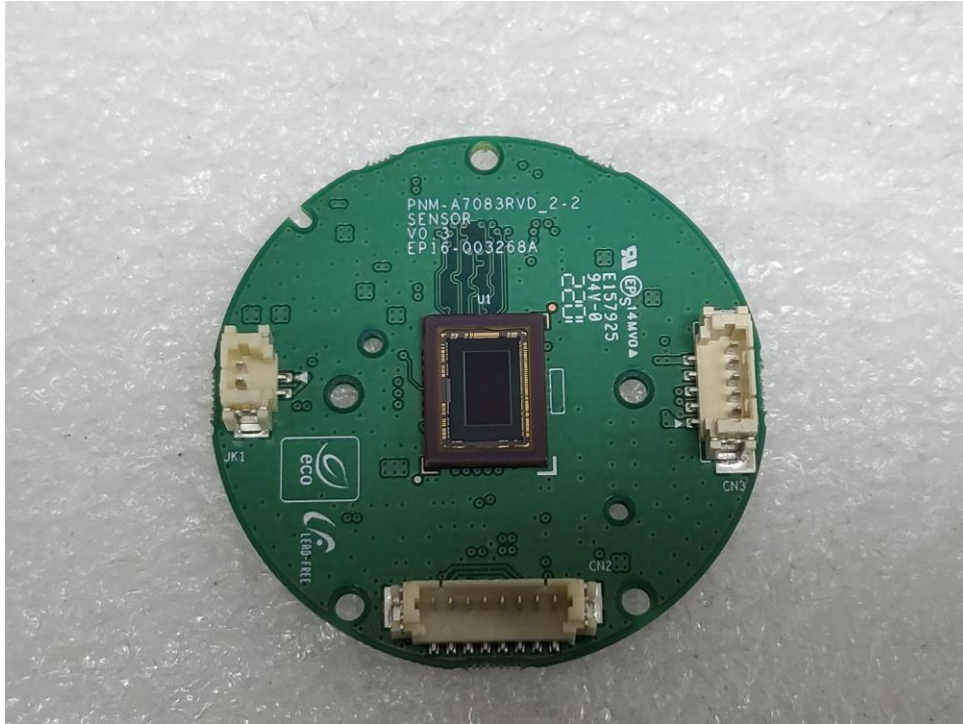
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EUT Internal View – Board 7

(Top)



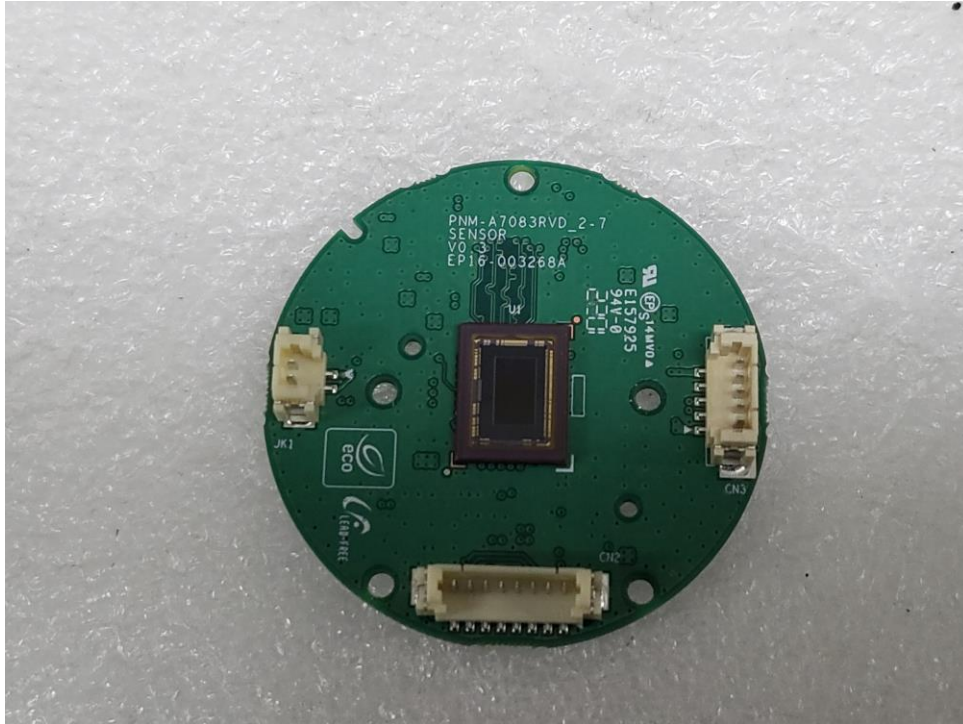
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EUT Internal View – Board 8

(Top)



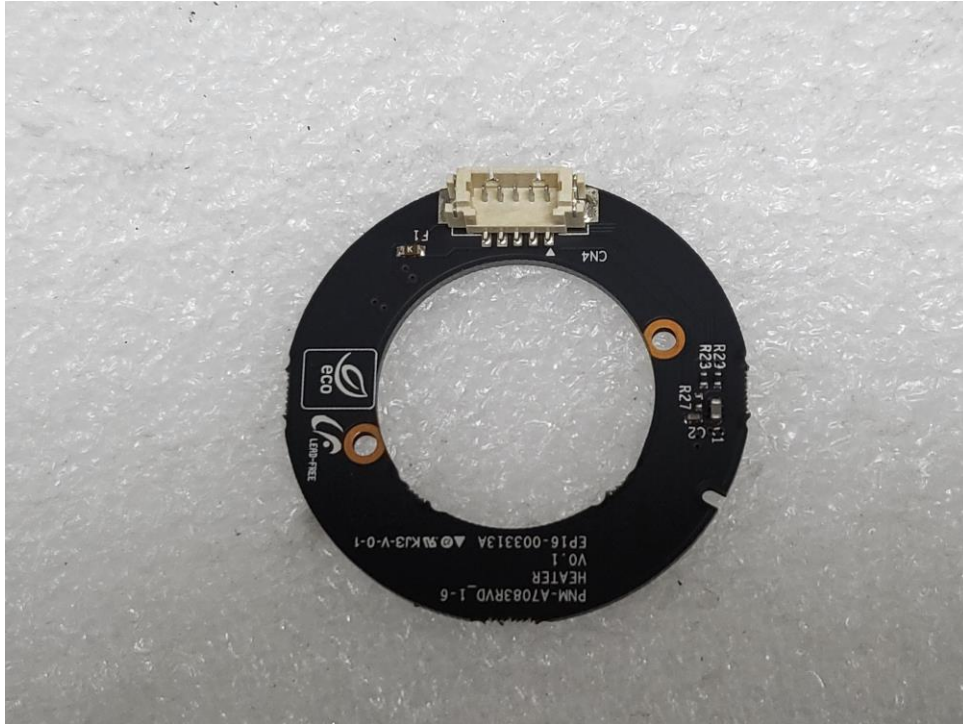
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EUT Internal View – Board 9

(Top)



(Bottom)



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EUT Internal View – Lens 1

(Top)



(Bottom)



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EUT Internal View – Lens 2

(Top)



(Bottom)



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