

# EMC TEST REPORT

Test Report No. : KES-EM-23T0407  
Date of Issue : May. 16, 2023  
Product name : Network Camera  
Model/Type No. : PNM-C32083RVQ  
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 : Mar. 22, 2023  
Test date : Apr. 28, 2023 ~ May. 04, 2023  
Test Results :  **In Compliance**  **Not in Compliance**

Tested by



Seong Min, Jang  
EMC Test Engineer

Reviewed by



Hyo Jin, Kim  
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
May. 16, 2023	KES-EM-23T0407	Issued

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## 1.0 General Product Description

### Main Specifications of EUT are:

<b>Video</b>	
Imaging Device	1/2.8" 4k CMOS x 4CH (Must have independent configuration)
Resolution	3840x2160, 3328x1872, 3072x1728, 2592x1944, 2688x1520, 1920x1080, 1600x1200, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360, 320x240
Max. FrameRate	H.265/H.264: 8MP Max. 20fps/20fps(60Hz/50Hz) MPEG: Max. 20fps/20fps(60Hz/50Hz)
Min. Illumination	Color: 0.10lux (F1.5, 1/30sec) BW: 0 lux(IR LED on)
Video Out	USB: micro USB Type B, 1280x720 for installation
<b>Lens</b>	
Focal Length (Zoom Ratio)	3.3~5.7mm motorized varifocal
Max. Aperture Ratio	F1.5(Wide) ~ F1.9(Tele)
Angular Field of View	H: 108.3(Wide)~56.4(Tele) V: 54.7(Wide)~31.2(Tele) D: 135.5(Wide)~65.2(Tele)
Min. Object Distance	Wide : 1.3m ; Tele : 3.3m
Focus Control	Simple focus
Pan / Tilt / Rotate Range	0~360°/0~73°/0~90°
Lens Type	Fixed Iris
<b>Operational</b>	
Camera Title	Displayed up to 85 characters
Day & Night	Auto(ICR)
Backlight Compensation	BLC, WDR, SDR
Wide Dynamic Range	120dB
Digital Noise Reduction	SSNR V, WiseNR II (using AI engine)
Digital Image Stabilization	None
Defog	Support
Motion Detection	8ea, 8point polygonal zones
Privacy Masking	6ea polygonal zones - Color: Grey/Black/White
Gain Control	Low / Middle / High
White Balance	ATW / AWC / Manual / Indoor / Outdoor
LDC	Support
Electronic Shutter Speed	Minimum / Maximum / Anti flicker (1/5 ~ 1/12,000sec), Auto prefer shutter control(Based on AI engine)
Video Rotation	Flip, Mirror, Hallway view(90/270) - Each channel separately
Analytics	- Analytics events based on AI engine: Object detection (Person/Vehicle (car/truck/bus/bicycle/bike)), IVA (Virtual line/Area, Enter/Exit, Loitering, direction, intrusion), Appear/Disappear, (Bestshot/Goodshot without attributes) - Analytics events : Defocus detection, Motion detection, Tampering, Audio detection, Sound classification
Alarm I/O	2 configurable I/O ports, + I/O Box compatibility
Alarm Triggers	Analytics, Network disconnect, Alarm input
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 - Alarm output - Handover(PTZ preset, Send message by HTTP/HTTPS/TCP) - Audio clip playback
Audio In	Selectable (microphone in/line in) Supply voltage: 2.5VDC(4mA), Input impedance: 2K Ohm
Audio Out	Line out, Maximum output level: 1Vrms
IR Viewable Length	Wise IR 20m
<b>Network</b>	
Ethernet	Metal shielded RJ-45(10/100/1000BASE-T)
Video Compression	H.265/H.264, Main/Baseline/High, MPEG
Smart Codec	Manual/Sea area, WiseStreamII, WiseStreamIII(Based on AI engine)
Bitrate Control	H.264/H.265, CBR or VBR MPEG: VBR
Streaming	(5 Profiles/channel) Unicast(10 users) / Multicast (TBD)
Protocol	IPv4, IPv6, TCP/IP, UDP/IP, RTP(JDPI, RTP(TCP), RTCP,RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, PIM-SM, UPnP, Bonjour, LLDP, SRT
Security	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, TPM with FIPS 140-2 level2
Application Programming Interface	ONVIF Profile S/T ONVIF Profile M SUNAPI(HTTP API)
<b>General</b>	
Webpage Language	English, Korean, Chinese, French, Italian, Spanish, German, Japanese, Russian, Portuguese, Czech, Polish, Turkish, Dutch, Hungarian, Greek
Edge Storage	Micro SD/SDHC/SDXC 2 slots x 512GB
Open platform	Open platform Application that has access to 4 channels
<b>Environmental &amp; Electrical</b>	
Operating Temperature / Humidity	-40°C ~ +55°C(-40°F ~ +131°F) / Less than 90% RH *Start up should be above at -35°C
Storage Temperature / Humidity	-50°C ~ +60°C(-58°F ~ +140°F) / Less than 90% RH
Certification	IP66, IK10, NEMA4X
Input Voltage	PoE+
Power Consumption	Max : 25.5W
<b>Mechanical</b>	
Color / Material	White / Aluminum Hard-coated dome bubble
RAL Code	RAL9003
Product dimensions / weight	250mm x 114.2mm, weight: 2.8kg
Gangbox compatibility	Single, Double, 4" Square, 4" Octagon

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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
Network Camera	PNM-C32083RVQ	-	HANWHA VISION VIETNAM COMPANY LIMITED	EUT

## 1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Micro SD Card	-	-	SanDisk	-
Laptop	Inspiron 15-7577	-	DELL	-
Laptop Adapter	LA130PM121	-	DELL	-
PoE Injector	PT-PSE109GBRO-AH-S	-	Dongguan PROCET Network Technology Co., Ltd	-
Headset	K550	-	Britz®	-
Cell Phone	SM-A305N	R59M503KX0M	SAMSUNG	-
LED Alarm	PRO-SL	-	SENSOR PRO	-
Button Alarm	-	-	-	-

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## 1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
Network Camera (EUT)	Micro SD Slot	Micro SD Card	Micro SD Slot	-	-
	RJ-45	PoE Injector	RJ-45	4.0	S
	Mic	Headset	3.5 mm	2.5	U
	Speaker		3.5 mm	2.5	U
	Alarm Out	LED Alarm	Alarm Out	3.1	U
	Alarm In	Button Alarm	Alarm In	3.1	U
PoE Injector	RJ-45	Laptop	RJ-45	1.0	U
Laptop	DC jack	Laptop Adapter	DC jack	1.5	U
	3.5 mm	Cell Phone	3.5 mm	0.1	U

\* Unshielded=U, Shielded=S

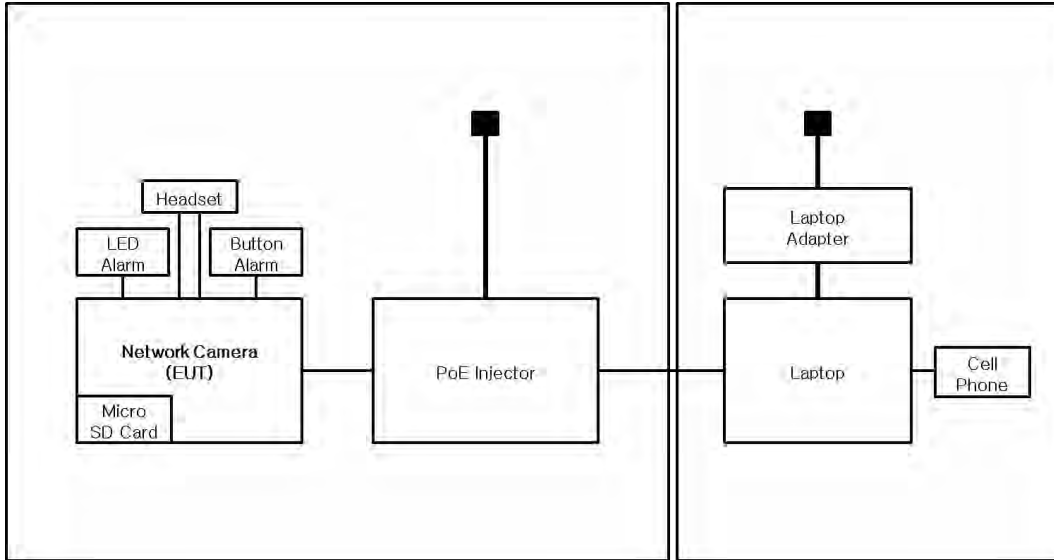
## 1.7 EUT Operating Mode(s)

Test Mode	operating
Operation	<ol style="list-style-type: none"> <li>1. Check if the EUT image is output to the laptop normally.</li> <li>2. Check if the network is operating normally through a ping test.</li> <li>3. After the test, check if the EUT video has been recorded normally.</li> </ol>

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

## 1.8 Configuration

■ AC Main  
 □ DC Main



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## **1.9 Remarks when standards applied**

- The USBMicro 5 Pin port was excluded from the test because it was for administrators.
- The PoE mode of this test equipment receives PoE power, and the PoE port is considered a wired network port, so the test items related to the power port are not applicable.

## **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	<b>RRA</b>	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	<b>KOLAS</b>	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	<b>FCC</b>	3 m & 10 m Semi-Anechoic Chamber Conducted test site to perform FCC Part 15/18 measurements.	 KR0100
Canada	<b>ISED</b>	3 m & 10 m Semi-Anechoic Chamber and Conducted test site	 23298
JAPAN	<b>VCCI</b>	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site)	 C-20136, T-20137, R-20181, G-20176
Europe	<b>TÜV SÜD</b>	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

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## 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

**EMC – Regulations 2016**

EN 55032:2015/A11:2020

Class A

Class B

EN 50130-4:2011

## 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	11, 11, 2023
<input type="checkbox"/>	LISN	ENV216	R & S	101787	11, 10, 2023
<input type="checkbox"/>	LISN	ESH2-Z5	R & S	100450	11, 10, 2023
<input type="checkbox"/>	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 10, 2023

**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

## 2.2 Conducted Emissions at Telecommunication Ports

### Test Date

May. 03, 2023

### 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	11, 11, 2023
<input checked="" type="checkbox"/>	LISN	ENV216	R & S	101787	11, 10, 2023
<input checked="" type="checkbox"/>	LISN	ESH2-Z5	R & S	100450	11, 10, 2023
<input checked="" type="checkbox"/>	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 10, 2023
<input type="checkbox"/>	8-WIRE ISN CAT3,5	ENY81	R & S	100174	11, 22, 2023
<input checked="" type="checkbox"/>	ISN	ISN S8	SCHWARZBECK	ISN-S8-0019	03, 06, 2024

### Test Conditions

Temperature: (23,1 ± 0,1) °C  
Relative Humidity: (43,5 ± 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.

## 2.3 Radiated Electric Field Emissions(Below 1 GHz)

### Test Date

May. 03, 2023

### 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	03, 21, 2024
<input checked="" type="checkbox"/>	AMPLIFIER	SCU 01	R & S	100603	11, 10, 2023
<input checked="" type="checkbox"/>	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	11, 17, 2024
<input checked="" type="checkbox"/>	ATTENUATOR	8491A	HP	32173	03, 03, 2024

### Test Conditions

Temperature: (23,2 ± 0,2) °C  
Relative Humidity: (42,4 ± 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

May. 03, 2023

### Test Location

SEMI ANECHOIC CHAMBER #3

### 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	ESR7	R & S	101190	08, 01, 2023
<input checked="" type="checkbox"/>	PREAMPLIFIER	8449B	AGILENT	3008A01967	03, 06, 2024
<input checked="" type="checkbox"/>	ATTENUATOR	8491A	HP	35496	03, 03, 2024
<input checked="" type="checkbox"/>	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 06, 2024

### Test Conditions

Temperature: (24,4 ± 0,2) °C  
Relative Humidity: (45,2 ± 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

### Remarks

See Appendix A for test data.

## 2.5 Harmonic Current Emissions

**Test Date**

N/A

**Test Location**

Electro wave Shieldroom #3

**Test Equipment**

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input type="checkbox"/>	EMI Test S/W	net.control	EM TEST	2.1.4	-
<input type="checkbox"/>	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	04, 06, 2023
<input type="checkbox"/>	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

**Test Conditions**

Temperature: ( ± ) °C

Relative Humidity: ( ± ) % 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**

N/A

## 2.6 Voltage Fluctuations and Flicker

**Test Date**

N/A

**Test Location**

Electro wave Shieldroom #3

**Test Equipment**

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input type="checkbox"/>	EMI Test S/W	net.control	EM TEST	2.1.4	-
<input type="checkbox"/>	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	04, 06, 2023
<input type="checkbox"/>	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

**Test Conditions**

Temperature: ( ± ) °C

Relative Humidity: ( ± ) % R.H.

**Test Results**

The requirements are:

- PASS
- NOT PASS
- NOT APPLICABLE

**Remarks**

N/A



### **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**

Apr. 28, 2023

**Test Location**

EMS-ESD: Electro wave Shieldroom #7

**Test Equipment**

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	ESD SIMULATOR	ESS-2000	Noise Ken	ESS01Z0454	01, 31, 2024
<input checked="" type="checkbox"/>	HCP	-	KES	-	-
<input checked="" type="checkbox"/>	VCP	-	Noise Ken	-	-

**Test Conditions**

Temperature: (24,2 ± 0,1) °C  
 Relative Humidity: (43,8 ± 0,1) % R.H.  
 Atmospheric Pressure: (100,3 ± 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:

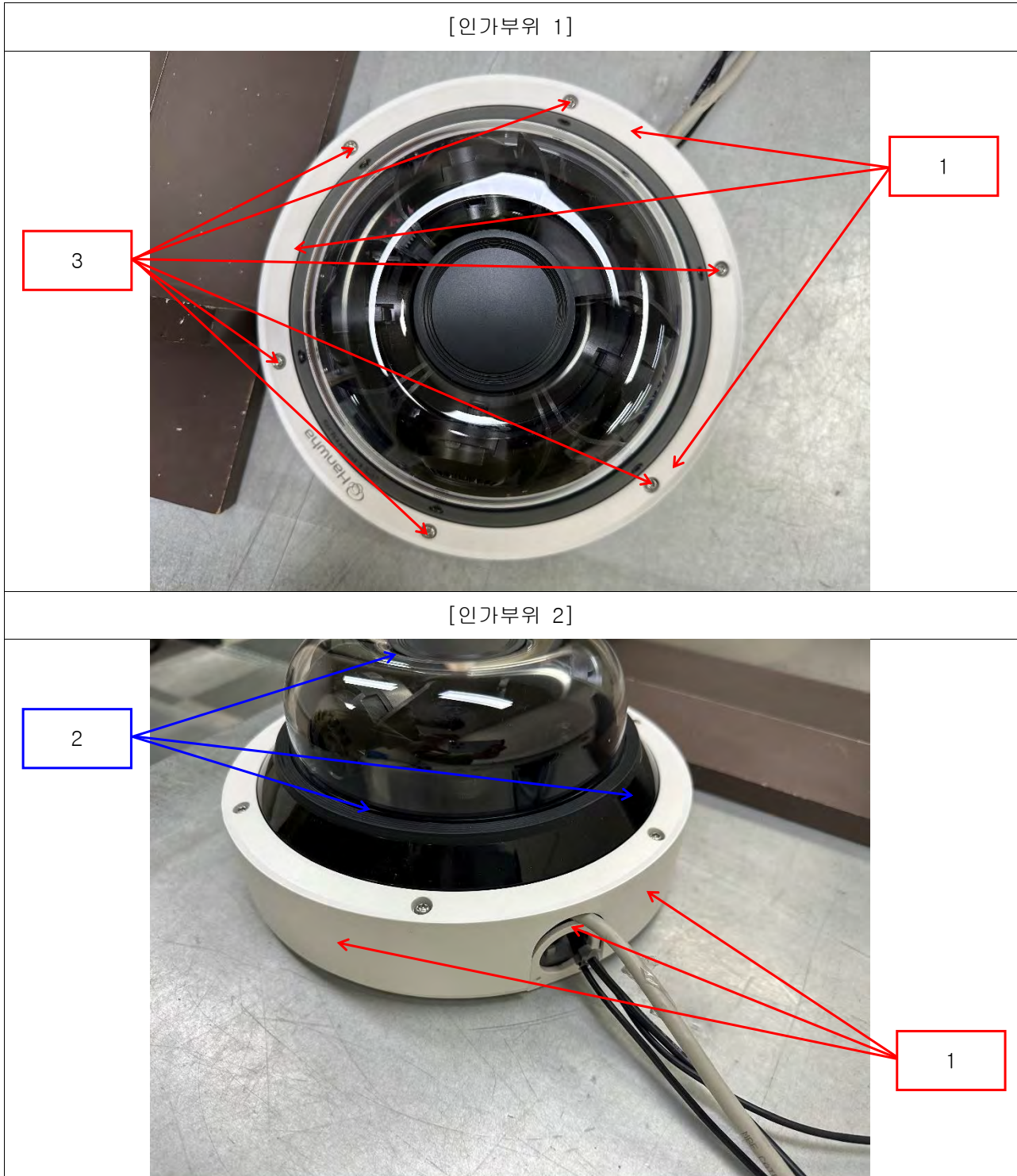
Contact	Air	HCP	VCP
<input type="checkbox"/> 2 kV	<input checked="" type="checkbox"/> 2 kV	<input type="checkbox"/> 2 kV	<input type="checkbox"/> 2 kV
<input type="checkbox"/> 4 kV	<input checked="" type="checkbox"/> 4 kV	<input type="checkbox"/> 4 kV	<input type="checkbox"/> 4 kV
<input checked="" type="checkbox"/> 6 kV	<input type="checkbox"/> 6 kV	<input checked="" type="checkbox"/> 6 kV	<input checked="" type="checkbox"/> 6 kV
<input type="checkbox"/> 8 kV	<input checked="" type="checkbox"/> 8 kV	<input type="checkbox"/> 8 kV	<input type="checkbox"/> 8 kV
<input type="checkbox"/> 15 kV	<input type="checkbox"/> 15 kV	<input type="checkbox"/> 15 kV	<input type="checkbox"/> 15 kV

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

Required Performance Criteria:  Complied

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**Location of Discharge:**



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**Test Data**

Indirect Discharge

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 1	Contact Discharge	Complied	-
2	Enclosure 2	Air Discharge	Complied	-
3	Screw	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**

May. 04, 2023

**Test Location**

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

**Test Equipment**

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMS Test S/W	EMC32	R & S	10.10.02	-
<input checked="" type="checkbox"/>	SIGNAL GENERATOR	SMB 100A	Rohde & Schwarz	108252	08, 01, 2023
<input checked="" type="checkbox"/>	HIGH POWER DUAL AMP	SSA532	SUNGSAN	SSA532-001	-
<input checked="" type="checkbox"/>	POWER METER	E4419B	Agilent	GB40203000	03, 21, 2024
<input checked="" type="checkbox"/>	AVERAGE POWER SENSOR	E9301A	Agilent	MY52170007	03, 21, 2024
<input checked="" type="checkbox"/>	AVERAGE POWER SENSOR	E9301A	Agilent	MY41498669	03, 21, 2024
<input checked="" type="checkbox"/>	STACKED DOUBLE LOG-PER- ANTENNA	STPL9128 E	Schwarzbeck	9128ES-121	-
<input checked="" type="checkbox"/>	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 06, 2024

**Test Conditions**

Temperature: (24,5 ± 0,2) °C  
 Relative Humidity: (45,0 ± 0,1) % R.H.  
 Atmospheric Pressure: (100,5 ± 0,1) kPa

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**Test Specifications**

Antenna Polarization: Horizontal &amp; vertical unless indicated otherwise

Antenna Distance:  3 mField Strength:  1 V/m  3 V/m  
 10 V/mFrequency Range:  80 MHz to 1 GHz  1,4 GHz to 2,7 GHz  
 80 MHz to 2,7 GHzModulation:  AM, 80 %, 1 kHz sine wave  
 PM, 1 Hz (0,5 s ON : 0,5 s OFF)Frequency step:  1 % stepDwell Time:  1 s  3 s# of Sides Radiated:  4Required 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**

Apr. 28, 2023

**Test Location**

EMS-EFT: Electro wave Shieldroom #7

**Test Equipment**

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMS Test S/W	iec.control	EM TEST	5.4.8	-
<input checked="" type="checkbox"/>	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	11, 28, 2023
<input checked="" type="checkbox"/>	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 29, 2023
<input checked="" type="checkbox"/>	CAPACITIVE COUPLING CLAMP	HFK	EM TEST	P1633183115	11, 28, 2023

**Test Conditions**

Temperature: (24,2 ± 0,2) °C  
 Relative Humidity: (43,8 ± 0,2) % R.H.  
 Atmospheric Pressure: (100,3 ± 0,1) kPa

**Test Specifications**

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

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

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**Test Data**

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

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
L	-	-
N	-	-
PE	-	-
L – N	-	-
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-45	Complied	Complied
Alarm In	Complied	Complied
Alarm Out	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

### 3.4 Surge Transients

**Reference Standard**

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

**Test Date**

Apr. 28, 2023

**Test Location**

EMS-Surge: Electro wave Shieldroom #7

**Test Equipment**

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMS Test S/W	iec.control	EM TEST	5.4.8	-
<input checked="" type="checkbox"/>	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	11, 28, 2023
<input checked="" type="checkbox"/>	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 29, 2023
<input checked="" type="checkbox"/>	CDN	CNV 508N1	EM TEST	P1610176296	11, 29, 2023

**Test Conditions**

Temperature: (24,2 ± 0,2) °C  
 Relative Humidity: (43,8 ± 0,1) % R.H.  
 Atmospheric Pressure: (100,3 ± 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

**Test Data**

Line to Line – Differential Mode

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

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)
RJ-45	CDN	Complied	Complied
	LINE	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

### 3.5 Conducted Disturbance

**Reference Standard**

EN 61000-4-6:2014

**Test Date**

Apr. 28, 2023

**Test Location**

EMS-CS: Electro wave Shieldroom #6

**Test Equipment**

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMS Test S/W	icd.control	EM TEST	5.3.12	-
<input checked="" type="checkbox"/>	CONTINUOUS WAVE SIMULATOR	CWS 500N1.4	EM TEST	P1602169880	11, 10, 2023
<input checked="" type="checkbox"/>	ATTENUATOR	ATT 6/80	EM TEST	P1614178148	11, 10, 2023
<input checked="" type="checkbox"/>	CDN	CDN M016	TESEQ	43694	11, 10, 2023
<input checked="" type="checkbox"/>	CDN	CDN M016	TESEQ	43697	11, 10, 2023
<input checked="" type="checkbox"/>	CDN	CDN ST08A	TESEQ	43886	11, 10, 2023
<input checked="" type="checkbox"/>	EM CLAMP	KEMZ 801A	TESEQ	44099	11, 14, 2023

**Test Conditions**

Temperature: (24,8 ± 0,2) °C  
 Relative Humidity: (44,1 ± 0,2) % R.H.  
 Atmospheric Pressure: (100,4 ± 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
-	CDN	-

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-45	CDN	Complied
Alarm In	Clamp	Complied
Alarm Out	Clamp	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**  
 N/A

**Test Location**  
 EMS-Voltage dip: Electro wave Shieldroom #7

**Test Equipment**

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input type="checkbox"/>	EMS Test S/W	iec.control	EM TEST	5.4.8	-
<input type="checkbox"/>	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	11, 29, 2023
<input type="checkbox"/>	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 29, 2023

**Test Conditions**

Temperature: ( ± ) °C  
 Relative Humidity: ( ± ) % R.H.  
 Atmospheric Pressure: ( ± ) 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>N/A</u>
<input type="checkbox"/> 20 % dip	<input type="checkbox"/> 250 / 5 000	<u>N/A</u>
<input type="checkbox"/> 30 % dip	<input type="checkbox"/> 25 / 500	<u>N/A</u>
<input type="checkbox"/> 60 % dip	<input type="checkbox"/> 10 / 200	<u>N/A</u>
<input type="checkbox"/> 100 % dip	<input type="checkbox"/> 250 / 5 000	<u>N/A</u>

- Voltage variations

<input type="checkbox"/> Unom + 10 %	<input type="checkbox"/> 253.0 V (ac)	<u>N/A</u>
<input type="checkbox"/> Unom - 15 %	<input type="checkbox"/> 195.5 V (ac)	<u>N/A</u>

Observations:

Complied – No degradation of function

Degradation - See "Remarks "

### Test Results

- PASS Required Performance Criteria
- NOT PASS Required Performance Criteria
- NOT APPLICABLE

### Remarks

It is not tested apply because it is powered by PoE



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## **APPENDIX A – TEST DATA**

### **Conducted Emissions at Mains Power Ports**

**[HOT]**

N/A

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**[NEUTRAL]**

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))

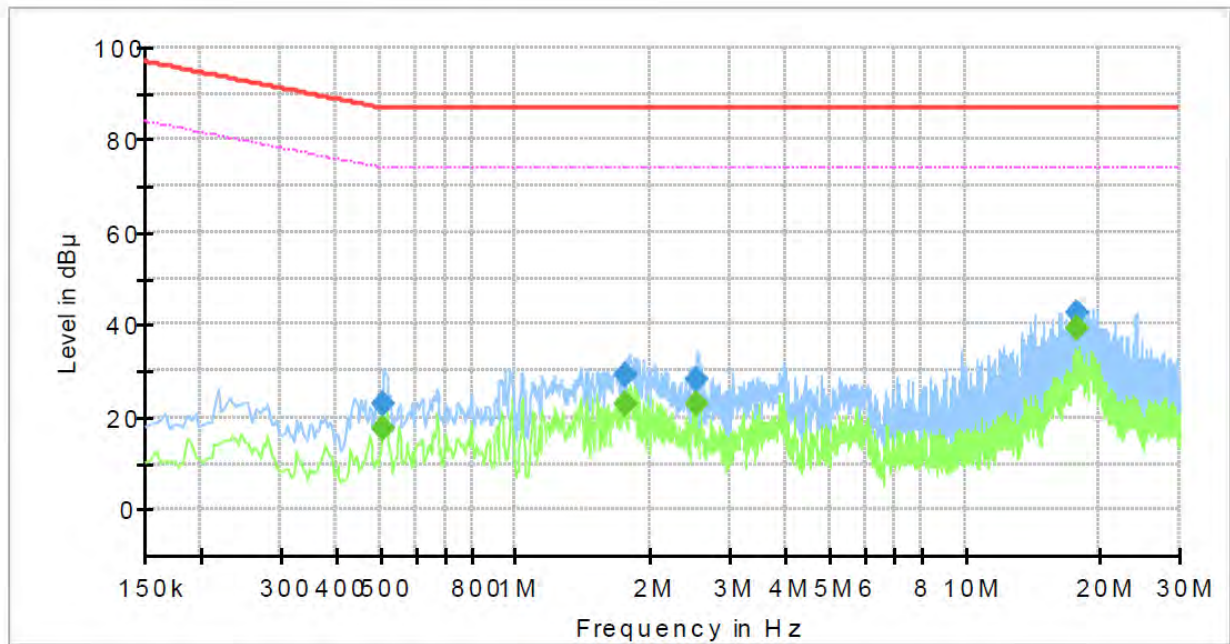
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## Conducted Emissions at Telecommunication Ports [1 000 Mbps]

### Common Information

Test Description:	Telecommunication Emission
Model No.:	PNM-C320832RVQ
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)
0.510000	---	17.58	74.00	56.42	1000.0	9.000	Single Line	19.4
0.510000	22.79	---	87.00	64.21	1000.0	9.000	Single Line	19.4
1.758000	---	22.78	74.00	51.22	1000.0	9.000	Single Line	20.0
1.758000	29.32	---	87.00	57.68	1000.0	9.000	Single Line	20.0
2.534000	---	22.94	74.00	51.06	1000.0	9.000	Single Line	20.0
2.534000	27.91	---	87.00	59.09	1000.0	9.000	Single Line	20.0
17.694000	---	39.34	74.00	34.66	1000.0	9.000	Single Line	19.9
17.694000	42.59	---	87.00	44.41	1000.0	9.000	Single Line	19.9

#### ◆ Calculation

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

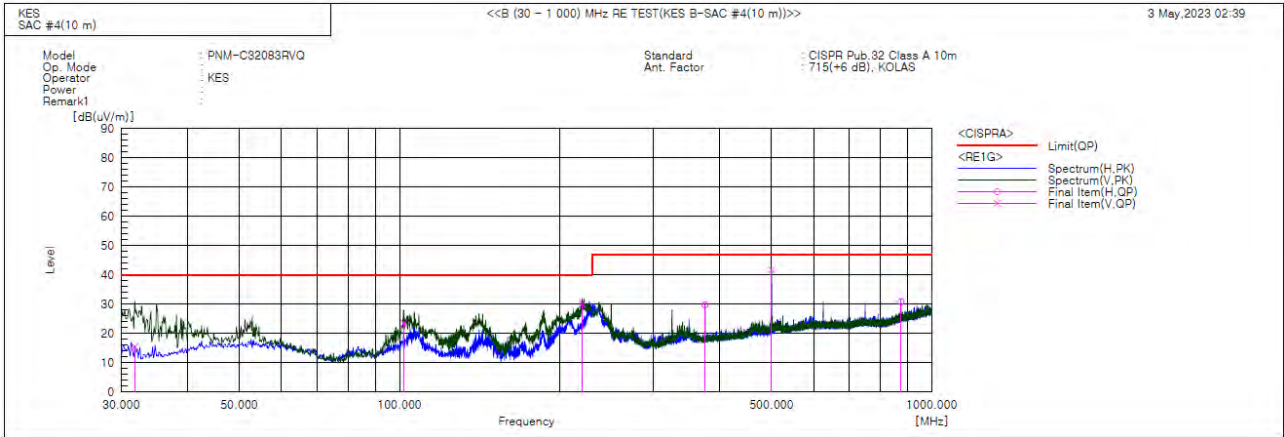
QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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



## 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	31.819	V	40.3	-24.9	15.4	40.0	24.6	110.0	16.0	
2	101.901	V	45.8	-22.4	23.4	40.0	16.6	121.0	269.0	
3	220.484	V	49.9	-19.9	30.0	40.0	10.0	109.0	5.0	
4	374.956	H	44.1	-14.4	29.7	47.0	17.3	377.0	139.0	
5	499.965	V	52.8	-11.1	41.7	47.0	5.3	109.0	192.0	
6	875.113	H	35.9	-5.1	30.8	47.0	16.2	395.0	47.0	

### ◆ 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)]

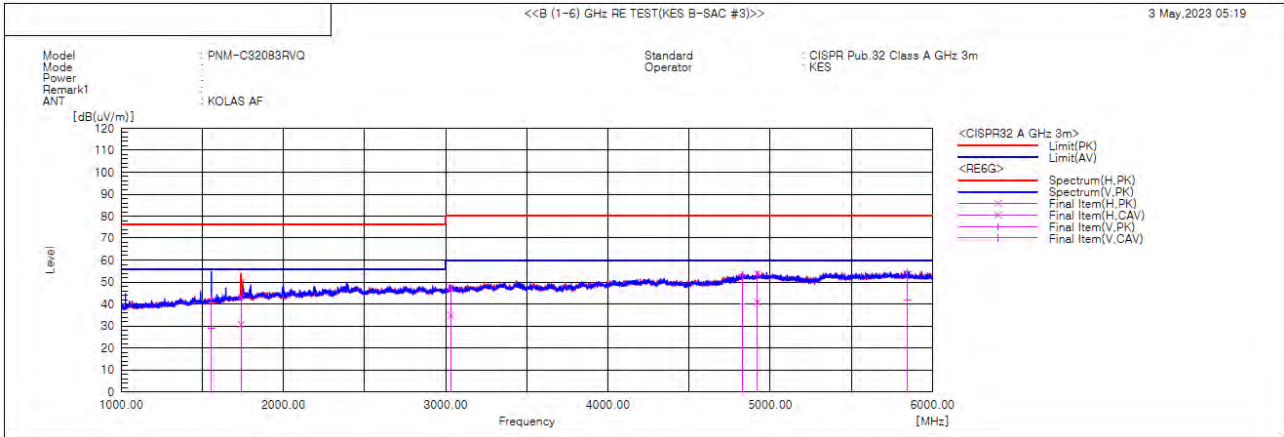
Reading(QP) : Reading value, Result(QP) : Reading value + Factor value

Limit(QP) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value

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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	1556.201	V	41.9	28.7	0.2	42.1	28.9	76.0	56.0	33.9	27.1	100.0	81.6	
2	1738.033	H	41.0	28.5	2.2	43.2	30.7	76.0	56.0	32.8	25.3	100.0	222.9	
3	3031.280	H	40.1	27.6	7.3	47.4	34.9	80.0	60.0	32.6	25.1	100.0	146.0	
4	4830.451	V	39.4	26.0	14.1	53.5	40.1	80.0	60.0	26.5	19.9	100.0	75.1	
5	4919.983	H	38.9	25.9	14.9	53.8	40.8	80.0	60.0	26.2	19.2	100.0	5.7	
6	5847.001	V	38.3	25.7	16.2	54.5	41.9	80.0	60.0	25.5	18.1	100.0	81.6	

### ◆ Calculation

$$\text{Result(PK/CAV)} \text{ [dB}(\mu\text{V/m)}] = (\text{Reading(PK/CAV)} \text{ [dB}(\mu\text{V)}] + \text{c.f} \text{ [dB(1/m)}])$$

$$\text{Margin(PK/CAV)} \text{ [dB]} = \text{Limit} \text{ [dB}(\mu\text{V/m)}] - \text{Result(PK/CAV)} \text{ [dB}(\mu\text{V/m)}]$$

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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**Harmonic Current Emissions and Voltage Fluctuations and Flicker**

<b>Average harmonic current results</b>				
Hn	I <sub>eff</sub> [A]	% of Limit	Limit [A]	Result
		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 - Harmonics (continued)

**Maximum harmonic current results**

Hn	I <sub>eff</sub> [A]	% of Limit	Limit [A]	Result
		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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Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
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KES-EM-23T0407  
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Test Data - Voltage Fluctuations  
**Maximum Flicker results**

Flicker Measurements					
	PIt	Max Pst	Max Dc	Max Dmax	Max Tmax
<b>Line 1:</b>	N/A				
<b>Limits:</b>					
<b>Results:</b>					

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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

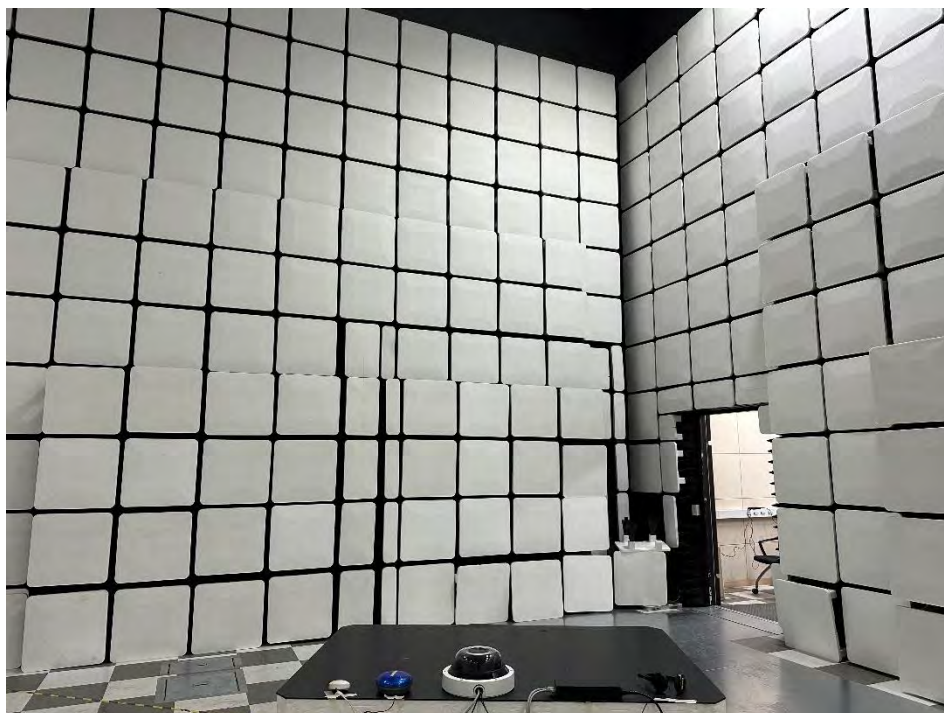


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## Radiated Electric Field Emissions(Below 1 GHz)



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## Radiated Electric Field Emissions(Above 1 GHz)



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## Harmonic Current Emissions and Voltage Fluctuations and Flicker

N/A

---

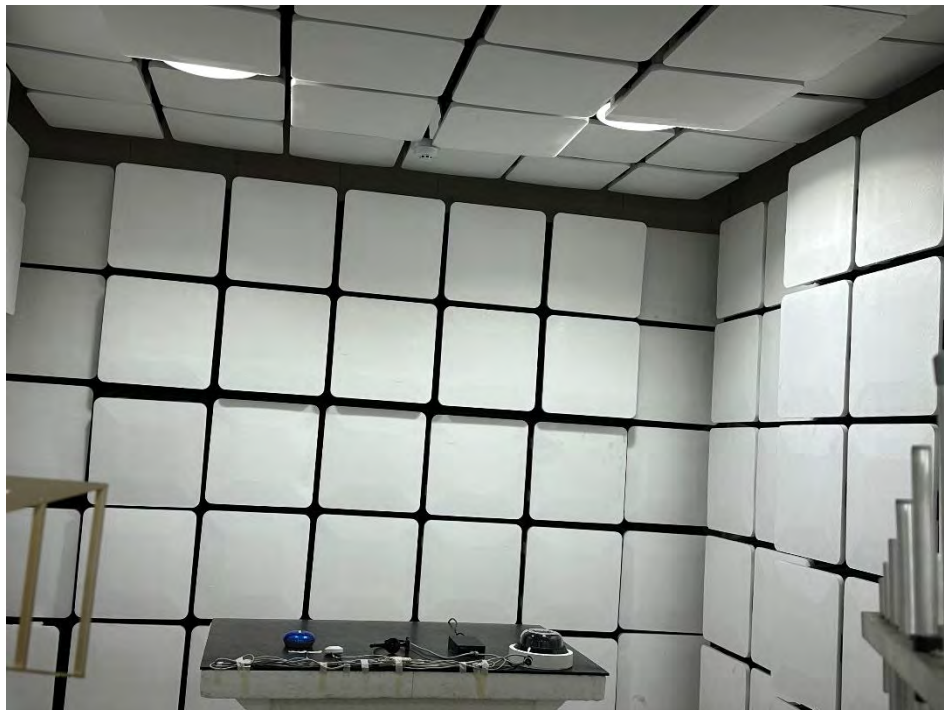
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## Electrostatic Discharge



## Radiated Electric Field Immunity



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## Electrical Fast Transients/Bursts



## Surge Transients



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## Conducted Disturbance



## Voltage Dips and Short Interruptions

N/A



---

## EUT External Photographs

(Top)



(Bottom)



---

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## EUT Internal Photographs

(Internal View)



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### EUT Internal View – Board 1

(Top)



(Bottom)



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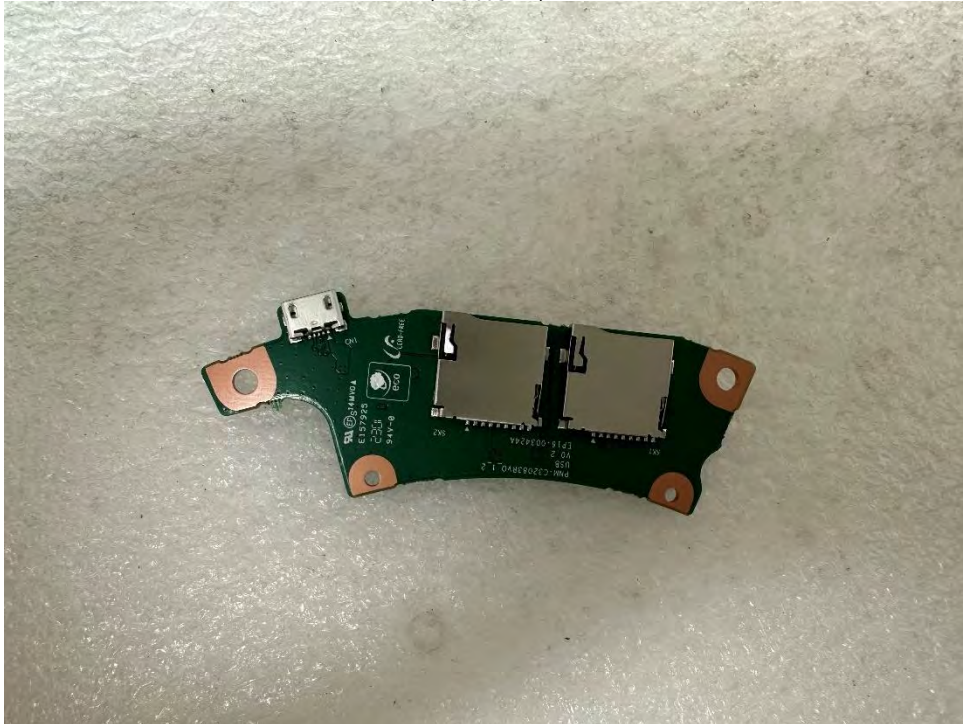


## EUT Internal View – Board 2

(Top)



(Bottom)



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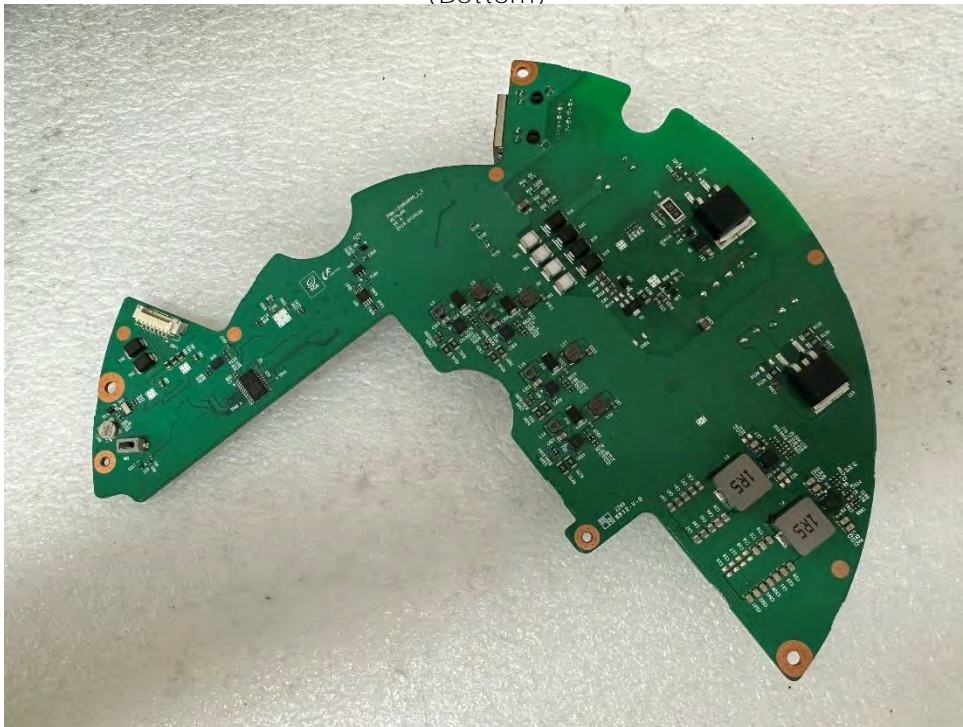


### EUT Internal View – Board 3

(Top)



(Bottom)

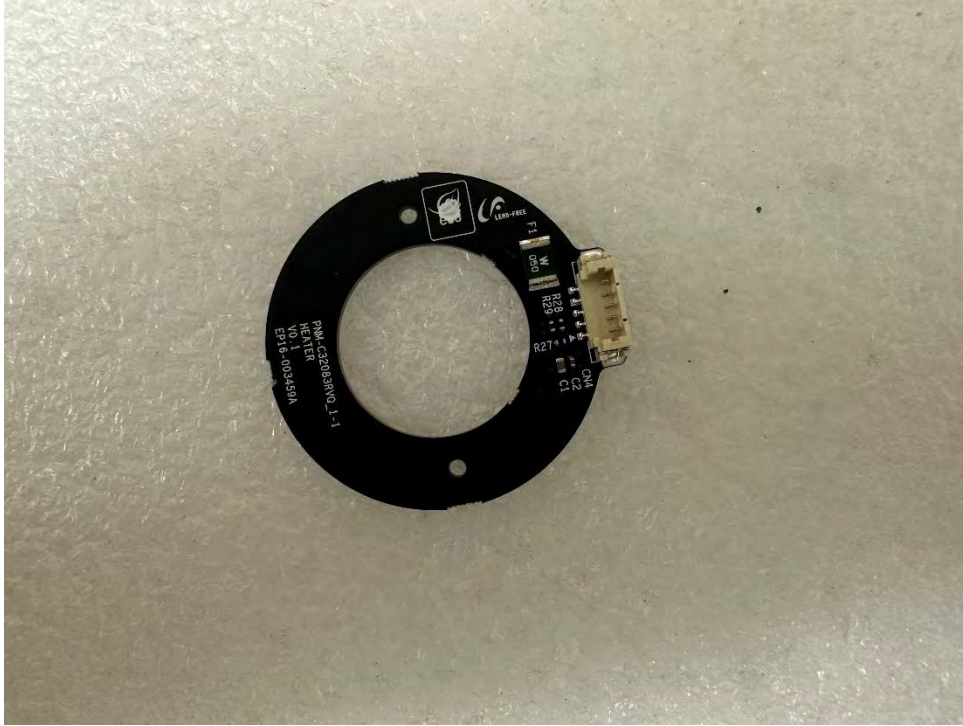


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## EUT Internal View – Board 4

(Top)



(Bottom)



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## EUT Internal View – Board 5

(Top)



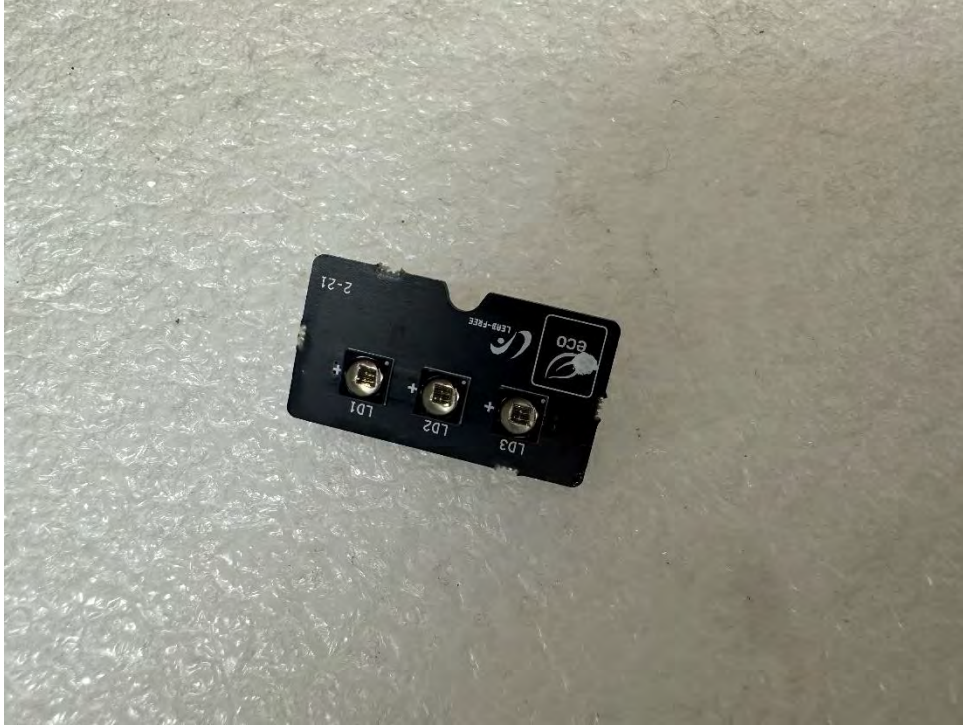
(Bottom)



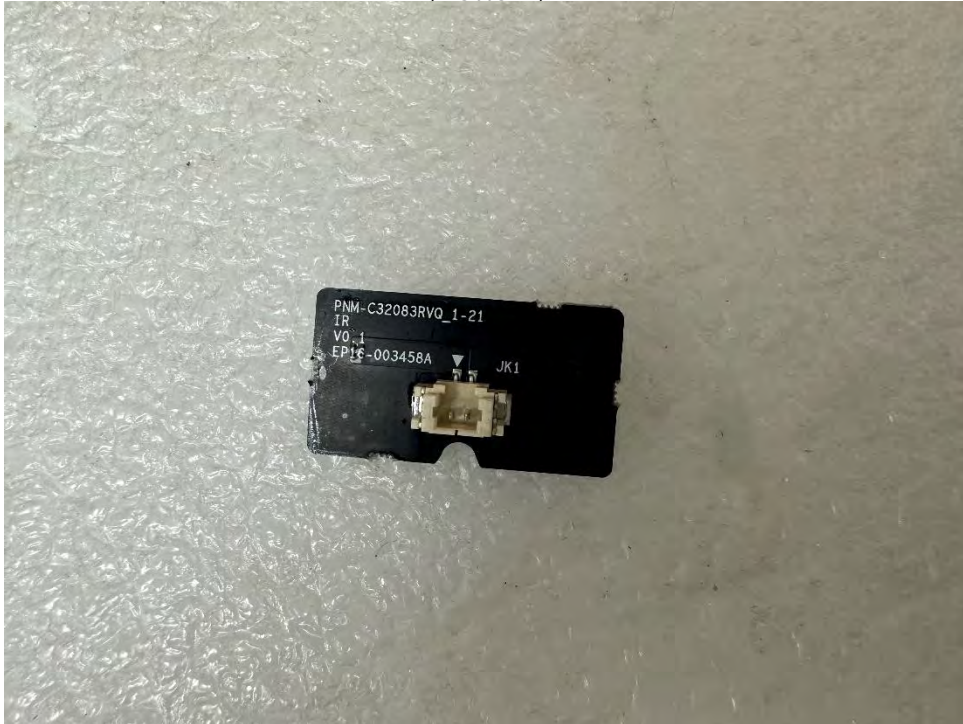
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## EUT Internal View – Board 6

(Top)



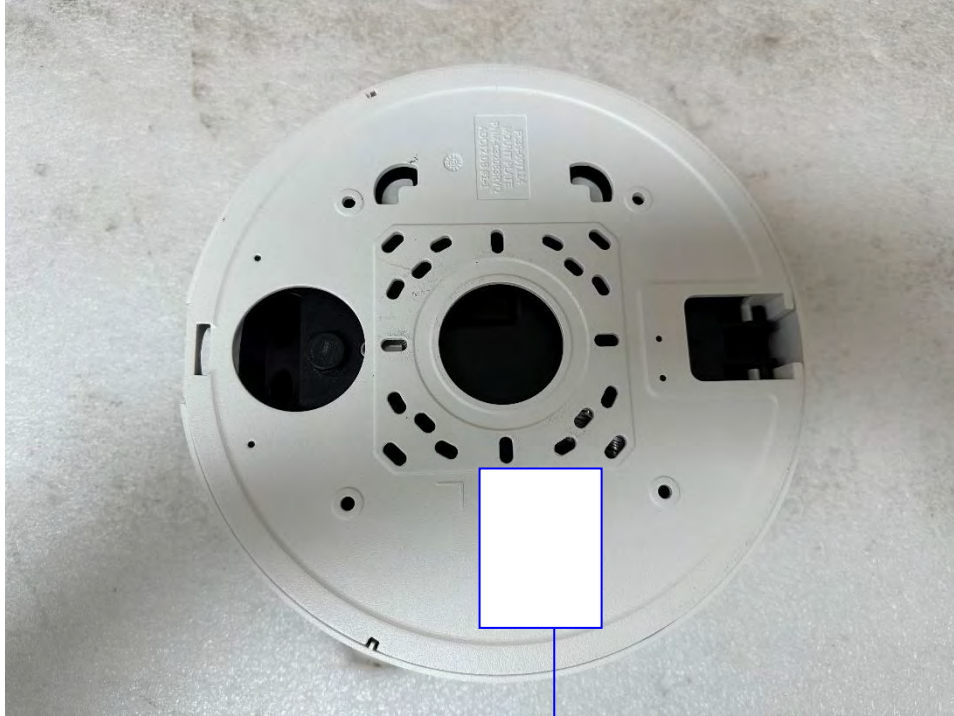
(Bottom)



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## Label and Location



**Network Camera**

Model No : PNM-C32083RVQ

Manufacturer : HANWHA VISION VIETNAM COMPANY LIMITED

Made in Vietnam

