



**KES Co., Ltd.**

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Report No.:

KES-EM-23T0404

Page (1) of (32)

## EMC TEST REPORT For VCCI

Test Report No. : KES-EM-23T0404

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 : May. 03, 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 No.:  
KES-EM-23T0404  
Page (2) of (32)

## REPORT REVISION HISTORY

| Date          | Test Report No. | Revision History |
|---------------|-----------------|------------------|
| May. 16, 2023 | KES-EM-23T0404  | Issued           |
|               |                 |                  |
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## TABLE OF CONTENTS

|                                                      |                                                             |    |
|------------------------------------------------------|-------------------------------------------------------------|----|
| 1.0                                                  | General Product Description.....                            | 4  |
| 1.1                                                  | Test Voltage & Frequency .....                              | 5  |
| 1.2                                                  | Variant Model Differences .....                             | 5  |
| 1.3                                                  | Device Modifications .....                                  | 5  |
| 1.4                                                  | Equipment Under Test.....                                   | 5  |
| 1.5                                                  | Support Equipments .....                                    | 5  |
| 1.6                                                  | External I/O Cabling .....                                  | 6  |
| 1.7                                                  | EUT Operating Mode(s) .....                                 | 6  |
| 1.8                                                  | Configuration.....                                          | 7  |
| 1.9                                                  | Remarks when standards applied .....                        | 8  |
| 1.10                                                 | Calibration Details of Equipment Used for Measurement ..... | 8  |
| 1.11                                                 | Test Facility .....                                         | 8  |
| 1.12                                                 | Laboratory Accreditations and Listings .....                | 9  |
| 2.0                                                  | Test Regulations.....                                       | 10 |
| 2.1                                                  | Conducted Emissions Mains Power Ports.....                  | 11 |
| 2.2                                                  | Conducted Emissions at Telecommunication Ports.....         | 12 |
| 2.3                                                  | Radiated Electric Field Emissions(Below 1 GHz) .....        | 13 |
| 2.4                                                  | Radiated Electric Field Emissions(Above 1 GHz) .....        | 14 |
| APPENDIX A – TEST DATA.....                          |                                                             | 15 |
| Conducted Emissions at Mains Power Ports.....        |                                                             | 15 |
| Conducted Emissions at Telecommunication Ports ..... |                                                             | 17 |
| Radiated Electric Field Emissions(Below 1 GHz) ..... |                                                             | 18 |
| Radiated Electric Field Emissions(Above 1 GHz).....  |                                                             | 19 |
| Test Setup Photos and Configuration .....            |                                                             | 20 |
| Conducted Emissions at Mains Power Ports.....        |                                                             | 20 |
| Conducted Emissions at Telecommunication Ports ..... |                                                             | 21 |
| Radiated Electric Field Emissions(Below 1 GHz) ..... |                                                             | 22 |
| Radiated Electric Field Emissions(Above 1 GHz).....  |                                                             | 23 |
| EUT External Photographs .....                       |                                                             | 24 |
| EUT Internal Photographs .....                       |                                                             | 25 |



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Report No.:  
KES-EM-23T0404  
Page (4) of (32)

## 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. Frame rate                       | H.265/H.264: 8MP Max. 20fps/20fps(60Hz/50Hz)<br>MJPEG: Max. 20fps/20fps(60Hz/50Hz)                                                                                                                                                                                                                                                                       |
| Min. Illumination                     | Color: 0.10lux (F1.5, 1/30sec)<br>B/W: 0.1ux@8 USD 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)<br>V: 54.7°(Wide)~31.2°(Tele)<br>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 lens                                                                                                                                                                                                                                                                                                                                               |
| <b>Operational</b>                    |                                                                                                                                                                                                                                                                                                                                                          |
| Camera Title                          | Displayed up to 85 characters                                                                                                                                                                                                                                                                                                                            |
| Day & Night                           | Auto(ICR)                                                                                                                                                                                                                                                                                                                                                |
| Backlight Compensation                | BLC, WDR, SSDR                                                                                                                                                                                                                                                                                                                                           |
| 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<br>- Color: Gray/Black/White                                                                                                                                                                                                                                                                                                         |
| Gain Control                          | Low / Middle / High                                                                                                                                                                                                                                                                                                                                      |
| White Balance                         | ATW / AWC / Manual / Indoor / Outdoor                                                                                                                                                                                                                                                                                                                    |
| UDC                                   | 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, Halfway 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)<br>- 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<br>- File upload(image) : e-mail/FTP<br>- Notification : e-mail<br>- Recording : SD/SDHC/SDXC or NAS recording at event triggers<br>- Alarm output<br>- Handover(PTZ preset, Send message by HTTP/HTTPS/TCP)<br>- Audio clip playback                                                                                        |
| Audio In                              | Selectable (microphone in/line in)<br>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, MJPEG                                                                                                                                                                                                                                                                                                                   |
| Smart Codec                           | Manual(Sea area), WiseStreamII, WiseStreamIII (Based on AI engine)                                                                                                                                                                                                                                                                                       |
| Bitrate Control                       | H.264/H.265: CBR or VBR<br>MJPEG: VBR                                                                                                                                                                                                                                                                                                                    |
| Streaming                             | (5 Profiles/channel) Unicast(10 users) / Multicast (TBD)                                                                                                                                                                                                                                                                                                 |
| 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, PIM-SM, UPnP, Bonjour, LLDP, SRT                                                                                                                                                          |
| Security                              | HTTPS(SSL) Login Authentication<br>Digest Login Authentication<br>IP Address Filtering<br>User access log<br>802.1X Authentication(EAP-TLS, EAP-LEAP, EAP-PEAP MSCHAPv2)<br>Device Certificate(Hanwha Techwin Root CA, pre-installed)<br>Secure by default certificate<br>Secure OS/Boot/Storage, Verify firmware forgery,<br>TPM with FIPS 140-2 level2 |
| Application Programming Interface     | ONVIF Profile S/T<br>ONVIF Profile M<br>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<br>*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<br>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<br>VIETNAM COMPANY<br>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<br>Network Technology<br>Co., Ltd | -       |
| Headset        | K550               | -             | Britz®                                            | -       |
| Cell Phone     | SM-A305N           | R59M503KX0M   | SAMSUNG                                           | -       |
| LED Alarm      | PRO-SL             | -             | SENSOR PRO                                        | -       |
| Button Alarm   | -                  | -             | -                                                 | -       |

## 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      |

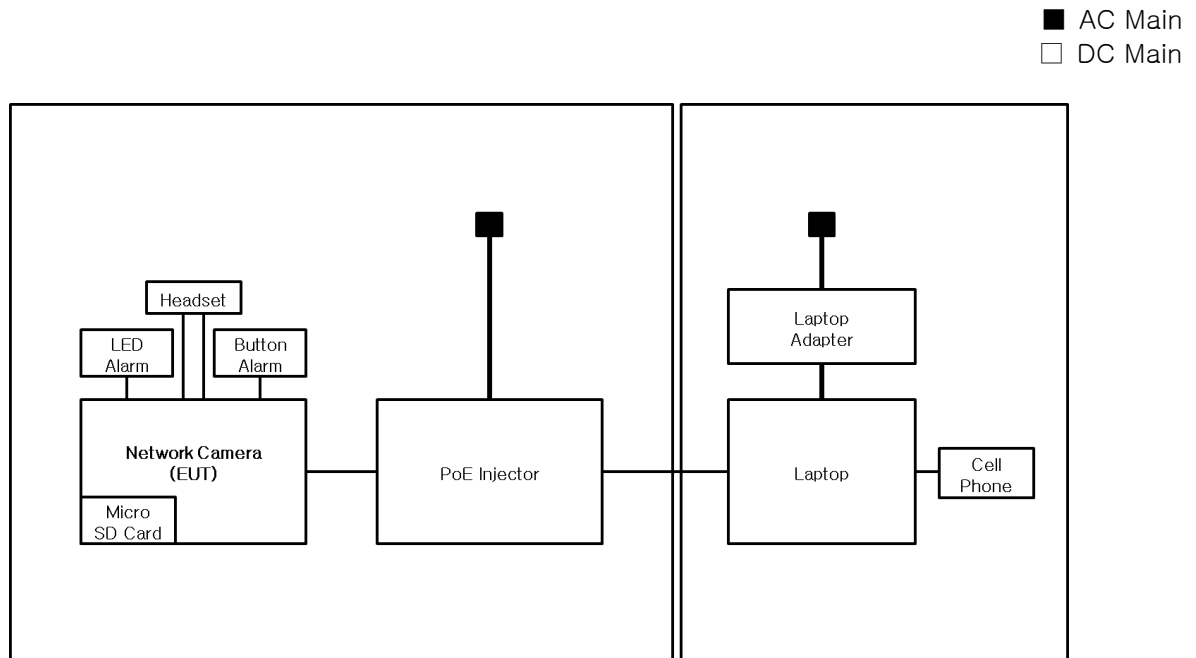
\* Unshielded=U, Shielded=S

## 1.7 EUT Operating Mode(s)

| Test mode | operating                                                                                                                                                                                                  |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operation | 1. Check if the EUT image is output to the laptop normally.<br>2. Check if the network is operating normally through a ping test.<br>3. After the test, check if the EUT video has been recorded normally. |

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

## 1.8 Configuration



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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)<br>EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions) | <br>KR0100                                  |
| International | <b>KOLAS</b>   | EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site)<br>EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions) | <br>KT489                                   |
| USA           | <b>FCC</b>     | 3 m & 10 m Semi-Anechoic Chamber<br>Conducted test site to perform FCC Part 15/18 measurements.                                         | <br>KR0100                                  |
| Canada        | <b>ISED</b>    | 3 m & 10 m Semi-Anechoic Chamber and Conducted test site                                                                                | <br>23298                                  |
| JAPAN         | <b>VCCI</b>    | EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site)                                                                          | <br>C-20136, T-20137,<br>R-20181, G-20176 |
| Europe        | <b>TÜV SÜD</b> | EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site)<br>EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions) | <br>CARAT 001633 0004                     |



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Report No.:  
KES-EM-23T0404  
Page (10) of (32)

## 2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **VCCI-CISPR 32:2016**

☒ Class A

☐ Class B

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## 2.1 Conducted Emissions 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**Refer to 'Remarks when standards applied'

## 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 ± 0,1) % 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

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.



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Report No.:  
KES-EM-23T0404  
Page (15) of (32)

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## **APPENDIX A – TEST DATA**

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

N/A

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KES-EM-23T0404  
Page (16) of (32)

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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))

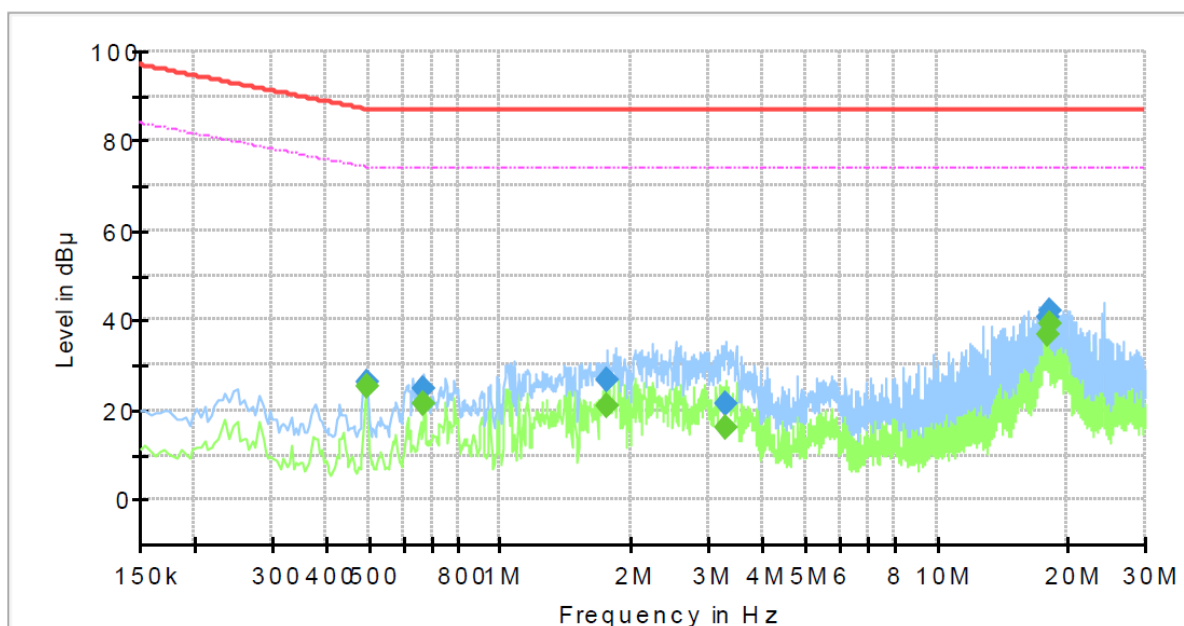
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## Conducted Emissions at Telecommunication Ports [1 000 Mbps]

### Common Information

Test Description: Telecommunication Emission  
 Model No.: PNM-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) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|-------------|------------|
| 0.494000        | ---              | 25.04           | 74.10        | 49.06       | 1000.0          | 9.000           | Single Line | 19.4       |
| 0.494000        | 26.29            | ---             | 87.10        | 60.81       | 1000.0          | 9.000           | Single Line | 19.4       |
| 0.670000        | ---              | 21.17           | 74.00        | 52.83       | 1000.0          | 9.000           | Single Line | 19.6       |
| 0.670000        | 24.75            | ---             | 87.00        | 62.25       | 1000.0          | 9.000           | Single Line | 19.6       |
| 1.754000        | ---              | 20.88           | 74.00        | 53.12       | 1000.0          | 9.000           | Single Line | 20.0       |
| 1.754000        | 26.80            | ---             | 87.00        | 60.20       | 1000.0          | 9.000           | Single Line | 20.0       |
| 3.298000        | ---              | 16.29           | 74.00        | 57.71       | 1000.0          | 9.000           | Single Line | 19.8       |
| 3.298000        | 21.16            | ---             | 87.00        | 65.84       | 1000.0          | 9.000           | Single Line | 19.8       |
| 17.978000       | ---              | 36.64           | 74.00        | 37.36       | 1000.0          | 9.000           | Single Line | 20.0       |
| 17.978000       | 40.86            | ---             | 87.00        | 46.14       | 1000.0          | 9.000           | Single Line | 20.0       |
| 18.242000       | ---              | 39.22           | 74.00        | 34.78       | 1000.0          | 9.000           | Single Line | 20.0       |
| 18.242000       | 42.14            | ---             | 87.00        | 44.86       | 1000.0          | 9.000           | Single Line | 20.0       |

#### ◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

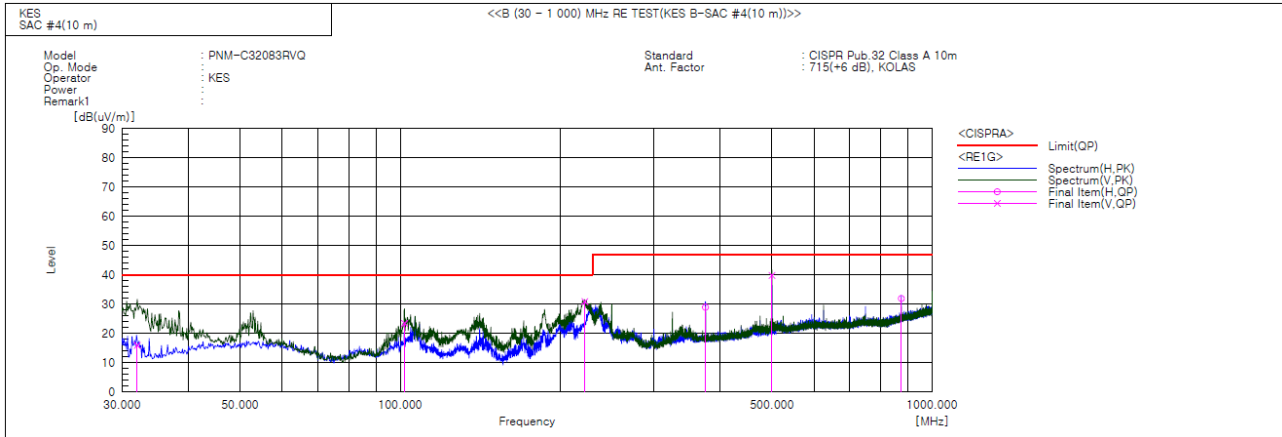
Corr. : Correction values (ISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

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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   | 32.061          | V   | 40.7                | -24.8         | 15.9                 | 40.0                | 24.1           | 106.0       | 220.0       |        |
| 2   | 101.901         | V   | 45.8                | -22.4         | 23.4                 | 40.0                | 16.6           | 133.0       | 284.0       |        |
| 3   | 222.303         | V   | 50.7                | -19.8         | 30.9                 | 40.0                | 9.1            | 107.0       | 4.0         |        |
| 4   | 374.956         | H   | 43.3                | -14.4         | 28.9                 | 47.0                | 18.1           | 389.0       | 139.0       |        |
| 5   | 499.965         | V   | 50.9                | -11.1         | 39.8                 | 47.0                | 7.2            | 112.0       | 185.0       |        |
| 6   | 875.113         | H   | 37.0                | -5.1          | 31.9                 | 47.0                | 15.1           | 389.0       | 57.0        |        |

### ◆ Calculation

Corrected Amplitude [dBuV] = Amplitude[dBuV] + Correction Factor [dB]

Corrected Amplitude : The Final Value, Amplitude : Reading Value,

Correction Factor : ANT FACTOR + Cable loss



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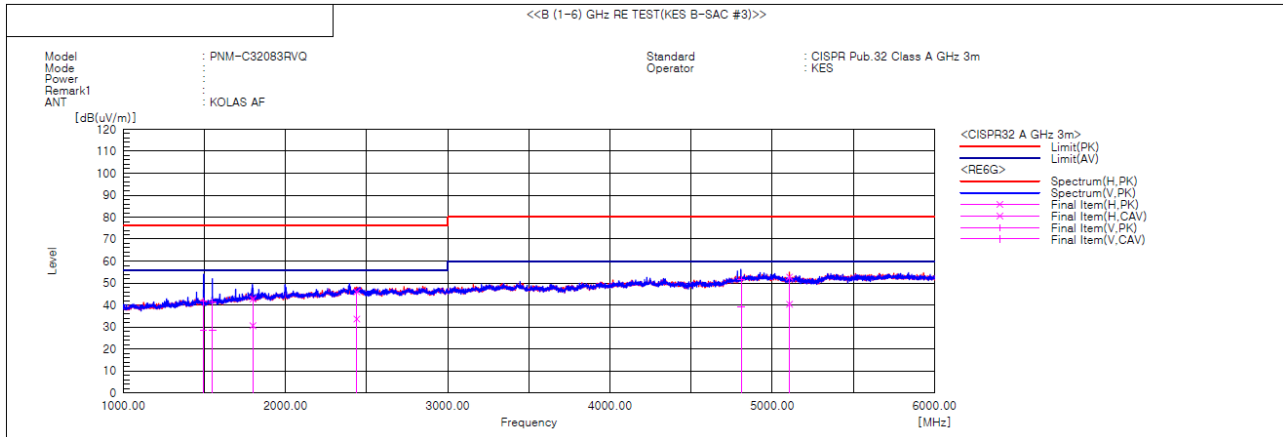
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Report No.:

KES-EM-23T0404

Page (19) of (32)

### Radiated Electric Field Emissions(Above 1 GHz)



#### Final Result

| No. | Frequency<br>[MHz] | (P) | Reading<br>PK<br>[dB(uV)] | Reading<br>CAV<br>[dB(uV)] | c.f<br>[dB(1/m)] | Result<br>PK<br>[dB(uV/m)] | Result<br>CAV<br>[dB(uV/m)] | Limit<br>PK<br>[dB(uV/m)] | Limit<br>AV<br>[dB(uV/m)] | Margin<br>PK<br>[dB] | Margin<br>CAV<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark |
|-----|--------------------|-----|---------------------------|----------------------------|------------------|----------------------------|-----------------------------|---------------------------|---------------------------|----------------------|-----------------------|----------------|----------------|--------|
| 1   | 1495.521           | V   | 42.0                      | 28.6                       | -0.1             | 41.9                       | 28.5                        | 76.0                      | 56.0                      | 34.1                 | 27.5                  | 100.0          | 80.4           |        |
| 2   | 1550.474           | V   | 41.1                      | 28.2                       | 0.2              | 41.3                       | 28.4                        | 76.0                      | 56.0                      | 34.7                 | 27.6                  | 100.0          | 49.1           |        |
| 3   | 1799.050           | H   | 40.0                      | 27.8                       | 2.8              | 42.8                       | 30.6                        | 76.0                      | 56.0                      | 33.2                 | 25.4                  | 100.0          | 8.7            |        |
| 4   | 2438.692           | H   | 39.9                      | 27.6                       | 6.1              | 46.0                       | 33.7                        | 76.0                      | 56.0                      | 30.0                 | 22.3                  | 100.0          | 4.1            |        |
| 5   | 4807.673           | V   | 37.6                      | 25.4                       | 13.9             | 51.5                       | 39.3                        | 80.0                      | 60.0                      | 28.5                 | 20.7                  | 100.0          | 235.7          |        |
| 6   | 5106.026           | H   | 37.9                      | 25.5                       | 14.9             | 52.8                       | 40.4                        | 80.0                      | 60.0                      | 27.2                 | 19.6                  | 100.0          | 296.4          |        |

#### ◆ Calculation

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

Margin(PK/CAV)[dB] = Limit[dB( $\mu$ V/m)] - Result(PK/CAV) [dB( $\mu$ 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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Report No.:  
KES-EM-23T0404  
Page (20) of (32)

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## **Test Setup Photos and Configuration**

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

N/A

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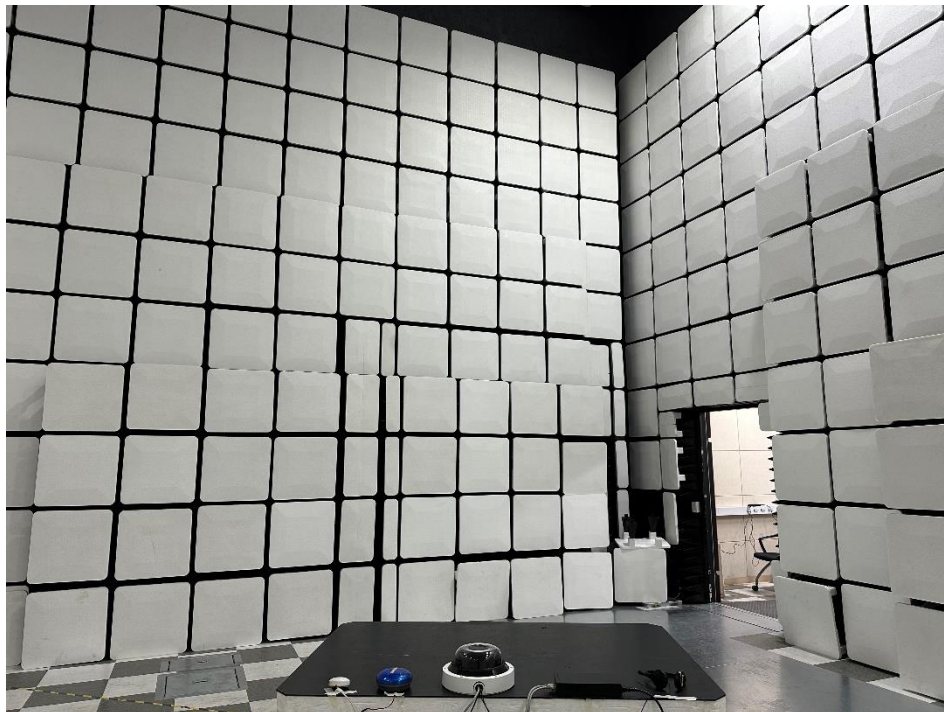
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## Conducted Emissions at Telecommunication Ports

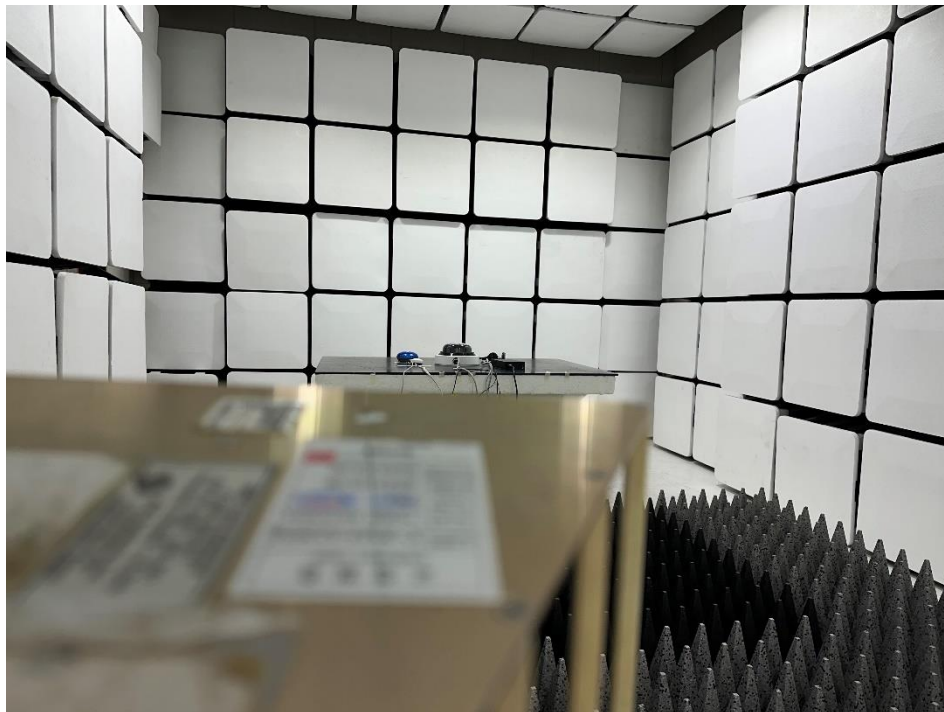


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## Radiated Electric Field Emissions(Below 1 GHz)



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**Radiated Electric Field Emissions(Above 1 GHz)**

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## EUT External Photographs

(Top)



(Bottom)



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**EUT Internal Photographs**

(Internal View)

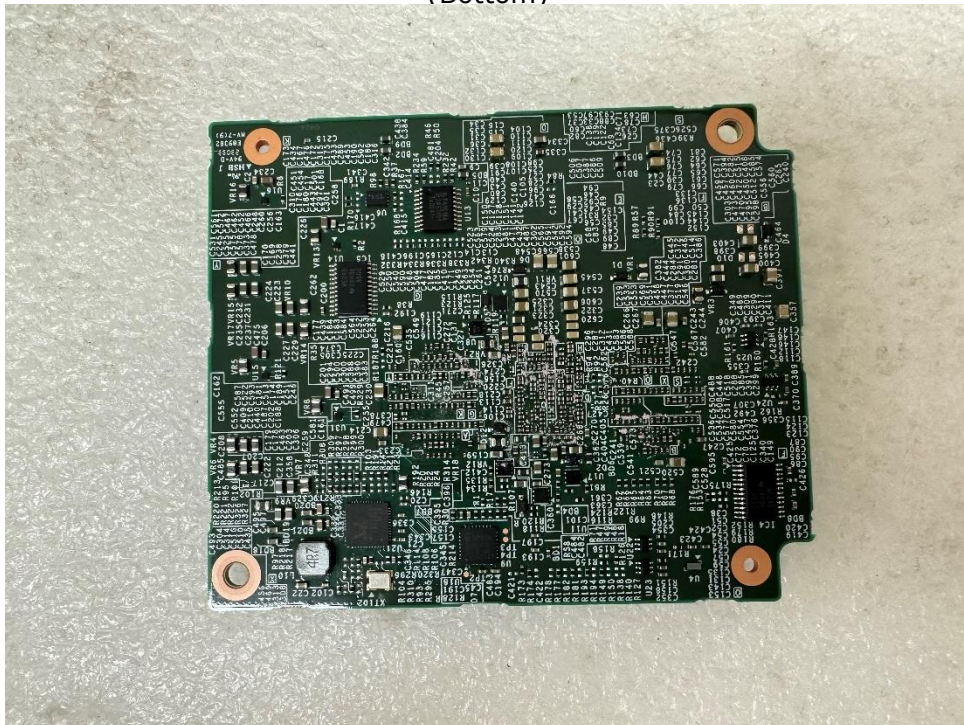


## EUT Internal View – Board 1

(Top)



(Bottom)



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**EUT Internal View – Board 2**

(Top)



(Bottom)



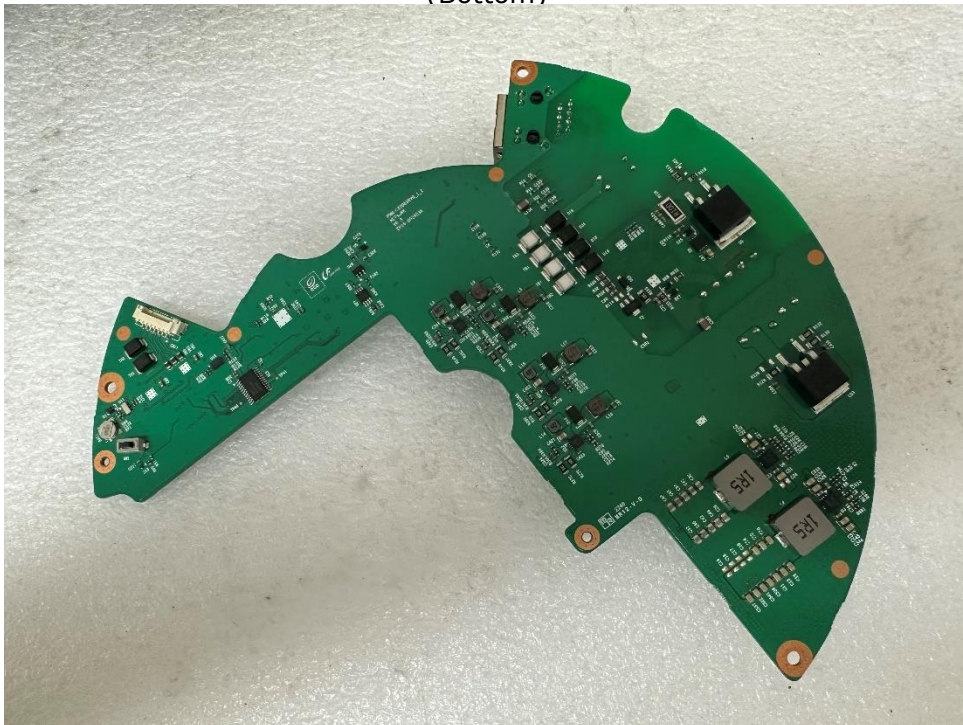
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## EUT Internal View – Board 3

(Top)



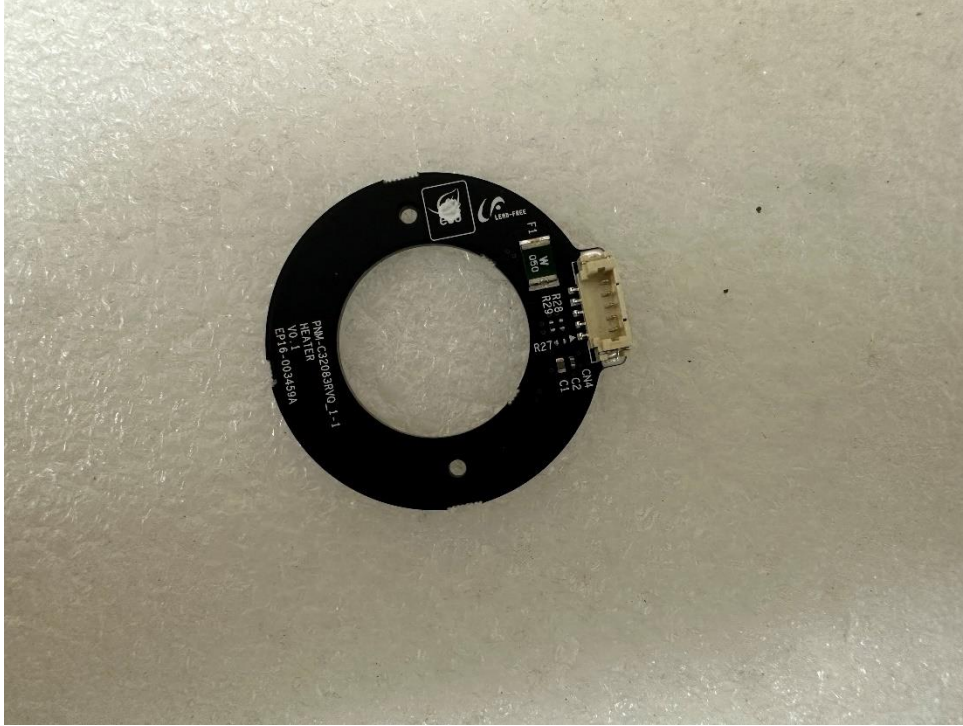
(Bottom)



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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)

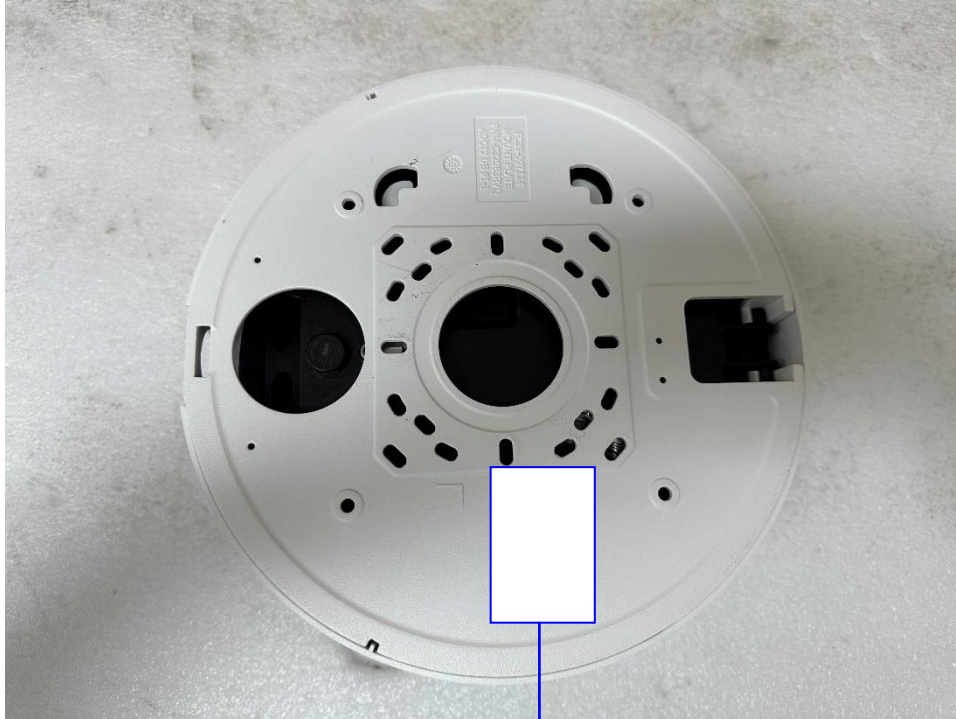


(Bottom)



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