



## EMC TEST REPORT For CE

Test Report No. : KES-EM-21T0171  
Date of Issue : Mar. 16, 2021  
Product name : NETWORK CAMERA  
Model/Type No. : PND-A6081RF  
Variant Model : -  
Applicant : Hanwha Techwin Co., Ltd.  
Applicant Address : 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si,  
Gyeonggi-do, Republic of Korea  
Manufacturer : 1. HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.  
2. D-TECH CO.,LTD.  
Manufacturer Address : 1. Lot O-2, Que Vo Industrial Zone extended area,  
Nam Son commune, Bac Ninh city, Bac Ninh province, Vietnam  
2. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi- do,  
Korea (Suwon Industrial Complex)  
Date of Receipt : Jan. 28, 2021  
Test date : Feb. 08, 2021 ~ Feb. 15, 2021  
Test Results : ☒ In Compliance ☐ Not in Compliance

Tested by

Dae Jung, Choi  
EMC Test Engineer

Reviewed by

Dong-Hun, Jang  
EMC Technical Manager

This test report is not related to KS Q ISO/IEC 17025 and KOLAS.

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## REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Mar. 16, 2021	KES-EM-21T0171	Issued

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## 1.0 General Product Description

Main Specifications of EUT are:

	PND-A6081RF
Video	
Imaging Device	1/2" CMOS
Resolution	1920x1080, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360
Max. Framerate	H.265/H.264: Max. 60/50fps(60Hz/50Hz, AI analytics on), Max. 120/100fps(60Hz/50Hz, AI analytics off) MJPEG: Max. 15fps/12fps(60Hz/50Hz)
NETD	None
Pixel Size	None
Min. Illumination	Color: 0.008Lux(F1.3, 1/30sec, 30IRE) B/W : 0.0008Lux(F1.3, 1/30sec, 30IRE), 0Lux(IR LED on), 30/25fps Color: 0.016Lux(F1.3, 1/60sec, 30IRE) B/W : 0.0016Lux(F1.3, 1/60sec, 30IRE), 0Lux(IR LED on), 60/50fps Color: 0.032Lux(F1.3, 1/120sec, 30IRE) B/W : 0.0032Lux(F1.3, 1/120sec, 30IRE), 0Lux(IR LED on), 120/100fps
Video Out	CVBS: 1.0 Vp-p / 75Ω composite, 720x480(N), 720x576(P) for installation USB: Micro USB Type B, 1280x720 for installation
Video Transmission Distance	None
Lens	
Focal Length (Zoom Ratio)	4.38~9.33mm(2.13x) motorized varifocal
Max. Aperture Ratio	F1.3(Wide)~F2.15(Tele)
Angular Field of View	H:103.1°(Wide)~44.5°(Tele) / V:54.2°(Wide)~24.9°(Tele) / D:124°(Wide)~51.1°(Tele)
Min. Object Distance	0.5m(1.64ft)
Focus Control	Simple focus
Lens Type	P iris
Mount Type	None
Optional Lens	None
Pan / Tilt / Rotate	
Pan / Tilt / Rotate Range	0°~360° / -45°~85° / 0°~355°
Pan Range	None
Pan Speed	None
Tilt Range	None
Tilt Speed	None
Rotate Range	None
Sequence	None
Preset Accuracy	None
Operational	
Camera Title	Displayed up to 85 characters
Direction Indicator	None
Day & Night	Auto(ICR)
Backlight Compensation	BLC, WDR, SDR
Wide Dynamic Range	120dB
Digital Noise Reduction	SSNR, WiseNR II(using AI engine)
Digital Image Stabilization	Stabilization Support(built-in gyro sensor)
Defog	None
Motion Detection	8ea, polygonal zones
Privacy Masking	6ea, rectangle zones - Color: Gray/Green/Red/Blue/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
Digital PTZ	None
Video Rotation	Flip, Mirror, Hallway view(90°/270°)
Analytics	- Classified object type : Person/Face/Vehicle/License plate with attributes, BestShot per object - Analytics events based on AI engine : Object detection, Face mask detection, Directional detection, Digital auto tracking, Enter/Exit, Loitering, Virtual line, Social distancing detection - Analytics events : Defocus detection, Motion detection, Appear/Disappear, Tampering, Audio detection, Sound classification, Shock detection
Business Intelligence	People counting, Queue management, Heatmap based on AI engine
Serial Interface	None
Alarm I/O	Input 1ea / Output 1ea / DC 12V Power(Max. 50mA) 1ea

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Alarm Triggers	Analytics, Network disconnect, Alarm input
Alarm Events	File upload via FTP and e-mail Notification via e-mail SD/SDHC/SDXC or NAS recording at event triggers Alarm output Handover Audio playback
Audio In	Selectable(mic in/line in) Supply voltage: 2.5VDC(4mA), Input impedance: 2K Ohm
Audio Out	Line out, Max.output level: 1Vrms
IR Viewable Length	40m(131.23ft), Wise IR
IR Illuminator (Optional)	None
Water Removal	None
Auto Tracking	None
Coaxial Protocol	None
Color Palettes	None
Radiometry	
Temperature detect range	None
Temperature accuracy	None
Temperature detection	None
Additional	None
Network	
Ethernet	Metal shielded RJ-45(10/100/1000 BASE-T)
Video Compression	H.265/H.264: Main/High, MJPEG
Audio Compression	G.711 u-law /G.726 Selectable G.726(ADPCM) 8KHz, G.711 8KHz G.726: 16Kbps, 24Kbps, 32Kbps, 40Kbps AAC-LC: 48Kbps at 16KHz
Smart Codec	Manual(Sea area), WiseStream II, WiseStream III(using AI engine)
Video Quality Adjustment	H.264/H.265: Target bitrate level control MJPEG: Target bitrate level control
Bitrate Control	H.264/H.265: CBR or VBR MJPEG: VBR
Streaming	Unicast(6 users) / Multicast Multiple streaming(Up to 5 profiles)
Protocol	IPv4, IPv6, TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP, RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, UPnP, Bonjour, LLDP, SRTP (TCP, UDP Unicast)
Security	HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access log 802.1X Authentication(EAP-TLS, EAP-LEAP) Device Certificate(Hanwha Techwin Root CA) TPM with FIPS 140-2 level2 Secure boot, Verify firmware forgery
Application Programming Interface	ONVIF Profile S/G/T SUNAPI(HTTP API) Wisenet open platform
General	
Webpage Language	English, French, German, Spanish, Italian, Chinese, Korean, Russian, Japanese, Swedish, Portuguese, Czech, Polish, Turkish, Dutch, Hungarian, Greek
Web Viewer	None
Edge Storage	Micro SD/SDHC/SDXC 2slots 512GB
Memory	4096MB RAM, 512MB Flash
Environmental & Electrical	
Operating Temperature / Humidity	-25°C ~ +50°C (-13°F ~ +122°F) / Less than 90% RH
Storage Temperature / Humidity	-50°C ~ +60°C(-58°F ~ +140°F) / Less than 90% RH
Certification	IP52, IK10, Plenum rate

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Input Voltage	PoE+(IEEE802.3at), 12VDC
Power Consumption	PoE+: Max 19.50W, typical 16.00W 12VDC: Max 17.00W, typical 13.50W
Mechanical	
Color / Material	White / Aluminum, Hard-coated dome bubble
RAL Code	RAL9003
Product dimensions / weight	Ø205x163mm(8.07x4.92"), Weight : 1.95Kg (4.30lb)
Conduit hole	None
Hanging mount(Dome)	None
Skin cover(Dome)	None
Weather cap(Dome)	None
Power module	None
Backbox	None
DORI (EN62676-4 standard)	
Detect (25PPM/ 8PPF)	Wide: 62.9m(206.34ft) / Tele: 183m(600.33ft)
Observe (63PPM/ 19PPF)	Wide: 25.1m(82.34ft) / Tele: 73.3m(240.46ft)
Recognize (125PPM/ 38PPF)	Wide: 12.6m(41.33ft) / Tele: 36.6m(120.07ft)
Identify (250PPM/ 76PPF)	Wide: 6.3m(20.67ft) / Tele: 18.3m(60.03ft)

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## 1.1 Test Voltage & Frequency

Unless indicated otherwise on the individual data sheet or test results, the test voltage and frequency was as indicated below.

Voltage ☒ 230 Vac ☐ 100 Vac ☐ 24 Vac ☐ 12 Vdc ☒ PoE

Frequency ☒ 50 Hz ☐ 60 Hz ☐ Hz

## 1.2 Variant Model Differences

Not applicable

## 1.3 Device Modifications

Not applicable

## 1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
NETWORK CAMERA	PND-A6081RF	-	HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.	EUT



## 1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Adapter	2ACB022F	-	Channel Well Technology (Guangzhou) Co., Ltd.	-
PoE Adapter	PT-PSE109GBRO-AH	PT1850221049	Dongguan PROCET Network Technology Co., Ltd	-
Notebook	CQ61-127TU	CNF91801TM	HP	-
Notebook Adapter	PPP09D	601W94D1CKU	HP	-
Alarm	SIP-1201DD D0	-	SAMSUNG TECHWIN CO., LTD.	-
Alarm Adapter	2ACB022F	-	Channel Well Technology (Guangzhou) Co., Ltd.	-
Button alarm	-	-	-	-
Smartphone	SHV-E210L	R33D713KA3F	Samsung Electronics Co., Ltd.	-
Speaker	BR1000A Cuve Black 2	-	DONGGUAN EDIFIER TECHNOLOGY Co., Ltd	-
MIC	MP1000	-	-	-
Micro SD Card	-	-	SanDisk	4 GB



## 1.6 External I/O Cabling

### ■ DC Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (EUT)	RJ-45	Notebook	RJ-45	3.5	S
	Alarm OUT	Alarm	Alarm IN	3.0	U
	Alarm IN	Button alarm	Alarm OUT	3.0	U
	Audio OUT	Speaker	Audio OUT	1.4	U
	Audio IN	MIC	Audio IN	1.4	U
	SLOT	Micro SD Card	SLOT	-	-
Notebook	3.5 mm	Smartphone	3.5 mm	0.5	U

\* Unshielded=U, Shielded=S

### ■ PoE Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (EUT)	RJ-45 (PoE)	PoE Adapter	RJ-45 (PoE)	3.5	S
	Alarm OUT	Alarm	Alarm IN	3.0	U
	Alarm IN	Button alarm	Alarm OUT	3.0	U
	Audio OUT	Speaker	Audio OUT	1.4	U
	Audio IN	MIC	Audio IN	1.4	U
	SLOT	Micro SD Card	SLOT	-	-
Notebook	RJ-45 (LAN)	PoE Adapter	RJ-45 (LAN)	3.0	U
	3.5 mm	Smartphone	3.5 mm	0.5	U

\* Unshielded=U, Shielded=S

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## 1.7 EUT Operating Mode(s)

### ■ DC/PoE Mode

Test Mode	operating
OP	the test was conducted while checking the camera video output from the laptop and making sure that they operate normally while performing a ping test.

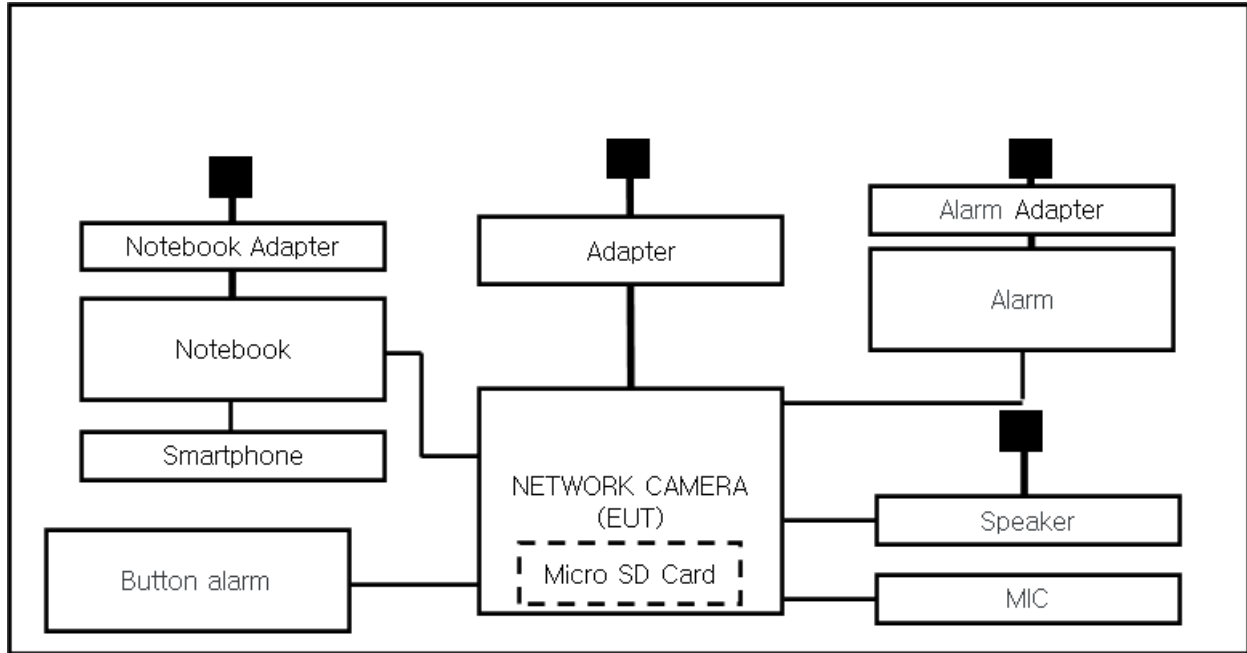
EUT Test operating S/W		
Name	Version	Manufacture Company
Web Viewer	-	Hanwha Techwin Co., Ltd.

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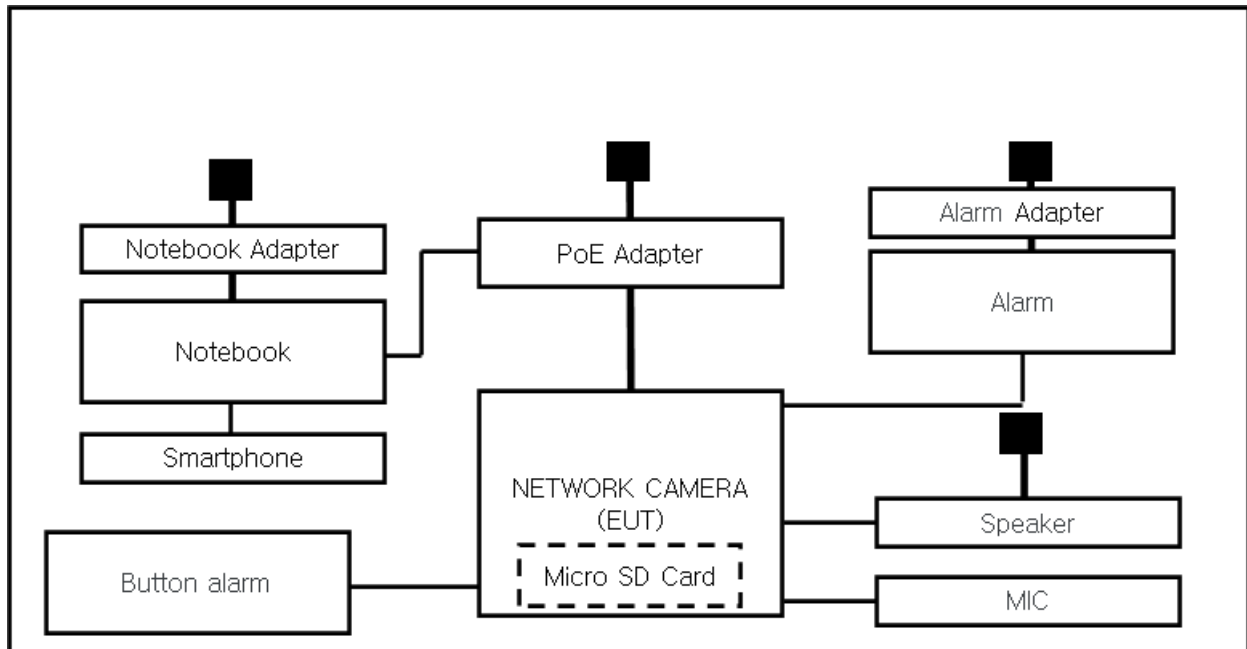
## 1.8 Configuration

■ AC Main  
 □ DC Main

### ■ DC Mode



### ■ PoE Mode



## 1.9 Remarks when standards applied

USB port and VIDEO port are for administrator use and are excluded from testing.

## 1.10 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less.

## 1.11 Test Facility

The measurement facility is located at 473-21 Gayeo-ro, Yeoju-si, Gyeonggi-do, 12658, Korea. The sites are constructed in conformance with the requirements of ANSI C63.4: 2014 and CISPR 16-1-4: 2012

## 1.12 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
KOREA	RRA	EMI (3 m & 10 m Semi-Anechoic Chamber , 10 m Open Area and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KR0100
International	KOLAS	EMI (3 m & 10 m Semi-Anechoic Chamber , and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KT489
USA	FCC	3 m & 10 m Semi-Anechoic Chamber, 10 m Open Area and Conducted test site to perform FCC Part 15/18 measurements.	 KR0100
Canada	ISED	3 m & 10 m Semi-Anechoic Chamber and Conducted test site	 23298-1
JAPAN	VCCI	Mains Ports Conducted Interference Measurement, Telecommunication Ports Conducted Disturbance Measurement and Radiation 10 meter site, Facility for measuring radiated disturbance above 1 GHz	 R-20056, C-20036, T-20040, G-20057
Europe	TÜV SÜD	EMI (3 m & 10 m Semi-Anechoic Chamber , 10 m Open Area and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 CARAT 001633 0004

## 2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ EMC – Directive 2014/30/EU

☐ EN 61000-6-3: 2011

☐ EN 61000-6-1: 2007

☐ EN 61000-6-4: 2007 +A1: 2011

☐ EN 61000-6-2: 2005

☐ EN 55011: 2007 +A1: 2010

☐ Group 1  
☐ Class A

☐ Group 2  
☐ Class B

☐ EN 55014-1: 2006 +A2: 2011

☐ EN 55014-2: 1997 +A2: 2008

☐ EN 55015: 2013

☐ EN 61547: 2009

☒ EN 55032: 2012/AC: 2013

☒ Class A

☐ Class B

☐ EN 55024: 2010 +A1: 2015

☒ EN 50130-4: 2011

☒ EN 61000-3-2: 2014

☒ EN 61000-3-3: 2013

☐ EN 61326-1: 2013

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- |  |                                  |                                  |
|--|----------------------------------|----------------------------------|
| <input type="checkbox"/> VCCI -CISPR 32:2016           | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> AS/NZS CISPR32:2015           | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> 47 CFR Part 15, Subpart B     |                                  |                                  |
| <input type="checkbox"/> CISPR 22:2009 +A1:2010        | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> ANSI C63.4-2014               |                                  |                                  |
| <input type="checkbox"/> IC Regulation ICES-003 : 2016 |                                  |                                  |
| <input type="checkbox"/> CAN/CSA CISPR 22-10           | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> ANSI C63.4-2014               |                                  |                                  |
| <input type="checkbox"/> RE- Directive 2014/53/EU      |                                  |                                  |
| <input type="checkbox"/> EN 301 489-1 V1.9.2           |                                  |                                  |
| <input type="checkbox"/> Equipment for fixed use       |                                  |                                  |
| <input type="checkbox"/> Equipment for vehicular use   |                                  |                                  |
| <input type="checkbox"/> Equipment for portable use    |                                  |                                  |
| <input type="checkbox"/> EN 301 489-3 V1.6.1           |                                  |                                  |
| <input type="checkbox"/> EN 301 489-17 V2.2.1          |                                  |                                  |
| <input type="checkbox"/> EN 60945: 2002                |                                  |                                  |

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## 2.1 Conducted Emissions at Mains Power Ports

Test Date  
Feb. 08, 2021

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	01, 15, 2022
<input checked="" type="checkbox"/>	LISN	ENV216	R & S	101787	12, 29, 2021
<input checked="" type="checkbox"/>	LISN	ESH2-Z5	R & S	100450	12, 29, 2021
<input checked="" type="checkbox"/>	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 29, 2021

Test Conditions  
Temperature: 22,9 °C  
Relative Humidity: 46,2 % 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.

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## 2.2 Conducted Emissions at Telecommunication Ports

Test Date  
Feb. 08, 2021

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	01, 15, 2022
<input checked="" type="checkbox"/>	LISN	ENV216	R & S	101787	12, 29, 2021
<input checked="" type="checkbox"/>	LISN	ESH2-Z5	R & S	100450	12, 29, 2021
<input checked="" type="checkbox"/>	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 29, 2021
<input type="checkbox"/>	8-WIRE ISN CAT3,5	ENY81	R & S	100174	12, 30, 2021
<input type="checkbox"/>	8-WIRE ISN CAT6	ENY81-CAT6	R & S	101665	12, 30, 2021
<input checked="" type="checkbox"/>	ISN	ISN S8	SCHWARZBECK	ISN-S8-0019	03, 10, 2022

Test Conditions  
Temperature: 22,9 °C  
Relative Humidity: 46,2 % 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.

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

Test Date  
Feb. 08, 2021

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

### Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
<input checked="" type="checkbox"/>	EMI TEST RECEIVER	ESU26	R & S	100551	04, 01, 2021
<input checked="" type="checkbox"/>	AMPLIFIER	SCU 01	R & S	100603	11, 25, 2021
<input checked="" type="checkbox"/>	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	12, 08, 2022
<input checked="" type="checkbox"/>	ATTENUATOR	8491A	HP	32173	03, 10, 2022

Test Conditions  
Temperature: 20,1 °C  
Relative Humidity: 46,1 % R.H.

Frequency Range of Measurement  
30 MHz to 1 GHz

Instrument Settings  
IF Band Width: 120 kHz

Test Results  
The requirements are:

☒ PASS  
☐ NOT PASS  
☐ NOT APPLICABLE

Remarks  
See Appendix A for test data.

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

Test Date  
Feb. 08, 2021

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, 05, 2021
<input checked="" type="checkbox"/>	PREAMPLIFIER	8449B	AGILENT	3008A01967	04, 20, 2021
<input type="checkbox"/>	ATTENUATOR	8491A	HP	35496	03, 10, 2022
<input checked="" type="checkbox"/>	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 11, 2022

Test Conditions  
Temperature: 20,2 °C  
Relative Humidity: 45,7 % 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  
Feb. 08, 2021

Test Location  
Electro wave Shieldroom #3

### Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test S/W	net.control	EM TEST	2.1.4	-
<input checked="" type="checkbox"/>	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	04, 06, 2021
<input checked="" type="checkbox"/>	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions  
Temperature: 22,4 °C  
Relative Humidity: 43,2 % 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  
See Appendix A for test data.



## 2.6 Voltage Fluctuations and Flicker

Test Date  
Feb. 08, 2021

Test Location  
Electro wave Shieldroom #3

### Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test S/W	net.control	EM TEST	2.1.4	-
<input checked="" type="checkbox"/>	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	04, 06, 2021
<input checked="" type="checkbox"/>	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions  
Temperature: 22,4 °C  
Relative Humidity: 43,2 % R.H.

Test Results  
The requirements are:

☒ PASS  
☐ NOT PASS  
☐ NOT APPLICABLE

Remarks  
See Appendix A for test data.

### 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  
Feb. 09, 2021

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	02, 01, 2022
<input checked="" type="checkbox"/>	HCP	-	KES	-	-
<input checked="" type="checkbox"/>	VCP	-	Noise Ken	-	-

Test Conditions  
Temperature: 22,6 °C  
Relative Humidity: 44,6 % R.H.  
Atmospheric Pressure: 101,2 kPa

Test Specifications  
Discharge Factor:  $\geq 1$  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

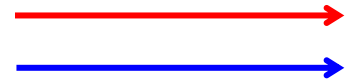
Notes: HCP: Horizontal coupling plane  
VCP: Vertical coupling plane

Required Performance Criteria: ☒ Complied

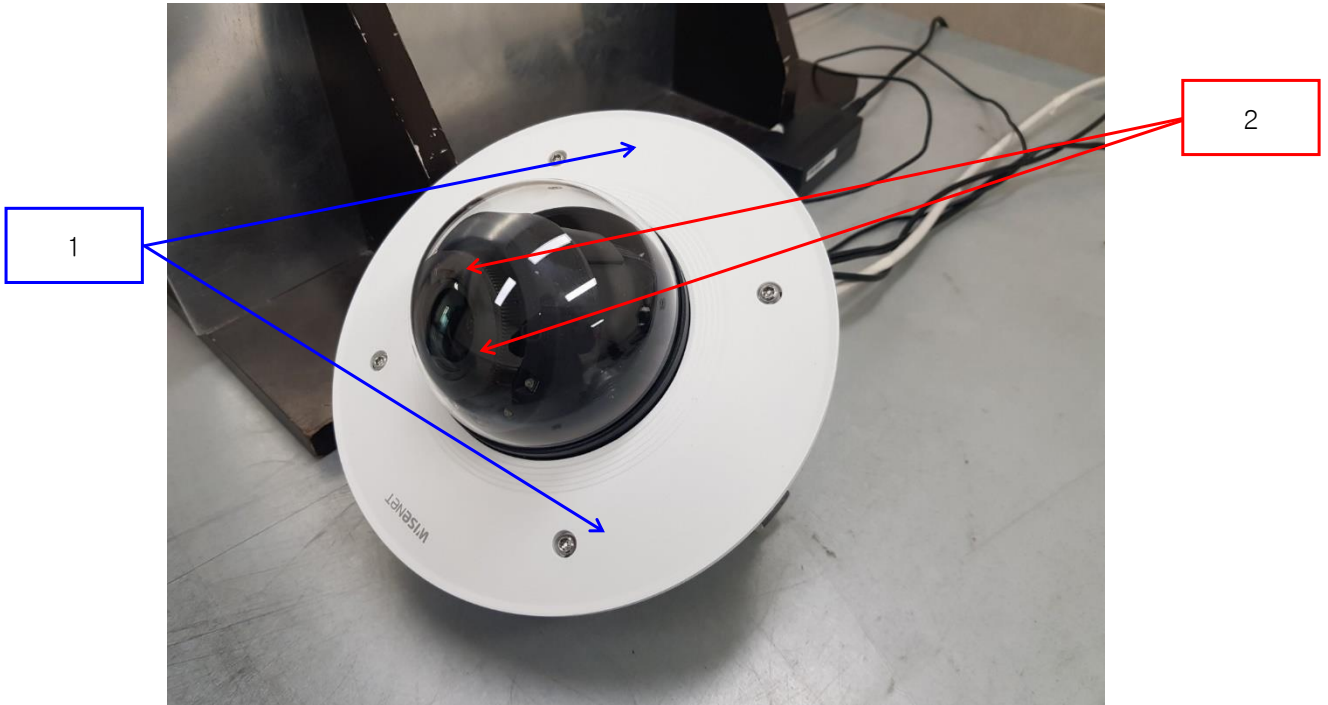
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Location of Discharge:

Air
Contact



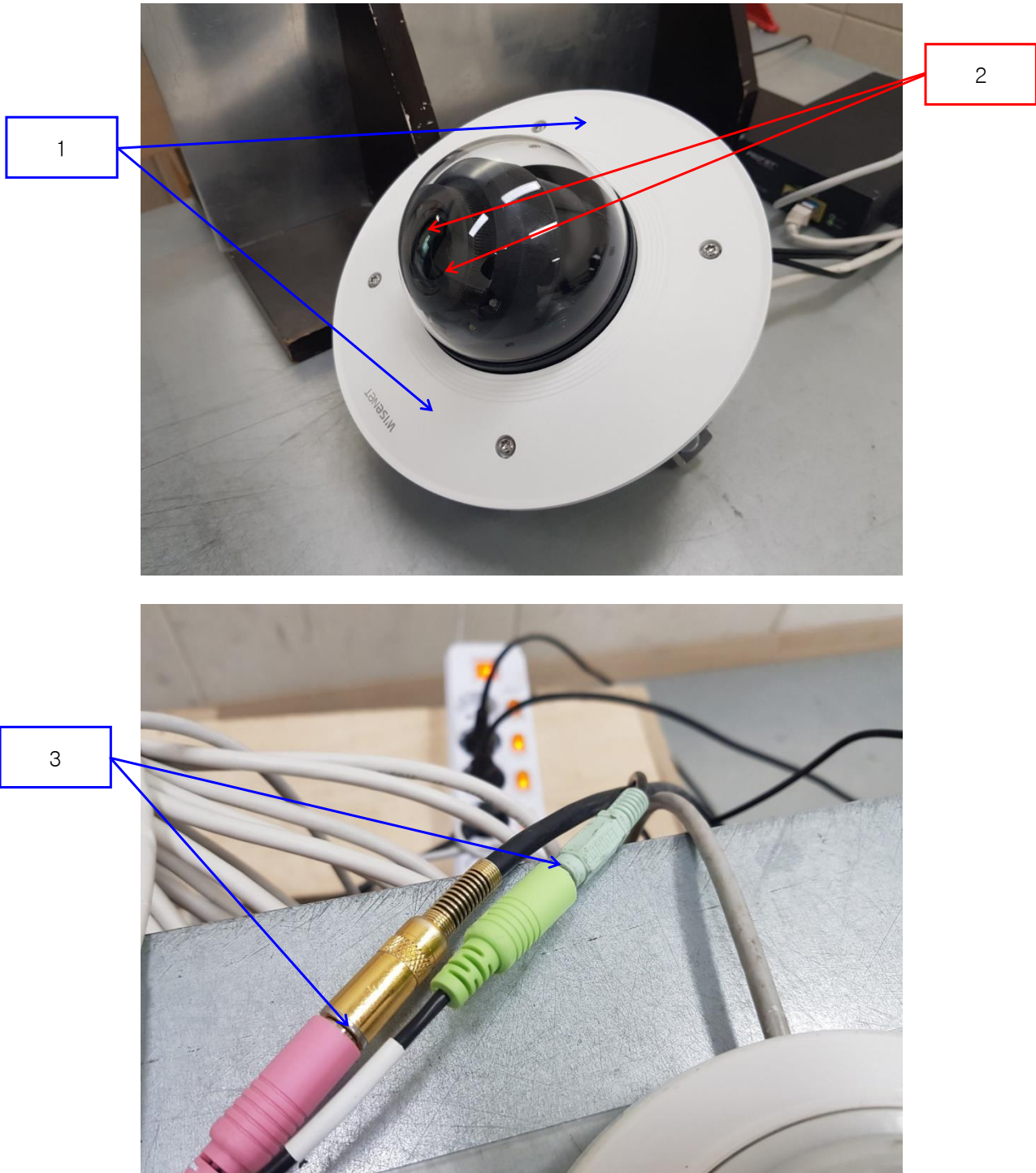
■ DC Mode



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■ PoE Mode



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## Test Data

### ■ DC Mode

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	Contact Discharge	Complied	-
2	Camera Lens	Air Discharge	Complied	-
3	3.5 mm Port	Contact Discharge	Complied	-

### ■ PoE Mode

#### 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	Contact Discharge	Complied	-
2	Camera Lens	Air Discharge	Complied	-
3	3.5 mm Port	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 61000-4-3: 2006 + A2: 2010

Test Date  
Feb. 10, 2021

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	9.12.00	-
<input checked="" type="checkbox"/>	SIGNAL GENERATOR	SMB 100A	Rohde & Schwarz	108252	08, 05, 2021
<input checked="" type="checkbox"/>	HIGH POWER DUAL AMP	SSA532	SUNGSAN	SSA532-001	-
<input checked="" type="checkbox"/>	POWER METER	E4419B	Agilent	GB40203000	04, 20, 2021
<input checked="" type="checkbox"/>	CW POWER SENSOR	E4412A	Agilent	US38488240	04, 20, 2021
<input checked="" type="checkbox"/>	CW POWER SENSOR	E4412A	Agilent	MY41501662	04, 20, 2021
<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, 11, 2022

Test Conditions  
Temperature: 21,9 °C  
Relative Humidity: 43,7 % R.H.  
Atmospheric Pressure: 100,7 kPa

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**Test Specifications**

Antenna Polarization: Horizontal & vertical unless indicated otherwise

Antenna Distance: ☒ 3 m

Field Strength: ☐ 1 V/m ☐ 3 V/m  
☒ 10 V/m

Frequency Range: ☐ 80 MHz to 1 GHz ☐ 1,4 GHz to 2,7 GHz  
☒ 80 MHz to 2,7 GHz

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

# of Sides Radiated: ☒ 4

Required Performance Criteria: ☒ Complied

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## Test Data

## ■ DC Mode

Side Exposed	Observations	
	Horizontal	Vertical
Front	Complied	Complied
Right	Complied	Complied
Back	Complied	Complied
Left	Complied	Complied

## ■ PoE Mode

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  
Feb. 09, 2021

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	5.4.7	-
<input checked="" type="checkbox"/>	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	11, 26, 2021
<input checked="" type="checkbox"/>	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 26, 2021
<input checked="" type="checkbox"/>	CAPACITIVE COUPLING CLAMP	HFK	EM TEST	P1633183115	11, 26, 2021

#### Test Conditions

Temperature: 22,6 °C  
Relative Humidity: 44,0 % R.H.  
Atmospheric Pressure: 101,2 kPa

#### Test Specifications

Pulse Amplitude & Polarity: (AC Power Lines)	<input type="checkbox"/> ± 1.0 kV <input type="checkbox"/> ± 4.0 kV	<input checked="" type="checkbox"/> ± 2.0 kV
Pulse Amplitude & Polarity: (Other supply / Signal Lines)	<input type="checkbox"/> ± 0.5 kV <input type="checkbox"/> ± 2.0 kV	<input checked="" type="checkbox"/> ± 1.0 kV
Burst Period:	<input checked="" type="checkbox"/> 300 ms	<input type="checkbox"/> 2 s
Repetition Rate:	<input type="checkbox"/> 5 kHz	<input checked="" type="checkbox"/> 100 kHz
Duration of Test Voltage:	<input checked="" type="checkbox"/> ≥ 1 min	
Required Performance Criteria:	<input checked="" type="checkbox"/> Complied	

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**Test Data**

■ DC Mode

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

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
L	Complied	Complied
N	Complied	Complied
PE	-	-
L – N	Complied	Complied
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

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☒ PoE Mode

☐ 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 (PoE)	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



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### 3.4 Surge Transients

Reference Standard  
EN 61000-4-5: 2014

Test Date  
Feb. 09, 2021

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	5.4.7	-
<input checked="" type="checkbox"/>	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	11, 26, 2021
<input checked="" type="checkbox"/>	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 26, 2021
<input checked="" type="checkbox"/>	CDN	CNV 504N7.3	EM TEST	P1744207079	11, 26, 2021

#### Test Conditions

Temperature: 22,6 °C  
Relative Humidity: 44,0 % R.H.  
Atmospheric Pressure: 101,2 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

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## Test Data

☒ DC Mode☒ Line to Line – Differential Mode

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

☐ 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(LAN)	CDN	Complied	Complied
	LINE	Complied	Complied

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☒ PoE Mode

☐ 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(PoE)	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

☐ NOT APPLICABLE

### Remarks

PASS Required Performance Criteria

### 3.5 Conducted Disturbance

Reference Standard  
EN 61000-4-6: 2014

Test Date  
Feb. 15, 2021

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	5.3.11	-
<input checked="" type="checkbox"/>	CONTINUOUS WAVE SIMULATOR	CWS 500N1.4	EM TEST	P1602169880	11, 25, 2021
<input checked="" type="checkbox"/>	ATTENUATOR	ATT 6/80	EM TEST	P1614178148	11, 25, 2021
<input checked="" type="checkbox"/>	CDN	CDN M016	TESEQ	43694	11, 25, 2021
<input checked="" type="checkbox"/>	CDN	CDN M016	TESEQ	43697	11, 25, 2021
<input checked="" type="checkbox"/>	CDN	CDN ST08A	TESEQ	43886	11, 25, 2021
<input checked="" type="checkbox"/>	EM CLAMP	KEMZ 801A	TESEQ	44099	11, 26, 2021

#### Test Conditions

Temperature: 22,5 °C  
Relative Humidity: 46,7 % R.H.  
Atmospheric Pressure: 100,6 kPa

#### 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

■ DC Mode

☒ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
L – N	CDN	Complied

☐ 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 (LAN)	CDN	Complied
Alarm In	Clamp	Complied
Alarm Out	Clamp	Complied

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**■ PoE Mode**☐ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
-	-	-

☐ 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 (PoE)	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

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### 3.6 Voltage Dips and Short Interruptions

Reference Standard  
EN 61000-4-11:2004

Test Date  
Feb. 09, 2021

Test Location  
EMS-Voltage dip: 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	5.4.7	-
<input checked="" type="checkbox"/>	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	11, 26, 2021
<input checked="" type="checkbox"/>	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 26, 2021

#### Test Conditions

Temperature: 22,6 °C  
Relative Humidity: 44,0 % R.H.  
Atmospheric Pressure: 101,2 kPa

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**Test Specifications & Observations/Remarks****■ DC Mode****- Voltage Dips and Short Interruptions**

<u>Test Level</u>	<u>Duration [in period/ms (50 Hz)]</u>	<u>Results</u>
<input checked="" type="checkbox"/> 20 % dip	<input checked="" type="checkbox"/> 250 / 5 000	<u>Complied</u>
<input checked="" type="checkbox"/> 30 % dip	<input checked="" type="checkbox"/> 25 / 500	<u>Complied</u>
<input checked="" type="checkbox"/> 60 % dip	<input checked="" type="checkbox"/> 10 / 200	<u>Complied</u>
<input checked="" type="checkbox"/> 100 % dip	<input checked="" type="checkbox"/> 250 / 5 000	<u>Degradation</u>

**- Voltage variations**

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

**Observations:**

Complied – No degradation of function

Degradation - See "Remarks "

**Test Results**

- ☒ PASS Required Performance Criteria  
☐ NOT PASS Required Performance Criteria  
☐ NOT APPLICABLE

**Remarks**

During the test(100%, 250cycle), EUT was turned off but after the test, it was recovered by no operator's intervention.



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## APPENDIX A – TEST DATA

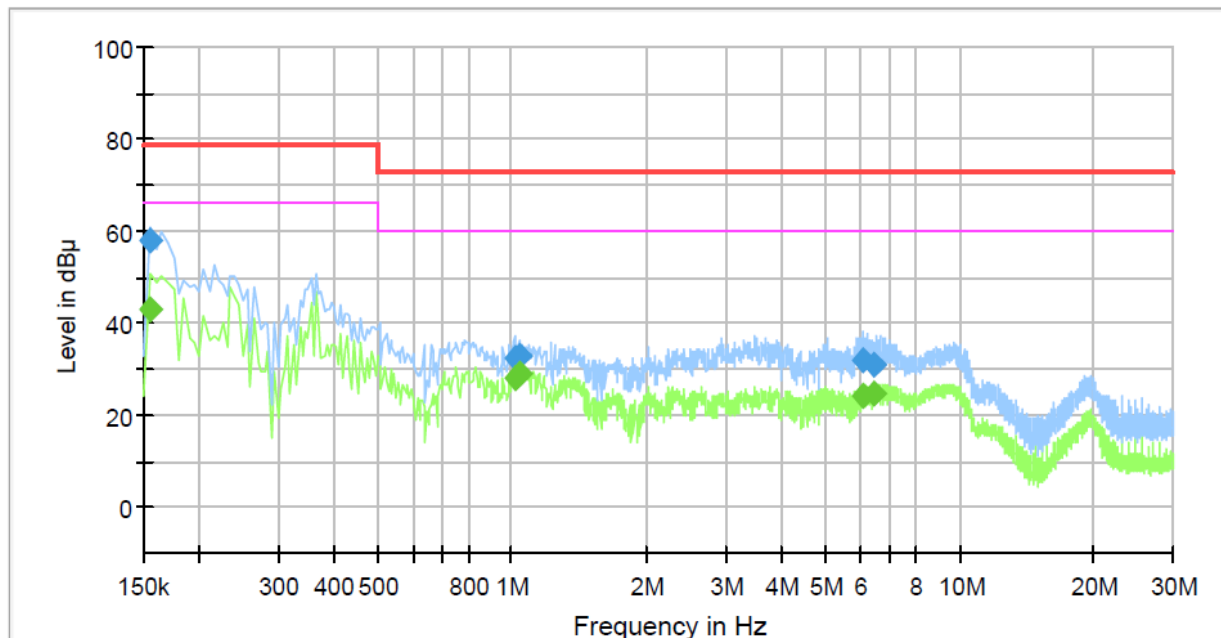
### Conducted Emissions at Mains Power Ports

■ DC Mode

[HOT]

### Common Information

Test Description:	Conducted Emission
Model No.:	PND-A6081RF
Phase:	L1
Mode:	
Operator Name:	KES



### Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	42.97	66.00	23.03	1000.0	9.000	L1	19.4
0.155000	57.81	---	79.00	21.19	1000.0	9.000	L1	19.4
1.015000	---	28.07	60.00	31.93	1000.0	9.000	L1	20.0
1.015000	32.68	---	73.00	40.32	1000.0	9.000	L1	20.0
1.040000	---	29.08	60.00	30.92	1000.0	9.000	L1	20.0
1.040000	33.17	---	73.00	39.83	1000.0	9.000	L1	20.0
6.060000	---	24.23	60.00	35.77	1000.0	9.000	L1	19.5
6.060000	31.78	---	73.00	41.22	1000.0	9.000	L1	19.5
6.440000	---	24.58	60.00	35.42	1000.0	9.000	L1	19.5
6.440000	31.13	---	73.00	41.87	1000.0	9.000	L1	19.5

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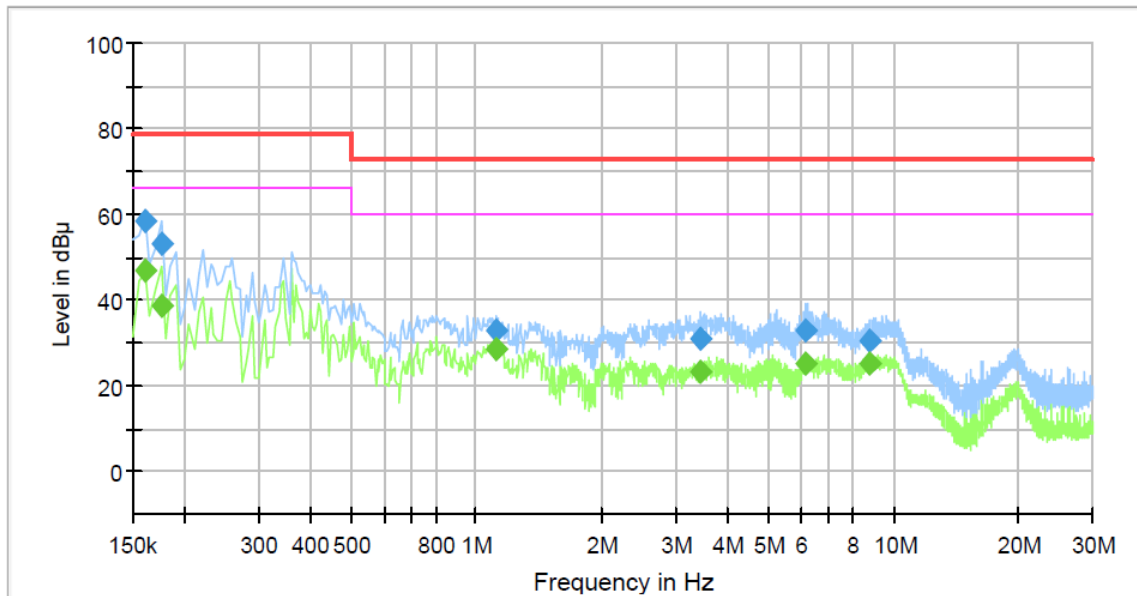
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[NEUTRAL]

### Common Information

Test Description: Conducted Emission  
Model No.: PND-A6081RF  
Phase: N  
Mode:  
Operator Name: KES



### Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.160000	---	46.79	66.00	19.21	1000.0	9.000	N	19.4
0.160000	58.33	---	79.00	20.67	1000.0	9.000	N	19.4
0.175000	---	38.92	66.00	27.08	1000.0	9.000	N	19.4
0.175000	53.01	---	79.00	25.99	1000.0	9.000	N	19.4
1.120000	---	28.53	60.00	31.47	1000.0	9.000	N	20.0
1.120000	32.78	---	73.00	40.22	1000.0	9.000	N	20.0
3.430000	---	23.25	60.00	36.75	1000.0	9.000	N	19.9
3.430000	31.20	---	73.00	41.80	1000.0	9.000	N	19.9
6.180000	---	25.46	60.00	34.54	1000.0	9.000	N	19.5
6.180000	33.13	---	73.00	39.87	1000.0	9.000	N	19.5
8.740000	---	25.23	60.00	34.77	1000.0	9.000	N	19.7
8.740000	30.39	---	73.00	42.61	1000.0	9.000	N	19.7

#### ◆ 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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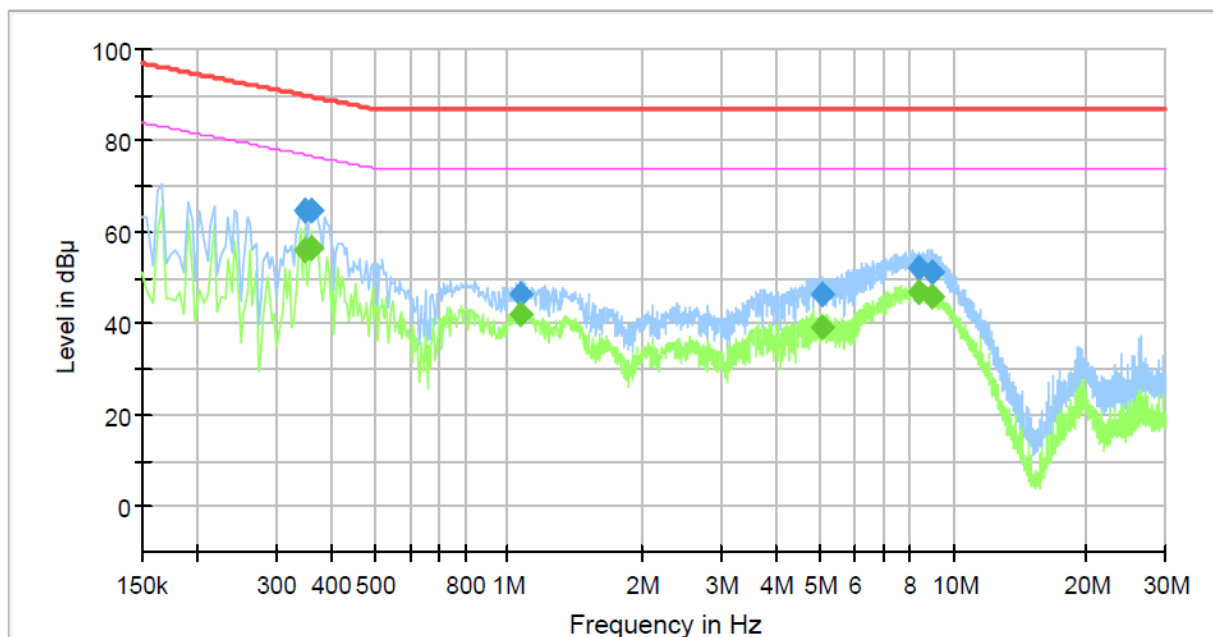
## Conducted Emissions at Telecommunication Ports

■ DC Mode

[1 000 Mbps]

### Common Information

Test Description: Telecommunication Emission  
 Model No.: PND-A6081RF  
 Mode : DC\_TEL 1 000 Mbps  
 Speed :  
 Operator Name: KES



### Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.350000	---	56.31	76.96	20.65	1000.0	9.000	Single Line	19.6
0.350000	64.56	---	89.96	25.40	1000.0	9.000	Single Line	19.6
0.362000	---	56.71	76.68	19.97	1000.0	9.000	Single Line	19.6
0.362000	64.67	---	89.68	25.01	1000.0	9.000	Single Line	19.6
1.066000	---	42.26	74.00	31.74	1000.0	9.000	Single Line	20.0
1.066000	46.42	---	87.00	40.58	1000.0	9.000	Single Line	20.0
5.058000	---	39.45	74.00	34.55	1000.0	9.000	Single Line	19.5
5.058000	46.44	---	87.00	40.56	1000.0	9.000	Single Line	19.5
8.410000	---	46.98	74.00	27.02	1000.0	9.000	Single Line	19.6
8.410000	52.28	---	87.00	34.72	1000.0	9.000	Single Line	19.6
9.002000	---	45.94	74.00	28.06	1000.0	9.000	Single Line	19.7
9.002000	51.14	---	87.00	35.86	1000.0	9.000	Single Line	19.7



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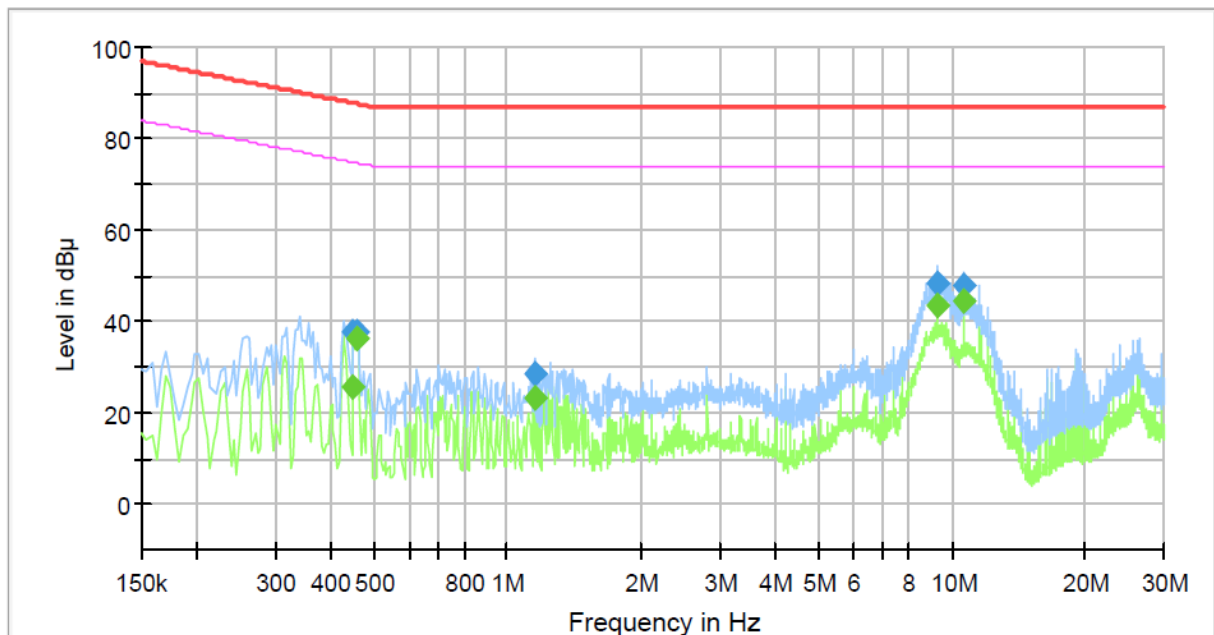
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■ PoE Mode

[1 000 Mbps]

### Common Information

Test Description: Telecommunication Emission  
Model No.: PND-A6081RF  
Mode : PoE\_TEL 1 000 Mbps  
Speed :  
Operator Name: KES



### Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.450000	---	25.58	74.88	49.30	1000.0	9.000	Single Line	19.7
0.450000	37.99	---	87.88	49.89	1000.0	9.000	Single Line	19.7
0.458000	---	36.50	74.73	38.23	1000.0	9.000	Single Line	19.7
0.458000	37.67	---	87.73	50.06	1000.0	9.000	Single Line	19.7
1.150000	---	23.52	74.00	50.48	1000.0	9.000	Single Line	20.0
1.150000	28.65	---	87.00	58.35	1000.0	9.000	Single Line	20.0
9.234000	---	43.68	74.00	30.32	1000.0	9.000	Single Line	19.7
9.234000	48.50	---	87.00	38.50	1000.0	9.000	Single Line	19.7
10.622000	---	44.41	74.00	29.59	1000.0	9.000	Single Line	19.9
10.622000	48.00	---	87.00	39.00	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))

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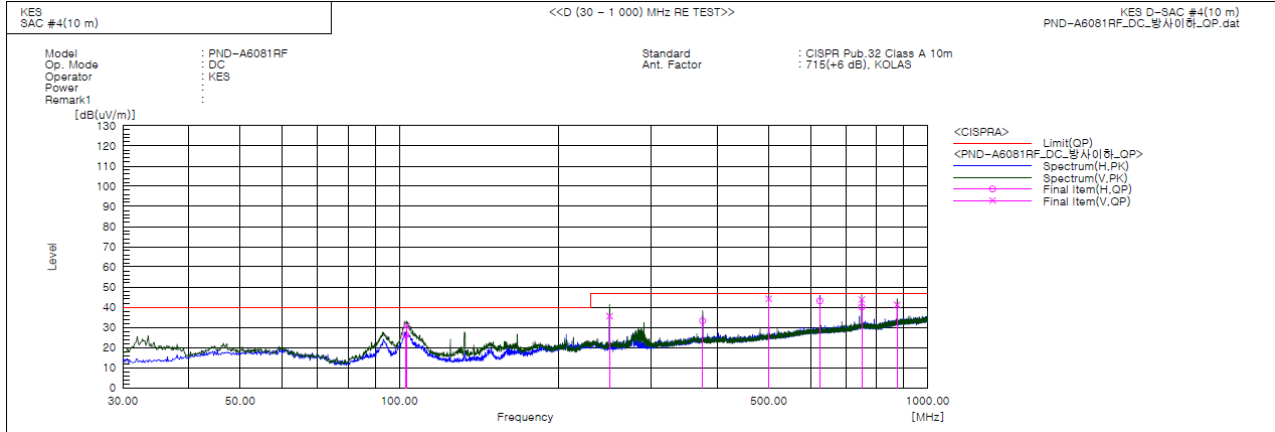
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## Radiated Electric Field Emissions(Below 1 GHz)

### ■ DC Mode



### 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	102.871	H	48.8	-22.5	26.3	40.0	13.7	391.0	214.0	
2	103.235	V	53.2	-22.5	30.7	40.0	9.3	114.0	92.0	
3	249.948	V	54.7	-19.1	35.6	47.0	11.4	107.0	330.0	
4	374.956	H	48.1	-14.8	33.3	47.0	13.7	197.0	52.0	
5	499.965	V	55.8	-11.6	44.2	47.0	2.8	396.0	218.0	
6	624.974	H	51.3	-8.2	43.1	47.0	3.9	112.0	234.0	
7	749.983	V	49.6	-5.7	43.9	47.0	3.1	147.0	199.0	
8	749.983	H	45.8	-5.7	40.1	47.0	6.9	109.0	328.0	
9	874.991	V	45.5	-4.3	41.2	47.0	5.8	141.0	131.0	

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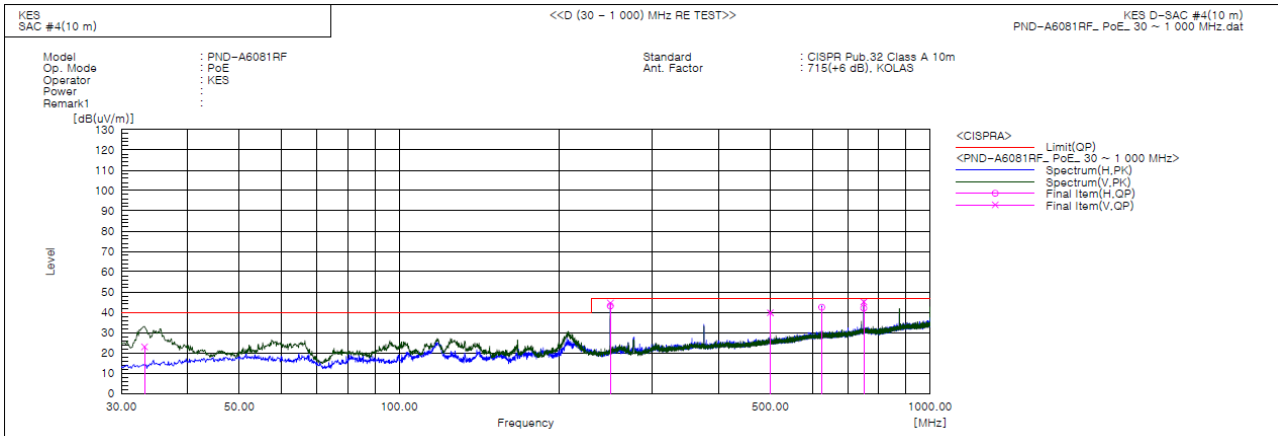


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### PoE Mode



### 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	33.153	V	48.0	-25.0	23.0	40.0	17.0	156.0	158.0	
2	249.996	H	62.2	-19.1	43.1	47.0	3.9	365.0	188.0	
3	250.005	V	63.7	-19.1	44.6	47.0	2.4	114.0	142.0	
4	499.965	V	51.4	-11.6	39.8	47.0	7.2	128.0	157.0	
5	624.974	H	50.7	-8.2	42.5	47.0	4.5	359.0	67.0	
6	749.979	H	47.7	-5.7	42.0	47.0	5.0	384.0	332.0	
7	749.988	V	50.8	-5.7	45.1	47.0	1.9	149.0	162.0	

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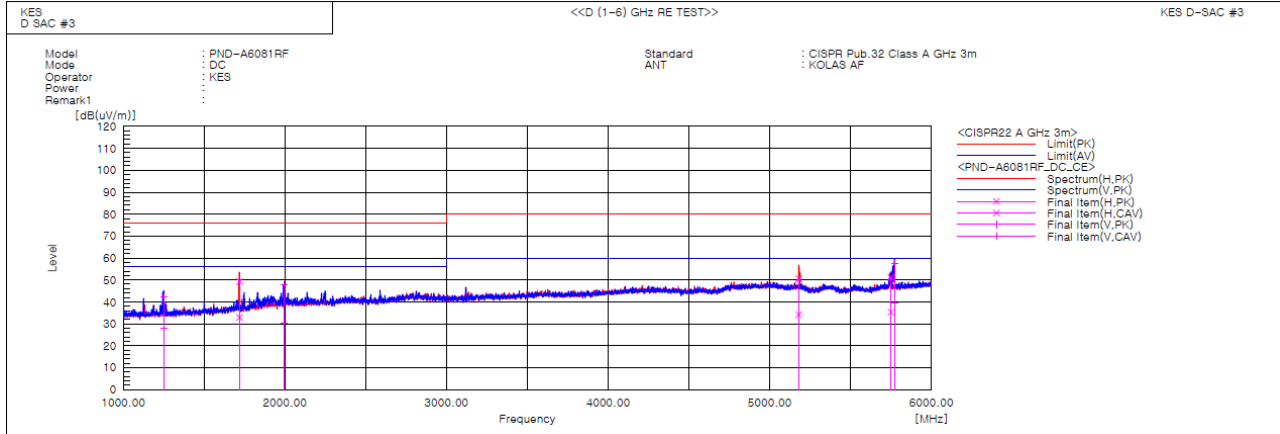
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### Radiated Electric Field Emissions(Above 1 GHz)

#### ■ DC Mode



#### 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	1250.000	V	50.3	36.1	-7.9	42.4	28.2	76.0	56.0	33.6	27.8	100.0	242.1	
2	1718.000	H	53.5	37.2	-4.3	49.2	32.9	76.0	56.0	26.8	23.1	100.0	176.4	
3	1992.000	V	49.5	31.7	-1.6	47.9	30.1	76.0	56.0	28.1	25.9	100.0	4.1	
4	5179.000	H	41.9	25.5	8.7	50.6	34.2	80.0	60.0	29.4	25.8	100.0	32.7	
5	5749.000	H	41.6	25.8	9.5	51.1	35.3	80.0	60.0	28.9	24.7	100.0	4.5	
6	5772.000	V	47.7	29.9	9.7	57.4	39.6	80.0	60.0	22.6	20.4	100.0	320.6	

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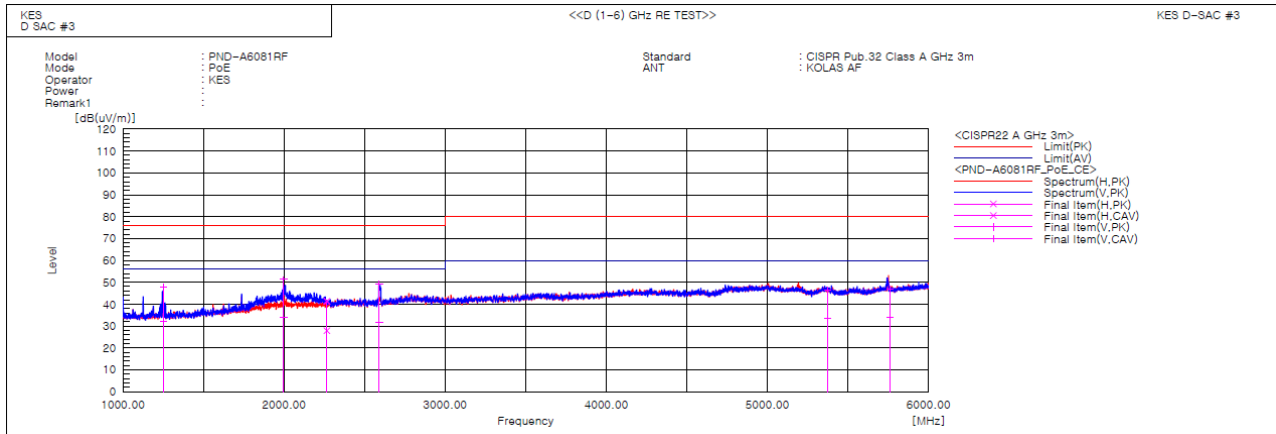


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### PoE Mode



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	1249.750	V	55.6	39.9	-7.9	47.7	32.0	76.0	56.0	28.3	24.0	100.0	235.6	
2	1998.032	V	52.9	35.4	-1.6	51.3	33.8	76.0	56.0	24.7	22.2	100.0	351.6	
3	2264.967	H	42.1	28.7	-0.8	41.3	27.9	76.0	56.0	34.7	28.1	100.0	24.1	
4	2590.811	V	49.0	31.5	0.3	49.3	31.8	76.0	56.0	26.7	24.2	100.0	299.5	
5	5374.795	V	38.1	25.0	8.4	46.5	33.4	80.0	60.0	33.5	26.6	100.0	80.7	
6	5762.696	V	37.4	24.3	9.6	47.0	33.9	80.0	60.0	33.0	26.1	100.0	52.7	

### 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



## Harmonic Current Emissions and Voltage Fluctuations and Flicker

### Average harmonic current results

Hn	I <sub>eff</sub> [A]	% of Limit	Limit [A]	Result
1	0.039			
2	0.002	0.158	1.080	n/a
3	0.032	1.385	2.300	PASS
4	0.002	0.505	0.430	n/a
5	0.033	2.852	1.140	PASS
6	0.002	0.595	0.300	n/a
7	0.032	4.191	0.770	PASS
8	0.002	0.777	0.230	n/a
9	0.030	7.485	0.400	PASS
10	0.002	1.006	0.184	n/a
11	0.028	8.624	0.330	PASS
12	0.002	1.155	0.153	n/a
13	0.027	12.842	0.210	PASS
14	0.002	1.379	0.131	n/a
15	0.025	16.682	0.150	PASS
16	0.002	1.462	0.115	n/a
17	0.023	17.566	0.132	PASS
18	0.002	1.603	0.102	n/a
19	0.021	18.029	0.118	PASS
20	0.002	1.784	0.092	n/a
21	0.019	12.039	0.161	PASS
22	0.002	1.939	0.084	n/a
23	0.017	11.793	0.147	PASS
24	0.002	2.118	0.077	n/a
25	0.015	11.409	0.135	PASS
26	0.002	2.149	0.071	n/a
27	0.014	10.909	0.125	PASS
28	0.002	2.399	0.066	n/a
29	0.012	9.899	0.116	PASS
30	0.001	2.390	0.061	n/a
31	0.010	9.102	0.109	PASS
32	0.001	2.522	0.058	n/a
33	0.008	8.132	0.102	PASS
34	0.001	2.689	0.054	n/a
35	0.007	6.933	0.096	PASS
36	0.001	2.619	0.051	n/a
37	0.006	6.154	0.091	PASS
38	0.001	2.799	0.048	n/a
39	0.004	5.138	0.087	n/a
40	0.001	2.680	0.046	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.



Test Data - Harmonics (continued)

**Maximum harmonic current results**

Hn	I <sub>eff</sub> [A]	% of Limit	Limit [A]	Result
1	0.039			
2	0.002	0.131	1.620	n/a
3	0.032	0.940	3.450	PASS
4	0.002	0.387	0.645	n/a
5	0.033	1.911	1.710	PASS
6	0.002	0.448	0.450	n/a
7	0.032	2.811	1.155	PASS
8	0.002	0.599	0.345	n/a
9	0.030	5.026	0.600	PASS
10	0.002	0.758	0.276	n/a
11	0.029	5.796	0.495	PASS
12	0.002	0.866	0.230	n/a
13	0.027	8.606	0.315	PASS
14	0.002	1.100	0.197	n/a
15	0.025	11.175	0.225	PASS
16	0.002	1.124	0.173	n/a
17	0.023	11.795	0.199	PASS
18	0.002	1.258	0.153	n/a
19	0.021	12.086	0.178	PASS
20	0.002	1.378	0.138	n/a
21	0.019	12.101	0.161	PASS
22	0.002	1.524	0.125	n/a
23	0.017	11.860	0.147	PASS
24	0.002	1.648	0.115	n/a
25	0.015	11.480	0.135	PASS
26	0.002	1.693	0.106	n/a
27	0.014	11.029	0.125	PASS
28	0.002	1.944	0.099	n/a
29	0.012	10.004	0.116	PASS
30	0.002	1.846	0.092	n/a
31	0.010	9.198	0.109	PASS
32	0.002	1.952	0.086	n/a
33	0.008	8.248	0.102	PASS
34	0.002	2.119	0.081	n/a
35	0.007	7.067	0.096	PASS
36	0.002	2.005	0.077	n/a
37	0.006	6.289	0.091	PASS
38	0.002	2.197	0.073	n/a
39	0.005	5.290	0.087	n/a
40	0.001	1.970	0.069	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.

**KES Co., Ltd.**

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Report No.:  
KES-EM-21T0171  
Page (52) of (73)

Test Data - Voltage Fluctuations

## **Maximum Flicker results**

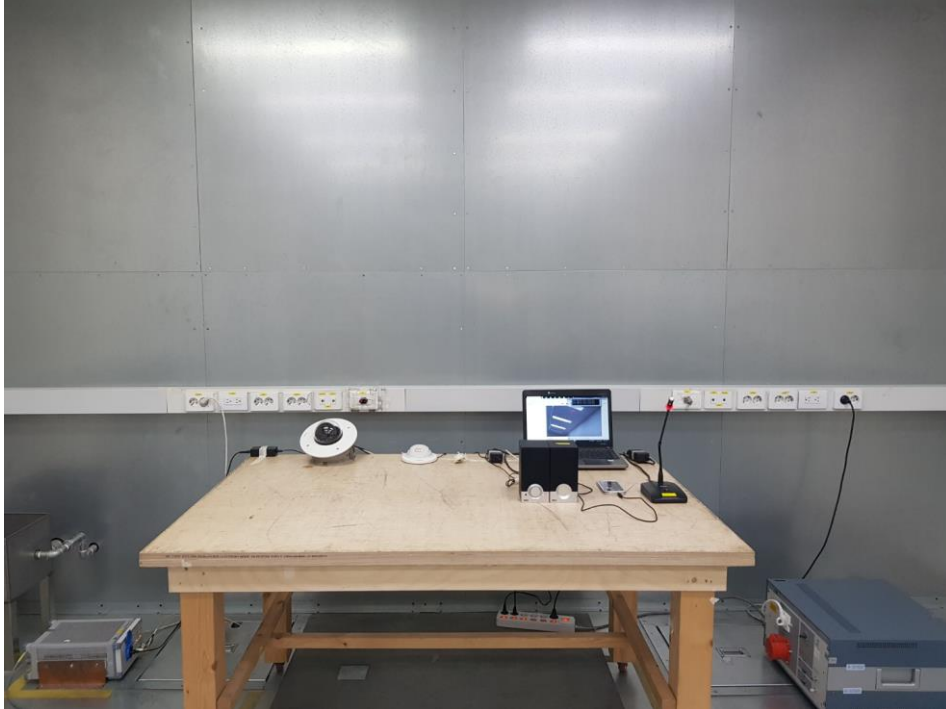
Flicker Measurements					
	Plt	Max Pst	Max Dc	Max Dmax	Max Tmax
Line 1:	0.028	0.028	0	< 0.2	0
Limits:	0.65	1	3.3	4	0.5
Results:	PASS	PASS	PASS	PASS	PASS

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## Test Setup Photos and Configuration

### Conducted Emissions at Mains Power Ports

■ DC Mode



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## Conducted Emissions at Telecommunication Ports

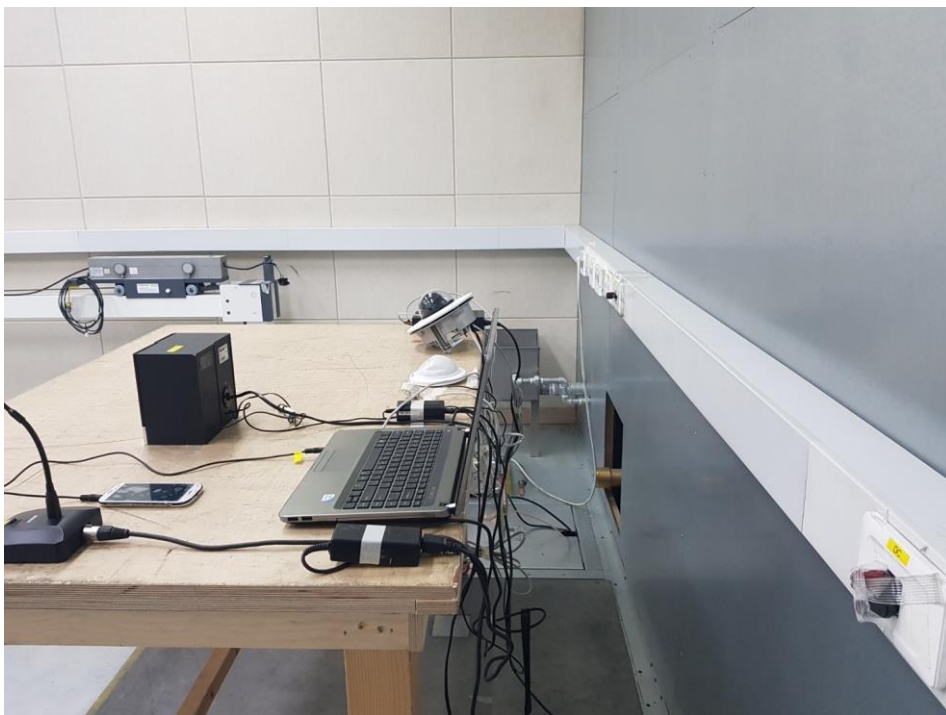
■ DC Mode



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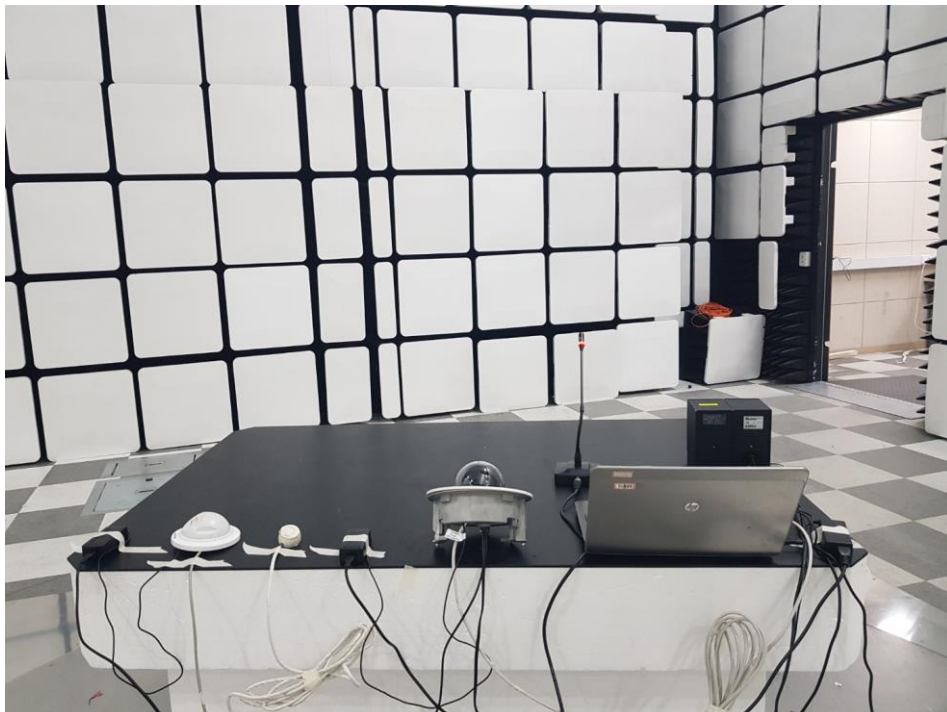
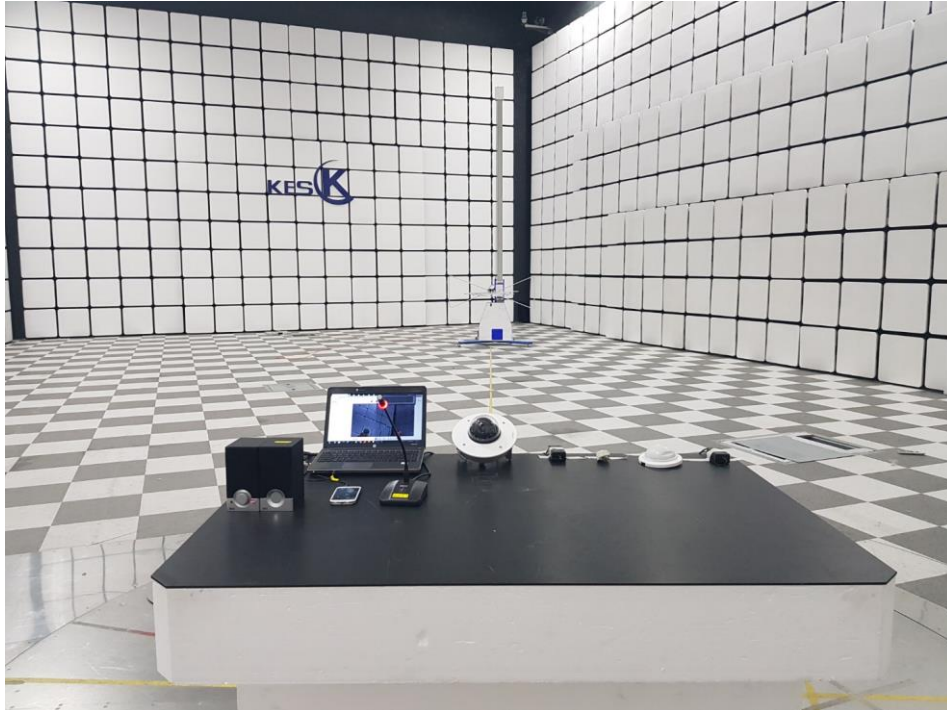
## ■ PoE Mode



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## Radiated Electric Field Emissions(Below 1 GHz)

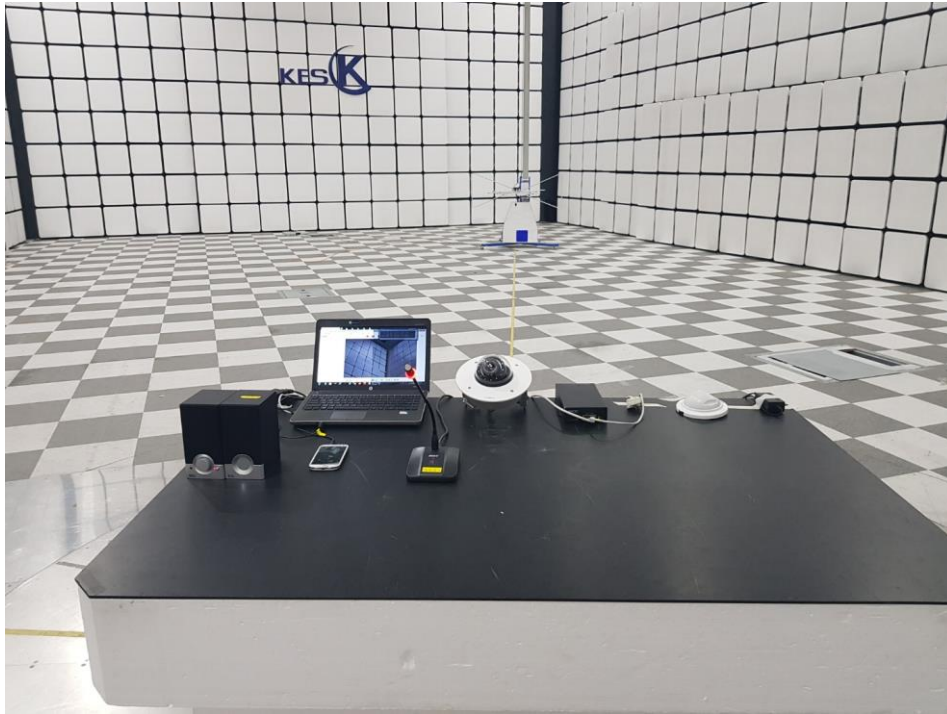
■ DC Mode



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## ■ PoE Mode



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## Radiated Electric Field Emissions(Above 1 GHz)

■ DC Mode



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## ■ PoE Mode



## Harmonic Current Emissions and Voltage Fluctuations and Flicker

■ DC Mode



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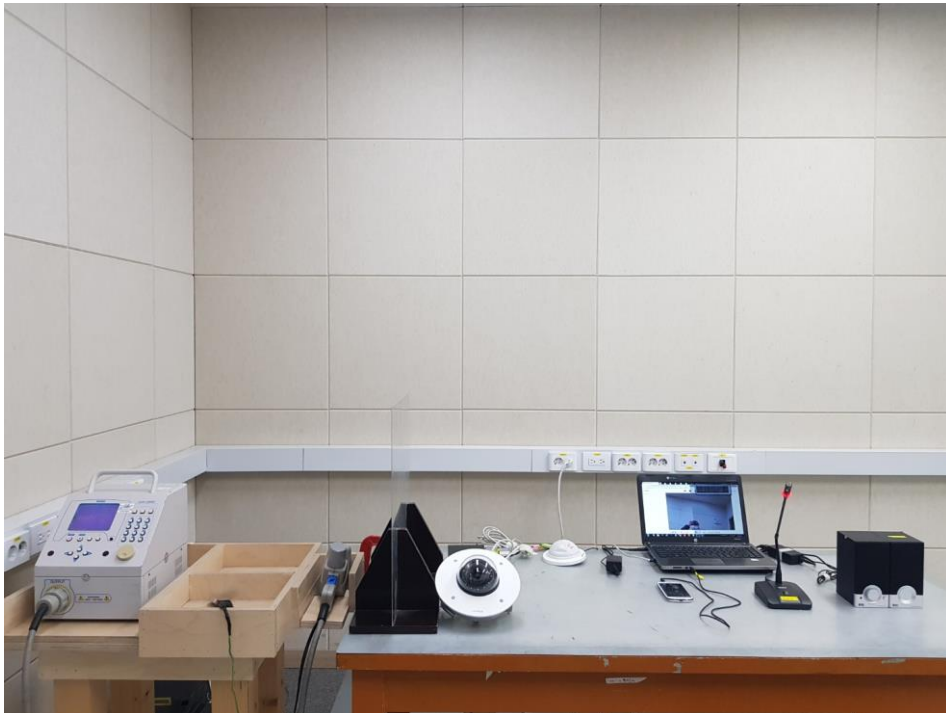


## Electrostatic Discharge

### ■ DC Mode



### ■ PoE Mode



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## Radiated Electric Field Immunity

### ■ DC Mode



### ■ PoE Mode



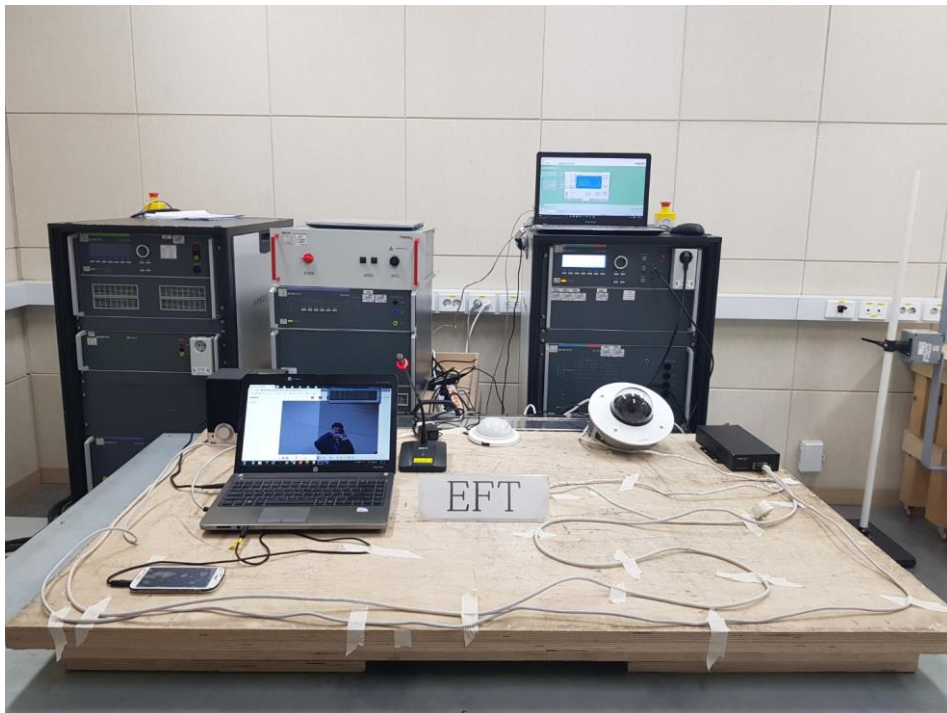
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## Electrical Fast Transients/Bursts

### ■ DC Mode



### ■ PoE Mode



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## Surge Transients

### ■ DC Mode



### ■ PoE Mode





## Conducted Disturbance

### ■ DC Mode



### ■ PoE Mode



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## Voltage Dips and Short Interruptions

■ DC Mode



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## EUT External Photographs

(Top)



(Bottom)



## EUT Internal Photographs

(Internal View)

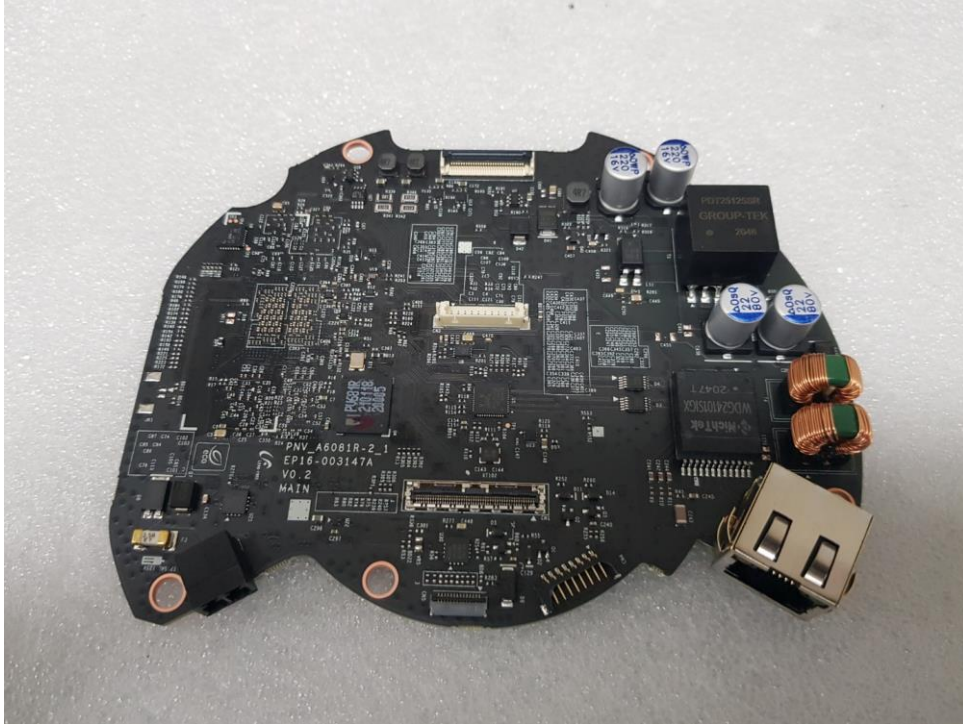


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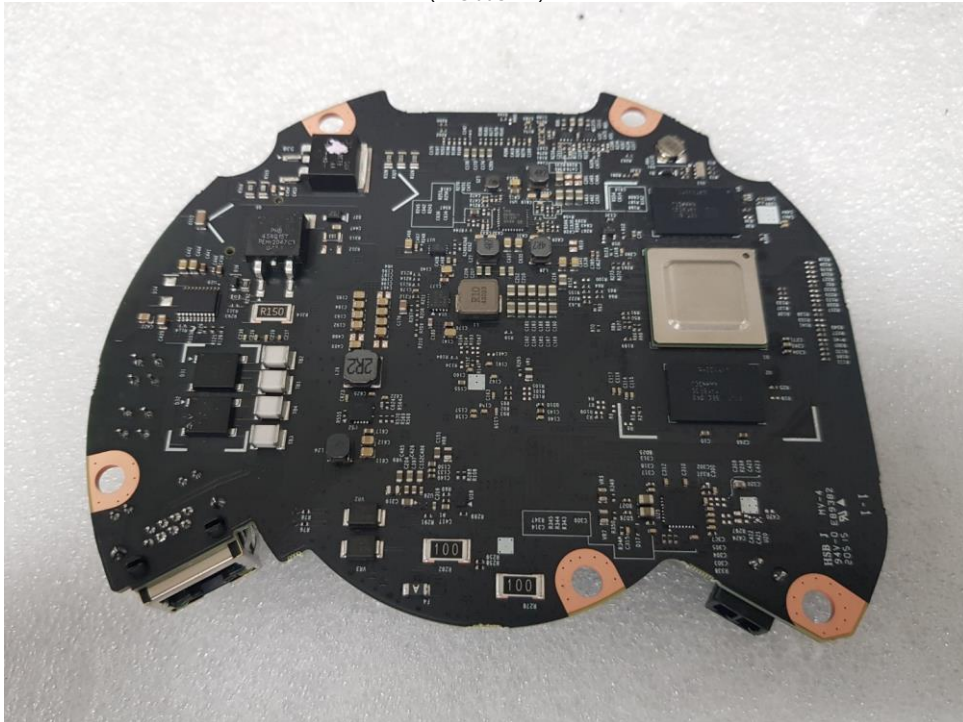


## EUT Internal View – Main Board

(Top)



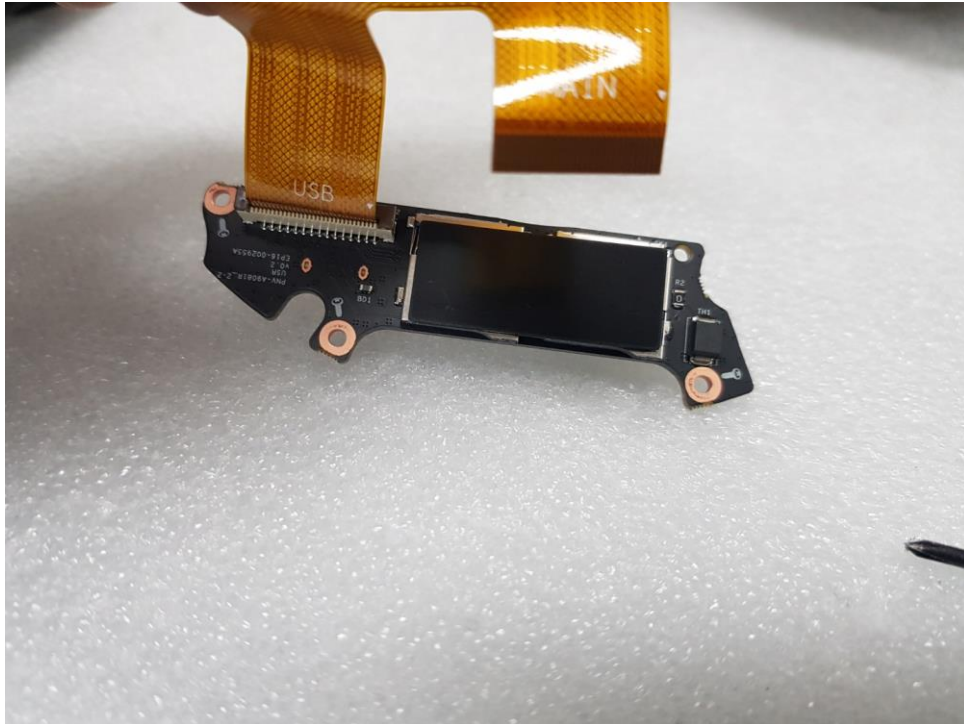
(Bottom)



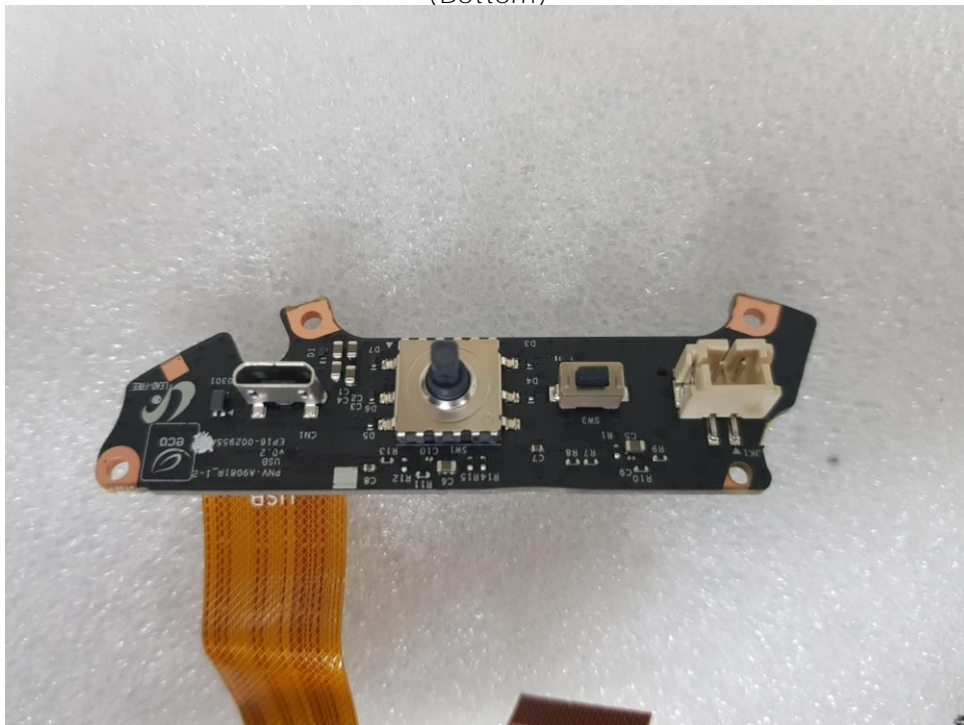
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## EUT Internal View – Sub Board 1

(Top)



(Bottom)



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## EUT Internal View – Sub Board 2

(Top)



(Bottom)



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## EUT Internal View – Camera Lens

(Top)



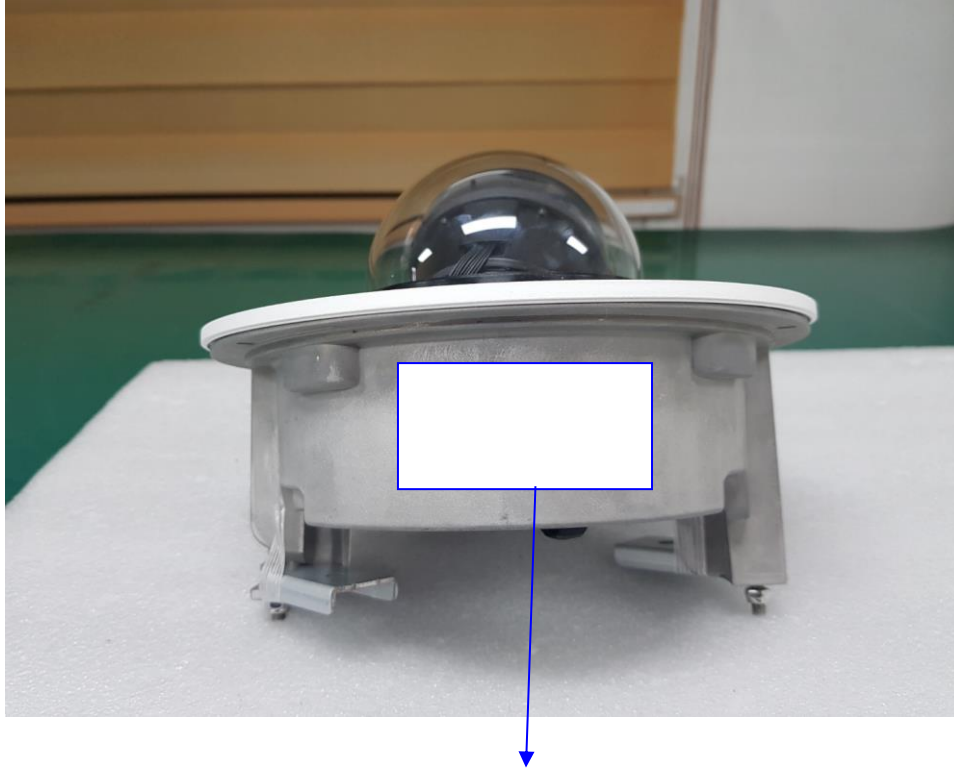
(Bottom)



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## Label and Location



### NETWORK CAMERA

Model No : PND-A6081RF

Manufacturer : HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.

Made in Vietnam

