



EMC TEST REPORT For CE

Test Report No. : KES-E1-18T0418-R1

Date of Issue : May. 15, 2019

Product name : NETWORK CAMERA

Model/Type No. : PNM-9320VQP

Variant Model : -

Applicant : Hanwha Techwin Co., Ltd.

Applicant Address : 6, Pangyo-ro 319 Beon-gil, Bundang-gu, Seongnam-si,
Gyeonggi-do, 13488, KOREA

Manufacturer : 1. Hanwha Techwin (Tianjin) Co.,Ltd.
2. HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.
3. D-TECH CO.,LTD.

Manufacturer Address : 1. No.11 Weiliu Rd, Micro-Electronic Industrial Park, TEDA, Tianjin,
300385, People's Republic of China
2. Lot O-2, Que Vo Industrial Zone extended area,
Nam Son commune, Bac Ninh city, Bac Ninh province, Vietnam
3. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi-do,
Korea (Suwon Industrial Complex)

Date of Receipt : Jul. 04, 2018

Test date : Jul. 05, 2018 ~ Jul. 10, 2018

Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Dae Jung, Choi
EMC Test Engineer

Reviewed by

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EMC Technical Manager

This test report is not related to KOLAS.

**KES Co., Ltd.**

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Test report No.:

KES-E1-18T0418-R1

Page (2) of (71)

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Jul. 30, 2018	KES-E1-18T0418	Issued
May. 15, 2019	KES-E1-18T0418-R1	Re-issue due to regulations update

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TABLE OF CONTENTS

1.0	General Product Description	4
1.1	Test Voltage & Frequency	6
1.2	Variant Model Differences	6
1.3	Device Modifications	6
1.4	Equipment Under Test	6
1.5	Support Equipments	6
1.6	External I/O Cabling	7
1.7	EUT Operating Mode(s)	7
1.8	Configuration	8
1.9	Remarks when standards applied	9
1.10	Calibration Details of Equipment Used for Measurement	9
1.11	Test Facility	9
1.12	Laboratory Accreditations and Listings	9
2.0	Test Regulations	10
2.1	Conducted Emissions at Mains Power Ports	12
2.2	Conducted Emissions at Telecommunication Ports	13
2.3	Radiated Electric Field Emissions(Below 1 GHz)	14
2.4	Radiated Electric Field Emissions(Above 1 GHz)	15
2.5	Harmonic Current Emissions	16
2.6	Voltage Fluctuations and Flicker	17
3.0	Criteria for compliance	18
3.1	Electrostatic Discharge	20
3.2	Radiated Electric Field Immunity	25
3.3	Electrical Fast Transients/Bursts	28
3.4	Surge Transients	30
3.5	Conducted Disturbance	33
3.6	Voltage Dips and Short Interruptions	35
APPENDIX A – TEST DATA		37
Conducted Emissions at Mains Power Ports		37
Conducted Emissions at Telecommunication Ports		39
Radiated Electric Field Emissions(Below 1 GHz)		43
Radiated Electric Field Emissions(Above 1 GHz)		44
Harmonic Current Emissions and Voltage Fluctuations and Flicker		45
Test Setup Photos and Configuration		48
Conducted Voltage Emissions		48
Conducted Telecommunication Emissions		49
Radiated Electric Field Emissions(Below 1 GHz)		50
Radiated Electric Field Emissions(Above 1 GHz)		51
Harmonic Current Emissions and Voltage Fluctuations and Flicker		52
Electrostatic Discharge		53
Radiated Electric Field Immunity		53
Electrical Fast Transients/Bursts		54
Surge Transients		54
Conducted Disturbance		55
Voltage Dips and Short Interruptions		55
EUT External Photographs		56
EUT Internal Photographs		57



1.0 General Product Description

Main Specifications of EUT are:

	Multi-directional (CH 1 ~ 4)	PTZ (CH 5)
Video		
Imaging Device	(See the optional lens)	1/2.8" 2.4M CMOS
Total/Effective Pixels	(See the optional lens)	1,981(H)x1,288(V), 2.55M / 1,944(H)x1,212(V), 2.35M
Scanning System	(See the optional lens)	Progressive scan
Min. Illumination	(See the optional lens)	Color : 0.05Lux(1/30sec, F1.6, 30IRE), BW : 0.005Lux(1/30sec, F1.6, 30IRE)
S / N Ratio	(See the optional lens)	50dB
Video Out	CVBS : 1.0 Vp-p / 75Ω composite, 720x480(N), 720x576(P), for installation	-
LENS		
Focal length(Zoom ratio)	(See the optional lens)	4.44~142.6mm(Optical 32x)
Max. Aperture Ratio	(See the optional lens)	F1.6(Wide)~F4.4(Tele)
Angular Field of View	(See the optional lens)	H:61.8°(Wide)~2.19°(Tele) / V:36.2°(Wide)~1.24°(Tele)
Min. Object Distance	(See the optional lens)	Wide:1.5m, Tele:2m
Focus Control	(See the optional lens)	Auto / Manual / One shot AF
Lens/Mount type	(See the optional lens)	DC Auto Iris/Board-in type
Pan/Tilt/Rotate		
Pan / Tilt / Rotate Range	(See the optional lens)	360° Endless / 210°(-15°~195°)
Pan / Tilt Speed	-	Preset:700°/sec, Manual:0.024°/sec~200°/sec
Sequence	-	Preset(300ea), Swing, Group(6ea), Trace, Tour, Auto run, Schedule
Preset Accuracy	-	±2°
Auto tracking	-	Off/On
Operational		
Camera Title	Off / On (displayed up to 85 characters) - W/W : English/Numeric/Special characters - China : English/Numeric/Special/Chinese characters - Common : Multi-line (Max 5), Color (Grey/Green/Red/Blue/Black/White), Transparency, Auto scale by resolution	
Day & Night	Electrical	Auto(ICR) / Color / B/W / Schedule
Backlight Compensation	Off / BLC / HLC(Masking/Dimming) / WDR	
WDR	150dB (SLA-2M), 120dB (SLA-5M)	150dB
Contrast Enhancement	SSDR (Off / On)	
Digital Noise Reduction	SSNR5 (2D+3D noise filter) (Off / On)	
Digital Image Stabilization	Off / On	Off / On (Built-in gyro sensor)
Defog	Off / Auto / Manual	
Motion Detection	Off/ On(8ea, 8point Polygonal zones), Hand over	
Privacy Masking	Off / On (32ea, polygonal zones) - Color : Grey/Green/Red/Blue/Black/White - Mosaic	
Gain Control	Off / Low / Middle / High	
White Balance	ATW / AWC / Manual / Indoor / Outdoor((included Mercury & Sodium))	
Contrast	Level adjustment	
LDC	On/Off (5 levels with Min/Max)	-
Electronic Shutter Speed	Minimum / Maximum / Anti flicker (2 ~ 1/12,000sec)	
Digital Zoom	24x	32x
Flip / Mirror	On/Off, Hallway view : 90°/270°	On/Off
Video Analytics	Tampering, Loitering, Directional detection, Fog detection, Virtual line, Enter/Exit, Appear/Disappear, Face detection, Motion detection, Defocus detection	
Alarm I/O	Input 1ea / Output 2ea(Relay type)	
Alarm Triggers	Motion detection, Video analytics, Network disconnect	
Alarm events	File upload via FTP, E-Mail, Notification via E-Mail, Local storage(SD/SDHC/SDXC) recording at event triggers, External output	
Pixel Counter	Support	

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Test report No.:

KES-EI-18T0418-R1

Page (5) of (71)

Network	
Ethernet	RJ-45 (10/100/1000 BASE-T)
SFP	SFP slot(100/1000Mbps)
Video Compression Format	H.265/H.264 (MPEG-4 Part 10/AVC) : Main/Baseline/High, Motion JPEG
Resolution	[5MP] 2560x1920, 2560x1440, 1920x1080, 1600x1200, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 320x240
	[2MP] 1920x1080, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360, 320x240
Max. Framerate	H.265/H.264 : 2M Max. 60fps, 5M 30fps at all resolutions Motion JPEG : Max. 30fps
Smart Codec	Manual Mode (area-based : 5EA)
WiseStreamII	Support
Video Quality Adjustment	H.264 /H.265 / MJPEG : Target bitrate level control
Bitrate Control Method	H.264/H.265 : CBR or VBR MJPEG : VBR
Streaming Capability	Multiple Streaming (up to 10 profiles)
IP	IPv4, IPv6
Protocol	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
Security	HTTPS(SSL) Login Authentication, Digest Login Authentication, IP Address Filtering, User access Log, 802.1X Authentication (EAP-TLS, EAP-LEAP)
Streaming Method	Unicast / Multicast
Max. User Access	20 users at Unicast mode
Edge Storage	SD/SDHC/SDXC 5slot (Each CH)
	- Motion Images recorded in the SD/SDHC/SDXC memory card can be downloaded. - Local PC for Instant Recording
Application Programming Interface	ONVIF Profile S, SUNAPI(HTTP API)
Webpage Language	English, Korean, Chinese, French, Italian, Spanish, German, Japanese, Russian, Swedish, Portuguese, Czech, Polish, Turkish, Dutch, Hungarian, Greek
Web Viewer	Supported OS : Windows 7, 8.1, 10, Mac OS X 10.10, 10.11, 10.12
	Supported Browser : Google Chrome 67, MS Edge 41, Mozilla Firefox 61 (Windows 64bit only), Apple Safari 11 (Mac OS X only), MS Explorer 11
Central Management Software	Smartviewer, SSM
Environmental	
Operating Temperature / Humidity	-40°C ~ +55°C (-40°F ~ +131°F) / Less than 90% RH
Storage Temperature / Humidity	-50°C ~ +60°C (-58°F ~ +140°F) / Less than 90% RH
Ingress Protection	IP66
Vandal Resistance	IK10
Electrical	
Input Voltage / Current	HPoE
Power Consumption	Max. 65W
Mechanical	
Optional Lens	SLA-2M2400P / SLA-2M2800P / SLA-2M3600P / SLA-2M6000P
	SLA-5M3700P / 5M4600P / 5M7000P
Color / Material	Ivory / Metal
Dimension (WxHxD)	Ø 367.8 x 381.5mm (Ø 14.49" x 15.02")
Weight	7.05 kg (16.1 lb)

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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 ☐ 230Vac ☐ 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	PNM-9320VQP	-	Hanwha Techwin (Tianjin) Co., Ltd.	EUT
PoE Injector	PT-PSE109GBRO-AH	PT1824010157	Dongguan PROCET Network Technology Co.,Ltd	

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Notebook	NT730U3E	JJRE91CF200065A	Samsung Electronics Co., Ltd.	-
AC/DC Adaptor	PA-1600-66	AD-6019P	LITEON	-
2M LENS Module	SLA-2M6000P	-	Hanwha Techwin (Tianjin) Co., Ltd.	1 EA
5M LENS Module	SLA-5M3700P	-	Hanwha Techwin (Tianjin) Co., Ltd.	1EA
5M LENS Module	SLA-5M3700P	-	Hanwha Techwin (Tianjin) Co., Ltd.	1EA
5M LENS Module	SLA-5M3700P	-	Hanwha Techwin (Tianjin) Co., Ltd.	1EA



1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (EUT)	RJ-45 (PoE)	PoE Injector	RJ-45 (PoE)	3.0	U
	40 PIN	2M LENS Module	40 PIN	-	-
	40 PIN	5M LENS Module	40 PIN	-	-
	40 PIN	5M LENS Module	40 PIN	-	-
	40 PIN	5M LENS Module	40 PIN	-	-
PoE Injector	RJ-45 (LAN)	Notebook	RJ-45 (LAN)	3.0	U

* Unshielded=U, Shielded=S

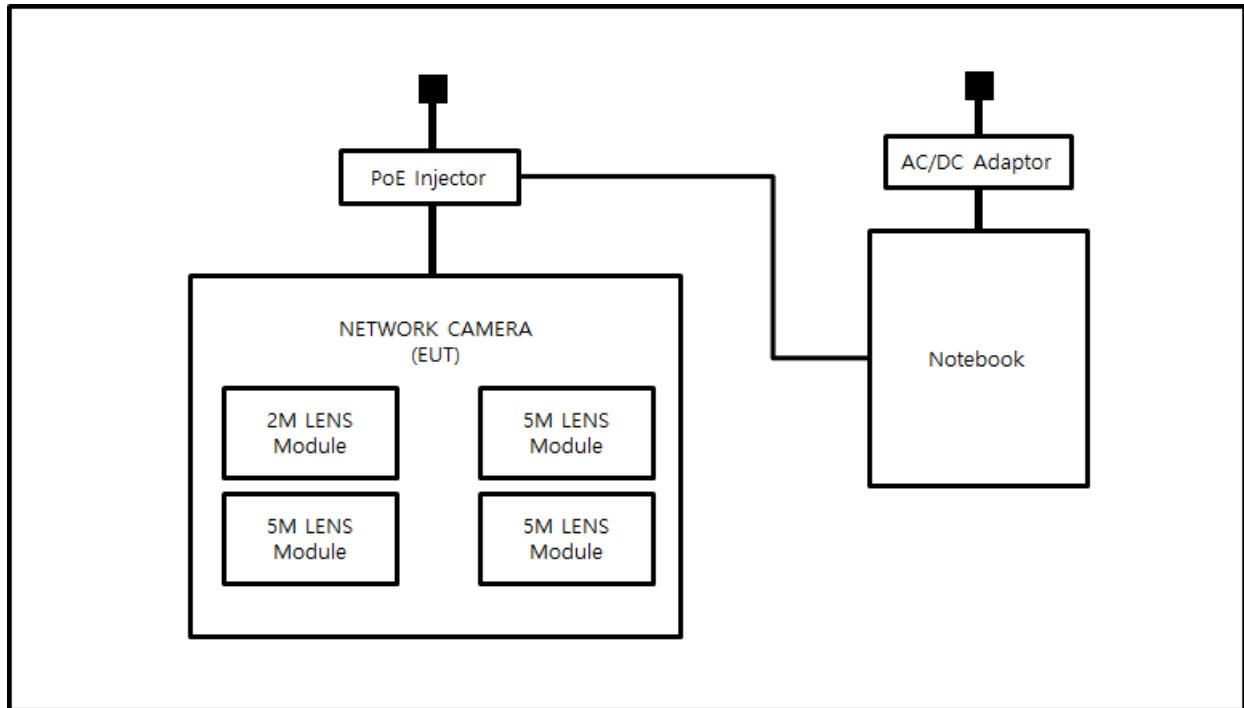
1.7 EUT Operating Mode(s)

Test Mode	operating
PoE	EUT Monitoring, Ping Test

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

1.8 Configuration

■ AC Main
□ DC Main



1.9 Remarks when standards applied

N/A

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-Aechoic 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-Aechoic Chamber , and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KT489
USA	FCC	3 m & 10 m Semi-Aechoic Chamber, 10 m Open Area and Conducted test site to perform FCC Part 15/18 measurements.	 KR0100
Canada	ISED	3 m & 10 m Semi-Aechoic 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-4308, C-4798, T-2311, G-914
Europe	TÜV SÜD	EMI (3 m & 10 m Semi-Aechoic Chamber , 10 m Open Area and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 CARAT 17 07 01633 001

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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

☐ Group 2

☐ Class A

☐ 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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Test report No.:
KES-E1-18T0418-R1
Page (11) of (71)

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- | | | |
|---|----------------------------------|----------------------------------|
| ☐ VCCI V-3 / 2015.04 | ☐ Class A | ☐ Class B |
| ☐ AS/NZS CISPR22:2009 +A1:2010 | ☐ Class A | ☐ Class B |
| ☐ 47 CFR Part 15, Subpart B | | |
| ☐ CISPR 22:2009 +A1:2010 | ☐ Class A | ☐ Class B |
| ☐ ANSI C63.4-2009 | | |
| ☐ IC Regulation ICES-003 : 2016 | | |
| ☐ CAN/CSA CISPR 22-10 | ☐ Class A | ☐ Class B |
| ☐ ANSI C63.4-2014 | | |
| ☐ RE- Directive 2014/53/EU | | |
| ☐ EN 301 489-1 V1.9.2 | | |
| ☐ Equipment for fixed use | | |
| ☐ Equipment for vehicular use | | |
| ☐ Equipment for portable use | | |
| ☐ EN 301 489-3 V1.6.1 | | |
| ☐ EN 301 489-17 V2.2.1 | | |
| ☐ EN 60945:2002 | | |

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2.1 Conducted Emissions at Mains Power Ports

Test Date

Jul. 05, 2018

Test Location

Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EMC32	R & S	9.12.00	-
☒	EMI TEST RECEIVER	ESR3	R & S	101781	04, 25, 2019
☒	LISN	ENV216	R & S	101787	01, 31, 2019
☒	LISN	ESH2-Z5	R & S	100450	04, 25, 2019
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 27, 2018
☐	LISN	NNBM8124	SCHWARZBECK	8124-1002	08, 07, 2018
☐	LISN	NNBM8124	SCHWARZBECK	8124-1003	08, 07, 2018

Test Conditions

Temperature: 23,1 °C
Relative Humidity: 53,7 % 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.

2.2 Conducted Emissions at Telecommunication Ports

Test Date

Jul. 05, 2018

Test Location

Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EMC32	R & S	9.12.00	-
☒	EMI TEST RECEIVER	ESR3	R & S	101781	04, 25, 2019
☒	LISN	ENV216	R & S	101787	01, 05, 2019
☒	LISN	ESH2-Z5	R & S	100450	04, 25, 2019
☐	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 27, 2018
☒	8-WIRE ISN CAT3,5	ENY81	R & S	100174	01, 07, 2019
☒	8-WIRE ISN CAT6	ENY81-CAT6	R & S	101665	01, 07, 2019
☐	ISN	ISN S8	SCHWARZBECK	ISN-S8-0019	05, 09, 2019
☐	CDN	CDNS502A	TESEQ	40431	01, 05, 2019

Test Conditions

Temperature: 23,1 °C
Relative Humidity: 53,7 % 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

Jul. 07, 2018

Test Location

☐ OPEN AREA TEST SITE #2

☒ SEMI ANECHOIC CHAMBER #4(10m)

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESU26	R & S	100551	04, 11, 2019
☒	AMPLIFIER	SCU 01	R & S	100603	11, 27, 2018
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	714	11, 28, 2018

Test Conditions

Temperature: 24,3 °C

Relative Humidity: 52,7 % 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

Jul. 07, 2018

Test Location

SEMI ANECHOIC CHAMBER #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESR7	R & S	101190	08, 07, 2018
☒	PREAMPLIFIER	8449B	AGILENT	3008A01967	05, 31, 2019
☐	ATTENUATOR	8491A	HP	35496	03, 21, 2019
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	05, 02, 2019

Test Conditions

Temperature: 25,7 °C
Relative Humidity: 51,8 % 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

Jul. 06, 2018

Test Location

Electro wave Shieldroom #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	dpa.control	EM TEST	5.4.11.0	-
☒	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	08, 09, 2018
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: 22,9 °C
Relative Humidity: 51,6 % 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

Jul. 06, 2018

Test Location

Electro wave Shieldroom #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	dpa.control	EM TEST	5.4.11.0	-
☒	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	08, 08, 2018
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: 22,9 °C
Relative Humidity: 51,6 % 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

Jul. 10, 2018

Test Location

EMS-ESD: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	ESD SIMULATOR	ESS-2000	Noise Ken	ESS01Z0454	10, 11, 2018
☒	HCP	-	KES	-	-
☒	VCP	-	KES	-	-

Test Conditions

Temperature: 24,7 °C
Relative Humidity: 54,5 % R.H.
Atmospheric Pressure: 100,2 kPa

Test Specifications

Discharge Factor: ≥ 1 s

Discharge Impedance: 330 ohm / 150 pF

Kind of Discharge: Air, Contact (direct and indirect)

Polarity: Positive and Negative

Number of Discharge: 10 at all locations for Air discharge
10 at all locations for Contact discharge

Discharge Voltage:	Contact ☐ 2 kV ☐ 4 kV ☒ 6 kV ☐ 8 kV ☐ 15 kV	Air ☒ 2 kV ☒ 4 kV ☐ 6 kV ☒ 8 kV ☐ 15 kV	HCP ☐ 2 kV ☐ 4 kV ☒ 6 kV ☐ 8 kV ☐ 15 kV	VCP ☐ 2 kV ☐ 4 kV ☒ 6 kV ☐ 8 kV ☐ 15 kV
--------------------	---	---	---	---

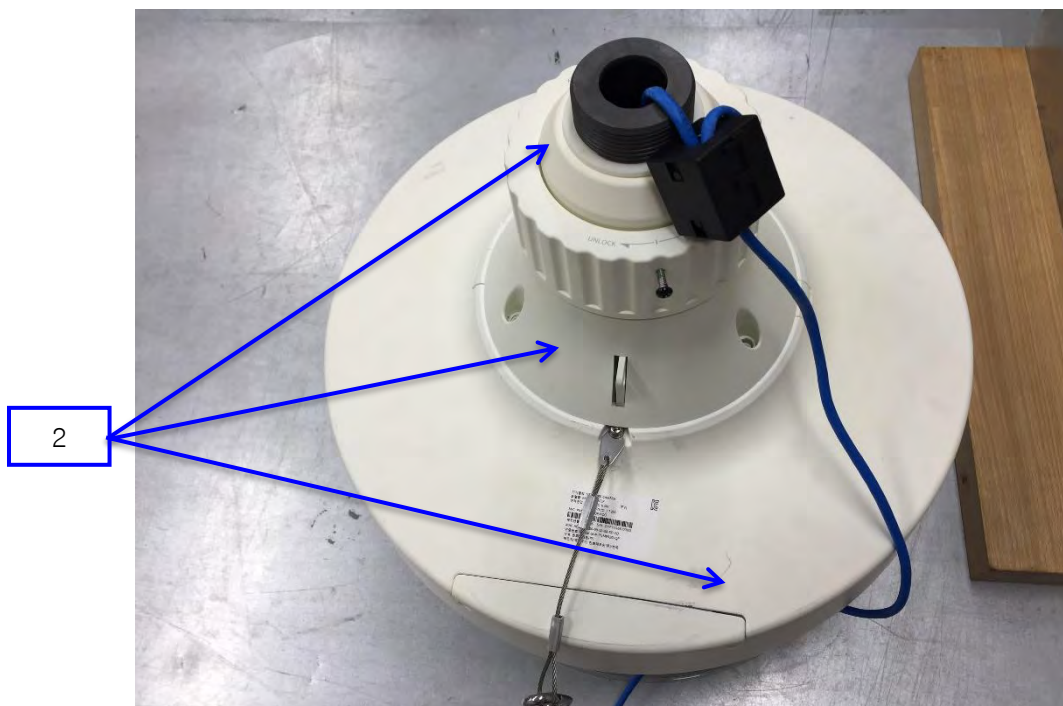
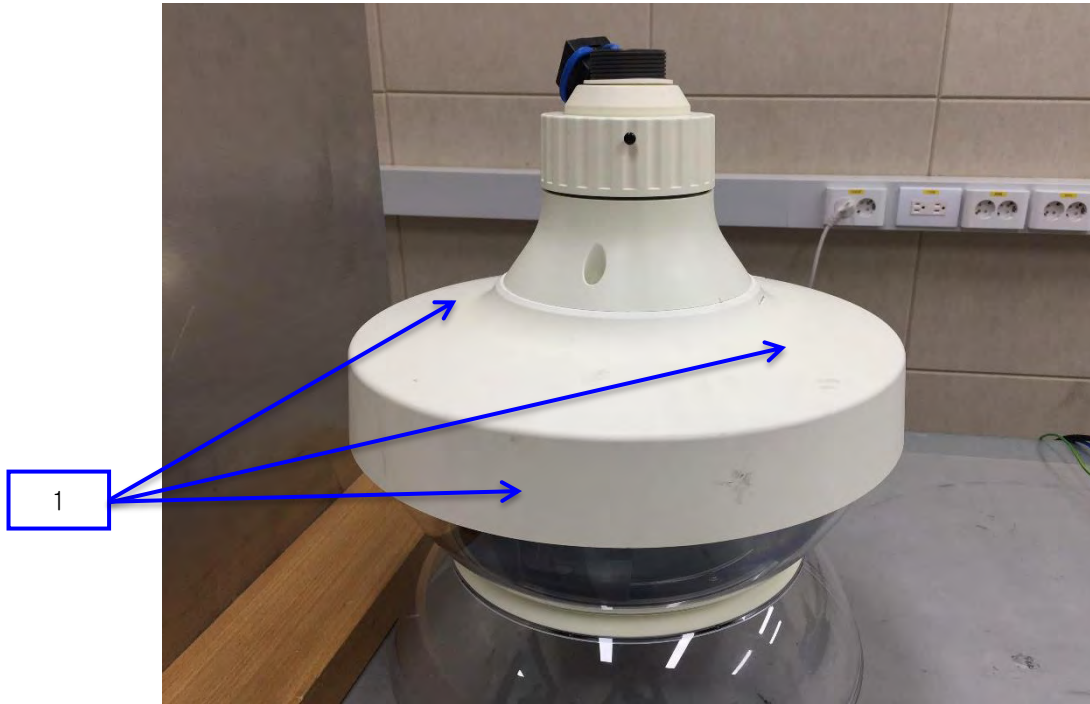
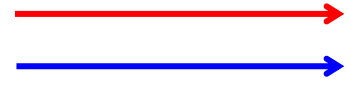
Notes: HCP: Horizontal coupling plane

VCP: Vertical coupling plane

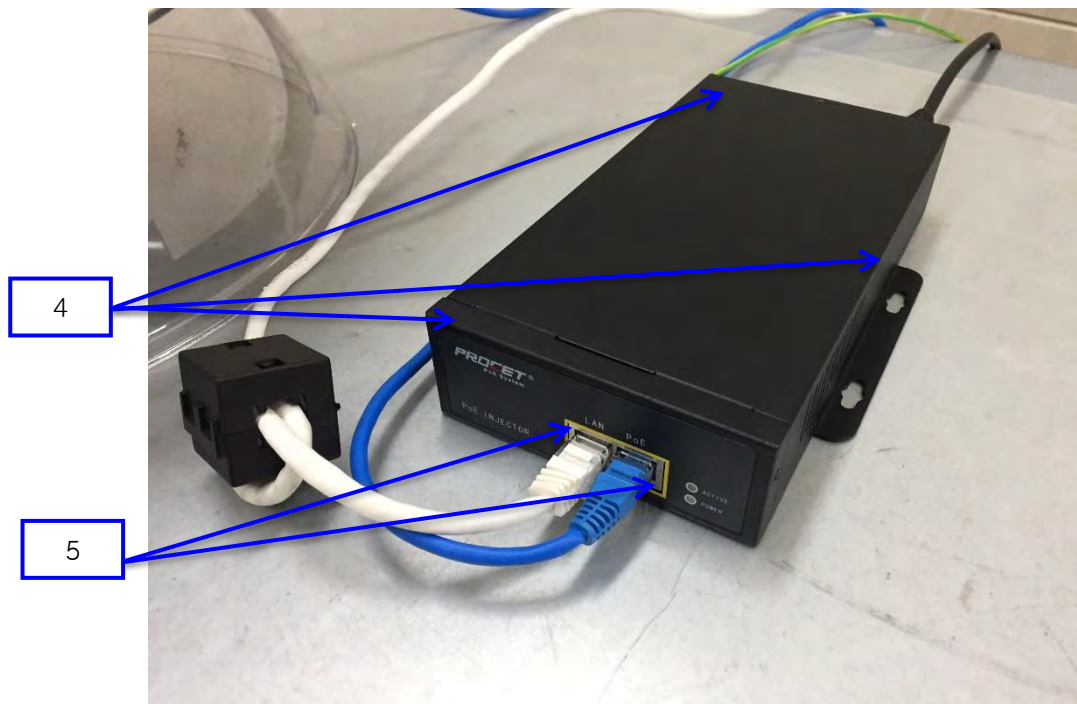
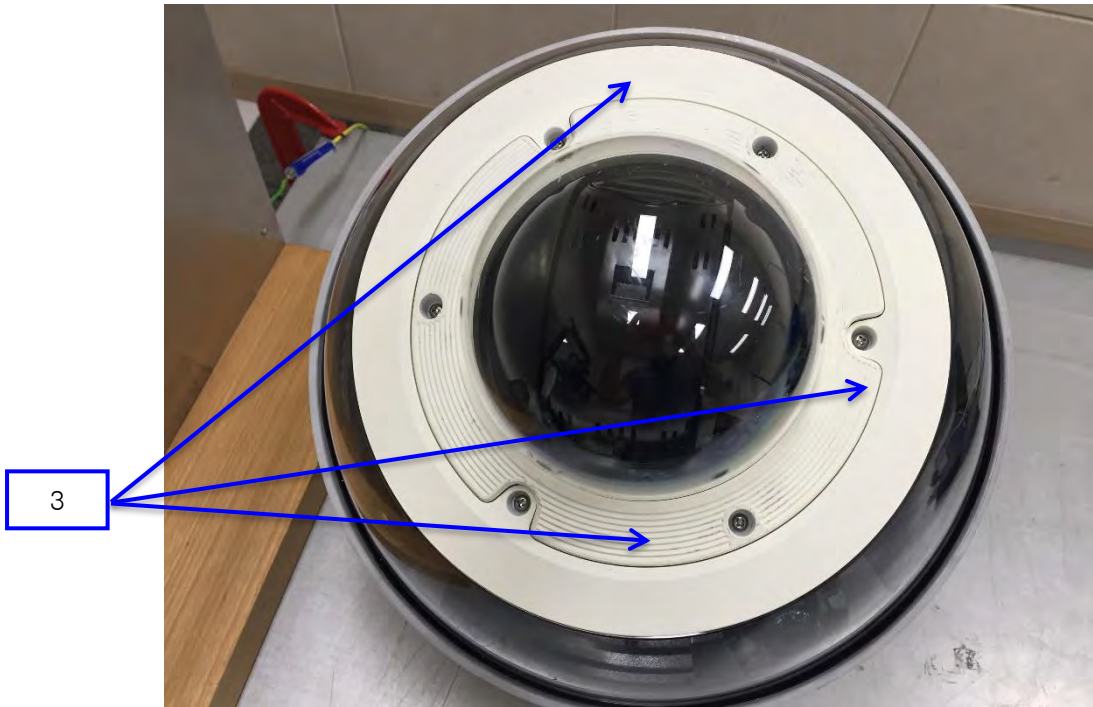
Required Performance Criteria: ☒ Complied

Location of Discharge:

Air
Contact



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Test report No.:

KES-E1-18T0418-R1

Page (24) of (71)

Test Data

Indirect Discharge

No.	Test Point	Discharge Method	Observations	Remarks
1	HCP Contact	Contact Discharge	Complied	-
2	VCP Contact	Contact Discharge	Complied	-

Direct Discharge

No.	Test Point	Discharge Method	Observations	Remarks
1	Camera enclosure	Contact Discharge	Complied	-
2	Camera enclosure	Contact Discharge	Complied	-
3	Camera enclosure	Contact Discharge	Complied	-
4	PoE enclosure	Contact Discharge	Complied	-
5	RJ-45 Port (LAN, PoE)	Contact Discharge	Complied	-
6	PoE enclosure	Contact Discharge	Complied	-

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

Test Results

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

RemarksN/A

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3.2 Radiated Electric Field Immunity

Reference Standard

EN 61000-4-3:2006 +A2:2010

Test Date

Jul. 09, 2018

Test Location

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

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	EMC32	R & S	10.10.02	-
☒	SIGNAL GENERATOR	SMB 100A	R & S	177586	08, 07, 2018
☒	BROADBAND AMPLIFIER	BBA100	R & S	101239	08, 07, 2018
☒	BROADBAND AMPLIFIER	100S1G6M1	AR	579931	08, 07, 2018
☒	POWER METER	NRP2	R & S	103475	08, 07, 2018
☒	AVG POWER SENSOR	NRP-Z91	R & S	102526	08, 07, 2018
☒	AVG POWER SENSOR	NRP-Z91	R & S	102527	08, 07, 2018
☒	STACKED DOUBLE LOG-PER- ANTENNA	STPL9128 E	Schwarzbeck	9128ES-121	-
☒	DIRECTIONAL COUPLER	KYDC-D1070-DX40	KY TELECOM	KY150001	08, 07, 2018
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM, INC	781	05, 02, 2019

Test Conditions

Temperature: 23,2 °C
Relative Humidity: 58,4 % R.H.
Atmospheric Pressure: 100,6 kPa



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 report No.:

KES-E1-18T0418-R1

Page (27) of (71)

Test Data

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

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

Test Results

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

RemarksN/A

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3.3 Electrical Fast Transients/Bursts

Reference Standard

EN 61000-4-4:2012

Test Date

Jul. 10, 2018

Test Location

EMS-EFT: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	EM TEST	5.4.7	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	11, 27, 2018
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 27, 2018
☒	CAPACITIVE COUPLING CLAMP	HFK	EM TEST	P1633183115	11, 27, 2018

Test Conditions

Temperature: 24,7 °C
Relative Humidity: 54,5 % R.H.
Atmospheric Pressure: 100,2 kPa

Test Specifications

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

Test Data

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

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

☐ 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 (LAN)	Complied	Complied
RJ-45 (PoE)	Complied	Complied

Note: “Blank” = Not performed

Observations:

Complied – No degradation of function

Test Results

☒ PASS Required Performance Criteria

☐ NOT PASS Required Performance Criteria

Remarks

N/A



3.4 Surge Transients

Reference Standard

EN 61000-4-5:2014

Test Date

Jul. 10, 2018

Test Location

EMS-Surge: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	EM TEST	5.4.7	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	11, 27, 2018
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 27, 2018
☒	CDN	CNV 508N1	EM TEST	P1610176296	11, 28, 2018
☐	CDN	CNV 504N7.3	EM TEST	P1744207079	12, 18, 2018

Test Conditions

Temperature: 24,7 °C
Relative Humidity: 54,5 % R.H.
Atmospheric Pressure: 100,2 kPa



Test Specifications

AC Power Lines

Source Impedance: 12 ohm for common Mode and 2 ohm for differential Mode

Surge Amplitude :

Common Mode

☒ (0,5 / 1,0 / 2,0) kV

Differential Mode

☒ (0,5 / 1,0) kV

Number of Surges:

☒ 5 surges per angle

Angle:

☒ 0°, 90°, 180°, 270° (input a.c. power port)

Polarity:

☒ Positive & Negative

Repetition Rate:

☐ 1 surge per min ☒ 1 surge per 30 sec.

Required Performance Criteria: ☒ Complied

Other supply / Signal Lines

Source Impedance:

42 ohm for common Mode

Surge Amplitude:

Common Mode

☒ (0,5 / 1,0) kV

Number of Surges:

☒ 5 Surges

Polarity:

☒ Positive & Negative

Repetition Rate:

☒ 1 surge per min ☐ 1 surge per 30 sec.

Required Performance Criteria: ☒ Complied

**Test Data**☒ Line to Line – Differential Mode

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

☒ Line to Earth – Common Mode

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

Signal Lines☒ Line to Earth – Common Mode

Mode of Application	Observations	
	(+) Surge (kV)	(-) Surge (kV)
RJ-45 (LAN)	Complied	Complied
RJ-45 (PoE)	Complied	Complied

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

Test Results☒ PASS Required Performance Criteria☐ NOT PASS Required Performance Criteria**Remarks**N/A

3.5 Conducted Disturbance

Reference Standard

EN 61000-4-6:2014

Test Date

Jul. 05, 2018

Test Location

EMS-CS: Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	icd.control	EM TEST	5.3.11	-
☒	CONTINUOUS WAVE SIMULATOR	CWS 500N1.4	EM TEST	P1602169880	11, 27, 2018
☒	ATTENUATOR	ATT 6/80	EM TEST	P1614178148	11, 27, 2018
☒	CDN	CDN M016	TESEQ	43694	11, 27, 2018
☐	CDN	CDN M016	TESEQ	43697	11, 27, 2018
☒	CDN	CDN T800	TESEQ	42800	11, 27, 2018
☐	EM CLAMP	KEMZ 801A	TESEQ	44099	11, 28, 2018

Test Conditions

Temperature: 23,1 °C
Relative Humidity: 53,7 % R.H.
Atmospheric Pressure: 99,2 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

☒ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
L – N -PE	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
RJ-45 (PoE)	CDN	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

N/A



3.6 Voltage Dips and Short Interruptions

Reference Standard

EN 61000-4-11:2004

Test Date

Jul. 10, 2018

Test Location

EMS-Voltage dip: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	EM TEST	5.4.7	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	11, 27, 2018
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 27, 2018

Test Conditions

Temperature: 24,7 °C
Relative Humidity: 54,5 % R.H.
Atmospheric Pressure: 100,2 kPa

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Test report No.:

KES-E1-18T0418-R1

Page (36) of (71)

Test Specifications & Observations/Remarks

(Test Voltage : 230 V (ac))

<u>Test Level</u>	<u>Duration [in period/ms (50 Hz)]</u>	<u>Results</u>
☒ 20 % dip	☒ 250 / 5 000	<u>Complied</u>
☒ 30 % dip	☒ 25 / 500	<u>Complied</u>
☒ 60 % dip	☒ 10 / 200	<u>Complied</u>
☒ 100 % dip	☒ 250 / 5 000	<u>Complied</u>

- Voltage variations

☒ Unom + 10 %	☒ 253.0 V (ac)	<u>Complied</u>
☒ Unom - 15 %	☒ 195.5 V (ac)	<u>Complied</u>

Observations:

Complied – No degradation of function

Test Results

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

RemarksPASS Required Performance Criteria.

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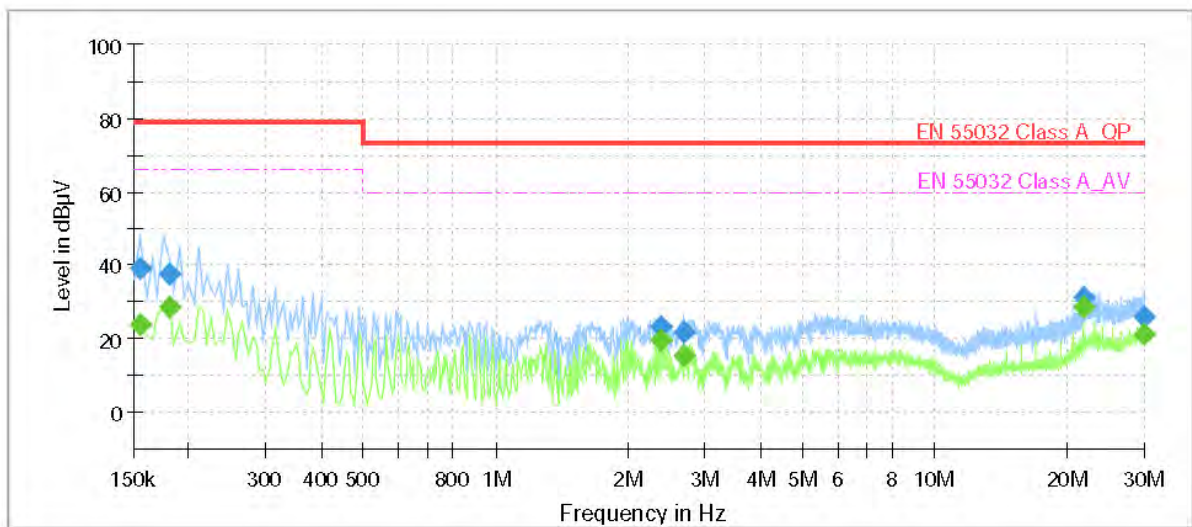
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

[HOT]

Common Information

Test Description:	Conducted Emission
Model No.:	PNM-9320VQP
Mode	H
Operator Name:	KES



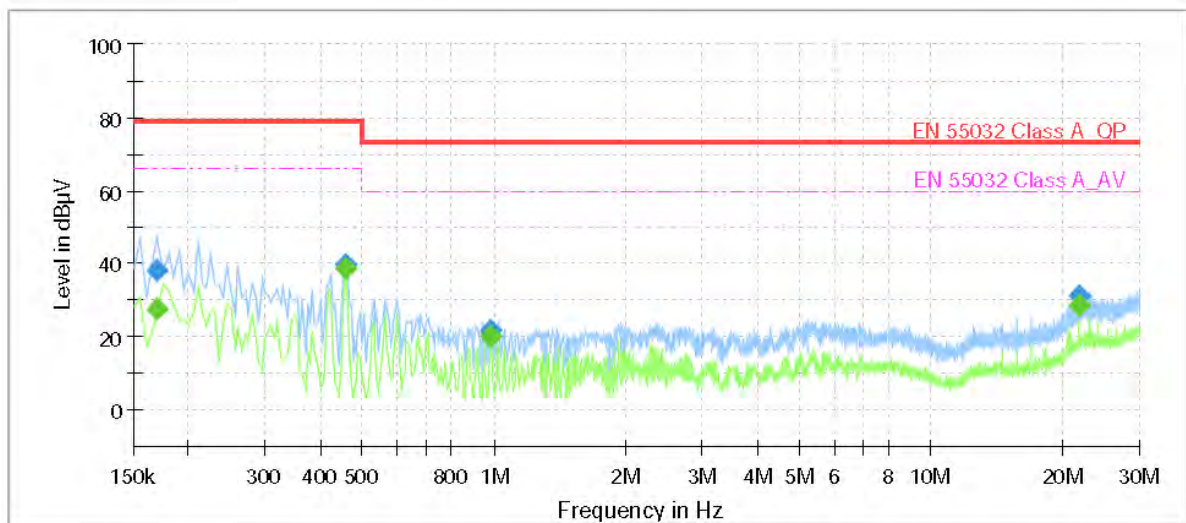
Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	23.66	66.00	42.34	1000.0	9.000	L1	19.3
0.155000	39.15	---	79.00	39.85	1000.0	9.000	L1	19.3
0.180000	---	28.73	66.00	37.27	1000.0	9.000	L1	19.3
0.180000	37.48	---	79.00	41.52	1000.0	9.000	L1	19.3
2.385000	---	19.83	60.00	40.17	1000.0	9.000	L1	20.1
2.385000	23.15	---	73.00	49.85	1000.0	9.000	L1	20.1
2.690000	---	15.26	60.00	44.74	1000.0	9.000	L1	20.1
2.690000	21.68	---	73.00	51.32	1000.0	9.000	L1	20.1
21.795000	---	28.69	60.00	31.31	1000.0	9.000	L1	20.4
21.795000	31.40	---	73.00	41.60	1000.0	9.000	L1	20.4
29.900000	---	20.99	60.00	39.01	1000.0	9.000	L1	20.6
29.900000	25.76	---	73.00	47.24	1000.0	9.000	L1	20.6

[NEUTRAL]

Common Information

Test Description: Conducted Emission
Model No.: PNM-9320VQP
Mode: N
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.170000	---	27.76	66.00	38.24	1000.0	9.000	N	19.3
0.170000	38.38	---	79.00	40.62	1000.0	9.000	N	19.3
0.455000	---	38.43	66.00	27.57	1000.0	9.000	N	19.6
0.455000	39.70	---	79.00	39.30	1000.0	9.000	N	19.6
0.985000	---	20.11	60.00	39.89	1000.0	9.000	N	20.0
0.985000	21.61	---	73.00	51.39	1000.0	9.000	N	20.0
21.795000	---	28.71	60.00	31.29	1000.0	9.000	N	20.4
21.795000	31.24	---	73.00	41.76	1000.0	9.000	N	20.4

◆ 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))

Conducted Emissions at Telecommunication Ports

■ LAN MODE

[10 Mbps]

Common Information

Test Description:

Telecommunication Emission

Model No.:

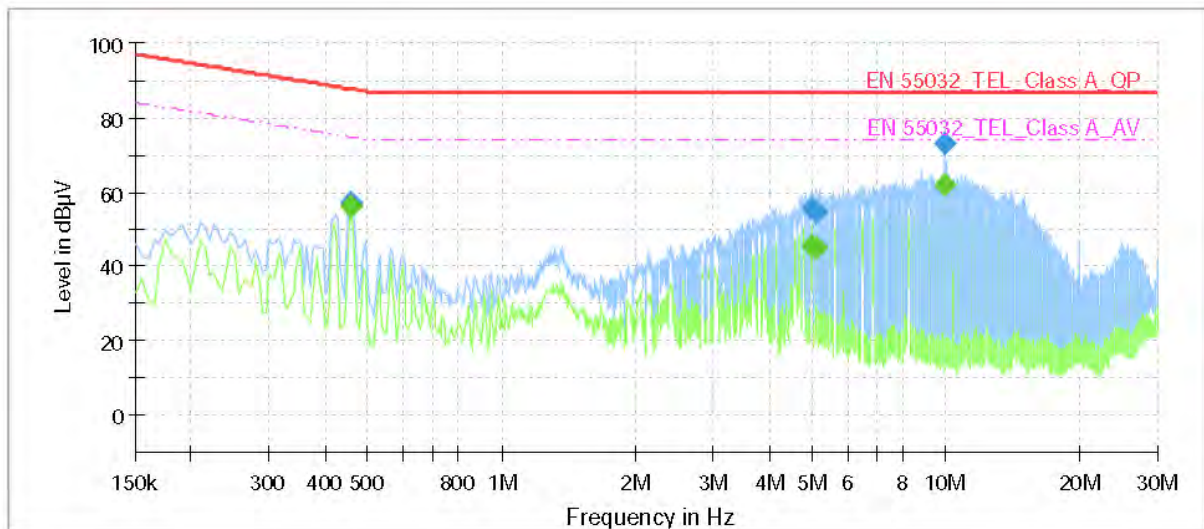
PNM-9320VQP

Mode

LAN , TEL 10 Mbps

Operator Name:

KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.455000	---	55.94	74.78	18.84	1000.0	9.000	Single Line	19.4
0.455000	56.97	---	87.78	30.81	1000.0	9.000	Single Line	19.4
5.020000	---	45.44	74.00	28.56	1000.0	9.000	Single Line	19.4
5.020000	55.33	---	87.00	31.67	1000.0	9.000	Single Line	19.4
5.100000	---	44.94	74.00	29.06	1000.0	9.000	Single Line	19.3
5.100000	54.40	---	87.00	32.60	1000.0	9.000	Single Line	19.3
10.000000	---	61.98	74.00	12.02	1000.0	9.000	Single Line	19.6
10.000000	72.77	---	87.00	14.23	1000.0	9.000	Single Line	19.6

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[1 000 Mbps]

Common Information

Test Description:

Model No.:

Mode

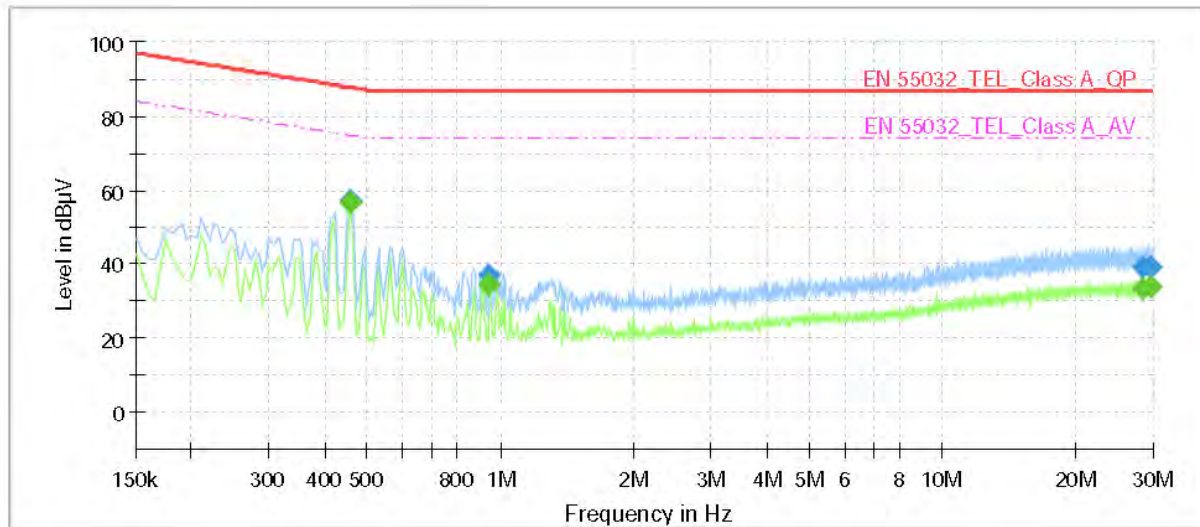
Operator Name:

Telecommunication Emission

PNM-9320VQP

LAN , TEL 1 000 Mbps

KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.455000	---	56.58	74.78	18.20	1000.0	9.000	Single Line	19.6
0.455000	57.42	---	87.78	30.36	1000.0	9.000	Single Line	19.6
0.945000	---	34.65	74.00	39.35	1000.0	9.000	Single Line	19.9
0.945000	37.25	---	87.00	49.75	1000.0	9.000	Single Line	19.9
28.485000	---	33.40	74.00	40.60	1000.0	9.000	Single Line	20.2
28.485000	39.08	---	87.00	47.92	1000.0	9.000	Single Line	20.2
29.630000	---	33.65	74.00	40.35	1000.0	9.000	Single Line	20.3
29.630000	39.23	---	87.00	47.77	1000.0	9.000	Single Line	20.3

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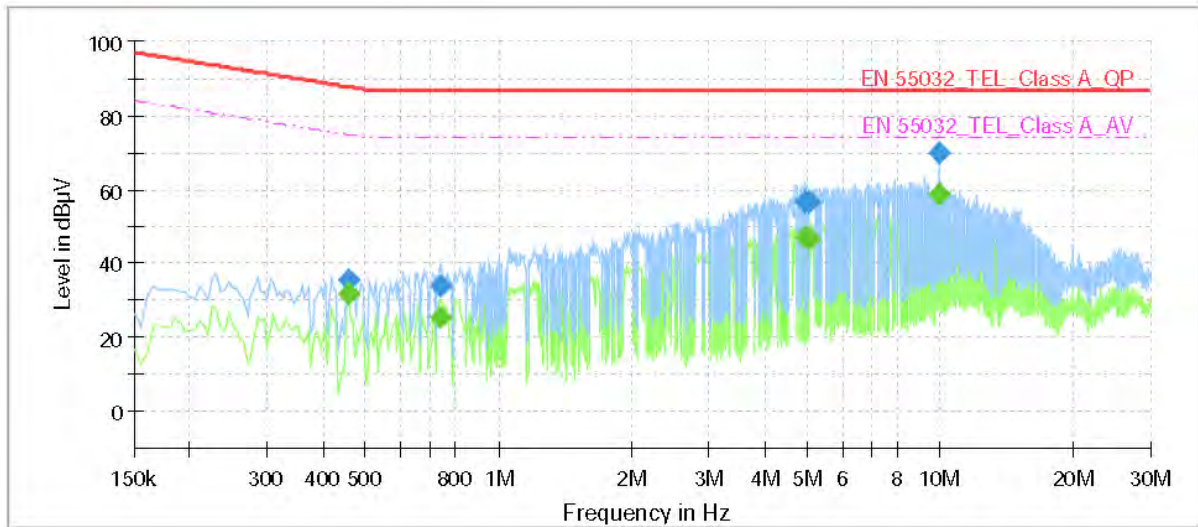
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■ PoE MODE
[10 Mbps]

Common Information

Test Description:
Model No.:
Mode
Operator Name:

Telecommunication Emission
PNM-9320VQP
PoE , TEL 10 Mbps
KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.455000	---	31.68	74.78	43.10	1000.0	9.000	Single Line	19.4
0.455000	35.68	---	87.78	52.10	1000.0	9.000	Single Line	19.4
0.740000	---	25.22	74.00	48.78	1000.0	9.000	Single Line	19.6
0.740000	34.02	---	87.00	52.98	1000.0	9.000	Single Line	19.6
4.945000	---	46.89	74.00	27.11	1000.0	9.000	Single Line	19.4
4.945000	56.73	---	87.00	30.27	1000.0	9.000	Single Line	19.4
5.030000	---	46.63	74.00	27.37	1000.0	9.000	Single Line	19.4
5.030000	56.52	---	87.00	30.48	1000.0	9.000	Single Line	19.4
10.000000	---	58.71	74.00	15.29	1000.0	9.000	Single Line	19.6
10.000000	69.71	---	87.00	17.29	1000.0	9.000	Single Line	19.6

[1 000 Mbps]

Common Information

Test Description:

Model No.:

Mode

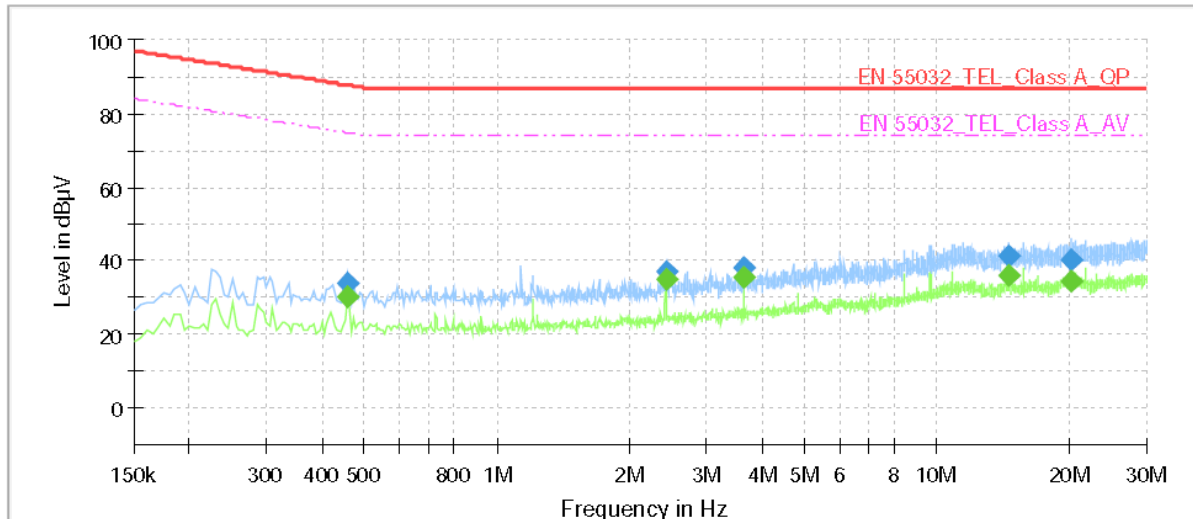
Operator Name:

Telecommunication Emission

PNM-9320VQP

PoE , TEL 1 000 Mbps

KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.455000	---	30.26	74.78	44.52	1000.0	9.000	Single Line	19.6
0.455000	34.06	---	87.78	53.72	1000.0	9.000	Single Line	19.6
2.420000	---	34.91	74.00	39.09	1000.0	9.000	Single Line	19.9
2.420000	37.26	---	87.00	49.74	1000.0	9.000	Single Line	19.9
3.630000	---	35.31	74.00	38.69	1000.0	9.000	Single Line	19.7
3.630000	37.93	---	87.00	49.07	1000.0	9.000	Single Line	19.7
14.520000	---	35.89	74.00	38.11	1000.0	9.000	Single Line	19.8
14.520000	41.48	---	87.00	45.52	1000.0	9.000	Single Line	19.8
20.255000	---	34.42	74.00	39.58	1000.0	9.000	Single Line	20.1
20.255000	40.17	---	87.00	46.83	1000.0	9.000	Single Line	20.1

◆ Calculation

$$\text{QuasiPeak [dBuV]} / \text{CAverage [dBuV]} = \text{Reading Value [dBuV]} + \text{Corr. [dB]}$$

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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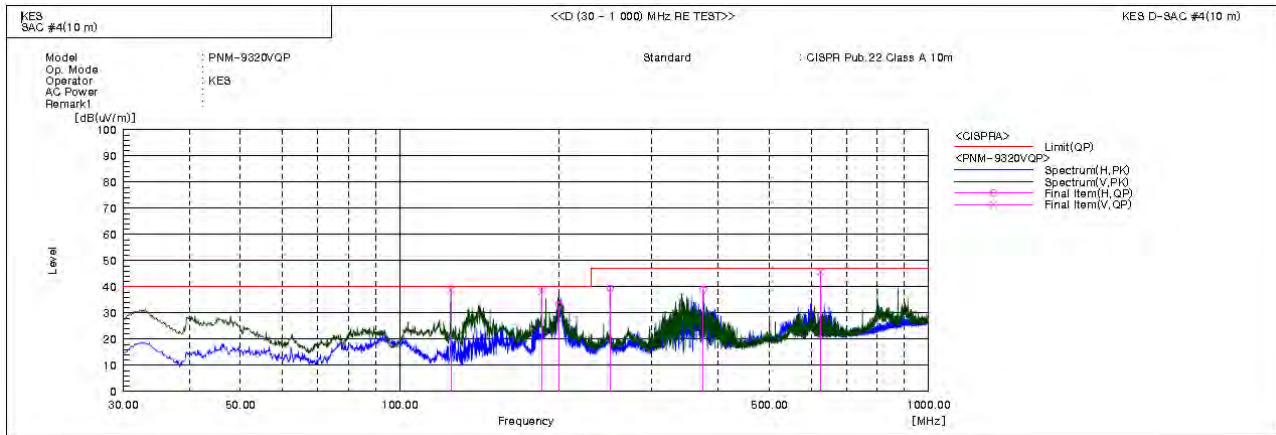
3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Test report No.:

KES-E1-18T0418-R1

Page (43) of (71)

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	124.997	V	70.8	-32.1	38.7	40.0	1.3	111.0	29.0	
2	185.614	V	67.8	-29.4	38.4	40.0	1.6	103.0	33.0	
3	199.996	H	60.5	-27.5	33.0	40.0	7.0	393.0	248.0	
4	249.996	H	65.9	-26.4	39.5	47.0	7.5	400.0	11.0	
5	374.984	H	61.4	-22.4	39.0	47.0	8.0	269.0	97.0	
6	624.980	V	61.5	-15.7	45.8	47.0	1.2	201.0	284.0	

◆ Calculation – SEMI ANECHOIC CHAMBER #4(10 m)

Result(QP) [dB(μ V/m)] = (Reading(QP)[dB(μ V)] + c.f[dB(1/m)])

Margin(QP)[dB] = Limit[dB(μ V/m)] - Result(QP) [dB(μ V/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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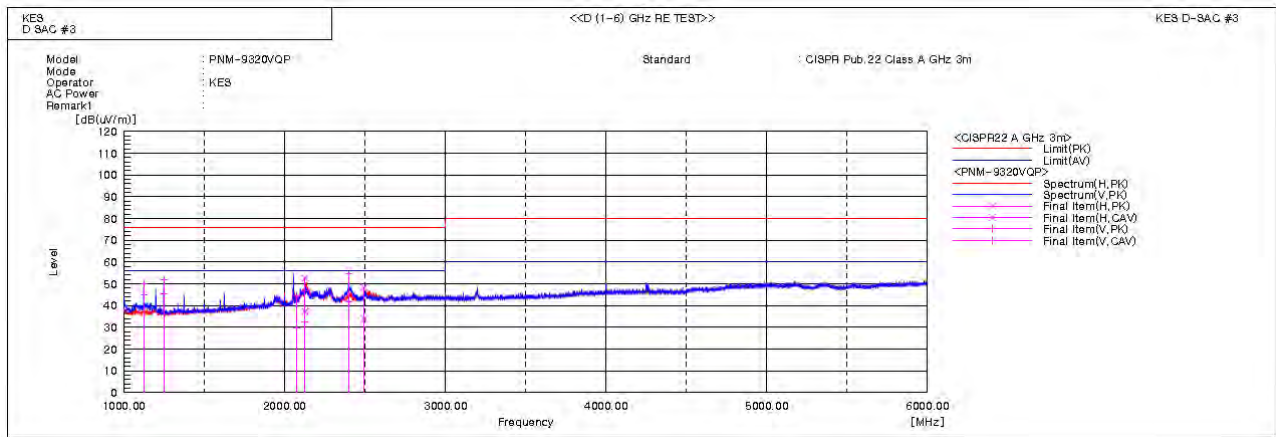
3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
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Test report No.:

KES-EI-18T0418-R1

Page (44) of (71)

Radiated Electric Field Emissions(Above 1 GHz)



Final Result

No.	Frequency (P) [MHz]	Reading PK [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Result CAV [dB(μV/m)]	Limit PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1124.970	V	56.3	-6.4	49.9	44.9	76.0	56.0	26.1	11.1	100.0	357.6	
2	1249.910	V	57.6	-5.8	51.8	45.3	76.0	56.0	24.2	10.7	100.0	134.8	
3	2075.596	V	44.6	-0.2	44.4	29.8	76.0	56.0	31.6	26.2	100.0	179.2	
4	2126.731	V	46.8	0.1	46.9	32.7	76.0	56.0	29.1	23.3	100.0	132.8	
5	2128.122	H	52.6	0.1	52.7	37.4	76.0	56.0	23.3	18.6	100.0	321.7	
6	2400.460	V	53.3	1.3	54.6	41.8	76.0	56.0	21.4	14.2	100.0	0.6	
7	2494.993	H	46.8	1.6	48.4	33.8	76.0	56.0	27.6	22.2	100.0	327.8	

◆ Calculation

Result(PK/CAV) [dB(μV/m)] = (Reading(PK/CAV)[dB(μV)] + c.f[dB(1/m)])

Margin(PK/CAV)[dB] = Limit[dB(μV/m)] - Result(PK/CAV) [dB(μV/m)]

Reading(PK/CAV) : Reading value, Result(PK/CAV) : Reading value + Factor value

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

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

Average harmonic current results				
Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	126.297E-3			
2	2.957E-3			PASS
3	117.906E-3	5.126	2.30	PASS
4	4.630E-3			PASS
5	113.336E-3	9.942	1.14	PASS
6	3.776E-3			PASS
7	107.054E-3	13.903	770.00E-3	PASS
8	3.816E-3			PASS
9	98.338E-3	24.585	400.00E-3	PASS
10	4.275E-3			PASS
11	88.965E-3	26.959	330.00E-3	PASS
12	3.402E-3			PASS
13	78.816E-3	37.532	210.00E-3	PASS
14	2.880E-3			PASS
15	67.698E-3	45.132	150.00E-3	PASS
16	2.341E-3			PASS
17	56.477E-3	42.673	132.35E-3	PASS
18	2.011E-3			PASS
19	45.221E-3	38.187	118.42E-3	PASS
20	1.637E-3			PASS
21	34.609E-3	21.535	160.71E-3	PASS
22	1.135E-3			PASS
23	25.573E-3	17.427	146.74E-3	PASS
24	918.480E-6			PASS
25	17.567E-3	13.013	135.00E-3	PASS
26	771.676E-6			PASS
27	10.585E-3	8.468	124.99E-3	PASS
28	791.662E-6			PASS
29	5.496E-3	4.722	116.39E-3	PASS
30	722.846E-6			PASS
31	2.707E-3			PASS
32	597.657E-6			PASS
33	3.072E-3			PASS
34	670.336E-6			PASS
35	4.576E-3			PASS
36	652.565E-6			PASS
37	5.138E-3	5.633	91.21E-3	PASS
38	717.151E-6			PASS
39	4.829E-3			PASS
40	716.531E-6			PASS

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.



Test Data - Harmonics (continued)

Maximum harmonic current results				
Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	126.527E-3			
2	3.614E-3			PASS
3	118.133E-3	3.424	3.45	PASS
4	5.134E-3	0.796	645.00E-3	PASS
5	113.546E-3	6.640	1.71	PASS
6	4.344E-3			PASS
7	107.287E-3	9.289	1.15	PASS
8	4.278E-3			PASS
9	98.551E-3	16.425	600.00E-3	PASS
10	4.707E-3			PASS
11	89.142E-3	18.009	495.00E-3	PASS
12	3.844E-3			PASS
13	79.025E-3	25.087	315.00E-3	PASS
14	3.288E-3			PASS
15	67.957E-3	30.203	225.00E-3	PASS
16	2.750E-3			PASS
17	56.696E-3	28.558	198.52E-3	PASS
18	2.361E-3			PASS
19	45.409E-3	25.564	177.63E-3	PASS
20	1.934E-3			PASS
21	34.753E-3	21.625	160.71E-3	PASS
22	1.392E-3			PASS
23	25.743E-3	17.543	146.74E-3	PASS
24	1.102E-3			PASS
25	17.763E-3	13.158	135.00E-3	PASS
26	991.545E-6			PASS
27	10.758E-3	8.606	124.99E-3	PASS
28	895.456E-6			PASS
29	5.644E-3	4.850	116.39E-3	PASS
30	813.955E-6			PASS
31	2.850E-3			PASS
32	688.731E-6			PASS
33	3.174E-3			PASS
34	739.611E-6			PASS
35	4.682E-3			PASS
36	739.945E-6			PASS
37	5.263E-3	5.770	91.21E-3	PASS
38	834.080E-6			PASS
39	4.933E-3			PASS
40	812.586E-6			PASS

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.

**KES Co., Ltd.**

3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
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Test report No.:

KES-E1-18T0418-R1

Page (47) of (71)

Test Data - Voltage Fluctuations

Maximum Flicker results

	EUT values	Limit	Result
Pst	0.028	1.00	PASS
Plt	0.028	0.65	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.069	4.00	PASS
Tmax [s]	0.000	0.50	PASS

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Test Setup Photos and Configuration

Conducted Voltage Emissions



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Conducted Telecommunication Emissions



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Radiated Electric Field Emissions(Below 1 GHz)



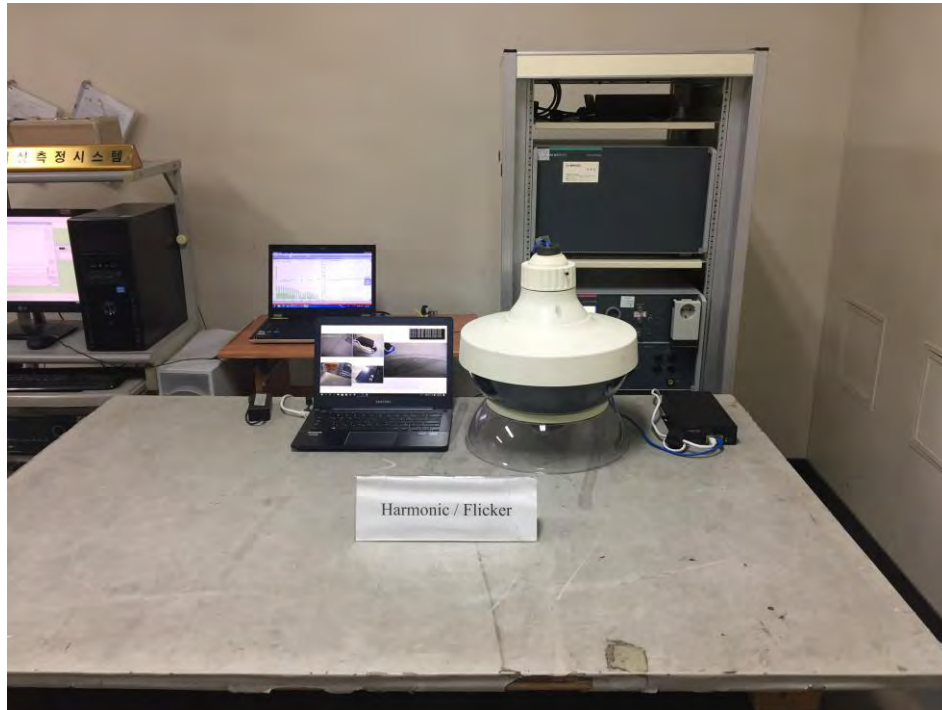
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Radiated Electric Field Emissions(Above 1 GHz)



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Harmonic Current Emissions and Voltage Fluctuations and Flicker



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Electrostatic Discharge

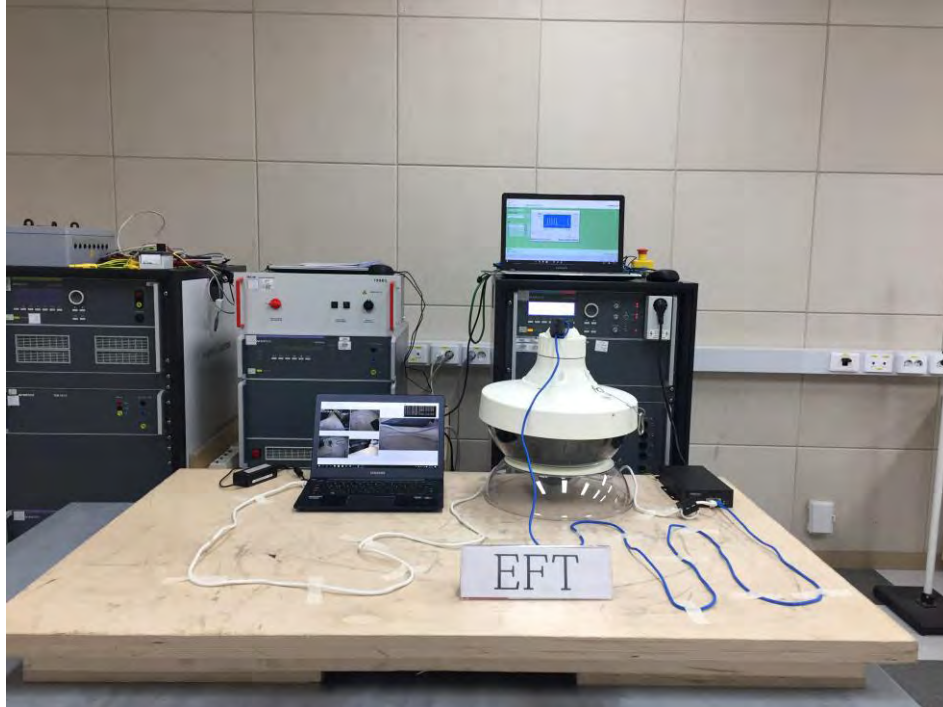


Radiated Electric Field Immunity



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Electrical Fast Transients/Bursts



Surge Transients



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Conducted Disturbance



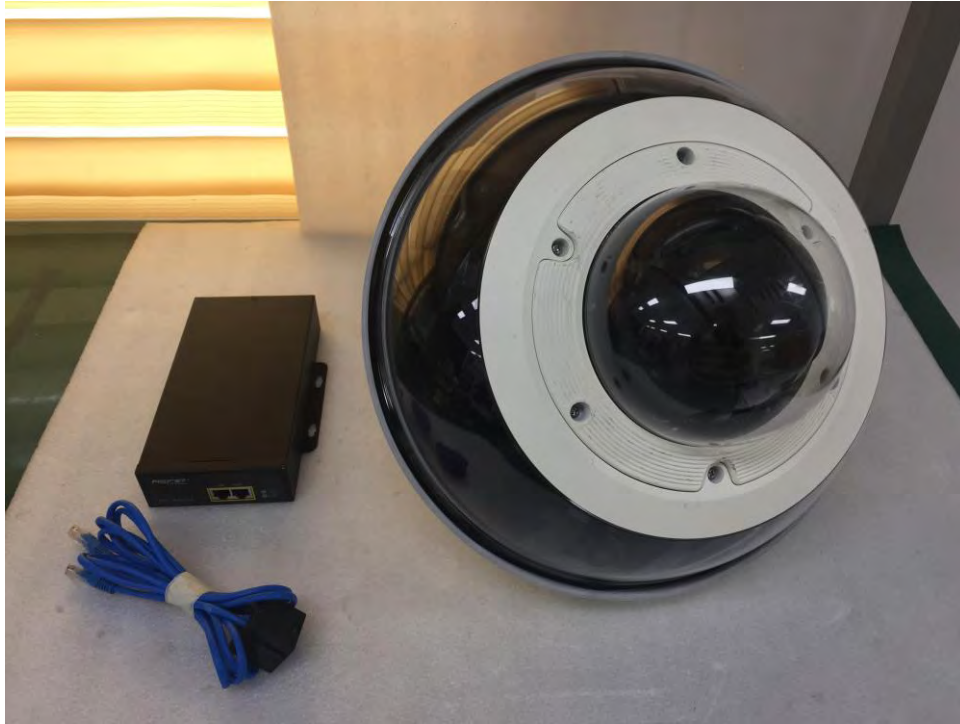
Voltage Dips and Short Interruptions



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EUT External Photographs

(Top)



(Bottom)



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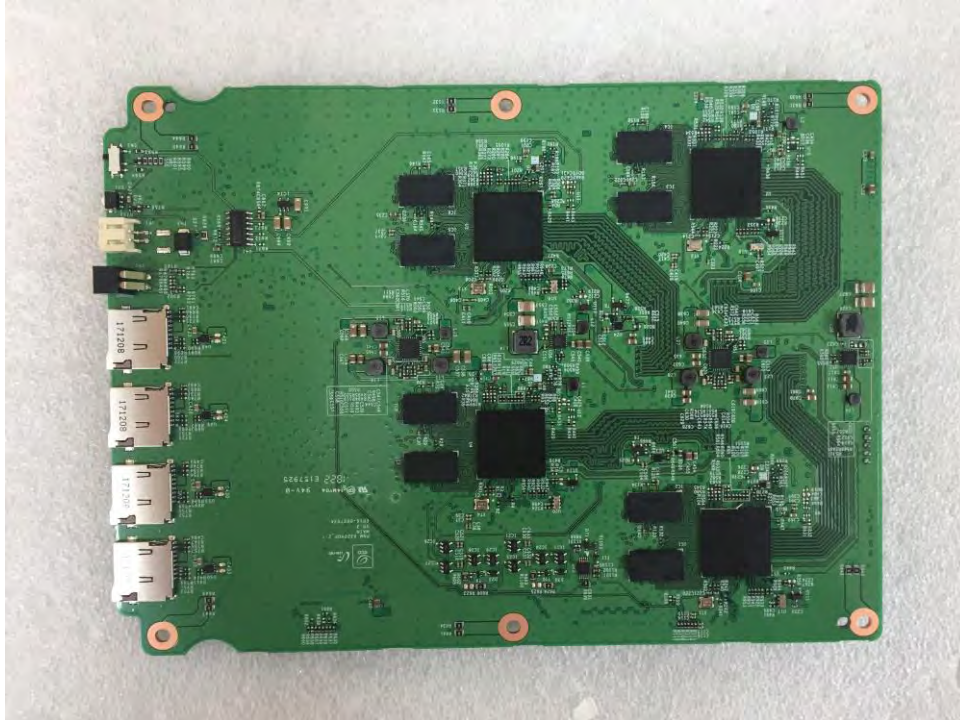
EUT Internal Photographs

(Internal View)

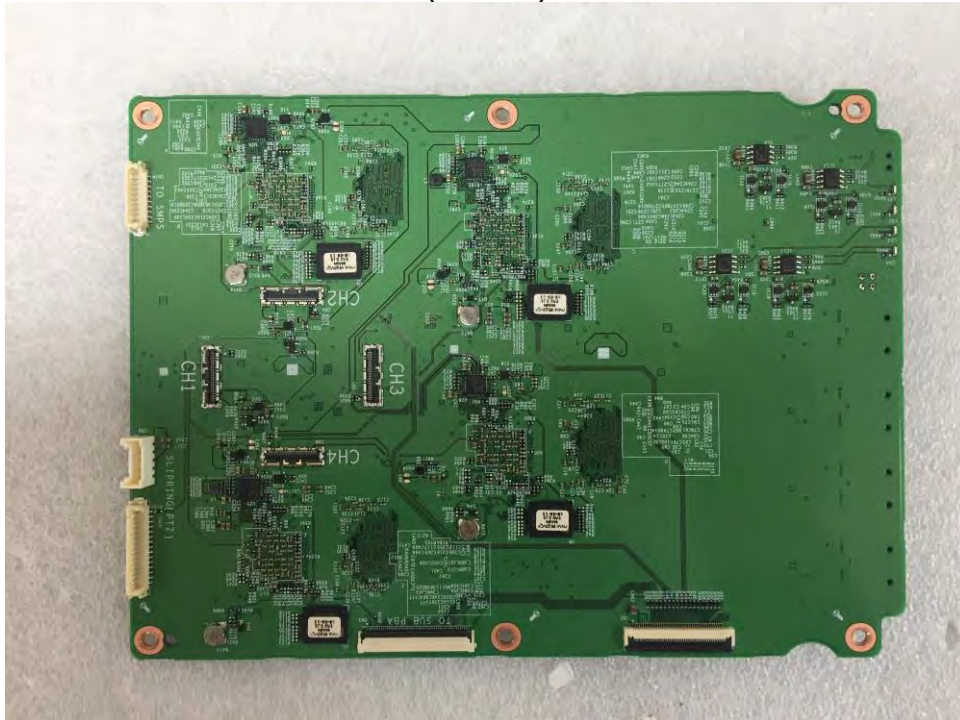


EUT Internal View – Main Board

(Top)



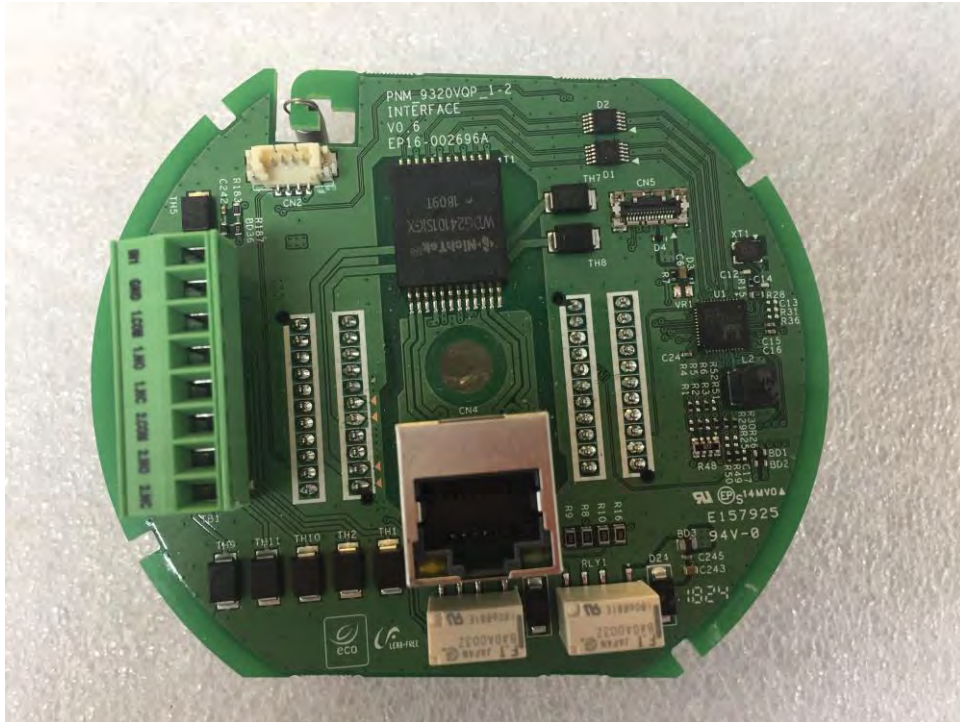
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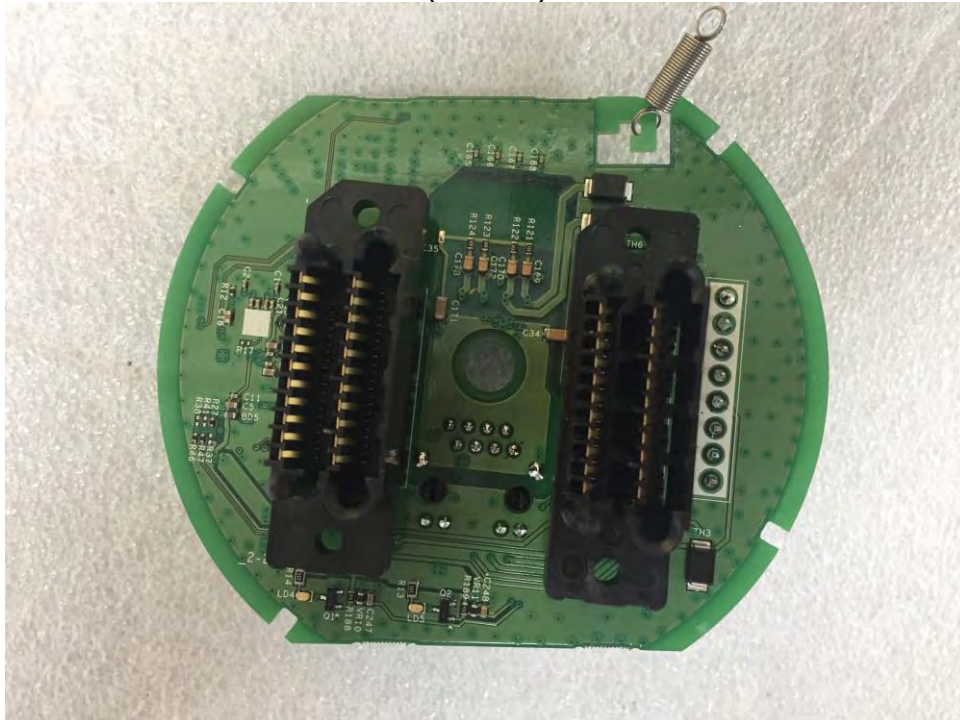
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EUT Internal View – SUB Board 1

(Top)



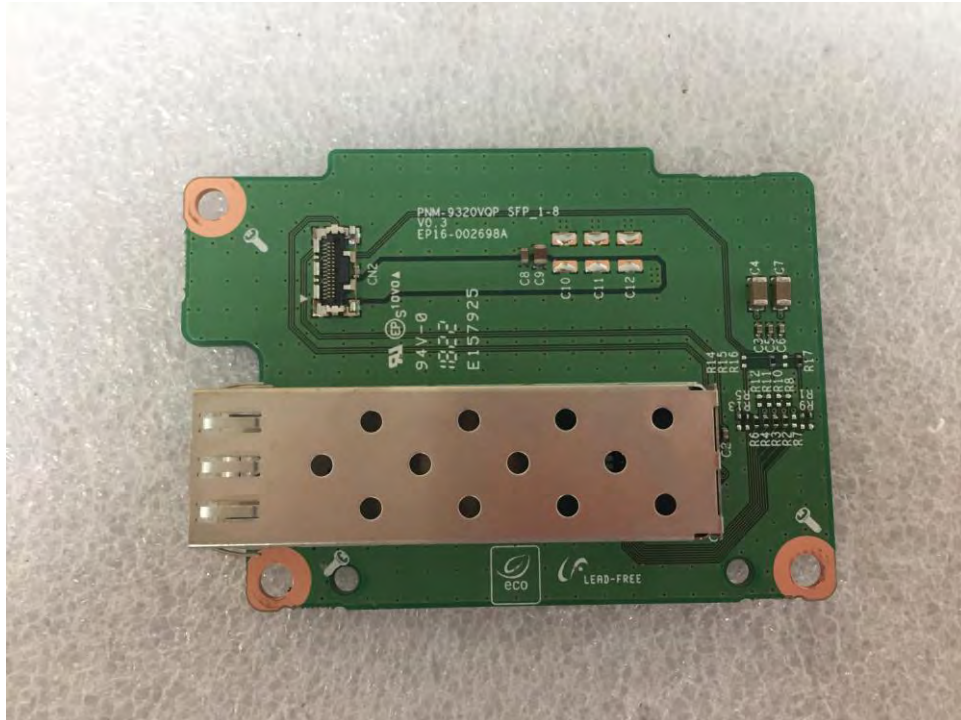
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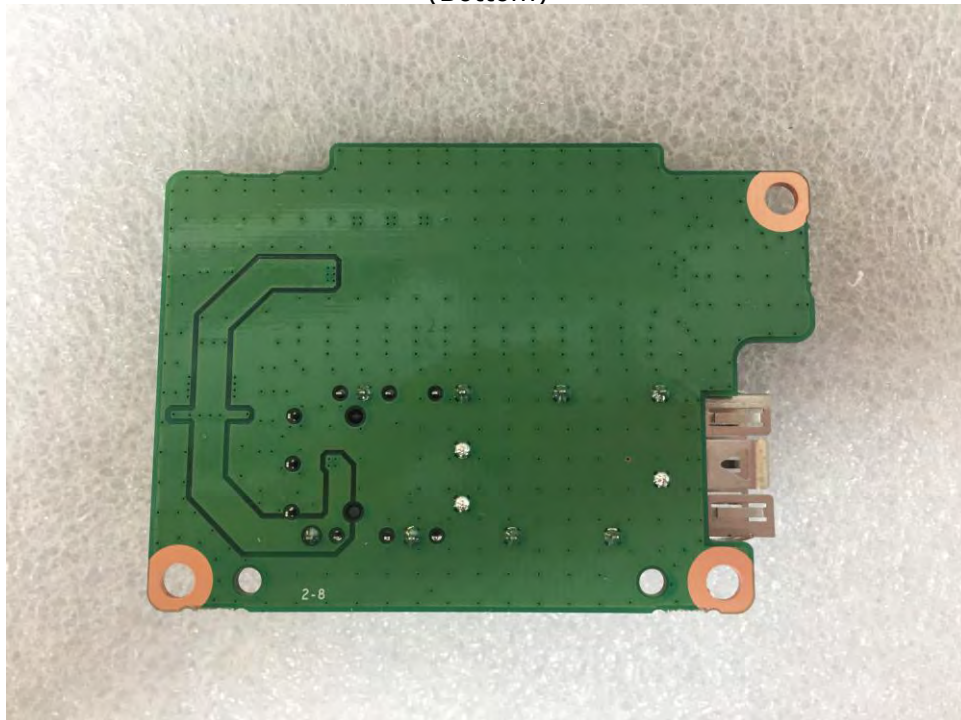
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EUT Internal View – SUB Board 2

(Top)



(Bottom)



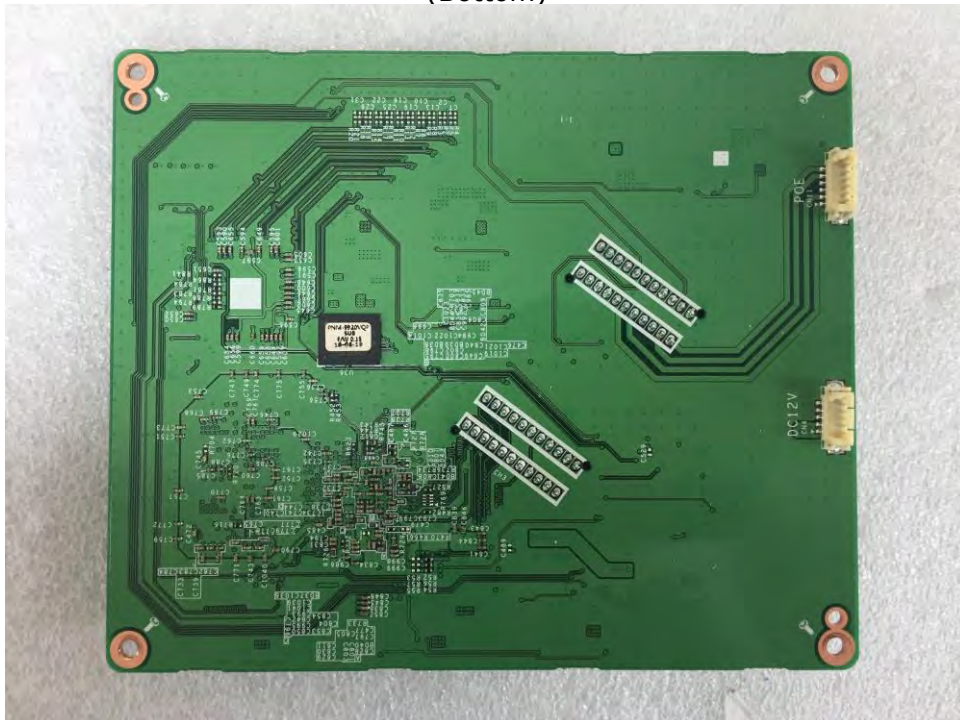
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EUT Internal View – SUB Board 3

(Top)



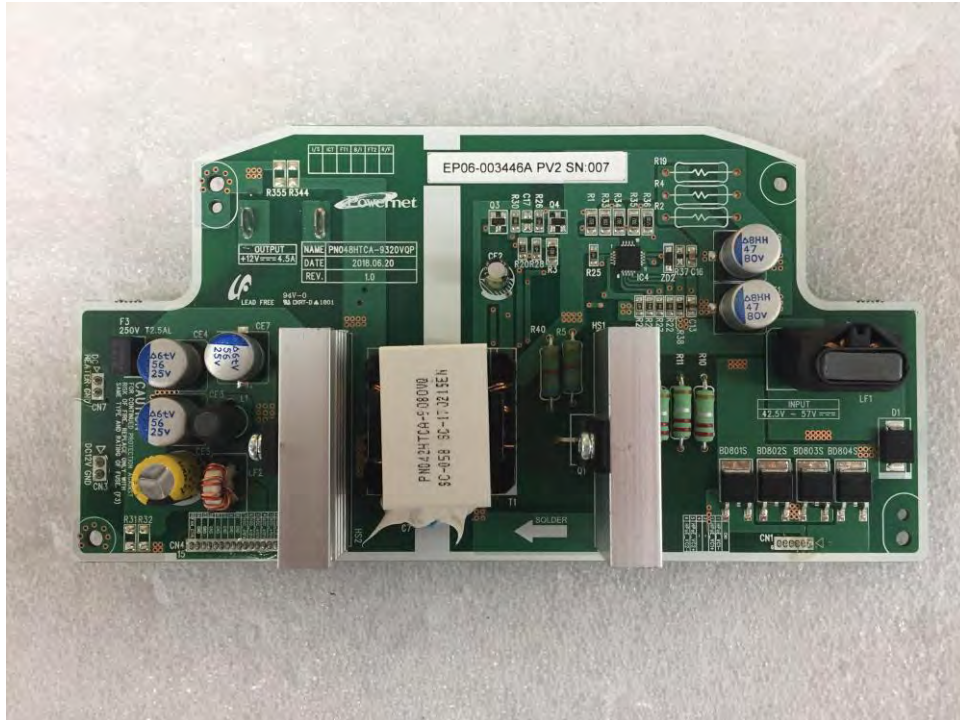
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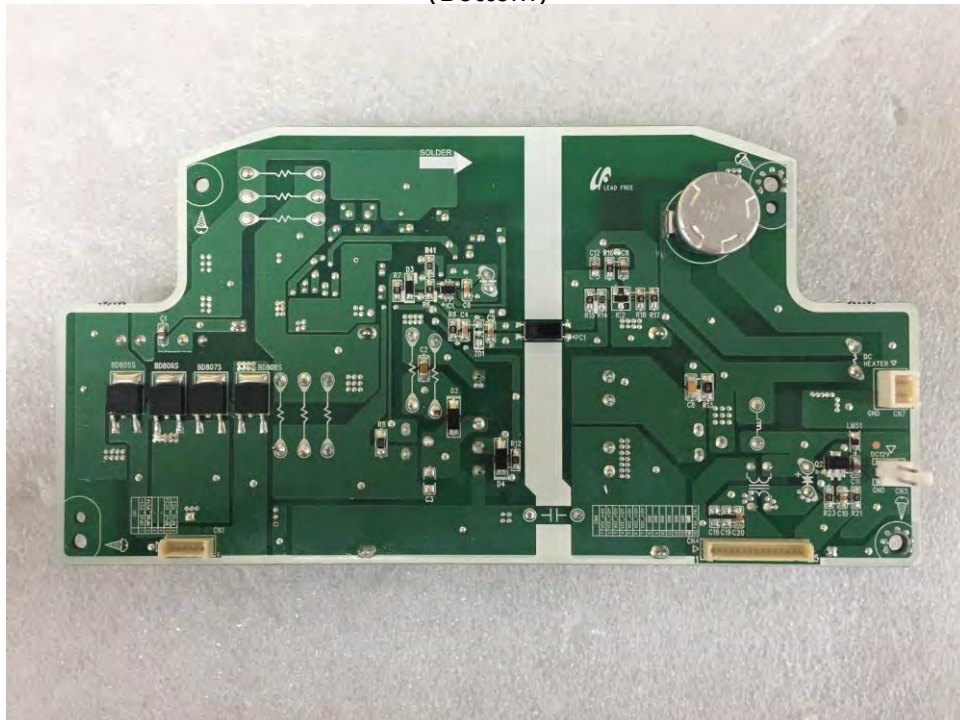
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EUT Internal View – SUB Board 4

(Top)



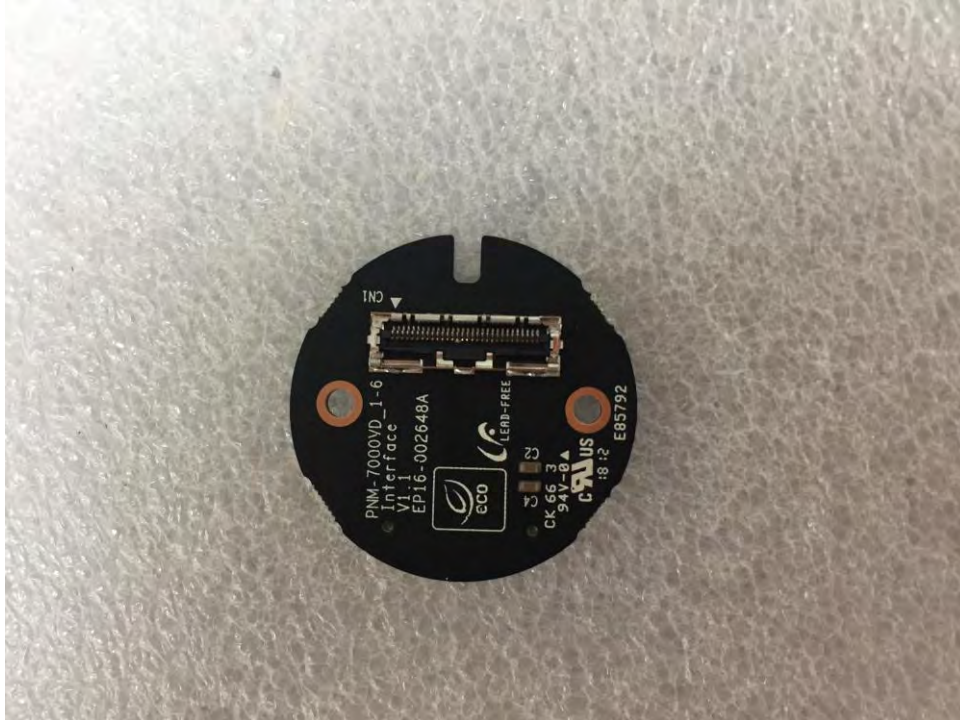
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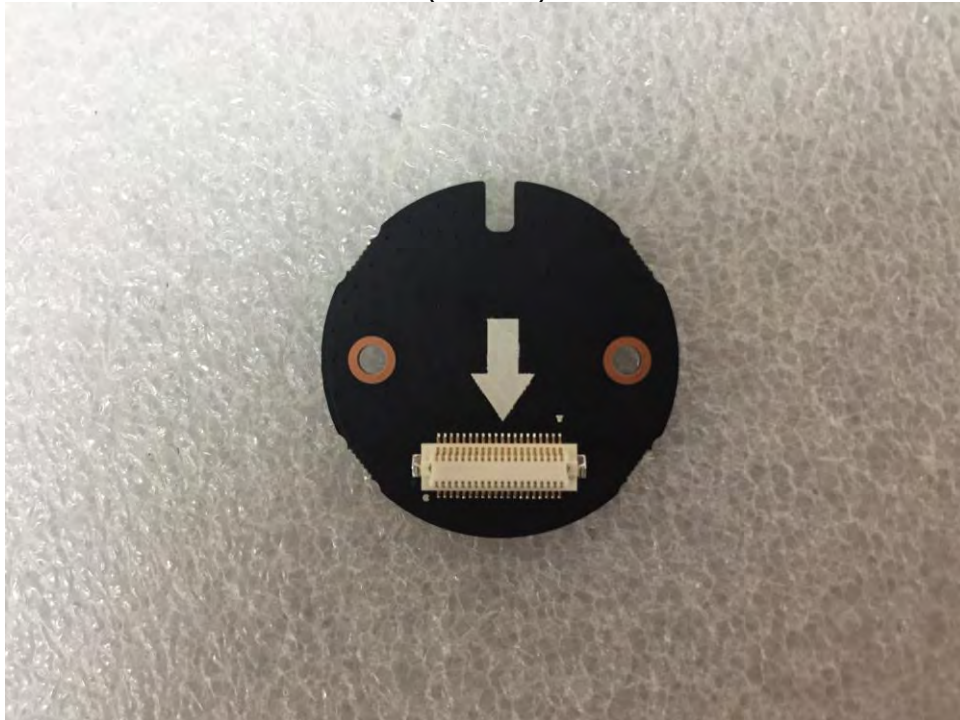
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EUT Internal View – Camera connector Board

(Top)



(Bottom)



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EUT Internal View – Camera LENS

(Top)



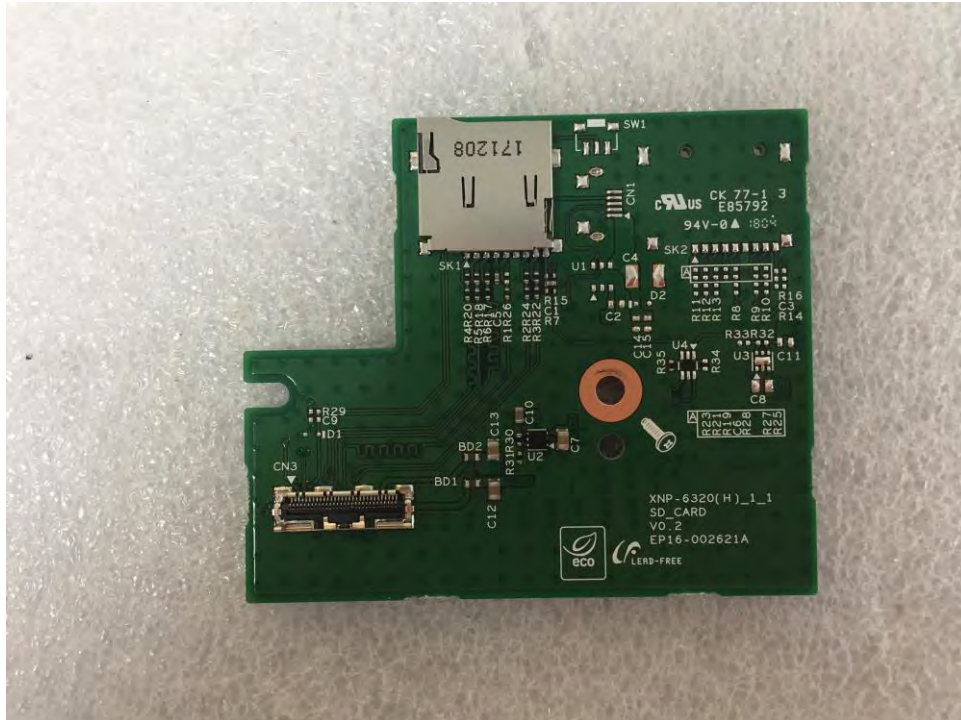
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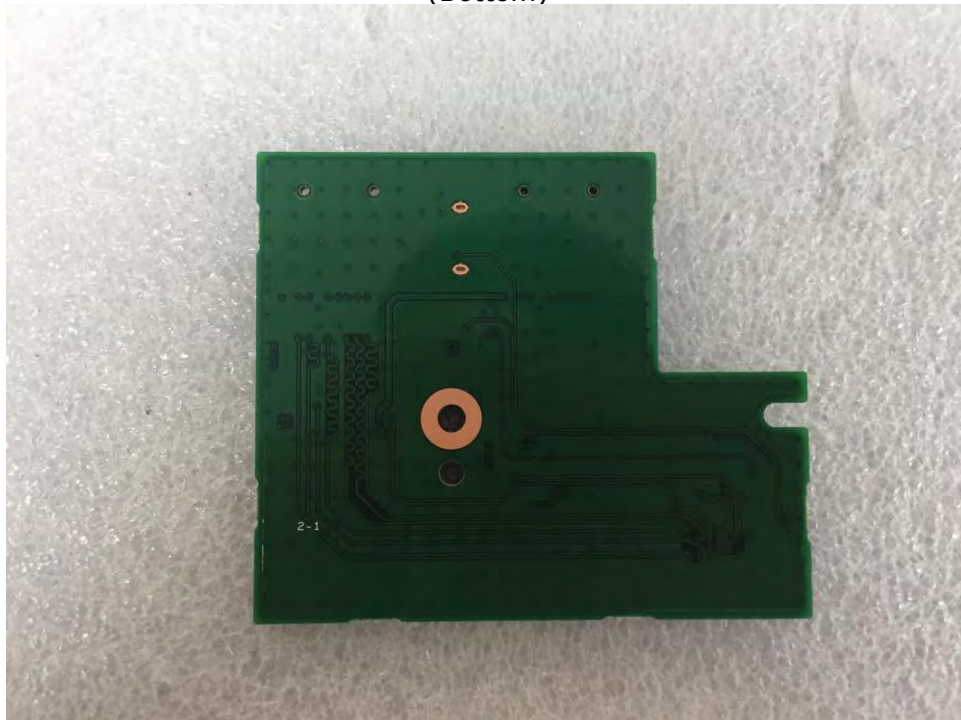
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EUT Internal View – Camera SUB Board 1

(Top)



(Bottom)



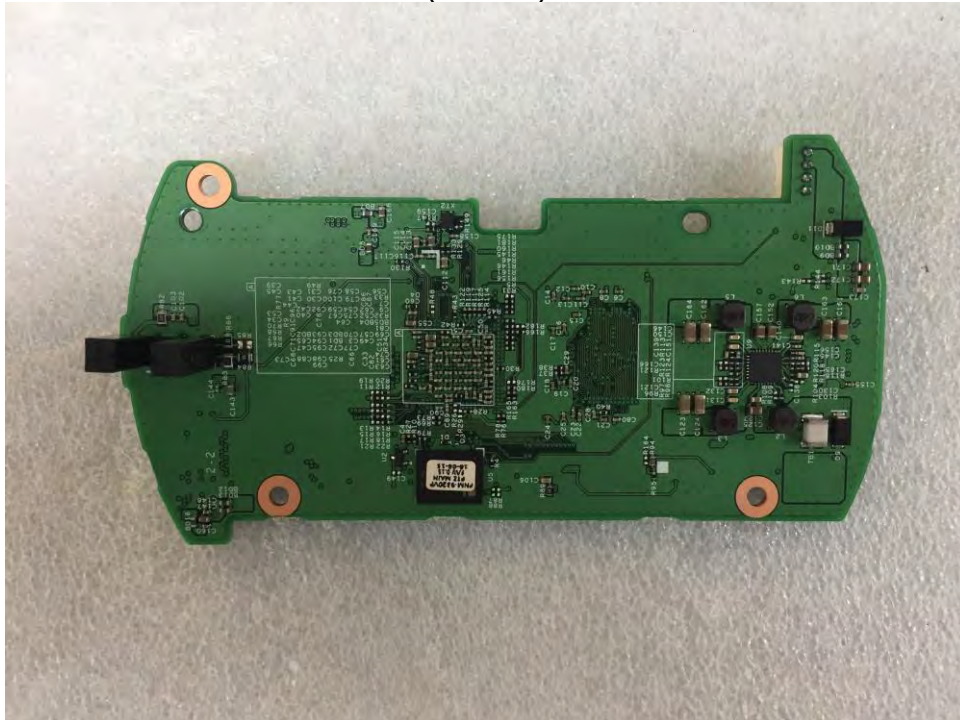
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EUT Internal View – Camera SUB Board 2

(Top)



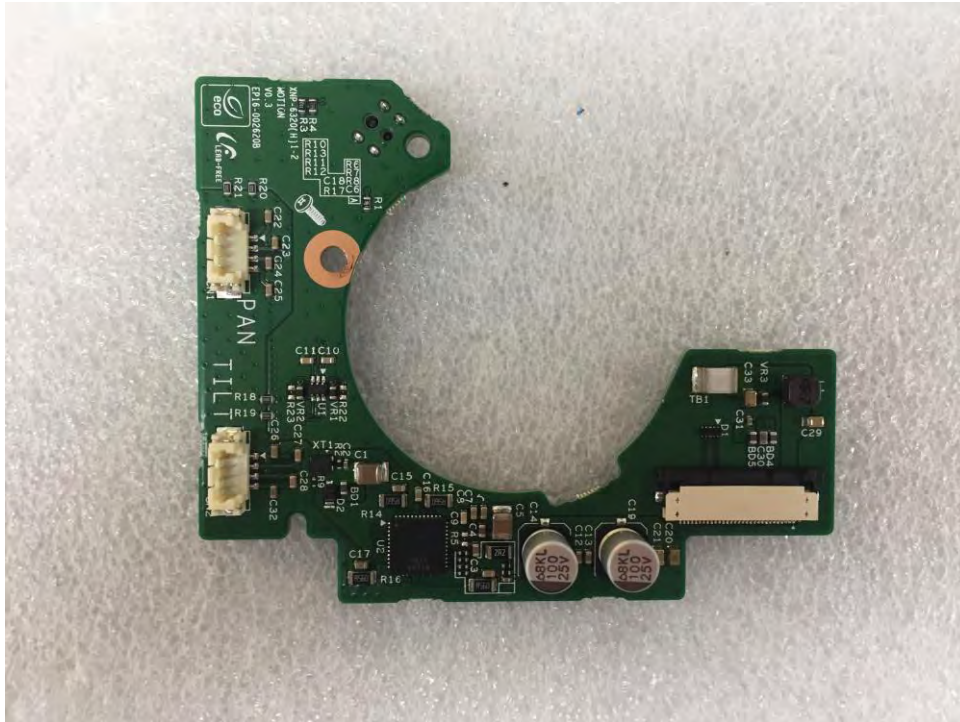
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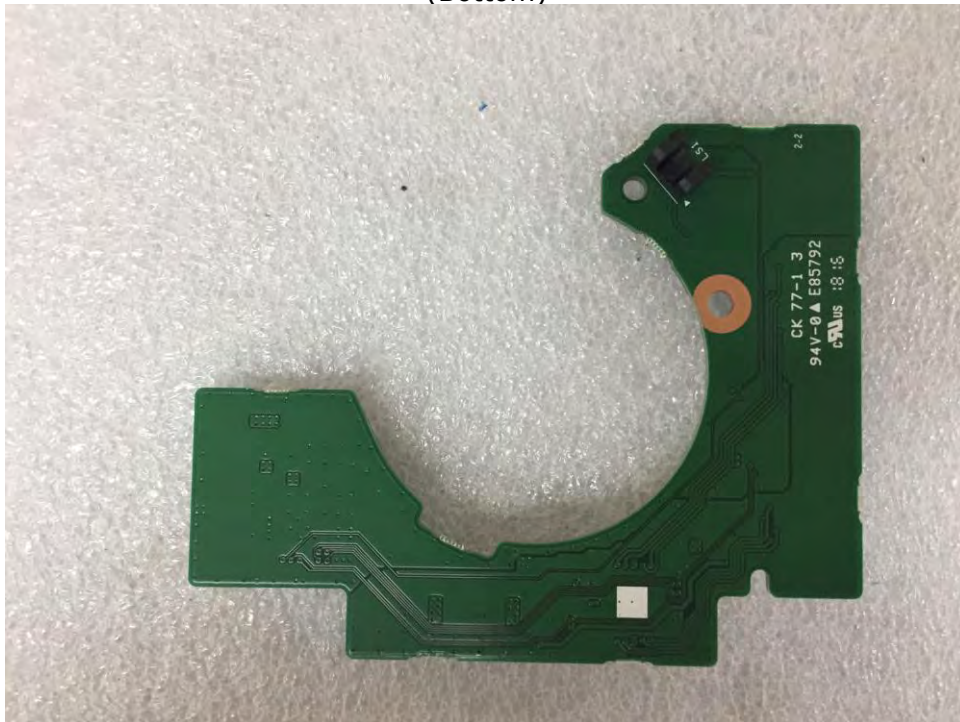
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EUT Internal View – Camera SUB Board 3

(Top)



(Bottom)



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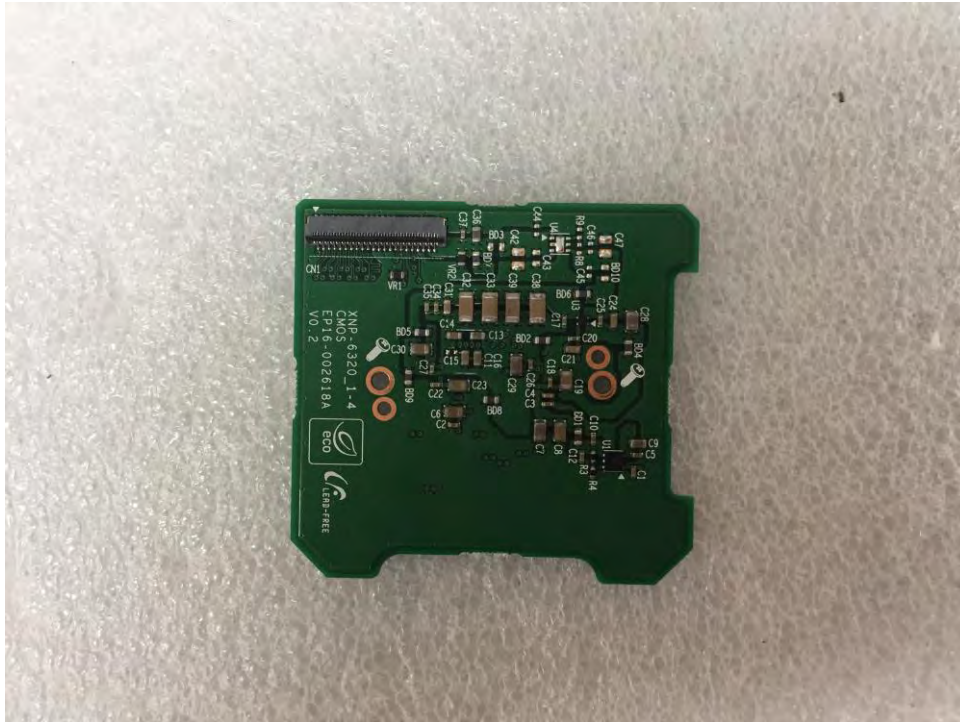
EUT Internal View – Camera SUB Board 4

(Top)

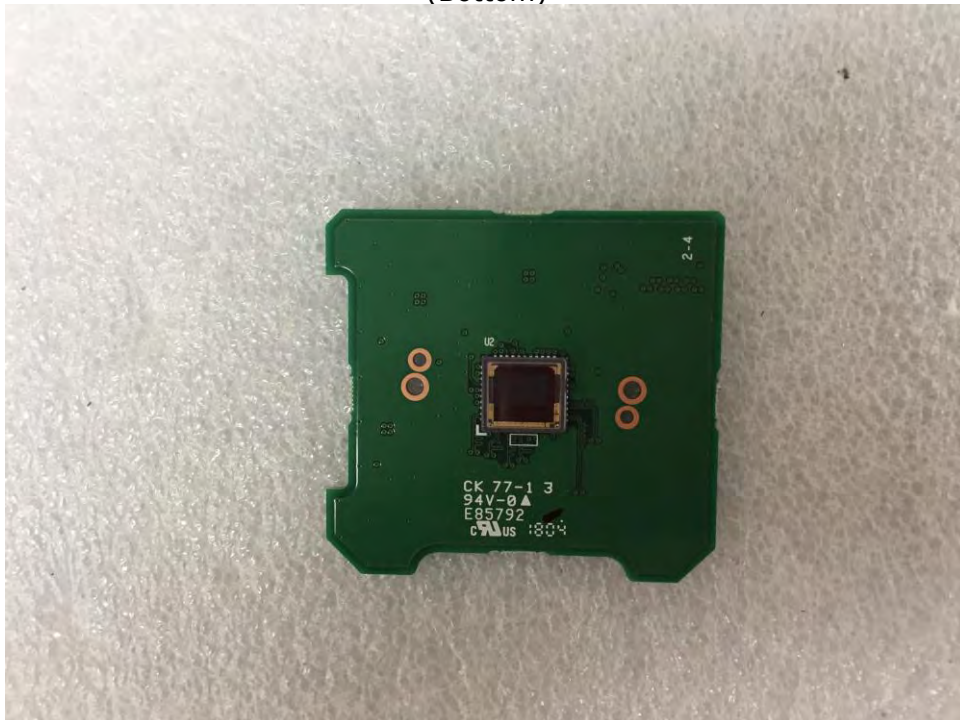


EUT Internal View – Camera SUB Board 5

(Top)



(Bottom)



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EUT Internal View – PoE Adapter

(Top)

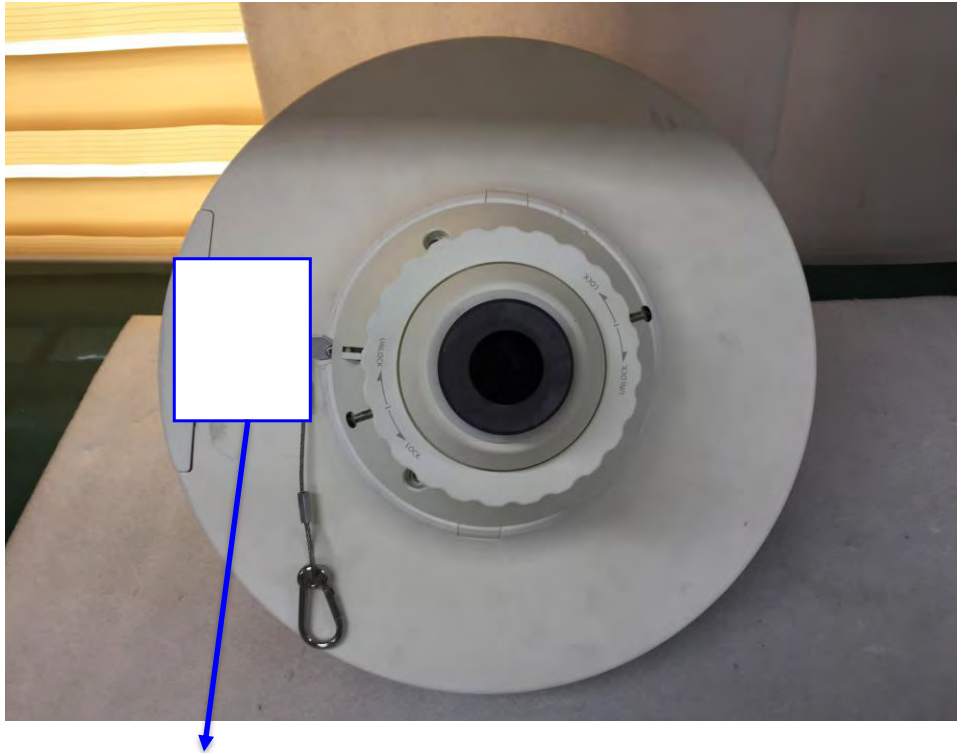


(Bottom)



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Label and Location



NETWORK CAMERA

Model No : PNM-9320VQP

Manufacturer : Hanwha Techwin (Tianjin) Co.,Ltd.

Made in China

