



EMC TEST REPORT For CE

Test Report No. : KES-E1-18T0345-R1

Date of Issue : May. 15, 2019

Product name : NETWORK CAMERA

Model/Type No. : PNM-9000VQ

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 : Jun. 08, 2018

Test date : Jun. 09, 2018 ~ Jun. 11, 2018

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

Tested by

Kang Hyeon, Kim
EMC Test Engineer

Reviewed by

Dong-Hun, Jang
EMC Technical Manager

This test report is not related to KOLAS.

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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Jun. 25, 2018	KES-E1-18T0345	Issued
May. 15, 2019	KES-E1-18T0345-R1	Re-issue due to regulations update

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1.0 General Product Description

Main Specifications of EUT are:

	PNM-9000VQ
Video	
Video Out	CVBS : 1.0 Vp-p / 75Ω composite, 720x480(N), 720x576(P), for installation
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	Auto (Electrical) / Color / B/W
Backlight Compensation	Off / BLC / HLC(Masking/Dimming), WDR
Wide Dynamic Range	150dB(2MP), 120dB(5MP)
Contrast Enhancement	SSDR (Off / On)
Digital Noise Reduction	SSNR5 (2D+3D Noise Filter) (Off / On)
Digital Image Stabilization	Off / On
Defog	Off / Auto / Manual
Motion Detection	Off/ On(8ea, 8point Polygonal zones)
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

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Flip / Mirror	Flip : On/Off Mirror : On/Off Hallway view : 90°/270°
Video Analytics	Tampering, Loitering, Directional Detection, Fog&Dust Detection, Virtual Line, Enter/Exit, Appear / Disappear, Face Detection, Motion Detection
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) or NAS recording at Event Triggers External output
Pixel Counter	Support
Network	
Video Compression Format	H.265/H.264 (MPEG-4 Part 10/AVC) : Main/Baseline/High , Motion JPEG
Resolution	[2MP] 1920x1080, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360, 320x240 [5MP] 2560 x 1920, 2560 x 1440, 1920 x 1080, 1600 x 1200, 1280 x 1024, 1280 x 960 1280 x 720, 1024 x 768, 800 x 600, 720 x 576, 720 x 480, 640 x 480, 320 x 240
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)
WiseStream II	Support
Video Quality Adjustment	H.264/H.265 : Target Bitrate Level Control MJPEG : Target Bitrate Level Control

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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, PPPoE, 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

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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-9000VQ	-	Hanwha Techwin (Tianjin) Co.,Ltd	EUT
POE Adaptor	PT-PSE109GBRO-A	PT1817220025	PROCET	-

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Notebook	ProBook4430s	-	HP	-
Notebook Adaptor	SeriesPPP0009 H	-	CHICONY POWER TECHNOLOGY (SUZHOU) CO.,LTD,	-
5M LENS Module	SLA-5M3700Q	-	Hanwha Techwin (Tianjin) Co.,Ltd	1EA
5M LENS Module	SLA-5M4600Q	-	Hanwha Techwin (Tianjin) Co.,Ltd	1EA
5M LENS Module	SLA-5M7000Q	-	Hanwha Techwin (Tianjin) Co.,Ltd	2EA



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 Adaptor	RJ-45	4.0	U
	-	5M LENS Module	-	-	-
	-	5M LENS Module	-	-	-
	-	5M LENS Module	-	-	-
Notebook	RJ-45	POE Adaptor	RJ-45	4.0	U

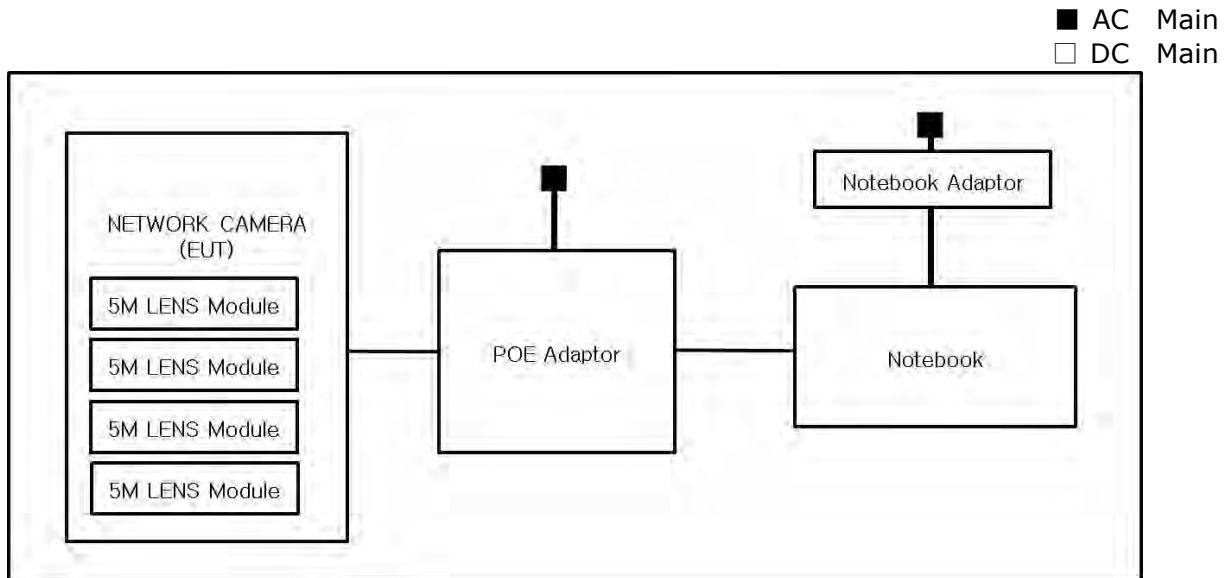
* Unshielded=U, Shielded=S

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



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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-
- | | | |
|---|----------------------------------|----------------------------------|
| ☐ 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

Jun. 09, 2018

Test Location

Electro wave Shieldroom #3

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	101783	04, 25, 2019
☒	LISN	ENV216	R & S	101137	01, 31, 2019
☒	LISN	ENV216	R & S	101786	04, 25, 2019

Test Conditions

Temperature: 22,9 °C

Relative Humidity: 48,7 % 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

Jun. 09, 2018

Test Location

Electro wave Shieldroom #3

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	101783	04, 25, 2019
☒	LISN	ENV216	R & S	101137	01, 31, 2019
☒	LISN	ENV216	R & S	101786	04, 25, 2019
☒	8-WIRE ISN CAT3	CAT3 8158	SCHWARZBECK	8158-0019	03, 22, 2019
☐	8-WIRE ISN CAT5	CAT5 8158	SCHWARZBECK	8158-0030	03, 22, 2019
☒	8-WIRE ISN CAT6	NTFM 8158	SCHWARZBECK	8158-0029	08, 10, 2018

Test Conditions

Temperature: 22,9 °C
Relative Humidity: 48.7 % 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.



2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Jun. 09, 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: 25,2 °C

Relative Humidity: 57,8 % 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

Jun. 09, 2018

Test Location

SEMI ANECHOIC CHAMBER #2

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	e3	AUDIX	8.083b	-
☒	EMI TEST RECEIVER	ESU26	R & S	100552	04, 18, 2019
☒	PREAMPLIFIER	8449B	AGILENT	8008A01640	01, 11, 2019
☐	ATTENUATOR	8491A	HP	32173	03, 21, 2019
☒	LOG-PERIODIC ANTENNA	STLP 9149	SCHWARZBECK	9149-255	05, 18, 2019

Test Conditions

Temperature: 22,9 °C
Relative Humidity: 48,7 % 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

Jun. 11, 2018

Test Location

Electro wave Shieldroom

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: 22,8 °C
Relative Humidity: 48,5 % 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

Jun. 11, 2018

Test Location

Electro wave Shieldroom

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: 22,8 °C
Relative Humidity: 48,5 % 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

Jun. 11, 2018

Test Location

EMS-ESD: Electro wave Shieldroom #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	ESD SIMULATOR	ESS-2000	Noise Ken	ESS05X4620	02, 21, 2019
☒	HCP	-	Noise Ken	-	-
☒	VCP	-	Noise Ken	-	-

Test Conditions

Temperature: 22,8 °C
Relative Humidity: 48,5 % R.H.
Atmospheric Pressure: 99,9 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

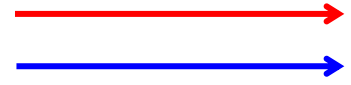
Discharge Voltage:	Contact ☐ 2 kV ☐ 4 kV ☒ 6 kV ☐ 8 kV ☐ 15 kV	Air ☒ 2 kV ☒ 4 kV ☐ 6 kV ☒ 8 kV ☐ 15 kV	HCP ☐ 2 kV ☐ 4 kV ☒ 6 kV ☐ 8 kV ☐ 15 kV	VCP ☐ 2 kV ☐ 4 kV ☒ 6 kV ☐ 8 kV ☐ 15 kV
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Notes: HCP: Horizontal coupling plane
VCP: Vertical coupling plane

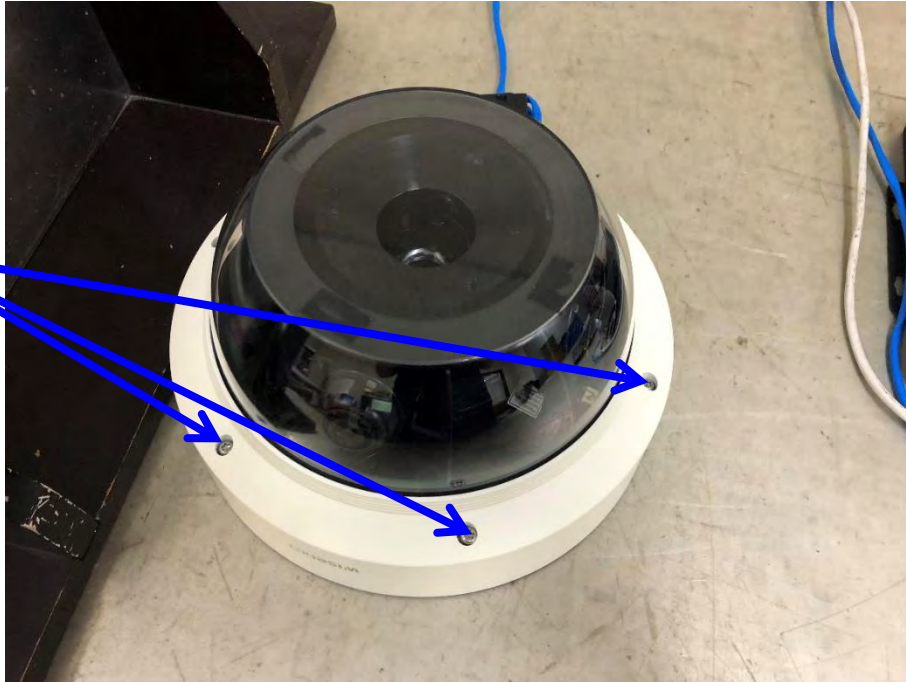
Required Performance Criteria: ☒ Complied

Location of Discharge:

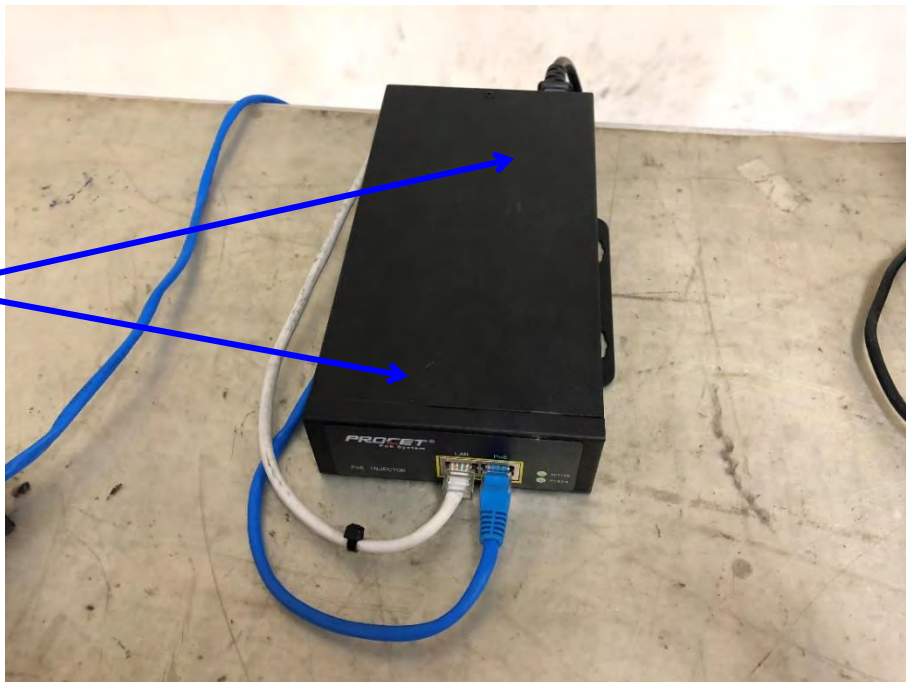
Air
Contact



1



2



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Test report No.:

KES-E1-18T0345-R1

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Test Data

Indirect Discharge

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

Direct Discharge

No.	Test Point	Discharge Method	Observations	Remarks
1	Screw	Contact Discharge	Complied	-
2	Adapter 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

Jun. 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: 24,9 °C
Relative Humidity: 55,8 % R.H.
Atmospheric Pressure: 99,8 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 report No.:

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Test Data

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

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

Test Results

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

RemarksN/A

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3.3 Electrical Fast Transients/Bursts

Reference Standard

EN 61000-4-4:2012

Test Date

Jun. 11, 2018

Test Location

EMS-EFT: Electro wave Shieldroom #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	AMETEK CTS	7.1.2	-
☒	ULTRA COMPACT SIMULATOR	UCS 500 N5	EM TEST	V0936105120	06, 26, 2018
☒	MOTOR VARIAC	MV2616	EM TEST	V0936105123	06, 26, 2018
☒	CAPACITIVE COUPLING CLAMP	HFK	EM TEST	070925	06, 26, 2018

Test Conditions

Temperature: 22,8 °C
Relative Humidity: 48,5 % R.H.
Atmospheric Pressure: 99,9 kPa

Test Specifications

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

Pulse Amplitude & Polarity:
(Other supply / Signal Lines) ☐ ± 0.5 kV ☒ ± 1.0 kV
☐ ± 2.0 kV

Burst Period: ☒ 300 ms ☐ 2 s

Repetition Rate: ☐ 5 kHz ☒ 100 kHz

Duration of Test Voltage: ☒ ≥ 1 min

Required Performance Criteria: ☒ Complied

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	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

Jun. 11, 2018

Test Location

EMS-Surge: Electro wave Shieldroom #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	AMETEK CTS	7.1.2	-
☒	ULTRA COMPACT SIMULATOR	UCS 500 N5	EM TEST	V0936105120	11, 27, 2018
☒	MOTOR VARIAC	MV2616	EM TEST	V0936105123	11, 27, 2018
☒	CDN	CNV 508N1	EM TEST	P1551168979	11, 28, 2018
☐	CDN	CNV 508T5	EM TEST	P1549168422	12, 18, 2018

Test Conditions

Temperature: 22,8 °C
Relative Humidity: 48,5 % R.H.
Atmospheric Pressure: 99,9 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	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

RemarksN/A

3.5 Conducted Disturbance

Reference Standard

EN 61000-4-6:2014

Test Date

Jun. 11, 2018

Test Location

EMS-CS: Electro wave Shieldroom #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	icd.control	EM TEST	5.3.7	-
☒	CONTINUOUS WAVE SIMULATOR	CWS 500N1	EM TEST	V0936105119	08, 07, 2018
☒	ATTENUATOR	ATT6	EM TEST	1208-34	08, 07, 2018
☒	CDN	CDN-M2/M3N	EM TEST	0909-06	08, 07, 2018
☒	CDN	CDN T8RJ45	EM TEST	0909-09	08, 07, 2018
☐	EM INJECTION CLAMP	EM 101	Liithi	35943	02, 02, 2019

Test Conditions

Temperature: 22,8 °C
Relative Humidity: 48,5 % R.H.
Atmospheric Pressure: 99,9 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
-	CDN (☐ M2, ☐ M3)	-

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
RJ-45	CDN T800	Complied
RJ-45(PoE)	CDN T800	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

RemarksN/A



3.6 Voltage Dips and Short Interruptions

Reference Standard

EN 61000-4-11:2004

Test Date

Jun. 11, 2018

Test Location

EMS-Voltage dip: Electro wave Shieldroom #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	AMETEK CTS	7.1.2	-
☒	ULTRA COMPACT SIMULATOR	UCS 500 N5	EM TEST	V0936105120	06, 26, 2018
☒	MOTOR VARIAC	MV2616	EM TEST	V0936105123	06, 26, 2018

Test Conditions

Temperature: 22,8 °C
Relative Humidity: 48,5 % R.H.
Atmospheric Pressure: 99,9 kPa

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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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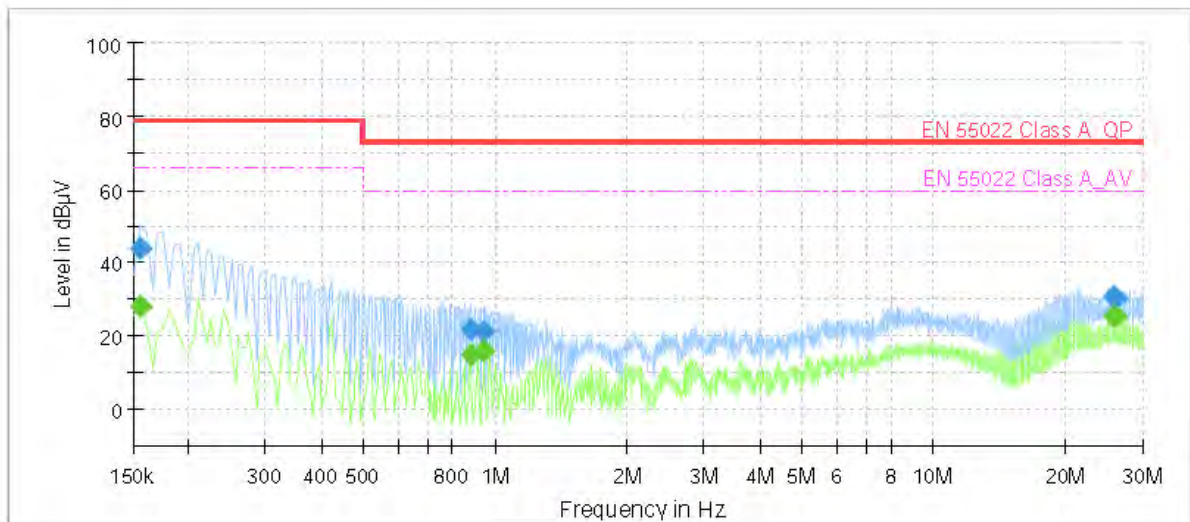
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

[HOT]

Common Information

Test Description:	Conducted Emission
Model No.:	PNM-9000VQ
Mode	CE
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	---	28.33	66.00	37.67	1000.0	9.000	L1	9.6
0.155000	43.93	---	79.00	35.07	1000.0	9.000	L1	9.6
0.880000	---	14.69	60.00	45.31	1000.0	9.000	L1	10.0
0.880000	21.90	---	73.00	51.10	1000.0	9.000	L1	10.0
0.940000	---	16.06	60.00	43.94	1000.0	9.000	L1	10.0
0.940000	21.25	---	73.00	51.75	1000.0	9.000	L1	10.0
25.850000	---	25.41	60.00	34.59	1000.0	9.000	L1	10.2
25.850000	30.47	---	73.00	42.53	1000.0	9.000	L1	10.2
26.045000	---	25.24	60.00	34.76	1000.0	9.000	L1	10.2
26.045000	30.25	---	73.00	42.75	1000.0	9.000	L1	10.2

[NEUTRAL]

Common Information

Test Description:

Model No.:

Mode

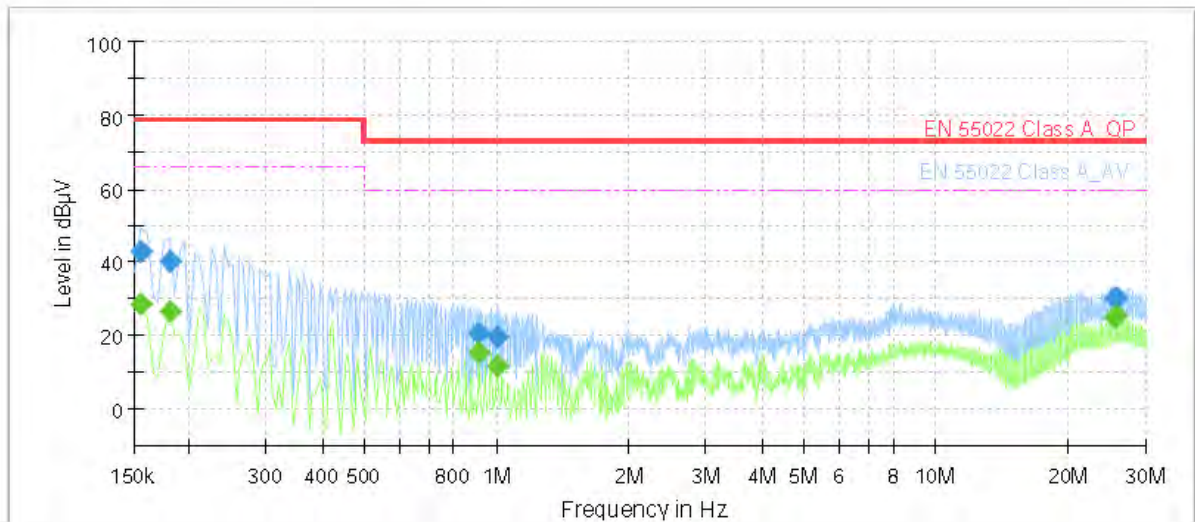
Operator Name:

Conducted Emission

PNM-9000VQ

CE

KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	28.40	66.00	37.60	1000.0	9.000	N	9.6
0.155000	42.99	---	79.00	36.01	1000.0	9.000	N	9.6
0.180000	---	26.36	66.00	39.64	1000.0	9.000	N	9.6
0.180000	40.39	---	79.00	38.61	1000.0	9.000	N	9.6
0.910000	---	15.48	60.00	44.52	1000.0	9.000	N	9.9
0.910000	20.49	---	73.00	52.51	1000.0	9.000	N	9.9
1.005000	---	11.49	60.00	48.51	1000.0	9.000	N	10.0
1.005000	19.41	---	73.00	53.59	1000.0	9.000	N	10.0
25.555000	---	24.84	60.00	35.16	1000.0	9.000	N	10.2
25.555000	30.01	---	73.00	42.99	1000.0	9.000	N	10.2
25.750000	---	25.20	60.00	34.80	1000.0	9.000	N	10.2
25.750000	30.08	---	73.00	42.92	1000.0	9.000	N	10.2

◆ Calculation

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

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

- RJ-45(PoE)

[10 Mbps]

Common Information

Test Description:

Telecommunication Emission

Model No.:

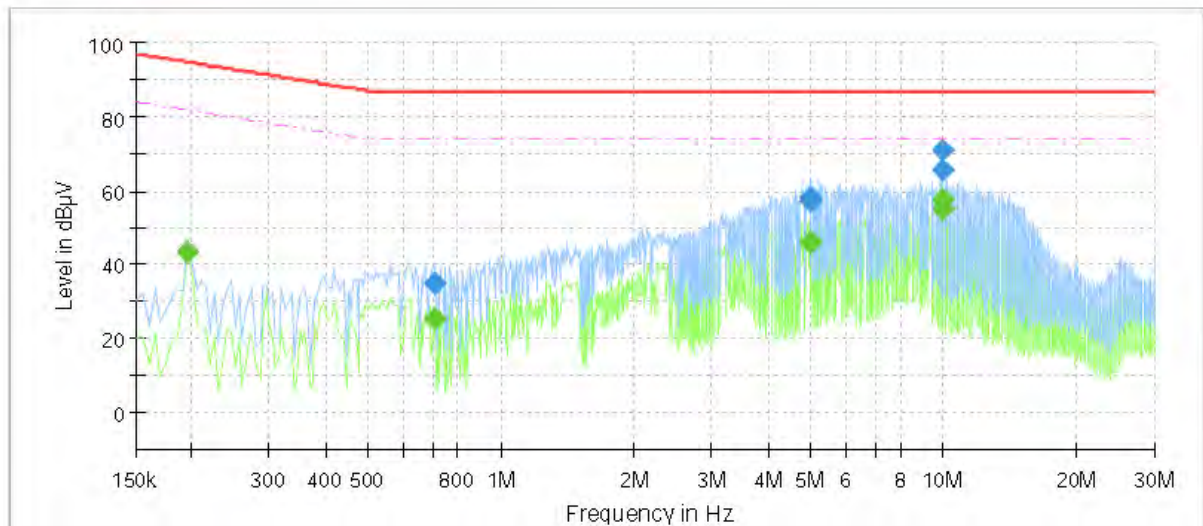
PNM-9000VQ

Mode

10

Operator Name:

KES



Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.195000	---	43.34	81.82	38.48	1000.0	9.000	Single Line	10.1
0.195000	43.67	---	94.82	51.15	1000.0	9.000	Single Line	10.1
0.705000	---	25.51	74.00	48.49	1000.0	9.000	Single Line	10.2
0.705000	35.09	---	87.00	51.91	1000.0	9.000	Single Line	10.2
4.995000	---	46.27	74.00	27.73	1000.0	9.000	Single Line	10.2
4.995000	57.38	---	87.00	29.62	1000.0	9.000	Single Line	10.2
5.000000	---	45.92	74.00	28.08	1000.0	9.000	Single Line	10.2
5.000000	58.23	---	87.00	28.77	1000.0	9.000	Single Line	10.2
9.995000	---	54.95	74.00	19.05	1000.0	9.000	Single Line	9.9
9.995000	65.83	---	87.00	21.17	1000.0	9.000	Single Line	9.9
10.000000	---	57.95	74.00	16.05	1000.0	9.000	Single Line	9.9
10.000000	70.96	---	87.00	16.04	1000.0	9.000	Single Line	9.9

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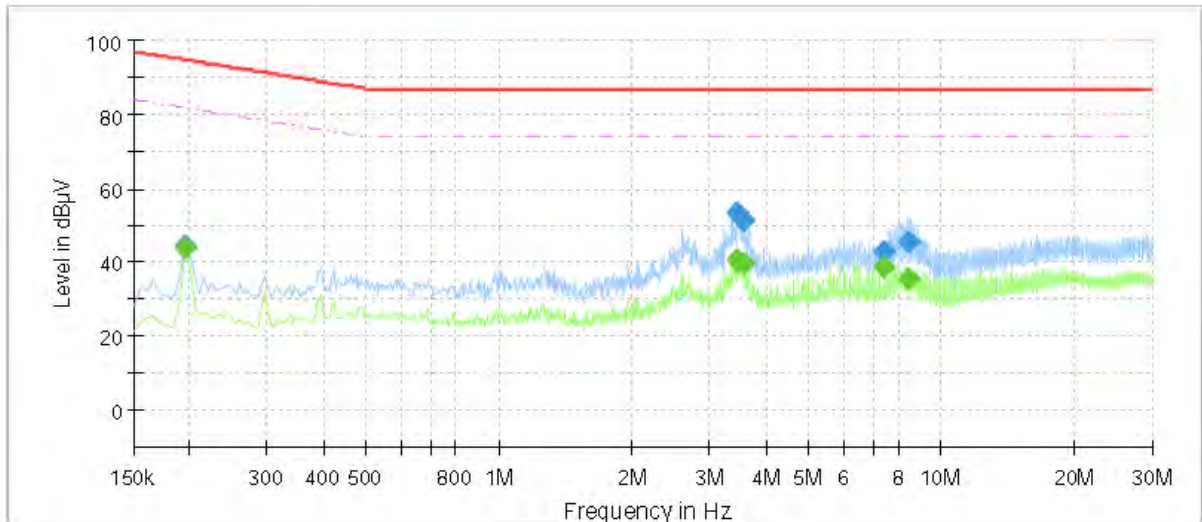
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[1 000 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	PNM-9000VQ
Mode	CE
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.195000	---	43.70	81.82	38.12	1000.0	9.000	Single Line	9.6
0.195000	44.31	---	94.82	50.51	1000.0	9.000	Single Line	9.6
3.445000	---	40.66	74.00	33.34	1000.0	9.000	Single Line	9.7
3.445000	53.30	---	87.00	33.70	1000.0	9.000	Single Line	9.7
3.555000	---	39.46	74.00	34.54	1000.0	9.000	Single Line	9.7
3.555000	51.15	---	87.00	35.85	1000.0	9.000	Single Line	9.7
7.375000	---	38.71	74.00	35.29	1000.0	9.000	Single Line	9.4
7.375000	42.93	---	87.00	44.07	1000.0	9.000	Single Line	9.4
8.445000	---	35.40	74.00	38.60	1000.0	9.000	Single Line	9.4
8.445000	45.40	---	87.00	41.60	1000.0	9.000	Single Line	9.4



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- RJ-45

[10 Mbps]

Common Information

Test Description:

Telecommunication Emission

Model No.:

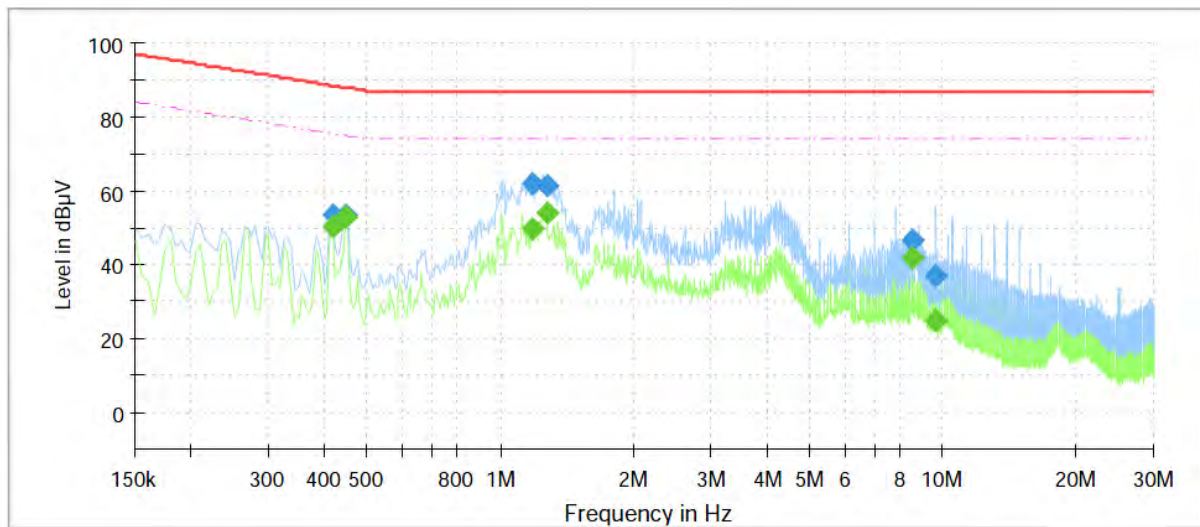
PNM-9000VQ

Mode

10 - 1

Operator Name:

KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.420000	---	50.33	75.45	25.12	1000.0	9.000	Single Line	10.1
0.420000	53.32	---	88.45	35.13	1000.0	9.000	Single Line	10.1
0.445000	---	52.86	74.97	22.11	1000.0	9.000	Single Line	10.1
0.445000	53.63	---	87.97	34.34	1000.0	9.000	Single Line	10.1
1.180000	---	49.88	74.00	24.12	1000.0	9.000	Single Line	10.3
1.180000	62.14	---	87.00	24.86	1000.0	9.000	Single Line	10.3
1.270000	---	54.25	74.00	19.75	1000.0	9.000	Single Line	10.3
1.270000	61.65	---	87.00	25.35	1000.0	9.000	Single Line	10.3
8.540000	---	41.89	74.00	32.11	1000.0	9.000	Single Line	9.9
8.540000	46.58	---	87.00	40.42	1000.0	9.000	Single Line	9.9
9.670000	---	24.76	74.00	49.24	1000.0	9.000	Single Line	9.9
9.670000	36.92	---	87.00	50.08	1000.0	9.000	Single Line	9.9

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[1 000 Mbps]

Common Information

Test Description:

Telecommunication Emission

Model No.:

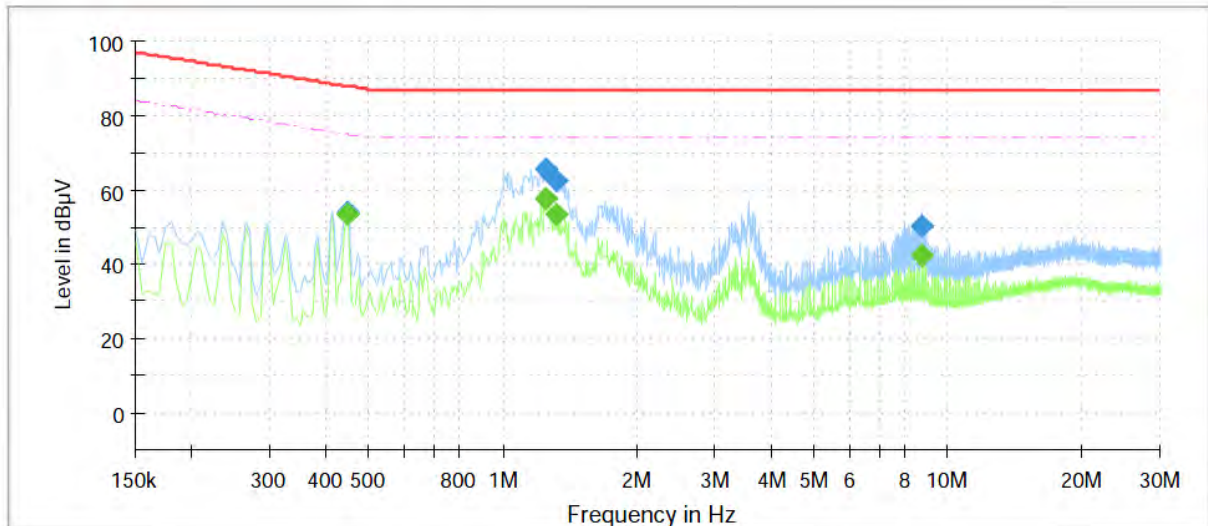
PNM-9000VQ

Mode

1000 - 1

Operator Name:

KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.445000	---	53.53	74.97	21.44	1000.0	9.000	Single Line	9.5
0.445000	54.01	---	87.97	33.96	1000.0	9.000	Single Line	9.5
1.255000	---	57.83	74.00	16.17	1000.0	9.000	Single Line	9.7
1.255000	65.45	---	87.00	21.55	1000.0	9.000	Single Line	9.7
1.320000	---	53.22	74.00	20.78	1000.0	9.000	Single Line	9.7
1.320000	62.45	---	87.00	24.55	1000.0	9.000	Single Line	9.7
8.740000	---	42.62	74.00	31.38	1000.0	9.000	Single Line	9.4
8.740000	50.40	---	87.00	36.60	1000.0	9.000	Single Line	9.4

◆ 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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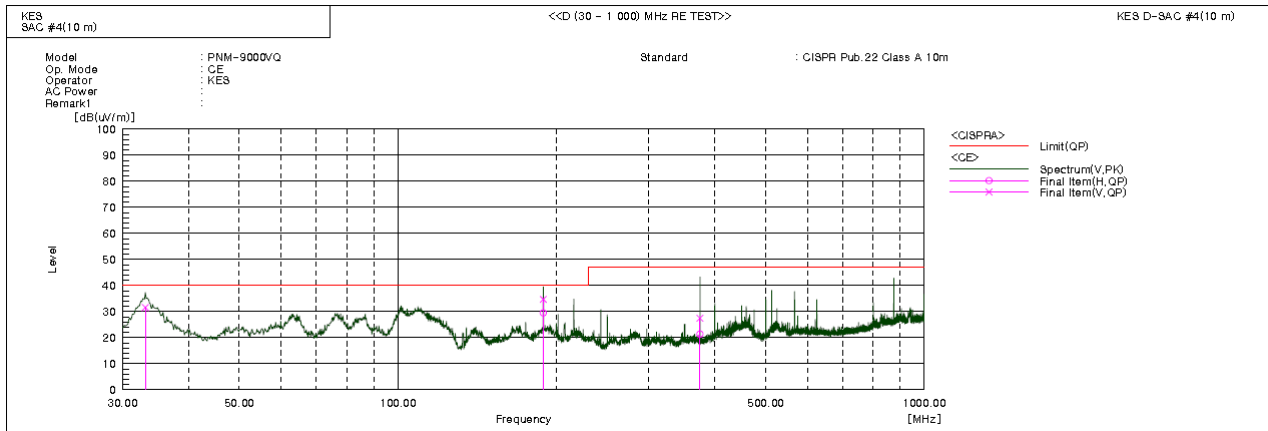
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Test report No.:

KES-E1-18T0345-R1

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Radiated Electric Field Emissions(Below 1 GHz)



Final Result

No.	Frequency (P) [MHz]	Reading QP [dB(μV)]	c.f [dB(1/m)]	Result QP [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	33.153	V 64.2	-32.6	31.6	40.0	8.4	150.0	187.0	
2	188.959	H 58.3	-28.8	29.5	40.0	10.5	400.0	199.0	
3	188.959	V 63.5	-28.8	34.7	40.0	5.3	100.0	48.0	
4	374.956	H 43.8	-22.4	21.4	47.0	25.6	200.0	253.0	
5	374.956	V 49.9	-22.4	27.5	47.0	19.5	100.0	222.0	

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

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

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

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

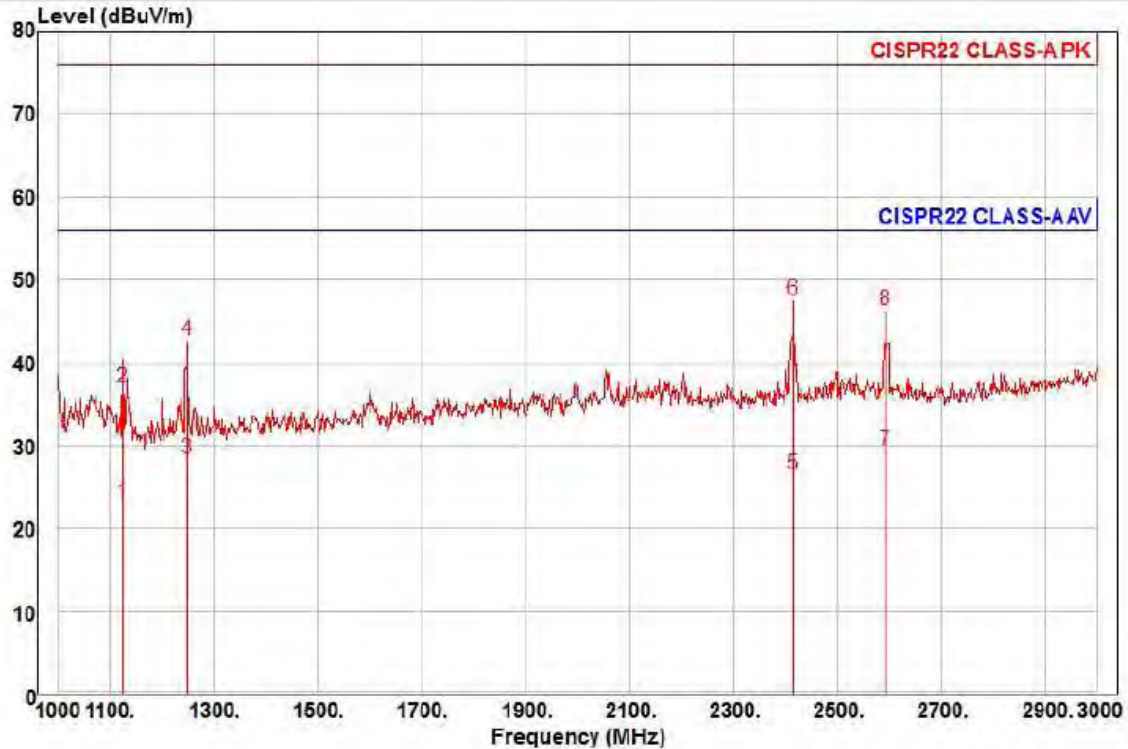
Limit(QP) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value

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Radiated Electric Field Emissions(Above 1 GHz)



Site : YEOJU_C 3 m SAC

Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) horizontal

: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto

Project :

Model : PNM-9000VQ

Mode : CE

Memo : (1 ~ 3) GHz

	Read Freq	Ant Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1124.00	33.37	22.88	6.31	39.49	153	56.00	-32.93	horizontal	Average
2	1124.00	47.23	22.88	6.31	39.49	153	76.00	-39.07	horizontal	Peak
3	1248.00	37.48	23.25	6.66	39.01	204	56.00	-27.62	horizontal	Average
4	1248.00	51.85	23.25	6.66	39.01	204	76.00	-33.25	horizontal	Peak
5	2416.00	27.81	27.27	9.44	38.09	239	56.00	-29.57	horizontal	Average
6 pk	2416.00	48.98	27.27	9.44	38.09	239	76.00	-28.40	horizontal	Peak
7 pp	2592.00	29.76	27.94	9.84	38.07	54	56.00	-26.53	horizontal	Average
8	2592.00	46.60	27.94	9.84	38.07	54	76.00	-29.69	horizontal	Peak

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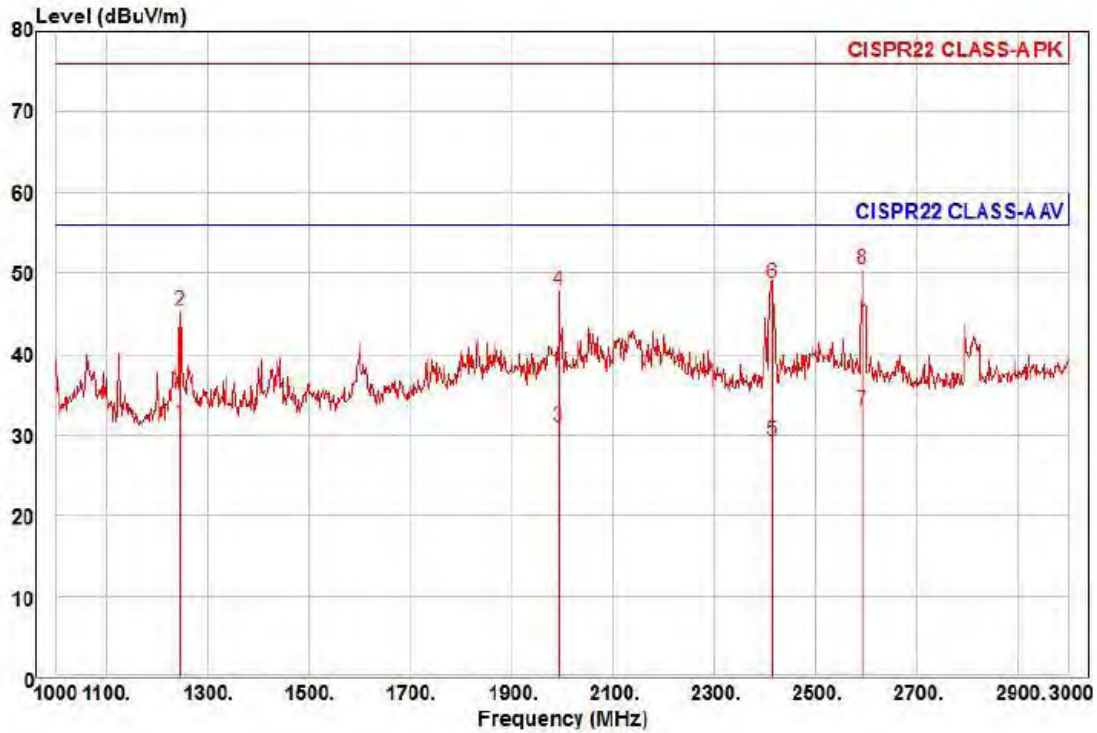
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Test report No.:

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Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : PNM-9000VQ
Mode : CE
Memo : (1 ~ 3) GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1246.00	40.52	23.25	6.66	39.02	179	56.00	-24.59	vertical	Average
2	1246.00	54.40	23.25	6.66	39.02	179	76.00	-30.71	vertical	Peak
3	1994.00	34.96	25.99	8.47	38.36	11	56.00	-24.94	vertical	Average
4	1994.00	51.89	25.99	8.47	38.36	11	76.00	-28.01	vertical	Peak
5	2414.00	30.66	27.27	9.43	38.10	93	56.00	-26.74	vertical	Average
6	2414.00	50.24	27.27	9.43	38.10	93	76.00	-27.16	vertical	Peak
7 pp	2592.00	33.25	27.94	9.84	38.07	230	56.00	-23.04	vertical	Average
8 pk	2592.00	50.77	27.94	9.84	38.07	230	76.00	-25.52	vertical	Peak

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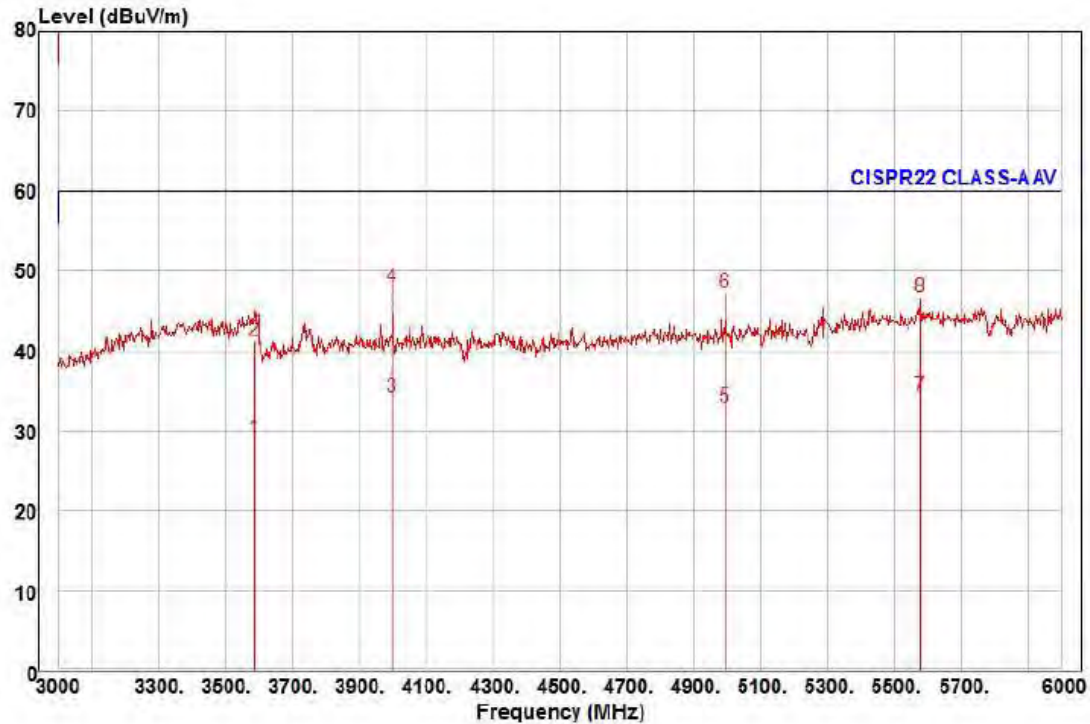
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Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : PNM-9000VQ
Mode : CE
Memo : (1 ~ 3) GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3585.00	24.10	31.38	11.60	38.21	234	60.00	-31.13	horizontal	Average
2	3585.00	36.54	31.38	11.60	38.21	234	80.00	-38.69	horizontal	Peak
3	3999.00	27.28	32.50	12.19	37.84	339	60.00	-25.87	horizontal	Average
4 pk	3999.00	41.05	32.50	12.19	37.84	339	80.00	-32.10	horizontal	Peak
5	4995.00	23.94	33.40	13.63	38.06	122	60.00	-27.09	horizontal	Average
6	4995.00	38.34	33.40	13.63	38.06	122	80.00	-32.69	horizontal	Peak
7 pp	5577.00	22.22	35.49	14.71	38.16	181	60.00	-25.74	horizontal	Average
8	5577.00	34.69	35.49	14.71	38.16	181	80.00	-33.27	horizontal	Peak

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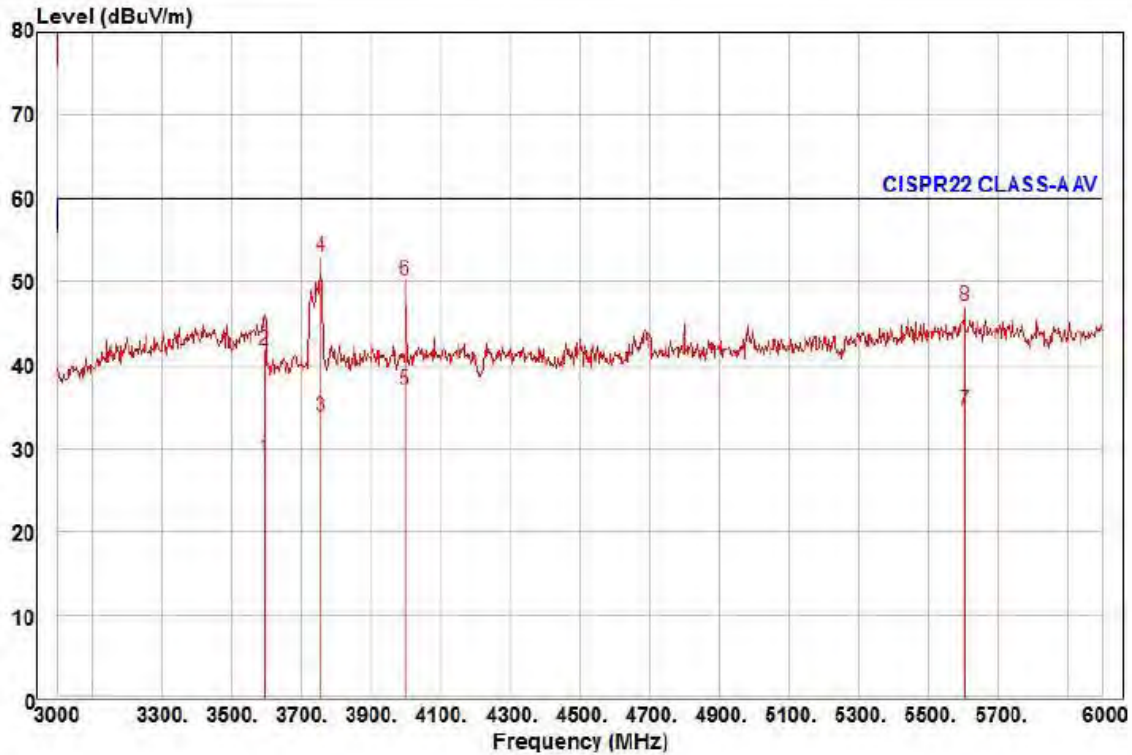
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Test report No.:

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Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : PNM-9000VQ
Mode : CE
Memo : (1 ~ 3) GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3594.00	23.99	31.40	11.61	38.20	310	60.00	-31.20	vertical	Average
2	3594.00	37.07	31.40	11.61	38.20	310	80.00	-38.12	vertical	Peak
3	3756.00	28.21	31.84	11.79	38.05	21	60.00	-26.21	vertical	Average
4 pk	3756.00	47.35	31.84	11.79	38.05	21	80.00	-27.07	vertical	Peak
5 pp	3999.00	30.15	32.50	12.19	37.84	344	60.00	-23.00	vertical	Average
6	3999.00	43.31	32.50	12.19	37.84	344	80.00	-29.84	vertical	Peak
7	5604.00	22.32	35.53	14.76	38.17	257	60.00	-25.56	vertical	Average
8	5604.00	35.01	35.53	14.76	38.17	257	80.00	-32.87	vertical	Peak

◆ 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	78.086E-3			
2	2.419E-3			PASS
3	68.274E-3	2.968	2.30	PASS
4	3.965E-3			PASS
5	65.993E-3	5.789	1.14	PASS
6	2.883E-3			PASS
7	63.036E-3	8.187	770.00E-3	PASS
8	2.722E-3			PASS
9	58.839E-3	14.710	400.00E-3	PASS
10	3.694E-3			PASS
11	54.198E-3	16.424	330.00E-3	PASS
12	2.886E-3			PASS
13	49.199E-3	23.428	210.00E-3	PASS
14	1.864E-3			PASS
15	43.731E-3	29.154	150.00E-3	PASS
16	1.615E-3			PASS
17	37.954E-3	28.677	132.35E-3	PASS
18	1.694E-3			PASS
19	31.787E-3	26.843	118.42E-3	PASS
20	1.383E-3			PASS
21	25.843E-3	16.080	160.71E-3	PASS
22	964.250E-6			PASS
23	20.718E-3	14.119	146.74E-3	PASS
24	896.117E-6			PASS
25	15.832E-3	11.728	135.00E-3	PASS
26	703.063E-6			PASS
27	11.303E-3	9.043	124.99E-3	PASS
28	664.412E-6			PASS
29	7.707E-3	6.622	116.39E-3	PASS
30	706.697E-6			PASS
31	4.773E-3			PASS
32	658.270E-6			PASS
33	2.587E-3			PASS
34	700.494E-6			PASS
35	2.210E-3			PASS
36	615.576E-6			PASS
37	2.656E-3			PASS
38	628.739E-6			PASS
39	3.038E-3			PASS
40	630.884E-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	81.583E-3			
2	2.810E-3			PASS
3	72.106E-3	2.090	3.45	PASS
4	4.376E-3			PASS
5	69.622E-3	4.071	1.71	PASS
6	3.246E-3			PASS
7	66.403E-3	5.749	1.15	PASS
8	3.063E-3			PASS
9	61.916E-3	10.319	600.00E-3	PASS
10	4.050E-3			PASS
11	56.966E-3	11.508	495.00E-3	PASS
12	3.263E-3			PASS
13	51.599E-3	16.381	315.00E-3	PASS
14	2.137E-3			PASS
15	45.752E-3	20.334	225.00E-3	PASS
16	1.890E-3			PASS
17	39.560E-3	19.927	198.52E-3	PASS
18	1.932E-3			PASS
19	33.039E-3	18.600	177.63E-3	PASS
20	1.553E-3			PASS
21	26.726E-3	16.630	160.71E-3	PASS
22	1.117E-3			PASS
23	21.320E-3	14.529	146.74E-3	PASS
24	1.084E-3			PASS
25	16.163E-3	11.972	135.00E-3	PASS
26	850.396E-6			PASS
27	11.409E-3	9.127	124.99E-3	PASS
28	741.473E-6			PASS
29	8.569E-3	7.362	116.39E-3	PASS
30	801.694E-6			PASS
31	6.012E-3	5.522	108.87E-3	PASS
32	742.485E-6			PASS
33	3.845E-3			PASS
34	821.011E-6			PASS
35	2.608E-3			PASS
36	689.479E-6			PASS
37	2.896E-3			PASS
38	711.326E-6			PASS
39	3.356E-3			PASS
40	705.498E-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.

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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 [%]	0.101	4.00	PASS
Tmax [s]	0.000	0.50	PASS

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Test Setup Photos and Configuration

Conducted Voltage Emissions



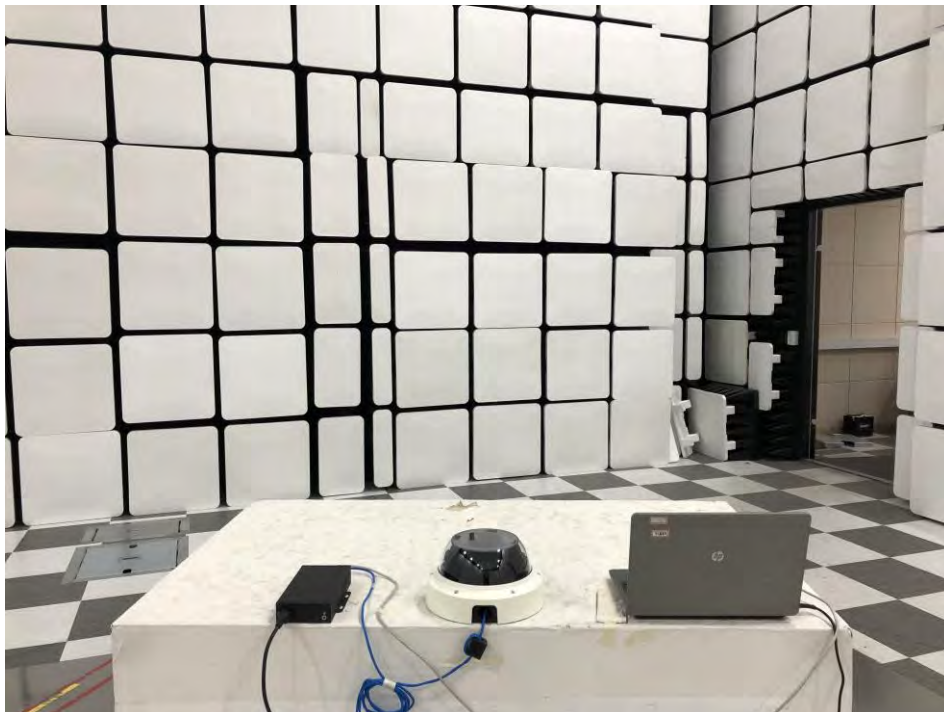
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Conducted Telecommunication Emissions



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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)



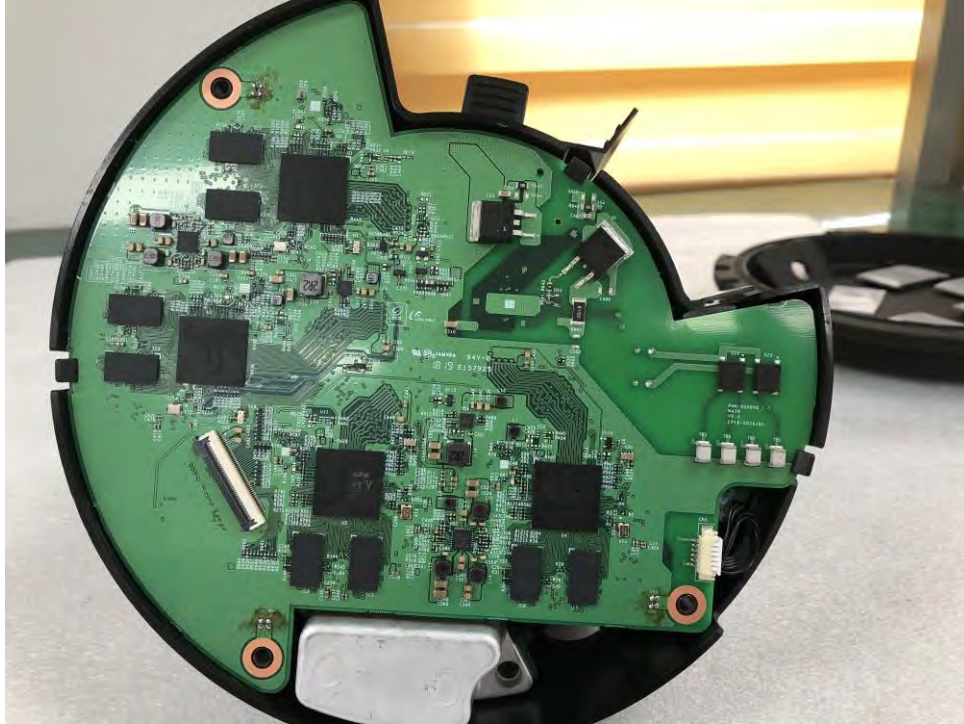
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EUT Internal Photographs

(Internal View)



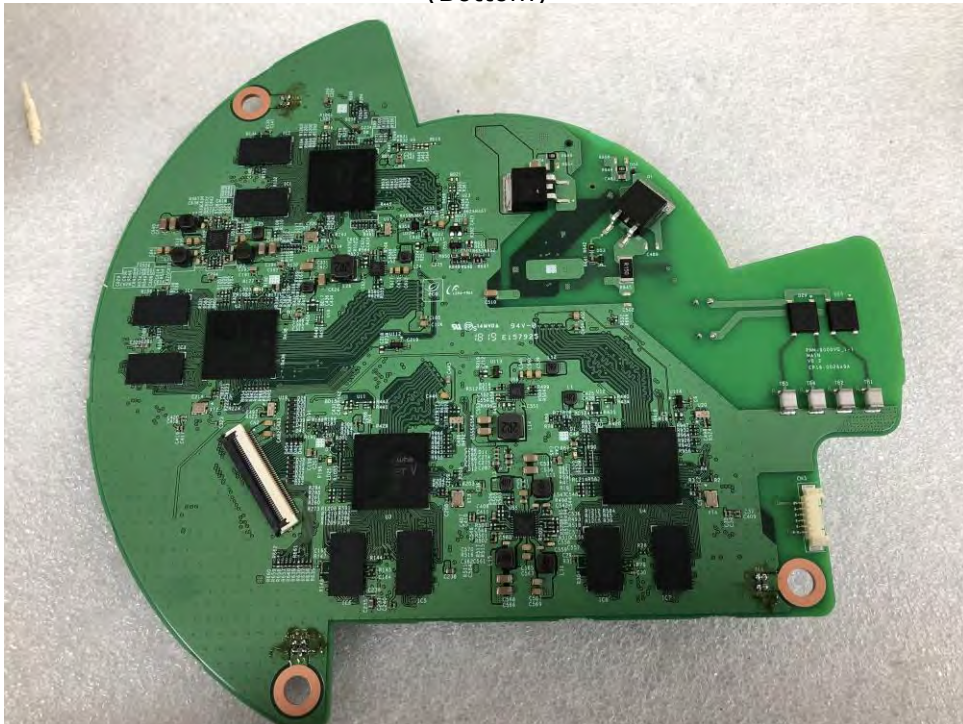
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EUT Internal View – Board 1

(Top)



(Bottom)



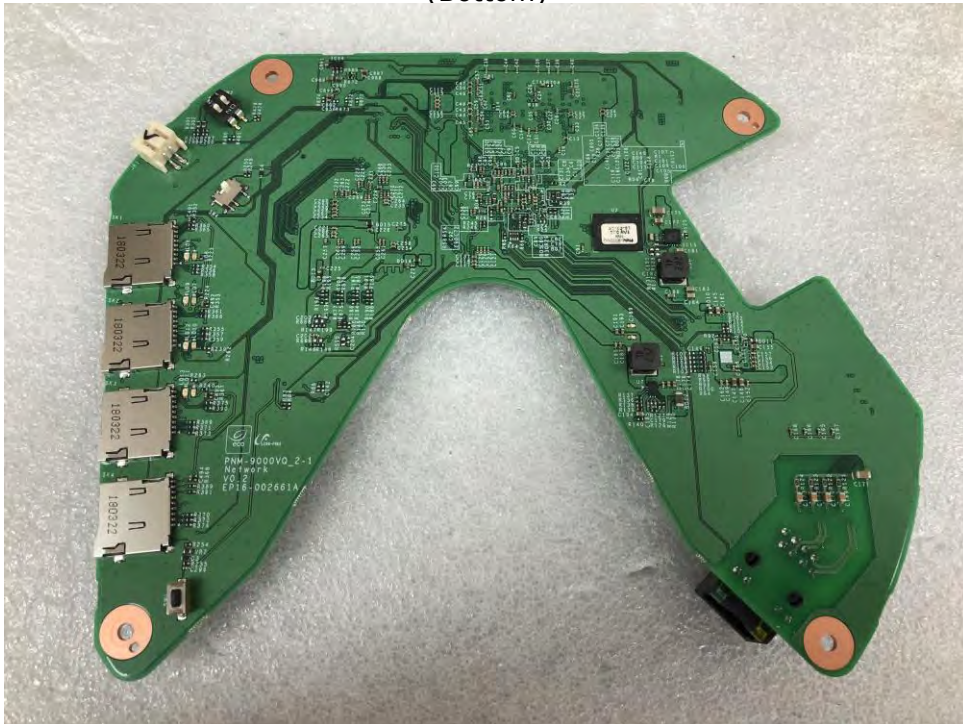
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EUT Internal View – Board 2

(Top)



(Bottom)



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EUT Internal View – Board 3

(Top)



(Bottom)



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Label and Location



NETWORK CAMERA

Model No : PNM-9000VQ

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

Made in China

