



EMC TEST REPORT For VCCI

Test Report No. : KES-E1-18T0420

Date of Issue : Jul. 30, 2018

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)

Equipment authorization : ☐ Declaration of Conformity
☒ Verification
☐ Certification

Date of Receipt : Jul. 04, 2018

Test date : Jul. 05, 2018 ~ Jul. 07, 2018

Test Results : ☒ In Compliance ☐ Not in Compliance

Tested by

Dae Jung, Choi
EMC Test Engineer

Reviewed by

Dong-Hun, Jang
EMC Technical Manager

This test report is not related to KOLAS.

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

**KES Co., Ltd.**

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-E1-18T0420
Page (2) of (42)

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Jul. 30, 2018	KES-E1-18T0420	Issued

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd. This document Sep be altered or revised by KES Co., Ltd. personnel only, and shall be noted in the revision section of the document. Any alteration of this document not carried out by KES Co., Ltd. will constitute fraud and shall nullify the document.

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr



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	7
1.6	External I/O Cabling	7
1.7	EUT Operating Mode(s)	8
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 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
APPENDIX A – TEST DATA.....		16
Conducted Emissions at Mains Power Ports.....		16
Conducted Emissions at Telecommunication Ports		18
Radiated Electric Field Emissions(Below 1 GHz)		22
Radiated Electric Field Emissions(Above 1 GHz)		23
Test Setup Photos and Configuration		24
Conducted Voltage Emissions		24
Conducted Telecommunication Emissions		25
Radiated Electric Field Emissions(Below 1 GHz)		26
Radiated Electric Field Emissions(Above 1 GHz)		27
EUT External Photographs		28
EUT Internal Photographs		29



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	Tampering, Loitering, Directional detection, Fog detection, Virtual line, Enter/Exit, Appear/Disappear, Face detection, Motion 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	

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr



KES Co., Ltd.

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-E1-18T0420
Page (5) of (42)

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)

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr



1.1 Test Voltage & Frequency

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

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

Frequency ☐ 50 Hz ☐ 60 Hz ☐ Hz

1.2 Variant Model Differences

Not applicable

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
NETWORK CAMERA	PNM-9320VQP	-	Hanwha Techwin (Tianjin) Co., Ltd.	EUT
PoE Injector	PT-PSE109GBRO-AH	PT1824010157	Dongguan PROCET Network Technology Co.,Ltd	

**KES Co., Ltd.**

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-E1-18T0420
Page (7) of (42)

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

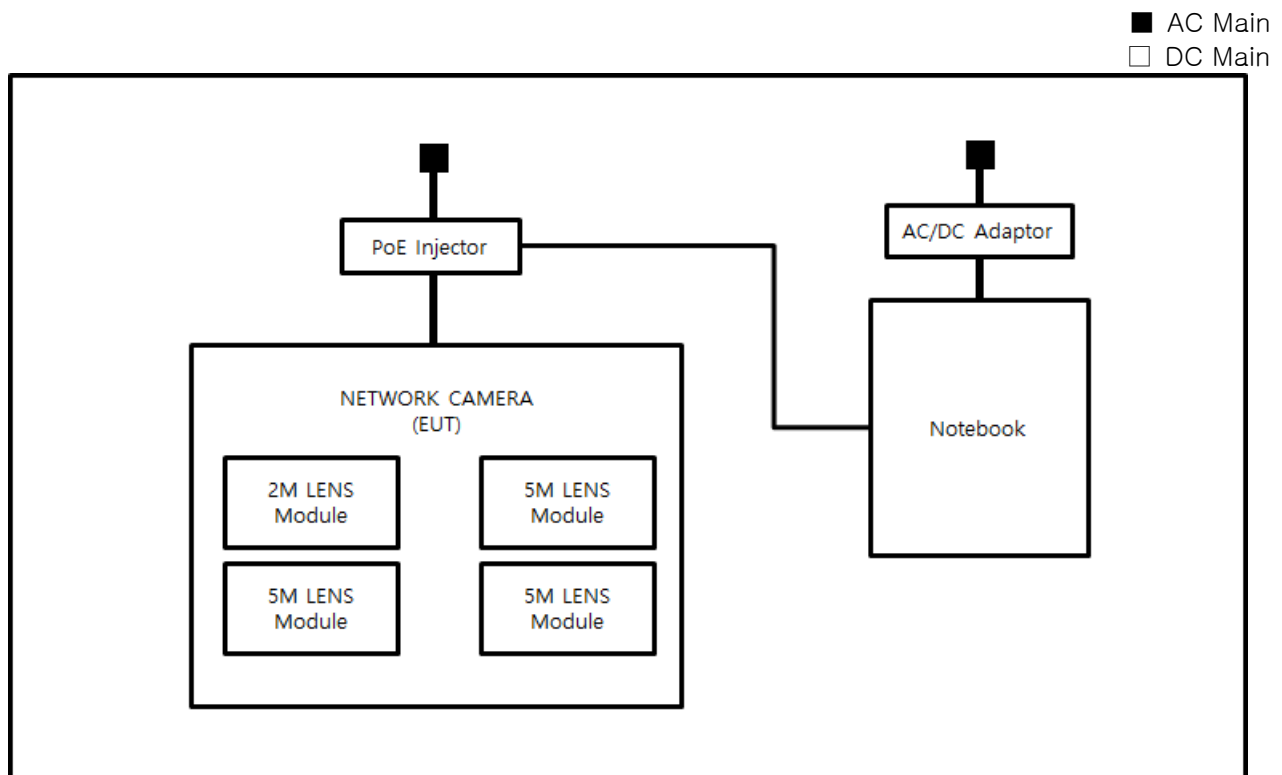
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

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, Yeosu-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

2.0 Test Regulations

The emissions tests were performed according to following regulations:

☐ **EMC – Directive 2014/30/EU**

☐ EN 61000-6-3:2011

☐ EN 61000-6-1:2007

☐ EN 61000-6-4:2007 +A1:2011

☐ EN 61000-6-2:2005

☐ EN 55011:2007 +A1:2010

☐ Group 1
☐ Class A

☐ Group 2
☐ Class B

☐ EN 55014-1:2006 +A2:2011

☐ EN 55014-2:1997 +A2:2008

☐ EN 55015:2013

☐ EN 61547 :2009

☐ EN 55032:2015

☐ Class A

☐ Class B

☐ EN 55024:2010 +A1:2015

☐ EN 50130-4:2011 +A1:2014

☐ EN 61000-3-2:2014

☐ EN 61000-3-3:2013

☐ EN 61326-1:2013



KES Co., Ltd.

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-E1-18T0420
Page (11) of (42)

-
- | | | |
|---|---|----------------------------------|
| ☒ 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 | | |

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr



2.1 Conducted Emissions 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, 05, 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.

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr



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.

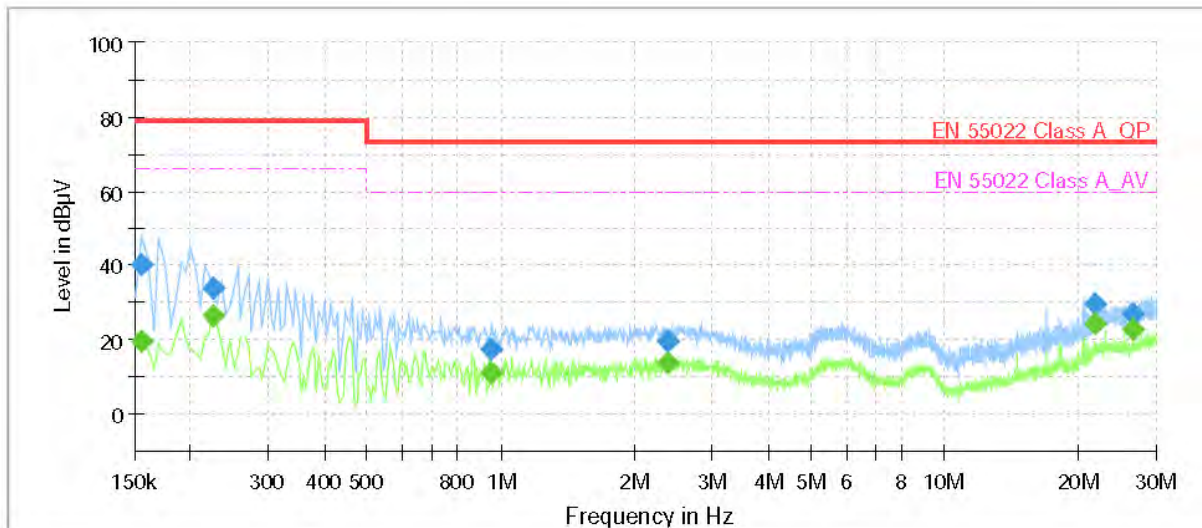
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

HOT LINE

Common Information

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



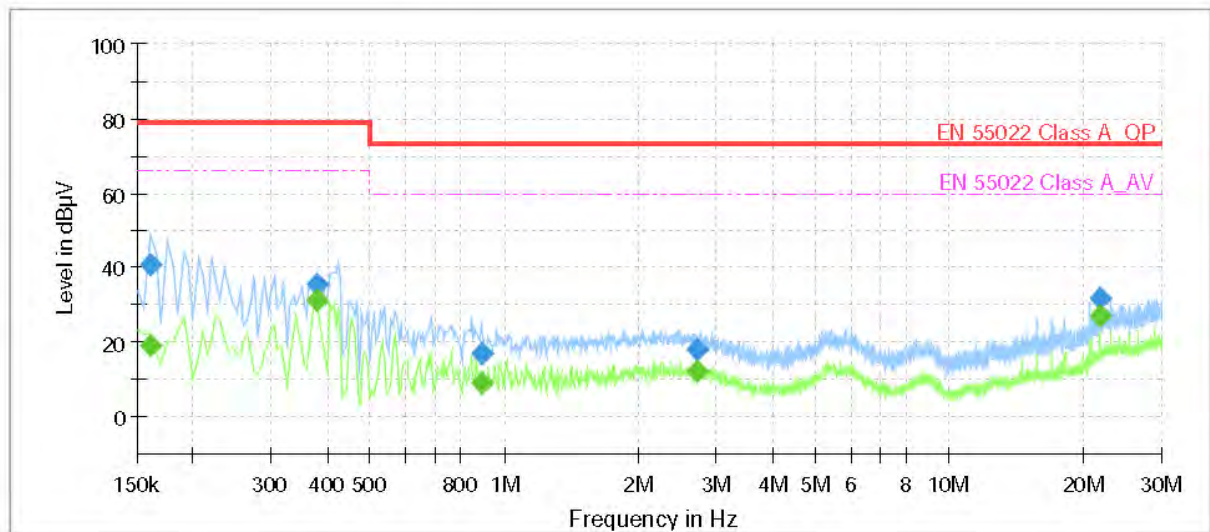
Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	19.78	66.00	46.22	1000.0	9.000	L1	19.3
0.155000	40.39	---	79.00	38.61	1000.0	9.000	L1	19.3
0.225000	---	26.36	66.00	39.64	1000.0	9.000	L1	19.4
0.225000	34.05	---	79.00	44.95	1000.0	9.000	L1	19.4
0.955000	---	11.20	60.00	48.80	1000.0	9.000	L1	19.9
0.955000	17.62	---	73.00	55.38	1000.0	9.000	L1	19.9
2.375000	---	13.80	60.00	46.20	1000.0	9.000	L1	20.1
2.375000	19.39	---	73.00	53.61	1000.0	9.000	L1	20.1
21.810000	---	24.22	60.00	35.78	1000.0	9.000	L1	20.4
21.810000	29.49	---	73.00	43.51	1000.0	9.000	L1	20.4
26.650000	---	22.88	60.00	37.12	1000.0	9.000	L1	20.4
26.650000	27.19	---	73.00	45.81	1000.0	9.000	L1	20.4

NEUTRAL LINE

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)
0.160000	---	18.89	66.00	47.11	1000.0	9.000	N	19.3
0.160000	40.76	---	79.00	38.24	1000.0	9.000	N	19.3
0.380000	---	31.40	66.00	34.60	1000.0	9.000	N	19.5
0.380000	35.40	---	79.00	43.60	1000.0	9.000	N	19.5
0.890000	---	9.09	60.00	50.91	1000.0	9.000	N	19.9
0.890000	17.23	---	73.00	55.77	1000.0	9.000	N	19.9
2.710000	---	12.25	60.00	47.75	1000.0	9.000	N	20.1
2.710000	17.77	---	73.00	55.23	1000.0	9.000	N	20.1
21.805000	---	27.21	60.00	32.79	1000.0	9.000	N	20.4
21.805000	31.59	---	73.00	41.41	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.:

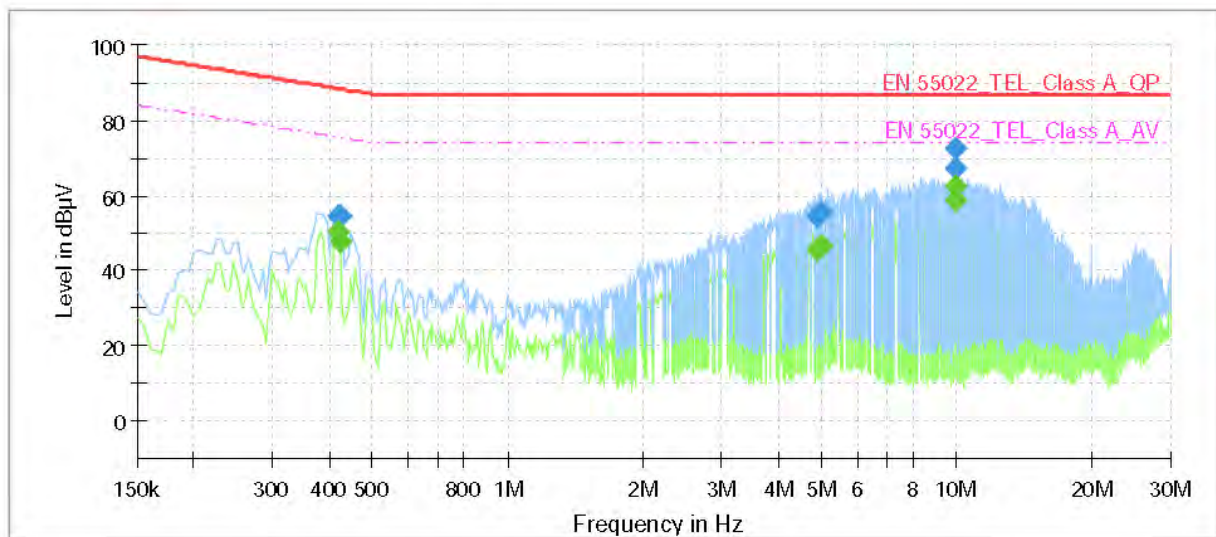
PNM-9320VQP

Mode

LAN , TEL 10 Mbps

Operator Name:

KES



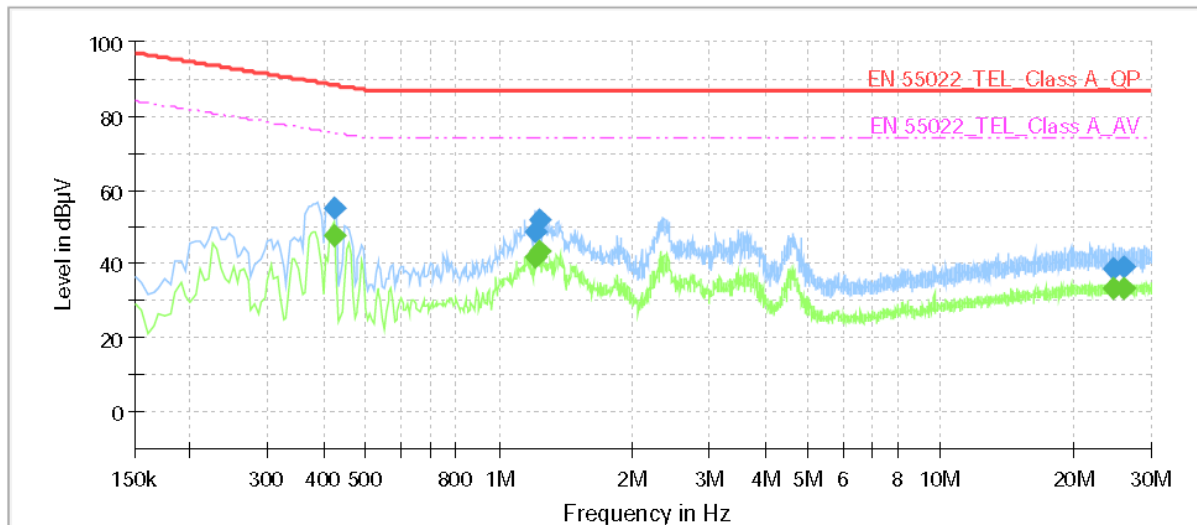
Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.420000	---	50.52	75.45	24.93	1000.0	9.000	Single Line	19.4
0.420000	54.34	---	88.45	34.11	1000.0	9.000	Single Line	19.4
0.425000	---	47.39	75.35	27.96	1000.0	9.000	Single Line	19.4
0.425000	54.40	---	88.35	33.95	1000.0	9.000	Single Line	19.4
4.915000	---	45.63	74.00	28.37	1000.0	9.000	Single Line	19.4
4.915000	54.45	---	87.00	32.55	1000.0	9.000	Single Line	19.4
5.025000	---	46.48	74.00	27.52	1000.0	9.000	Single Line	19.4
5.025000	55.47	---	87.00	31.53	1000.0	9.000	Single Line	19.4
9.995000	---	58.50	74.00	15.50	1000.0	9.000	Single Line	19.6
9.995000	67.22	---	87.00	19.78	1000.0	9.000	Single Line	19.6
10.000000	---	62.29	74.00	11.71	1000.0	9.000	Single Line	19.6
10.000000	72.66	---	87.00	14.34	1000.0	9.000	Single Line	19.6

[1 000 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: PNM-9320VQP
Mode: LAN , TEL 1 000 Mbps
Operator Name: KES



Final Result

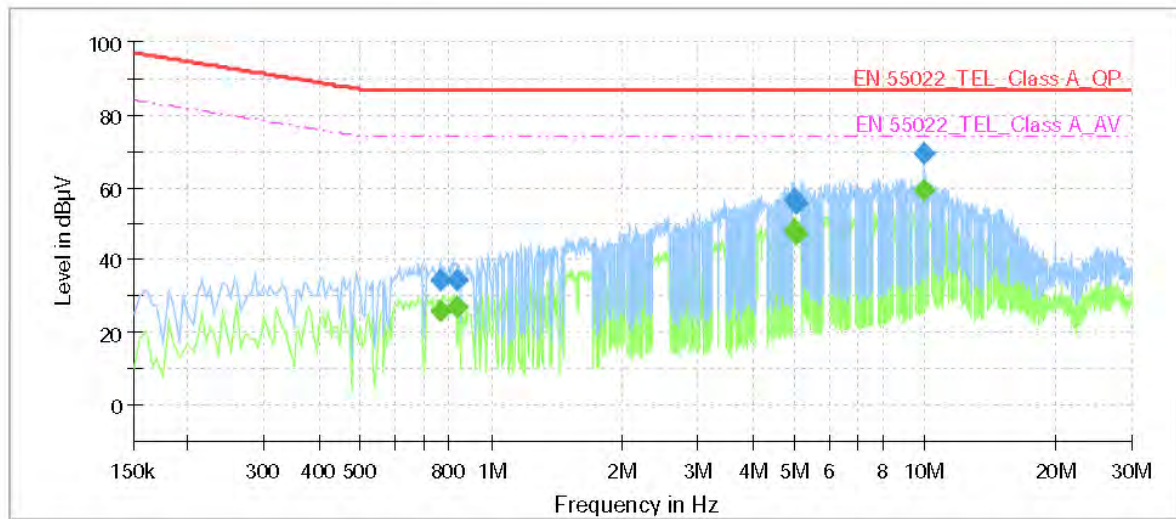
Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.425000	---	47.57	75.35	27.78	1000.0	9.000	Single Line	19.6
0.425000	55.29	---	88.35	33.06	1000.0	9.000	Single Line	19.6
1.210000	---	41.90	74.00	32.10	1000.0	9.000	Single Line	19.9
1.210000	48.76	---	87.00	38.24	1000.0	9.000	Single Line	19.9
1.240000	---	43.49	74.00	30.51	1000.0	9.000	Single Line	19.9
1.240000	51.70	---	87.00	35.30	1000.0	9.000	Single Line	19.9
24.695000	---	33.26	74.00	40.74	1000.0	9.000	Single Line	20.1
24.695000	38.87	---	87.00	48.13	1000.0	9.000	Single Line	20.1
26.040000	---	33.29	74.00	40.71	1000.0	9.000	Single Line	20.1
26.040000	38.94	---	87.00	48.06	1000.0	9.000	Single Line	20.1

■ PoE MODE

[10 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	PNM-9320VQP
Mode	PoE , TEL 10 Mbps
Operator Name:	KES



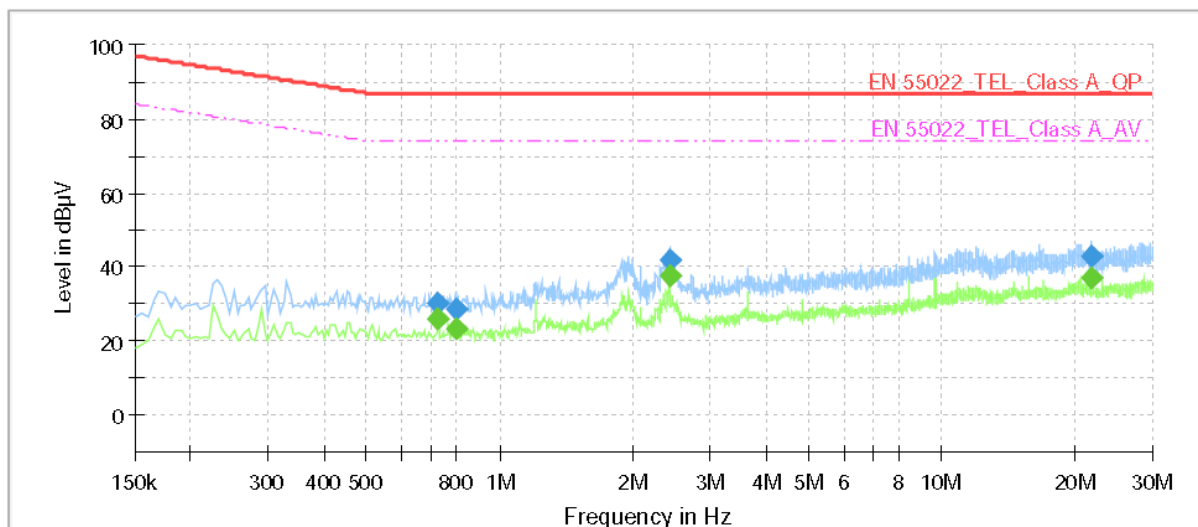
Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.760000	---	26.22	74.00	47.78	1000.0	9.000	Single Line	19.6
0.760000	34.17	---	87.00	52.83	1000.0	9.000	Single Line	19.6
0.830000	---	26.88	74.00	47.12	1000.0	9.000	Single Line	19.7
0.830000	34.51	---	87.00	52.49	1000.0	9.000	Single Line	19.7
4.980000	---	47.91	74.00	26.09	1000.0	9.000	Single Line	19.4
4.980000	56.82	---	87.00	30.18	1000.0	9.000	Single Line	19.4
5.040000	---	47.02	74.00	26.98	1000.0	9.000	Single Line	19.4
5.040000	55.69	---	87.00	31.31	1000.0	9.000	Single Line	19.4
10.000000	---	59.27	74.00	14.73	1000.0	9.000	Single Line	19.6
10.000000	69.39	---	87.00	17.61	1000.0	9.000	Single Line	19.6

[1 000 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	PNM-9320VQP
Mode	PoE , TEL 1 000 Mbps
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.725000	---	25.92	74.00	48.08	1000.0	9.000	Single Line	19.7
0.725000	30.23	---	87.00	56.77	1000.0	9.000	Single Line	19.7
0.795000	---	23.24	74.00	50.76	1000.0	9.000	Single Line	19.8
0.795000	28.49	---	87.00	58.51	1000.0	9.000	Single Line	19.8
2.420000	---	37.57	74.00	36.43	1000.0	9.000	Single Line	19.9
2.420000	41.74	---	87.00	45.26	1000.0	9.000	Single Line	19.9
21.780000	---	37.15	74.00	36.85	1000.0	9.000	Single Line	20.1
21.780000	42.89	---	87.00	44.11	1000.0	9.000	Single Line	20.1

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

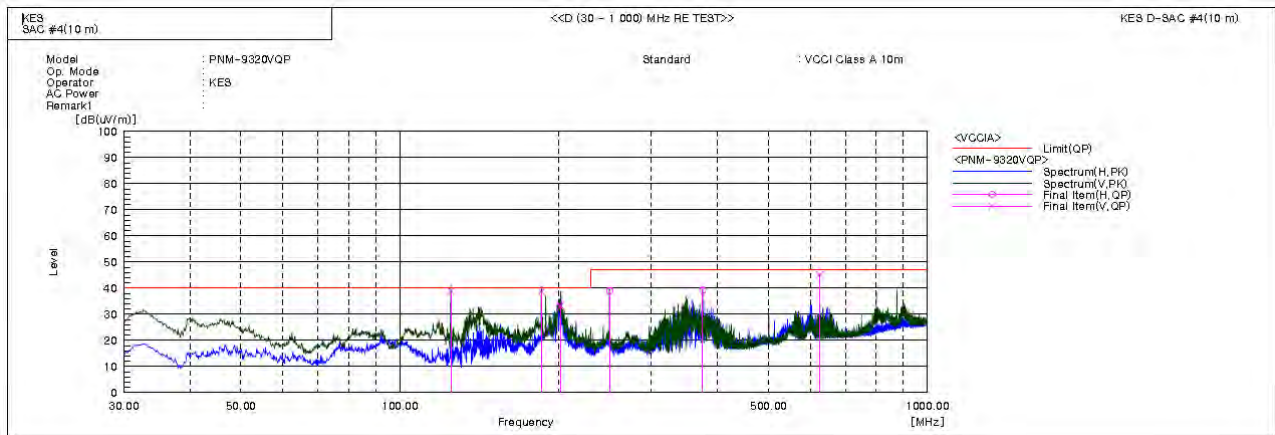


KES Co., Ltd.

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-E1-18T0420
Page (22) of (42)

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	124.998	V	71.0	-32.1	38.9	40.0	1.1	100.0	42.0	
2	185.632	V	68.2	-29.4	38.8	40.0	1.2	100.0	42.0	
3	201.686	V	60.7	-27.5	33.2	40.0	6.8	100.0	311.0	
4	249.996	H	65.4	-26.4	39.0	47.0	8.0	400.0	16.0	
5	374.985	H	61.6	-22.4	39.2	47.0	7.8	200.0	104.0	
6	624.975	V	60.9	-15.7	45.2	47.0	1.8	400.0	268.0	

◆ Calculation

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

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

Correction Factor : ANT FACTOR + Cable loss

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr



KES Co., Ltd.

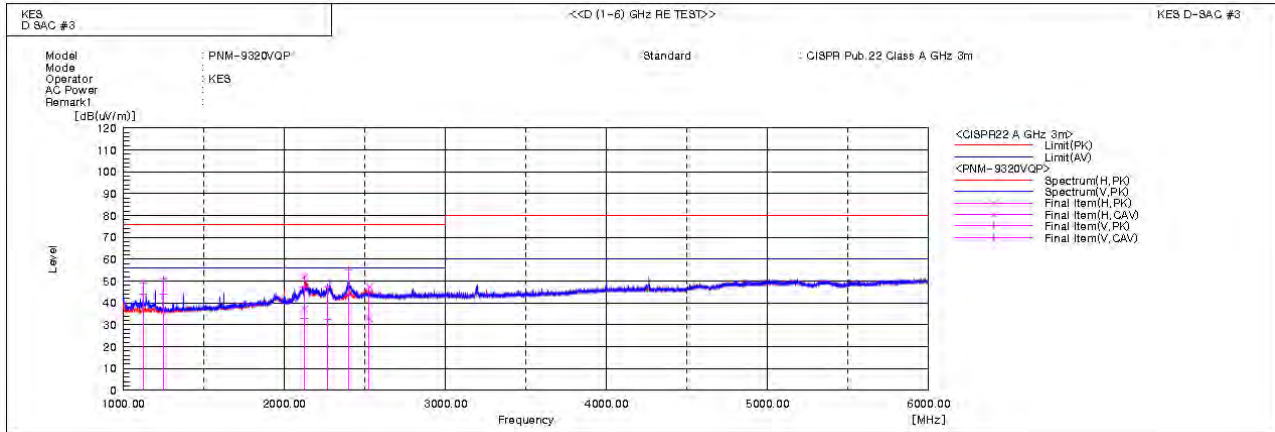
3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Test report No.:

KES-E1-18T0420

Page (23) of (42)

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	1125.150	V	55.5	50.5	-6.4	49.1	76.0	56.0	26.9	11.9	100.0	354.0	
2	1249.780	V	56.9	50.1	-5.8	51.1	76.0	56.0	24.9	11.7	100.0	136.4	
3	2123.185	V	47.5	33.1	0.0	47.5	76.0	56.0	28.5	22.9	100.0	58.5	
4	2127.731	H	52.1	37.3	0.1	52.2	76.0	56.0	23.8	18.6	100.0	322.0	
5	2266.924	V	46.6	31.8	0.8	47.4	76.0	56.0	28.6	23.4	100.0	54.9	
6	2400.280	V	53.9	42.2	1.3	55.2	76.0	56.0	20.8	12.5	100.0	2.5	
7	2527.606	H	45.7	31.2	1.7	47.4	76.0	56.0	28.6	23.1	100.0	286.6	

◆ 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

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

Test Setup Photos and Configuration

Conducted Voltage Emissions



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

Conducted Telecommunication Emissions



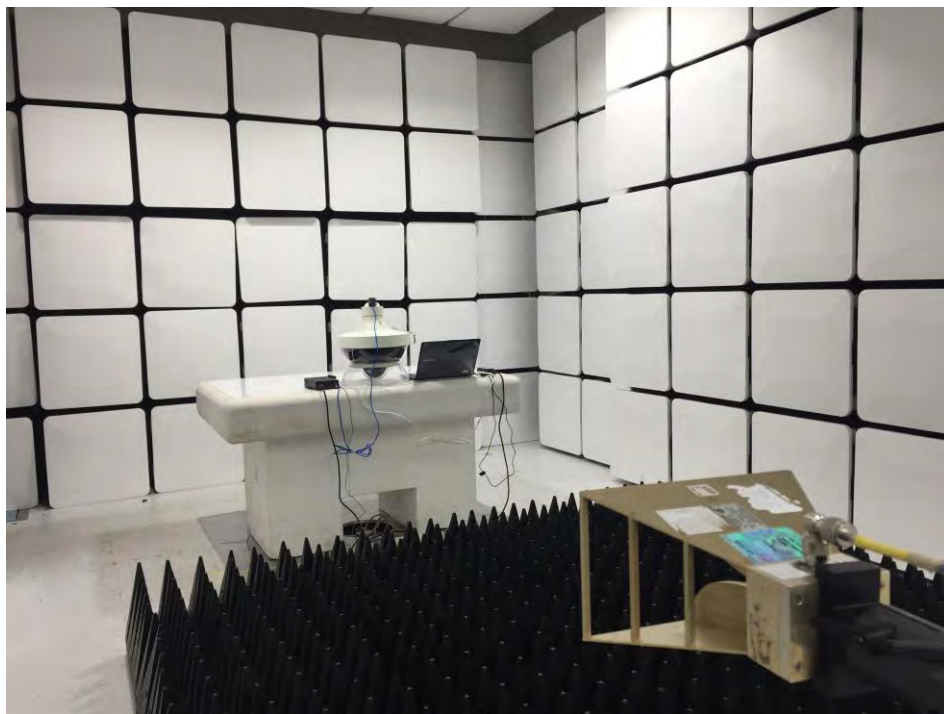
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

Radiated Electric Field Emissions(Below 1 GHz)



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

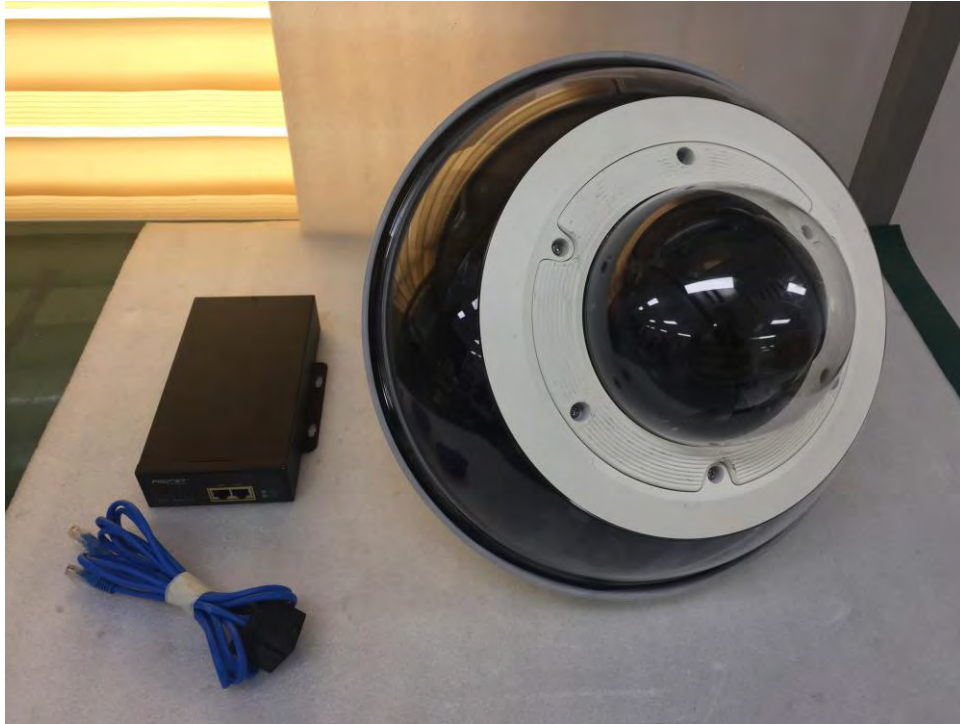
Radiated Electric Field Emissions(Above 1 GHz)



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT External Photographs

(Top)



(Bottom)



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal Photographs

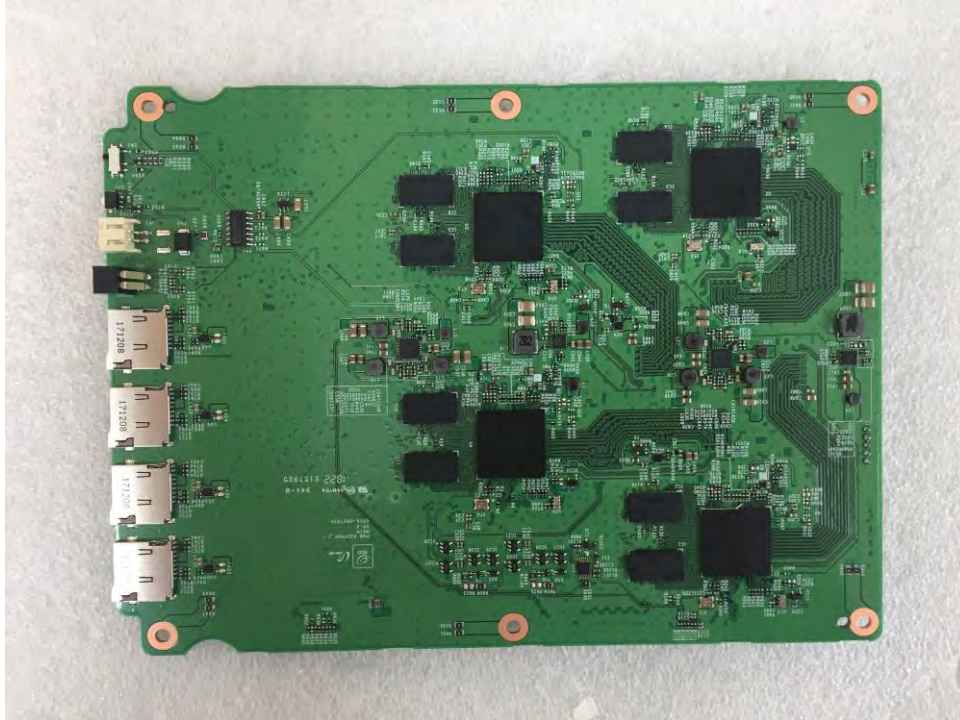
(Internal View)



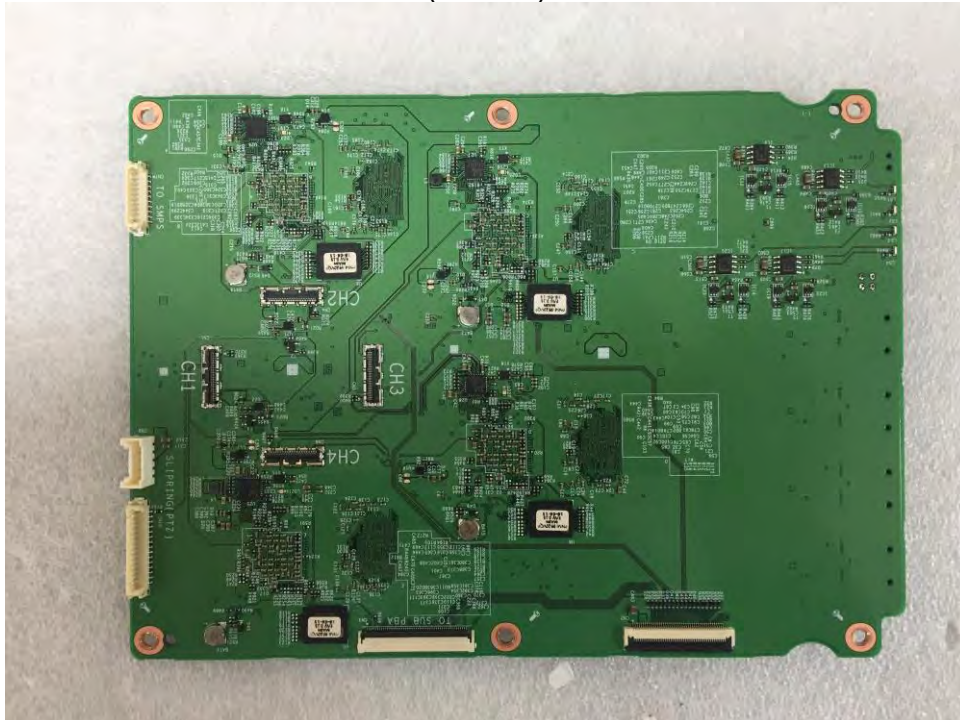
S

EUT Internal View – Main Board

(Top)



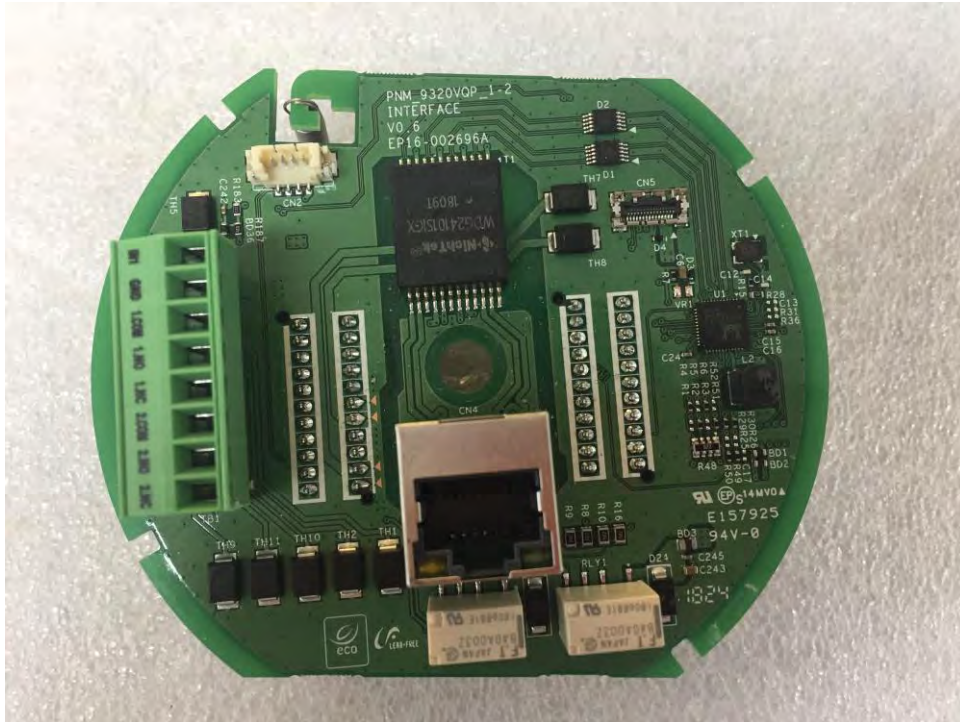
(Bottom)



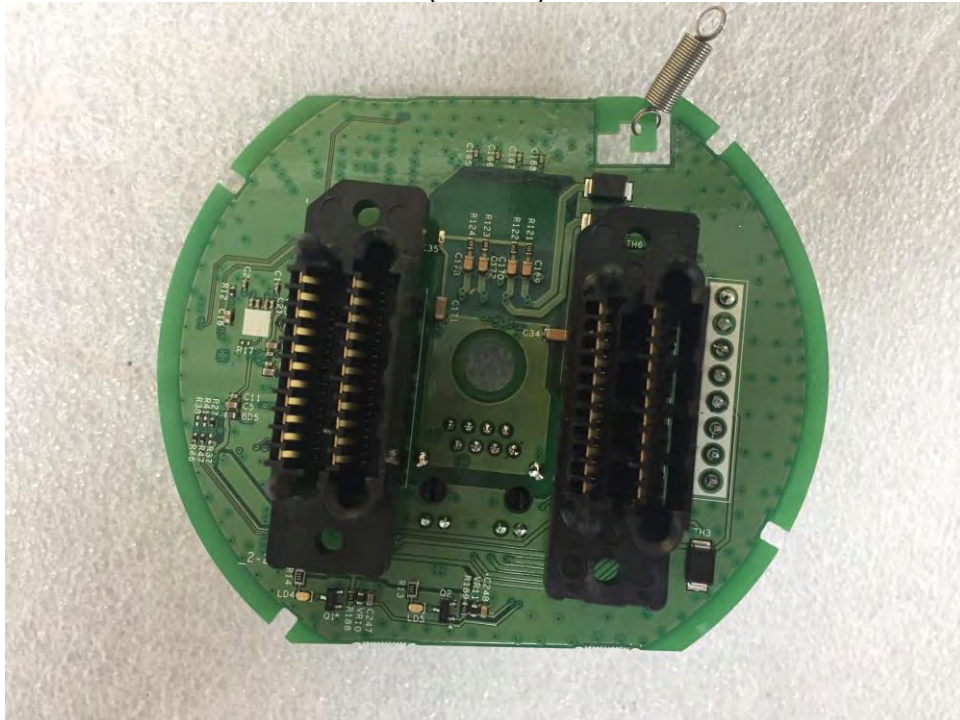
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – SUB Board 1

(Top)



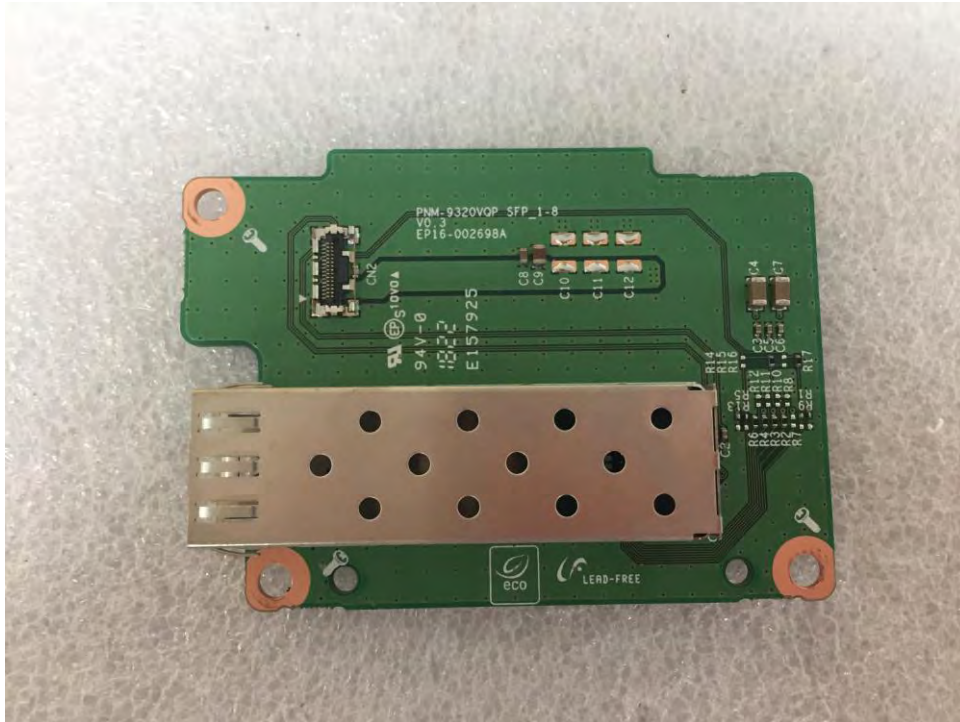
(Bottom)



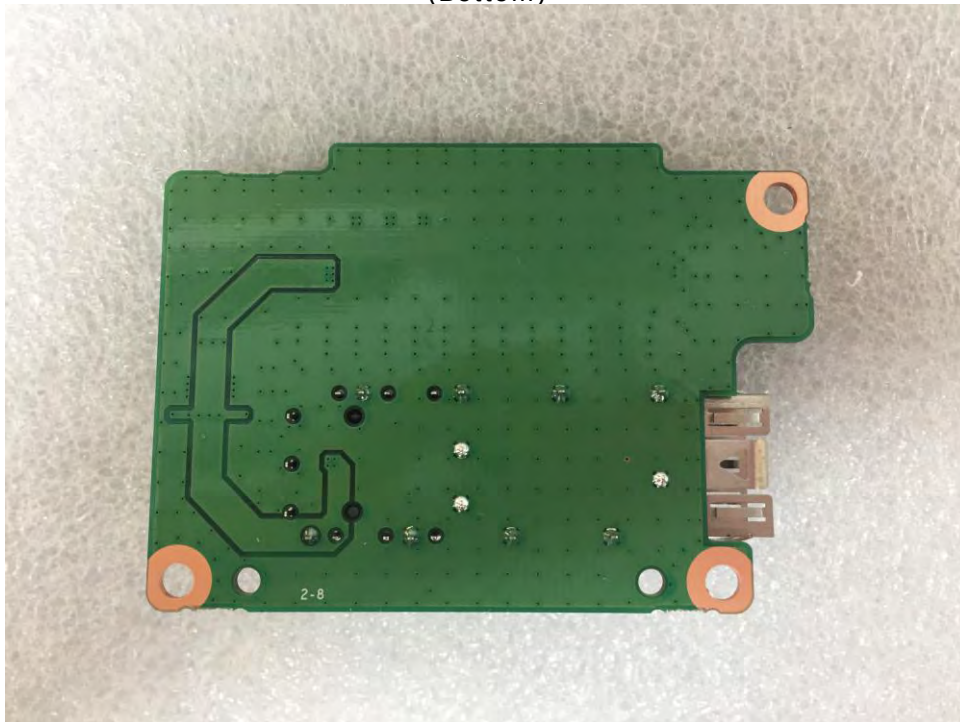
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – SUB Board 2

(Top)



(Bottom)



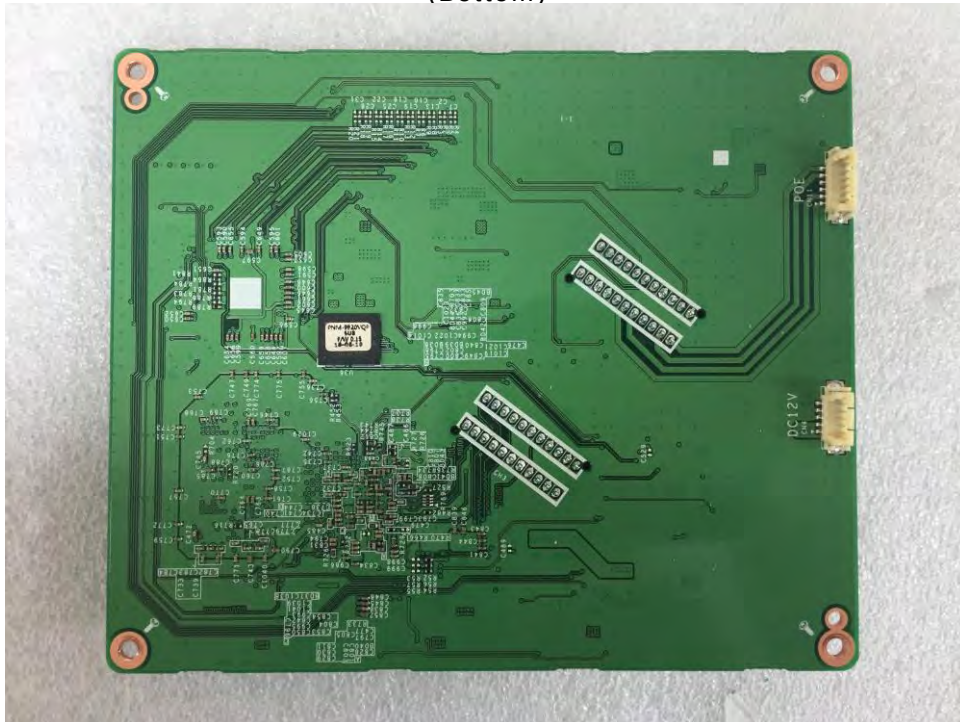
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – SUB Board 3

(Top)



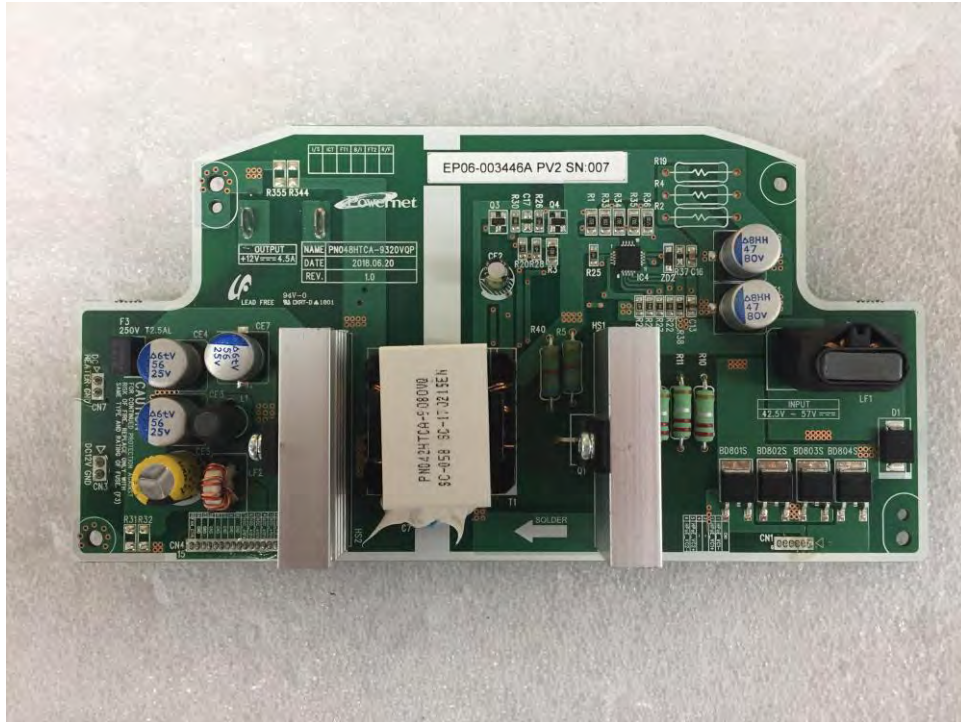
(Bottom)



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

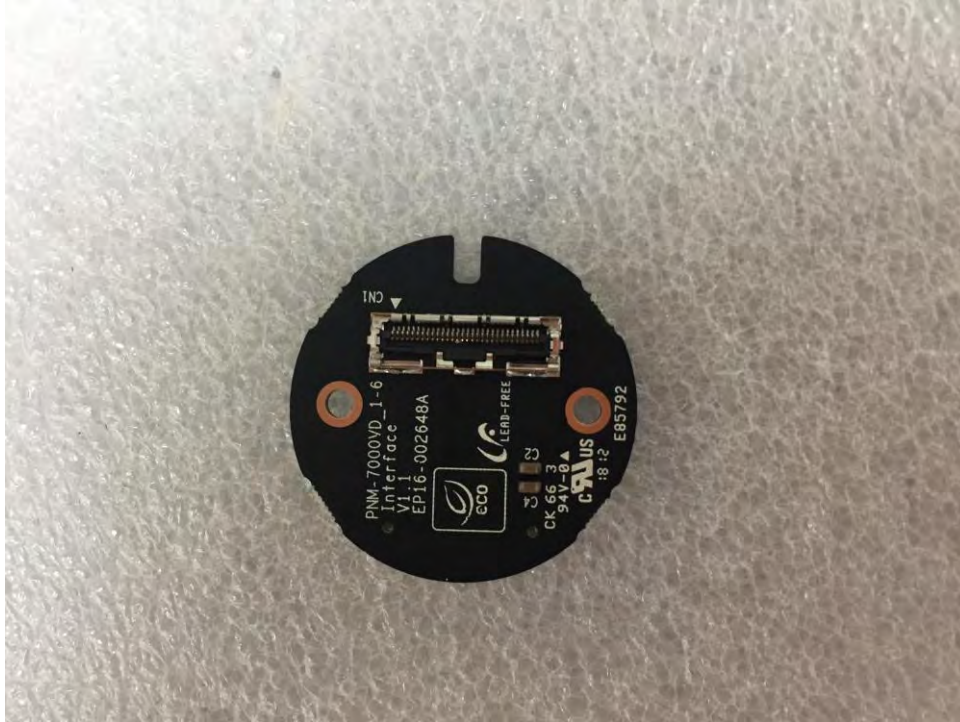
EUT Internal View – SUB Board 4

(Top)

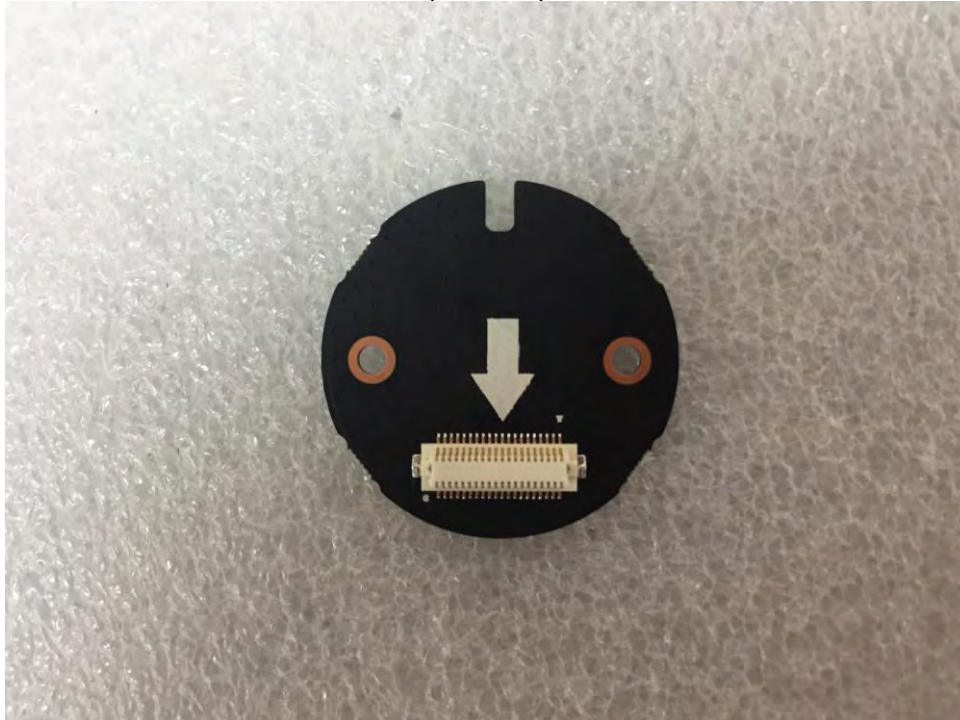


EUT Internal View – Camera connector Board

(Top)



(Bottom)



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – Camera LENS

(Top)



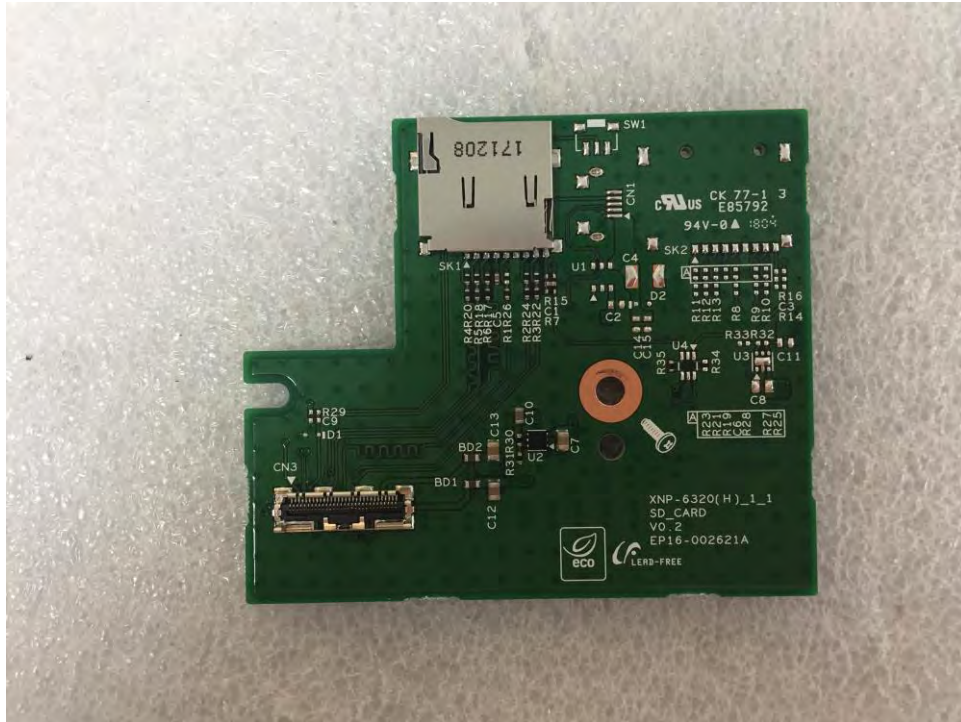
(Bottom)



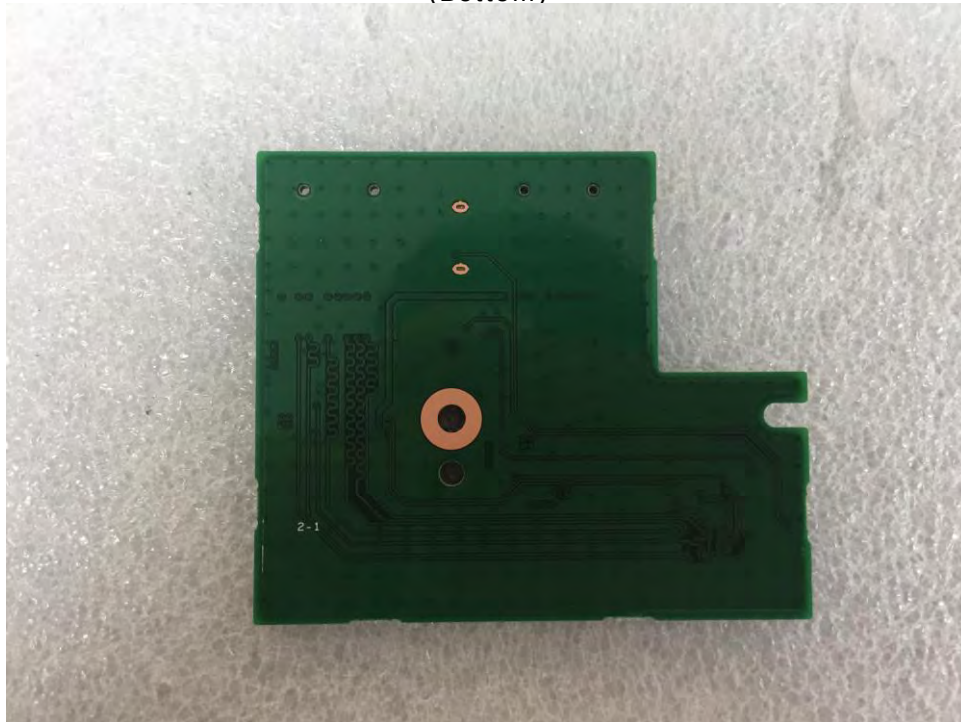
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – Camera SUB Board 1

(Top)



(Bottom)



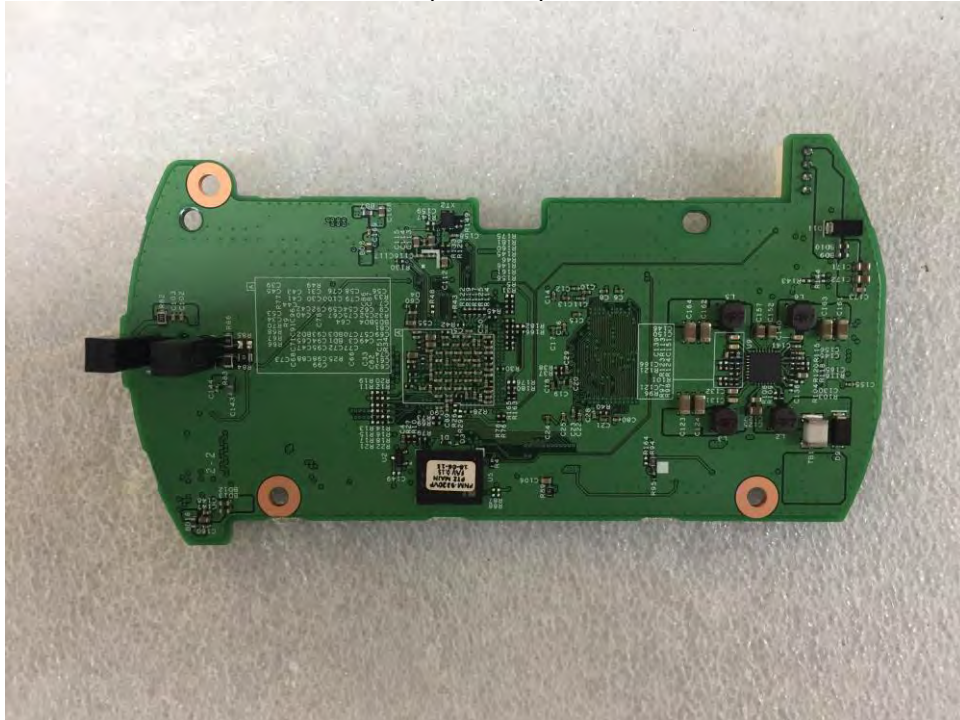
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – Camera SUB Board 2

(Top)



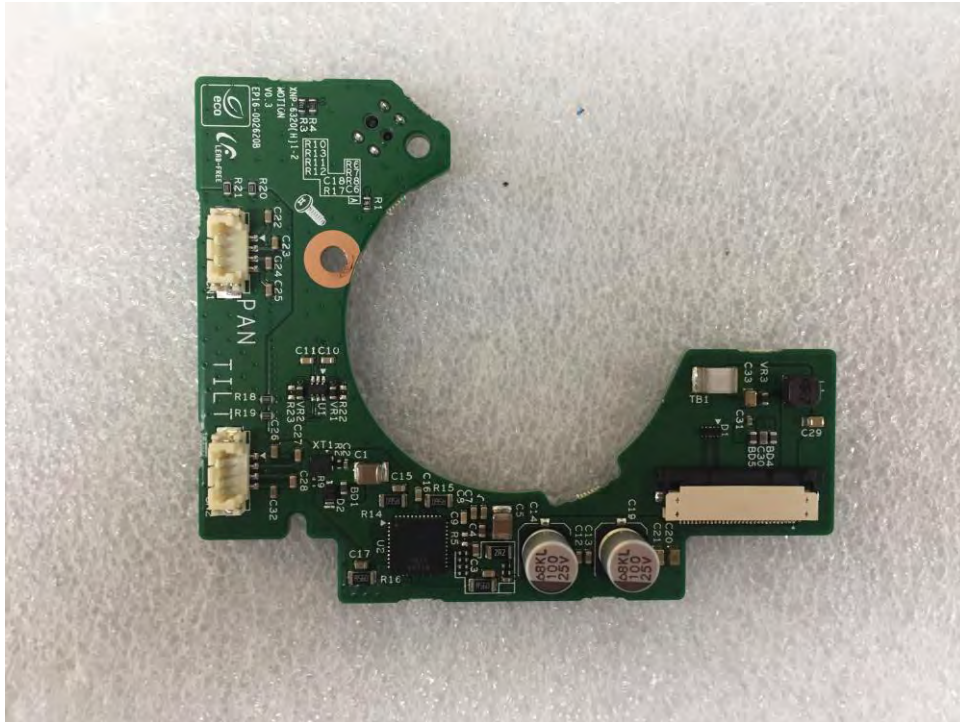
(Bottom)



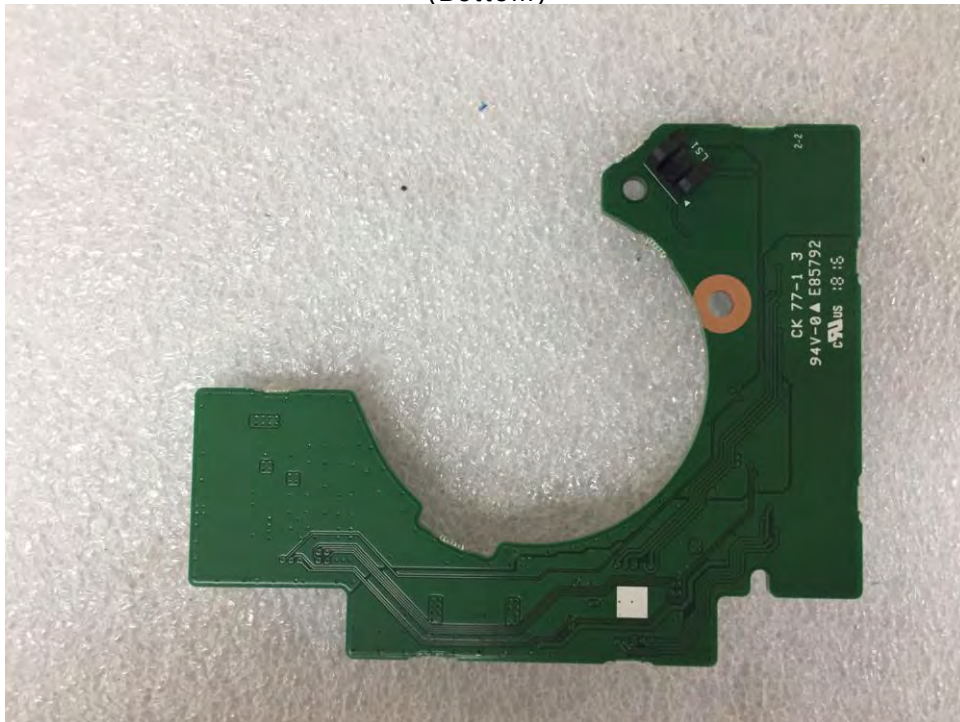
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – Camera SUB Board 3

(Top)



(Bottom)



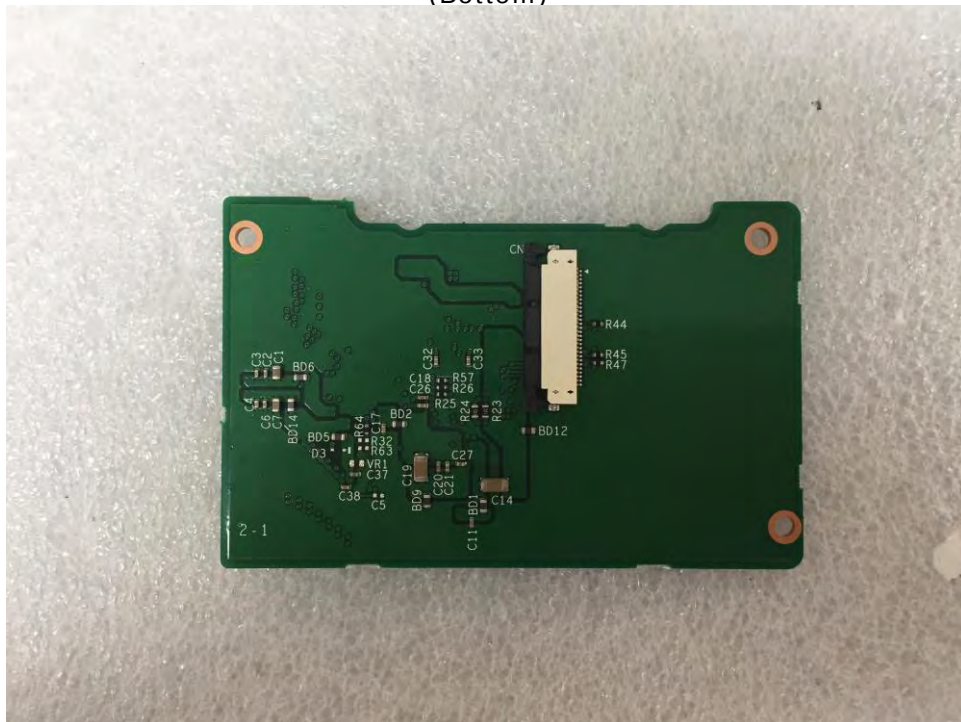
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – Camera SUB Board 4

(Top)



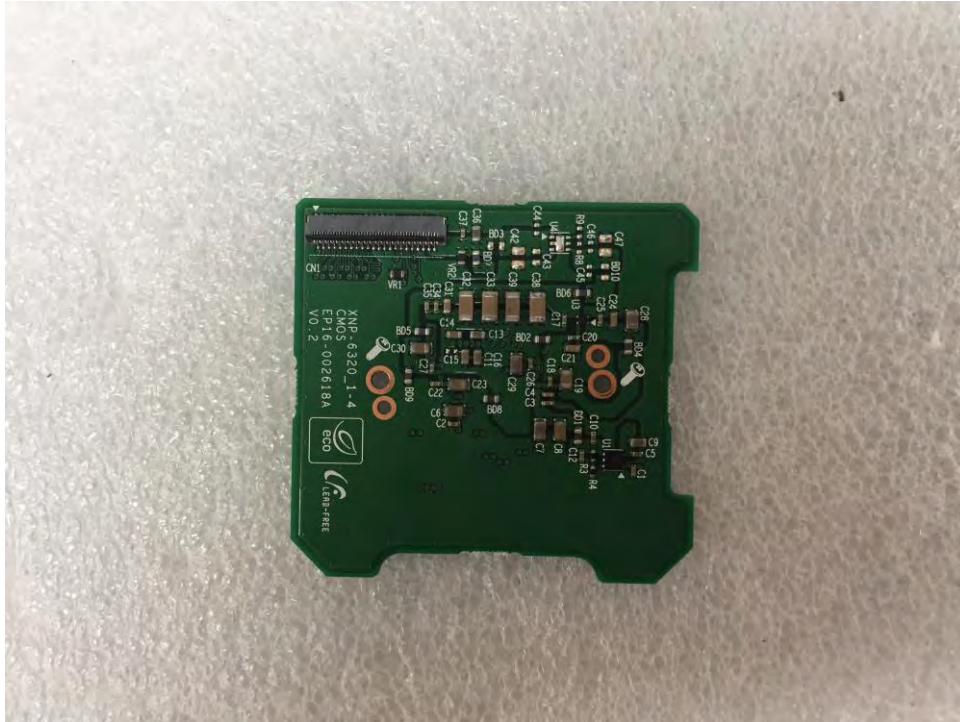
(Bottom)



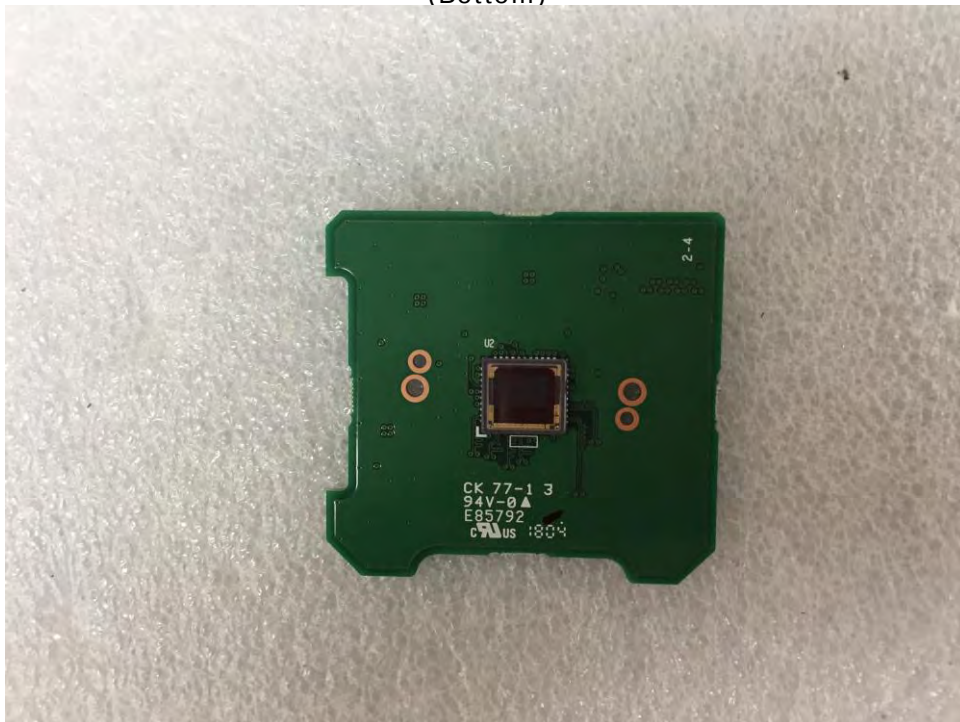
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – Camera SUB Board 5

(Top)



(Bottom)



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
 The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
 The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – PoE Adapter

(Top)



(Bottom)



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
 The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
 The authenticity of the test report, contact shchoi@kes.co.kr