



EMC TEST REPORT For CE

Test Report No. : KES-E1-17T0446-R2

Date of Issue : Sep. 28, 2018

Product name : NETWORK CAMERA

Model/Type No. : SNP-6320HP

Variant Model : SNP-6320H

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. 06, 2017

Test date : Jul. 10, 2017 – Jul. 12, 2017

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

Tested by

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EMC Test Engineer

Reviewed by

Dong-Hun, Jang
EMC Technical Manager

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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Jul. 14, 2017	KES-E1-17T0446	Issued
Jun. 27, 2018	KES-E1-17T0446-R1	Re-issue due to manufacturer change
Sep. 28, 2018	KES-E1-17T0446-R2	Add a derived model

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1.0 General Product Description

Main Specifications of E.U.T are:

1	Imaging Device	1/2.8" Progressive Scan CMOS
2	Total Pixels	1952(H) x 1236(V), 2.41M
3	Effective Pixels	1944(H) x 1224(V), 2.38M
4	Scanning System	Progressive
5	Min. Illumination	Color : 0.3 Lux (1/30sec, F1.6, 50IRE) B/W : 0.03 Lux (1/30sec, F1.6, 50IRE)
6	S / N Ratio	50dB
7	Video Out	CVBS : 1.0 Vp-p / 75Ω composite, 720x480(N), 720x576(P), for installation
Lens		
8	Focal Length (Zoom Ratio)	4.44~142.6mm(Optical 32X)
9	Max. Aperture Ratio	1.6 (Wide) ~ 4.4 (Tele)
10	Angular Field of View	H : 62.8°(Wide) ~ 2.23°(Tele) / V : 36.80°(Wide) ~ 1.26°(Tele)
11	Min. Object Distance	Wide 10mm ,Tele 1.5m
12	Focus Control	Auto / Manual / One Push
13	Lens Type	DC Auto Iris
14	Mount Type	Board-in type
Pan/Tilt/Rotate		
15	Pan Range	360° Endless
16	Pan Speed	Preset : 700°/sec, Manual : 0.024°/sec ~120°/sec
17	Tilt Range	210°(-15° ~195°)
18	Tilt Speed	Preset : 700°/sec, Manual : 0.024°/sec ~120°/sec
19	Rotate Range	-
20	Preset	255ea
21	Preset Accuracy	±0.2°
22	Auto Tracking	Off / On , Schedule mode add Auto Tracking Mask mode add.
Operational		
23	Camera Title	Off / On (Displayed up to 45 characters)
24	Day & Night	Auto (ICR) / Color / B/W / External / Schedule
25	Backlight Compensation	Off / BLC / HLC
26	Wide Dynamic Range	120dB
27	Contrast Enhancement	SSDR (Samsung Super Dynamic Range) (Off / On)
28	Digital Noise Reduction	SSNR III (2D+3D Noise Filter) (Off / On)
29	Digital Image Stabilization	Off / On
30	Defog	Auto/Manual/Off

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31	Motion Detection	Off / On (4ea Rectangle zone)
32	Privacy Masking	Off / On (32 Zones of Rectangle zone)
33	Gain Control	Off / Low / Middle / High
34	White Balance	ATW / AWC / Manual / Indoor / Outdoor
35	Electronic Shutter Speed	Minimum / Maximum / Anti flicker (2 ~ 1/12,000sec)
36	Digital Zoom	16x
37	Flip / Mirror	Off / On
38	Intelligent Video Analytics	Tampering, Virtual Line, Enter/Exit, Appear / Disappear, Audio Detection, Face Detection
39	Alarm I/O	Input 4ea / Output 2ea (Relay)
40	Audio In	Selectable (Mic IN/Line IN), Max output level: 1 Vrms Supply voltage: 2.5VDC(4mA), Input impedance: approx. 2K Ohm
41	Audio out	Line out (3.5mm stereo mini jack)
42	Serial Interface	RS-485 - Samsung-T/E, Pelco-D/P, Sungjin, Panasonic, Bosch, AD, GE, Vicon, Honeywell
43	Alarm Triggers	Motion detection, Tampering, Audio Detection, Face Detecton, Video Analytics, Alarm Input, Network Disconnection
44	Alarm events	File upload via FTP and E-Mail Notification via E-Mail, TCP and HTTP local storage(SD/SDHC/SDXC) recording at Network disconnected & Event (Alarm Triggers) External output
Network		
45	Ethernet	RJ-45 (10/100BASE-T)
46	Video Compression Format	H.264 (MPEG-4 Part 10/AVC), Motion JPEG
47	Resolution	1920x1080 / 1280x1024 / 1280x960 / 1280x720 / 1024x768 / 800x600 / 800x450 / 640x480 / 640x360 / 320x240 / 320x180
48	Max. Framerate	H.264 : Max 60fps at all resolutions Motion JPEG : 1920x1080 / 1280x1024 / 1280x960 / 1280x720 / 1024x768 : Max. 15 fps 800x600 / 800x450 / 640x480 / 640x360 / 320x240 / 320x180 : Max. 30fps
49	Smart Codec	0

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50	Video Quality Adjustment	H.264 : Compression Level, Target Bitrate Level Control MJPEG : Quality Level Control
51	Bitrate Control Method	H.264 : CBR or VBR, Motion JPEG : VBR
52	Streaming Capability	Multiple Streaming (Up to 10 Profiles)
53	Audio Compression Format	G.711 u-law /G.726 Selectable G.726 (ADPCM) 8KHz, G.711 8KHz G.726 : 16Kbps, 24Kbps, 32Kbps, 40Kbps
54	Audio Communication	Bi-directional
55	IP	IPv4, IPv6
56	Protocol	TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP, RTSP, NTP, HTTP, HTTPS, SSL, DHCP, PPPoE, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, PIM-SM, UPnP, Bonjour

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57	Security	HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access Log 802.1x Authentication
58	Streaming Method	Unicast / Multicast
59	Max. User Access	15 users at Unicast Mode
60	Memory Slot	SD/SDHC/SDXC - motion Images recorded in the SD/SDHC/SDXC memory card can be downloaded.
61	Application Programming Interface	ONVIF Profile S & G SUNAPI 2.0 SVNP 1.2
62	Webpage Language	English, French, German, Spanish, Italian, Chinese, Korean, Russian, Japanese, Swedish, Danish, Portuguese, Turkish, Polish, Czech, Rumanian, Serbian, Dutch, Croatia, Hungary, Greek, Finnish, Norwegian
63	Web Viewer	Supported OS : Windows XP / VISTA / 7 / 8 or Higher, MAC OS X 10.7 or Higher Supported Browser : Microsoft Internet Explorer (Ver. 8~11) or Higher, Mozilla Firefox (Ver. 9~19) or Higher, Google Chrome (Ver. 15~25) or Higher, Apple Safari (Ver. 6.0.2(Mac OS X 10.8, 10.7 Only), 5.1.7) or Higher * Mac OS X Only
64	Central Management Software	SmartViewer 4.X, SSM
Environmental		
65	Operating Temperature / Humidity	-50°C ~ +55°C (-58°F ~ +131°F) / ~ 90% RH, AC24V Mode -30°C ~ +55°C, PoE+ Mode
66	Storage Temperature / Humidity	-30°C ~ +60°C / Less than 90% RH
67	Ingress Protection	IP66
68	Vandal Resistance	IK9 (SNP-6320 only, SHP-3701H : IK10 Accessory Housing)
Electrical		
69	Input Voltage / Current	AC24V±10%, PoE+(IEEE802.3at, Class3)
70	Power Consumption	26W Max(Heater Off), 60W Max(Heater On, AC24V)
Mechanical		
71	Color / Material	Ivory / Plastic
72	Dimension (WxHxD)	H293.6 x Ø220 mm
73	Weight	3.4Kg

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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

The Variant model is management model of each different sellers

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
NETWORK CAMERA	SNP-6320HP	-	Hanwha Techwin (Tianjin) Co.,Ltd.	E.U.T

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1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
POE Adaptor	POE36U-1AT-R	-	PHIHONG TECHNOLOGY CO., LTD.	-
AC Adaptor	AP-2410A	-	anjunsa	-
Notebook	X56K	HN11N5151FJ0045 W	hansung computer	-
Notebook Adaptor	A12-120P1A	F180271552011758	CHICONY POWER TECHNOLOGY CO.,LTD.	-
SmartPhone	LG-SU760	108KPQJ0186212	LG Electronics	
Speaker	BR10000A CUVE	-	BEIJING EDIFIER HI-TECH GROUP.	-
MIC	CMK-303	-	CAMAC	-
Controller	SPC-1010	C50E67WG10100F	SamSung Techwin Co.,Ltd	-
Controller Adaptor	RS-AB1000	-	Dongguan Jinhua Sheng Power Technology Co.,Ltd	-
Alarm	SIP-1201DD D0	-	SAMSUNG TECHWIN CO., LTD.	-

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1.6 External I/O Cabling

- AC Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (E.U.T)	RJ-45	Notebook	RJ-45	3.0	U
	3.5 mm	Speaker	3.5 mm	1.5	U
	3.5 mm	MIC	3.5 mm	1.7	U
	2 Pin	Controller	2 Pin	3.0	U
	3 Pin	Alarm	3 Pin	3.0	U
Notebook	3.5 mm	SmartPhone	3.5 mm	1.2	U

- PoE Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (E.U.T)	RJ-45	POE Adaptor	RJ-45	3.0	U
	3.5 mm	Speaker	3.5 mm	1.5	U
	3.5 mm	MIC	3.5 mm	1.7	U
	(2 Pin)	Controller	2 Pin	3.0	U
	3 Pin	Alarm	3 Pin	3.0	U
Notebook	RJ-45	POE Adaptor	RJ-45	3.0	U
	3.5 mm	SmartPhone	3.5 mm	1.2	U

* Unshielded=U, Shielded=S



1.7 E.U.T Operating Mode(s)

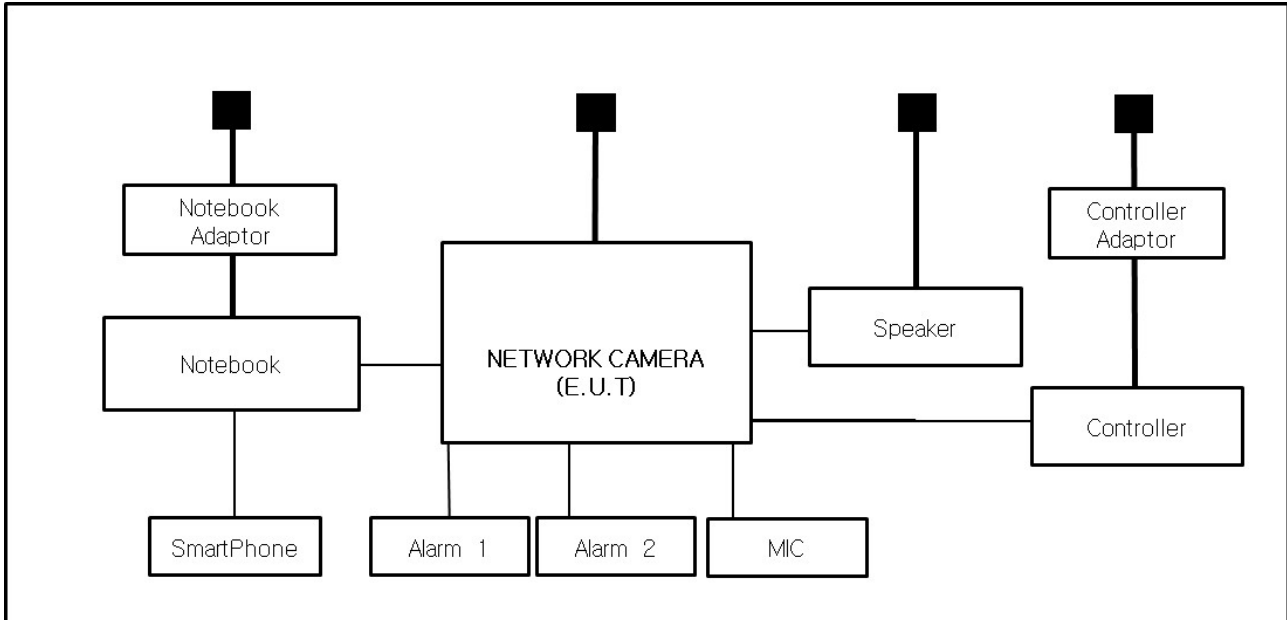
Test mode	operating
AC 24 V	E.U.T Monitoring, Ping Test
PoE	E.U.T Monitoring, Ping Test

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

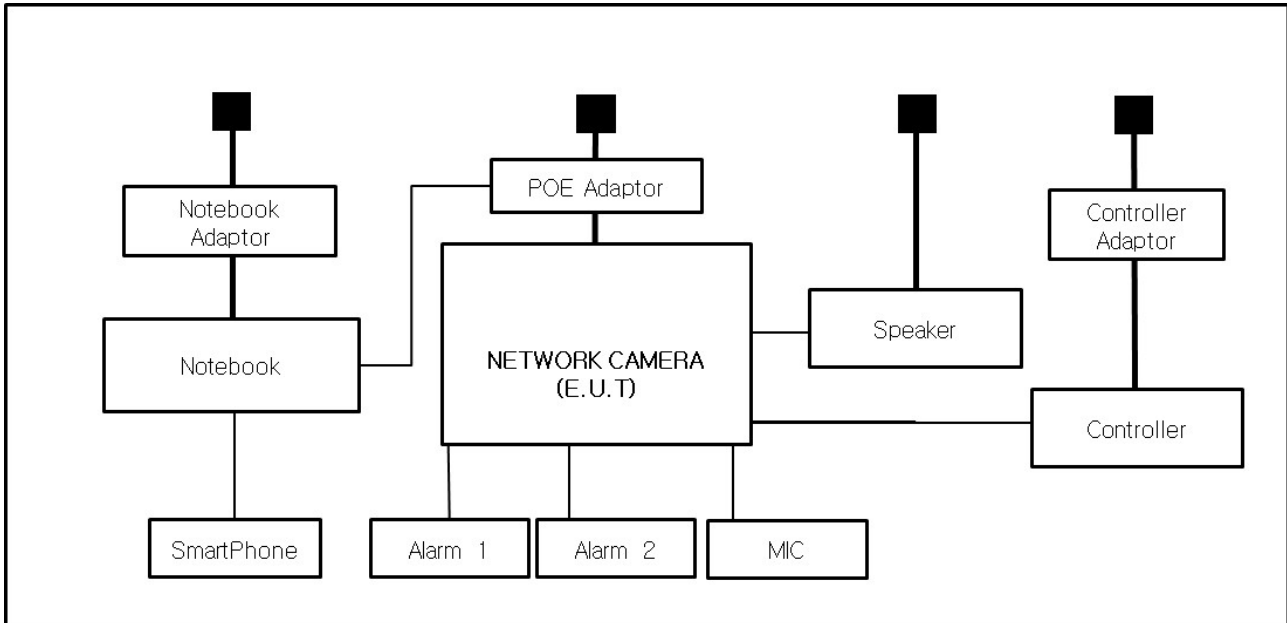
1.8 Configuration

■ AC Main
□ DC Main

- AC 24 V Mode



- PoE Mode



1.9 When standards apply remarks

- The adaptor is not included by the manufacturer.

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	Accreditation No
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 55032:2012/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



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



2.1 Conducted Emissions at Mains Power Ports

Test Date

Jul. 11, 2017

Test Location

Electro wave Shieldroom

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, 27, 2018
☒	LISN	ENV216	R & S	101787	01, 11, 2018
☒	LISN	ESH2-Z5	R & S	100450	04, 27, 2018
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 13, 2017

Test Conditions

Temperature: 25,4 °C

Relative Humidity: 57,0 %

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. 11, 2017

Test Location

Electro wave Shieldroom

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, 27, 2018
☒	LISN	ENV216	R & S	101787	01, 11, 2018
☒	LISN	ESH2-Z5	R & S	100450	04, 27, 2018
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 13, 2017
☒	8-WIRE ISN CAT3,5	ENY81	R & S	100174	01, 11, 2018

Test Conditions

Temperature: 25,4 °C

Relative Humidity: 57,0 %

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

RemarksSee Appendix A for test data.



2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Jul. 10, 2017

Test Location

☐ OPEN AREA TEST SITE #2 ☒ SAC #4(10 m)

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, 18, 2018
☒	AMPLIFIER	SCU 01	R & S	100603	12, 13, 2017
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	716	11, 28, 2018

Test Conditions

Temperature: 22,5 °C
Relative Humidity: 50,4 %

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. 10, 2017

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, 19, 2018
☒	PREAMPLIFIER	8449B	AGILENT	3008A01729	05, 31, 2018
☒	LOG-PERIODIC ANTENNA	STLP 9149	SCHWARZBECK	9149-255	05, 17, 2018

Test Conditions

Temperature: 22,0 °C

Relative Humidity: 50,4 %

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

N/A

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, 2017
☐	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	08, 08, 2017

Test Conditions

Relative Humidity: °C
 %

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

-

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. 11, 2017

Test Location

EMS-ESD: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	-	-	-	-
☒	ESD SIMULATOR	ESS-2000	Noise Ken	ESS05X4620	02, 24, 2018
☒	HCP	-	Noise Ken	-	-
☒	VCP	-	Noise Ken	-	-

Test Conditions

Temperature: 20,8 °C
Relative Humidity: 50,0 %
Atmospheric Pressure: 99,1 kPa



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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	Air	HCP	VCP
	☐ 2 kV	☒ 2 kV	☐ 2 kV	☐ 2 kV
	☐ 4 kV	☒ 4 kV	☐ 4 kV	☐ 4 kV
	☒ 6 kV	☐ 6 kV	☒ 6 kV	☒ 6 kV
	☐ 8 kV	☒ 8 kV	☐ 8 kV	☐ 8 kV
	☐ 15 kV	☐ 15 kV	☐ 15 kV	☐ 15 kV

Notes: HCP: Horizontal coupling plane

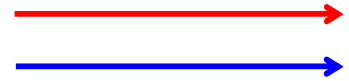
VCP: Vertical coupling plane

Required Performance Criteria: ☒ Complied

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Location of Discharge:

Air
Contact



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Test Data

- AC Mode

Indirect Discharge

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

Direct Discharge

No.	Test Point	Discharge Method	Observations	Remarks
1	Enclosure	Air Discharge	Complied	-
2	Screw	Contact Discharge	Complied	-
3	Port	Contact Discharge	Complied	-

- PoE Mode

Indirect Discharge

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

Direct Discharge

No.	Test Point	Discharge Method	Observations	Remarks
1	Enclosure	Air Discharge	Complied	-
2	Screw	Contact Discharge	Complied	-
3	Port	Contact Discharge	Complied	-

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

Test Results

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

Remarks

PASS Required Performance Criteria.

3.2 Radiated Electric Field Immunity

Reference Standard

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

Test Date

Jul. 10, 2017

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	KTI_RS2012	KOREA TECHNOLOGY INSTITUTE CO., LTD	2.1.1	-
☒	SIGNAL GENERATOR	ESG-3000A	HP	US37040210	11, 01, 2017
☒	AMPLIFIER	ITA0300-200	Infinitech	-	11, 01, 2017
☒	AMPLIFIER	ITA0750-200	Infinitech	-	11, 01, 2017
☒	AMPLIFIER	ITA1500-100	Infinitech	-	11, 01, 2017
☒	AMPLIFIER	ITA2500-100	Infinitech	-	11, 01, 2017
☒	POWER METER	E4419B	Agilent	MY45101506	06, 26, 2018
☒	AVERAGE POWER SENSOR	E9301A	Agilent	-	06, 26, 2018
☒	AVERAGE POWER SENSOR	E9301A	Agilent	MY41495698	06, 26, 2018
☒	HYBRID LOG-PERIODIC ANTENNA	HLP-2603	TDK	100400	-

Test Conditions

Temperature: 22,0 °C
Relative Humidity: 50,4 %
Atmospheric Pressure: 99,3 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 Data

- AC Mode

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

- PoE Mode

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

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

Test Results

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

Remarks

PASS Required Performance Criteria.

3.3 Electrical Fast Transients/Bursts

Reference Standard

EN 61000-4-4:2012

Test Date

Jul. 12, 2017

Test Location

EMS-EFT: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	EM TEST	5.3.9	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N5T	EM TEST	P1317117973	02, 08, 2018
☒	MOTOR VARIAC	MV2616	EM TEST	V0936105123	02, 08, 2018
☒	CAPACITIVE COUPLING CLAMP	HFK	EM TEST	070925	06, 26, 2018

Test Conditions

Temperature: 24,5 °C
Relative Humidity: 52,6 %
Atmospheric Pressure: 99,5 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 klz	☒ 100 klz
Duration of Test Voltage:	☒ ≥ 1 min	
Required Performance Criteria:	☒ Complied	



Test Data

- AC Mode

☒ 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
2Pin	Complied	Complied
3Pin	Complied	Complied

- PoE Mode

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

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
-	-	-

☐ 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
2Pin	Complied	Complied
3Pin	Complied	Complied

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

Test Results

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

Remarks

PASS Required Performance Criteria.



3.4 Surge Transients

Reference Standard

EN 61000-4-5:2014

Test Date

Jul. 12, 2017

Test Location

EMS-Surge: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	EM TEST	5.3.9	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N5T	EM TEST	P1317117973	02, 08, 2018
☒	MOTOR VARIAC	MV2616	EM TEST	V0936105123	02, 08, 2018
☐	CDN	CNV 508N1	EM TEST	P1551168979	04, 26, 2018
☒	CDN	CNV 508T5	EM TEST	P1549168422	04, 26, 2018

Test Conditions

Temperature: 24,5 °C
Relative Humidity: 52,6 %
Atmospheric Pressure: 99,5 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

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Test Data

- AC Mode

☒ Line to Line – Differential Mode

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

☐ Line to Earth – Common Mode

Mode of Application	Observations	
	(+) Surge (kV)	(-) Surge (kV)
-	-	-

Signal Lines

☒ Line to Earth – Common Mode

Mode of Application	Observations	
	(+) Surge (kV)	(-) Surge (kV)
RJ-45	Complied	Complied
2 Pin	Complied	Complied
3 Pin	Complied	Complied

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- PoE Mode☐ Line to Line – Differential Mode

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

☐ Line to Earth – Common Mode

Mode of Application	Observations	
	(+) Surge (kV)	(-) Surge (kV)
-	-	-

Signal Lines☒ Line to Earth – Common Mode

Mode of Application	Observations	
	(+) Surge (kV)	(-) Surge (kV)
RJ-45	Complied	Complied
2 Pin	Complied	Complied
3 Pin	Complied	Complied

Note: “Blank” = Not performed

Observations:

Complied – No degradation of function

Test Results☒ PASS Required Performance Criteria☐ NOT PASS Required Performance Criteria**Remarks**

PASS Required Performance Criteria.



3.5 Conducted Disturbance

Reference Standard

EN 61000-4-6:2014

Test Date

Jul. 12, 2017

Test Location

EMS-CS: Electro wave Shieldroom

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, 08, 2017
☒	ATTENUATOR	ATT6	EM TEST	1208-34	08, 08, 2017
☒	CDN	CDN-M2/M3N	EM TEST	0909-06	08, 08, 2017
☐	CDN	CDN T8RJ45	EM TEST	0909-09	08, 08, 2017
☒	EM INJECTION CLAMP	EM 101	Liithi	35943	02, 03, 2018

Test Conditions

Temperature: 24,5 °C
Relative Humidity: 52,6 %
Atmospheric Pressure: 99,5 kPa



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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

- AC mode

☒ 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	-

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
RJ-45	EM Injection Clamp	Complied
2Pin	EM Injection Clamp	Complied
3Pin	EM Injection Clamp	Complied

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- PoE mode

☐ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
-	CDN (☐ M2, ☐ M3)	-

☐ 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	EM Injection Clamp	Complied
2Pin	EM Injection Clamp	Complied
3Pin	EM Injection Clamp	Complied

Notes: CDN = Coupling Decoupling Network
"blank" = Not performed

Observations:

Complied – No degradation of function

Test Results

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

Remarks

PASS Required Performance Criteria.



3.6 Voltage Dips and Short Interruptions

Reference Standard

EN 61000-4-11:2004

Test Date

Jul. 12, 2017

Test Location

EMS-Voltage dip: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	EM TEST	5.3.9	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N5T	EM TEST	P1317117973	02, 08, 2018
☒	MOTOR VARIAC	MV2616	EM TEST	V0936105123	02, 08, 2018

Test Conditions

Temperature: 24,5 °C
Relative Humidity: 52,6 %
Atmospheric Pressure: 99,5 kPa



Test Specifications & Observations/Remarks

- AC Mode

(Test Voltage : 50 Hz)

<u>Test Level</u>	<u>Duration [in period/ms (50 Hz)]</u>	<u>Results</u>
☒ 20 % dip	☒ 250 / 5000	<u>Complied</u>
☒ 30 % dip	☒ 25 / 500	<u>Complied</u>
☒ 60 % dip	☒ 10 / 200	<u>Complied</u>
☒ 100 % dip	☒ 250 / 5000	<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

Remarks

PASS Required Performance Criteria.
- The test has been tested using the AC/DC Adapter

APPENDIX A – TEST DATA

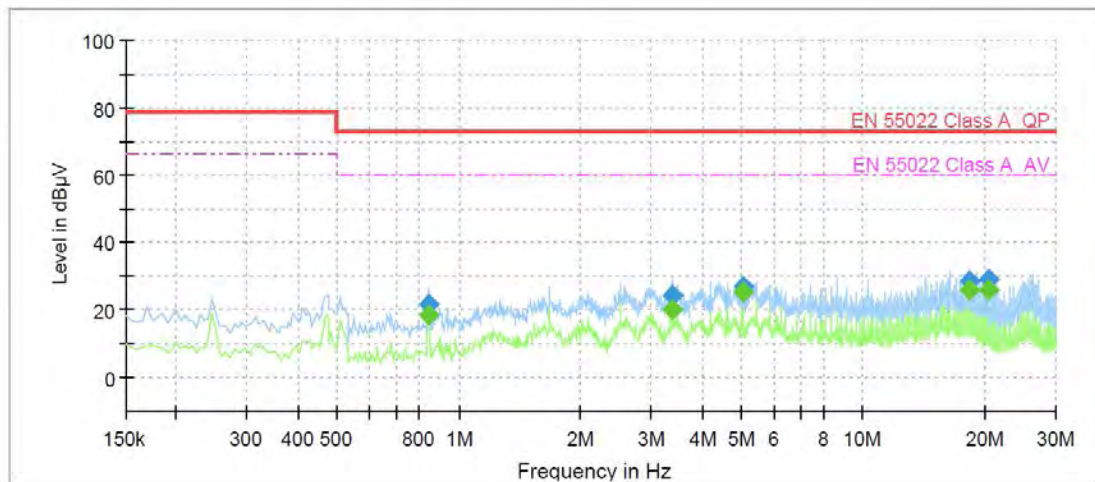
Conducted Emissions at Mains Power Ports

- AC Mode

[HOT]

Common Information

Test Description:	Conducted Emission
Model No.:	SNP-6320HP
Mode	AC
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.840000	---	18.32	60.00	41.68	1000.0	9.000	L1	20.2
0.840000	21.96	---	73.00	51.04	1000.0	9.000	L1	20.2
3.360000	---	20.30	60.00	39.70	1000.0	9.000	L1	19.8
3.360000	24.50	---	73.00	48.50	1000.0	9.000	L1	19.8
5.035000	---	25.37	60.00	34.63	1000.0	9.000	L1	19.7
5.035000	27.27	---	73.00	45.73	1000.0	9.000	L1	19.7
18.430000	---	25.94	60.00	34.06	1000.0	9.000	L1	20.3
18.430000	28.49	---	73.00	44.51	1000.0	9.000	L1	20.3
20.420000	---	26.20	60.00	33.80	1000.0	9.000	L1	20.3
20.420000	28.99	---	73.00	44.01	1000.0	9.000	L1	20.3

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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



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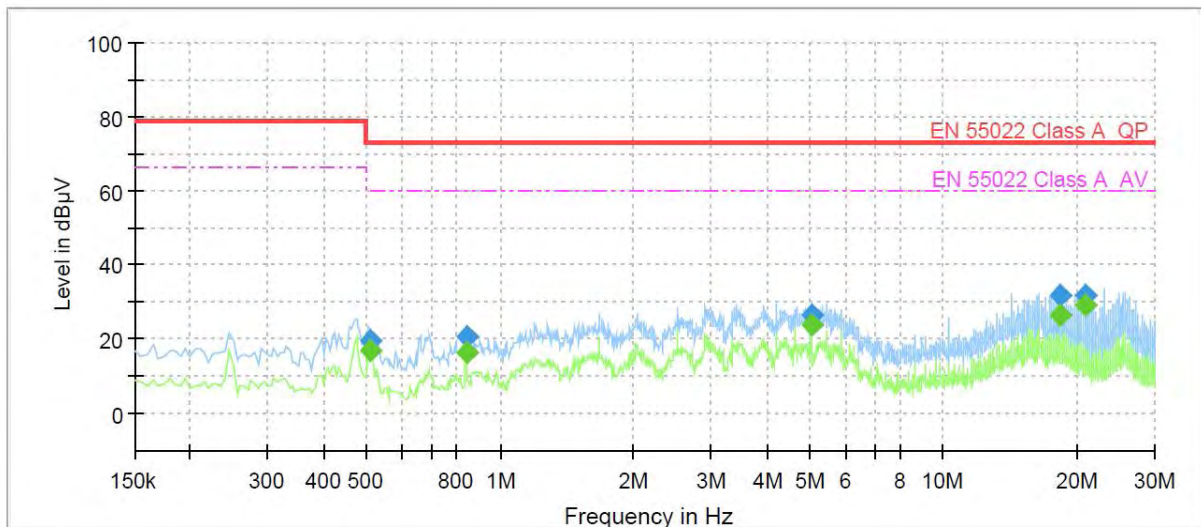
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[NEUTRAL]

Common Information

Test Description: Conducted Emission
Model No.: SNP-6320HP
Mode: AC
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.510000	---	17.07	60.00	42.93	1000.0	9.000	N	20.4
0.510000	19.87	---	73.00	53.13	1000.0	9.000	N	20.4
0.840000	---	16.68	60.00	43.32	1000.0	9.000	N	20.2
0.840000	20.45	---	73.00	52.55	1000.0	9.000	N	20.2
5.035000	---	23.81	60.00	36.19	1000.0	9.000	N	19.7
5.035000	26.52	---	73.00	46.48	1000.0	9.000	N	19.7
18.305000	---	26.34	60.00	33.66	1000.0	9.000	N	20.3
18.305000	31.76	---	73.00	41.24	1000.0	9.000	N	20.3
20.910000	---	29.20	60.00	30.80	1000.0	9.000	N	20.4
20.910000	31.63	---	73.00	41.37	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))

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- PoE Mode

[HOT]

Common Information

Test Description:

Model No.:

Mode

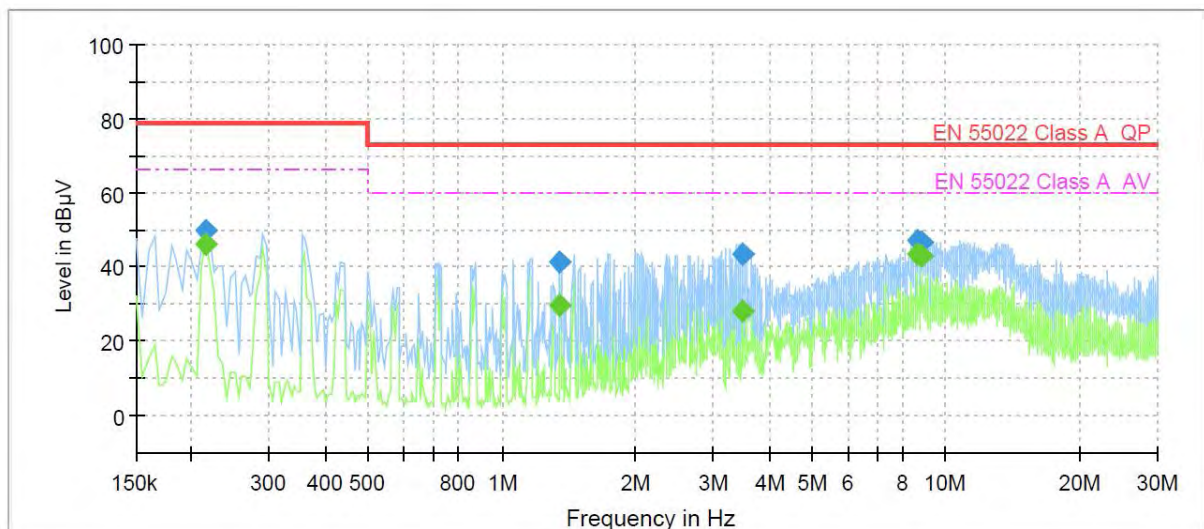
Operator Name:

Conducted Emission

SNP-6320HP

PoE

KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.215000	---	46.29	66.00	19.71	1000.0	9.000	L1	20.7
0.215000	49.69	---	79.00	29.31	1000.0	9.000	L1	20.7
1.355000	---	29.61	60.00	30.39	1000.0	9.000	L1	20.0
1.355000	41.33	---	73.00	31.67	1000.0	9.000	L1	20.0
3.495000	---	28.15	60.00	31.85	1000.0	9.000	L1	19.7
3.495000	43.49	---	73.00	29.51	1000.0	9.000	L1	19.7
8.595000	---	43.45	60.00	16.55	1000.0	9.000	L1	19.9
8.595000	47.00	---	73.00	26.00	1000.0	9.000	L1	19.9
8.840000	---	42.74	60.00	17.26	1000.0	9.000	L1	19.9
8.840000	46.68	---	73.00	26.32	1000.0	9.000	L1	19.9

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

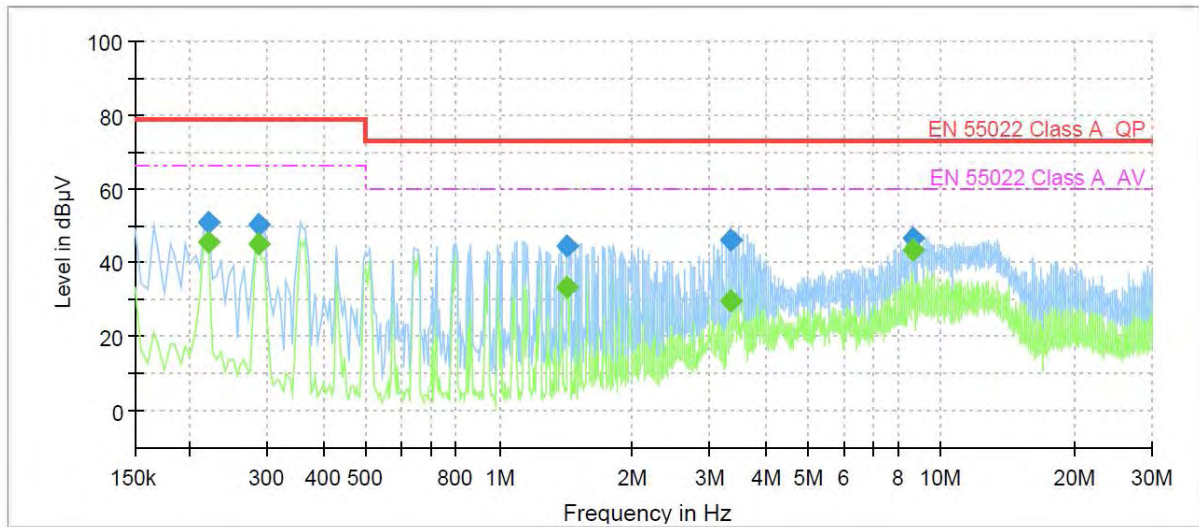
Reading Value : Not shown in the table.

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

[NEUTRAL]

Common Information

Test Description:	Conducted Emission
Model No.:	SNP-6320HP
Mode	PoE
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.220000	---	45.79	66.00	20.21	1000.0	9.000	N	20.7
0.220000	50.96	---	79.00	28.04	1000.0	9.000	N	20.7
0.285000	---	44.90	66.00	21.10	1000.0	9.000	N	20.7
0.285000	50.03	---	79.00	28.97	1000.0	9.000	N	20.7
1.425000	---	33.29	60.00	26.71	1000.0	9.000	N	20.0
1.425000	44.70	---	73.00	28.30	1000.0	9.000	N	20.0
3.355000	---	29.45	60.00	30.55	1000.0	9.000	N	19.8
3.355000	46.12	---	73.00	26.88	1000.0	9.000	N	19.8
8.595000	---	43.65	60.00	16.35	1000.0	9.000	N	19.9
8.595000	46.68	---	73.00	26.32	1000.0	9.000	N	19.9

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

Conducted Emissions at Telecommunication Ports

- AC Mode

[10 Mbps]

Common Information

Test Description:

Telecommunication Emission

Model No.:

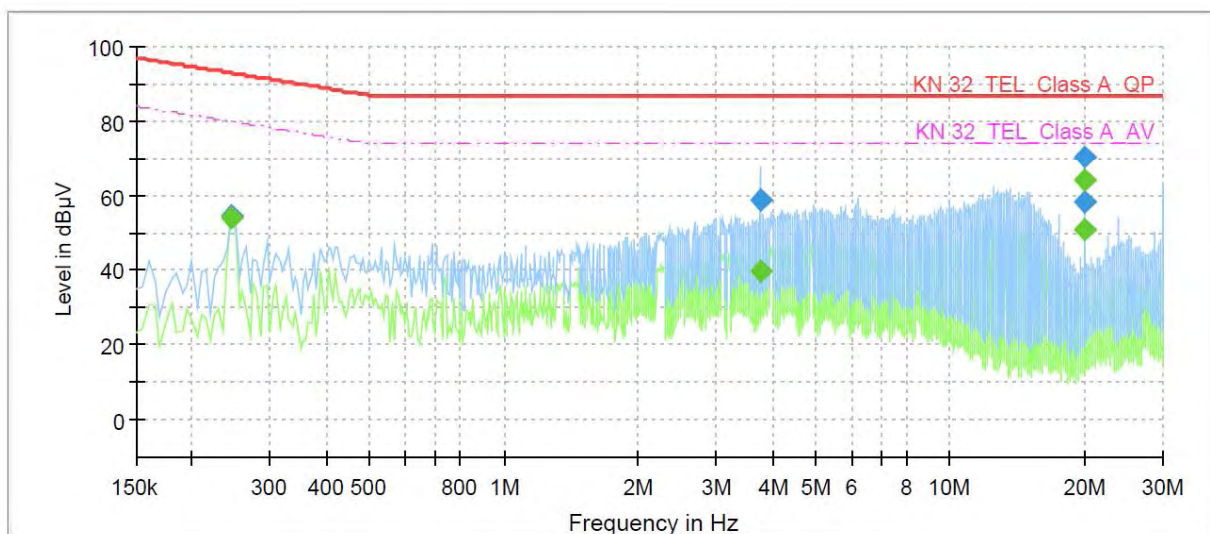
SNP-6320HP

Mode

AC_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)
0.245000	---	54.18	79.92	25.74	1000.0	9.000	Single Line	20.8
0.245000	54.53	---	92.92	38.39	1000.0	9.000	Single Line	20.8
3.745000	---	39.73	74.00	34.27	1000.0	9.000	Single Line	19.5
3.745000	58.71	---	87.00	28.29	1000.0	9.000	Single Line	19.5
20.000000	---	63.85	74.00	10.15	1000.0	9.000	Single Line	20.2
20.000000	70.41	---	87.00	16.59	1000.0	9.000	Single Line	20.2
20.005000	---	50.76	74.00	23.24	1000.0	9.000	Single Line	20.2
20.005000	58.17	---	87.00	28.83	1000.0	9.000	Single Line	20.2

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

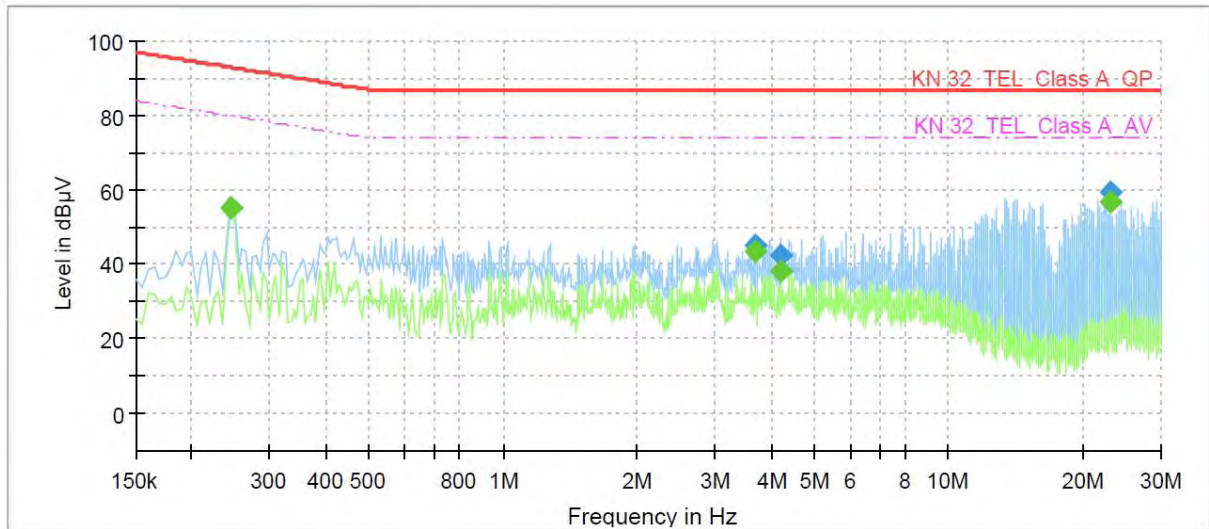
Reading Value : Not shown in the table.

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

[100 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	SNP-6320HP
Mode	AC_100 Mbps
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.245000	---	54.81	79.92	25.11	1000.0	9.000	Single Line	21.1
0.245000	55.14	---	92.92	37.78	1000.0	9.000	Single Line	21.1
3.690000	---	43.50	74.00	30.50	1000.0	9.000	Single Line	19.7
3.690000	44.87	---	87.00	42.13	1000.0	9.000	Single Line	19.7
4.200000	---	38.02	74.00	35.98	1000.0	9.000	Single Line	19.7
4.200000	42.44	---	87.00	44.56	1000.0	9.000	Single Line	19.7
23.130000	---	56.46	74.00	17.54	1000.0	9.000	Single Line	20.5
23.130000	59.28	---	87.00	27.72	1000.0	9.000	Single Line	20.5

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

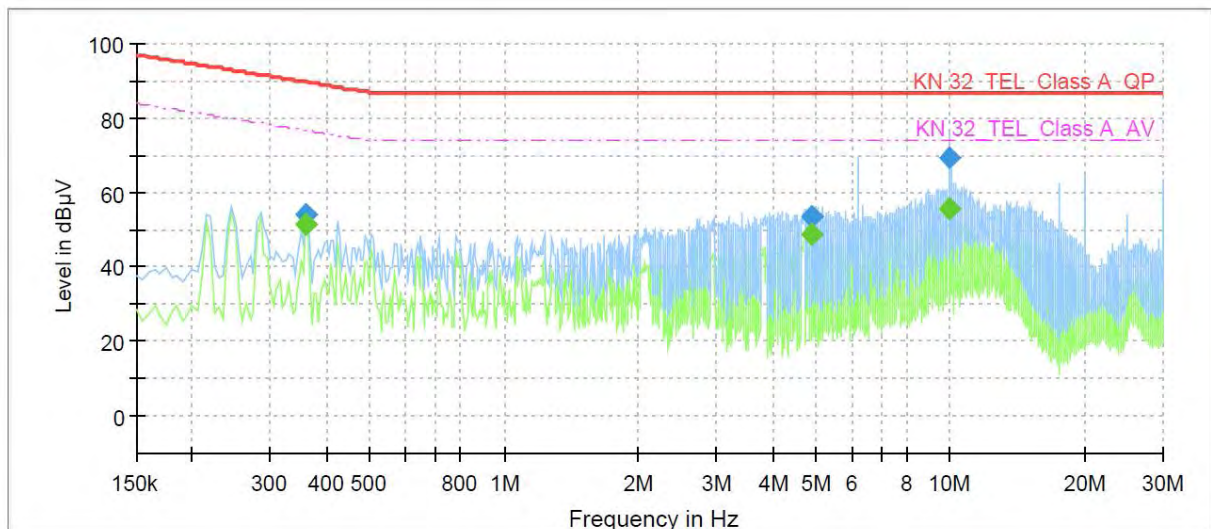
Corr. : Correction values (ISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

- PoE Mode

[10 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	SNP-6320HP
Mode	PoE_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)
0.360000	---	51.15	76.73	25.58	1000.0	9.000	Single Line	20.6
0.360000	53.81	---	89.73	35.92	1000.0	9.000	Single Line	20.6
4.910000	---	48.60	74.00	25.40	1000.0	9.000	Single Line	19.5
4.910000	53.34	---	87.00	33.66	1000.0	9.000	Single Line	19.5
10.000000	---	55.53	74.00	18.47	1000.0	9.000	Single Line	19.7
10.000000	69.29	---	87.00	17.71	1000.0	9.000	Single Line	19.7

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

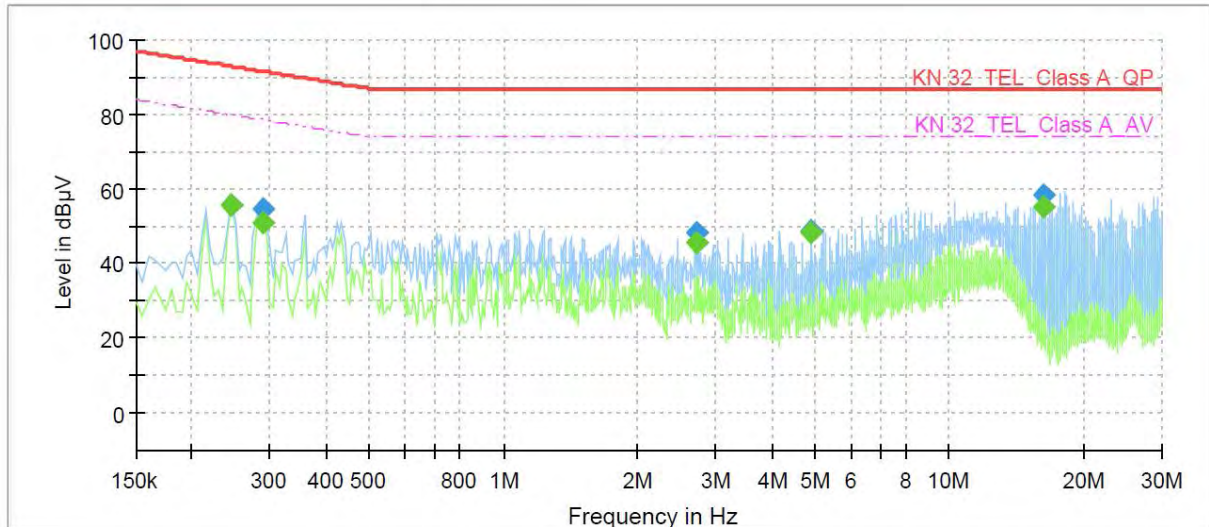
Reading Value : Not shown in the table.

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

[100 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	SNP-6320HP
Mode	PoE_100 Mbps
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.245000	---	55.53	79.92	24.39	1000.0	9.000	Single Line	21.1
0.245000	55.82	---	92.92	37.10	1000.0	9.000	Single Line	21.1
0.290000	---	50.98	78.52	27.54	1000.0	9.000	Single Line	21.0
0.290000	54.65	---	91.52	36.87	1000.0	9.000	Single Line	21.0
2.700000	---	45.29	74.00	28.71	1000.0	9.000	Single Line	19.8
2.700000	47.99	---	87.00	39.01	1000.0	9.000	Single Line	19.8
4.910000	---	47.96	74.00	26.04	1000.0	9.000	Single Line	19.7
4.910000	48.57	---	87.00	38.43	1000.0	9.000	Single Line	19.7
16.230000	---	55.09	74.00	18.91	1000.0	9.000	Single Line	20.2
16.230000	58.45	---	87.00	28.55	1000.0	9.000	Single Line	20.2

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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



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www.kes.co.kr

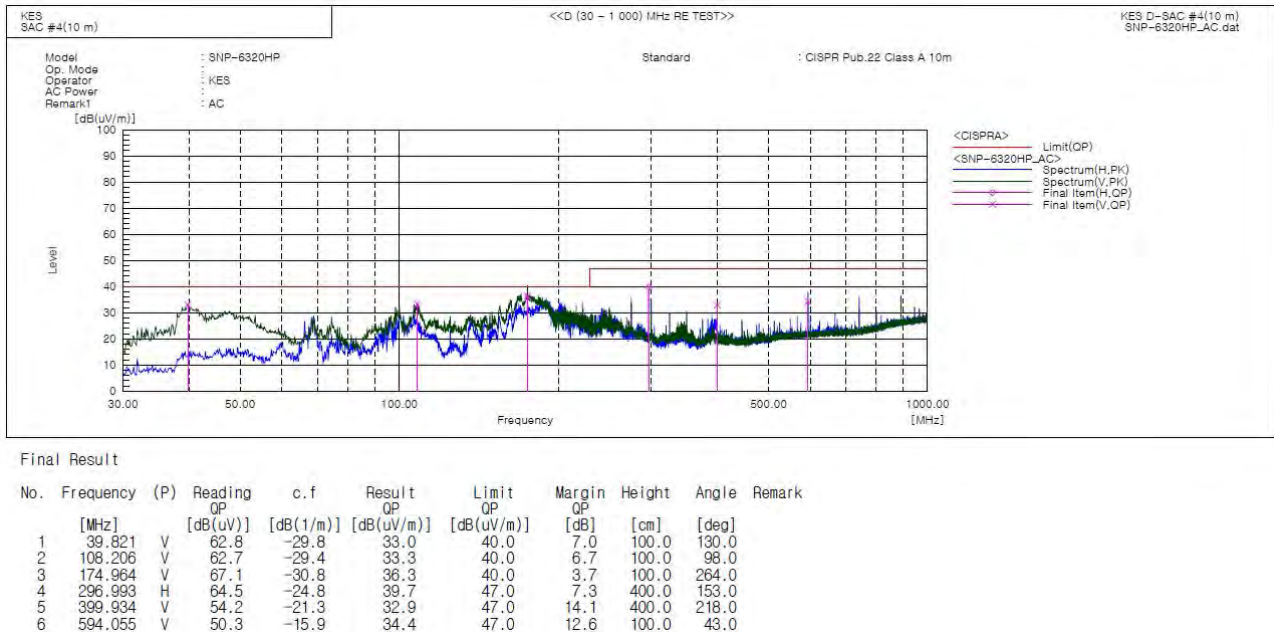
Test report No.:

KES-E1-17T0446-R2

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Radiated Electric Field Emissions(Below 1 GHz)

- AC Mode



◆ Calculation

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

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

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

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

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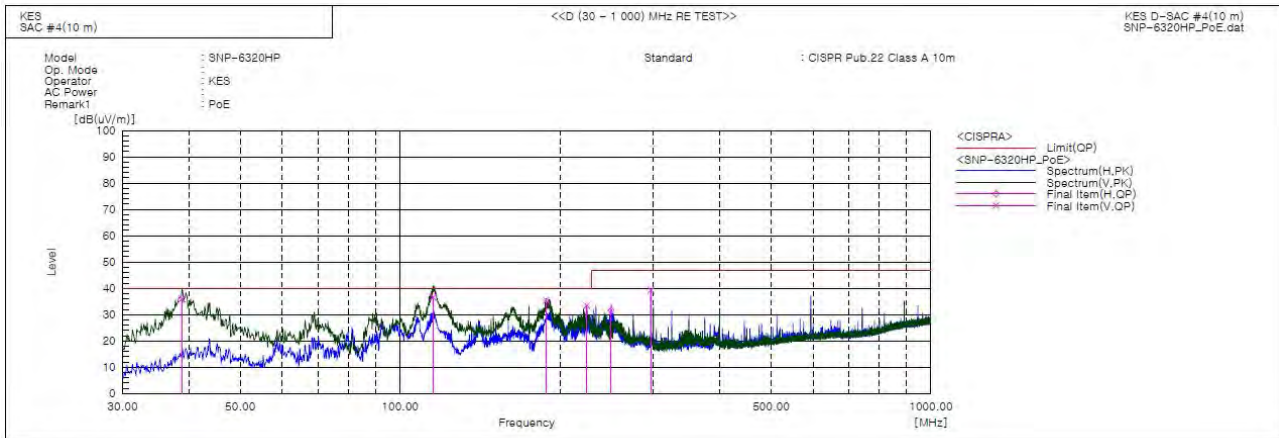
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Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
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Test report No.:

KES-E1-17T0446-R2

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- PoE Mode



Final Result

No.	Frequency [MHz]	(P)	Reading OP [dB(uV)]	c.f [dB(1/m)]	Result OP [dB(uV/m)]	Limit OP [dB(uV/m)]	Margin OP [dB]	Height [cm]	Angle [deg]	Remark
1	38.851	V	66.2	-30.2	36.0	40.0	4.0	100.0	358.0	
2	115.409	V	67.3	-30.7	36.6	40.0	3.4	103.0	235.0	
3	188.353	V	64.3	-28.8	35.5	40.0	4.5	100.0	269.0	
4	224.970	V	60.2	-26.8	33.4	40.0	6.6	100.0	154.0	
5	249.948	H	57.7	-26.1	31.6	47.0	15.4	400.0	68.0	
6	296.993	V	64.1	-24.8	39.3	47.0	7.7	100.0	355.0	

◆ Calculation

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

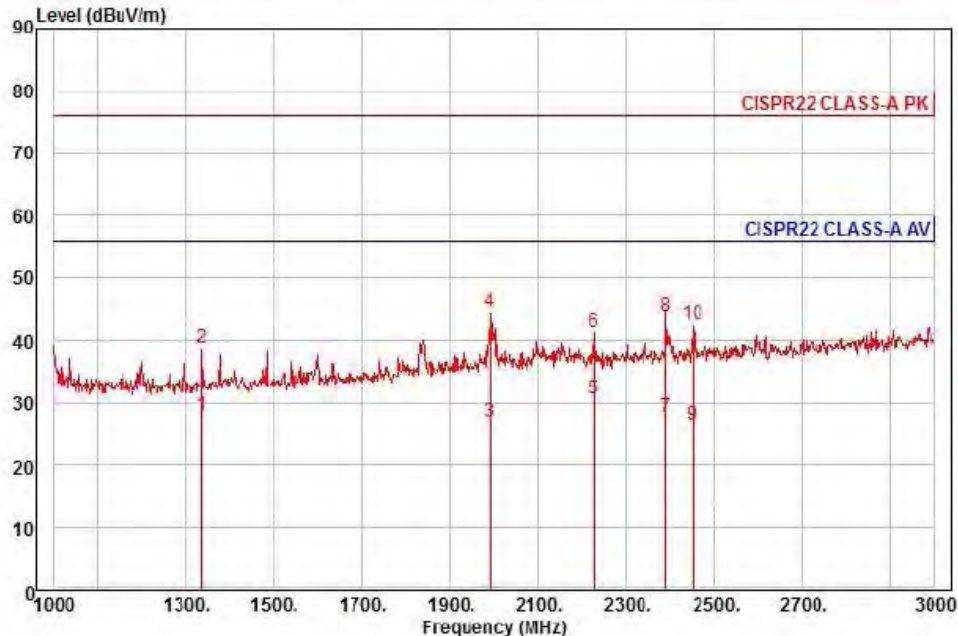
Margin(QP)[dB] = Limit[dB(μV/m)] - Result(QP) [dB(μV/m)]

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

Radiated Electric Field Emissions(Above 1 GHz)

- AC Mode



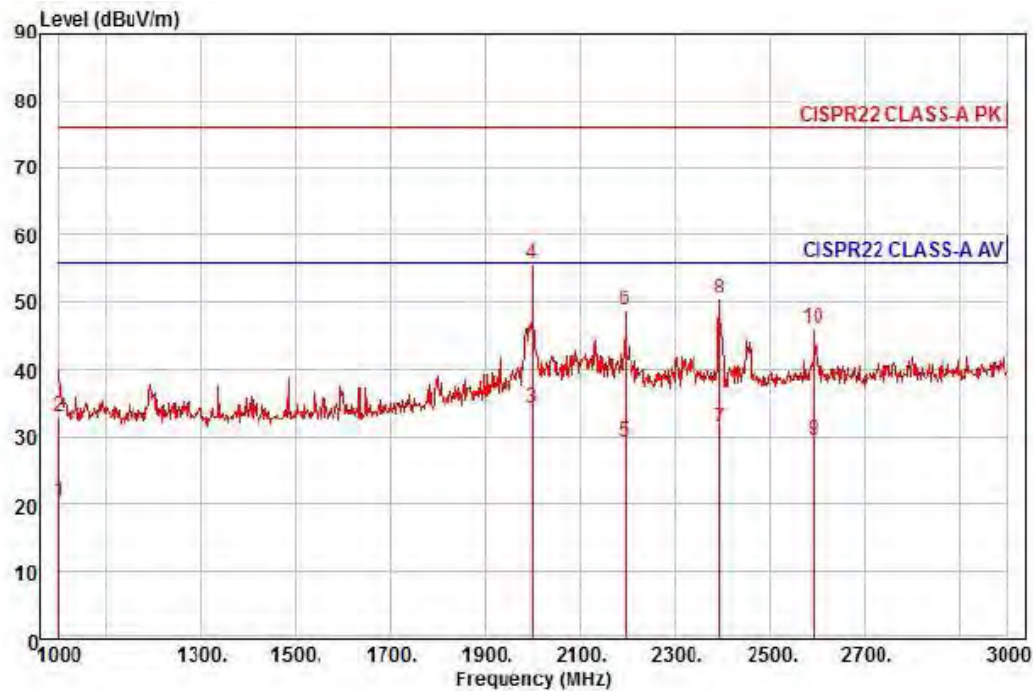
Site : chamber
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNP-6320HP
Mode : AC
Memo : (1 - 3) GHz

	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	1336.00	32.54	23.52	7.54	35.76	201	56.00	-28.16	horizontal	Average
2	1336.00	43.47	23.52	7.54	35.76	201	76.00	-37.23	horizontal	Peak
3	1992.00	26.90	25.98	9.32	35.18	206	56.00	-28.98	horizontal	Average
4 pk	1992.00	44.40	25.98	9.32	35.18	206	76.00	-31.48	horizontal	Peak
5 pp	2228.00	29.26	26.70	9.87	35.26	212	56.00	-25.43	horizontal	Average
6	2228.00	40.23	26.70	9.87	35.26	212	76.00	-34.46	horizontal	Peak
7	2390.00	25.53	27.20	10.30	35.32	100	56.00	-28.29	horizontal	Average
8	2390.00	41.71	27.20	10.30	35.32	100	76.00	-32.11	horizontal	Peak
9	2452.00	23.99	27.38	10.43	35.35	237	56.00	-29.55	horizontal	Average
10	2452.00	40.27	27.38	10.43	35.35	237	76.00	-33.27	horizontal	Peak

◆ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] - Preamp Factor [dB])
- Limit Line[dBuV]

Over Limit : Margin, Read Level : Reading value, Ant Factor : ANT Factor,
Cable Loss : Cable loss, Preamp Factor : Preamp Factor



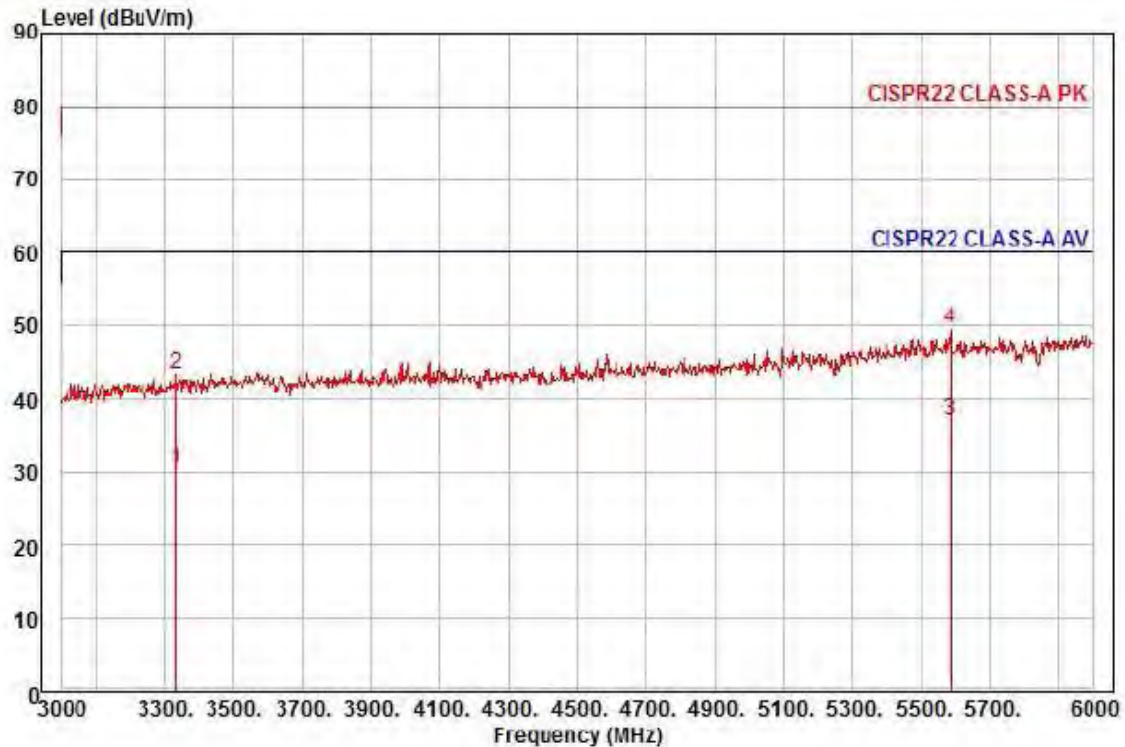
Site : chamber
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNP-6320HP
Mode : AC
Memo : (1 - 3) GHz

	Read	Ant	Cable	Preamp	TPos	Limit	Over		
Freq	Level	Factor	Loss	Factor		Line	Limit	Pol/Phase	Remark
MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1000.00	27.49	22.50	6.48	36.06	6	56.00	-35.59	vertical
2	1000.00	40.27	22.50	6.48	36.06	6	76.00	-42.81	vertical
3 av	2000.00	34.10	26.01	9.34	35.17	172	56.00	-21.72	vertical
4 pp	2000.00	55.53	26.01	9.34	35.17	172	76.00	-20.29	vertical
5	2194.00	27.96	26.60	9.79	35.25	103	56.00	-26.90	vertical
6	2194.00	47.63	26.60	9.79	35.25	103	76.00	-27.23	vertical
7	2394.00	29.19	27.21	10.31	35.32	37	56.00	-24.61	vertical
8	2394.00	48.43	27.21	10.31	35.32	37	76.00	-25.37	vertical
9	2592.00	26.14	27.94	10.72	35.40	46	56.00	-26.60	vertical
10	2592.00	42.76	27.94	10.72	35.40	46	76.00	-29.98	vertical

◆ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] – Preamp Factor [dB])
– Limit Line[dBuV]

Over Limit : Margin, Read Level : Reading value, Ant Factor : ANT Factor,
Cable Loss : Cable loss, Preamp Factor : Preamp Factor



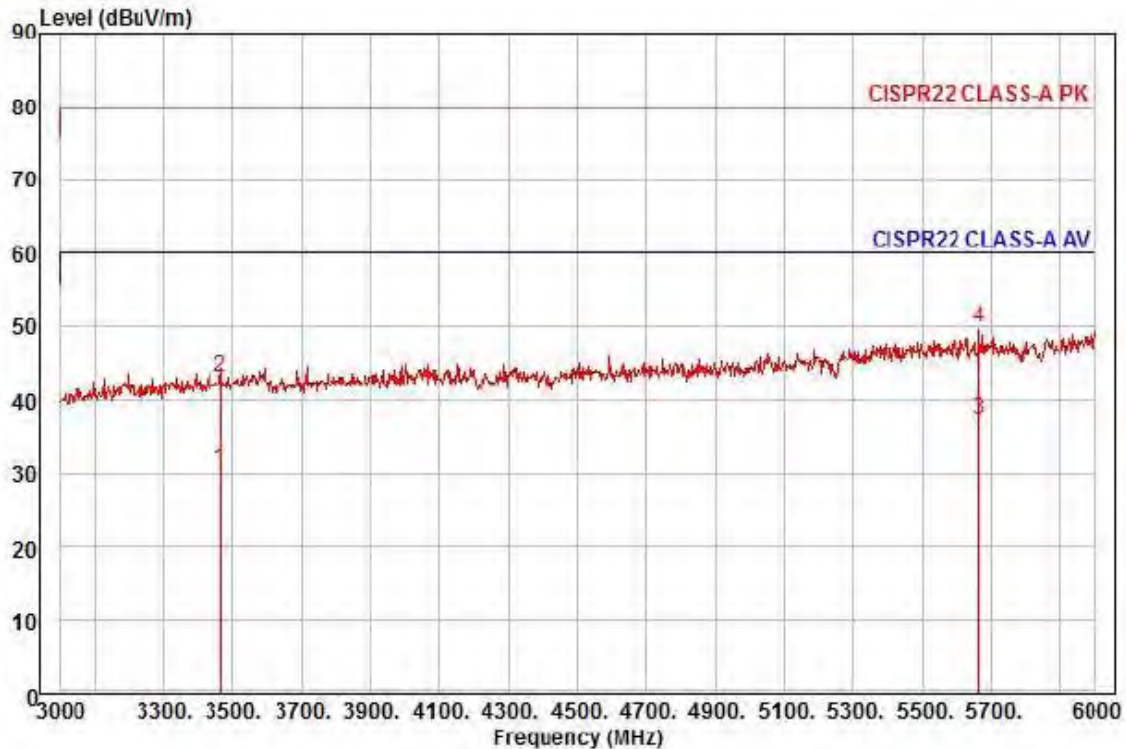
Site : chamber
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNP-6320HP
Mode : AC
Memo : (3 - 6) GHz

	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	3333.00	22.77	30.68	12.32	35.47	113	60.00	-29.70	horizontal	Average
2	3333.00	35.95	30.68	12.32	35.47	113	80.00	-36.52	horizontal	Peak
3 pp	5583.00	20.91	35.49	16.32	35.66	205	60.00	-22.94	horizontal	Average
4 pk	5583.00	33.32	35.49	16.32	35.66	205	80.00	-30.53	horizontal	Peak

◆ Calculation

Over Limit [dB] = (Read Level[dBμV] + Ant Factor[dB/m] + Cable Loss [dB] – Preamp Factor [dB])
– Limit Line[dBμV]

Over Limit : Margin, Read Level : Reading value, Ant Factor : ANT Factor,
Cable Loss : Cable loss, Preamp Factor : Preamp Factor



Site : chamber
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNP-6320HP
Mode : AC
Memo : (3 - 6) GHz

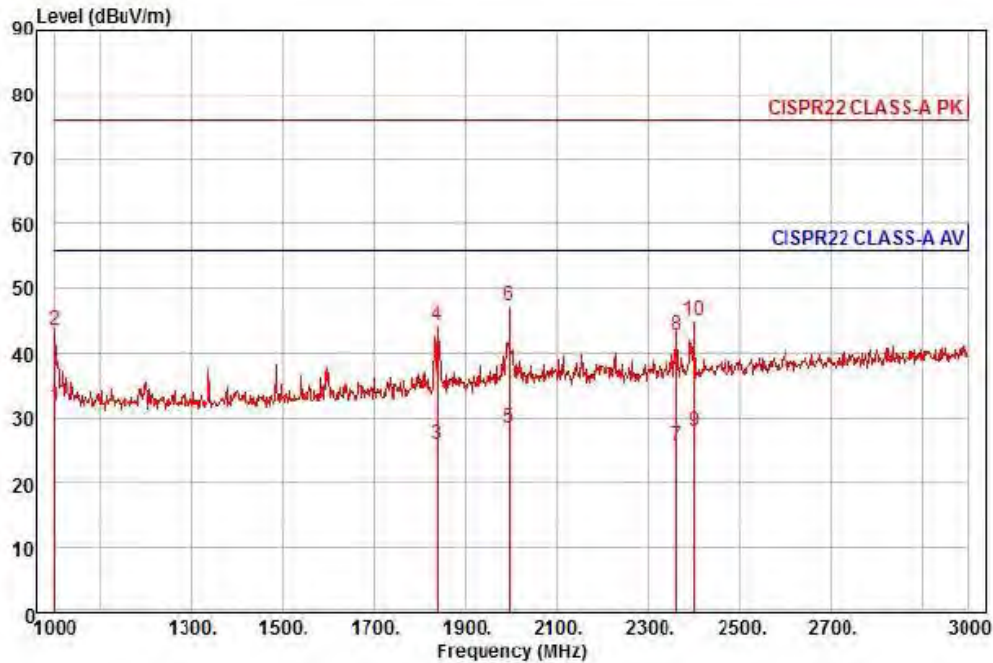
	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3465.00	22.36	31.05	12.56	35.43	46	60.00	-29.46	vertical	Average
2	3465.00	34.96	31.05	12.56	35.43	46	80.00	-36.86	vertical	Peak
3 pp	5664.00	20.75	35.62	16.46	35.67	23	60.00	-22.84	vertical	Average
4 pk	5664.00	33.48	35.62	16.46	35.67	23	80.00	-30.11	vertical	Peak

◆ Calculation

Over Limit [dB] = (Read Level[dBμV] + Ant Factor[dB/m] + Cable Loss [dB] – Preamp Factor [dB])
– Limit Line[dBμV]

Over Limit : Marjin, Read Level : Reading value, Ant Factor : ANT Factor,
Cable Loss : Cable loss, Preamp Factor : Preamp Factor

- PoE Mode



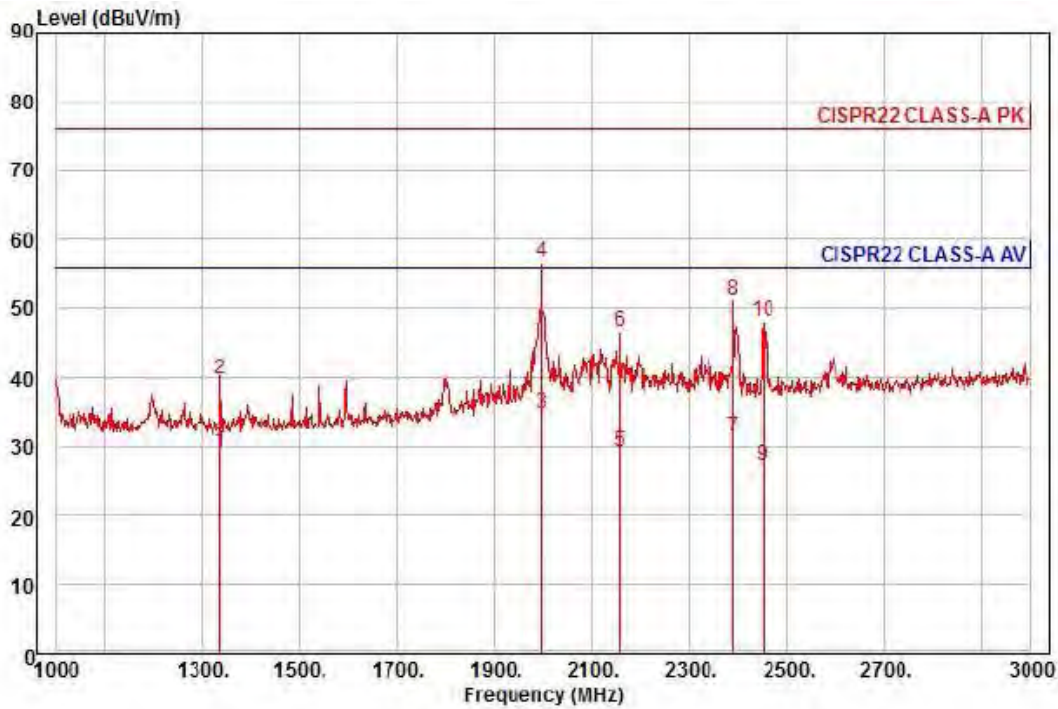
Site : chamber
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNP-6320HP
Mode : PoE
Memo : (1 - 3) GHz

		Read	Ant	Cable	Preamp	TPos	Limit	Over		
	Freq	Level	Factor	Loss	Factor		Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	pp 1000.00	38.85	22.50	6.48	36.06	178	56.00	-24.23	horizontal	Average
2	1000.00	50.78	22.50	6.48	36.06	178	76.00	-32.30	horizontal	Peak
3	1840.00	27.05	25.37	8.93	35.31	125	56.00	-29.96	horizontal	Average
4	1840.00	45.45	25.37	8.93	35.31	125	76.00	-31.56	horizontal	Peak
5	1996.00	28.32	25.99	9.33	35.17	77	56.00	-27.53	horizontal	Average
6	pk 1996.00	47.15	25.99	9.33	35.17	77	76.00	-28.70	horizontal	Peak
7	2362.00	23.75	27.11	10.22	35.31	195	56.00	-30.23	horizontal	Average
8	2362.00	40.99	27.11	10.22	35.31	195	76.00	-32.99	horizontal	Peak
9	2400.00	25.81	27.23	10.32	35.33	54	56.00	-27.97	horizontal	Average
10	2400.00	42.79	27.23	10.32	35.33	54	76.00	-30.99	horizontal	Peak

◆ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] - Preamp Factor [dB])
- Limit Line[dBuV]

Over Limit : Margin, Read Level : Reading value, Ant Factor : ANT Factor,
Cable Loss : Cable loss, Preamp Factor : Preamp Factor



Site : chamber

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

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

Project :

Model : SNP-6320HP

Mode : PoE

Memo : (1 - 3) GHz

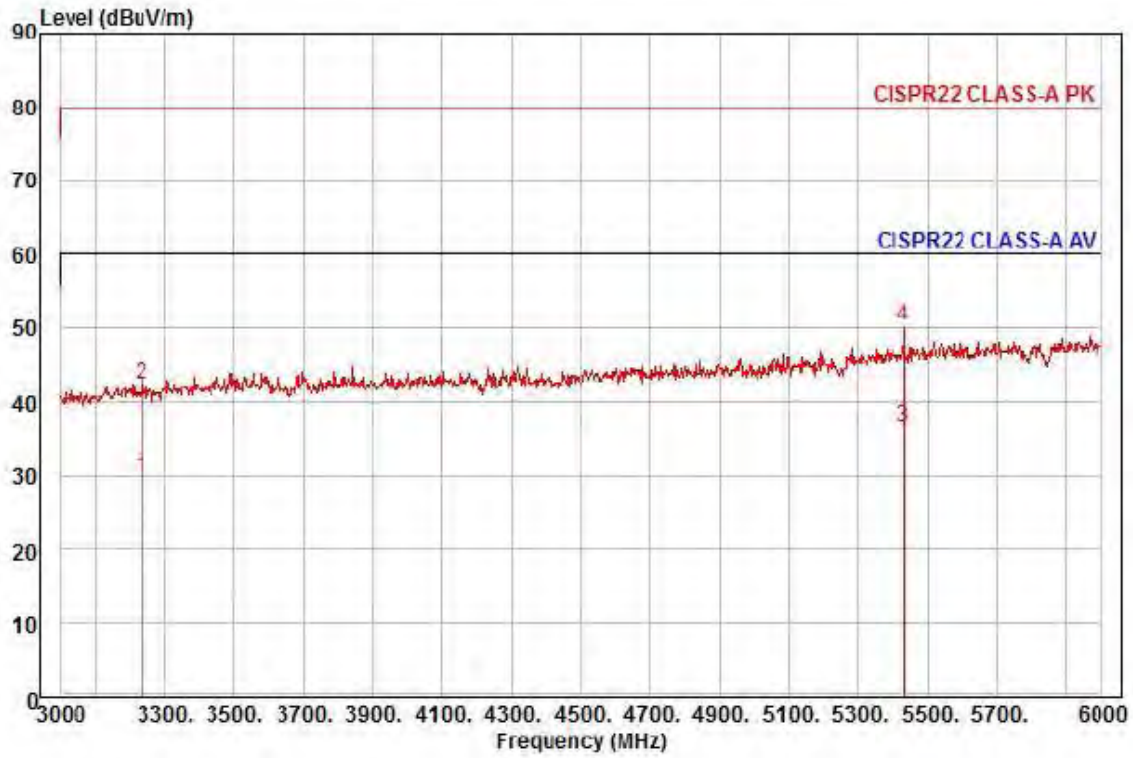
	Freq	Read Level	Ant Factor	Cable Loss	Preampl Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1336.00	33.96	23.52	7.54	35.76	204	56.00	-26.74	vertical	Average
2	1336.00	44.39	23.52	7.54	35.76	204	76.00	-36.31	vertical	Peak
3 av	1998.00	34.64	26.00	9.33	35.17	0	56.00	-21.20	vertical	Average
4 pp	1998.00	56.56	26.00	9.33	35.17	0	76.00	-19.28	vertical	Peak
5	2158.00	28.31	26.49	9.70	35.23	153	56.00	-26.73	vertical	Average
6	2158.00	45.70	26.49	9.70	35.23	153	76.00	-29.34	vertical	Peak
7	2390.00	29.13	27.20	10.30	35.32	40	56.00	-24.69	vertical	Average
8	2390.00	48.95	27.20	10.30	35.32	40	76.00	-24.87	vertical	Peak
9	2452.00	24.78	27.38	10.43	35.35	109	56.00	-28.76	vertical	Average
10	2452.00	45.63	27.38	10.43	35.35	109	76.00	-27.91	vertical	Peak

◆ Calculation

Over Limit [dB] = (Read Level[dBμV] + Ant Factor[dB/m] + Cable Loss [dB] – Preampl Factor [dB])
– Limit Line[dBμV]

Over Limit : Margin, Read Level : Reading value, Ant Factor : ANT Factor,

Cable Loss : Cable loss, Preamp Factor : Preamp Factor



Site : chamber
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNP-6320HP
Mode : PoE
Memo : (3 - 6) GHz

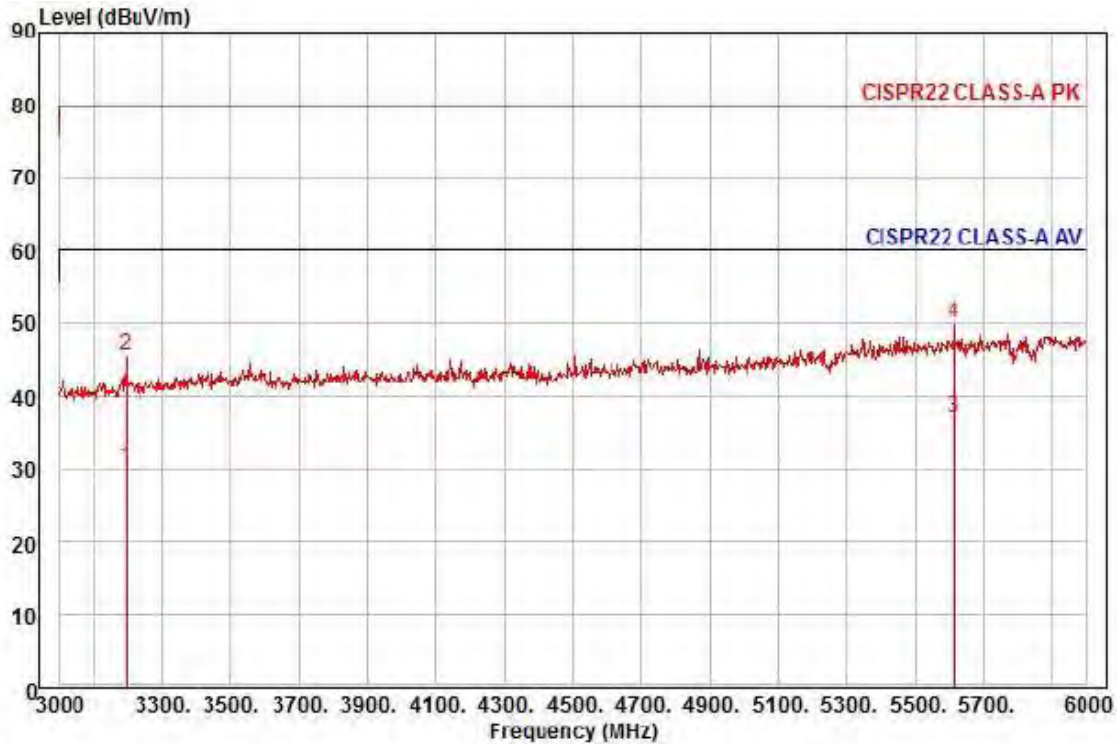
	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3237.00	22.58	30.41	12.13	35.49	155	60.00	-30.37	horizontal	Average
2	3237.00	35.32	30.41	12.13	35.49	155	80.00	-37.63	horizontal	Peak
3 pp	5433.00	21.08	35.11	16.09	35.66	130	60.00	-23.38	horizontal	Average
4 pk	5433.00	34.68	35.11	16.09	35.66	130	80.00	-29.78	horizontal	Peak

◆ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] – Preamp Factor [dB])
– Limit Line[dBuV]

Over Limit : Margin, Read Level : Reading value, Ant Factor : ANT Factor,

Cable Loss : Cable loss, Preamp Factor : Preamp Factor



Site : chamber
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNP-6320HP
Mode : PoE
Memo : (3 - 6) GHz

	Read	Ant	Cable	Preamp	TPos	Limit	Over		
Freq	Level	Factor	Loss	Factor		Line	Limit	Pol/Phase	Remark
MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3195.00	23.37	30.29	12.05	35.51	128	60.00	-29.80	vertical Average
2	3195.00	38.70	30.29	12.05	35.51	128	80.00	-34.47	vertical Peak
3 pp	5616.00	20.81	35.54	16.37	35.67	206	60.00	-22.95	vertical Average
4 pk	5616.00	33.70	35.54	16.37	35.67	206	80.00	-30.06	vertical Peak

◆ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] – Preamp Factor [dB])
– Limit Line[dBuV]

Over Limit : Margin, Read Level : Reading value, Ant Factor : ANT Factor,
Cable Loss : Cable loss, Preamp Factor : Preamp Factor



KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
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www.kes.co.kr

Test report No.:
KES-E1-17T0446-R2
Page (66) of (86)

Test Data - Voltage Fluctuations

Maximum Flicker results

	EUT values	Limit	Result
Pst	N/A		
Plt			
dc [%]			
dmax [%]			
Tmax [s]			

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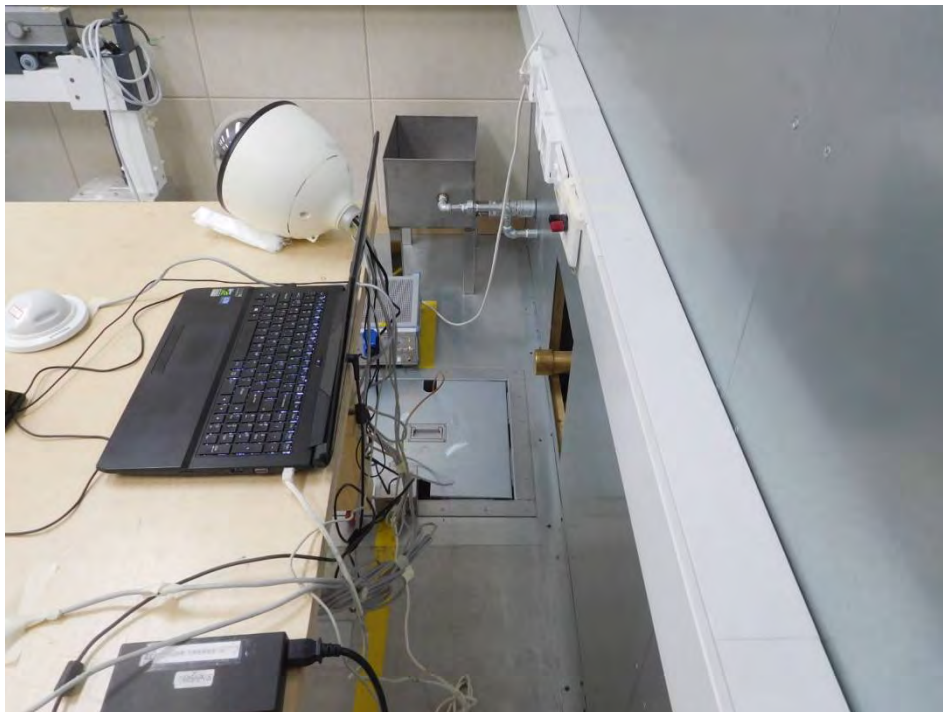
Test Setup Photos and Configuration

Conducted Voltage Emissions



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Conducted Telecommunication Emissions



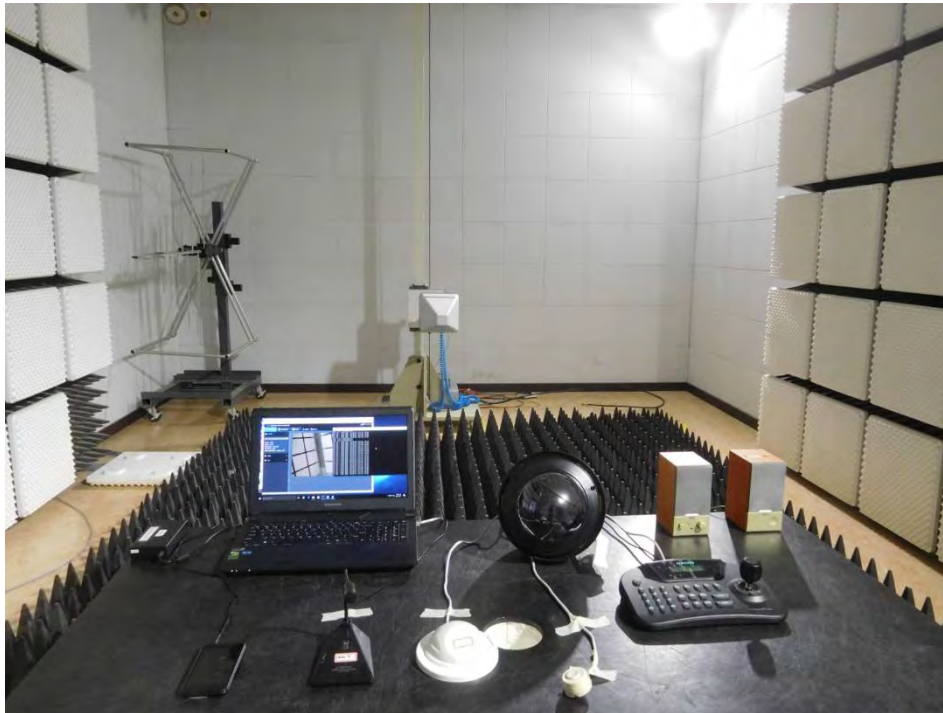
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Radiated Electric Field Emissions(Below 1 GHz)



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Radiated Electric Field Emissions(Above 1 GHz)



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www.kes.co.kr

Test report No.:
KES-E1-17T0446-R2
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Harmonic Current Emissions and Voltage Fluctuations and Flicker

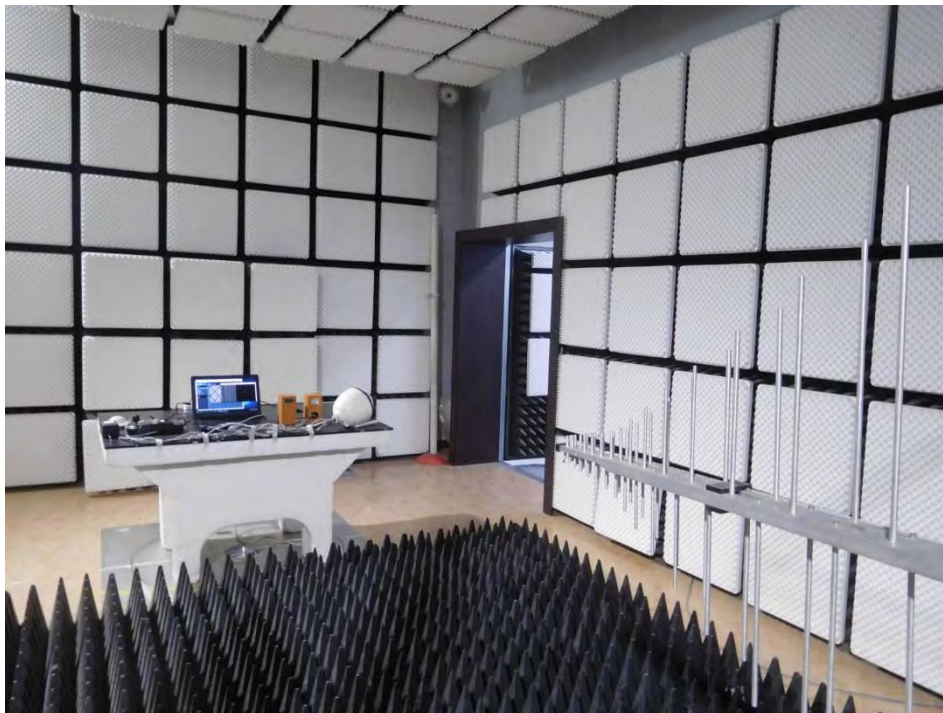
N/A

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Electrostatic Discharge



Radiated Electric Field Immunity



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Electrical Fast Transients/Bursts



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Surge Transients



Conducted Disturbance



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Voltage Dips and Short Interruptions



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EUT External Photographs

(Top)



(Bottom)



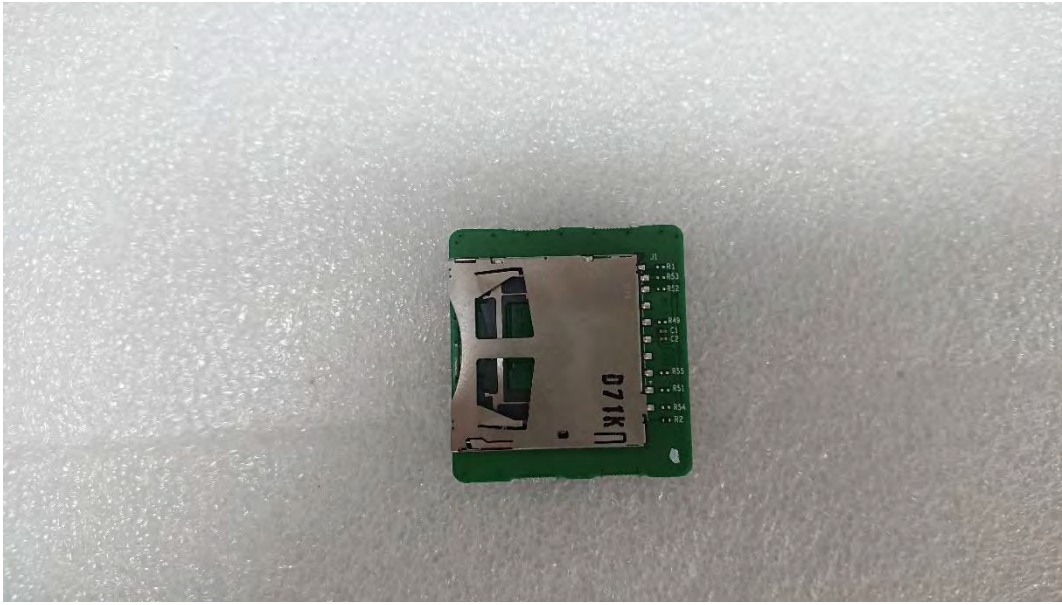
EUT Internal Photographs

(Internal View)

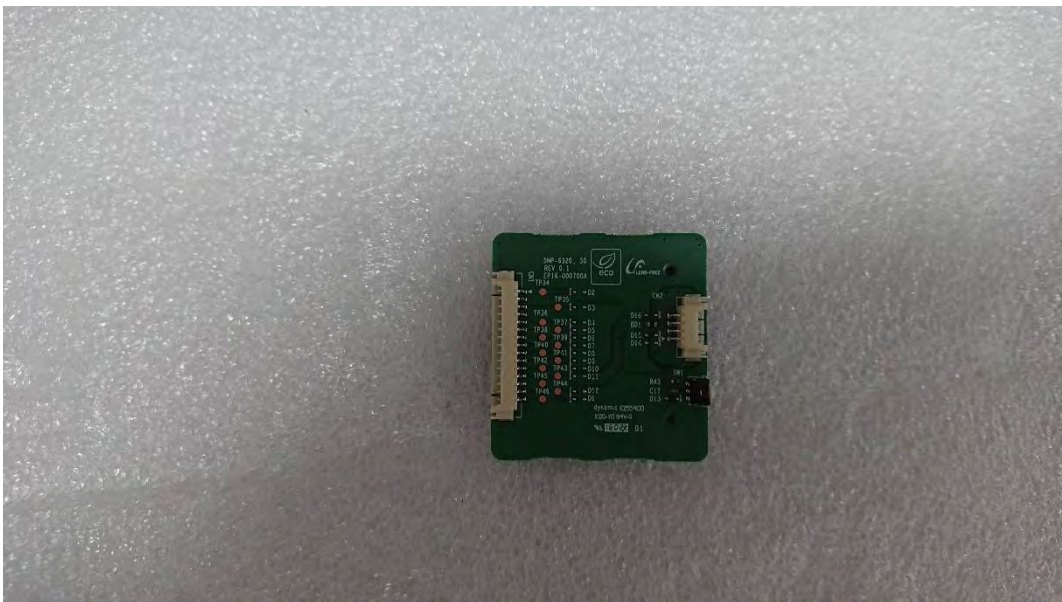


EUT Internal View – SD Card Board

(Top)



(Bottom)



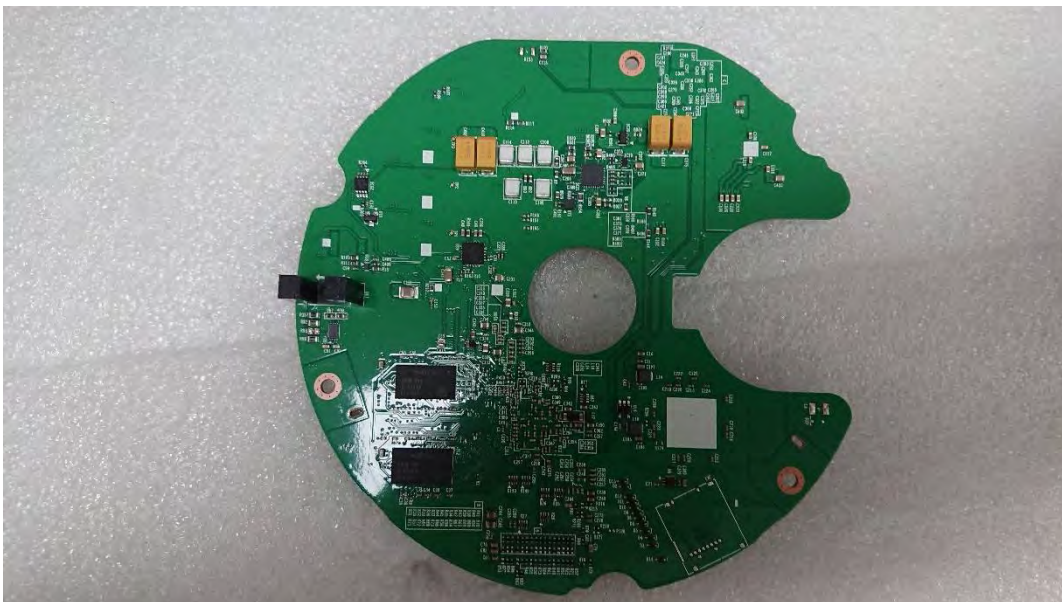
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EUT Internal View – Main Board

(Top)



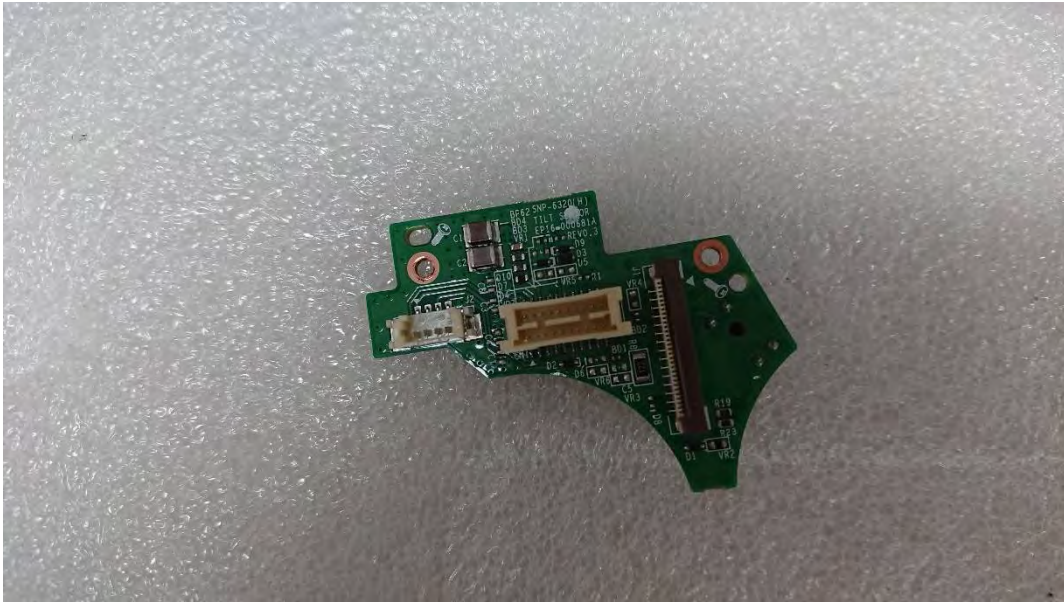
(Bottom)



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EUT Internal View – Sub Board 1

(Top)

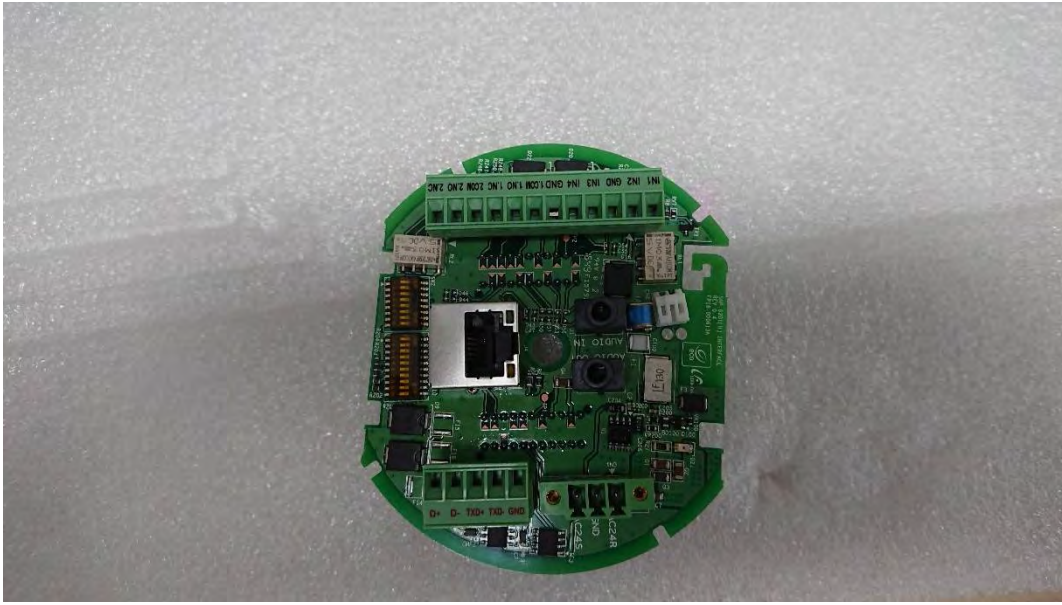


(Bottom)

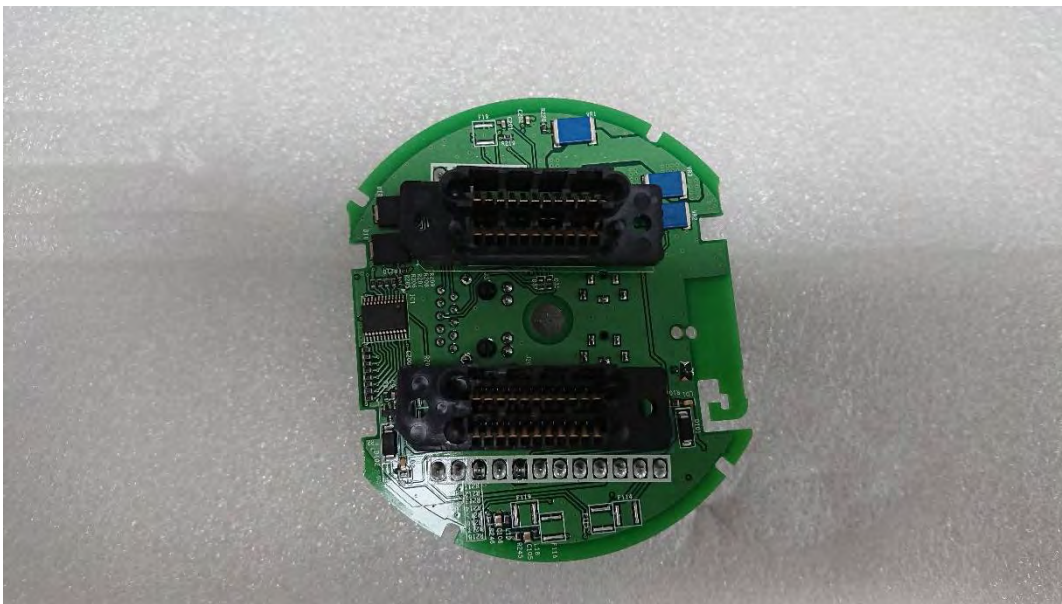


EUT Internal View – Power Board 1

(Top)



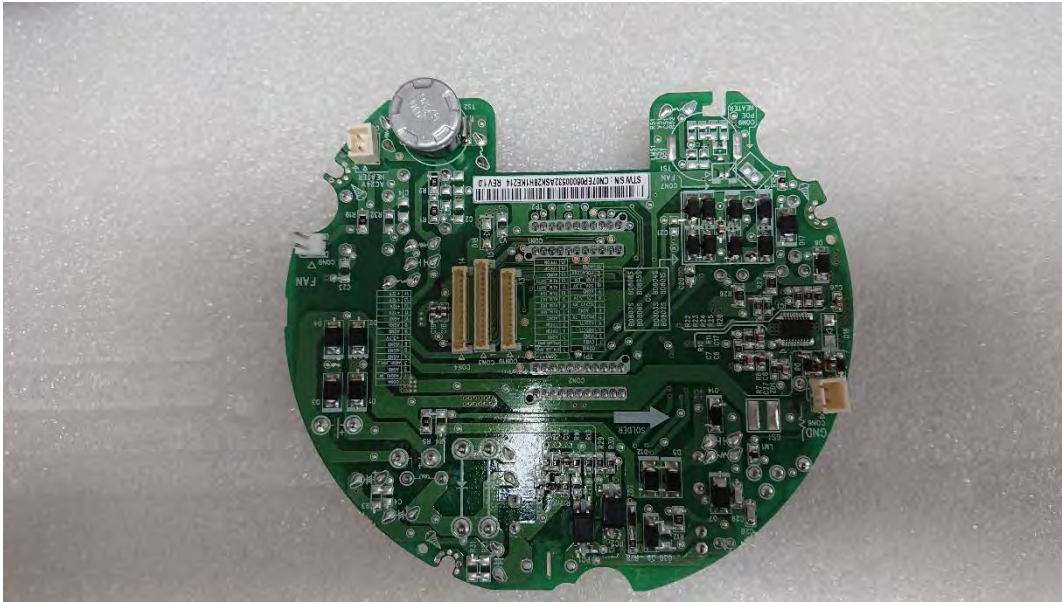
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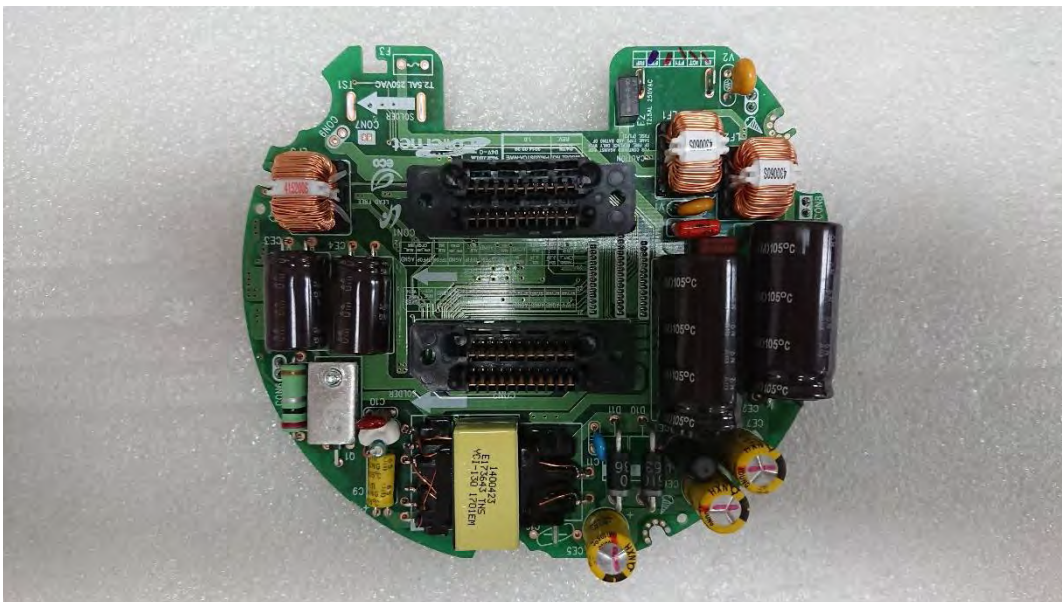
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EUT Internal View – Power Board 2

(Top)



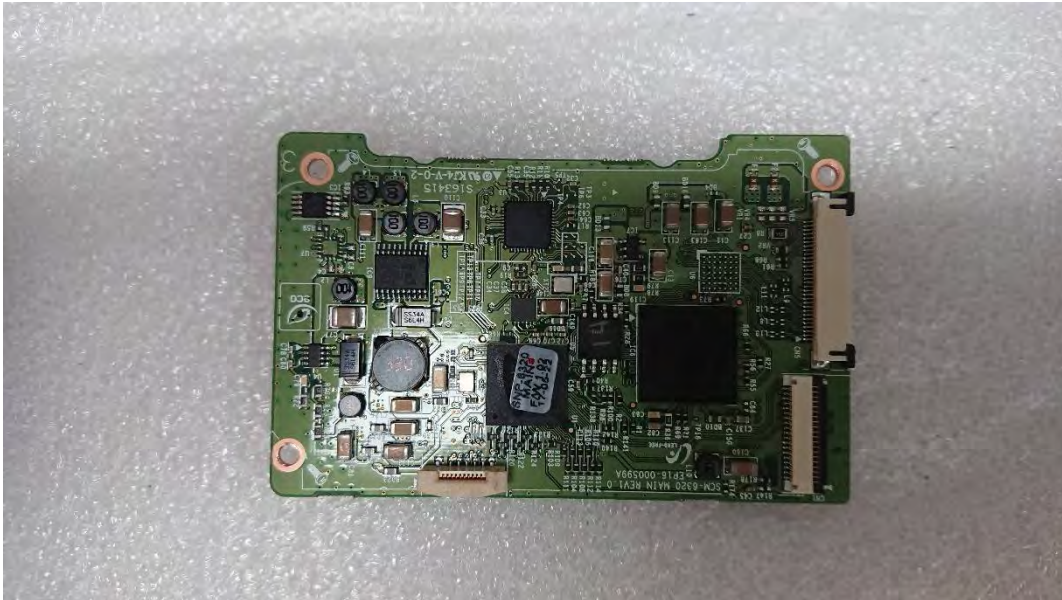
(Bottom)



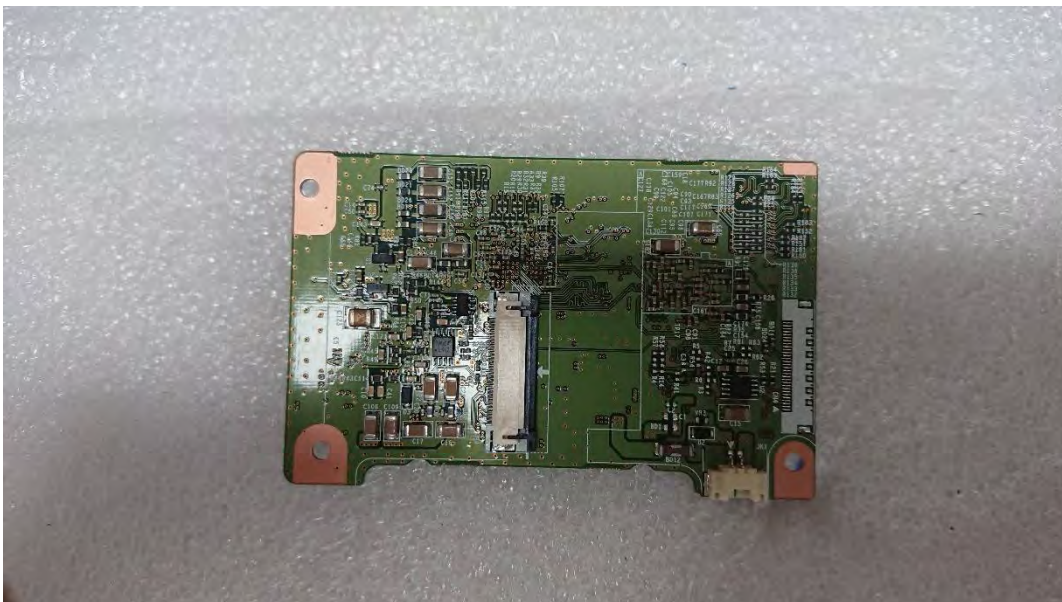
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EUT Internal View – Camera Board 1

(Top)

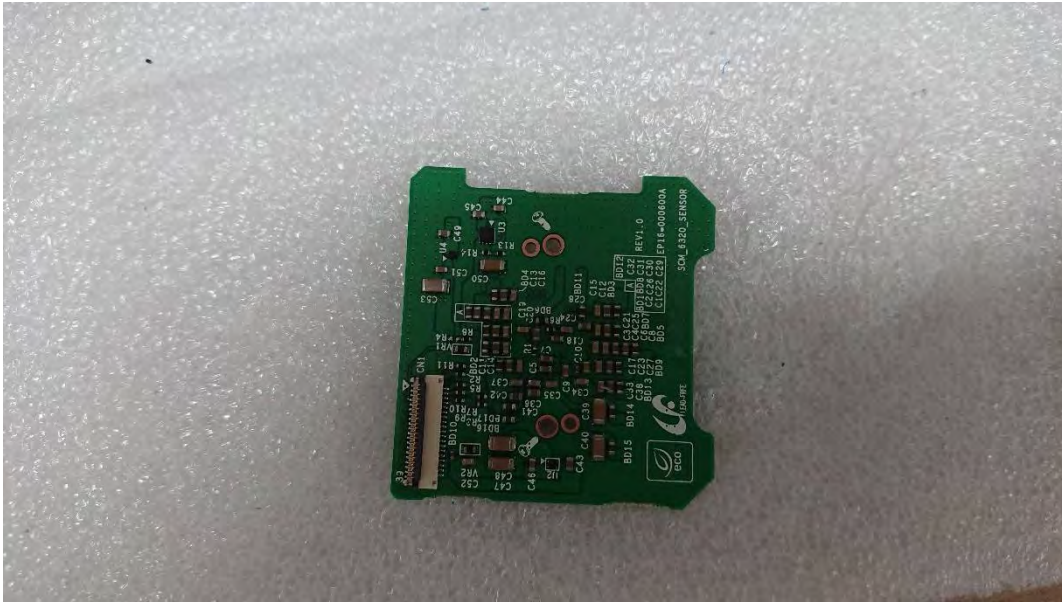


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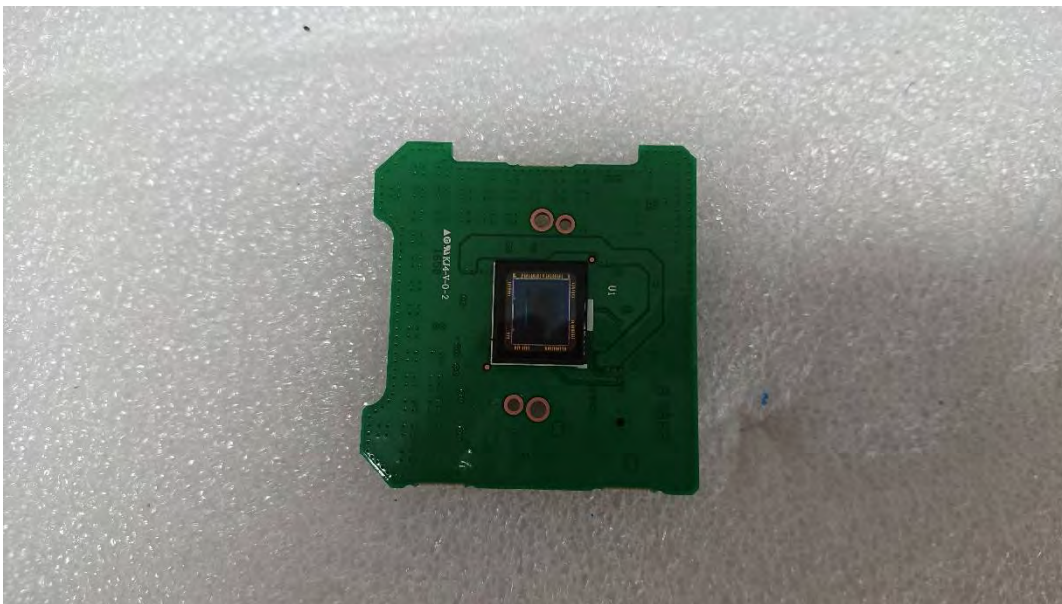


EUT Internal View – Camera Board 2

(Top)



(Bottom)



Label and Location



NETWORK CAMERA

Model No : SNP-6320HP

Manufacturer : HANWHA TECHWIN(TIANJIN)CO., LTD

Made in China

