



EMC TEST REPORT For CE

Test Report No. : KES-E1-17T0351-R1

Date of Issue : JUN. 22, 2018

Product name : NETWORK CAMERA

Model/Type No. : SNV-6084

Variant Model : -

Applicant : Hanwha Techwin Co., Ltd.

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

Manufacturer : 1. HANWHA TECHWIN(TIANJIN) CO., LTD
2. HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.
3. D-TECH CO.,LTD.

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

Date of Receipt : May. 22, 2017

Test date : May. 22, 2017 – May. 24, 2017

Test Results : ☒ In Compliance ☐ Not in Compliance

Tested by

Jin Bae, Lee
EMC Test Engineer

Reviewed by

Dong-Hun, Jang
EMC Technical Manager

This test report is not related to KOLAS.

**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

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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
May. 25, 2017	KES-E1-17T0351	Issued
Jun. 22, 2018	KES-E1-17T0351-R1	Re-issue due to manufacturer change

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1.0 General Product Description

Main Specifications of E.U.T are:

Video	
Imaging Device	1/2.8" PS Exmor 2.38M CMOS (IMX136)
Total Pixels	1952(H) x 1116(V)
Effective Pixels	1944(H) x 1104(V)
Scanning System	Progressive
Min. Illumination	Color : 0.1 Lux (1/30sec, F1.2, 50IRE), 0.0017Lux (2sec, F1.2, 50IRE) B/W : 0.01 Lux (1/30sec, F1.2, 50IRE)
S / N Ratio	50dB
Video Out	CVBS : 1.0 Vp-p / 75Ω composite, 720x480(N), 720x576(P), for installation - DIP connector type
Lens	
Focal Length (Zoom Ratio)	3~8.5mm (2.8X) Motorized Vari-focal
Max. Aperture Ratio	F1.2
Angular Field of View	H: 105.5°(Wide)~37.1°(Tele), V: 57.5°(Wide)~21.0°(Tele)
Min. Object Distance	0.5m
Focus Control	Simple Focus (Motorized V/F) / Manual - Remote control via network (Manual, Simple Focus)
Lens Type	DC Auto Iris
Mount Type	Board-in type
Pan / Tilt / Rotate	
Pan Range	0° ~ +354°
Tilt Range	0° ~ +67°
Rotate Range	0° ~ +355°
Operational	
Camera Title	Off / On (Displayed up to 45 characters)
Day & Night	Auto (ICR) / Color / B/W / External / Schedule
Backlight Compensation	Off / BLC
Wide Dynamic Range	120dB†
Contrast Enhancement	SSDR (Samsung Super Dynamic Range) (Off / On)
Digital Noise Reduction	SSNRIII (2D+3D Noise Filter) (Off / On)
Defog	Auto/Manual/Off
Digital Image Stabilization	Off / On
Motion Detection	Off / On (4ea 4 Points Polygonal zones)
Privacy Masking	Off / On (32 Zones with 4 Points of Polygonal)
Gain Control	Off / Low / Middle / High
White Balance	ATW / AWC / Manual / Indoor / Outdoor
Electronic Shutter Speed	Minimum / Maximum / Anti flicker
Digital PTZ	-
Flip / Mirror	Off / On
Intelligent Video Analytics	Tampering, Virtual Line, Enter/Exit, Appear / Disappear, Audio Detection, Face Detection
Alarm I/O	Input 1ea / Output 1ea
Audio In	Selectable (Mic IN/Line IN), Max output level: 1 Vrms Supply voltage: 2.5VDC(4mA), Input impedance: approx. 2K Ohm
Audio out	Line out (3.5mm stereo mini jack)
Alarm Triggers	Motion detection, Tampering, Audio Detection, Face Detection, Video Analytics, Network Disconnection, Alarm Input
Alarm events	File upload via FTP and E-Mail Notification via E-Mail, TCP local storage(SD/SDHC/SDXC) recording at Network disconnected & Event (Alarm Triggers) External output



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
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Network	
Ethernet	RJ-45 (10/100BASE-T)
Video Compression Format	H.264(MPEG-4 Part 10/AVC), Motion JPEG
Resolution	1920x1080 / 1280x1024 / 1280x960 / 1280x720 / 1024x768 / 800x600 / 800x450 / 640x480 / 640x360 / 320x240 / 320x180
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
Smart Codec	-
Video Quality Adjustment	H.264 : Compression Level, Target Bitrate Level Control MJPEG : Quality Level Control
Bitrate Control Method	H.264 : CBR or VBR M-JPEG : VBR
Streaming Capability	Multiple Streaming (Up to 10 Profiles)
Audio Compression Format	G.711 u-law / G.726 Selectable G.726 (ADPCM) 8KHz, G.711 8KHz G.726 : 16Kbps, 24Kbps, 32Kbps, 40Kbps
Audio Communication	Bi-directional
IP	IPv4, IPv6
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

Security	HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access Log 802.1X Authentication
Streaming Method	Unicast / Multicast
Max. User Access	15 users at Unicast Mode
Memory Slot	micro SD/SDHC/SDXC - motion Images recorded in the SD/SDHC/SDXC memory card can be downloaded.
Application Programming Interface	ONVIF Profile S HTTP API v2.0 SVNP 1.2
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
Web Viewer	Supported OS : Windows XP / VISTA / 7 / 8, MAC OS X 10.7 Supported Browser : Microsoft Internet Explorer (Ver. 7~10), Mozilla Firefox (Ver. 9~19), Google Chrome (Ver. 15~25), Apple Safari (Ver. 6.0.2(Mac OS X 10.8, 10.7 Only), 5.1.7) * Mac OS X Only
Central Management Software	SmartViewer 4.0
Environmental	
Operating Temperature / Humidity	PoE : -40°C to +55°C (-40°F ~ +131°F) / Less than 90% RH AC24, DC12V : -10°C to +55°C (+14°F ~ +131°F) / Less than 90% RH * Heater works at PoE power input. * After Start up, working at -40° by PoE
Storage Temperature / Humidity	-30°C ~ +60°C (-22°F ~ +140°F) / Less than 90% RH
Ingress Protection	IP66 Grade
Vandal Resistance	IK10
Electrical	
Input Voltage / Current	AC24, DC12V, PoE(IEEE802.3af) TBD
Power Consumption	Max 12.95W(PoE, Heater On) Max 14.0W(AC 24V, DC 12V, Heater On)
Mechanical	
Color / Material	Ivory / Aluminum
Dimension (WxHxD)	160 x H118.5
Weight	960g

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1.1 Test Voltage & Frequency

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

Voltage ☐ 230Vac ☐ 100 Vac ☒ 24 Vac ☒ 12 Vdc ☒ PoE
Frequency ☐ 50 Hz ☐ 60 Hz ☐ Hz

1.2 Variant Model Differences

Not applicable

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
NETWORK CAMERA	SNV-6084	-	Hanwha Techwin (Tianjin) Co.,Ltd.	E.U.T

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
POE Adaptor	POE36U-1AT-R	-	PHIHONG	-
Notebook	ProBook4430s	-	HP	-
Notebook Adaptor	SeriesPPP0009H	-	CHICONY POWER TECHNOLOGY (SUZHOU) CO.,LTD,	-
Speaker	BR10000A CUVE	-	BEIJING EDIFIER HI-TECH GROUP.	-
MIC	CMK-303	-	CAMAC	-
Alarm	SIP-1201DD D0	-	SAMSUNG TECHWIN CO., LTD.	-



1.6 External I / O Cabling

- AC 24 V Mode, DC 12 V 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	3.5	U
	3.5 mm	Speaker	3.5 mm	1.6	U
	3.5 mm	MIC	3.5 mm	1.7	U
	3 Pin	Alarm	3 Pin	3.0	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)	POE Adaptor	RJ-45 (POE)	3.5	U
	3.5 mm	Speaker	3.5 mm	1.6	U
	3.5 mm	MIC	3.5 mm	1.7	U
	3 Pin	Alarm	3 Pin	3.0	U
Notebook	RJ-45 (DATA)	POE Adaptor	RJ-45 (DATA)	3.0	U

* Unshielded=U, Shielded=S



1.7 E.U.T Operating Mode(s)

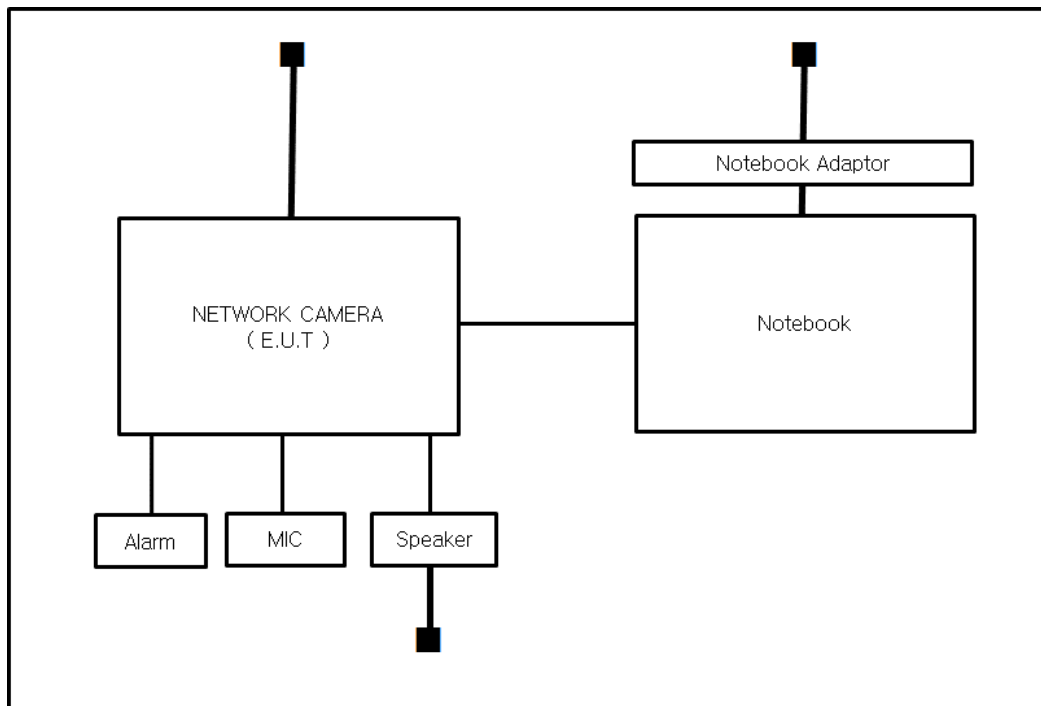
Test mode	operating
AC 24 V Mode	E.U.T Monitoring, Ping test
DC 12 V Mode	E.U.T Monitoring, Ping test
POE Mode	E.U.T Monitoring, Ping test

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

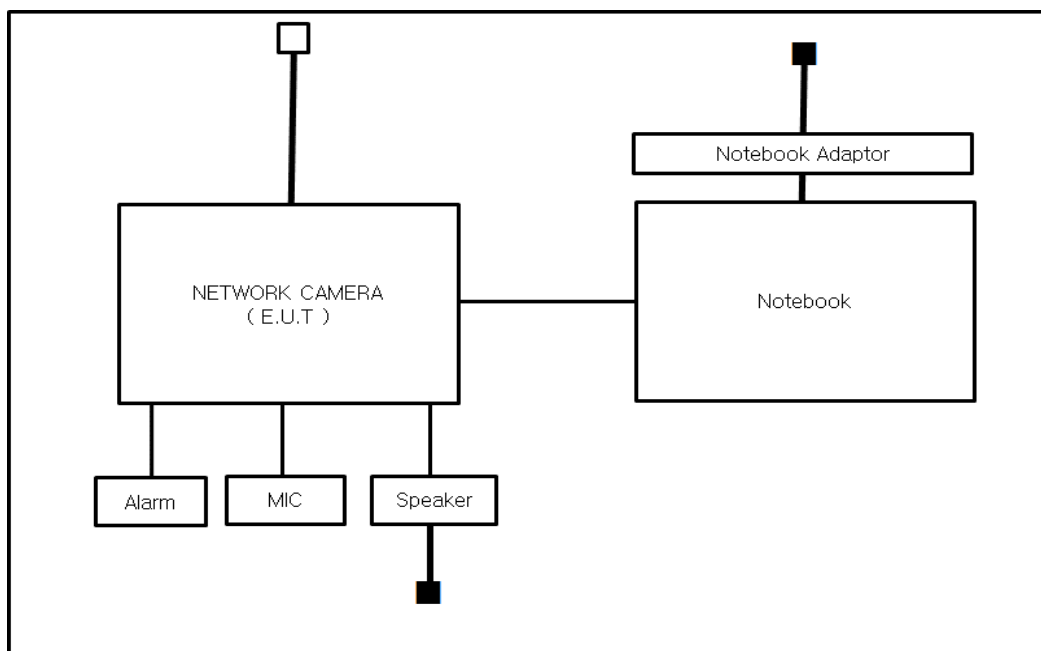
1.8 Configuration

■ AC Main
 □ DC Main

- AC 24 V Mode

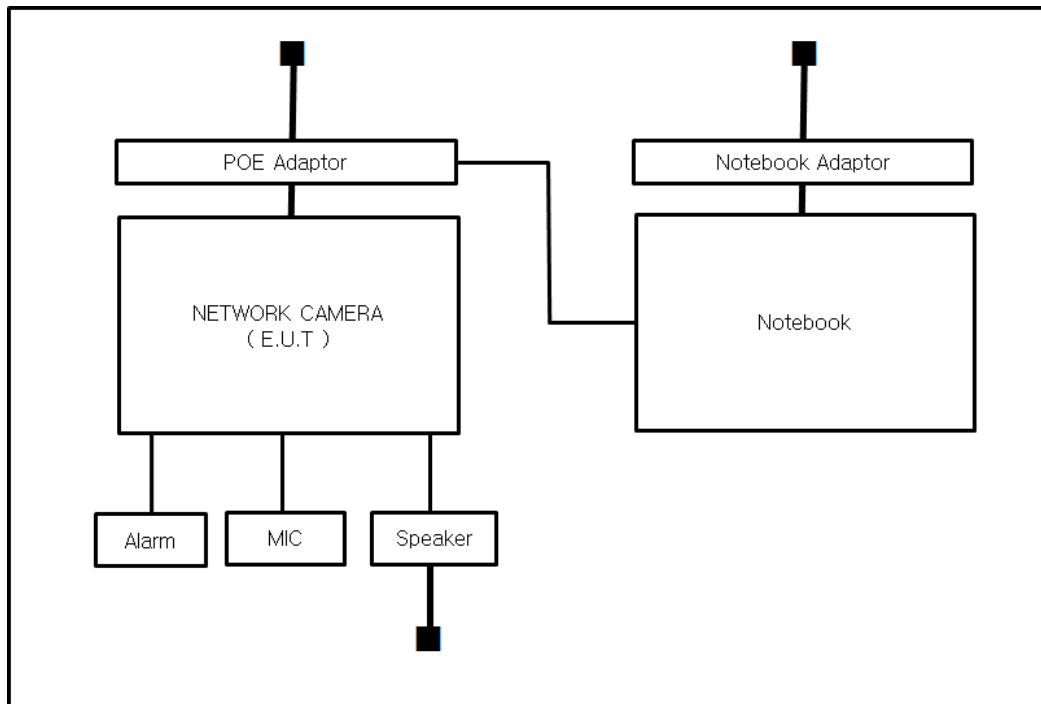


- DC 12 V Mode



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- PoE Mode



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	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

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2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **EMC – Directive 2014/30/EU**

☐ EN 61000-6-3:2011

☐ EN 61000-6-1:2007

☐ EN 61000-6-4:2007 +A1:2011

☐ EN 61000-6-2:2005

☐ EN 55011:2007 +A1:2010

☐ Group 1
☐ 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



KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
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- | | | |
|---|----------------------------------|----------------------------------|
| ☐ VCCI V-3 / 2015.04 | ☐ Class A | ☐ Class B |
| ☐ AS/NZS CISPR22:2009 + A1:2010 | ☐ Class A | ☐ Class B |
| ☐ 47 CFR Part 15, Subpart B | | |
| ☐ CISPR 22:2009 +A1:2010 | ☐ Class A | ☐ Class B |
| ☐ ANSI C63.4-2009 | | |
| ☐ IC Regulation ICES-003 : 2016 | | |
| ☐ CAN/CSA CISPR 22-10 | ☐ Class A | ☐ Class B |
| ☐ ANSI C63.4-2014 | | |
|
☐ RE- Directive 2014/53/EU | | |
|
☐ EN 301 489-1 V1.9.2 | | |
| ☐ Equipment for fixed use | | |
| ☐ Equipment for vehicular use | | |
| ☐ Equipment for portable use | | |
|
☐ EN 301 489-3 V1.6.1 | | |
|
☐ EN 301 489-17 V2.2.1 | | |
|
☐ EN 60945:2002 | | |

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2.1 Conducted Emissions at Mains Power Ports

Test Date

May. 22, 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	101783	04, 27, 2018
☒	LISN	ENV216	R & S	101137	02, 03, 2018
☒	LISN	ENV216	R & S	101786	04, 27, 2018
☒	PULSE LIMITER	ESH3-Z2	R & S	101914	12, 13, 2017

Test Conditions

Temperature: 22,4 °C

Relative Humidity: 41,8 %

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

May. 22, 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	101783	04, 27, 2018
☒	LISN	ENV216	R & S	101137	02, 03, 2018
☒	LISN	ENV216	R & S	101786	04, 27, 2018
☒	PULSE LIMITER	ESH3-Z2	R & S	101914	12, 13, 2017
☒	8-WIRE ISN CAT3	CAT3 8158	SCHWARZBECK	8158-0019	03, 29, 2018
☒	8-WIRE ISN CAT5	CAT5 8158	SCHWARZBECK	8158-0030	03, 29, 2018
☐	8-WIRE ISN CAT6	NTFM 8158	SCHWARZBECK	8158-0029	08, 11, 2017

Test Conditions

Temperature: 22,4 °C

Relative Humidity: 41,8 %

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

May. 22, 2017

Test Location

☐ Open Area Test Site #1

☒ Open Area Test Site #2

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	-	-	-	-
☒	EMI TEST RECEIVER	ESVS10	Rohde & Schwarz	826008/014	04, 18, 2018
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	714	11, 28, 2018
☐	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	04, 14, 2018

Test Conditions

Temperature: 27,5 °C

Relative Humidity: 36,0 %

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

May. 23, 2017

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, 08, 2017
☒	PREAMPLIFIER	SCU 18	R & S	102232	06, 29, 2017
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	05, 02, 2019

Test Conditions

Temperature: 22,1 °C

Relative Humidity: 43,0 %

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	5.4.8.0	-
☐	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	08, 08, 2017
☐	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	08, 08, 2017

Test Conditions

Temperature: °C

Relative Humidity: %

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

N/A



2.6 Voltage Fluctuations and Flicker

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	5.4.8.0	-
☐	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	08, 08, 2017
☐	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	08, 08, 2017

Test Conditions

Temperature:

°C

Relative Humidity:

%

Test Results

The requirements are:

- ☐ PASS
☐ NOT PASS
☒ NOT APPLICABLE

Remarks

N/A

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

May. 23, 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: 25,5 °C
Relative Humidity: 45,6 %
Atmospheric Pressure: 99,3 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 24 V 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	Screw	Contact Discharge	Complied	-

- DC 12 V 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	Screw	Contact Discharge	Complied	-

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- 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	Screw	Contact Discharge	Complied	-

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

Test Results

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

Remarks

PASS Required Performance Criteria.

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3.2 Radiated Electric Field Immunity

Reference Standard

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

Test Date

May. 23, 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	EMC32	R & S	10.10.02	-
☒	SIGNAL GENERATOR	SMB 100A	R & S	177586	08, 08, 2017
☒	BROADBAND AMPLIFIER	BBA100	R & S	101239	08, 08, 2017
☒	BROADBAND AMPLIFIER	100S1G6M1	AR	579931	08, 08, 2017
☒	POWER METER	NRP2	R & S	103475	08, 08, 2017
☒	AVG POWER SENSOR	NRP-Z91	R & S	102526	08, 08, 2017
☒	AVG POWER SENSOR	NRP-Z91	R & S	102527	08, 08, 2017
☒	STACKED DOUBLE LOG-PER- ANTENNA	STPL9128 E	Schwarzbeck	9128ES-121	-

Test Conditions

Temperature: 22,1 °C
Relative Humidity: 43,0 %
Atmospheric Pressure: 100,1 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

**Test Data****- AC 24 V Mode**

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

- DC 12 V 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

May. 24, 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	5.0.9.0	-
☒	ULTRA COMPACT SIMULATOR	UCS 500 N5	EM TEST	V0936105120	06, 27, 2017
☒	MOTOR VARIAC	MV2616	EM TEST	V0936105123	06, 27, 2017
☒	CAPACITIVE COUPLING CLAMP	HFK	EM TEST	070925	06, 27, 2017

Test Conditions

Temperature: 21,6 °C
Relative Humidity: 47,6 %
Atmospheric Pressure: 99,2 kPa

Test Specifications

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

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

Burst Period: ☒ 300 ms ☐ 2 s

Repetition Rate: ☐ 5 kHz ☒ 100 kHz

Duration of Test Voltage: ☒ ≥ 1 min

Required Performance Criteria: ☒ Complied

Test Data

- AC 24 V Mode

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

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
L – N	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
Alarm (3Pin)	Complied	Complied

- DC 12 V 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)
L – N	Complied	Complied

☒ Signal ports and telecommunication ports – Coupling Clamp used

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
RJ-45	Complied	Complied
Alarm (3Pin)	Complied	Complied

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

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

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

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

☒ Signal ports and telecommunication ports – Coupling Clamp used

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
RJ-45 (PoE)	Complied	Complied
Alarm (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.

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3.4 Surge Transients

Reference Standard

EN 61000-4-5:2014

Test Date

May. 24, 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	5.0.9.0	-
☒	ULTRA COMPACT SIMULATOR	UCS 500 N5	EM TEST	V0936105120	06, 27, 2017
☒	MOTOR VARIAC	MV2616	EM TEST	V0936105123	06, 27, 2017
☒	CDN	CNV 508N1	EM TEST	P1551168979	04, 27, 2017
☐	CDN	CNV 508T5	EM TEST	P1549168422	04, 27, 2017

Test Conditions

Temperature: 21,6 °C
Relative Humidity: 47,6 %
Atmospheric Pressure: 99,2 kPa

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Test Specifications

AC Power Lines

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

Surge Amplitude :

Common Mode

☐ (0,5 / 1,0 / 2,0) kV

Differential Mode

☒ (0,5 / 1,0) kV

Number of Surges:

☒ 5 surges per angle

Angle:

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

Polarity:

☒ Positive & Negative

Repetition Rate:

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

Required Performance Criteria: ☒ Complied

Other supply / Signal Lines

Source Impedance: 42 ohm for common mode

Surge Amplitude:

Common Mode

☒ (0,5 / 1,0) kV

Number of Surges:

☒ 5 Surges

Polarity:

☒ Positive & Negative

Repetition Rate:

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

Required Performance Criteria: ☒ Complied

**Test Data****- AC 24 V Mode**☒ Line to Line – Differential Mode

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

- DC 12 V 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

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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 (PoE)	Complied	Complied

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

Test Results

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

Remarks

PASS Required Performance Criteria.



3.5 Conducted Disturbance

Reference Standard

EN 61000-4-6:2014

Test Date

May. 24, 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
☒	EM INJECTION CLAMP	EM 101	Liithi	35943	02, 03, 2018

Test Conditions

Temperature: 21,6 °C
Relative Humidity: 47,6 %
Atmospheric Pressure: 99,2 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 24 V Mode

☒ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
L – N	CDN (☒ M2, ☐ M3)	Complied

☐ Input d.c. power ports

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

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
RJ-45	Complied	Complied
Alarm (3Pin)	Complied	Complied

- DC 12 V 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
L – N	CDN (☒ M2, ☐ M3)	Complied

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
RJ-45	Complied	Complied
Alarm (3Pin)	Complied	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 (PoE)	Complied	Complied
Alarm (3Pin)	Complied	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

May. 24, 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	5.0.9.0	-
☒	ULTRA COMPACT SIMULATOR	UCS 500 N5	EM TEST	V0936105120	06, 27, 2017
☒	MOTOR VARIAC	MV2616	EM TEST	V0936105123	06, 27, 2017

Test Conditions

Temperature: 21,6 °C
Relative Humidity: 47,6 %
Atmospheric Pressure: 99,2 kPa



Test Specifications & Observations / Remarks

- AC 24 V 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 Adaptor.



APPENDIX A – TEST DATA

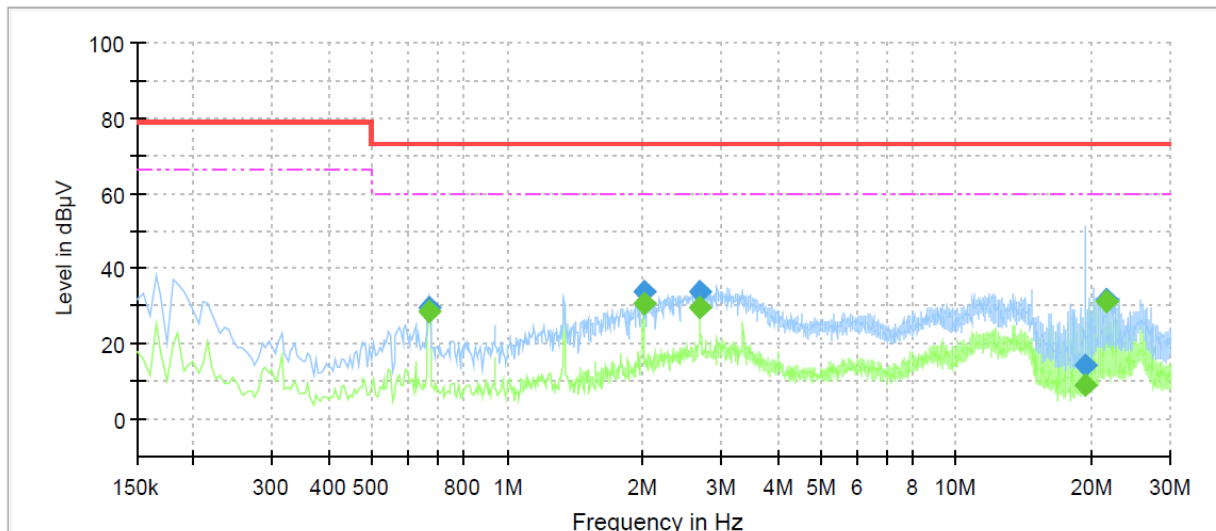
Conducted Emissions at Mains Power Ports

- AC 24 V Mode

[HOT]

Common Information

Test Description: Conducted Emission
Model No.: SNV-6084P
Mode: AC_H
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.670000	---	28.55	60.00	31.45	1000.0	9.000	L1	20.4
0.670000	29.76	---	73.00	43.24	1000.0	9.000	L1	20.4
2.010000	---	30.85	60.00	29.15	1000.0	9.000	L1	19.8
2.010000	33.71	---	73.00	39.29	1000.0	9.000	L1	19.8
2.680000	---	29.42	60.00	30.58	1000.0	9.000	L1	19.8
2.680000	33.93	---	73.00	39.07	1000.0	9.000	L1	19.8
19.310000	---	9.24	60.00	50.76	1000.0	9.000	L1	20.3
19.310000	14.13	---	73.00	58.87	1000.0	9.000	L1	20.3
21.665000	---	31.37	60.00	28.63	1000.0	9.000	L1	20.3
21.665000	31.96	---	73.00	41.04	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))



KES Co., Ltd.

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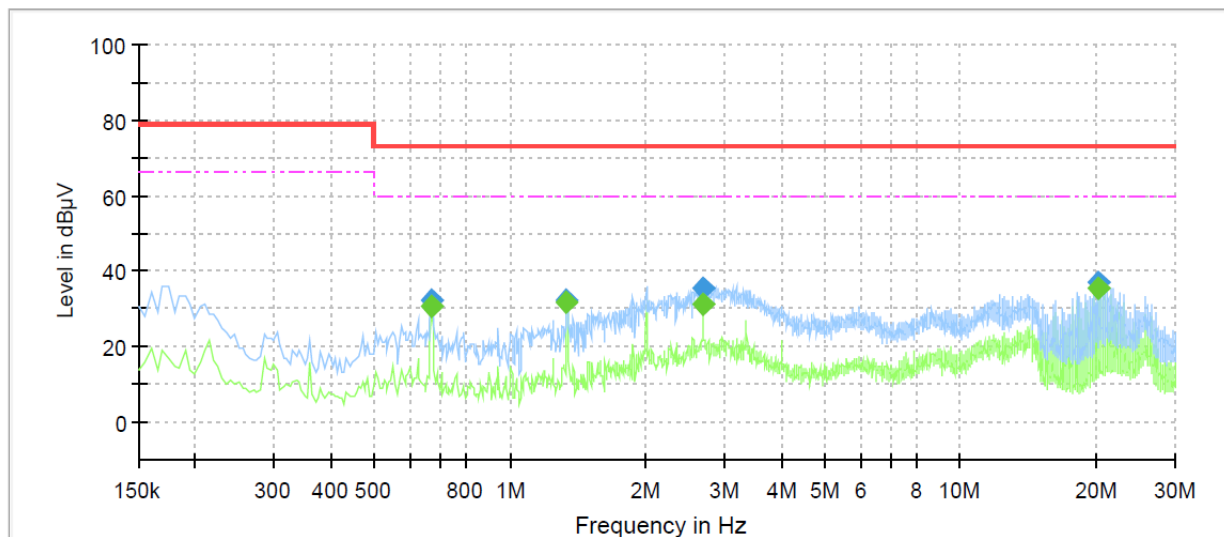
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[NEUTRAL]

Common Information

Test Description: Conducted Emission
Model No.: SNV-6084P
Mode: AC_N
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.670000	---	30.95	60.00	29.05	1000.0	9.000	N	20.4
0.670000	32.10	---	73.00	40.90	1000.0	9.000	N	20.4
1.340000	---	31.52	60.00	28.48	1000.0	9.000	N	20.0
1.340000	32.42	---	73.00	40.58	1000.0	9.000	N	20.0
2.680000	---	31.35	60.00	28.65	1000.0	9.000	N	19.8
2.680000	35.52	---	73.00	37.48	1000.0	9.000	N	19.8
20.260000	---	35.41	60.00	24.59	1000.0	9.000	N	20.2
20.260000	37.10	---	73.00	35.90	1000.0	9.000	N	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 (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

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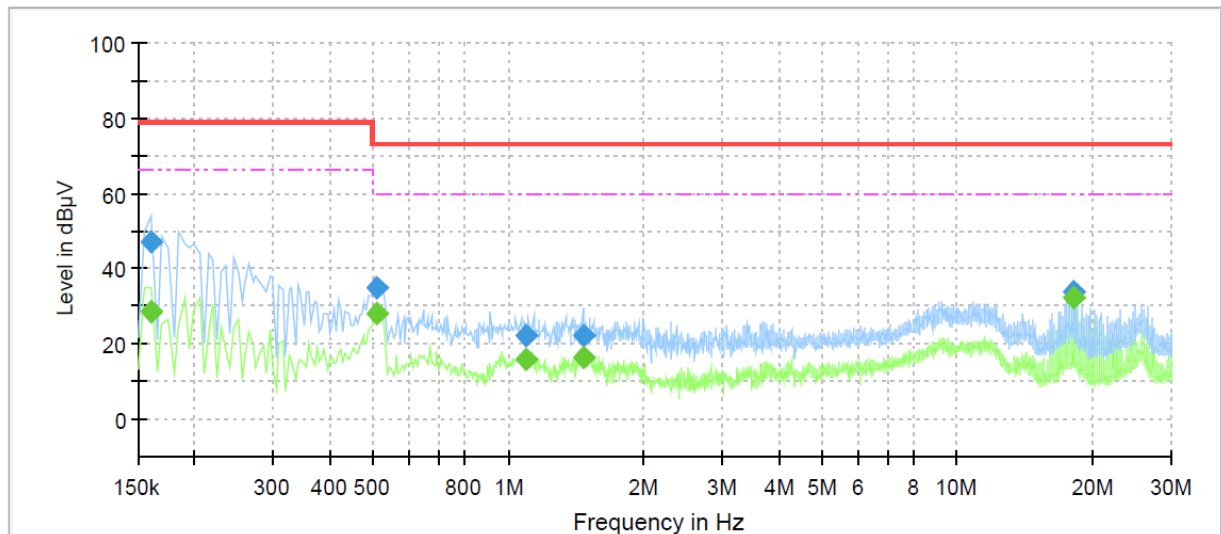
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- DC 12 V Mode

[HOT]

Common Information

Test Description: Conducted Emission
Model No.: SNV-6084P
Mode: DC_H
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.160000	---	28.80	66.00	37.20	1000.0	9.000	L1	21.0
0.160000	46.86	---	79.00	32.14	1000.0	9.000	L1	21.0
0.510000	---	28.11	60.00	31.89	1000.0	9.000	L1	20.5
0.510000	35.21	---	73.00	37.79	1000.0	9.000	L1	20.5
1.090000	---	16.08	60.00	43.92	1000.0	9.000	L1	20.1
1.090000	22.01	---	73.00	50.99	1000.0	9.000	L1	20.1
1.465000	---	16.46	60.00	43.54	1000.0	9.000	L1	20.0
1.465000	22.27	---	73.00	50.73	1000.0	9.000	L1	20.0
18.245000	---	32.53	60.00	27.47	1000.0	9.000	L1	20.3
18.245000	33.78	---	73.00	39.22	1000.0	9.000	L1	20.3

◆ 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 (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

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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

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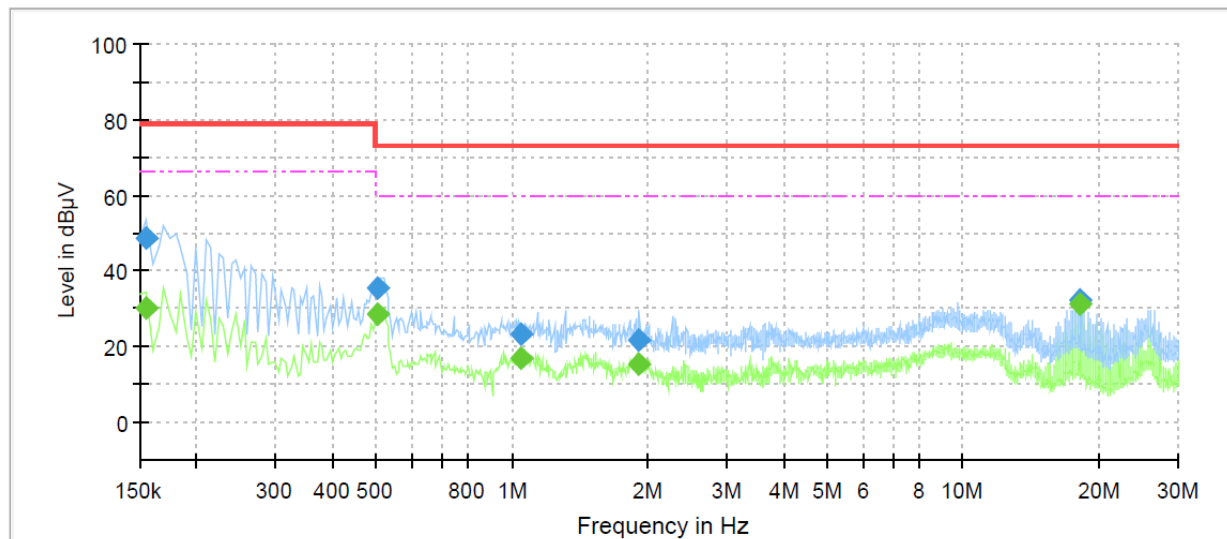
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[NEUTRAL]

Common Information

Test Description: Conducted Emission
Model No.: SNV-6084P
Mode: DC_N
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	30.16	66.00	35.84	1000.0	9.000	N	21.0
0.155000	48.52	---	79.00	30.48	1000.0	9.000	N	21.0
0.505000	---	28.44	60.00	31.56	1000.0	9.000	N	20.5
0.505000	35.62	---	73.00	37.38	1000.0	9.000	N	20.5
1.045000	---	16.92	60.00	43.08	1000.0	9.000	N	20.1
1.045000	23.06	---	73.00	49.94	1000.0	9.000	N	20.1
1.920000	---	15.51	60.00	44.49	1000.0	9.000	N	19.8
1.920000	21.52	---	73.00	51.48	1000.0	9.000	N	19.8
18.245000	---	31.11	60.00	28.89	1000.0	9.000	N	20.1
18.245000	32.30	---	73.00	40.70	1000.0	9.000	N	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 (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

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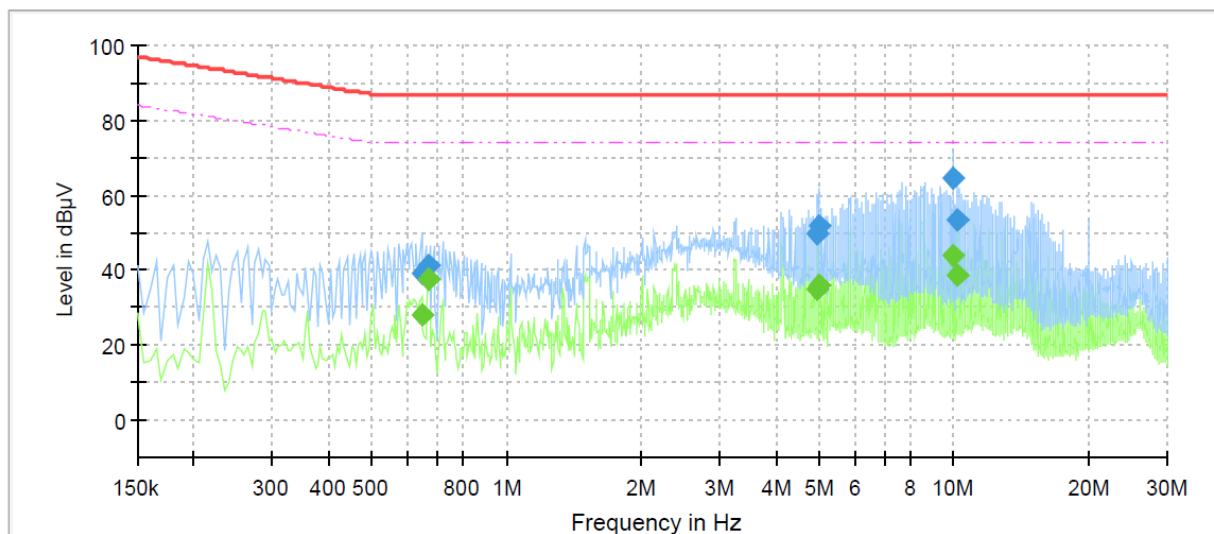
Conducted Emissions at Telecommunication Ports

- AC 24 V Mode

[10 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: SNV-6084P
Mode: AC_10 Mbps
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.645000	---	27.93	74.00	46.07	1000.0	9.000	Single Line	20.7
0.645000	39.30	---	87.00	47.70	1000.0	9.000	Single Line	20.7
0.670000	---	37.71	74.00	36.29	1000.0	9.000	Single Line	20.6
0.670000	41.46	---	87.00	45.54	1000.0	9.000	Single Line	20.6
4.970000	---	35.20	74.00	38.80	1000.0	9.000	Single Line	19.8
4.970000	49.98	---	87.00	37.02	1000.0	9.000	Single Line	19.8
4.995000	---	35.89	74.00	38.11	1000.0	9.000	Single Line	19.8
4.995000	52.03	---	87.00	34.97	1000.0	9.000	Single Line	19.8
9.990000	---	44.11	74.00	29.89	1000.0	9.000	Single Line	20.0
9.990000	64.77	---	87.00	22.23	1000.0	9.000	Single Line	20.0
10.220000	---	38.41	74.00	35.59	1000.0	9.000	Single Line	20.0
10.220000	53.53	---	87.00	33.47	1000.0	9.000	Single Line	20.0

◆ 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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Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

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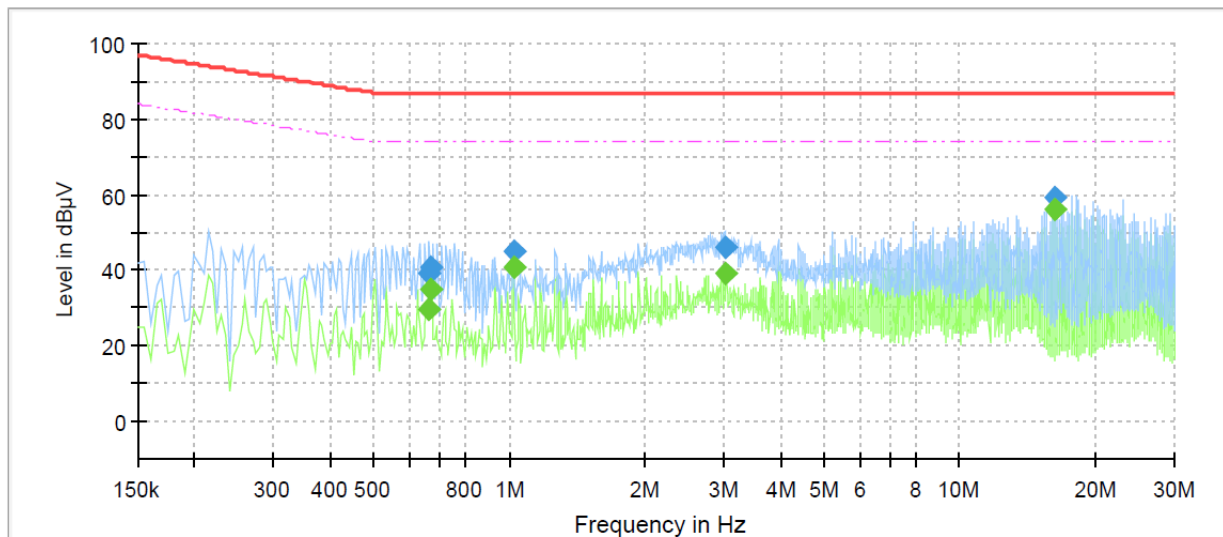
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[100 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: SNV-6084P
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)
0.665000	---	29.64	74.00	44.36	1000.0	9.000	Single Line	20.2
0.665000	39.34	---	87.00	47.66	1000.0	9.000	Single Line	20.2
0.670000	---	35.18	74.00	38.82	1000.0	9.000	Single Line	20.2
0.670000	40.83	---	87.00	46.17	1000.0	9.000	Single Line	20.2
1.025000	---	40.86	74.00	33.14	1000.0	9.000	Single Line	19.8
1.025000	45.14	---	87.00	41.86	1000.0	9.000	Single Line	19.8
3.010000	---	39.03	74.00	34.97	1000.0	9.000	Single Line	19.3
3.010000	46.04	---	87.00	40.96	1000.0	9.000	Single Line	19.3
16.230000	---	56.34	74.00	17.66	1000.0	9.000	Single Line	19.6
16.230000	59.54	---	87.00	27.46	1000.0	9.000	Single Line	19.6

◆ 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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3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
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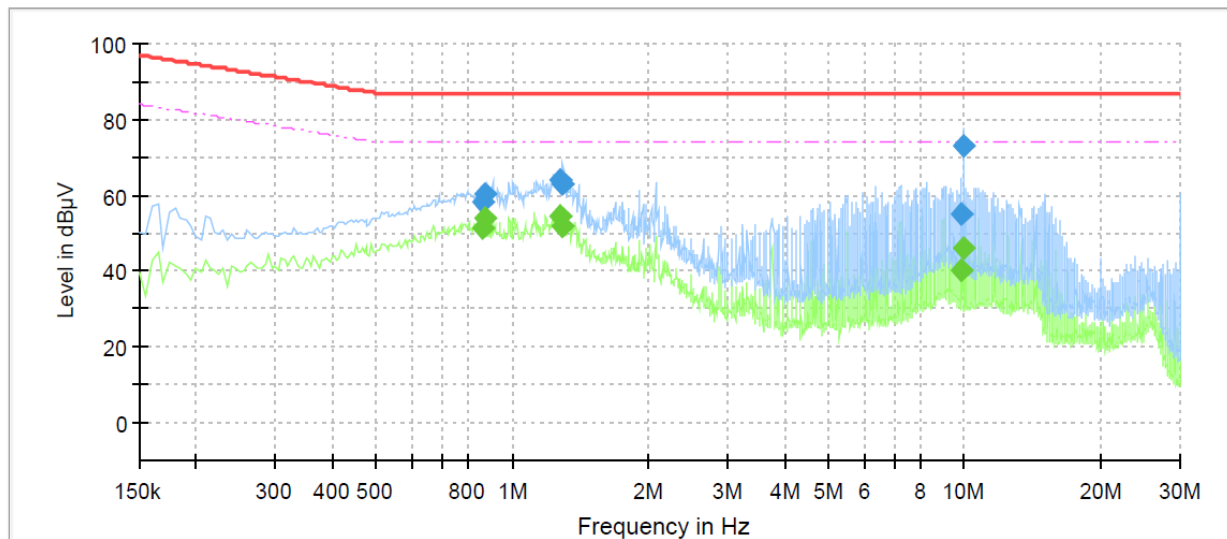
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- DC 12 V Mode

[10 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: SNV-6084P
Mode: DC_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)
0.860000	---	51.54	74.00	22.46	1000.0	9.000	Single Line	20.5
0.860000	58.16	---	87.00	28.84	1000.0	9.000	Single Line	20.5
0.870000	---	54.03	74.00	19.97	1000.0	9.000	Single Line	20.5
0.870000	60.14	---	87.00	26.86	1000.0	9.000	Single Line	20.5
1.280000	---	54.58	74.00	19.42	1000.0	9.000	Single Line	20.2
1.280000	63.83	---	87.00	23.17	1000.0	9.000	Single Line	20.2
1.295000	---	51.68	74.00	22.32	1000.0	9.000	Single Line	20.2
1.295000	62.77	---	87.00	24.23	1000.0	9.000	Single Line	20.2
9.870000	---	40.13	74.00	33.87	1000.0	9.000	Single Line	20.0
9.870000	54.92	---	87.00	32.08	1000.0	9.000	Single Line	20.0
9.995000	---	45.97	74.00	28.03	1000.0	9.000	Single Line	20.0
9.995000	73.29	---	87.00	13.71	1000.0	9.000	Single Line	20.0

◆ 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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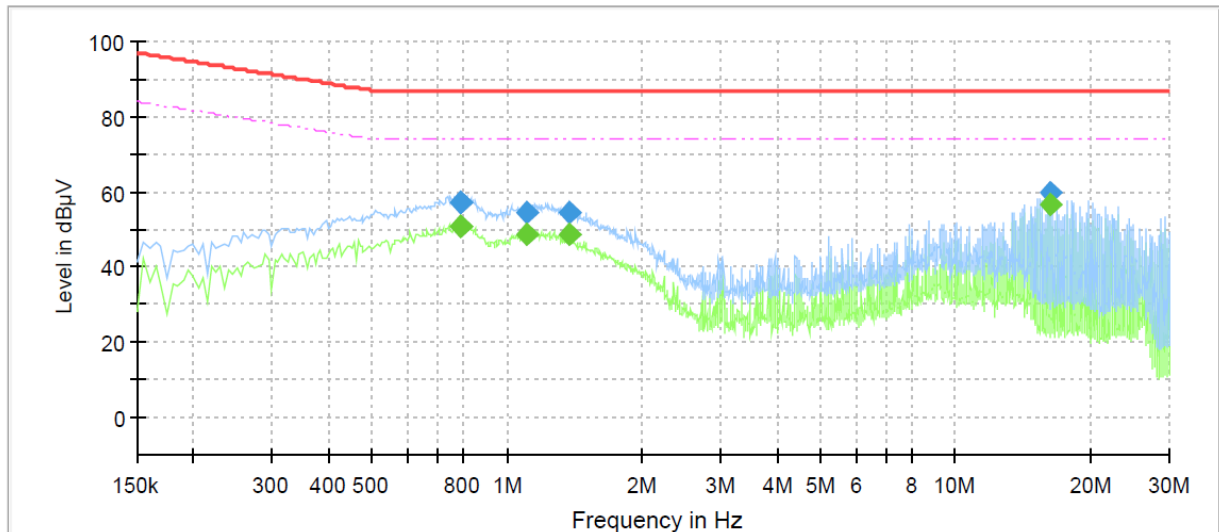
KES-E1-17T0351-R1

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[100 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: SNV-6084P
Mode: DC_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)
0.785000	---	50.83	74.00	23.17	1000.0	9.000	Single Line	20.0
0.785000	57.14	---	87.00	29.86	1000.0	9.000	Single Line	20.0
0.790000	---	50.97	74.00	23.03	1000.0	9.000	Single Line	20.0
0.790000	57.17	---	87.00	29.83	1000.0	9.000	Single Line	20.0
1.105000	---	48.46	74.00	25.54	1000.0	9.000	Single Line	19.8
1.105000	54.60	---	87.00	32.40	1000.0	9.000	Single Line	19.8
1.385000	---	48.71	74.00	25.29	1000.0	9.000	Single Line	19.7
1.385000	54.55	---	87.00	32.45	1000.0	9.000	Single Line	19.7
16.230000	---	56.64	74.00	17.36	1000.0	9.000	Single Line	19.6
16.230000	59.78	---	87.00	27.22	1000.0	9.000	Single Line	19.6

◆ 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))

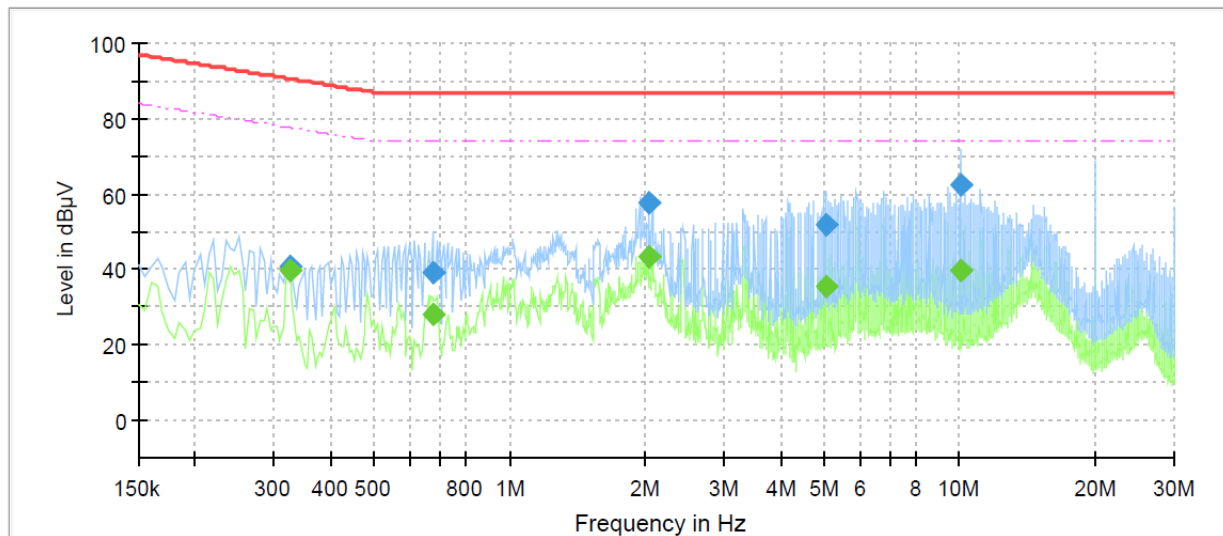
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- PoE Mode

[10 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	SNV-6084P
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)
0.325000	---	39.87	77.58	37.71	1000.0	9.000	Single Line	21.1
0.325000	40.93	---	90.58	49.65	1000.0	9.000	Single Line	21.1
0.675000	---	27.86	74.00	46.14	1000.0	9.000	Single Line	20.6
0.675000	39.40	---	87.00	47.60	1000.0	9.000	Single Line	20.6
2.040000	---	43.49	74.00	30.51	1000.0	9.000	Single Line	19.9
2.040000	57.66	---	87.00	29.34	1000.0	9.000	Single Line	19.9
5.055000	---	35.68	74.00	38.32	1000.0	9.000	Single Line	19.8
5.055000	52.07	---	87.00	34.93	1000.0	9.000	Single Line	19.8
10.010000	---	39.52	74.00	34.48	1000.0	9.000	Single Line	20.0
10.010000	62.55	---	87.00	24.45	1000.0	9.000	Single Line	20.0

◆ 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))



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
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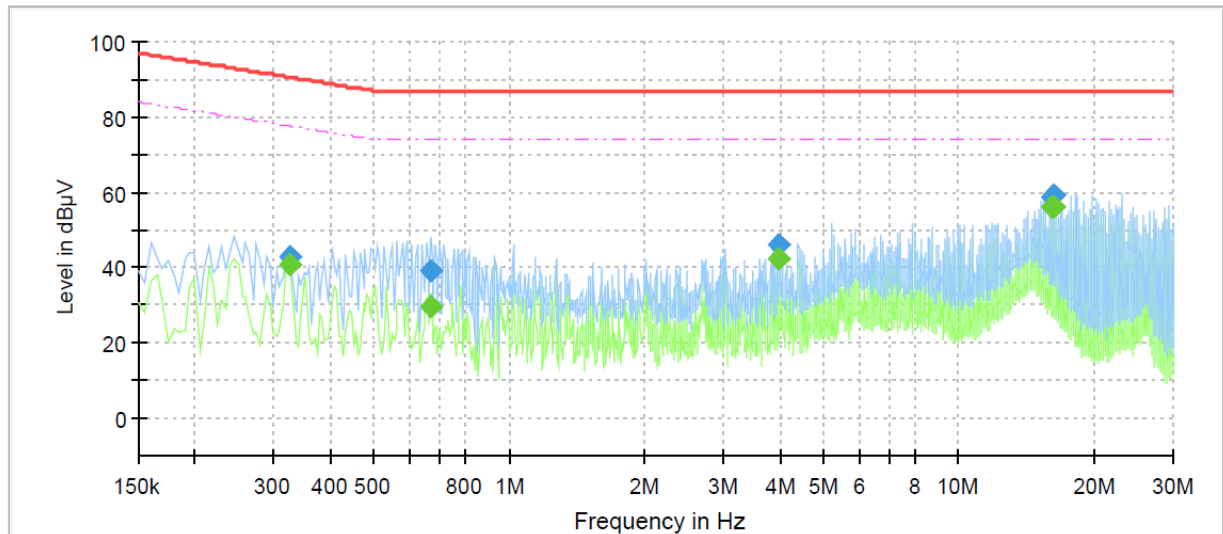
KES-E1-17T0351-R1

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[100 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: SNV-6084P
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)
0.325000	---	40.75	77.58	36.83	1000.0	9.000	Single Line	20.6
0.325000	43.11	---	90.58	47.47	1000.0	9.000	Single Line	20.6
0.670000	---	29.87	74.00	44.13	1000.0	9.000	Single Line	20.2
0.670000	39.33	---	87.00	47.67	1000.0	9.000	Single Line	20.2
3.955000	---	42.43	74.00	31.57	1000.0	9.000	Single Line	19.3
3.955000	45.90	---	87.00	41.10	1000.0	9.000	Single Line	19.3
16.165000	---	55.97	74.00	18.03	1000.0	9.000	Single Line	19.6
16.165000	58.98	---	87.00	28.02	1000.0	9.000	Single Line	19.6
16.230000	---	56.09	74.00	17.91	1000.0	9.000	Single Line	19.6
16.230000	59.33	---	87.00	27.67	1000.0	9.000	Single Line	19.6

◆ 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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**Radiated Electric Field Emissions(Below 1 GHz)**

- AC 24 V Mode

Frequency	Amplitude	ANT	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin
[MHz]	[dB μ V]	Polar. (H/V)	[m]	ANT. [dB/m]	Cable [dB]	[dB μ V/m]	[dB μ V/m]	[dB]
67.92	18.20	H	3.98	9.39	1.91	29.50	40.00	10.50
74.63	18.30	V	1.01	7.81	2.00	28.11	40.00	11.89
224.69	15.60	H	3.99	12.15	3.42	31.17	40.00	8.83
274.93	16.10	V	1.02	12.95	3.90	32.95	47.00	14.05
475.23	16.90	H	4.00	16.92	5.16	38.98	47.00	8.02
666.63	17.60	V	1.00	19.54	6.14	43.28	47.00	3.72

* H : Horizontal, V : Vertical

◆ Calculation

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

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

Correction Factor : ANT FACTOR + Cable loss

- DC 12 V Mode

Frequency	Amplitude	ANT	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin
[MHz]	[dB μ V]	Polar. (H/V)	[m]	ANT. [dB/m]	Cable [dB]	[dB μ V/m]	[dB μ V/m]	[dB]
61.24	17.00	H	3.99	11.45	1.81	30.26	40.00	9.74
299.63	15.90	V	1.02	13.41	4.10	33.41	47.00	13.59
350.12	16.20	H	3.98	14.52	4.24	34.96	47.00	12.04
399.63	16.60	V	1.01	15.60	4.60	36.80	47.00	10.20
666.12	17.80	H	4.00	19.54	6.14	43.48	47.00	3.52
666.73	18.10	V	1.00	19.54	6.14	43.78	47.00	3.22

* H : Horizontal, V : Vertical

◆ Calculation

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

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

Correction Factor : ANT FACTOR + Cable loss

**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
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- PoE Mode

Frequency	Amplitude	ANT	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin
[MHz]	[dBμV]	Polar. (H/V)	[m]	ANT. [dB/m]	Cable [dB]	[dBμV/m]	[dBμV/m]	[dB]
42.63	22.10	V	1.00	12.57	1.58	36.25	40.00	3.75
65.32	18.90	V	1.01	10.19	1.87	30.96	40.00	9.04
224.97	18.60	H	4.00	12.15	3.42	34.17	40.00	5.83
250.19	18.70	H	3.98	12.49	3.69	34.88	47.00	12.12
299.16	19.30	V	1.02	13.40	4.10	36.80	47.00	10.20
324.96	19.20	H	3.99	13.97	4.17	37.34	47.00	9.66

* H : Horizontal, V : Vertical

◆ Calculation

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

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

Correction Factor : ANT FACTOR + Cable loss

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Tel: +82-31-425-6200 / Fax: +82-31-424-0450
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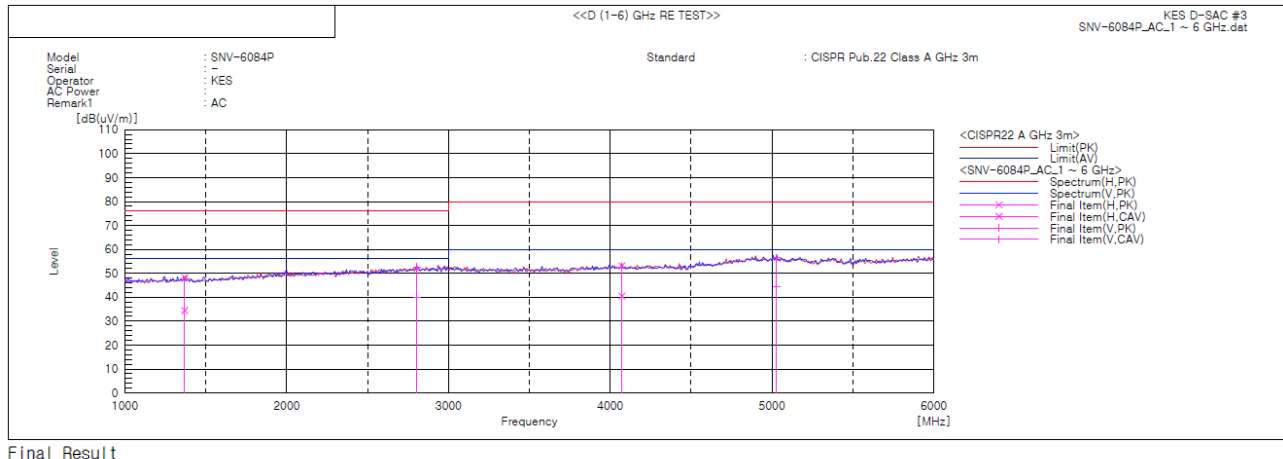
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Radiated Electric Field Emissions(Above 1 GHz)

- AC 24 V Mode



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result CAV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1369.917	H	50.9	37.2	-2.7	48.2	34.5	76.0	56.0	27.8	21.5	100.0	287.8	
2	2804.348	V	47.8	34.9	4.9	52.7	39.8	76.0	56.0	23.3	16.2	100.0	33.7	
3	4072.464	H	45.6	33.0	7.5	53.1	40.5	80.0	60.0	26.9	19.5	100.0	214.6	
4	5028.985	V	45.1	32.8	11.5	56.6	44.3	80.0	60.0	23.4	15.7	100.0	113.5	

◆ Calculation

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

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

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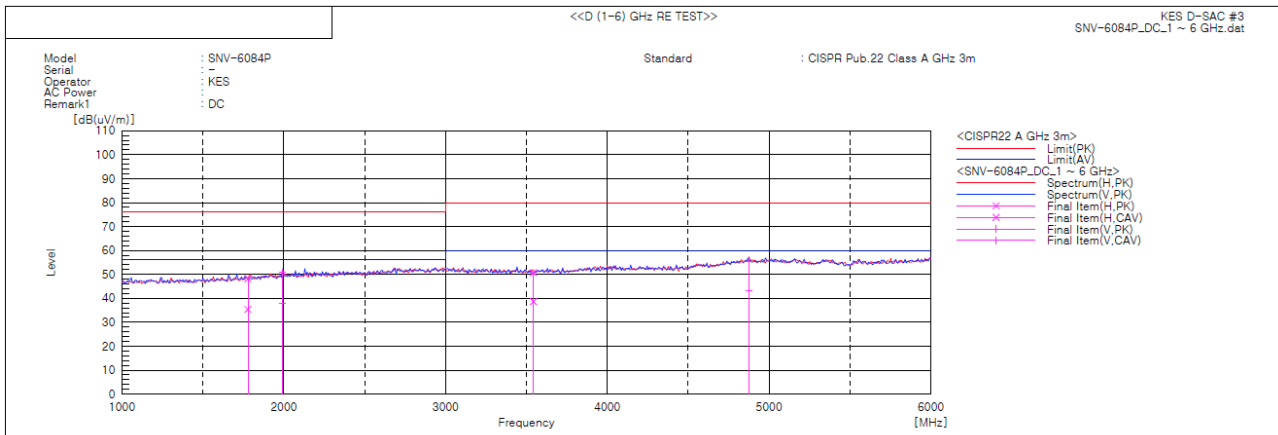
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Tel: +82-31-425-6200 / Fax: +82-31-424-0450
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Test report No.:

KES-E1-17T0351-R1

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- DC 12 V Mode



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result CAV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1778.712	H	48.4	35.6	-0.2	48.2	35.4	76.0	56.0	27.8	20.6	100.0	351.3	
2	1992.754	V	49.8	36.9	1.1	50.9	38.0	76.0	56.0	25.1	18.0	100.0	241.4	
3	3543.478	H	45.1	33.0	5.6	50.7	38.6	80.0	60.0	29.3	21.4	100.0	31.3	
4	4876.812	V	44.2	32.1	11.1	55.3	43.2	80.0	60.0	24.7	16.8	100.0	84.0	

◆ Calculation

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

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

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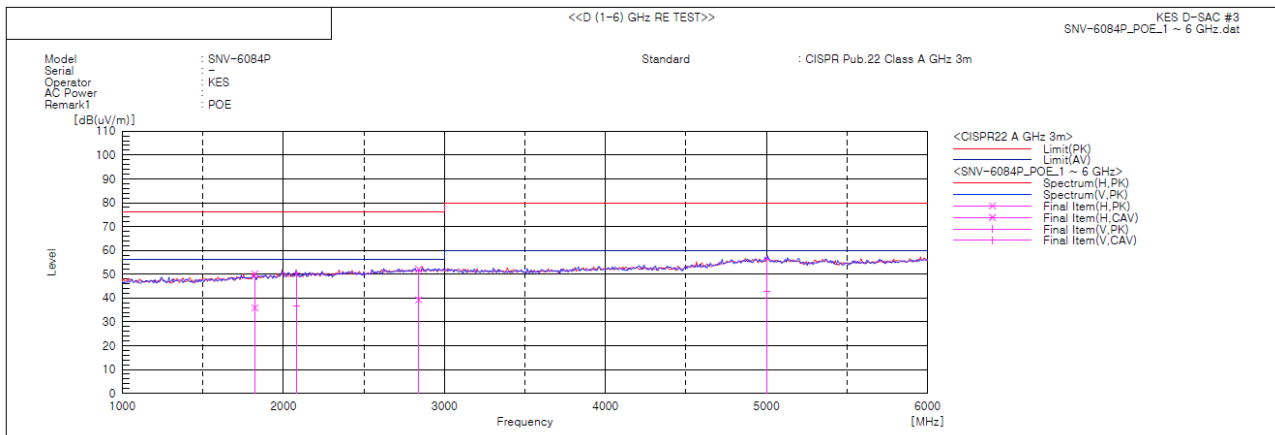
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Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
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Test report No.:

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- PoE Mode



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result CAV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1823.678	H	50.0	35.8	0.1	50.1	35.9	76.0	56.0	25.9	20.1	100.0	256.3	
2	2081.881	V	48.8	35.2	1.5	50.3	36.7	76.0	56.0	25.7	19.3	100.0	213.0	
3	2840.250	H	47.1	34.3	5.0	52.1	39.3	76.0	56.0	23.9	16.7	100.0	261.5	
4	5002.327	V	44.5	31.5	11.5	56.0	43.0	80.0	60.0	24.0	17.0	100.0	120.3	

◆ Calculation

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

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

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Test Data - Voltage Fluctuations

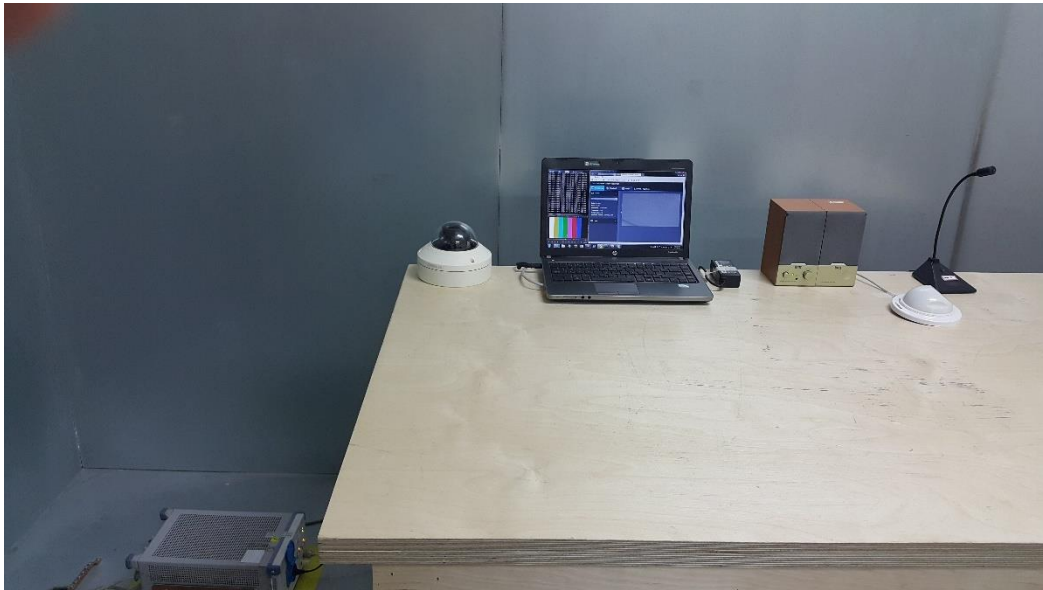
Maximum Flicker results

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

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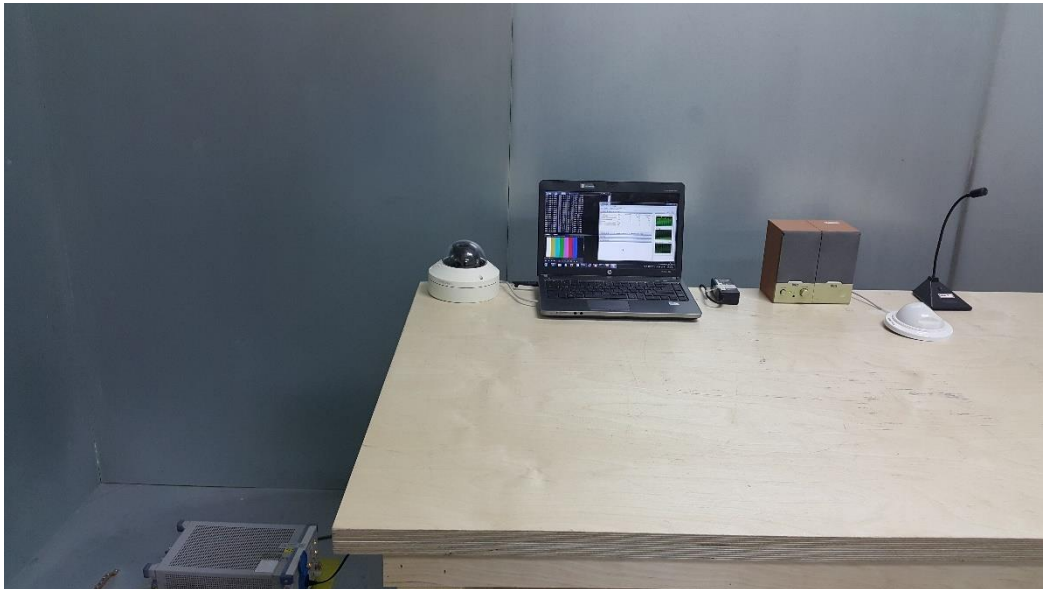
Test Setup Photos and Configuration

Conducted Voltage Emissions



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Conducted Telecommunication Emissions



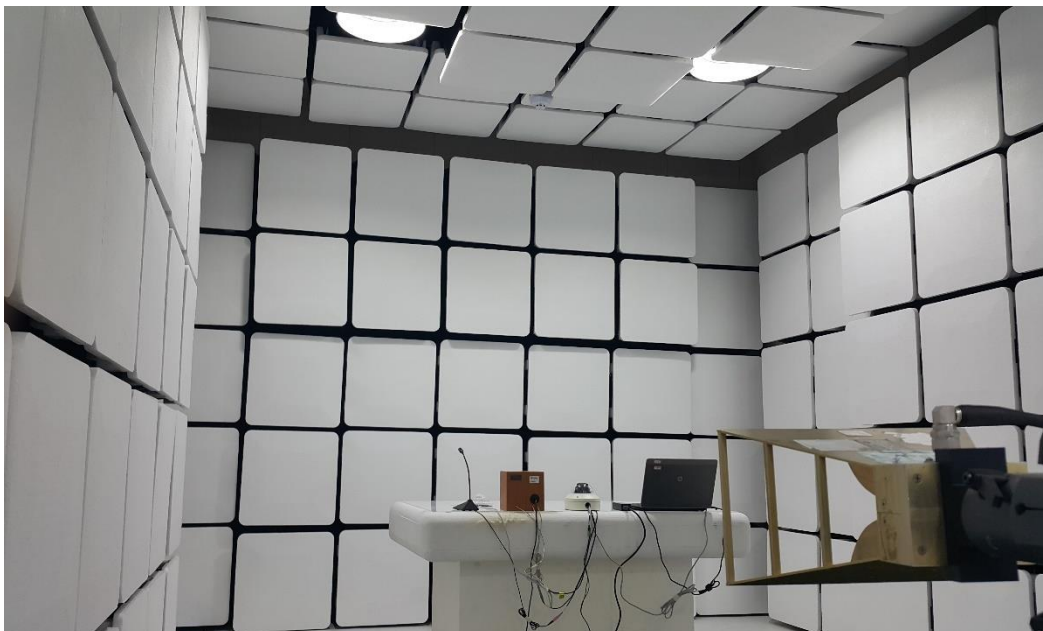
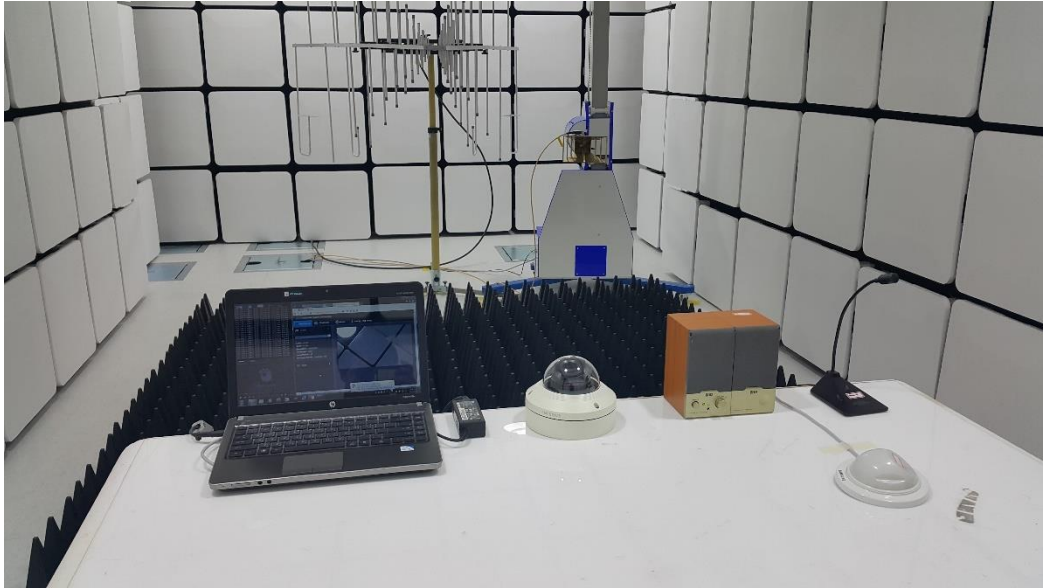
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Radiated Electric Field Emissions(Below 1 GHz)



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Radiated Electric Field Emissions(Above 1 GHz)



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Harmonic Current Emissions and Voltage Fluctuations and Flicker

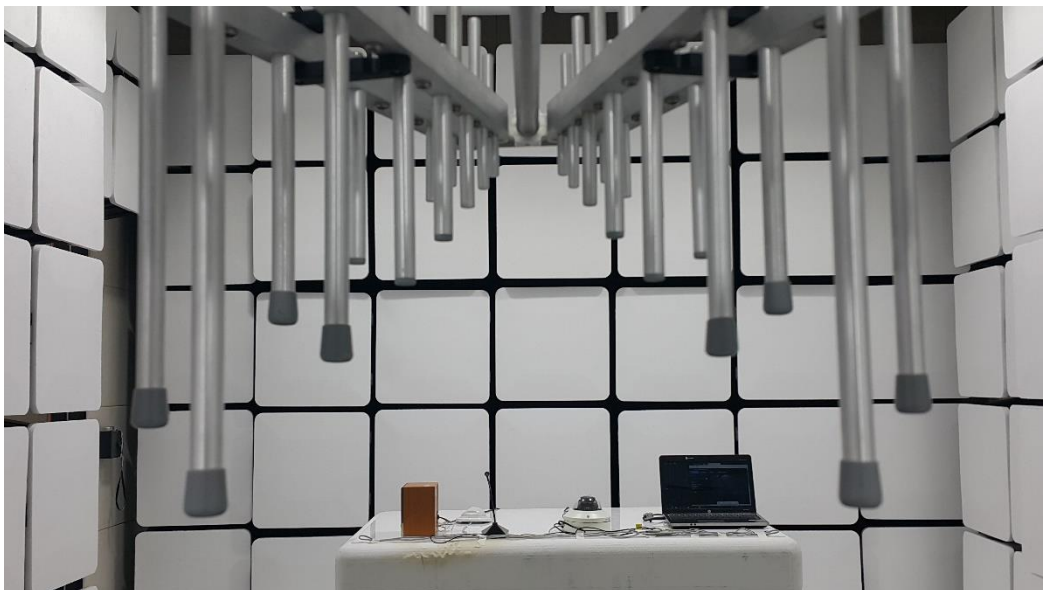
N/A

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Electrostatic Discharge

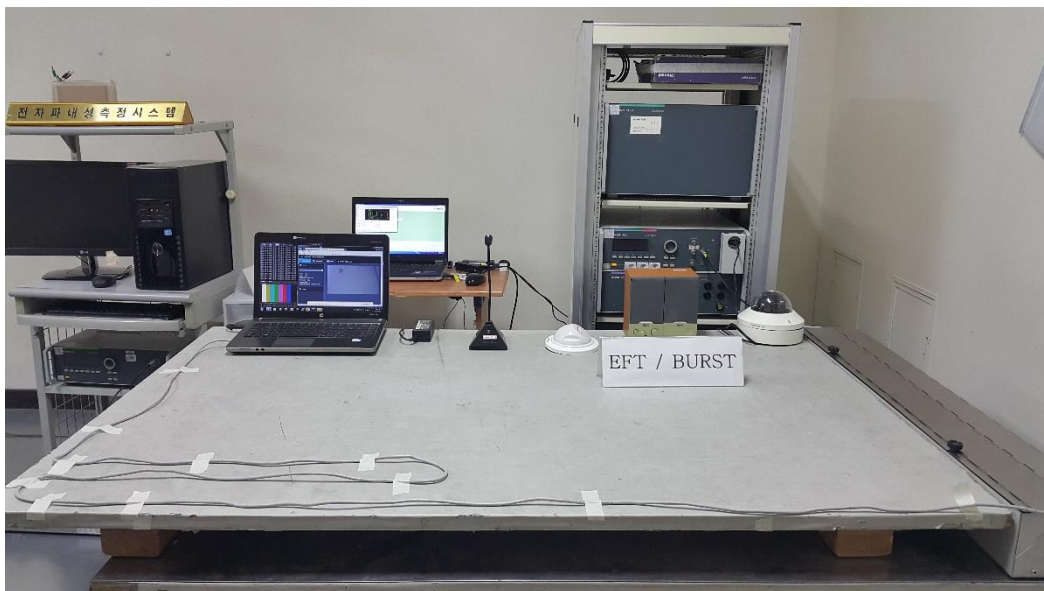


Radiated Electric Field Immunity



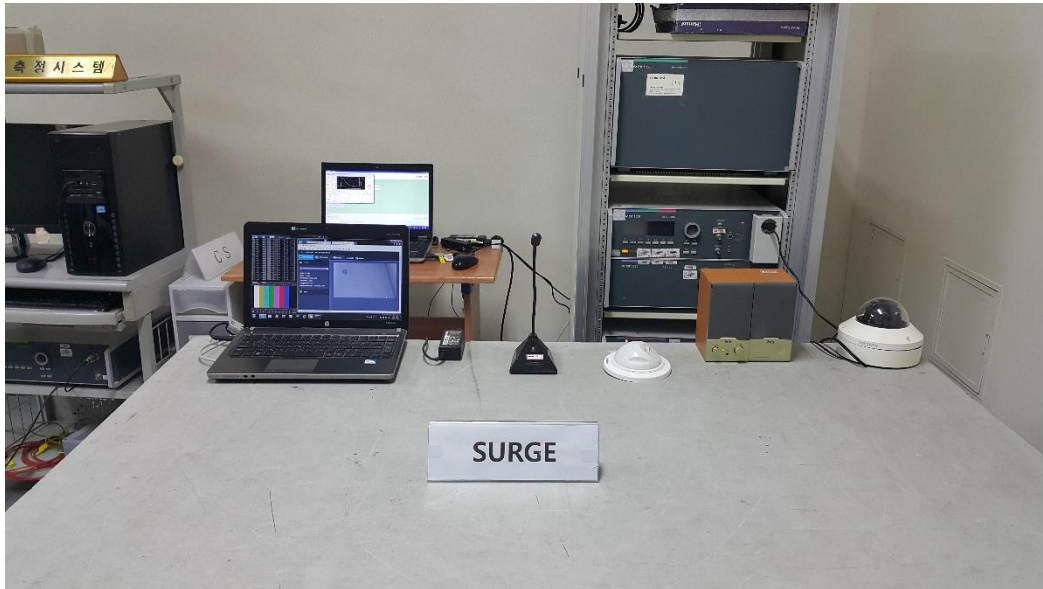
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Electrical Fast Transients / Bursts



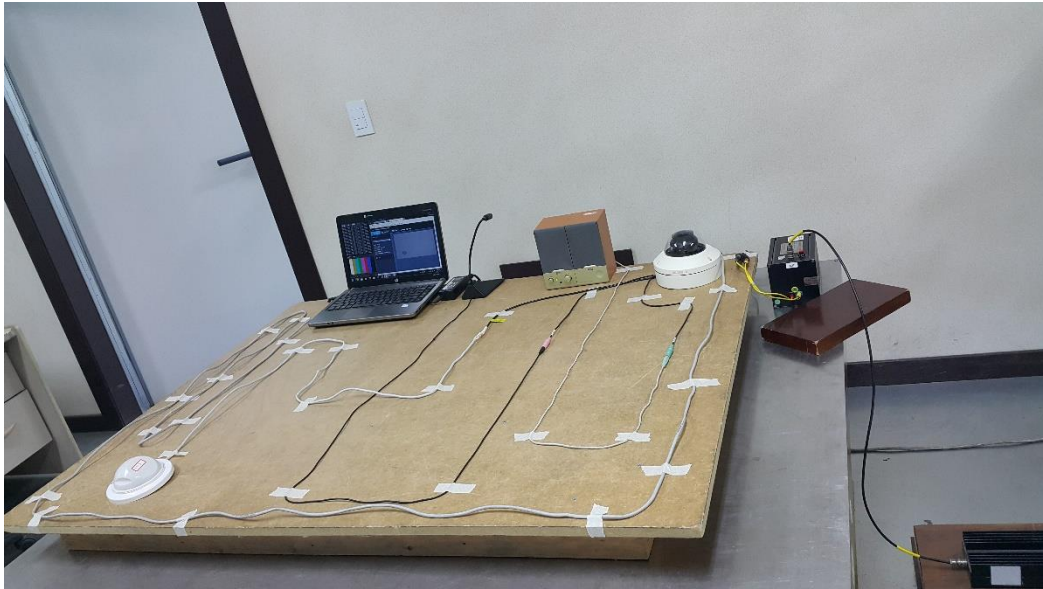
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Surge Transients



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Conducted Disturbance



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Voltage Dips and Short Interruptions



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EUT External Photographs

(Top)



(Bottom)



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EUT Internal Photographs

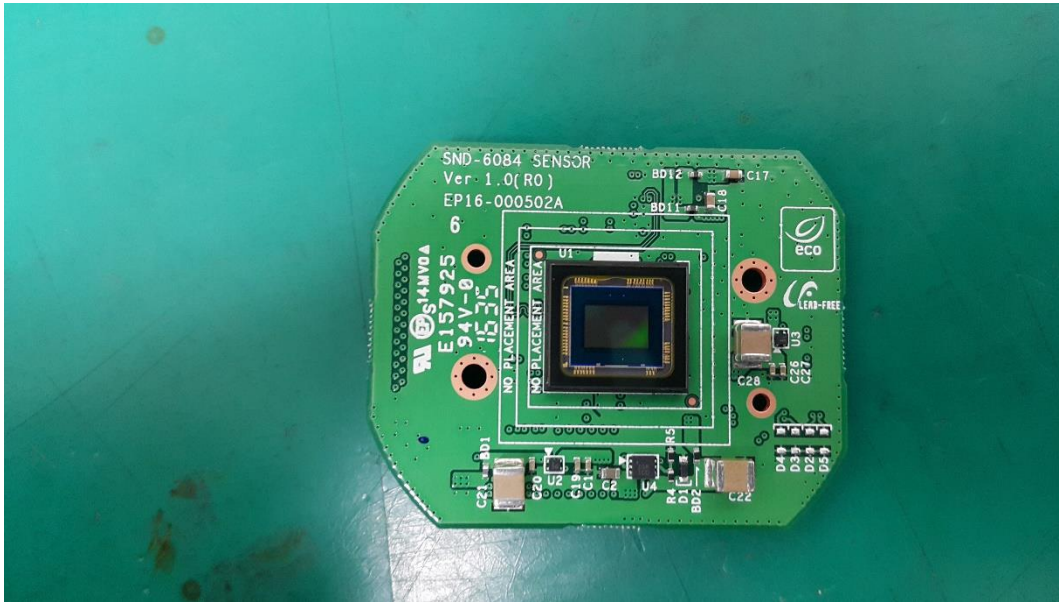
(Internal View)



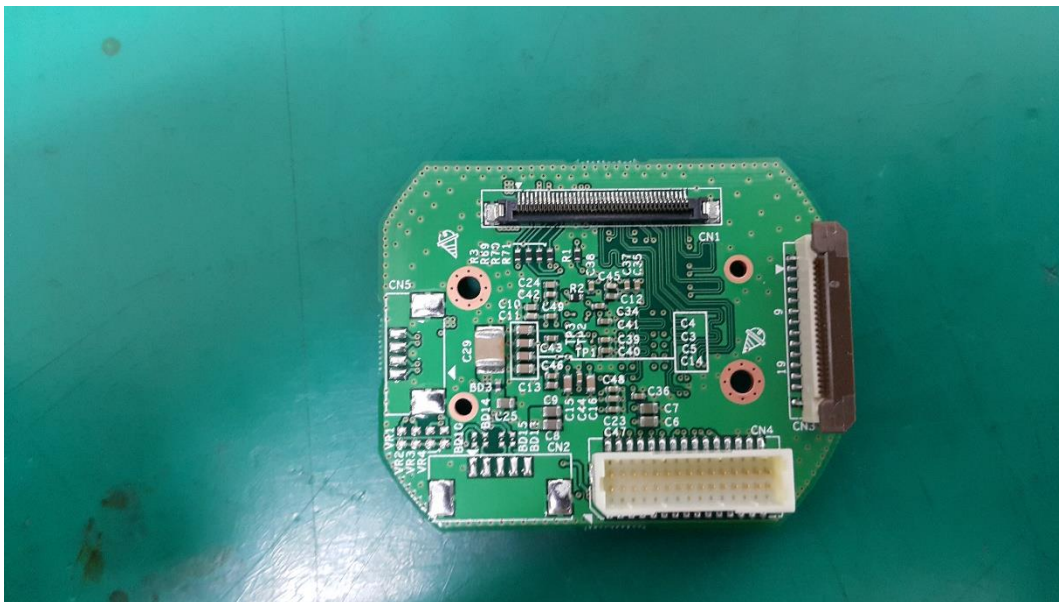
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EUT Internal View – Lens Board

(Top)



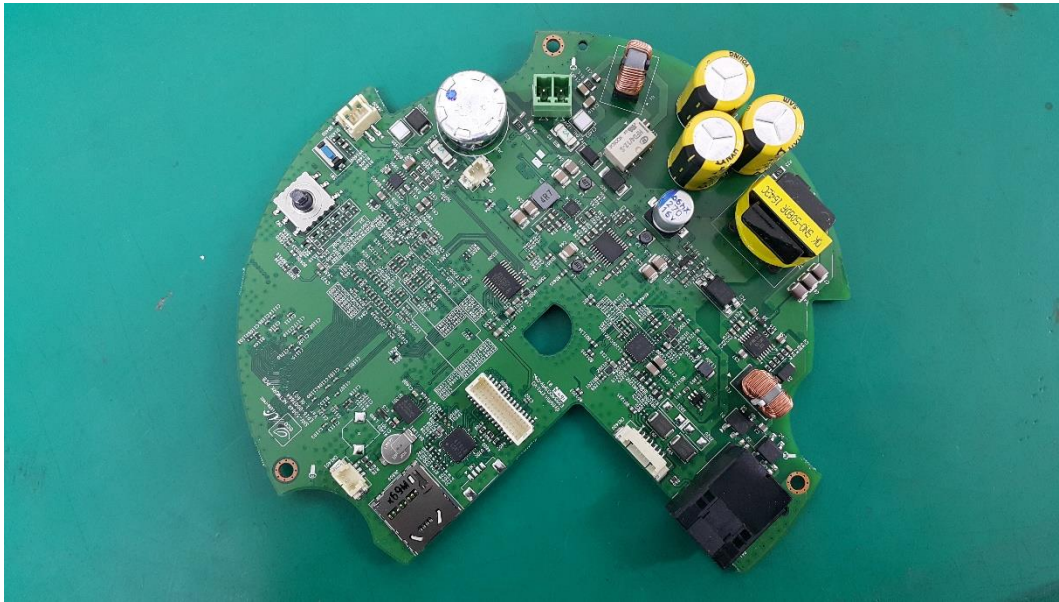
(Bottom)



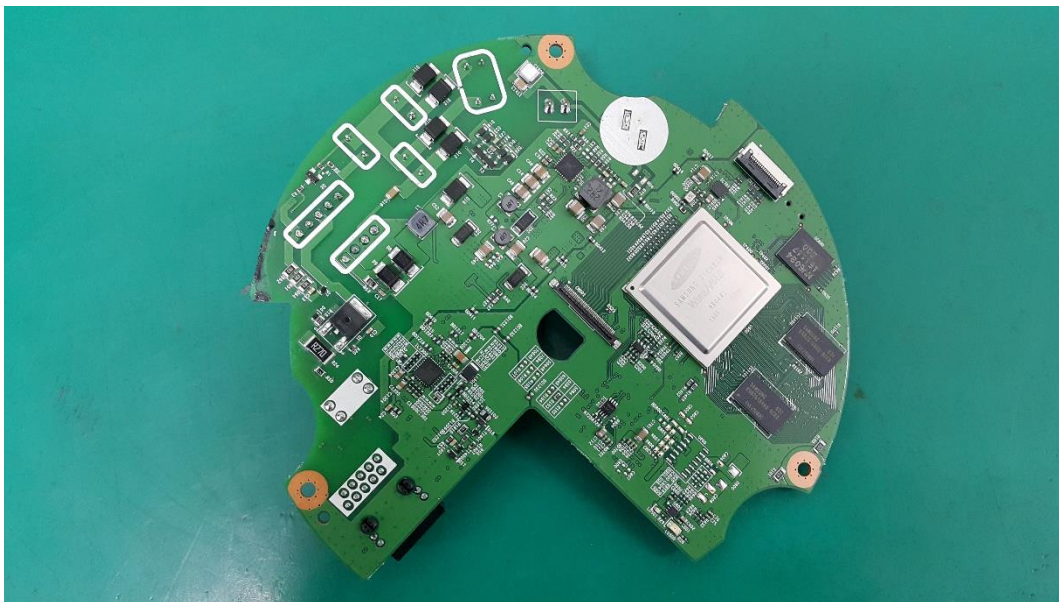
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EUT Internal View – Board

(Top)

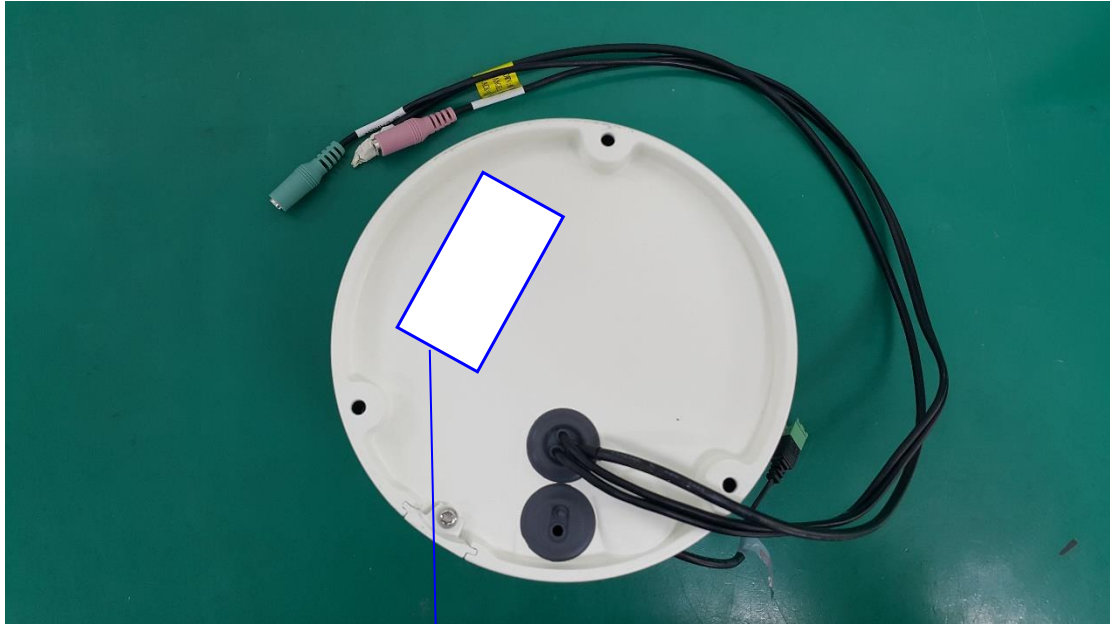


(Bottom)



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Label and Location



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Manufacturer : HANWHA TECHWIN(TIANJIN)CO., LTD

Made in China

