



EMC TEST REPORT For CE

Test Report No. : KES-E1-16T0104-R2

Date of Issue : JUN. 22, 2018

Product name : NETWORK CAMERA

Model/Type No. : SNV-L6013R

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 : Jan. 06, 2016

Test date : Mar. 15, 2016 – Mar. 17, 2016

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

Tested by

Hyo Jin, Kim
EMC Test Engineer

Reviewed by

Dong-Hun, Jang
EMC Technical Manager

This test report is not related to KOLAS.

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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Mar. 18, 2016	KES-E1-16T0104	Issued
Oct. 02, 2017	KES-E1-16T0104-R1	Standard Revision
Jun. 22, 2018	KES-E1-16T0104-R2	Re-issue due to manufacturer change

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Main Board EUT Internal View – Main Board		오류! 책갈피가 정의되어 있지 않습니다.



1.0 General Product Description

Main Specifications of E.U.T are:

	SNV-L6013R
Video	
Imaging Device	1/2.9" 2.19M CMOS
Total Pixels	2,000(H) x 1,121(V)
Effective Pixels	1,984(H) x 1,105(V)
Scanning System	Progressive
Min. Illumination	Color : 0.15Lux (1/30sec, F1.8), 0.003Lux(2sec, F1.8) B/W : 0Lux (IR LED on)
Lens	
Focal Length (Zoom Ratio)	3.6mm
Max. Aperture Ratio	F1.8
Angular Field of View	H: 86.5°, V: 47.8°, D: 101.2°
Min. Object Distance	0.5m
Lens Type	Fixed
Mount Type	Board type
Pan / Tilt / Rotate	
Pan Range	-5~+5°
Tilt Range	0~67°
Rotate Range	90°
Operational	
IR Viewable Length	15m
Camera Title	Off / On (Displayed up to 15 characters)
Day & Night	True Day & Night
Backlight Compensation	Off / BLC
Contrast Enhancement(DWDR)	SSDR (Samsung Super Dynamic Range) (Off / On)
Digital Noise Reduction	SSNR(Off / On)
Motion Detection	Off / On (4ea rectangler zones)
Privacy Masking	Off / On (6ea rectangler zones)
Gain Control	Off / Low / Middle / High
White Balance	ATW / AWC / Manual / Indoor / Outdoor
LDC(Lens distortion control)	On/Off (5 levels with Min/Max)
Electronic Shutter Speed	Minimum / Maximum / Anti flicker
Flip / Mirror	Flip / Mirror / Hallway view
Intelligent Video Analytics	Motion Detection with metadata, Tampering
Alarm Triggers	Motion detection, Tampering Detection, SD card error, NAS error
Alarm Events	File upload via FTP and E-Mail Local storage recording at Event Notification via E-Mail
Network	
Ethernet	RJ-45 (10/100BASE-T)
Video Compression Format	H.264, MJPEG
Resolution	1920x1280 / 1280x960 / 1280x720 / 1024x768 / 800x600 / 720x576 / 640x480 / 320x240
Max. Framerate	H.264 : Max 30fps at all resolutions MJPEG : Max 1fps at 1920x1080/1280x960/1280x720/1024x768, Max. 15fps at other resolution
Video Quality Ajustment	H.264 : Target Bitrate Level Control MJPEG : Quality Level Control
Bitrate control method	H.264 : CBR or VBR MJPEG : VBR

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Audio I/O	Line-in
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	Uni-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	6 users at Unicast Mode
Edge storage	Micro SD/SDHC Max 32G, NAS - Motion images recorded in the SD memory card can be downloaded - Manual recording at Local PC
Application Programming Inter	ONVIF Profile S, G SUNAPI(HTTP API)
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 7, 8, 10, Mac OS X 10.8, 10.9, 10.10, 10.11 Supported Browser: Explore 11 , Mozilla Firefox 43, Apple Safari 9 * Mac OS X only
Central Management Software	SmartViewer
Environmental	
Operating Temperature / Humi	-30°C ~ +55°C / Less than 90% RH * Start up should be done at above -20°C
Storage Temperature / Humidit	-30°C ~ +60°C (-22°F ~ +140°F) / Less than 90% RH
Ingress Protection	IP66
Vandal Resistance	IK10 EN50155 class T3 (Vibration, Shock, bump, temperature) EN50121, ISO 16750-3(Vibration) NEMA 250 type 4x
Electrical	
Input Voltage / Current	PoE(IEEE802.3af, Class2)
Power Consumption	Max. 5.8W
Mechanical	
Color / Material	Ivory / Metal
Dimension (WxHxD)	99x100x52mm
Weight	300g

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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 ☐ 220 Vac ☐ 230 Vac ☐ 240 Vac ☐ 24 Vac ☒ 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-L6013R	-	Hanwha Techwin(Tianjin) Co., Ltd.	E.U.T

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
POE Adapter	KST-PSE-G808SR	-	-	-
Notebook	NT-R410Y	Z9YJ93CS300631H	Samsung Electronics Co., Ltd.	-
AC/DC Adapter	AD-6019	-	LI SHIN INTERNATIONAL ENTERPRISE CORP.	-
MIC	CMK-303	-	CAMAC	-



1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (E.U.T)	RJ-45	POE Adapter	Notebook	3.0	U
	MIC	MIC	Line Out	1.5	U
POE Adapter	RJ-45	Notebook	RJ-45	1.0	U

* Unshielded=U, Shielded=S

1.7 E.U.T Operating Mode(s)

Equipment under test was operated during the measurement under the following conditions:

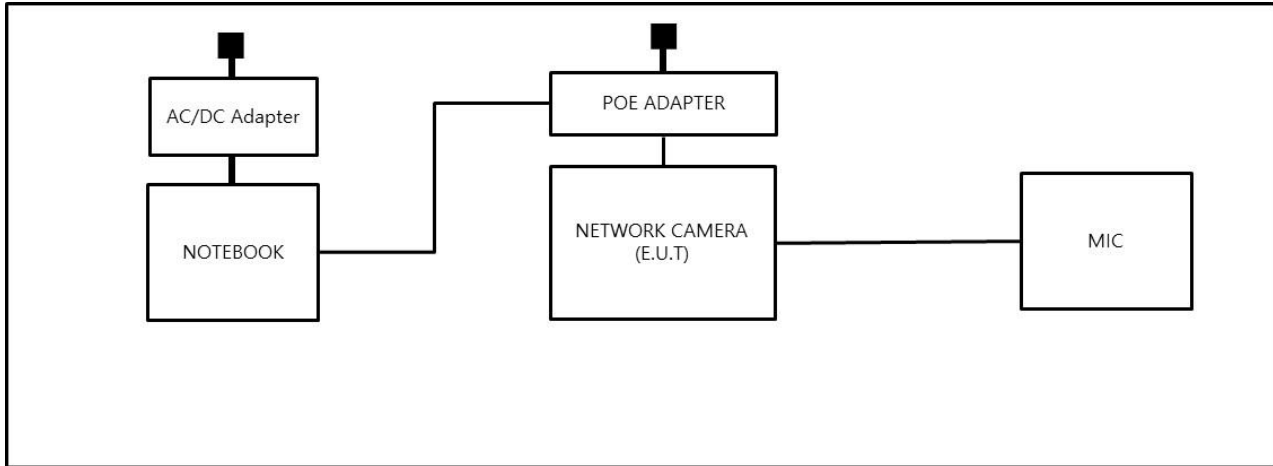
Test mode	Normal operating
OP	MONITORING Network ping test

- Input power condition during the measurements was PoE

1.8 Configuration

■ AC Main

□ DC Main



1.9 Remarks when standards applied

- N/A

1.10 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less.

1.11 Test Facility

The measurement facility is located at 473-21 Gayeo-ro, 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



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

N/A

Test Location

Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☐	EMI Test Receiver	ESR3	R&S	101783	05, 06, 2016
☐	LISN	ENV216	R&S	101137	02, 04, 2017
☐	LISN	ENV216	R&S	101786	05, 06, 2016
☐	Electro wave Shieldroom	-	SEMITEC	-	-

Test Conditions

Temperature: °C

Relative Humidity: %

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

Because the E.U.T power is PoE, limits are not specified.

2.2 Conducted Emissions at Telecommunication Ports

Test Date

Mar. 15, 2016

Test Location

Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test Receiver	ESR3	R&S	101783	05, 06, 2016
☒	LISN	ENV216	R&S	101137	02, 04, 2017
☒	LISN	ENV216	R&S	101786	05, 06, 2016
☒	8-Wire ISN CAT3	CAT3 8158	Schwarzbeck Mess	8158-0019	04, 02, 2016
☐	8-Wire ISN CAT5	CAT5 8158	Schwarzbeck Mess	8158-0030	04, 02, 2016
☒	8-Wire ISN CAT6	NTFM 8158	Schwarzbeck Mess	8158-0029	08, 14, 2016
☒	Electro wave Shieldroom	-	SEMITEC	-	-

Test Conditions

Temperature: 25,1 °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

Mar. 16, 2016

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 Receiver	ESR3	R&S	101781	05, 06, 2016
☒	Trilog-Broadband Antenna	VULB 9163	SCHWARZBECK	9168-713	05, 15, 2017
☒	Open Area Test Site	-	KES	-	-
☒	Antenna Mast	-	DAEIL EMC	-	-
☒	Turn Table	-	DAEIL EMC	-	-

Test Conditions

Temperature: 16,7 °C

Relative Humidity: 38,0 %

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

Mar. 16, 2016

Test Location

Semi Anchoic Chamber #2

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test Receiver	ESU26	R&S	100552	05, 06, 2016
☒	Broadband Coaxial Preamplifier	BBV 9718	Schwarzbeck Mess - Elektronik	9718-246	10, 23, 2016
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	05, 07, 2017
☒	Semi Anchoic Chamber #2	-	SEMITEC	-	-
☒	Antenna Mast	-	AUDIX	-	-
☒	Turn Table	-	AUDIX	-	-

Test Conditions

Temperature: 24,9 °C

Relative Humidity: 43,7 %

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
☐	AC Source	ACS 500 N	EM TEST	V1024106760	08, 13, 2016
☐	Digital Power Analyzer	DPA 500 N	EM TEST	V1024106759	08, 13, 2016

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

Because the E.U.T power is less than 75 W, limits are not specified.



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
☐	AC Source	ACS 500 N	EM test	V1024106760	08, 13, 2016
☐	Digital Power Analyzer	DPA 500 N	EM test	V1024106759	08, 13, 2016

Test Conditions

Temperature: °C
Relative Humidity: %

Test Results

The requirements are:

- ☐ PASS
☐ NOT PASS
☒ NOT APPLICABLE

Remarks

Because the E.U.T power is PoE, limits are not specified.

3.0 Criteria for compliance

Criteria for compliance was based on the following guidelines:

EN 50130-4:2011 +A1:2014 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

Mar. 03, 2016

Test Location

EMS-ESD: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	ESD SIMULATOR	ESS-2000	Noise Ken	ESS01Z0454	10, 23, 2016
☒	HCP	-	KES	-	-
☒	VCP	-	KES	-	-

Test ConditionsTemperature: 25,1 °C
Relative Humidity: 41,8 %
Atmospheric Pressure: 100,9 kPa**Test Specifications**Discharge Factor: ≥ 1 s

Discharge Impedance: 330 ohm / 150 pF

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

Polarity: Positive and Negative

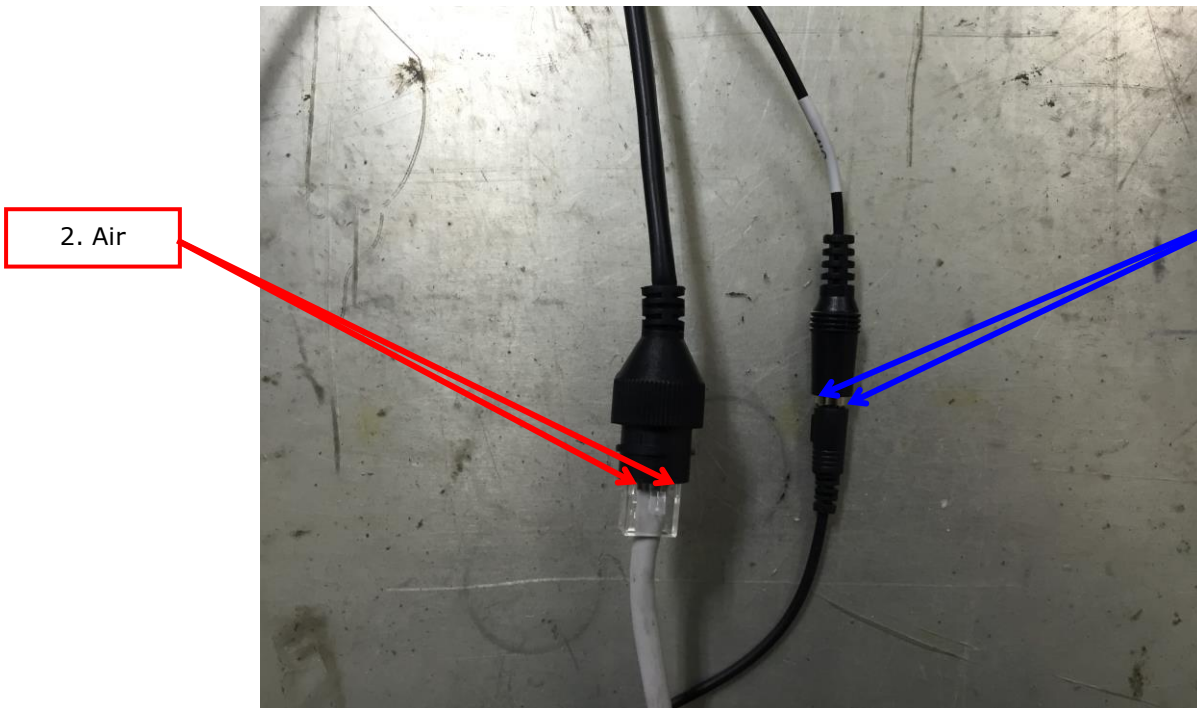
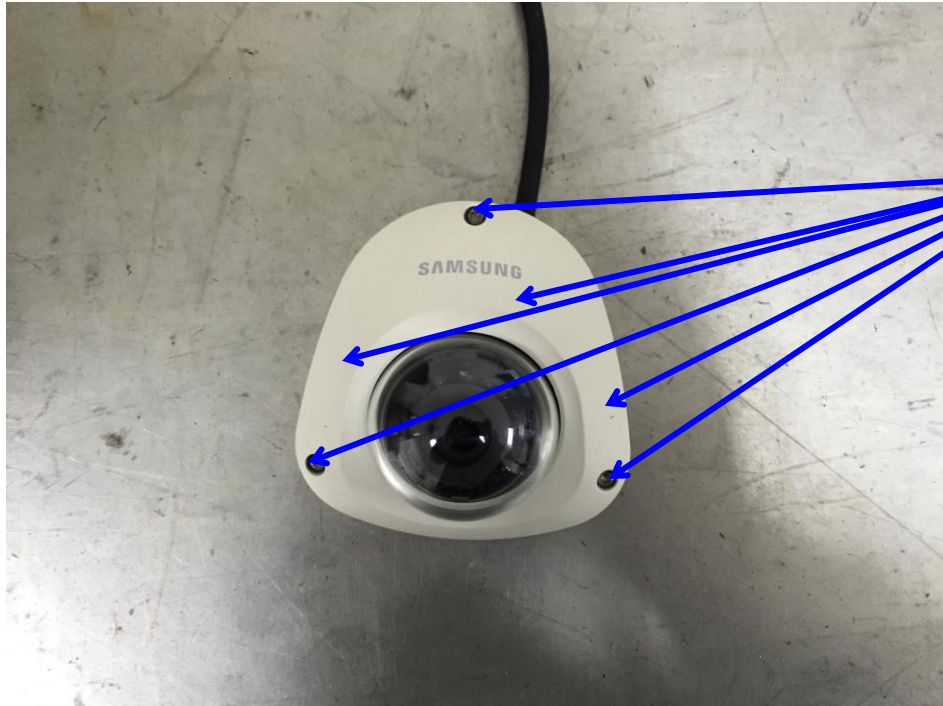
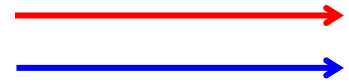
Number of Discharge: 10 at all locations for Air discharge
10 at all locations for Contact discharge

Discharge Voltage:	Contact	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 planeRequired Performance Criteria: ☒ CompliedThis report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
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Location of Discharge:

Air
Contact



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Test Data

Indirect Discharge

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

Direct Discharge

No.	Test Point	Discharge Method	Performance	Remarks
			Observation	
1	Enclosure, Screw	Contact Discharge	Complied	-
2	RJ-45 Ports	Air Discharge	Complied	-
3	MIC Ports	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

Mar. 16, 2016

Test Location

EMS-RS: ☐ Semi Anechoic Chamber #1 ☒ Semi Anechoic Chamber #2

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	SIGNAL GENERATOR	SMB 100A	R&S	108252	08, 13, 2016
☒	BROADBAND AMPLIFIER	BBA100	R&S	101239	08, 13, 2016
☒	BROADBAND AMPLIFIER	100S1G6M1	AR	579931	08, 13, 2016
☒	POWER METER	NRP2	R&S	103475	08, 13, 2016
☒	AVG POWER SENSOR	NRP-Z91	R&S	102526	08, 13, 2016
☒	AVG POWER SENSOR	NRP-Z91	R&S	102527	08, 13, 2016
☒	Stacked Log.-Per.Antenna	STLP 9128 D	Schwarzbeck	9128D038	-
☒	Semi Anechoic Chamber #2		SEMITEC	-	-

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Test Conditions

Temperature: 24,9 °C
Relative Humidity: 43,7 %
Atmospheric Pressure: 100,2 kPa

Test Specifications

Antenna Polarization: Horizontal & vertical unless indicated otherwise

Antenna Distance: ☒ 3 mField Strength: ☐ 1 V/m ☐ 3 V/m
☒ 10 V/mFrequency Range: ☐ 80 MHz to 1 GHz ☐ 1,4 GHz to 2,7 GHz
☒ 80 MHz to 2,7 GHzModulation: ☒ AM, 80 %, 1 kHz sine wave
☒ PM, 1 Hz (0,5 s ON : 0,5 s OFF)Frequency step: ☒ 1 % stepDwell Time: ☒ 1 s ☐ 3 s# of Sides Radiated: ☒ 4Required Performance Criteria: ☒ Complied**Test Data**

Side Exposed	Observation	
	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.

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3.3 Electrical Fast Transients/Bursts

Reference Standard

EN 61000-4-4:2012

Test Date

Mar. 17, 2016

Test Location

EMS-EFT: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	Ultra Compact Simulator	UCS 500 N5	EM TEST	V0936105120	07, 14, 2016
☒	Capacitive Coupling Clamp	HFK	EM TEST	070925	07, 14, 2016
☒	MotorVariac	MV2616	EM TEST	V0936105123	07, 14, 2016

Test ConditionsTemperature: 24,2 °C
Relative Humidity: 42,5 %
Atmospheric Pressure: 100,5 kPa**Test Specifications**

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

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Test Data☐ 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

Note: “Blank” = Not performed

Observations:

A – No degradation of function

B – Distortion/Error of function (self-recoverable)

C – Loss 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

Mar. 17, 2016

Test Location

EMS-Surge: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	Ultra Compact Simulator	UCS 500 N5	EM TEST	V0936105120	07, 14, 2016
☒	MotorVariac	MV2616	EM TEST	V0936105123	07, 14, 2016
☒	CDN	CNV 508T5	EM TEST	P1530162238	01, 25, 2017

Test ConditionsTemperature: 24,2 °C
Relative Humidity: 42,5 %
Atmospheric Pressure: 100,5 kPa**Test Specifications****Signal 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) kVNumber of Surges: ☐ 5 surges per angleAngle: ☐ 0°, 90°, 180°, 270° (input a.c. power port)Polarity: ☐ Positive & NegativeRepetition Rate: ☐ 1 surge per min ☐ 1 surge per 30 sec.Required Performance Criteria: ☐ Complied

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Signal Lines

Source Impedance: 42 ohm for common mode

Surge Amplitude: Common Mode
☒ (0,5 / 1,0) kVNumber of Surges: ☒ 5 SurgesPolarity: ☒ Positive & NegativeRepetition Rate: ☐ 1 surge per min ☒ 1 surge per 30 sec.Required Performance Criteria: ☒ Complied**Test Data**☐ Line to Line – Differential Mode

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

☐ 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

Note: "Blank" = Not performed

Observations:

A – No degradation of function

B – Distortion/Error of function (self-recoverable)

C – Loss of function

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

No any function degraded during the test.

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3.5 Conducted Disturbance

Reference Standard

EN 61000-4-6:2009

Test Date

Mar. 17, 2016

Test Location

EMS-CS: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	Continuous Wave Generator	CWS 500N1	EM TEST	V0936105119	09, 25, 2016
☒	6dB Attenuator	ATT6	EM TEST	1208-34	08, 13, 2016
☒	CDN	CDN-M2/M3N	EM TEST	0909-06	08, 13, 2016
☐	CDN	CDN-T2-RJ11	EM TEST	0909-07	08, 13, 2016
☐	CDN	CDN-T4	EM TEST	0909-08	08, 13, 2016
☐	CDN	CDN-T8RJ45	EM TEST	0909-09	08, 13, 2016
☐	CDN	CDN-AF2	EM TEST	0909-10	08, 13, 2016
☐	CDN	CDN-AF4	EM TEST	0909-11	08, 13, 2016
☒	EM Injection Clamp	EM 101	Liithi	35943	02, 04, 2017

Test Conditions

Temperature: 24,2 °C
Relative Humidity: 42,5 %
Atmospheric Pressure: 100,5 kPa



Test Specifications

- Frequency range: ☒ 150 kHz to 100 MHz ☐ 10 kHz to 30 MHz
☐ 150 kHz to 230 MHz ☐ 10 kHz to 100 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

Test Data

☐ Input a.c. power ports

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

☐ Input d.c. power ports

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

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observation
RJ-45	EM Injection Clamp	Complied

Notes: CDN = Coupling Decoupling Network
EMC = Electro Magnetic Clamp
"blank" = Not performed

Observations:

- A – No degradation of function
B – Distortion/Error of function (self-recoverable)
C – Loss of function

Test Results

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

Remarks

No any function degraded during the test.



3.6 Voltage Dips and Short Interruptions

Reference Standard

EN 61000-4-6:2009

Test Date

N/A

Test Location

EMS-Voltage dip: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☐	Ultra Compact Simulator	UCS 500 N5	EM TEST	V0936105120	07, 14, 2016
☐	MotorVariac	MV2616	EM TEST	V0936105123	07, 14, 2016

Test Conditions

Temperature: °C
Relative Humidity: %
Atmospheric Pressure: kPa



Test Specifications & Observations/Remarks

Test Level	Duration [in period/ms (50 Hz)]	Results
☐ 20 % dip	☐ 250 /10	_____
☐ 30 % dip	☐ 25 /10	_____
☐ 60 % dip	☐ 10 /10	_____
☐ 100 % dip	☐ 250 /10	_____

- Voltage variations

☐ Unom + 10 %	☐ 253 V (ac)	_____
☐ Unom + 15 %	☐ 195.5 V (ac)	_____

Observations:

- A – No response observed from E.U.T
- B – Unit shuts down then automatically restarts when full voltage is restored.
- C – Unit shuts down then manually restarts when full voltage is restored or Loss of function.

Test Results

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

Remarks

Because the E.U.T power is PoE, limits are not specified.



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APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

[HOT]

N/A

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[NEUTRAL]

N/A

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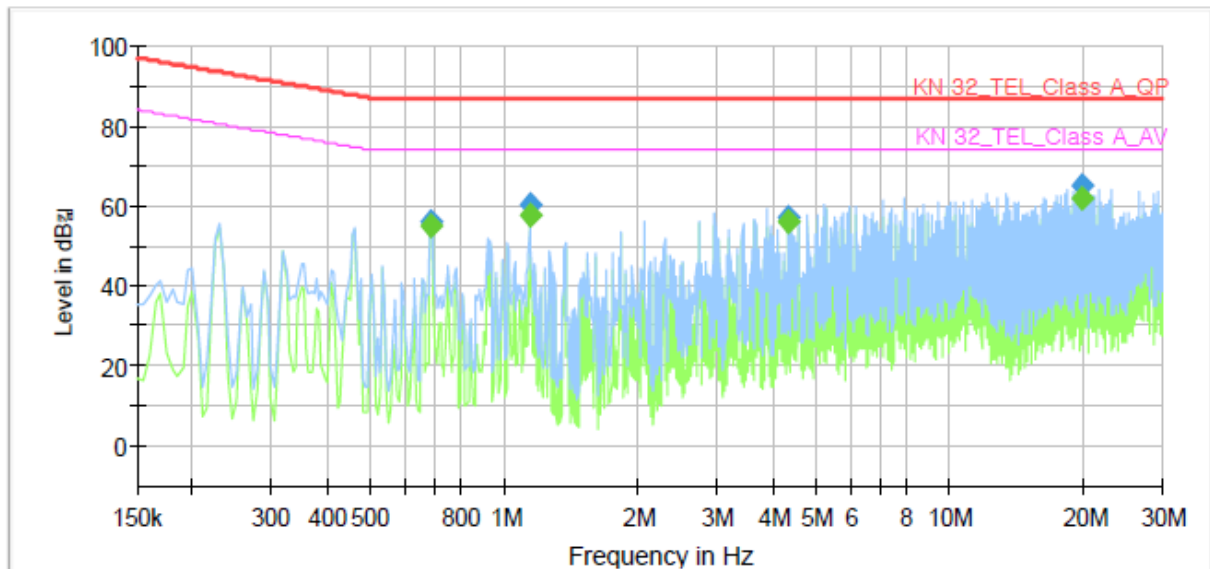
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Conducted Emissions at Telecommunication Ports

[10 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: SNV-L6013RP
Mode: 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)
0.685000	---	54.91	74.00	19.09	1000.0	9.000	Single Line	10.0
0.685000	55.97	---	87.00	31.03	1000.0	9.000	Single Line	10.0
1.145000	---	57.80	74.00	16.20	1000.0	9.000	Single Line	10.0
1.145000	60.58	---	87.00	26.42	1000.0	9.000	Single Line	10.0
4.350000	---	55.85	74.00	18.15	1000.0	9.000	Single Line	9.9
4.350000	57.42	---	87.00	29.58	1000.0	9.000	Single Line	9.9
19.710000	---	61.91	74.00	12.09	1000.0	9.000	Single Line	10.1
19.710000	65.14	---	87.00	21.86	1000.0	9.000	Single Line	10.1

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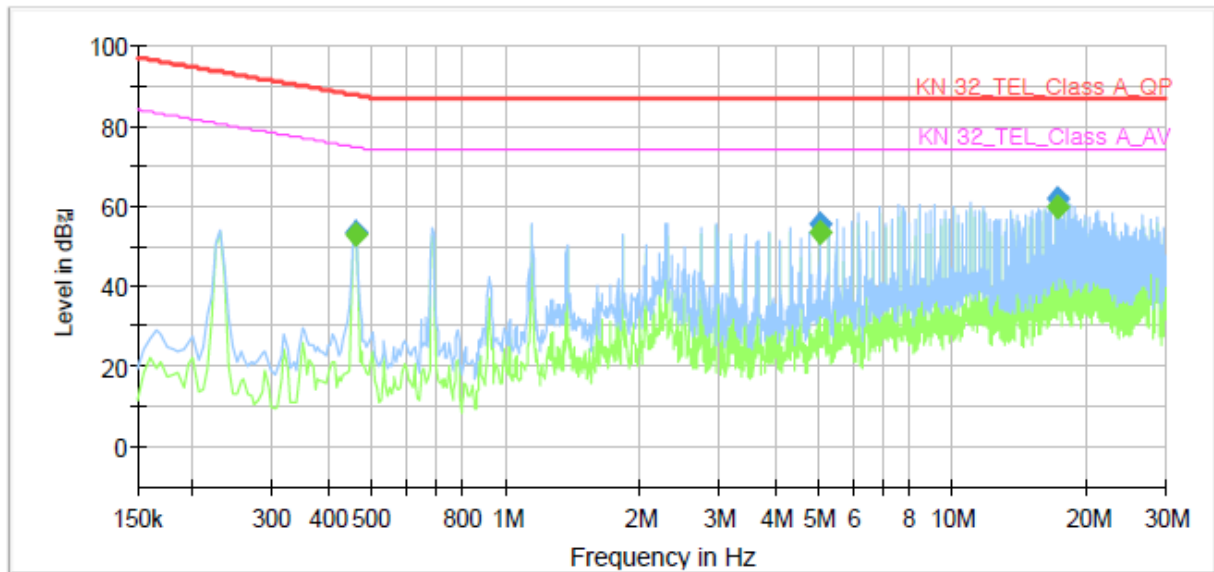
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[1 000 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: SNV-L6013RP
Mode: 1 000 GBps
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.460000	---	52.87	74.69	21.82	1000.0	9.000	Single Line	9.4
0.460000	53.58	---	87.69	34.11	1000.0	9.000	Single Line	9.4
5.035000	---	53.20	74.00	20.80	1000.0	9.000	Single Line	9.3
5.035000	55.35	---	87.00	31.65	1000.0	9.000	Single Line	9.3
17.165000	---	59.92	74.00	14.08	1000.0	9.000	Single Line	9.5
17.165000	61.95	---	87.00	25.05	1000.0	9.000	Single Line	9.5

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Radiated Electric Field Emissions(Below 1 GHz)

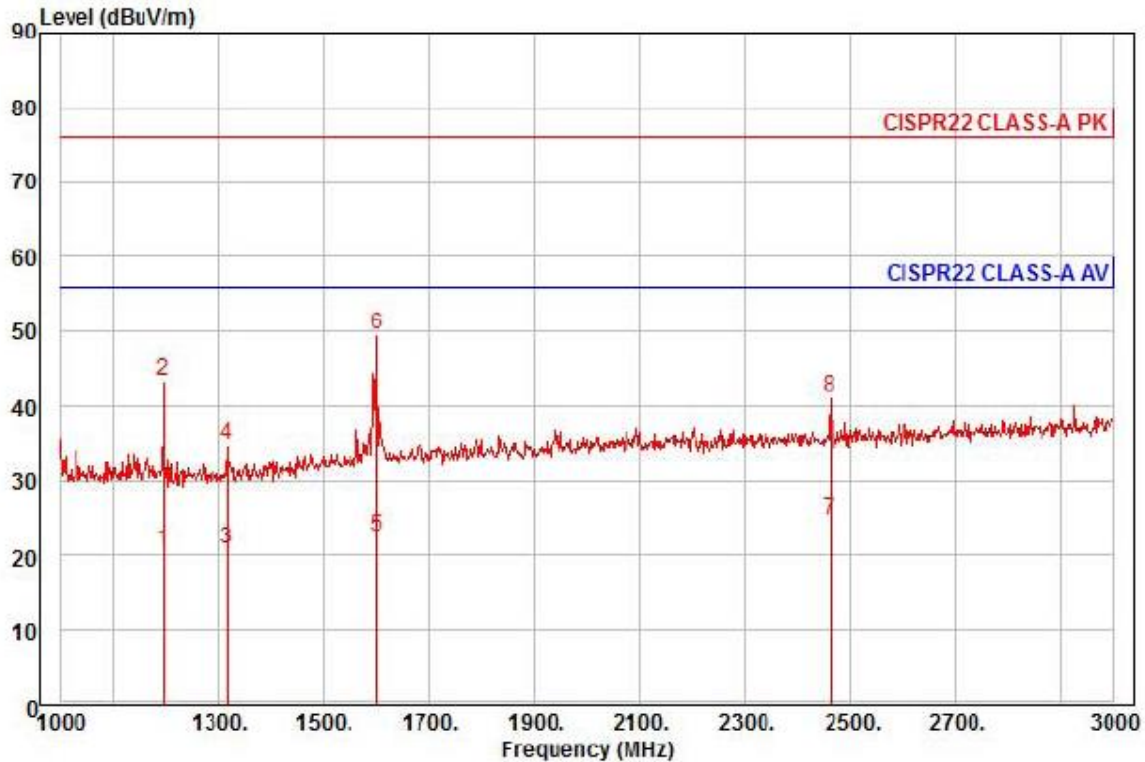
Frequency	Amplitude	ANT	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin
[MHz]	[dB μ V]	Polar. (H/V)	[m]	ANT. [dB/m]	Cable [dB]	[dB μ V/m]	[dB μ V/m]	[dB]
77.53	15.83	H	4.00	7.71	1.89	25.43	40.00	14.57
137.67	16.11	H	4.00	8.05	2.69	26.85	40.00	13.15
156.10	14.30	H	4.00	8.42	2.81	25.53	40.00	14.47
163.86	15.32	V	1.00	8.72	2.88	26.92	40.00	13.08
205.57	12.70	H	4.00	11.42	3.33	27.45	40.00	12.55
445.50	20.93	H	4.00	16.34	5.36	42.63	47.00	4.37

* H : Horizontal, V : Vertical

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Radiated Electric Field Emissions(Above 1 GHz)



Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNV-L6013RP
Mode :
Memo : (1 - 3) GHz

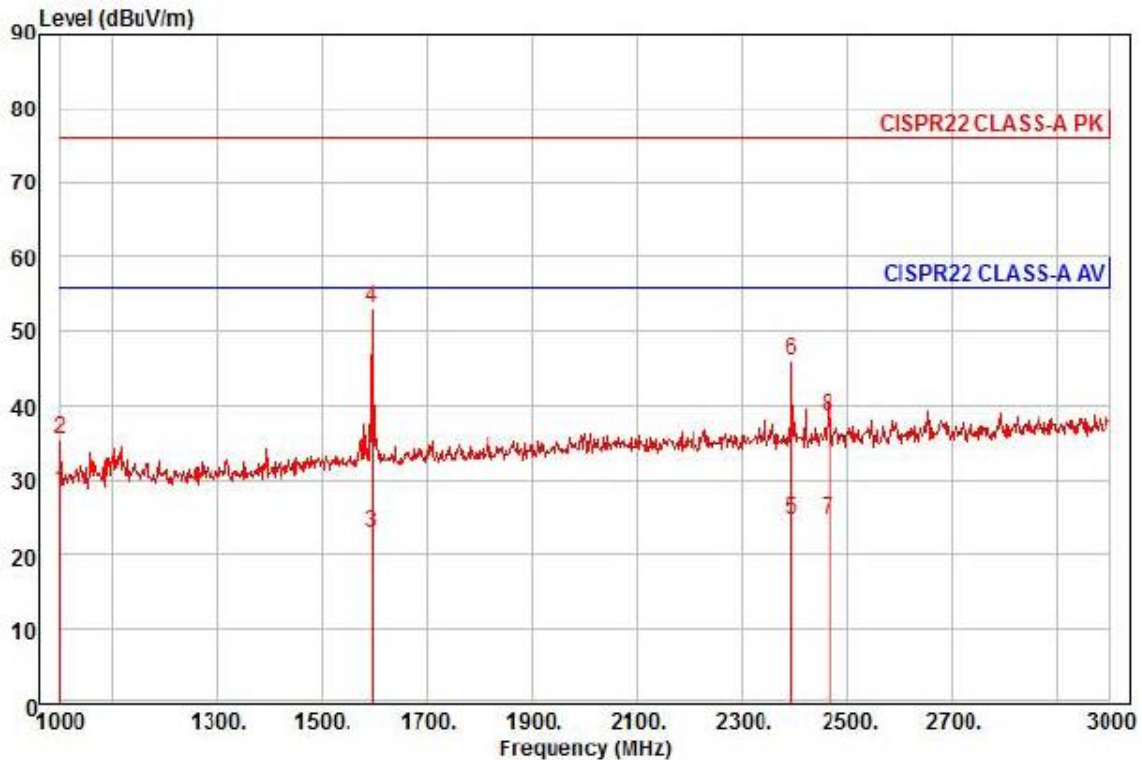
	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1196.00	28.77	24.69	7.08	40.02	164	56.00	-35.48	horizontal	Average
2	1196.00	51.73	24.69	7.08	40.02	164	76.00	-32.52	horizontal	Peak
3	1318.00	28.09	25.17	7.43	39.96	282	56.00	-35.27	horizontal	Average
4	1318.00	42.31	25.17	7.43	39.96	282	76.00	-41.05	horizontal	Peak
5	1600.00	27.94	26.29	8.25	39.83	126	56.00	-33.35	horizontal	Average
6 pp	1600.00	54.75	26.29	8.25	39.83	126	76.00	-26.54	horizontal	Peak
7 av	2462.00	25.69	29.01	10.06	39.90	310	56.00	-31.14	horizontal	Average
8	2462.00	41.94	29.01	10.06	39.90	310	76.00	-34.89	horizontal	Peak



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Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNV-L6013RP
Mode :
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 av	1000.00	38.10	23.91	6.51	40.12	17	56.00	-27.60	vertical	Average
2	1000.00	45.37	23.91	6.51	40.12	17	76.00	-40.33	vertical	Peak
3	1596.00	28.45	26.28	8.24	39.83	224	56.00	-32.86	vertical	Average
4 pp	1596.00	58.56	26.28	8.24	39.83	224	76.00	-22.75	vertical	Peak
5	2394.00	25.79	28.85	9.95	39.86	170	56.00	-31.27	vertical	Average
6	2394.00	47.16	28.85	9.95	39.86	170	76.00	-29.90	vertical	Peak
7	2466.00	25.57	29.02	10.06	39.90	227	56.00	-31.25	vertical	Average
8	2466.00	39.42	29.02	10.06	39.90	227	76.00	-37.40	vertical	Peak

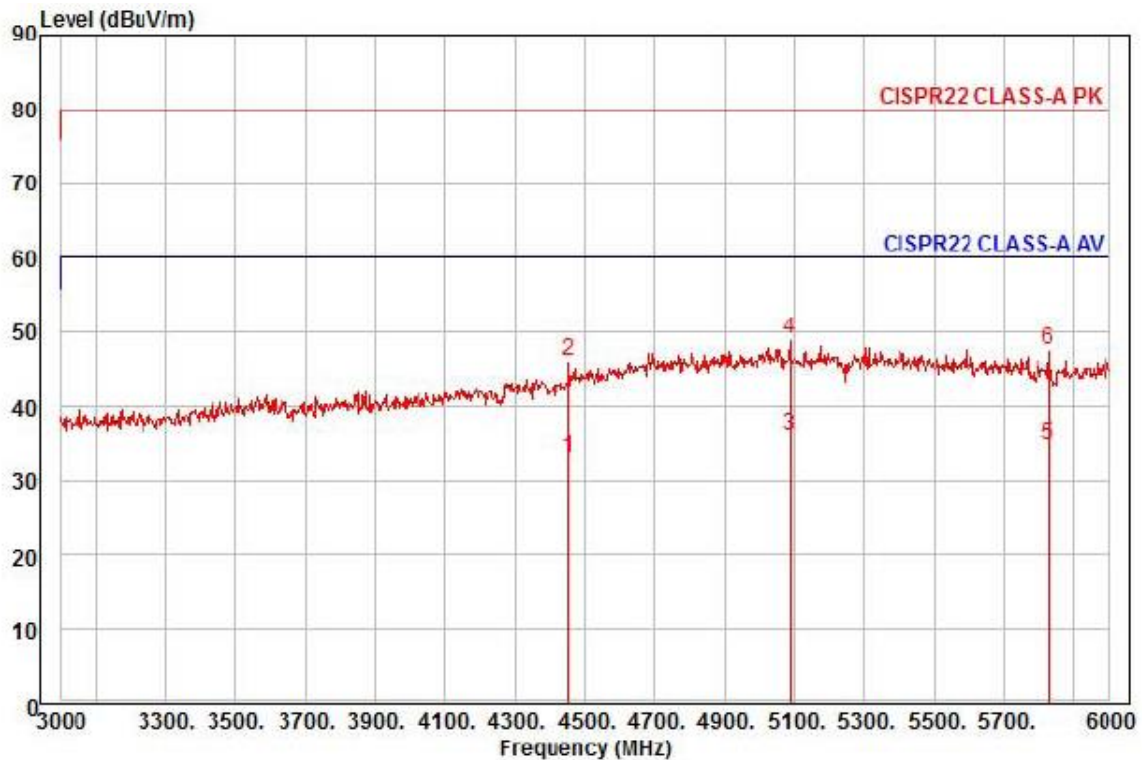
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Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNV-L6013RP
Mode :
Memo : (3 - 6) GHz

	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	4455.00	24.50	34.61	14.35	40.41	133	60.00	-26.95	horizontal	Average
2	4455.00	37.56	34.61	14.35	40.41	133	80.00	-33.89	horizontal	Peak
3 pp	5088.00	23.40	37.54	15.43	40.40	137	60.00	-24.03	horizontal	Average
4 pk	5088.00	36.45	37.54	15.43	40.40	137	80.00	-30.98	horizontal	Peak
5	5829.00	22.46	36.05	16.54	40.29	59	60.00	-25.24	horizontal	Average
6	5829.00	35.18	36.05	16.54	40.29	59	80.00	-32.52	horizontal	Peak

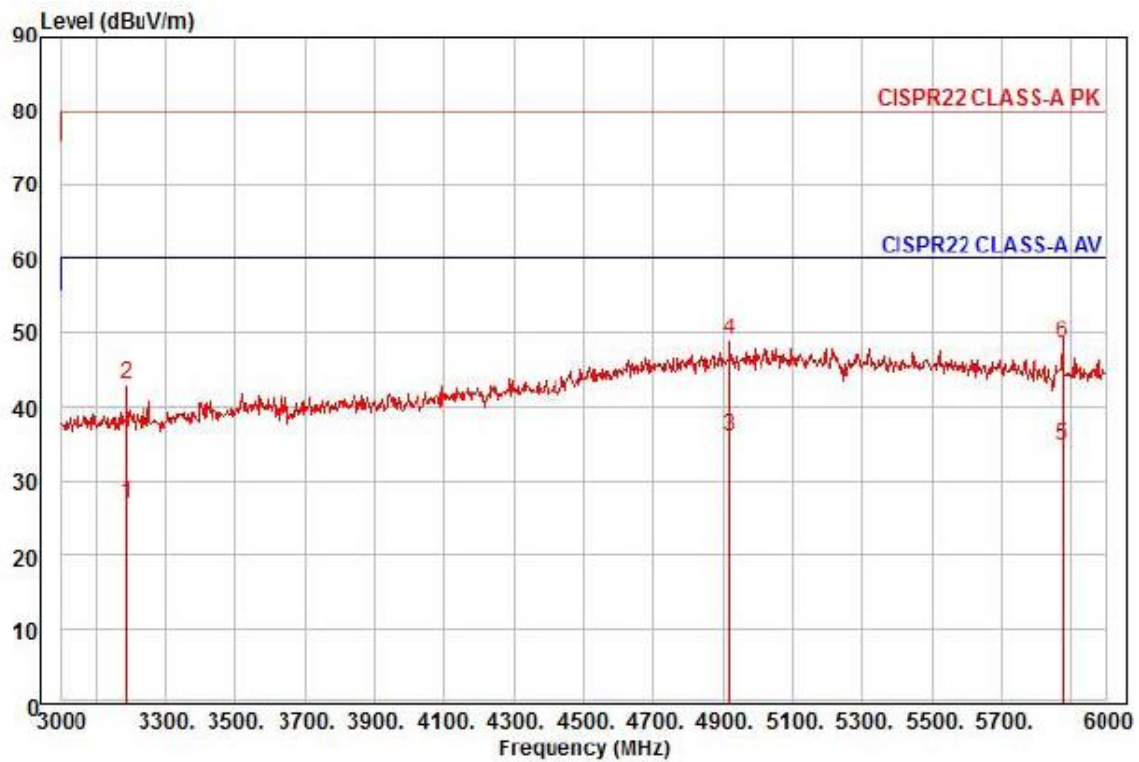
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Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNV-L6013RP
Mode :
Memo : (3 - 6) GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamplifier Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3186.00	24.87	30.64	11.70	40.25	216	60.00	-33.04	vertical	Average
2	3186.00	41.17	30.64	11.70	40.25	216	80.00	-36.74	vertical	Peak
3 pp	4920.00	23.96	37.26	15.19	40.41	301	60.00	-24.00	vertical	Average
4 pk	4920.00	36.96	37.26	15.19	40.41	301	80.00	-31.00	vertical	Peak
5	5877.00	22.60	35.95	16.63	40.29	229	60.00	-25.11	vertical	Average
6	5877.00	36.28	35.95	16.63	40.29	229	80.00	-31.43	vertical	Peak

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Harmonic Current Emissions and Voltage Fluctuations and Flicker

Average harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	N/A			
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
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22				
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35				
36				
37				
38				
39				
40				

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Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
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www.kes.co.kr

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Test Data - Harmonics (continued)**Maximum harmonic current results**

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	N/A			
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
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34				
35				
36				
37				
38				
39				
40				

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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

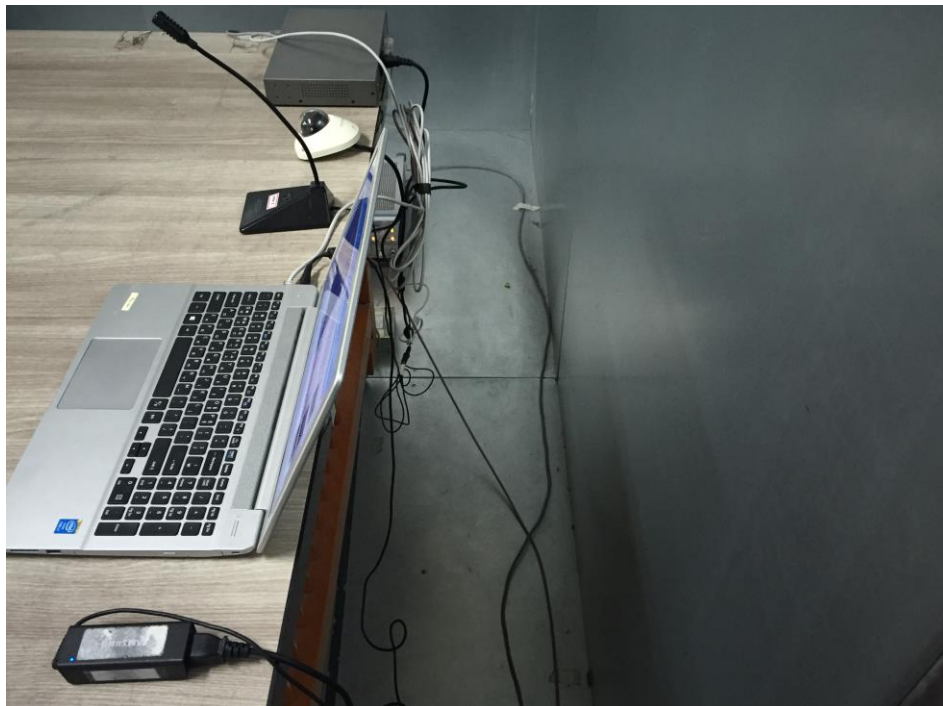
Conducted Voltage Emissions

N/A

N/A

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Conducted Emissions at Telecommunication Ports



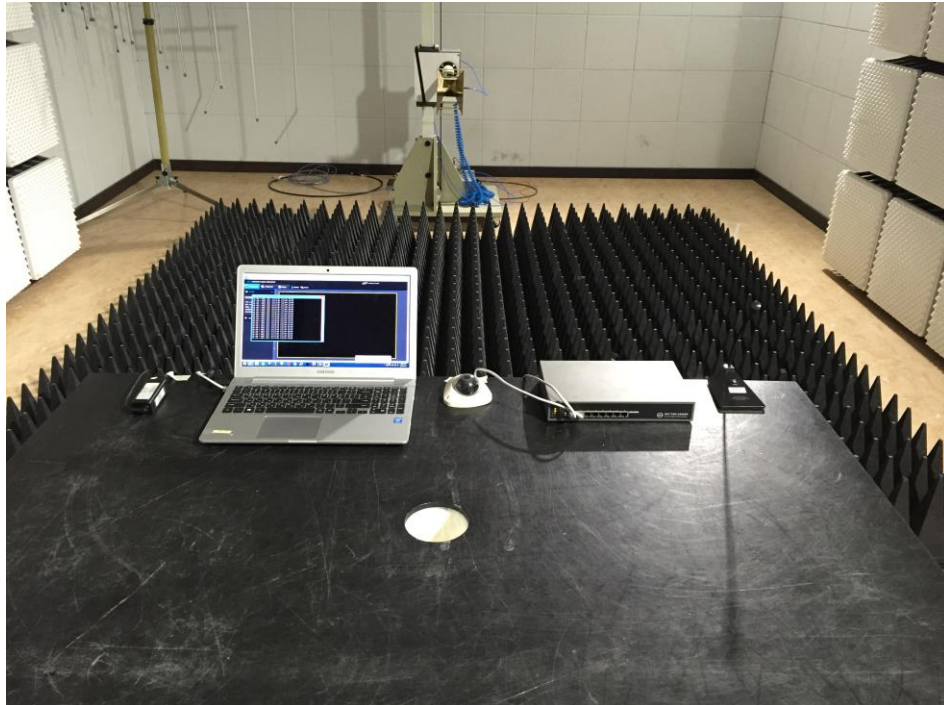
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Radiated Electric Field Emissions(Below 1 GHz)



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Radiated Electric Field Emissions(Above 1 GHz)



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Harmonic Current Emissions and Voltage Fluctuations and Flicker

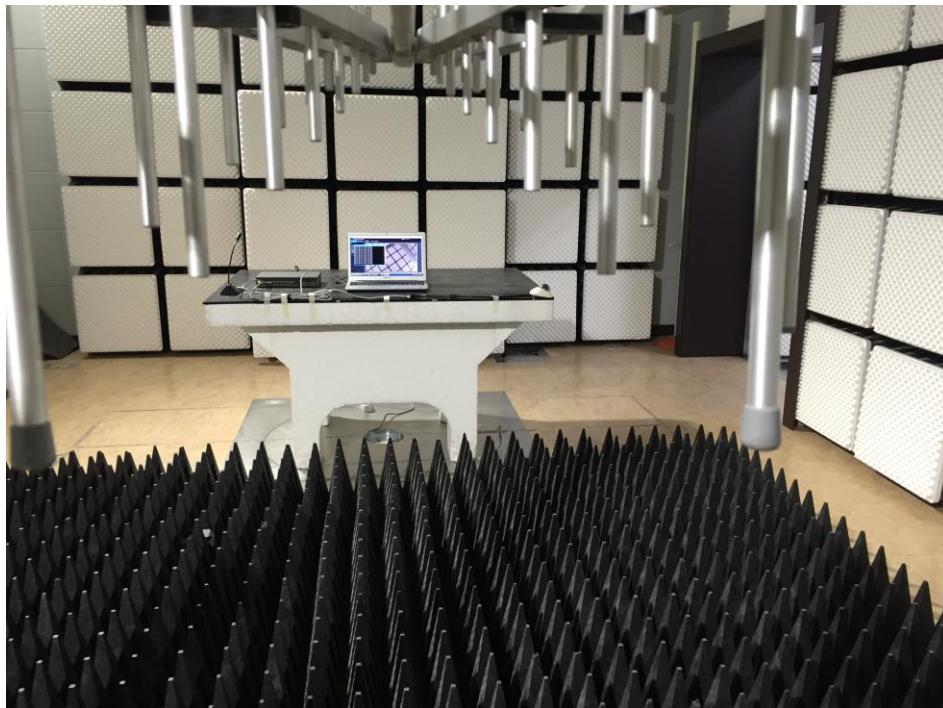
N/A

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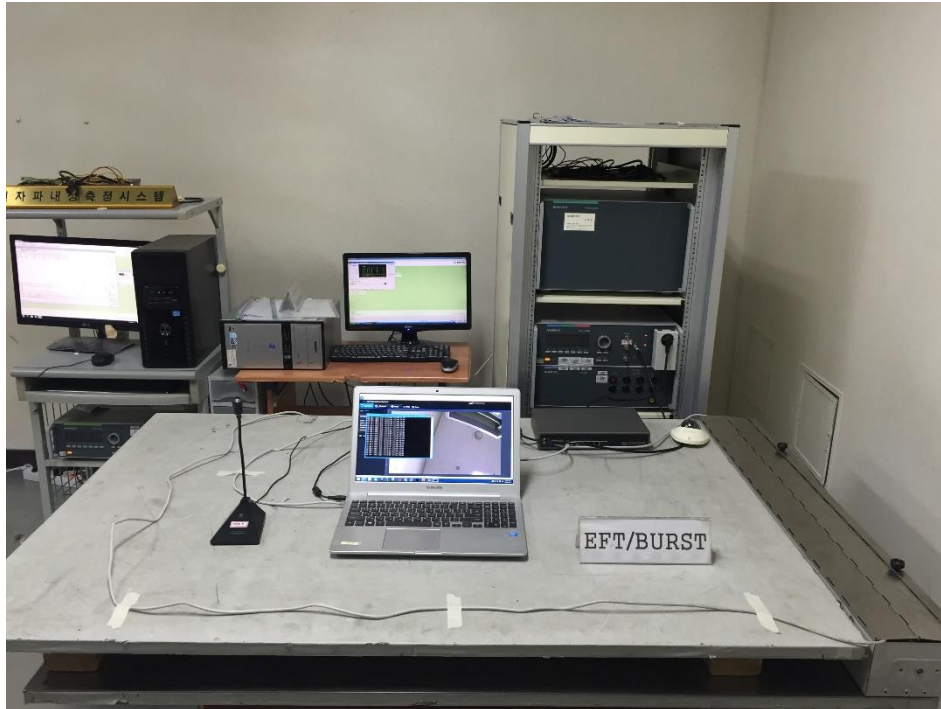
Electrostatic Discharge



Radiated Electric Field Immunity

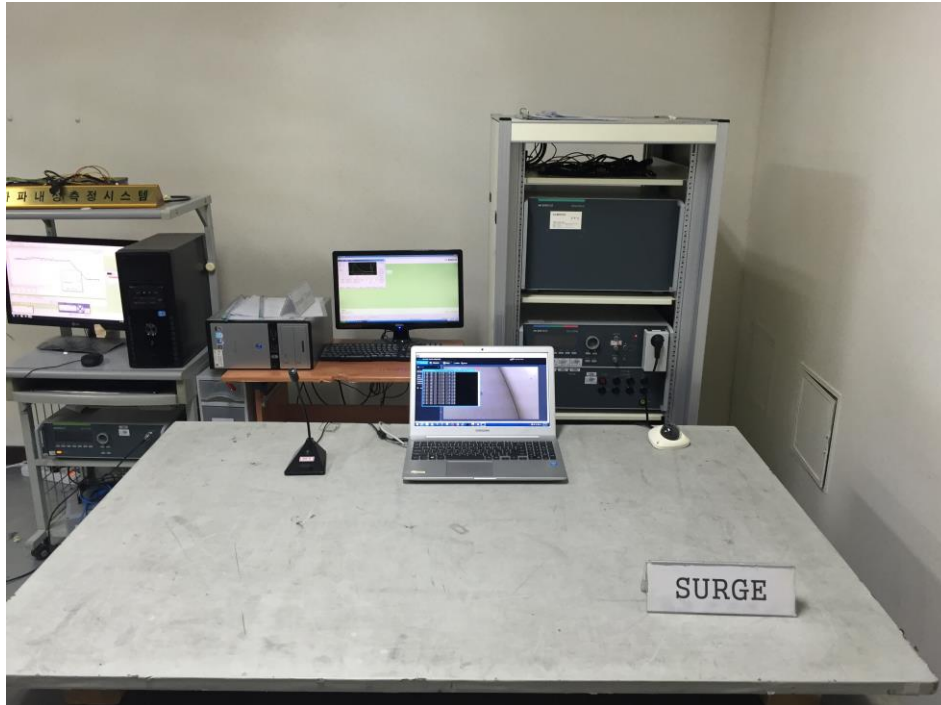


Electrical Fast Transients/Bursts

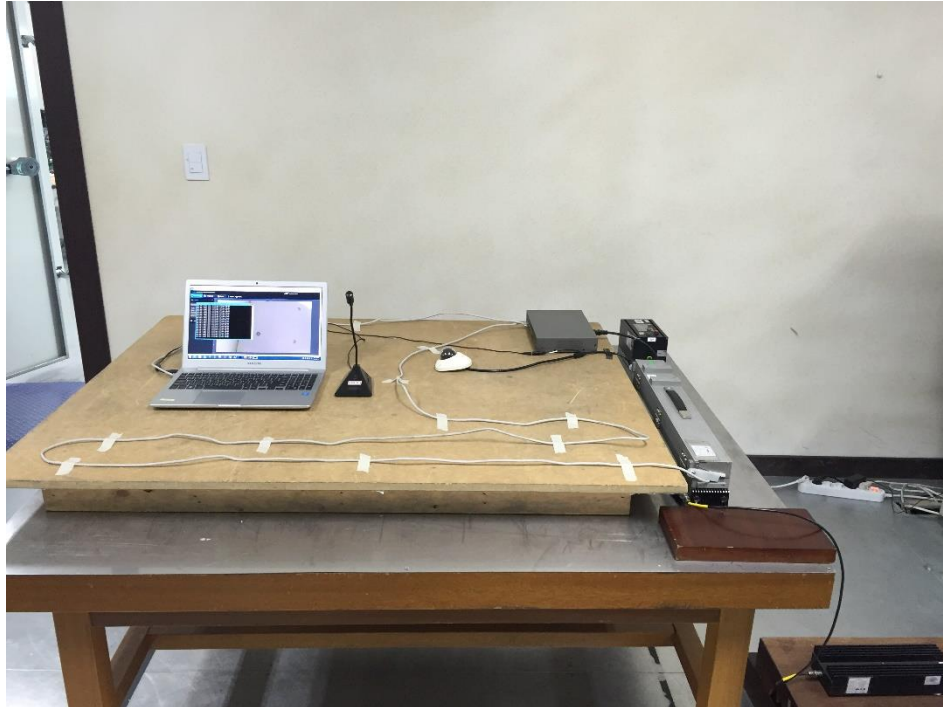


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Surge Transients



Conducted Disturbance



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Voltage Dips and Short Interruptions

N/A

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E.U.T External Photographs

(Top)



(Bottom)



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E.U.T Internal Photographs

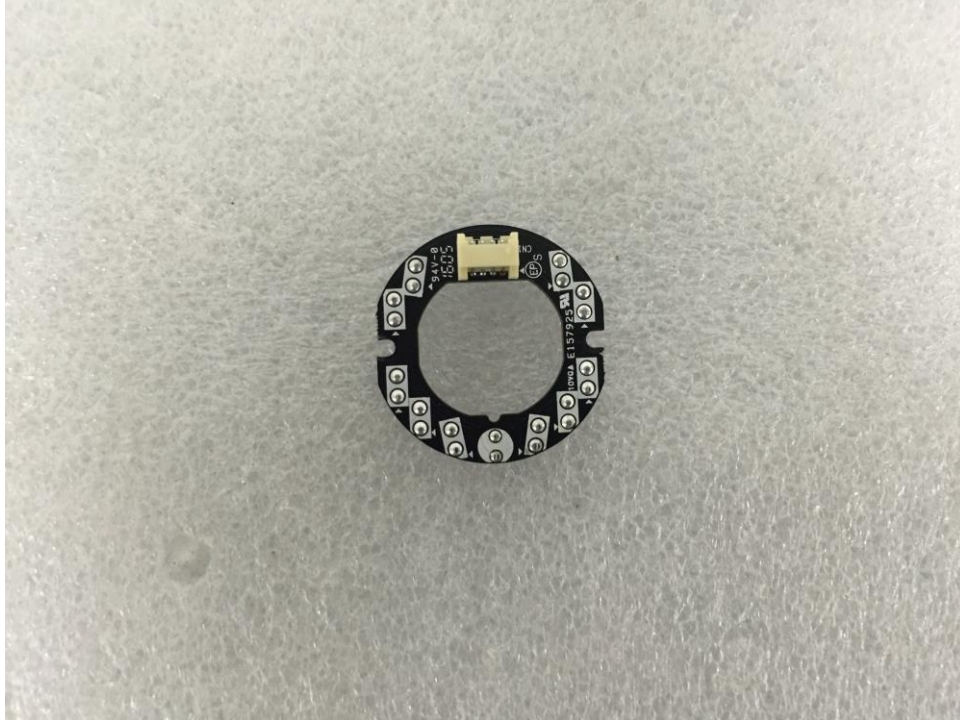
(Internal View)



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EUT Internal View – IR Board

(Top)



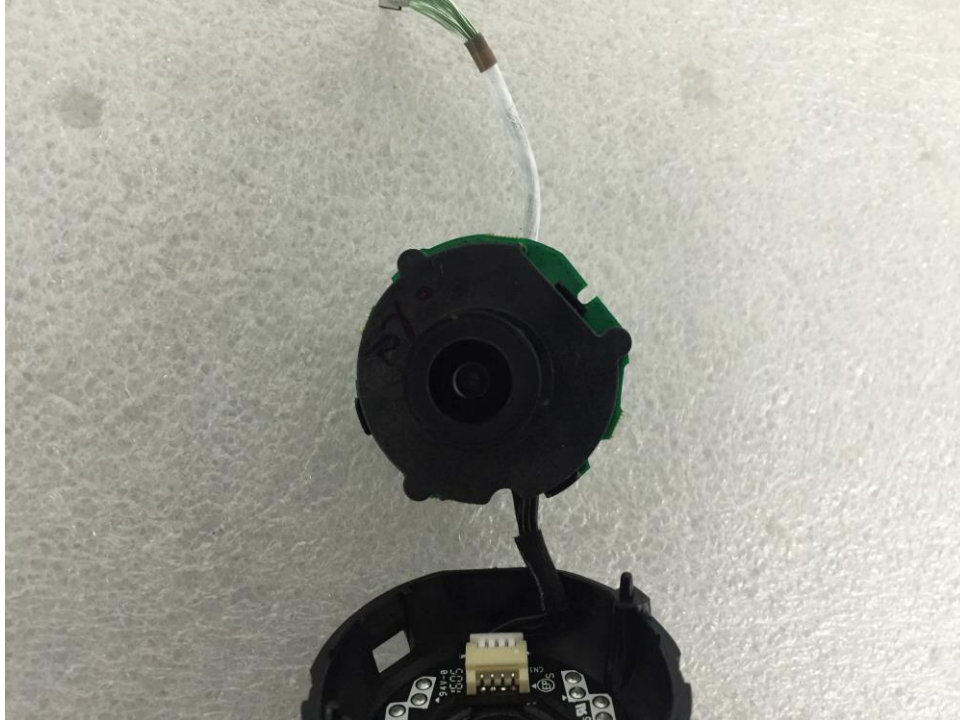
(Bottom)



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EUT Internal View – IR Board

(Top)



(Bottom)



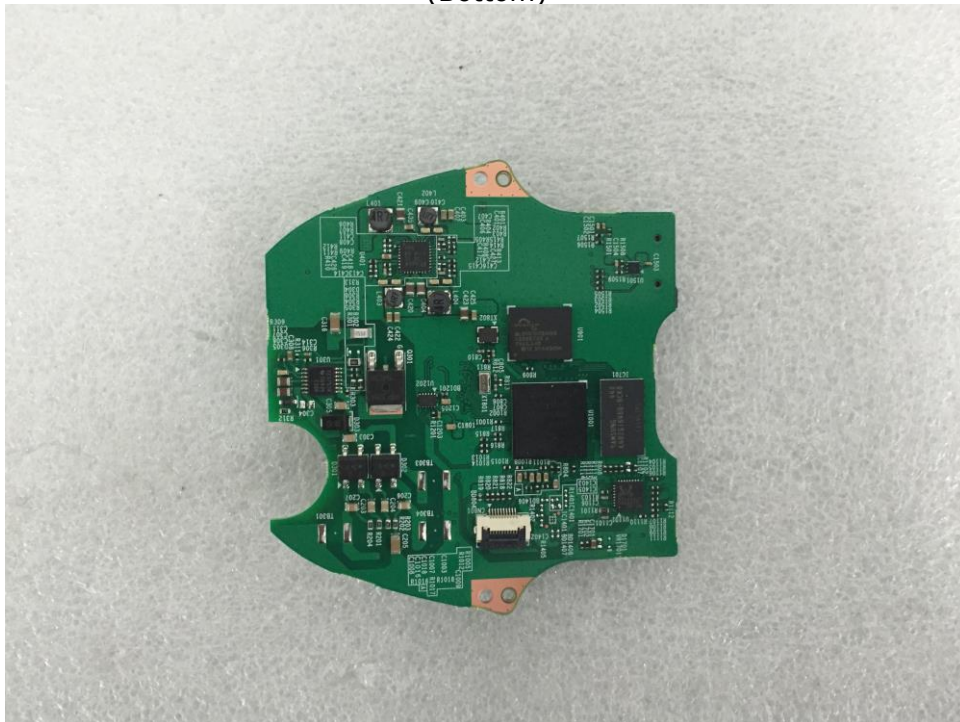
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EUT Internal View – IR Board

(Top)

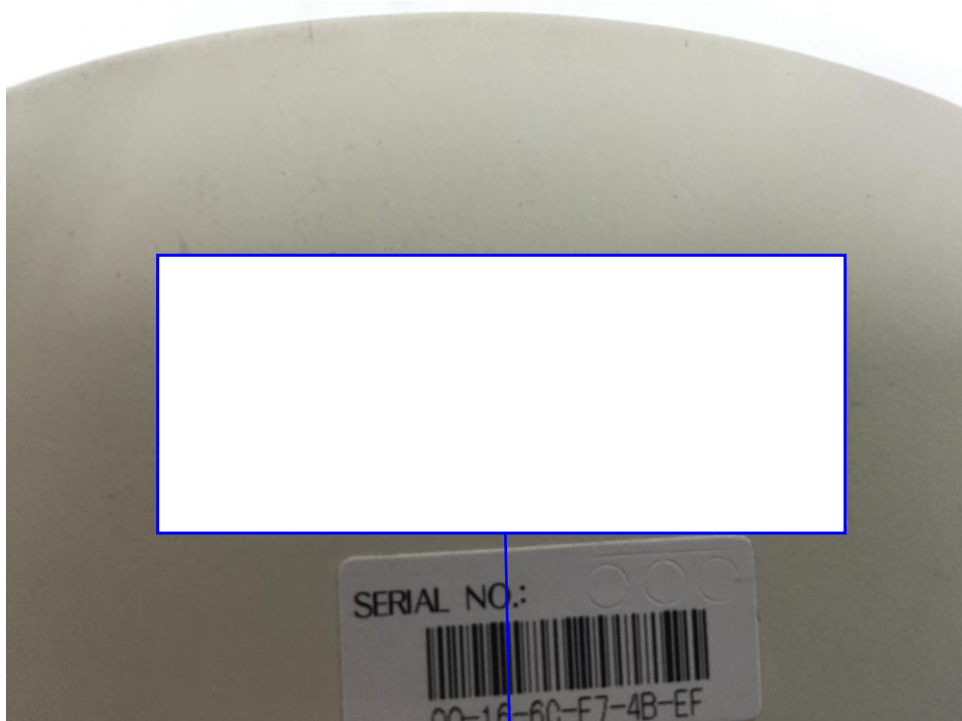


(Bottom)



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Label and Location



NETWORK CAMERA

Model No : SNV-6084R

Manufacturer : HANWHA TECHWIN(TIANJIN)CO., LTD

Made in China