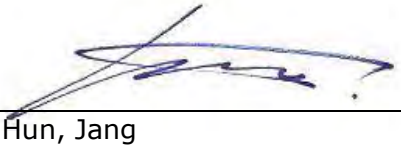
EMC TEST REPORT For CE

Test Report No.	:	KES-E1-16T0130-R2
Date of Issue	:	Sep. 28, 2018
Product name	:	NETWORK CAMERA
Model/Type No.	:	SNV-L6014RM
Variant Model	:	SNV-L6014RBM
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. 22, 2016 – Mar. 24, 2016 / Sep. 21, 2018
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.

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Mar. 29, 2016	KES-E1-16T0130	Issued
Jul. 25, 2016	KES-E1-16T0130-R1	Buyers demand models, and other hardware features are not changed
Sep. 28, 2018	KES-E1-16T0130-R2	Reissue due to RS, EFT retest. Added Manufacturer & address.

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1.0 General Product Description

Main Specifications of E.U.T are:

	SNV-L6014RM
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	M12 connector (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

Streaming Capability	Multiple Streaming(Up to 3 Profiles)
Audio I/O	Line-in, Line-out, Built-in MIC
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, Denish, 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 / Humidi	-30°C ~ +60°C (-22°F ~ +140°F) / Less than 90% RH
Ingress Protection	IP66
Vibration Resistance	IK10 EN50155 class T3 (Vibration, Shock, bump, temperature) EN50121, ISO 16750-3(Vibration) NEMA 250 type 4x
Vandal Resistance	IK10
Electrical	
Input Voltage / Current	PoE(IEEE802.3af, Class2)
Power Consumption	Max. 5.8W
Mechanical	
Color / Material	Ivory / Metal
Dimension (WxHxD)	99x100x52mm
Weight	300g

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 ☐ 48 Vac ☒ PoE

Frequency ☐ 50 Hz ☐ 60 Hz ☐ Hz

1.2 Variant Model Differences

Variant Model	Differences
SNV-L6014RBM	Buyers demand models, and other hardware features are not changed

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
NETWORK CAMERA	SNV-L6014RM	-	Hanwha Techwin (Tianjin) Co.,Ltd.	E.U.T

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
POE Switch	GS108PE	-	NETGEAR, INC.	-
AC/DC Adapter	AD8190LF	-	BAO HVI SCIENCE & TECHNOLOGY Co., LTD	-
Notebook	NT-R410Y	Z9YJ93CS300631H	Samsung Electronics Co., Ltd.	-
AC/DC Adapter	AD-6019	-	LI SHIN INTERNATIONAL ENTERPRISE CORP.	-
HEADSET	RHS-2000	-	ROYCHE	-
MIC	CMK-303	-	CAMAC	RS,EFT
Speaker	BR10000A CUVE	-	BEIJING EDIFIER HI-TECH GROUP.	RS,EFT

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 Switch	Notebook	3.0	U
	MIC	HEADSET	Line Out	1.5	U
	SPK	HEADSET	Line In	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)

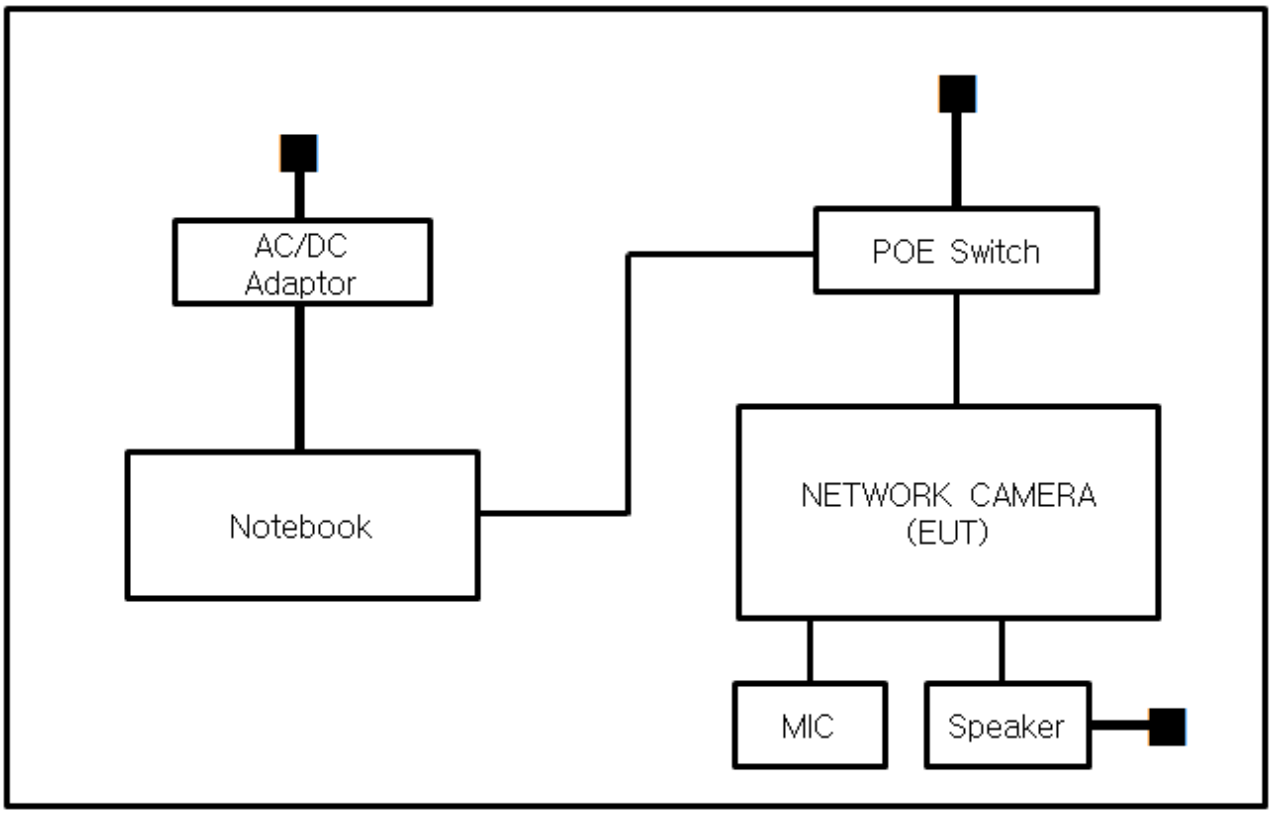
Equipment under test was operated during the measurement under the following conditions:

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 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.

1.10 Test Facility

The measurement facility is located at 473-21 Gayeo-ro, Yeoju-si, Gyeonggi-do, 12658, Korea. The sites are constructed in conformance with the requirements of ANSI C63.4:2014 and CISPR 16-1-4:2012

1.11 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
KOREA	**RRA**	EMI (3 m & 10 m Semi-Aechoic Chamber , 10 m Open Area and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	KR0100
International	**KOLAS**	EMI (3 m & 10 m Semi-Aechoic Chamber , and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	KT489
USA	**FCC**	3 m & 10 m Semi-Aechoic Chamber, 10 m Open Area and Conducted test site to perform FCC Part 15/18 measurements.	KR0100
Canada	**ISED**	3 m & 10 m Semi-Aechoic Chamber and Conducted test site	23298-1
JAPAN	**VCCI**	Mains Ports Conducted Interference Measurement, Telecommunication Ports Conducted Disturbance Measurement and Radiation 10 meter site, Facility for measuring radiated disturbance above 1 GHz	R-4308, C-4798, T-2311, G-914
Europe	**TÜV SÜD**	EMI (3 m & 10 m Semi-Aechoic Chamber , 10 m Open Area and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	CARAT 17 07 01633 001

2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **EMC – Directive 2014/30/EU**

☐ EN 61000-6-3:2011		
☐ EN 61000-6-1:2007		
☐ EN 61000-6-4:2007 +A1:2011		
☐ EN 61000-6-2:2005		
☒ EN 55011:2007 +A1:2010	☒ Group 1 ☒ Class A	☐ Group 2 ☐ Class B
☐ EN 55014-1:2006 +A2:2011		
☐ EN 55014-2:1997 +A2:2008		
☐ EN 55015:2013		
☐ EN 55022:2010	☐ Class A	☐ Class B
☐ EN 55024:2010		
☐ EN 50130-4:2011 +A1:2014		
☒ EN 50121-3-2:2016		
☐ EN 61000-3-2:2014		
☐ EN 61000-3-3:2013		
☐ EN 61326-1:2013		
☐ VCCI V-3 / 2013.04	☐ Class A	☐ Class B
☐ AS / NZS CISPR22:2009 +A1:2010	☐ Class A	☐ Class B
☐ 47 CFR Part 15, Subpart B / ANSI C63.4-2009	☐ Class A	☐ Class B
☐ IC Regulation ICES-003 : 2012 / ANSI C63.4-2014	☐ Class A	☐ Class B
☐ CISPR 22:2009 +A1:2010	☐ Class A	☐ Class B

☐ **R&TTE – Directive 1999/5/EC**

☐ 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: ℃
Relative Humidity: %

.

Frequency Range of Measurement
150 ㎑ to 30 ㎒

Instrument Settings
IF Band Width: 9 ㎑

Test Results
The requirements are:

☐ PASS
☐ NOT PASS
☒ NOT APPLICABLE

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

2.2 Radiated Electric Field Emissions(Below 1 ㎓)

Test Date
Mar. 23, 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: 13,0 ℃
Relative Humidity: 46,0 %

Frequency Range of Measurement
30 ㎒ to 1 ㎓

Instrument Settings
IF Band Width: 120 ㎑

Test Results
The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks
See Appendix A for test data.

2.3 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: ℃
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.

2.4 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: ℃
Relative Humidity: %

Test Results
The requirements are:

☐ PASS
☐ NOT PASS
☒ NOT APPLICABLE

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

3.0 Criteria for compliance

Criteria for compliance was based on the following guidelines:

The variety and the diversity of the apparatus within the scope of this set standards makes if difficult to define to define precise criteria for the evaluation of the immunity results.

if, as a result of the application of the tests defined in this set standards, the apparatus becomes dangerous or unsafe, the apparatus shall be deemed to have failed the test.

A functional description and a definition of performance criteria, during or as a consequence of the EMC testing shall be provided by manufacturer and noted in the test report, based of the following criteria:

Performance criterion A: The apparatus shall continue to operate as intended during and after the test. No degradation of performance of loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible description and documentation, and from what the user may reasonably expect from the apparatus if used intended.

* Though the noise appeared on the display during the testing, it is judged criterion A if there is no problem to distinguish the things. This is the criterion set by the manufacturer.

Performance criterion B: The apparatus shall continue of operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed. If the minimum performance level of the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation, and from what the user may reasonable expect from the apparatus if used as intended.

Performance criterion C: Temporary loss of function as allowed, provided the function is self-recoverable or can restored by the operation of the controls.

3.1 Electrostatic Discharge

Reference Standard
EN 61000-4-2:2009

Test Date
Mar. 22, 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	ESS05X4620	02, 24, 2017
☒	HCP	-	Noise Ken	-	-
☒	VCP	-	Noise Ken	-	-

Test Conditions
Temperature: 24,3 ℃
Relative Humidity: 41,1 %
Atmospheric Pressure: 100,1 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:

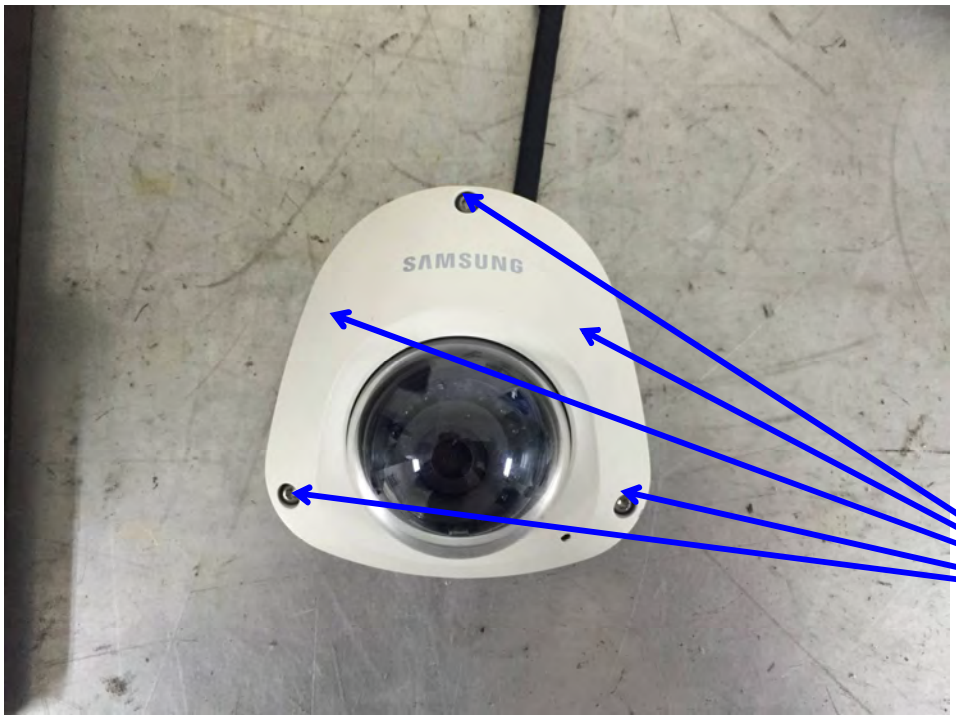
Contact	Air	HCP	VCP
☐ 2 kV	☒ 2 kV	☒ 2 kV	☒ 2 kV
☐ 4 kV	☒ 4 kV	☒ 4 kV	☒ 4 kV
☒ 6 kV	☐ 6 kV	☒ 6 kV	☒ 6 kV
☐ 8 kV	☒ 8 kV	☐ 8 kV	☐ 8 kV
☐ 15 kV	☐ 15 kV	☐ 15 kV	☐ 15 kV

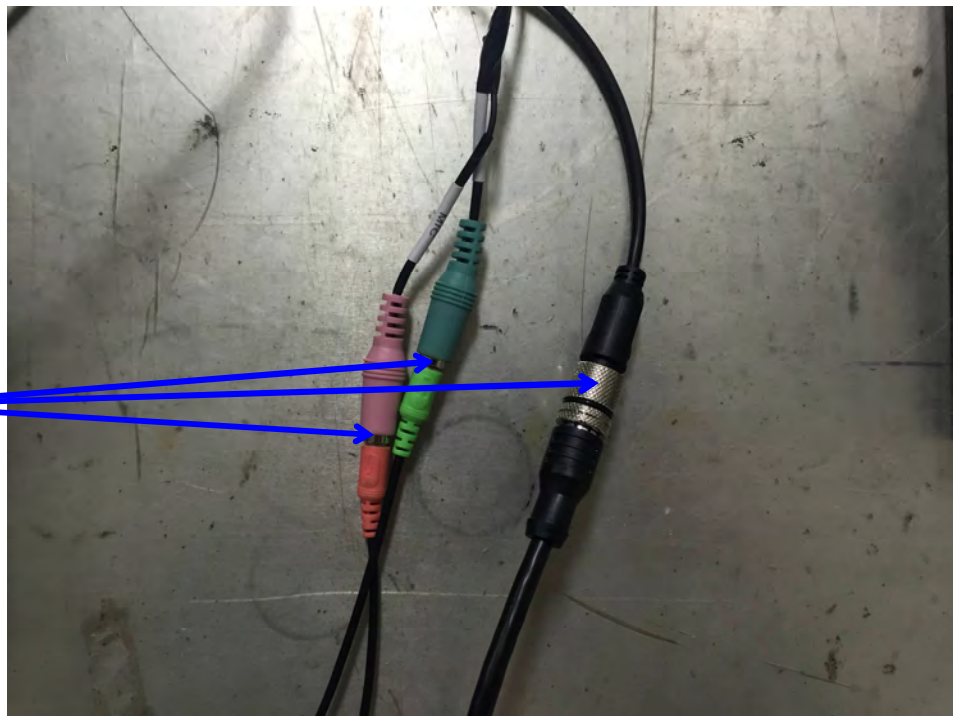
Notes: HCP: Horizontal coupling plane
VCP: Vertical coupling plane

Required Performance Criteria: ☒ B

Location of Discharge:

Air
Contact





Test Data

Indirect Discharge

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

Direct Discharge

No.	Test Point	Discharge Method	Performance Observation	Remarks
1	Enclosure	Contact Discharge	A	-
2	Port	Contact Discharge	A	-

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.

3.2 Radiated Electric Field Immunity

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

Test Date
Sep. 21, 2018

Test Location
EMS-RS: ☒ Semi Anachoic Chamber #3 ☐ Semi Anachoic Chamber #2

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	EMC32	R & S	9.12.00	-
☒	SIGNAL GENERATOR	SMB 100A	Rohde & Schwarz	108252	08, 06, 2019
☒	HIGH POWER DUAL AMP	SSA532	성산전자	SSA532-001	05, 18, 2019
☒	POWER METER	E4419B	Agilent	GB40203000	05, 18, 2019
☒	CW POWER SENSOR	E4412A	Agilent	US38488240	05, 18, 2019
☒	CW POWER SENSOR	E4412A	Agilent	MY41501662	05, 18, 2019

Test Conditions
Temperature: 23,8 ℃
Relative Humidity: 57,7 %
Atmospheric Pressure: 100,3 kPa

Test Specifications

Antenna Polarization: Horizontal & vertical unless indicated otherwise

Antenna Distance: ☒ 3 m

Field Strength: ☒ 10 V/m ☒ 3 V/m ☒ 20 V/m ☒ 5 V/m

Frequency Range: ☒ 80 MHz to 1 GHz ☒ 1,4 GHz to 2 GHz ☐ 80 MHz to 2,7 GHz ☒ 2 GHz to 2,7 GHz ☒ 5,1 GHz to 6 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: ☒ A

Test Data

Side Exposed	Observation	
	Horizontal	Vertical
Front	A	A
Right	A	A
Back	A	A
Left	A	A

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
☐ NOT APPLICABLE

Remarks

PASS Required Performance Criteria.

3.3 Electrical Fast Transients/Bursts

Reference Standard
EN 61000-4-4:2012

Test Date
Sep. 21, 2018

Test Location
EMS-EFT: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	AMETEK CTS	7.1.2	-
☒	ULTRA COMPACT SIMULATOR	UCS 500 N5	EM TEST	V0936105120	06, 26, 2019
☒	MOTOR VARIAC	MV2616	EM TEST	V0936105123	06, 26, 2019
☒	CAPACITIVE COUPLING CLAMP	HFK	EM TEST	070925	06, 26, 2019

Test Conditions

Temperature:	23,2 ℃
Relative Humidity:	52,4 %
Atmospheric Pressure:	99,9 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:	☒ A	

Test Data

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

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

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

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

☒ Signal ports and telecommunication ports – Coupling Clamp used

Mode of Application	OBSERVATIONS	
	(+) Burst (㎸)	(-) Burst (㎸)
RJ-45	A	A

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.

3.4 Surge Transients

Reference Standard
EN 61000-4-5:2014

Test Date
Mar. 24, 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 Conditions
Temperature: 24,4 ℃
Relative Humidity: 40,5 %
Atmospheric Pressure: 100,9 kPa

Test Specifications

Siqnal 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

Signal lines
☐ (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: ☐ B

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: ☒ B

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	A	A

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.

3.5 Conducted Disturbance

Reference Standard
EN 61000-4-6:2009

Test Date
Mar. 24, 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: 24,4 ℃
Relative Humidity: 40,5 %
Atmospheric Pressure: 100,9 kPa

Test Specifications

Frequency range: ☒ 150 ㎑ to 80 ㎒ ☐ 10 ㎑ to 30 ㎒
☐ 150 ㎑ to 230 ㎒ ☐ 10 ㎑ to 100 ㎒

Voltage Level: ☐ 1 Vrms ☐ 3 Vrms
☒ 10 Vrms

Modulation: ☒ AM, 80 %, 1 ㎑ sine wave
☐ PM, 1 ㎐ (0,5 s ON : 0,5 s OFF)

Frequency step: ☒ 1 % step

Dwell Time: ☐ 1 s ☒ 3 s

Required Performance Criteria: ☒ A

Test Data

☐ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observation
-	-	-

☐ Input d.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observation
Input d.c. power port	CDN (☐M2, ☐M3)	-

☒ Signal ports and telecommunication ports

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

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

PASS Required Performance Criteria.

3.6 Voltage Dips and Short Interruptions

Reference Standard
N/A

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
☐	Capacitive Coupling Clamp	HFK	EM TEST	070925	07, 14, 2016
☐	MotorVariac	MV2616	EM TEST	V0936105123	07, 14, 2016

Test Conditions
Temperature: ℃
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 cariations

☐ 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
NOT APPLICABLE.

APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

[HOT]

N/A

[NEUTRAL]

N/A

Conducted Emissions at Telecommunication Ports

[10 Mbps]

N/A

[100 Mbps]

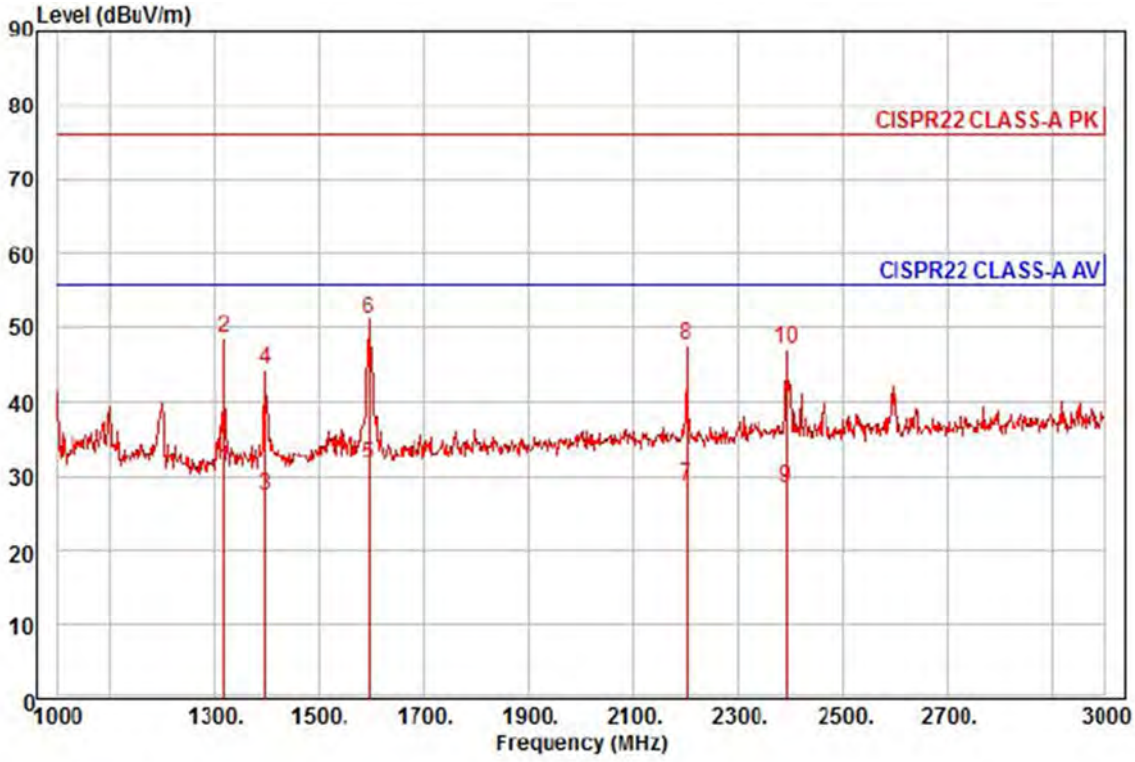
N/A

Radiated Electric Field Emissions(Below 1 ㎓)

Frequency	Amplitude	ANT Polar. (H/V)	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin
[㎒]	[dBμV]		[m]	ANT. [dB/m]	Cable [dB]	[dBμV/m]	[dBμV/m]	[dB]
69.75	14.30	H	4.00	9.76	1.76	25.82	40.00	14.18
70.75	17.53	V	1.00	9.48	1.77	28.78	40.00	11.22
125.06	13.35	H	4.00	9.21	2.53	25.09	40.00	14.91
445.50	17.25	H	4.00	16.34	5.36	38.95	47.00	8.05
519.83	14.38	H	4.00	17.54	5.86	37.78	47.00	9.22
660.50	11.31	V	4.00	19.54	6.88	37.73	47.00	9.27

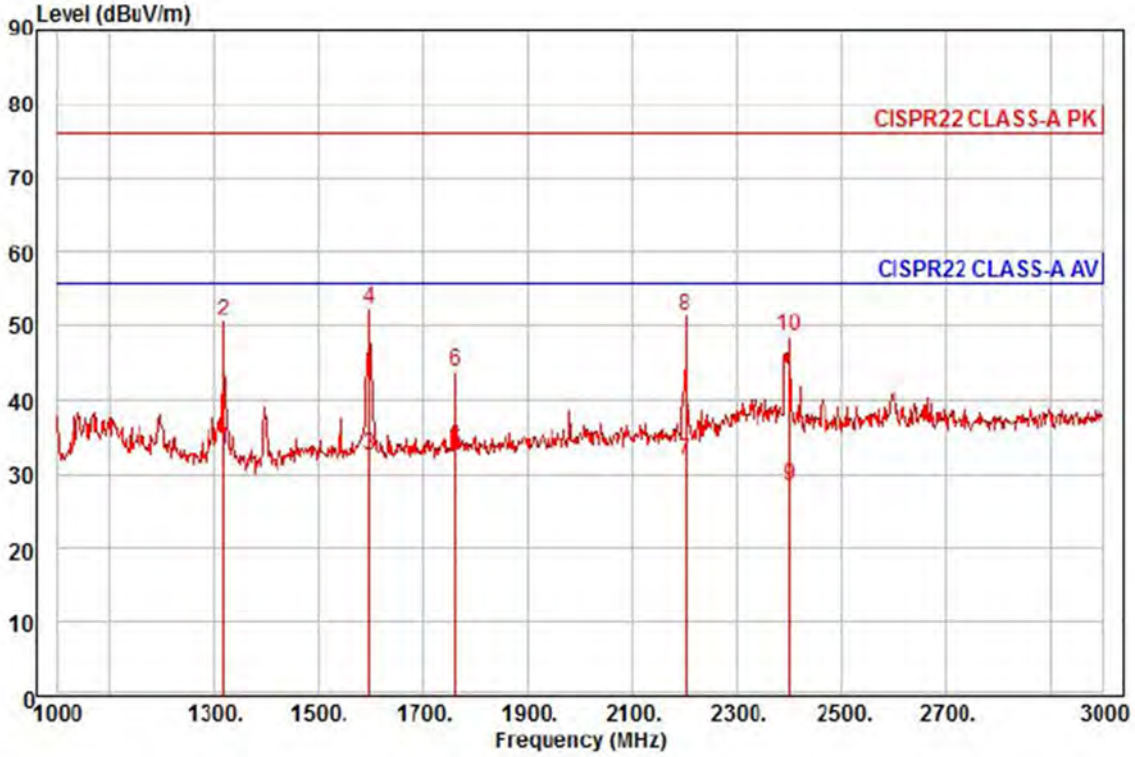
* H : Horizontal, V : Vertical

Radiated Electric Field Emissions(Above 1 ㎓)



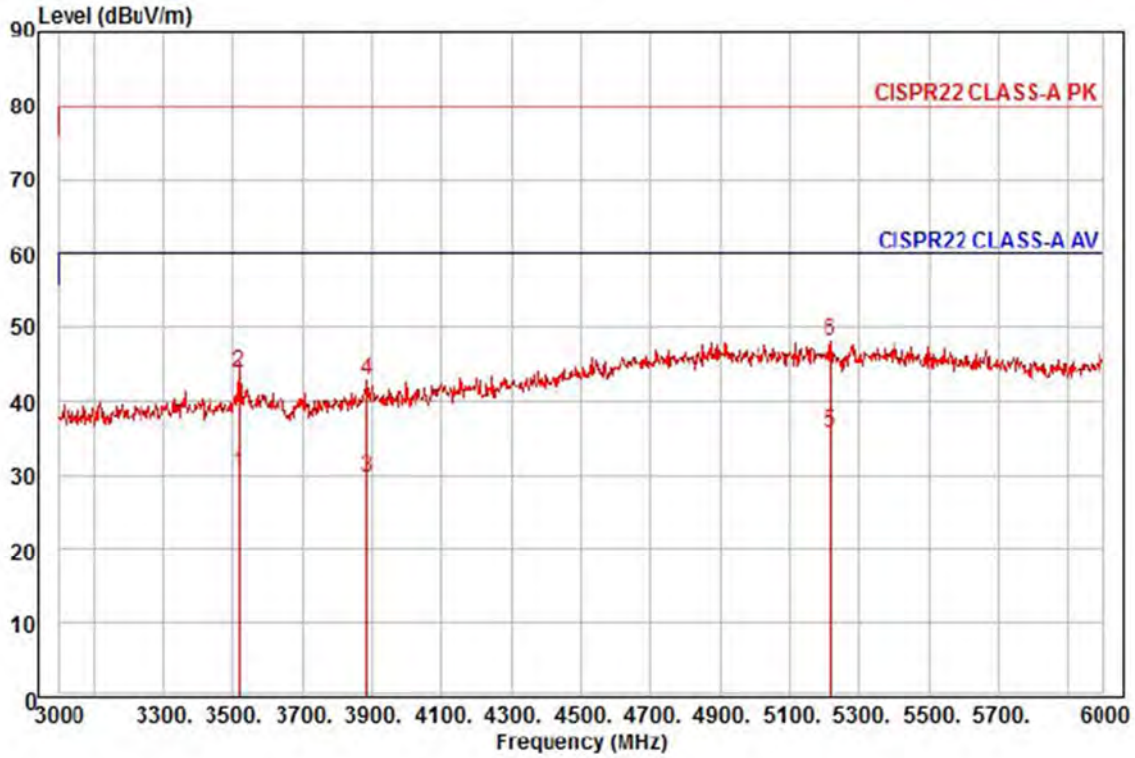
Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNV-L6014RMP
Mode :
Memo : (1 - 3) GHz

	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	1320.00	38.40	25.18	7.44	39.96	15	56.00	-24.94	horizontal	Average
2	1320.00	55.92	25.18	7.44	39.96	15	76.00	-27.42	horizontal	Peak
3	1396.00	34.37	25.48	7.66	39.93	122	56.00	-28.42	horizontal	Average
4	1396.00	51.24	25.48	7.66	39.93	122	76.00	-31.55	horizontal	Peak
5 pp	1596.00	37.02	26.28	8.24	39.83	108	56.00	-24.29	horizontal	Average
6 pk	1596.00	56.69	26.28	8.24	39.83	108	76.00	-24.62	horizontal	Peak
7	2200.00	30.40	28.37	9.66	39.75	170	56.00	-27.32	horizontal	Average
8	2200.00	49.30	28.37	9.66	39.75	170	76.00	-28.42	horizontal	Peak
9	2392.00	29.47	28.84	9.95	39.86	122	56.00	-27.60	horizontal	Average
10	2392.00	48.25	28.84	9.95	39.86	122	76.00	-28.82	horizontal	Peak



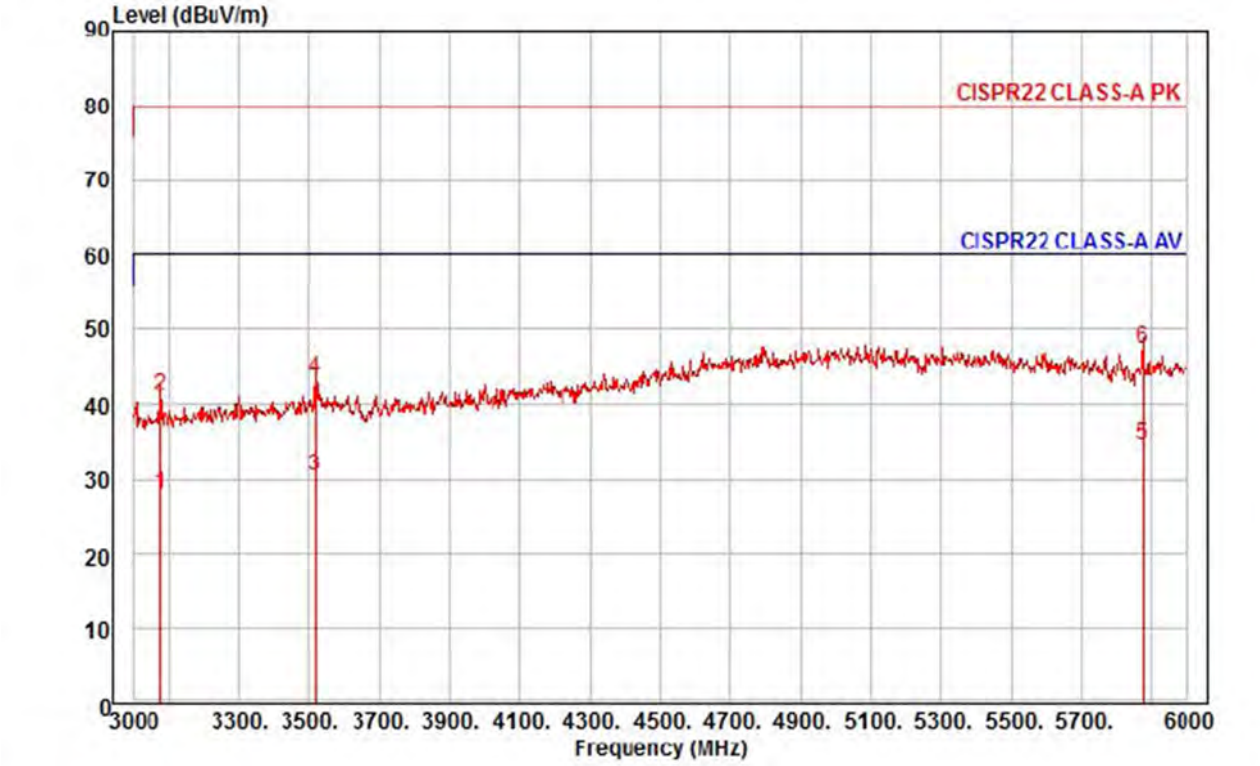
Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNV-L6014RMP
Mode :
Memo : (1 - 3) GHz

	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 pp	1320.00	40.68	25.18	7.44	39.96	286	56.00	-22.66	vertical	Average
2	1320.00	58.17	25.18	7.44	39.96	286	76.00	-25.17	vertical	Peak
3	1598.00	37.96	26.28	8.24	39.83	232	56.00	-23.35	vertical	Average
4 pk	1598.00	57.84	26.28	8.24	39.83	232	76.00	-23.47	vertical	Peak
5	1760.00	37.35	26.93	8.69	39.75	284	56.00	-22.78	vertical	Average
6	1760.00	48.02	26.93	8.69	39.75	284	76.00	-32.11	vertical	Peak
7	2200.00	33.67	28.37	9.66	39.75	278	56.00	-24.05	vertical	Average
8	2200.00	53.32	28.37	9.66	39.75	278	76.00	-24.40	vertical	Peak
9	2400.00	29.44	28.86	9.96	39.86	224	56.00	-27.60	vertical	Average
10	2400.00	49.66	28.86	9.96	39.86	224	76.00	-27.38	vertical	Peak



Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNV-L6014RMP
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	3519.00	26.97	31.20	12.55	40.31	249	60.00	-29.59	horizontal	Average
2	3519.00	40.52	31.20	12.55	40.31	249	80.00	-36.04	horizontal	Peak
3	3885.00	25.01	31.82	13.28	40.39	135	60.00	-30.28	horizontal	Average
4	3885.00	38.27	31.82	13.28	40.39	135	80.00	-37.02	horizontal	Peak
5 pp	5220.00	23.42	37.28	15.59	40.38	283	60.00	-24.09	horizontal	Average
6 pk	5220.00	35.66	37.28	15.59	40.38	283	80.00	-31.85	horizontal	Peak



Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNV-L6014RMP
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	3078.00	26.19	30.46	11.42	40.23	176	60.00	-32.16	vertical	Average
2	3078.00	39.46	30.46	11.42	40.23	176	80.00	-38.89	vertical	Peak
3	3519.00	26.95	31.20	12.55	40.31	79	60.00	-29.61	vertical	Average
4	3519.00	39.99	31.20	12.55	40.31	79	80.00	-36.57	vertical	Peak
5 pp	5877.00	22.35	35.95	16.63	40.29	279	60.00	-25.36	vertical	Average
6 pk	5877.00	35.04	35.95	16.63	40.29	279	80.00	-32.67	vertical	Peak

Harmonic Current Emissions and Voltage Fluctuations and Flicker

N/A

Test Setup Photos and Configuration

Conducted Voltage Emissions

N/A

N/A

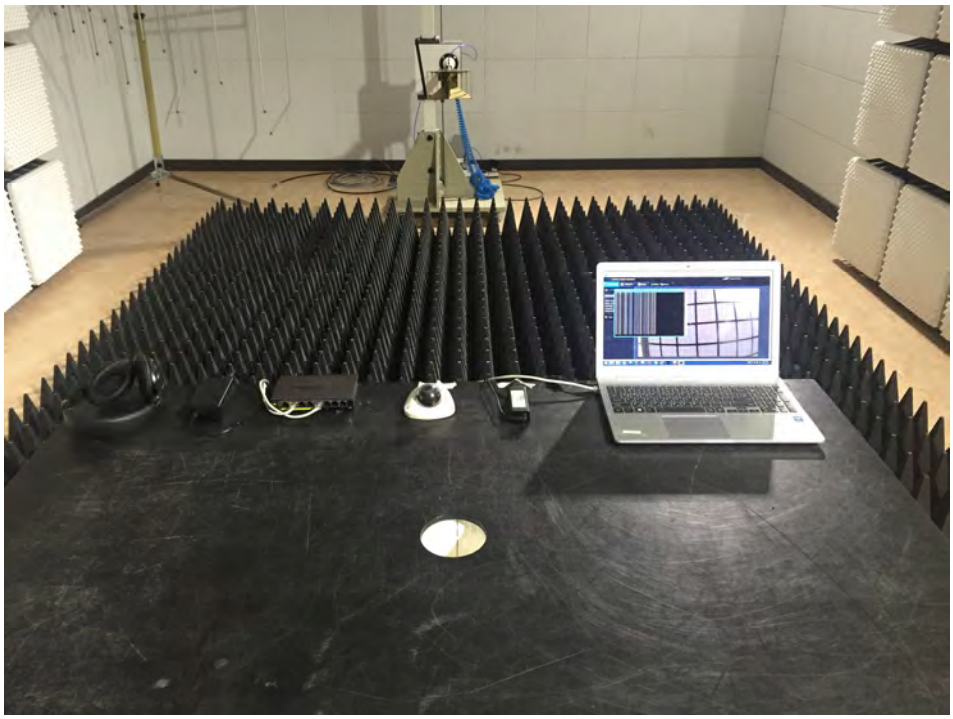
Conducted Emissions at Telecommunication Ports

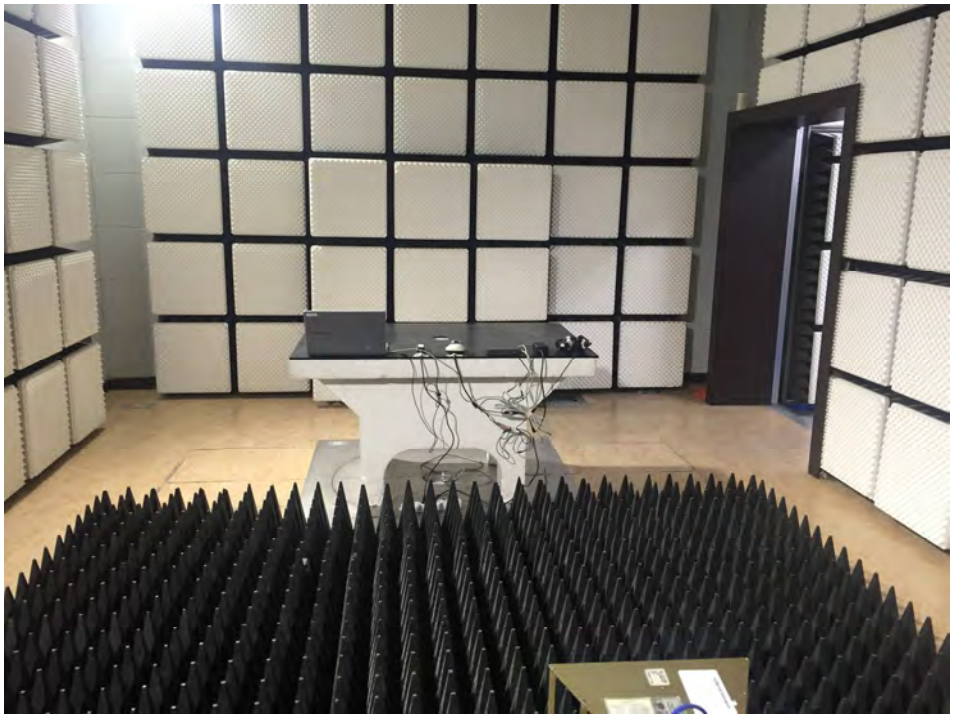
N/A

N/A

Radiated Electric Field Emissions(Below 1 ㎓)

Radiated Electric Field Emissions(Above 1 ㎓)



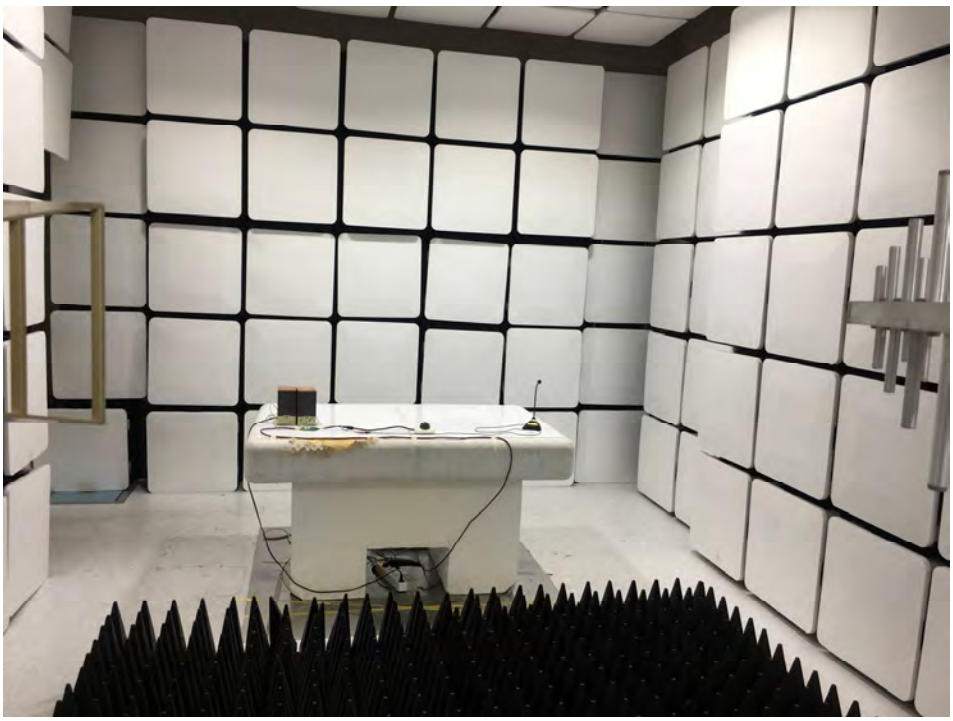


Harmonic Current Emissions and Voltage Fluctuations and Flicker

N/A

Electrostatic Discharge

Radiated Electric Field Immunity



Electrical Fast Transients/Bursts

Surge Transients

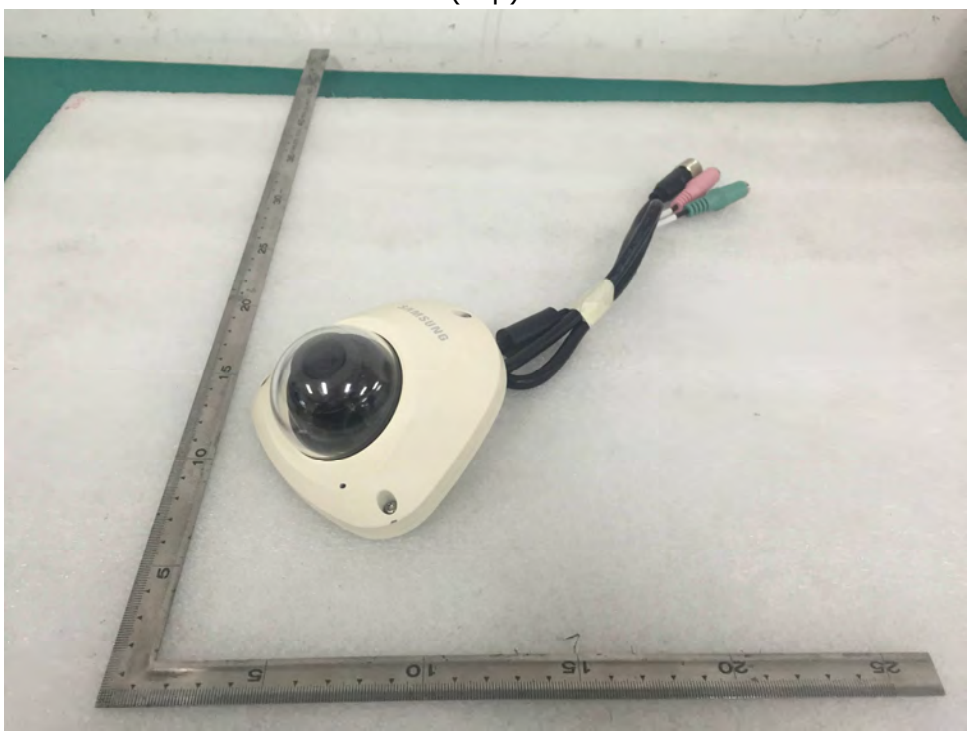
Conducted Disturbance

Voltage Dips and Short Interruptions

N/A

EUT External Photographs

(Top)



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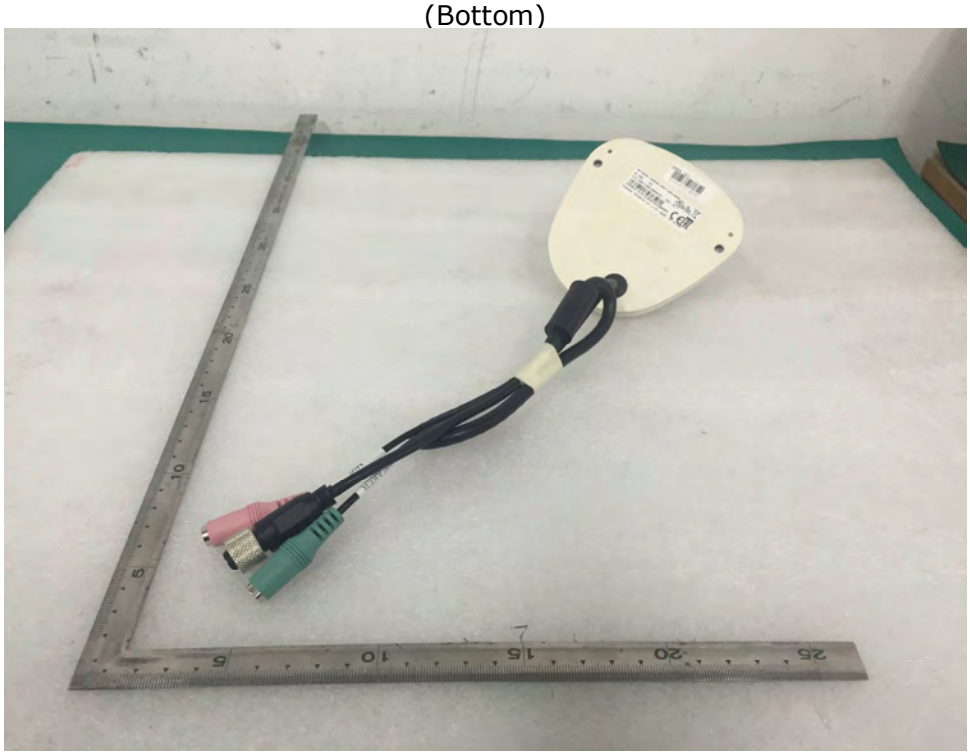
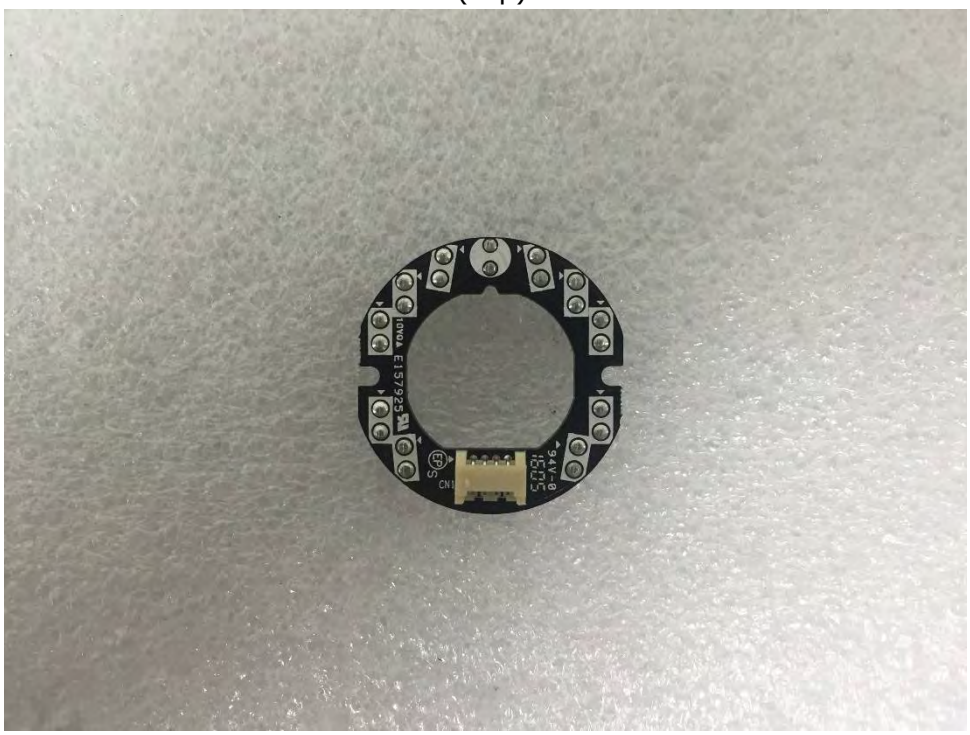


EUT Internal Photographs

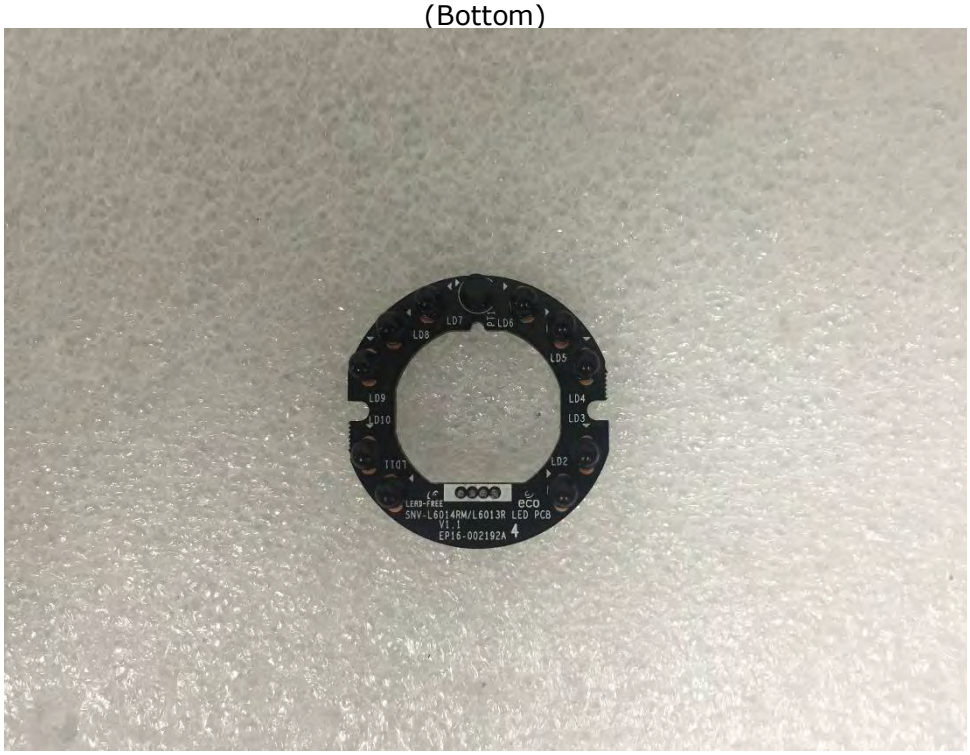
(Internal View)

Main Board EUT Internal View – IR Board

(Top)

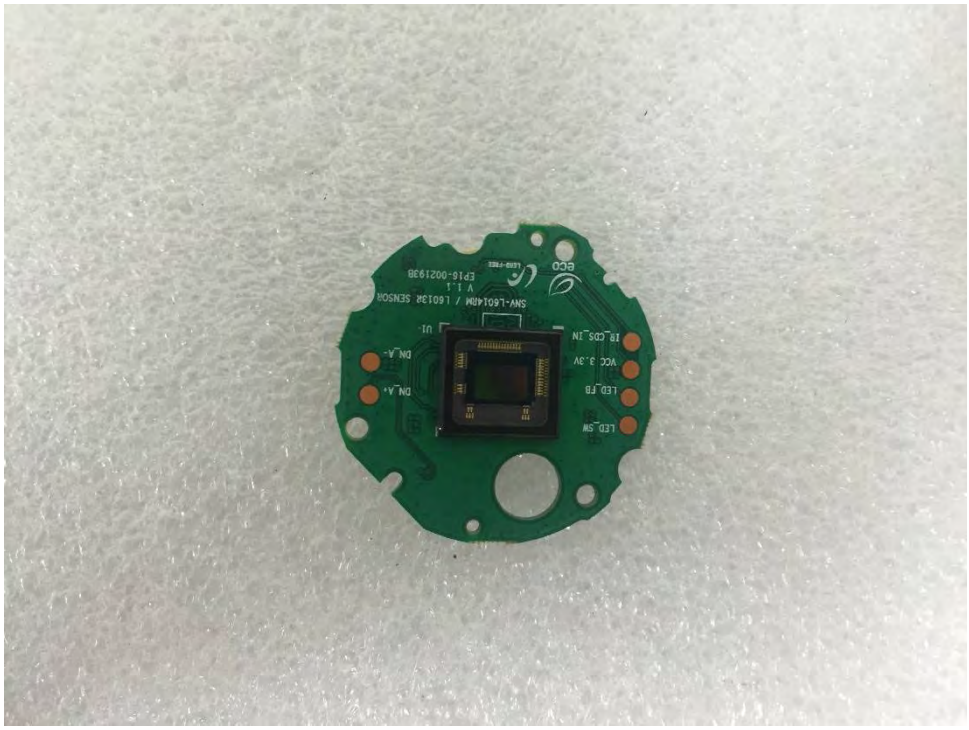


(Bottom)



Main Board EUT Internal View – Camera Board

(Top)



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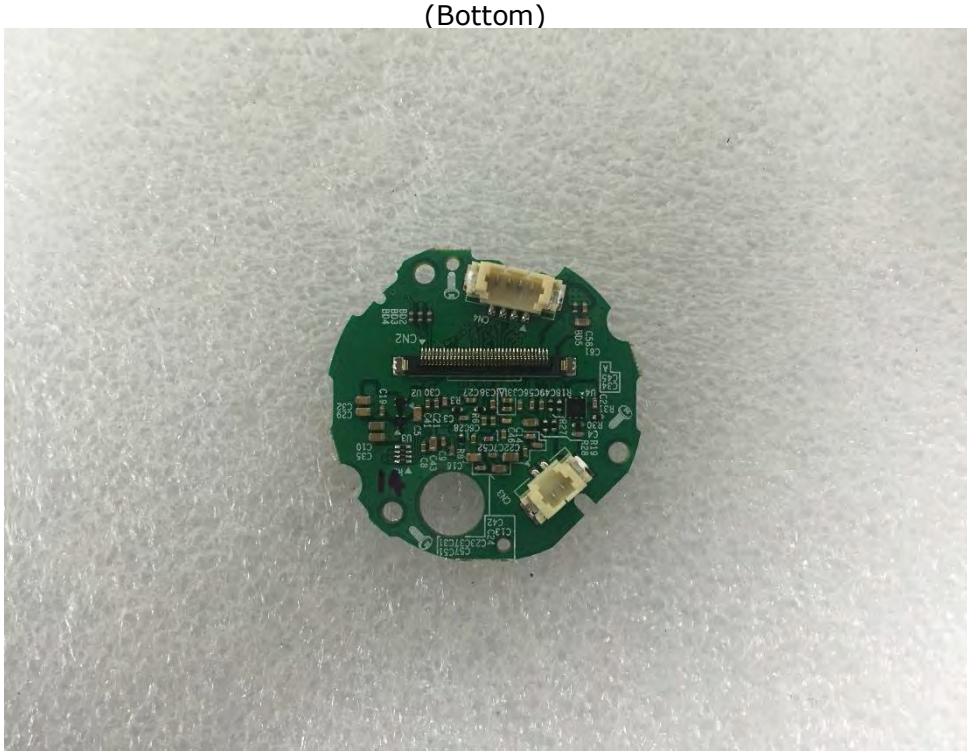
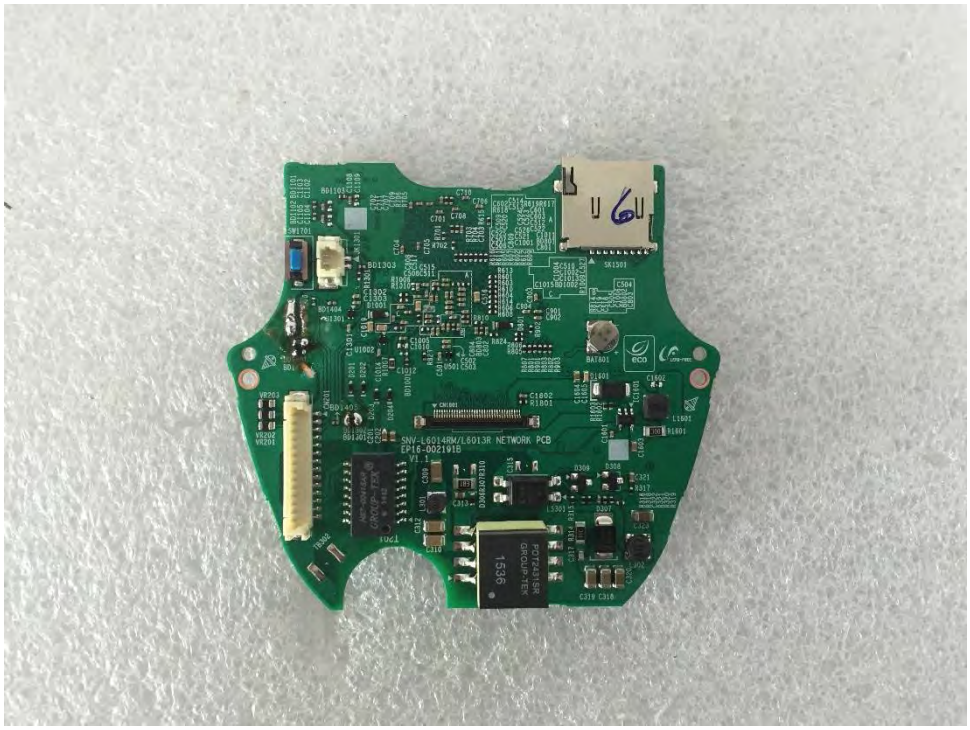


Main Board EUT Internal View – Main Board

(Top)



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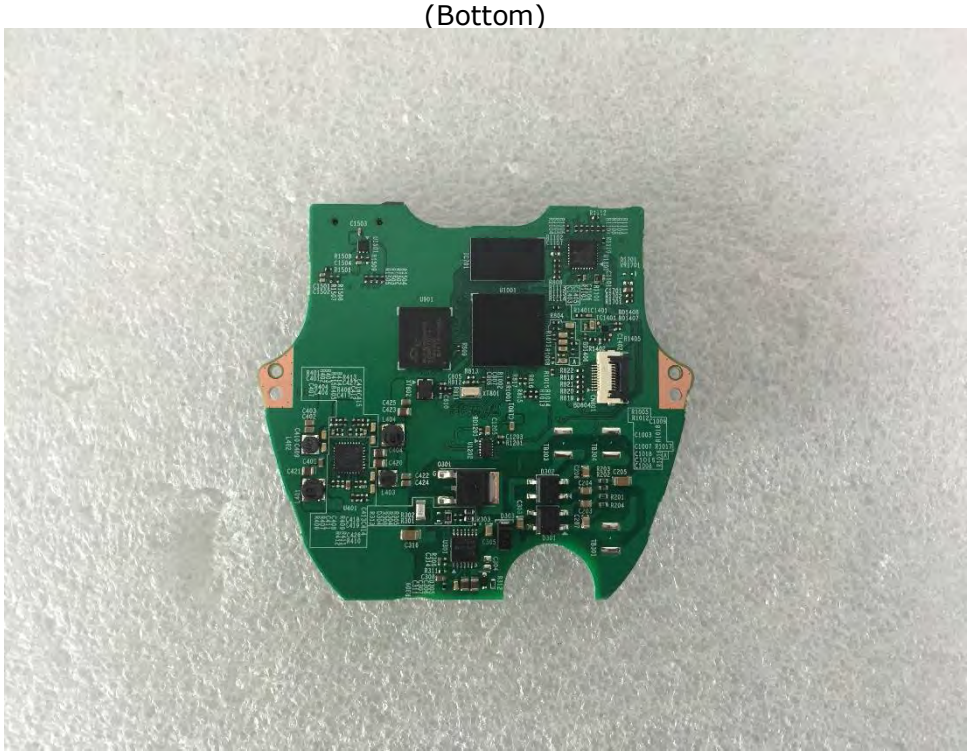
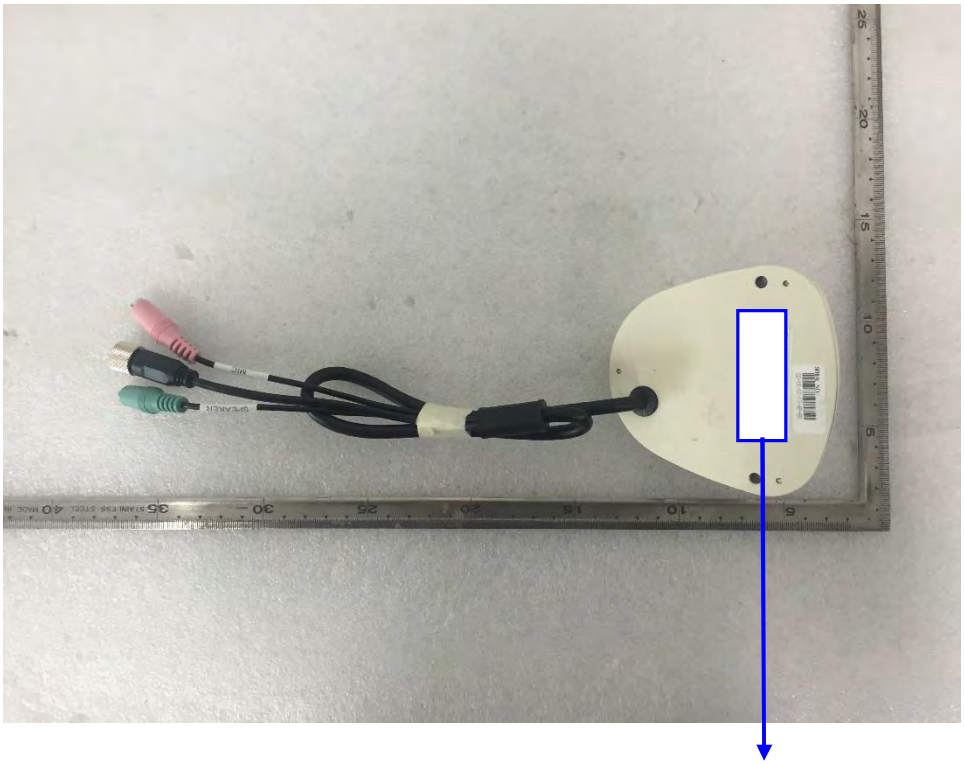


Label and Location



NETWORK CAMERA

Model No : SNV-L6014RM

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

Made in China