



EMC TEST REPORT For CE

Test Report No. : KES-E1-16T0262-R1

Date of Issue : JUN. 22, 2018

Product name : Network Camera

Model/Type No. : SNV-7084R

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. 18, 2016

Test date : MAY. 24, 2016 ~ MAY. 25, 2016

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

Tested by

Dong Il, 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

Test report No.:

KES-E1-16T0262-R1

Page (2) of (93)

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
JUN. 01, 2016	KES-E1-16T0262	Issued
Jun. 22, 2018	KES-E1-16T0262-R1	Re-issue due to manufacturer change

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

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



TABLE OF CONTENTS

1.0	General Product Description	4
1.1	Test Voltage & Frequency	8
1.2	Variant Model Differences.....	8
1.3	Device Modifications	8
1.4	Equipment Under Test.....	8
1.5	Support Equipments	8
1.6	External I/O Cabling	9
1.7	E.U.T Operating Mode(s).....	10
1.8	Configuration.....	11
1.9	Remarks when standards applied	13
1.10	Calibration Details of Equipment Used for Measurement	13
1.11	Test Facility	오류! 책갈피가 정의되어 있지 않습니다.
1.12	Laboratory Accreditations and Listings	오류! 책갈피가 정의되어 있지 않습니다.
2.0	Test Regulations.....	오류! 책갈피가 정의되어 있지 않습니다.
2.1	Conducted Emissions at Mains Power Ports	16
2.2	Conducted Emissions at Telecommunication Ports	17
2.3	Radiated Electric Field Emissions(Below 1 GHz)	18
2.4	Radiated Electric Field Emissions(Above 1 GHz)	19
2.5	Harmonic Current Emissions	20
2.6	Voltage Fluctuations and Flicker	21
3.0	Criteria for compliance	22
3.1	Electrostatic Discharge.....	24
3.2	Radiated Electric Field Immunity	30
3.3	Electrical Fast Transients/Bursts	33
3.4	Surge Transients	36
3.5	Conducted Disturbance	39
3.6	Voltage Dips and Short Interruptions	42
APPENDIX A – TEST DATA.....		44
Conducted Emissions at Mains Power Ports.....		44
Conducted Emissions at Telecommunication Ports		46
Radiated Electric Field Emissions(Below 1 GHz)		52
Radiated Electric Field Emissions(Above 1 GHz).....		54
Harmonic Current Emissions and Voltage Fluctuations and Flicker		66
Test Setup Photos and Configuration		69
Conducted Voltage Emissions		69
Conducted Telecommunication Emissions		70
Radiated Electric Field Emissions(Below 1 GHz)		73
Radiated Electric Field Emissions(Above 1 GHz).....		76
Harmonic Current Emissions and Voltage Fluctuations and Flicker		79
Electrostatic Discharge		79
Radiated Electric Field Immunity		81
Electrical Fast Transients/Bursts.....		83
Surge Transients		85
Conducted Disturbance.....		85
Voltage Dips and Short Interruptions.....		87
EUT External Photographs		88



1.0 General Product Description

Main Specifications of E.U.T are:

Video	
Imaging Device	1/2.8" PS Exmor 3.20M CMOS (IMX124)
Total Pixels	2,065(H) X 1,565(V)
Effective Pixels	2,065(H) X 1,553(V)
Scanning System	Progressive
Min. Illumination	Color : 0.1 Lux (F1.2, 50IRE), 0.01Lux (Sens-up 60x, 50IRE) B/W : 0 Lux (IR LED on)
S / N Ratio	50dB
Video Out	CVBS : 1.0 Vp-p / 75Ω composite, 720x480(N), 720x576(P), for installation - connector type
Lens	
Focal Length (Zoom Ratio)	3 ~ 8.5mm (2.8x) Motorized Varifocal
Max. Aperture Ratio	F1.2
Angular Field of View	H : 100.12°(Wide) ~ 35.38°(Tele) / V : 73.76°(Wide) ~ 26.58°(Tele)
Min. Object Distance	0.5m(1.64ft)
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 ° ~ +355 °
Tilt Range	0 ° ~ +67 °
Rotate Range	0 ° ~ +355 °
Operational	
IR LED	12ea
Viewable Length	25m(82.02ft)
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	Max. 120dB
Contrast Enhancement	SSDR (Samsung Super Dynamic Range) (Off / On)
Digital Noise Reduction	SSNRIII (2D+3D Noise Filter) (Off / On)

**KES Co., Ltd.**

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

Test report No.:

KES-E1-16T0262-R1

Page (5) of (93)

Digital Image Stabilization	Off / On
Defog	Auto/Manual/Off
Motion Detection	Off / On (4 zones with 4 points Polygon)
Privacy Masking	Off / On (32 zones with 4 points of polygon)
Sens-up (Frame Integration)	-
Gain Control	Off / Low / Middle / High
White Balance	ATW / AWC / Manual / Indoor / Outdoor
Electronic Shutter Speed	Minimum / Maximum / Anti flicker (1 ~ 1/12,000sec)
Digital PTZ	-
Flip / Mirror	Off / On
Intelligent Video Analytics	Tampering, Virtual Line, Enter/Exit, Appear / Disappear, Audio Detection, Face Detection with Metadata
Alarm I/O	Input 1ea / Output 1ea
Alarm Triggers	Motion detection, Tampering Detection, Audio Detection, Face Detecton, Video Loss, Video Analytics, Alarm Input
Alarm events	File upload via FTP and E-Mail Notification via E-Mail, TCP and HTTP local storage(SD/SDHC/SDXC) recording at Network disconnected & Event (Alarm Triggers) External output
Network	
Ethernet	RJ-45 (10/100BASE-T)
Video Compression Format	H.264 (MPEG-4 Part 10/AVC), Motion JPEG
Resolution	2048x1536 / 1920x1080 / 1600x1200 / 1280x1024 / 1280x960 / 1280x720 / 1024x768 / 800x600 / 800x450 / 640x480 / 640x360 / 320x240 / 320x180
Max. Framerate	H.264 : 3M Mode Max 30fps@2048x1536 / 1920x1080 / 1600x1200 / 1280x1024 / 1280x960 / 1280x720 / 1024x768 / 800x600 / 800x450 / 640x480 / 640x360 / 320x240 / 320x180 2M Mode Max 60fps @1920x1080 / 1600x1200 / 1280x1024 / 1280x960 / 1280x720 / 1024x768 / 800x600 / 800x450 / 640x480 / 640x360 / 320x240 / 320x180 MJPEG : Max 10fps@2048x 1536 / 1920x1080 / 1600x1200 / 1280x1024 / 1280x960 / 1280x720 / 1024x768 Max 30fps@ 800x600 / 800x450 / 640x480 / 640x360 / 320x240 / 320x180
Smart Codec	Built-in Area-Based : 5EA Face detection Mode
Video Quality Adjustment	H.264 : Compression Level, Target Bitrate Level Control MJPEG : Quality Level Control
Bitrate Control Method	H.264 : CBR or VBR, MJPEG : VBR
Streaming Capability	Multiple Streaming (Up to 10 Profiles)

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



KES Co., Ltd.

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

Test report No.:

KES-E1-16T0262-R1

Page (6) of (93)

Audio I/O	Mic(Line)-in Selectable via UI, Line-out (Mono, 1Vrms) 2.5VDC(4mA) powered 2K Ohm
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

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

**KES Co., Ltd.**

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

Test report No.:

KES-E1-16T0262-R1

Page (7) of (93)

Streaming Method	Unicast / Multicast
Max. User Access	15 users at Unicast Mode
Memory Slot	micro SD/SDHC/SDXC - motion Images recorded in the SDX/SDHC/SD memory card can be downloaded.
Application Programming Interface	ONVIF Profile S SUNAPI(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, Croatian, Hungarian, Greek, Norwegian, Finnish
Web Viewer	Supported OS : Windows XP / VISTA / 7 / 8, MAC OS X 10.7 Supported Browser : Microsoft Internet Explorer (Ver. 10, 9, 8, 7), Mozilla Firefox (Ver. 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 9), Google Chrome (Ver. 25, 24, 23, 22, 21, 20, 19, 18, 17, 16, 15), 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.x
Environmental	
Operating Temperature / Humidity	AC24V : -40°C to +55°C / Less than 90% RH DC12V, PoE (IEEE802.3af) : -10°C to +55°C / Less than 90% RH
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	AC24V, DC12V, PoE(IEEE802.3af class 3)
Power Consumption	Max. 10.5W (DC 12V) Max. 11.5W (PoE) Max. 12.0W(AC24V, Heater Off), Max 15.0W(AC24V, Heater On)
Mechanical	
Color / Material	Ivory / Aluminum
Dimension (WxHxD)	Ø160 x H118.5
Weight	960g

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



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-7084R	-	Tianjin Samsung Techwin Opto-Electronic Co., Ltd.	E.U.T

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
NOTEBOOK	X56K	HN11N5151FJ0045 W	Hansung Computer	-
NOTEBOOK AC/DC ADAPTER	A12-120P1A	F180271552011758	CHICONY POWER TECHNOLOGY CO.,LTD.	-
POE ADAPTER	ANY4805C-LT1	10H300002	ANY ELECTRONICS CO., LTD	-
SPEAKER	BR10000A CUVE	-	BEIJING EDIFIER HI-TECH GROUP.	-
MIC	CMK-303	-	CAMAC	-
Alarm	-	-	-	-
Micro SD Card	-	-	Sandisk	-



1.6 External I/O Cabling

■ AC, DC 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	☐ S ☒ U
	AUDIO	SPEAKER	AUDIO	1.6	☐ S ☒ U
	MIC	MIC	MIC	1.7	☐ S ☒ U
	3PIN	Alarm	3PIN	3.5	☐ S ☒ U
	Micro SD	Micro SD Card	Micro SD	-	☐ S ☐ U

* Unshielded=U, Shielded=S

■ PoE Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
Network Camera (E.U.T)	RJ-45	POE ADAPTER	RJ-45	3.5	☐ S ☒ U
POE ADAPTER	RJ-45	NOTEBOOK	RJ-45	3.5	☐ S ☒ U
Network Camera (E.U.T)	AUDIO	SPEAKER	AUDIO	1.6	☐ S ☒ U
	MIC	MIC	MIC	1.7	☐ S ☒ U
	3PIN	Alarm	3PIN	3.5	☐ S ☒ U
	Micro SD	Micro SD Card	Micro SD	-	☐ S ☐ U

* Unshielded=U, Shielded=S

**KES Co., Ltd.**

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

Test report No.:
KES-E1-16T0262-R1
Page (10) of (93)

1.7 E.U.T Operating Mode(s)

Test mode	operating
AC, DC, POE	E.U.T Monitoring, ping test

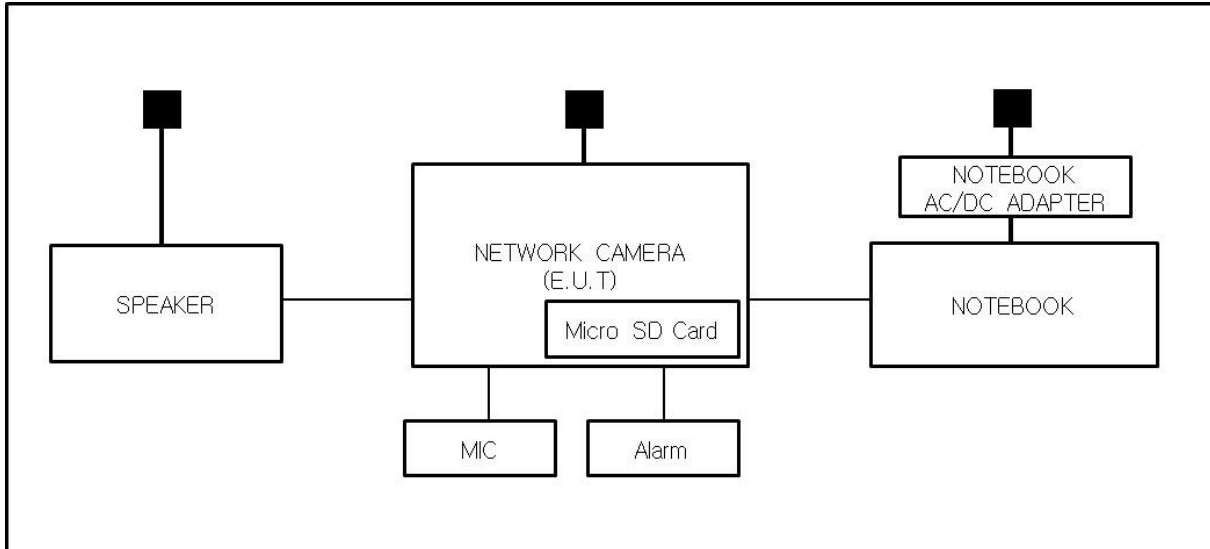
E.U.T Test operating S/W		
Name	Version	Manufacture Company
-	-	-

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

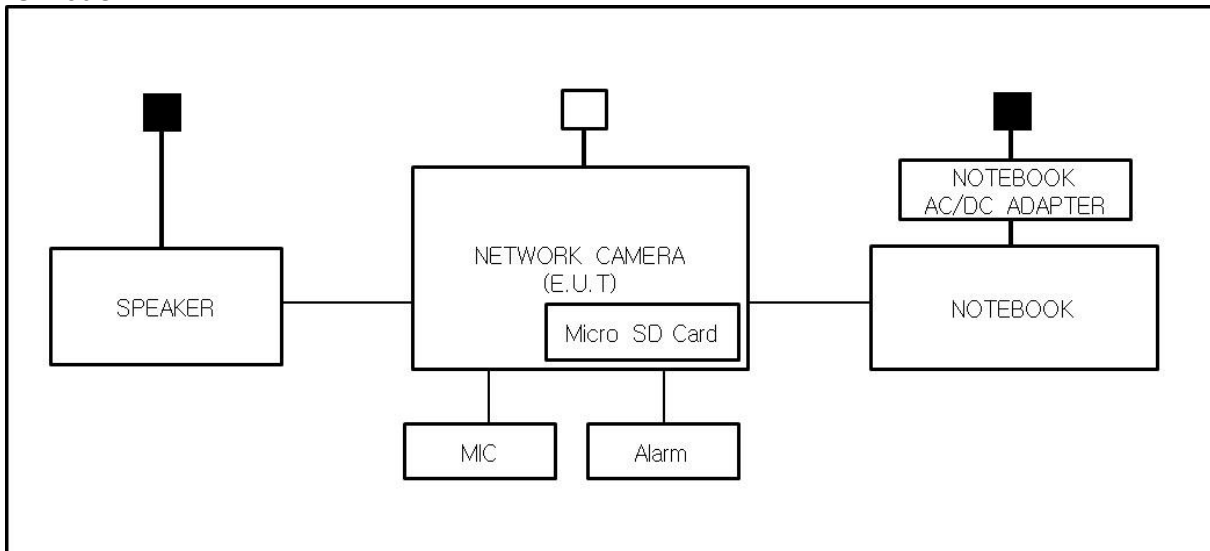
1.8 Configuration

■ AC Main
 □ DC Main

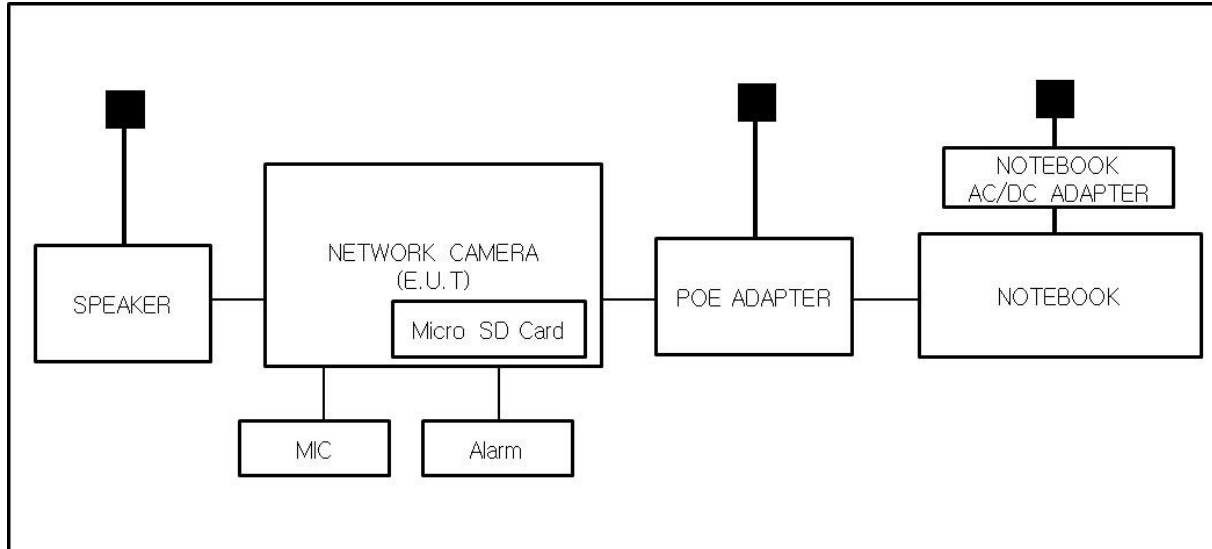
■ AC Mode



■ DC Mode



■ 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

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

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

MAY. 24, 2016

Test Location

Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EMC32	R & S	9.12.00	-
☒	EMI TEST RECEIVER	ESR3	R & S	101781	05, 03, 2017
☒	LISN	ENV216	R & S	101787	02, 04, 2017
☒	LISN	ESH2-Z5	R & S	100450	05, 02, 2017
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 13, 2016

Test Conditions

Temperature: 22,5 °C

Relative Humidity: 48,2 %

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. 24, 2016

Test Location

Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EMC32	R & S	9.12.00	-
☒	EMI TEST RECEIVER	ESR3	R & S	101781	05, 03, 2017
☒	LISN	ENV216	R & S	101787	02, 04, 2017
☒	LISN	ESH2-Z5	R & S	100450	05, 02, 2017
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 13, 2016
☒	8-WIRE ISN CAT3,5	ENY81	R & S	100174	01, 08, 2017
☐	8-WIRE ISN CAT6	ENY81-CAT6	R & S	101665	01, 11, 2017

Test Conditions

Temperature: 22,5 °C

Relative Humidity: 48,2 %

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.



2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

MAY. 24, 2016

Test Location

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

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	-	-	-	-
☒	EMI TEST RECEIVER	ESVS10	R & S	826008/014	04, 18, 2017
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	714	11, 28, 2016

Test Conditions

Temperature: 24,9 °C

Relative Humidity: 50,0 %

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. 24, 2016

Test Location

SEMI ANECHOIC CHAMBER #2

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	e3	AUDIX	8.083b	-
☒	EMI TEST RECEIVER	ESU26	R & S	100552	04, 19, 2017
☒	PREAMPLIFIER	8449B	AGILENT	3008A01729	05, 31, 2017
☐	ATTENUATOR	8491A	HP	35496	03, 24, 2017
☒	LOG-PERIODIC ANTENNA	STLP 9149	SCHWARZBECK	9149-255	05, 17, 2017

Test Conditions

Temperature: 22,9 °C

Relative Humidity: 54,1 %

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

N/A

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☐	EMI Test S/W	dpa.control	EM TEST	5.4.11.0	-
☐	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	08, 09, 2016(H) 08, 08, 2016(F)
☐	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

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



2.6 Voltage Fluctuations and Flicker

Test Date

MAY. 24, 2016

Test Location

Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	dpa.control	EM TEST	5.4.11.0	-
☒	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	08, 09, 2016(H) 08, 08, 2016(F)
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: 22,5 °C

Relative Humidity: 48,2 %

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.

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. 25, 2016

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, 2017
☒	HCP	-	Noise Ken	-	-
☒	VCP	-	Noise Ken	-	-

Test Conditions

Temperature: 22,6 °C
Relative Humidity: 52,7 %
Atmospheric Pressure: 100,0 kPa



KES Co., Ltd.

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

Test report No.:

KES-E1-16T0262-R1

Page (25) of (93)

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

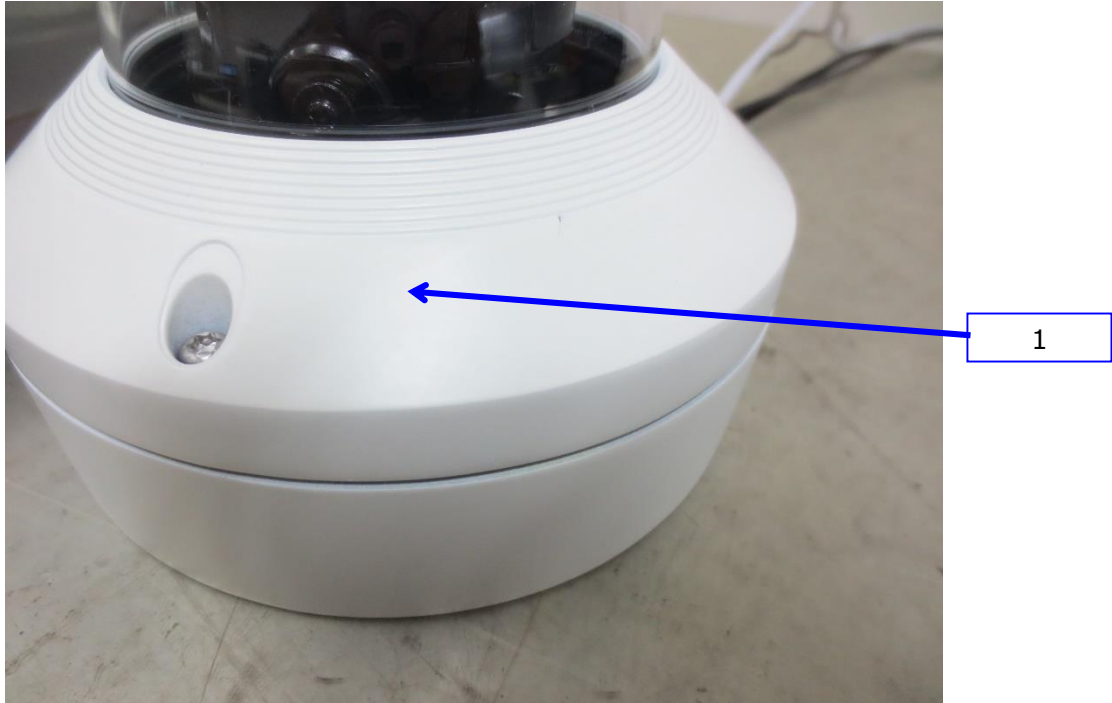
Location of Discharge:

Air	
Contact	

■ AC Mode



■ DC Mode



■ PoE Mode





Test Data

■ AC Mode

Indirect Discharge

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

Direct Discharge

No.	Test Point	Discharge Method	Observations	Remarks
1	Surface	Contact Discharge	Complied	-

■ DC 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	Surface	Contact Discharge	Complied	-

**KES Co., Ltd.**

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

Test report No.:

KES-E1-16T0262-R1

Page (29) of (93)

■ 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	Surface	Contact Discharge	Complied	-

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

Test Results

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

RemarksPASS Required Performance Criteria.

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



3.2 Radiated Electric Field Immunity

Reference Standard

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

Test Date

MAY. 25, 2016

Test Location

EMS-RS: ☒ SEMI ANECHOIC CHAMBER #2

☐ SEMI ANECHOIC CHAMBER #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	KTI_RS2012	KOREA TECHNOLOGY INSTITUTE CO., LTD	2.1.1	-
☒	SIGNAL GENERATOR	ESG-3000A	HP	US37040210	11, 01, 2016
☒	AMPLIFIER	ITA0300-200	Infinitech	-	11, 01, 2016
☒	AMPLIFIER	ITA0750-200	Infinitech	-	11, 01, 2016
☒	AMPLIFIER	ITA1500-100	Infinitech	-	11, 01, 2016
☒	AMPLIFIER	ITA2500-100	Infinitech	-	11, 01, 2016
☒	POWER METER	E4419B	Agilent	MY45101506	06, 26, 2016
☒	AVERAGE POWER SENSOR	E9301A	Agilent	-	06, 26, 2016
☒	AVERAGE POWER SENSOR	E9301A	Agilent	MY41495698	06, 26, 2016
☒	HYBRID LOG-PERIODIC ANTENNA	HLP-2603	TDK	100400	-
☐	AMPLIFIER	TK-PA8/3W	TESTEK	150008	06, 26, 2016
☐	COUPLER	ZARC-25-63-S+	Mini-Circuits	FM14101424	06, 26, 2016
☐	SIGNAL GENERATOR	SMB100A	R & S	108252	08, 07, 2016
☐	LOG-PERIODIC ANTENNA	STLP 9149	SCHWARZBECK	9149-255	05, 17, 2018

Test Conditions

Temperature: 23,1 °C
Relative Humidity: 53,8 %
Atmospheric Pressure: 100,1 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**

■ AC Mode

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

■ DC Mode

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

**KES Co., Ltd.**

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

Test report No.:

KES-E1-16T0262-R1

Page (32) of (93)

■ 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.

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



3.3 Electrical Fast Transients/Bursts

Reference Standard

EN 61000-4-4:2012

Test Date

MAY. 25, 2016

Test Location

EMS-EFT: Electro wave Shieldroom #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	EM TEST	5.3.9	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N5T	EM TEST	P1317117973	02, 08, 2017
☒	MOTOR VARIAC	MV2616	EM TEST	V0936105123	02, 08, 2017
☒	CAPACITIVE COUPLING CLAMP	HFK	EM TEST	070925	06, 26, 2017

Test Conditions

Temperature: 22,6 °C
Relative Humidity: 52,7 %
Atmospheric Pressure: 100,0 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 Mode

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

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
L1 – L2	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	Complied	Complied

■ DC Mode

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

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
L1 – L2	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	Complied	Complied

**KES Co., Ltd.**

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

Test report No.:

KES-E1-16T0262-R1

Page (35) of (93)

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

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

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

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

☒ Signal ports and telecommunication ports – Coupling Clamp used

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

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

Test Results

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

RemarksPASS Required Performance Criteria.

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



3.4 Surge Transients

Reference Standard

EN 61000-4-5:2014

Test Date

MAY. 25, 2016

Test Location

EMS-Surge: Electro wave Shieldroom #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	EM TEST	5.3.9	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N5T	EM TEST	P1317117973	02, 08, 2017
☒	MOTOR VARIAC	MV2616	EM TEST	V0936105123	02, 08, 2017
☐	CDN	CNV 508N1	EM TEST	P1551168979	04, 26, 2017
☐	CDN	CNV 508T5	EM TEST	P1549168422	04, 26, 2017

Test Conditions

Temperature: 22,6 °C
Relative Humidity: 52,7 %
Atmospheric Pressure: 100,0 kPa



Test Specifications

AC Power Lines

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

Surge Amplitude :

Common Mode

☐ (0,5 / 1,0 / 2,0) kV

Differential Mode

☒ (0,5 / 1,0) kV

Number of Surges:

☒ 5 surges per angle

Angle:

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

Polarity:

☒ Positive & Negative

Repetition Rate:

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

Required Performance Criteria: ☒ Complied

Other supply / Signal Lines

Source Impedance: 42 ohm for common mode

Surge Amplitude:

Common Mode

☒ (0,5 / 1,0) kV

Number of Surges:

☒ 5 Surges

Polarity:

☒ Positive & Negative

Repetition Rate:

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

Required Performance Criteria: ☒ Complied



Test Data

■ AC Mode

☒ Line to Earth – Common Mode

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

Signal Lines

☐ Line to Earth – Common Mode

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

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. 25, 2016

Test Location

EMS-CS: Electro wave Shieldroom #3

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, 07, 2016
☒	ATTENUATOR	ATT6	EM TEST	1208-34	08, 07, 2016
☒	CDN	CDN-M2/M3N	EM TEST	0909-06	08, 07, 2016
☒	CDN	CDN T8RJ45	EM TEST	0909-09	08, 07, 2016
☒	EM INJECTION CLAMP	EM 101	Liithi	35943	02, 03, 2017

Test Conditions

Temperature: 22,6 °C
Relative Humidity: 52,7 %
Atmospheric Pressure: 100,0 kPa

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

**Test Data**

■ AC Mode

☒ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
L1 – L2	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	CDN T8RJ45	Complied
Alarm	EM Injection Clamp	Complied

■ DC Mode

☐ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
L1 – L2	CDN (☐ M2, ☐ M3)	-

☒ Input d.c. power ports

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

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
RJ-45	CDN T8RJ45	Complied
Alarm	EM Injection Clamp	Complied

**KES Co., Ltd.**

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

Test report No.:

KES-E1-16T0262-R1

Page (41) of (93)

■ 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	CDN T8RJ45	Complied
Alarm	EM Injection Clamp	Complied

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

Observations:

Complied – No degradation of function

Test Results

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

RemarksPASS Required Performance Criteria.



3.6 Voltage Dips and Short Interruptions

Reference Standard

EN 61000-4-11:2004

Test Date

MAY. 25, 2016

Test Location

EMS-Voltage dip: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	EM TEST	5.3.9	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N5T	EM TEST	P1317117973	02, 08, 2017
☒	MOTOR VARIAC	MV2616	EM TEST	V0936105123	02, 08, 2017

Test Conditions

Temperature: 22,6 °C
Relative Humidity: 52,7 %
Atmospheric Pressure: 100,0 kPa



Test Specifications & Observations/Remarks

■ AC Mode

(Test Voltage : 230V)

<u>Test Level</u>	<u>Duration [in period/ms (50 Hz)]</u>	<u>Results</u>
☒ 20 % dip	☒ 250 / 5 000	Complied
☒ 30 % dip	☒ 25 / 500	Complied
☒ 60 % dip	☒ 10 / 200	Complied
☒ 100 % dip	☒ 250 / 5 000	Complied

- Voltage variations

☒ Unom + 10 %	☒ 253.0 V (ac)	Complied
☒ Unom - 15 %	☒ 195.5 V (ac)	Complied

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 / AC Adaptor



APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

[HOT]

Common Information

Test Description:

Conducted Emission

Model No.:

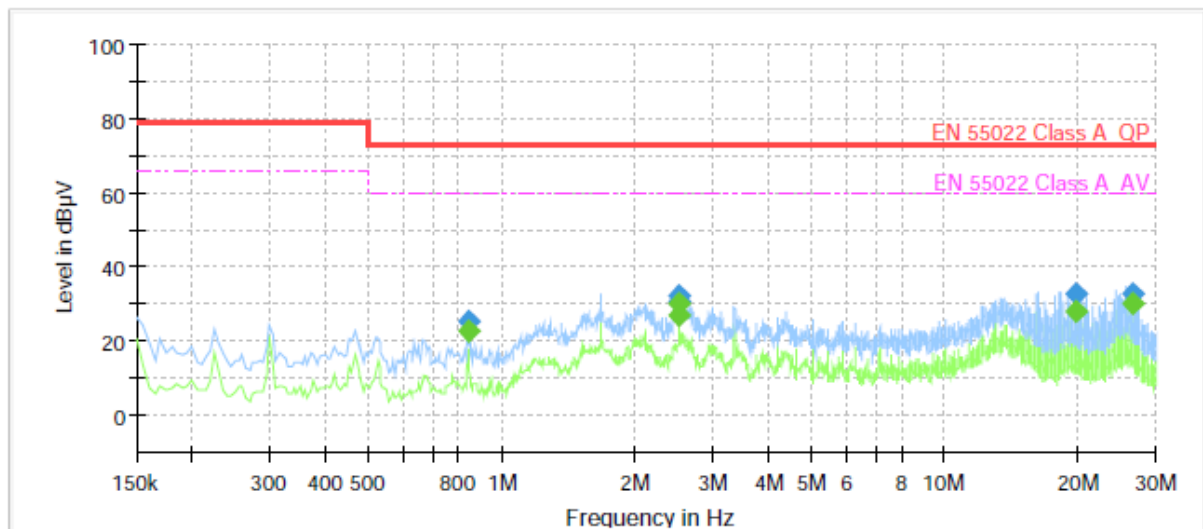
SNV-7084RP

Mode

AC

Operator Name:

KES



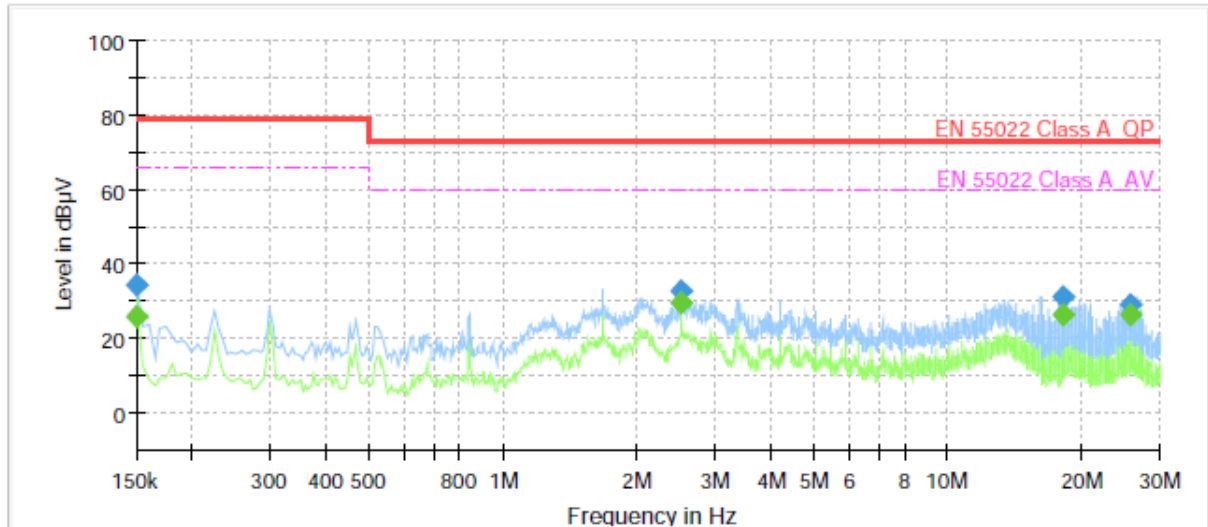
Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.840000	---	22.64	60.00	37.36	1000.0	9.000	L1	20.0
0.840000	25.33	---	73.00	47.67	1000.0	9.000	L1	20.0
2.515000	---	27.03	60.00	32.97	1000.0	9.000	L1	20.2
2.515000	30.50	---	73.00	42.50	1000.0	9.000	L1	20.2
2.520000	---	30.29	60.00	29.71	1000.0	9.000	L1	20.2
2.520000	32.53	---	73.00	40.47	1000.0	9.000	L1	20.2
19.710000	---	28.34	60.00	31.66	1000.0	9.000	L1	20.3
19.710000	33.05	---	73.00	39.95	1000.0	9.000	L1	20.3
26.610000	---	30.03	60.00	29.97	1000.0	9.000	L1	20.4
26.610000	32.59	---	73.00	40.41	1000.0	9.000	L1	20.4

[NEUTRAL]

Common Information

Test Description: Conducted Emission
Model No.: SNV-7084RP
Mode: AC
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.150000	---	25.78	66.00	40.22	1000.0	9.000	N	19.5
0.150000	34.56	---	79.00	44.44	1000.0	9.000	N	19.5
2.520000	---	29.84	60.00	30.16	1000.0	9.000	N	20.2
2.520000	32.76	---	73.00	40.24	1000.0	9.000	N	20.2
18.245000	---	26.57	60.00	33.43	1000.0	9.000	N	20.3
18.245000	31.00	---	73.00	42.00	1000.0	9.000	N	20.3
25.875000	---	26.52	60.00	33.48	1000.0	9.000	N	20.5
25.875000	29.12	---	73.00	43.88	1000.0	9.000	N	20.5

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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



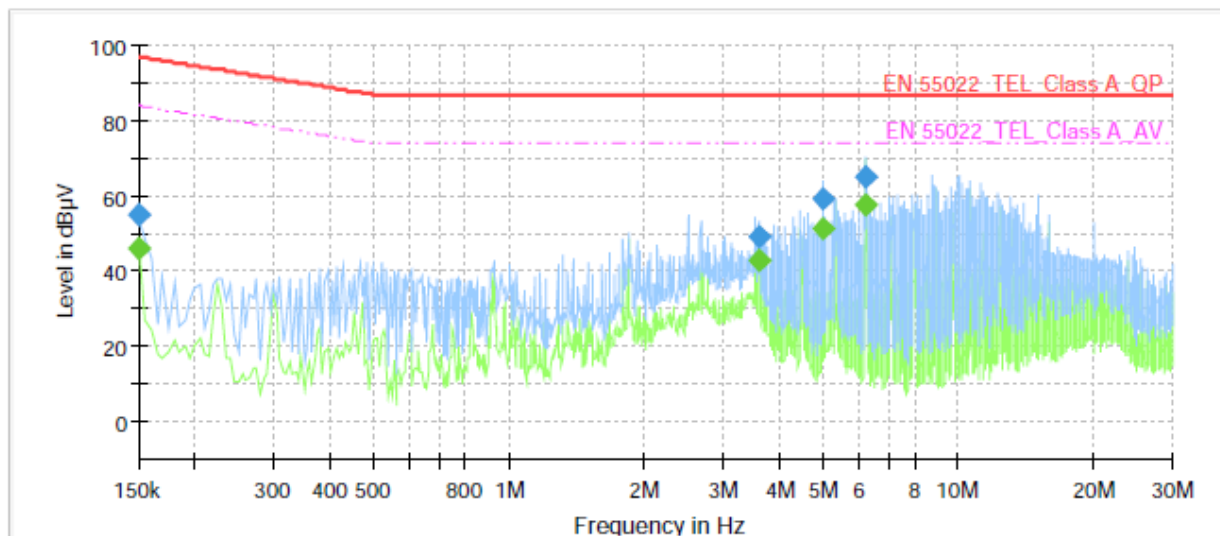
Conducted Emissions at Telecommunication Ports

■ AC Mode

[10 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: SNV-7084RP
Mode: AC CAT3
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.150000	---	46.19	84.00	37.81	1000.0	9.000	Single Line	19.8
0.150000	55.13	---	97.00	41.87	1000.0	9.000	Single Line	19.8
3.585000	---	42.69	74.00	31.31	1000.0	9.000	Single Line	19.8
3.585000	49.44	---	87.00	37.56	1000.0	9.000	Single Line	19.8
5.000000	---	51.18	74.00	22.82	1000.0	9.000	Single Line	19.5
5.000000	59.15	---	87.00	27.85	1000.0	9.000	Single Line	19.5
6.250000	---	57.44	74.00	16.56	1000.0	9.000	Single Line	19.4
6.250000	64.97	---	87.00	22.03	1000.0	9.000	Single Line	19.4



KES Co., Ltd.

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

Test report No.:

KES-E1-16T0262-R1

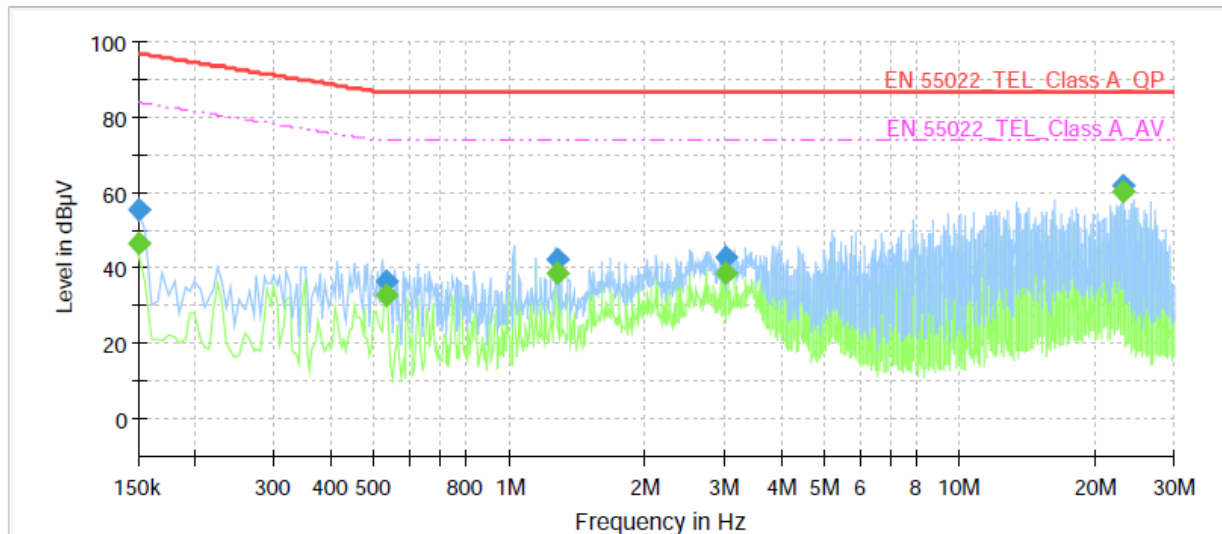
Page (47) of (93)

[100 Mbps]

Common Information

Test Description:
Model No.:
Mode
Operator Name:

Telecommunication Emission
SNV-7084RP
AC CAT5
KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.150000	---	46.59	84.00	37.41	1000.0	9.000	Single Line	20.1
0.150000	55.44	---	97.00	41.56	1000.0	9.000	Single Line	20.1
0.535000	---	32.84	74.00	41.16	1000.0	9.000	Single Line	20.0
0.535000	36.66	---	87.00	50.34	1000.0	9.000	Single Line	20.0
1.270000	---	38.71	74.00	35.29	1000.0	9.000	Single Line	20.2
1.270000	42.25	---	87.00	44.75	1000.0	9.000	Single Line	20.2
3.010000	---	38.59	74.00	35.41	1000.0	9.000	Single Line	20.2
3.010000	42.71	---	87.00	44.29	1000.0	9.000	Single Line	20.2
23.130000	---	60.23	74.00	13.77	1000.0	9.000	Single Line	20.6
23.130000	61.84	---	87.00	25.16	1000.0	9.000	Single Line	20.6

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



KES Co., Ltd.

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

Test report No.:

KES-E1-16T0262-R1

Page (48) of (93)

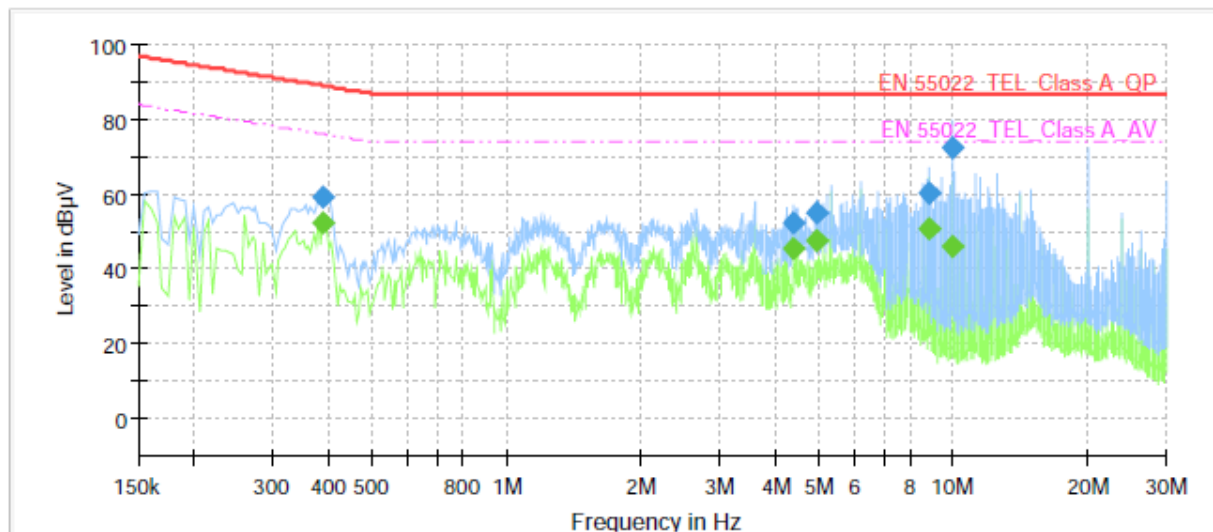
■ DC Mode

[10 Mbps]

Common Information

Test Description:
Model No.:
Mode
Operator Name:

Telecommunication Emission
SNV-7084RP
DC CAT3
KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.390000	---	52.14	76.06	23.92	1000.0	9.000	Single Line	19.6
0.390000	59.34	---	89.06	29.72	1000.0	9.000	Single Line	19.6
4.400000	---	45.53	74.00	28.47	1000.0	9.000	Single Line	19.6
4.400000	52.44	---	87.00	34.56	1000.0	9.000	Single Line	19.6
4.950000	---	47.87	74.00	26.13	1000.0	9.000	Single Line	19.5
4.950000	55.31	---	87.00	31.69	1000.0	9.000	Single Line	19.5
8.805000	---	50.92	74.00	23.08	1000.0	9.000	Single Line	19.6
8.805000	60.31	---	87.00	26.69	1000.0	9.000	Single Line	19.6
9.995000	---	46.14	74.00	27.86	1000.0	9.000	Single Line	19.8
9.995000	72.37	---	87.00	14.63	1000.0	9.000	Single Line	19.8

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



KES Co., Ltd.

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

Test report No.:

KES-E1-16T0262-R1

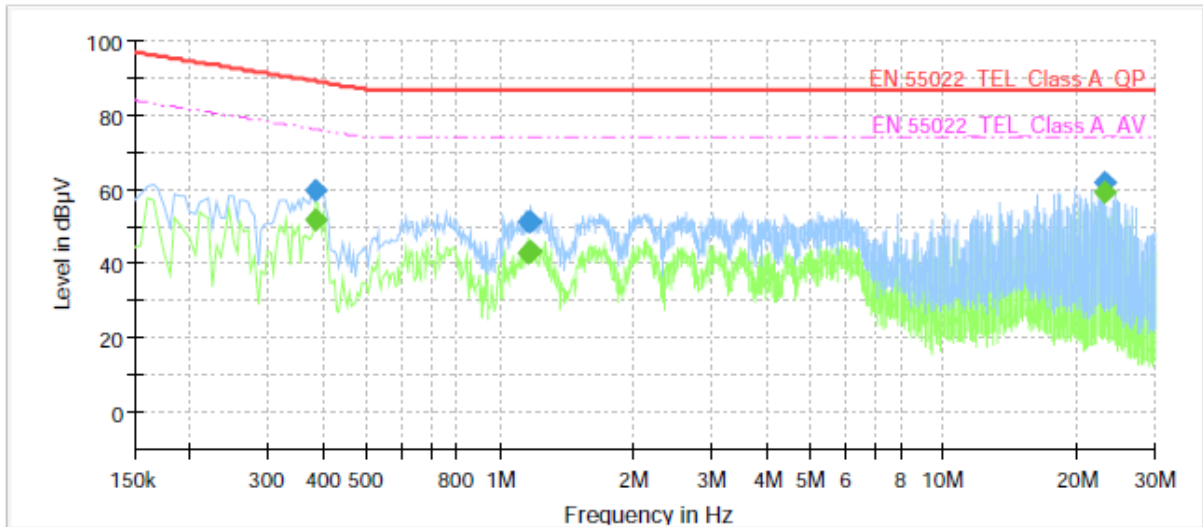
Page (49) of (93)

[100 Mbps]

Common Information

Test Description:
Model No.:
Mode
Operator Name:

Telecommunication Emission
SNV-7084RP
DC CAT5
KES



Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.385000	---	51.75	76.17	24.42	1000.0	9.000	Single Line	19.9
0.385000	59.58	---	89.17	29.59	1000.0	9.000	Single Line	19.9
1.160000	---	42.68	74.00	31.32	1000.0	9.000	Single Line	20.2
1.160000	51.38	---	87.00	35.62	1000.0	9.000	Single Line	20.2
1.175000	---	43.64	74.00	30.36	1000.0	9.000	Single Line	20.2
1.175000	51.61	---	87.00	35.39	1000.0	9.000	Single Line	20.2
23.130000	---	59.35	74.00	14.65	1000.0	9.000	Single Line	20.6
23.130000	62.03	---	87.00	24.97	1000.0	9.000	Single Line	20.6

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



KES Co., Ltd.

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

Test report No.:

KES-E1-16T0262-R1

Page (50) of (93)

■ PoE Mode

[10 Mbps]

Common Information

Test Description:

Telecommunication Emission

Model No.:

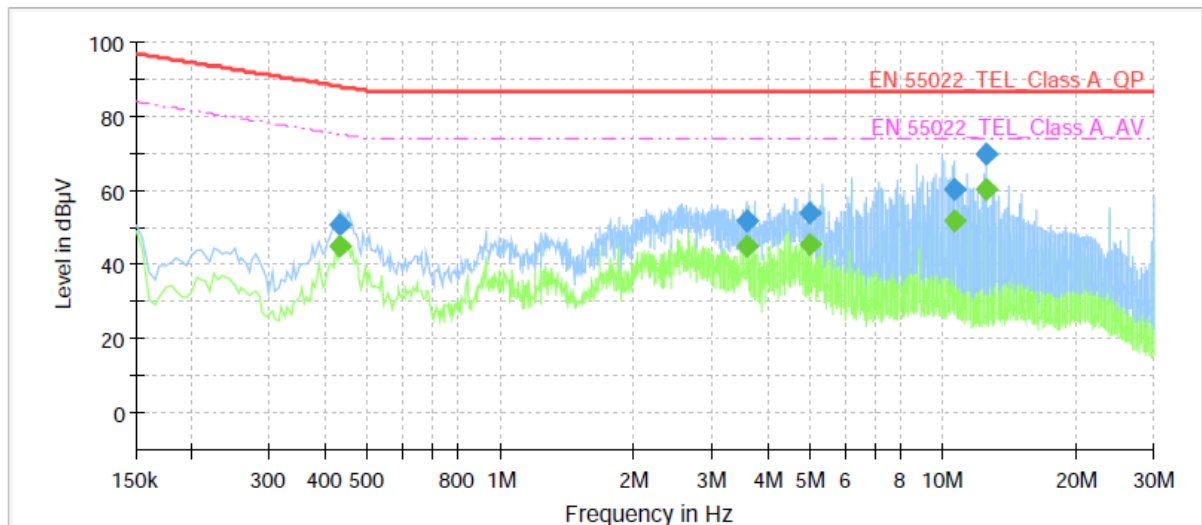
SNV-7084RP

Mode

POE CAT3

Operator Name:

KES



Final Result

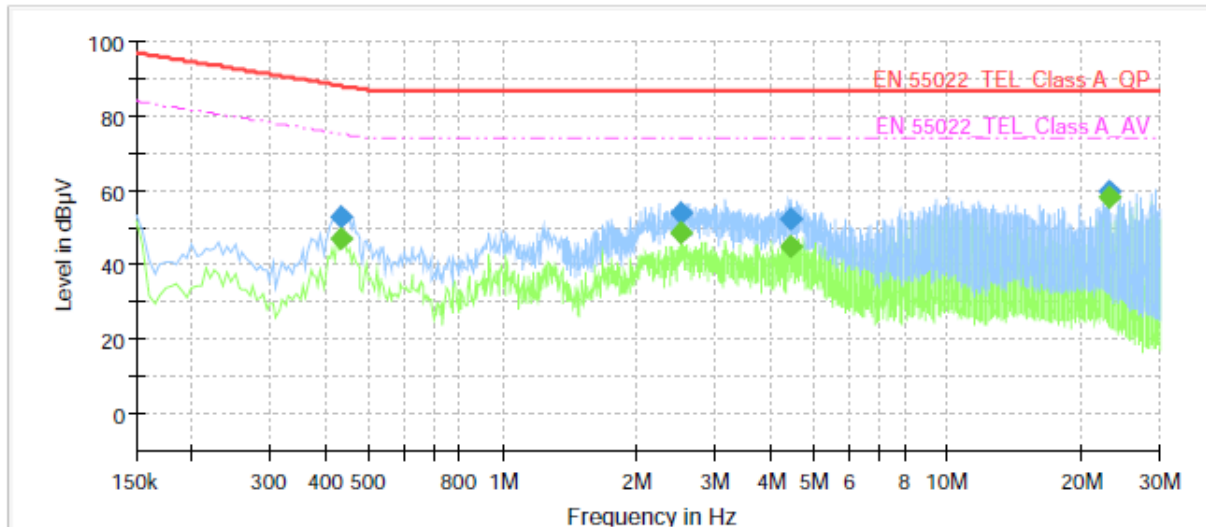
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.435000	---	44.87	75.16	30.29	1000.0	9.000	Single Line	19.6
0.435000	51.06	---	88.16	37.10	1000.0	9.000	Single Line	19.6
3.585000	---	44.79	74.00	29.21	1000.0	9.000	Single Line	19.8
3.585000	51.67	---	87.00	35.33	1000.0	9.000	Single Line	19.8
5.005000	---	45.75	74.00	28.25	1000.0	9.000	Single Line	19.5
5.005000	53.84	---	87.00	33.16	1000.0	9.000	Single Line	19.5
10.600000	---	52.12	74.00	21.88	1000.0	9.000	Single Line	19.8
10.600000	60.51	---	87.00	26.49	1000.0	9.000	Single Line	19.8
12.500000	---	60.41	74.00	13.59	1000.0	9.000	Single Line	19.9
12.500000	69.70	---	87.00	17.30	1000.0	9.000	Single Line	19.9

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

[100 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	SNV-7084RP
Mode	POE CAT5
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.435000	---	46.86	75.16	28.30	1000.0	9.000	Single Line	19.9
0.435000	52.91	---	88.16	35.25	1000.0	9.000	Single Line	19.9
2.520000	---	48.88	74.00	25.12	1000.0	9.000	Single Line	20.2
2.520000	54.10	---	87.00	32.90	1000.0	9.000	Single Line	20.2
4.455000	---	45.19	74.00	28.81	1000.0	9.000	Single Line	19.9
4.455000	52.65	---	87.00	34.35	1000.0	9.000	Single Line	19.9
23.130000	---	58.48	74.00	15.52	1000.0	9.000	Single Line	20.6
23.130000	59.56	---	87.00	27.44	1000.0	9.000	Single Line	20.6

◆ 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))

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

■ AC Mode

Frequency	Amplitude	ANT Polar. (H/V)	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin [dB]
[MHz]	[dB μ V]		[m]	ANT. [dB/m]	Cable [dB]	[dB μ V/m]	[dB μ V/m]	
155.06	15.80	V	1.00	8.05	3.51	27.36	40.00	12.64
224.84	11.40	H	4.00	12.15	4.31	27.86	40.00	12.14
274.39	13.30	V	1.00	12.94	4.81	31.05	47.00	15.95
324.80	14.20	H	4.00	13.96	5.28	33.44	47.00	13.56
399.56	12.70	V	1.00	15.60	6.17	34.47	47.00	12.53
666.00	13.70	V	1.00	19.54	8.20	41.44	47.00	5.56

* H : Horizontal, V : Vertical

■ DC Mode

Frequency	Amplitude	ANT Polar. (H/V)	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin [dB]
[MHz]	[dB μ V]		[m]	ANT. [dB/m]	Cable [dB]	[dB μ V/m]	[dB μ V/m]	
174.29	13.20	H	4.00	8.93	3.72	25.85	40.00	14.15
324.74	16.50	V	1.00	13.96	5.28	35.74	47.00	11.26
375.30	12.90	H	4.00	15.07	5.87	33.84	47.00	13.16
524.69	8.90	H	4.00	17.84	7.16	33.90	47.00	13.10
540.13	9.80	V	1.00	18.14	7.29	35.23	47.00	11.77
666.01	16.00	V	1.00	19.54	8.20	43.74	47.00	3.26

* H : Horizontal, V : Vertical

**KES Co., Ltd.**

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

Test report No.:

KES-E1-16T0262-R1

Page (53) of (93)

■ PoE Mode

Frequency	Amplitude	ANT Polar. (H/V)	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin [dB]
[MHz]	[dB μ V]		[m]	ANT. [dB/m]	Cable [dB]	[dB μ V/m]	[dB μ V/m]	
224.87	15.60	H	4.00	12.15	4.31	32.06	40.00	7.94
274.36	16.20	H	4.00	12.94	4.81	33.95	47.00	13.05
299.53	15.90	H	4.00	13.41	5.01	34.32	47.00	12.68
324.78	17.00	H	3.86	13.96	5.28	36.24	47.00	10.76
375.20	13.30	H	4.00	15.07	5.87	34.24	47.00	12.76
666.00	15.30	V	1.00	19.54	8.20	43.04	47.00	3.96

* H : Horizontal, V : Vertical

◆ Calculation

Result(QP) [dB(μ V/m)] = (Reading(QP)[dB(μ V)] + c.f[dB(1/m)])Margin(QP)[dB] = Limit[dB(μ V/m)] - Result(QP) [dB(μ V/m)]

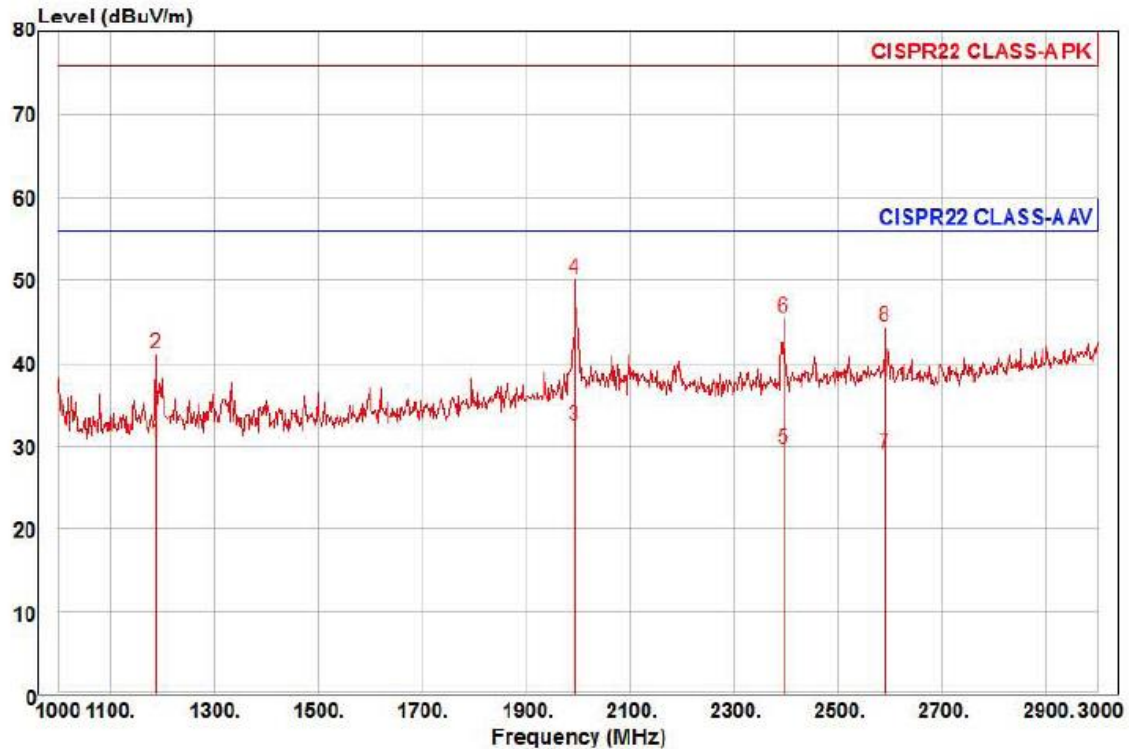
Reading(QP) : Reading value, Result(QP) : Reading value + Factor value

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



Radiated Electric Field Emissions(Above 1 GHz)

■ AC Mode



Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNV-7084RP
Mode : AC
Memo :

	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	1188.00	35.93	23.07	7.24	35.89	290	56.00	-25.65	horizontal Average
2	1188.00	46.80	23.07	7.24	35.89	290	76.00	-34.78	horizontal Peak
3 pp	1994.00	31.37	25.99	9.63	34.54	20	56.00	-23.55	horizontal Average
4 pk	1994.00	49.17	25.99	9.63	34.54	20	76.00	-25.75	horizontal Peak
5	2396.00	26.03	27.21	10.58	34.26	283	56.00	-26.44	horizontal Average
6	2396.00	41.92	27.21	10.58	34.26	283	76.00	-30.55	horizontal Peak
7	2590.00	24.31	27.93	11.04	34.12	299	56.00	-26.84	horizontal Average
8	2590.00	39.55	27.93	11.04	34.12	299	76.00	-31.60	horizontal Peak



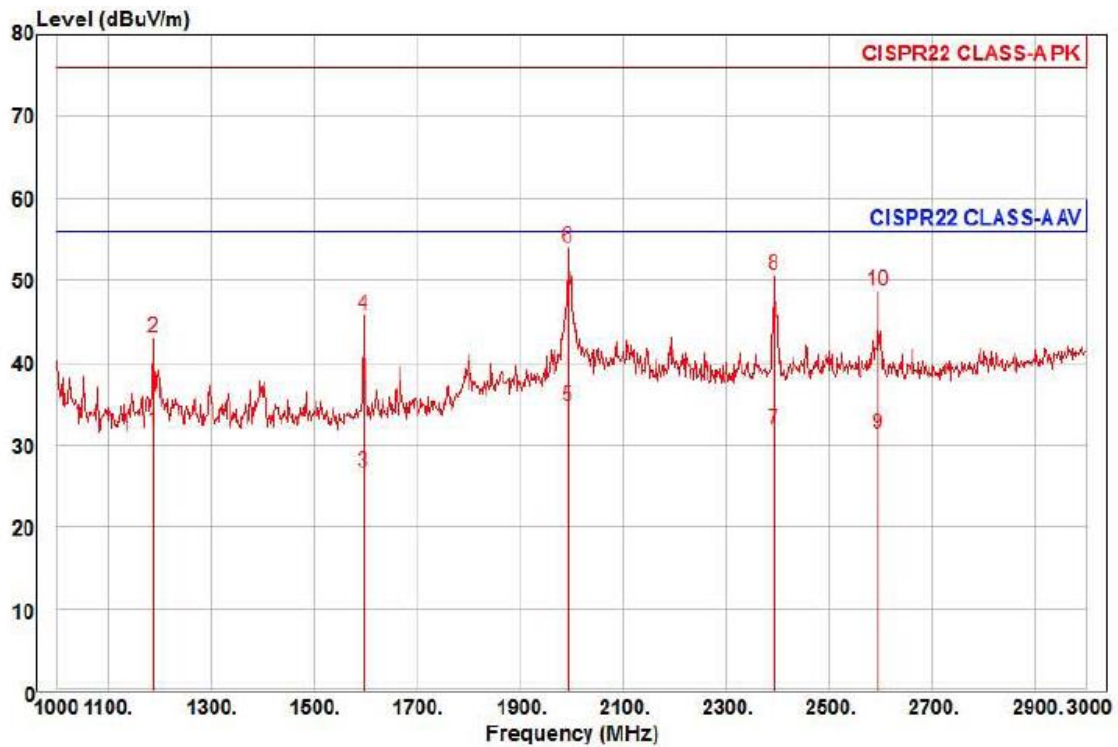
KES Co., Ltd.

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

Test report No.:

KES-E1-16T0262-R1

Page (55) of (93)



Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNV-7084RP
Mode : AC
Memo :

	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	1188.00	37.26	23.07	7.24	35.89	191	56.00	-24.32	vertical	Average
2	1188.00	48.60	23.07	7.24	35.89	191	76.00	-32.98	vertical	Peak
3	1596.00	29.02	24.40	8.49	35.20	326	56.00	-29.29	vertical	Average
4	1596.00	48.16	24.40	8.49	35.20	326	76.00	-30.15	vertical	Peak
5 pp	1994.00	33.56	25.99	9.63	34.54	357	56.00	-21.36	vertical	Average
6 pk	1994.00	52.96	25.99	9.63	34.54	357	76.00	-21.96	vertical	Peak
7	2392.00	28.41	27.20	10.58	34.26	336	56.00	-24.07	vertical	Average
8	2392.00	47.23	27.20	10.58	34.26	336	76.00	-25.25	vertical	Peak
9	2596.00	26.43	27.95	11.05	34.12	354	56.00	-24.69	vertical	Average
10	2596.00	43.96	27.95	11.05	34.12	354	76.00	-27.16	vertical	Peak

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



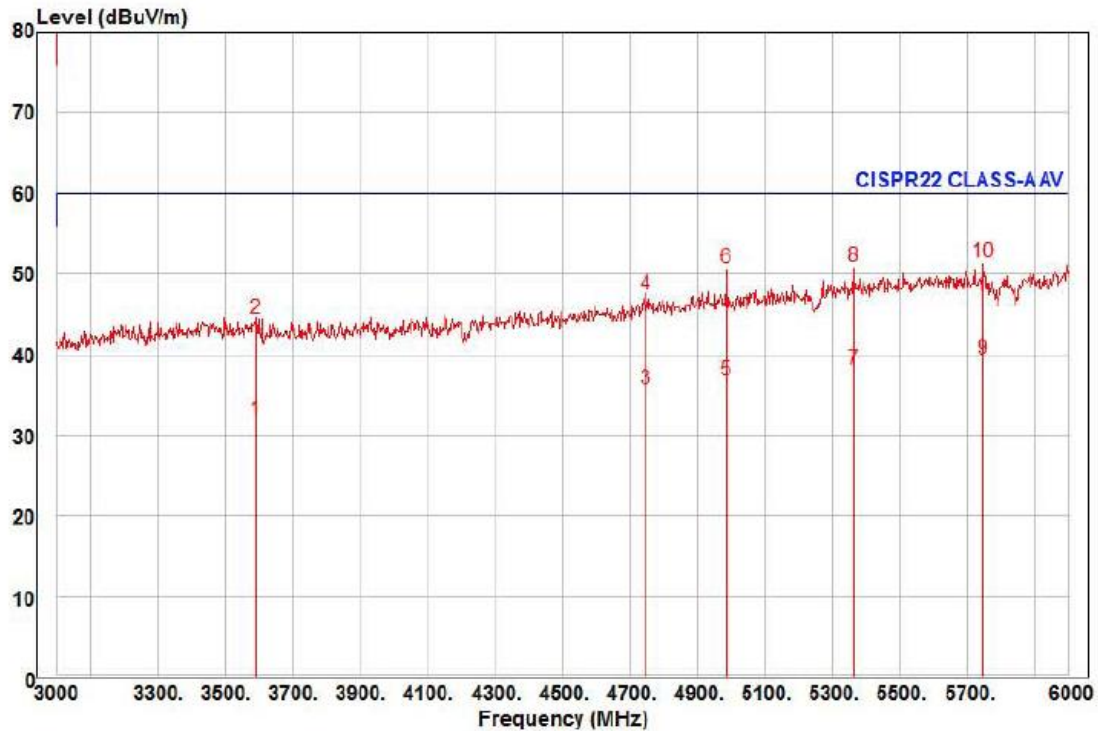
KES Co., Ltd.

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

Test report No.:

KES-E1-16T0262-R1

Page (56) of (93)



Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNV-7084RP
Mode : AC
Memo :

	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	3588.00	21.77	31.39	13.26	34.50	119	60.00	-28.08	horizontal	Average
2	3588.00	34.22	31.39	13.26	34.50	119	80.00	-35.63	horizontal	Peak
3	4749.00	21.17	32.88	15.41	33.65	134	60.00	-24.19	horizontal	Average
4	4749.00	32.77	32.88	15.41	33.65	134	80.00	-32.59	horizontal	Peak
5	4986.00	20.97	33.38	15.74	33.23	71	60.00	-23.14	horizontal	Average
6	4986.00	34.91	33.38	15.74	33.23	71	80.00	-29.20	horizontal	Peak
7	5364.00	20.25	34.84	16.38	33.26	273	60.00	-21.79	horizontal	Average
8	5364.00	32.98	34.84	16.38	33.26	273	80.00	-29.06	horizontal	Peak
9 pp	5748.00	20.06	35.74	16.97	33.31	65	60.00	-20.54	horizontal	Average
10 pk	5748.00	31.95	35.74	16.97	33.31	65	80.00	-28.65	horizontal	Peak

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



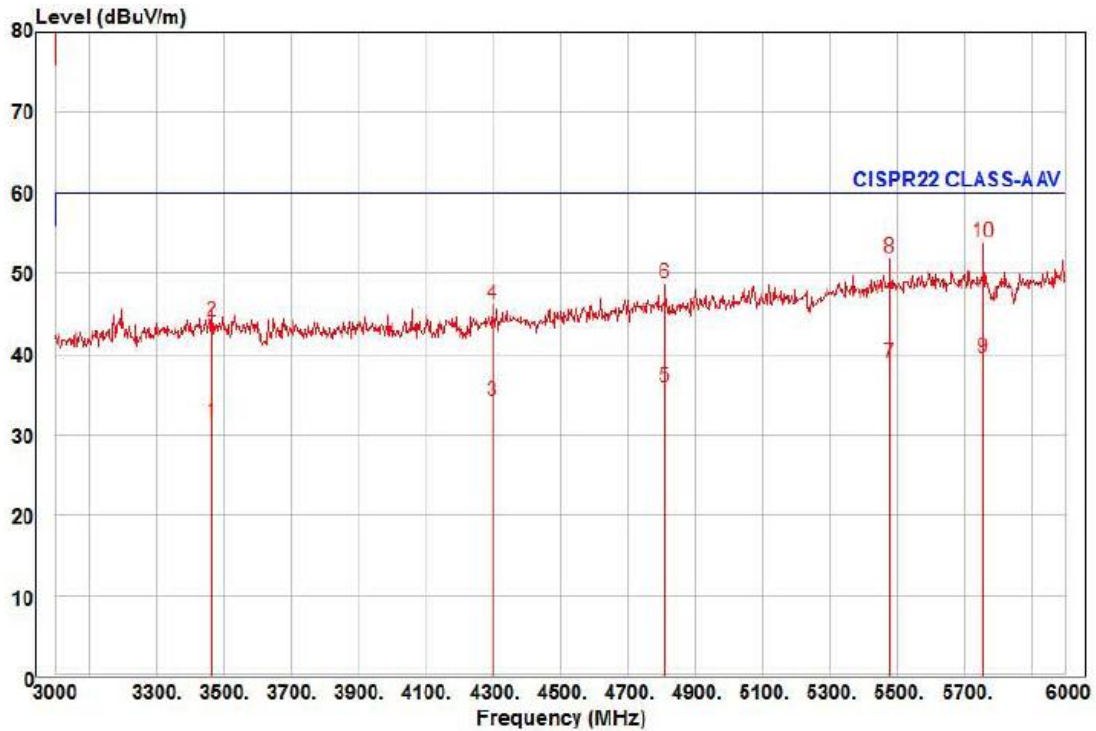
KES Co., Ltd.

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

Test report No.:

KES-E1-16T0262-R1

Page (57) of (93)



Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNV-7084RP
Mode : AC
Memo :

		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	3465.00	21.75	31.05	13.10	34.37	91	60.00	-28.47	vertical	Average
2	3465.00	34.27	31.05	13.10	34.37	91	80.00	-35.95	vertical	Peak
3	4296.00	21.62	32.42	14.60	34.45	338	60.00	-25.81	vertical	Average
4	4296.00	33.59	32.42	14.60	34.45	338	80.00	-33.84	vertical	Peak
5	4812.00	20.90	33.02	15.53	33.54	96	60.00	-24.09	vertical	Average
6	4812.00	33.71	33.02	15.53	33.54	96	80.00	-31.28	vertical	Peak
7	5478.00	20.37	35.28	16.58	33.28	311	60.00	-21.05	vertical	Average
8	5478.00	33.29	35.28	16.58	33.28	311	80.00	-28.13	vertical	Peak
9 pp	5757.00	20.08	35.76	16.99	33.32	28	60.00	-20.49	vertical	Average
10 pk	5757.00	34.37	35.76	16.99	33.32	28	80.00	-26.20	vertical	Peak

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



KES Co., Ltd.

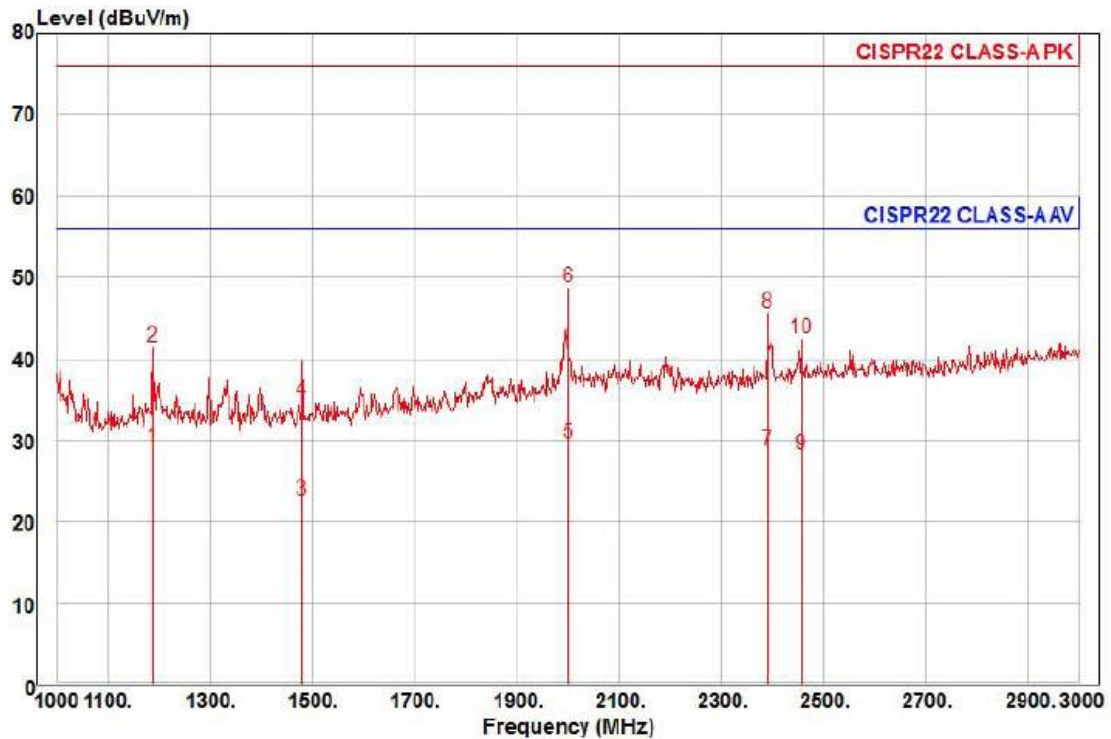
3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Test report No.:

KES-E1-16T0262-R1

Page (58) of (93)

DC Mode



Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNV-7084RP
Mode : DC
Memo :

	Freq	Read Level	Ant Factor	Cable Loss	Preamplifier	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1188.00	34.76	23.07	7.24	35.89	343	56.00	-26.82	horizontal	Average
2	1188.00	47.07	23.07	7.24	35.89	343	76.00	-34.51	horizontal	Peak
3	1480.00	26.01	23.96	8.16	35.40	233	56.00	-33.27	horizontal	Average
4	1480.00	38.20	23.96	8.16	35.40	233	76.00	-41.08	horizontal	Peak
5 pp	2000.00	28.49	26.01	9.65	34.53	318	56.00	-26.38	horizontal	Average
6 pk	2000.00	47.69	26.01	9.65	34.53	318	76.00	-27.18	horizontal	Peak
7	2390.00	25.34	27.20	10.57	34.26	297	56.00	-27.15	horizontal	Average
8	2390.00	42.09	27.20	10.57	34.26	297	76.00	-30.40	horizontal	Peak
9	2456.00	24.41	27.40	10.73	34.22	293	56.00	-27.68	horizontal	Average
10	2456.00	38.58	27.40	10.73	34.22	293	76.00	-33.51	horizontal	Peak

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



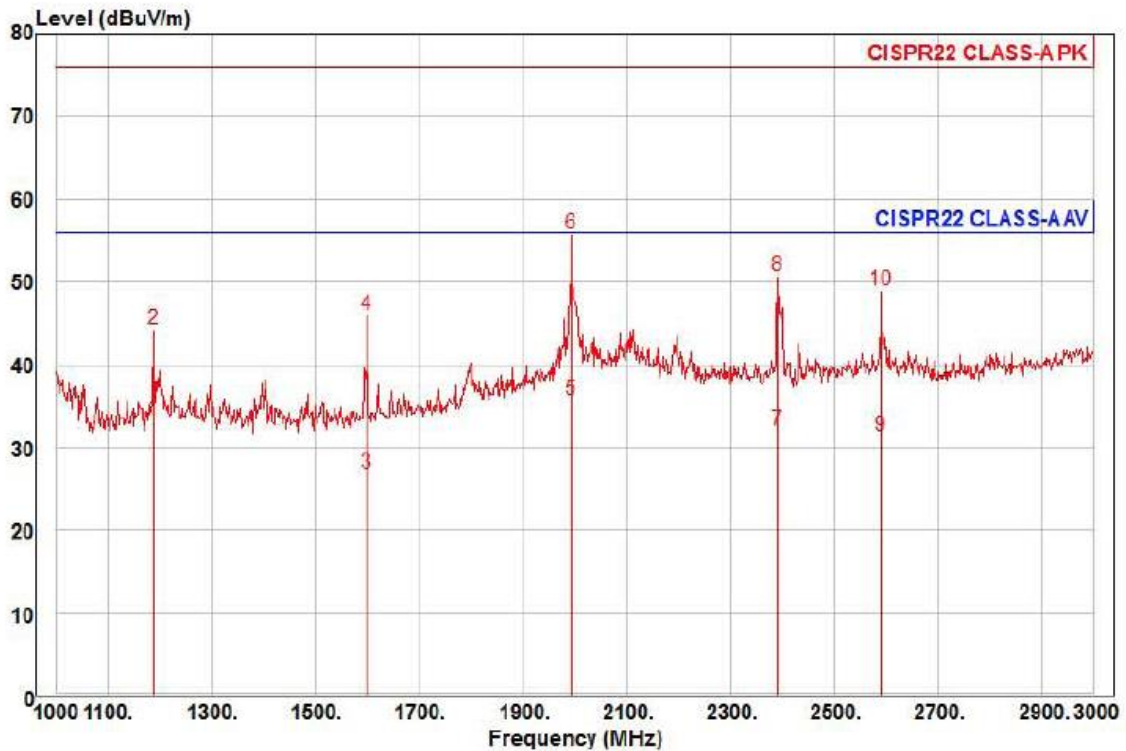
KES Co., Ltd.

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

Test report No.:

KES-E1-16T0262-R1

Page (59) of (93)



Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNV-7084RP
Mode : DC
Memo :

	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	1188.00	38.96	23.07	7.24	35.89	178	56.00	-22.62	vertical	Average
2	1188.00	49.92	23.07	7.24	35.89	178	76.00	-31.66	vertical	Peak
3	1598.00	29.13	24.41	8.50	35.20	324	56.00	-29.16	vertical	Average
4	1598.00	48.23	24.41	8.50	35.20	324	76.00	-30.06	vertical	Peak
5 av	1992.00	34.59	25.98	9.62	34.54	318	56.00	-20.35	vertical	Average
6 pp	1992.00	54.65	25.98	9.62	34.54	318	76.00	-20.29	vertical	Peak
7	2390.00	28.60	27.20	10.57	34.26	353	56.00	-23.89	vertical	Average
8	2390.00	47.25	27.20	10.57	34.26	353	76.00	-25.24	vertical	Peak
9	2590.00	26.59	27.93	11.04	34.12	259	56.00	-24.56	vertical	Average
10	2590.00	44.13	27.93	11.04	34.12	259	76.00	-27.02	vertical	Peak

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



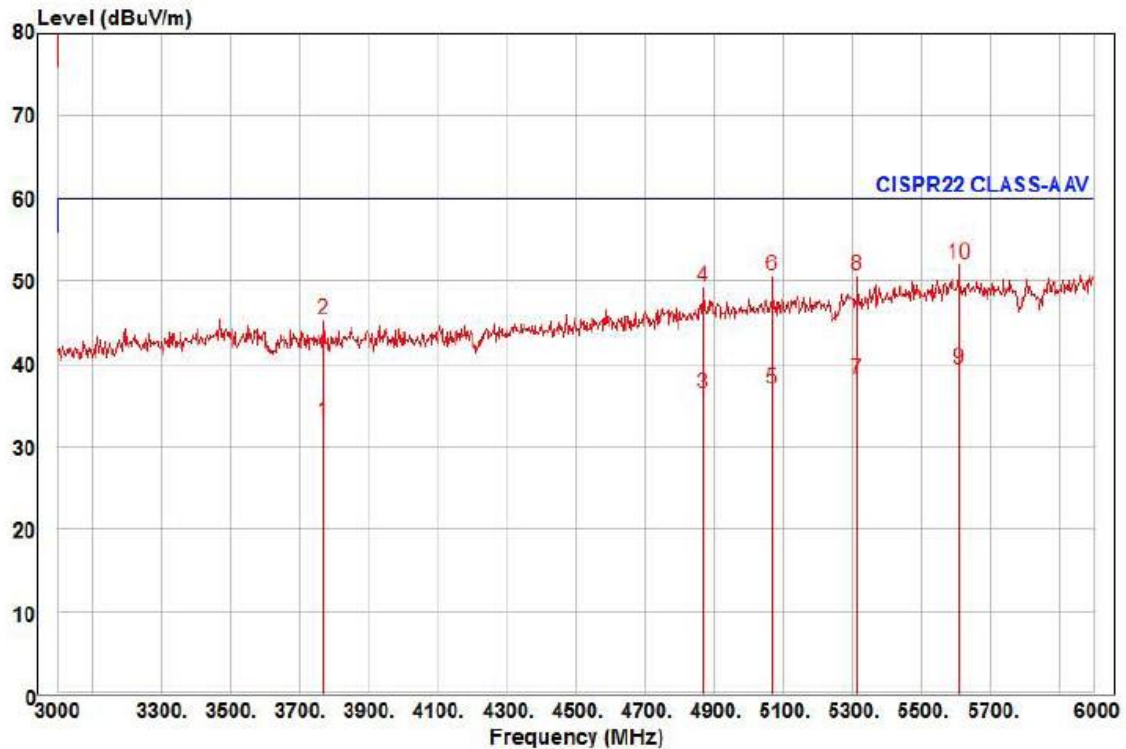
KES Co., Ltd.

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

Test report No.:

KES-E1-16T0262-R1

Page (60) of (93)



Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNV-7084RP
Mode : DC
Memo :

		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	3768.00	22.19	31.87	13.58	34.71	56	60.00	-27.07	horizontal	Average
2	3768.00	34.66	31.87	13.58	34.71	56	80.00	-34.60	horizontal	Peak
3	4869.00	21.08	33.13	15.60	33.44	315	60.00	-23.63	horizontal	Average
4	4869.00	34.03	33.13	15.60	33.44	315	80.00	-30.68	horizontal	Peak
5	5070.00	20.71	33.68	15.87	33.22	311	60.00	-22.96	horizontal	Average
6	5070.00	34.45	33.68	15.87	33.22	311	80.00	-29.22	horizontal	Peak
7	5316.00	20.41	34.65	16.29	33.25	297	60.00	-21.90	horizontal	Average
8	5316.00	32.99	34.65	16.29	33.25	297	80.00	-29.32	horizontal	Peak
9 pp	5610.00	20.36	35.53	16.78	33.30	58	60.00	-20.63	horizontal	Average
10 pk	5610.00	33.15	35.53	16.78	33.30	58	80.00	-27.84	horizontal	Peak

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



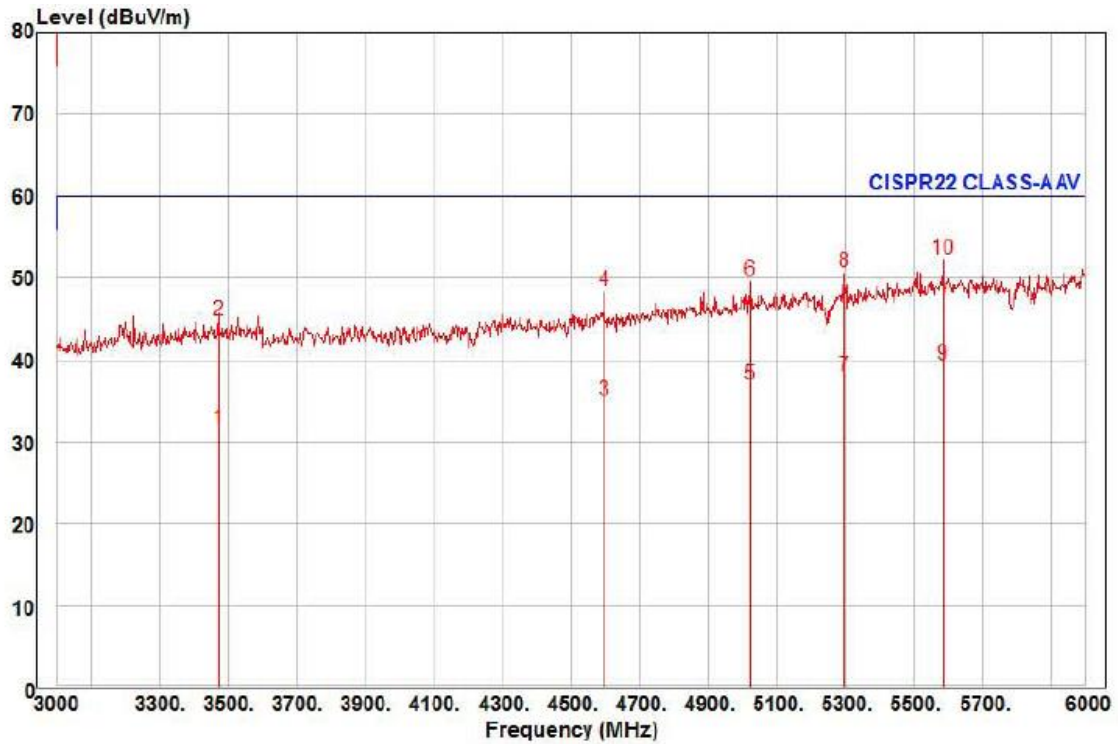
KES Co., Ltd.

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

Test report No.:

KES-E1-16T0262-R1

Page (61) of (93)



Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNV-7084RP
Mode : DC
Memo :

	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	3471.00	21.70	31.07	13.11	34.37	13	60.00	-28.49	vertical	Average
2	3471.00	35.01	31.07	13.11	34.37	13	80.00	-35.18	vertical	Peak
3	4596.00	21.29	32.56	15.12	33.92	291	60.00	-24.95	vertical	Average
4	4596.00	34.77	32.56	15.12	33.92	291	80.00	-31.47	vertical	Peak
5	5022.00	20.81	33.50	15.80	33.21	178	60.00	-23.10	vertical	Average
6	5022.00	33.63	33.50	15.80	33.21	178	80.00	-30.28	vertical	Peak
7	5298.00	20.34	34.58	16.26	33.25	33	60.00	-22.07	vertical	Average
8	5298.00	33.14	34.58	16.26	33.25	33	80.00	-29.27	vertical	Peak
9 pp	5583.00	20.43	35.49	16.74	33.29	18	60.00	-20.63	vertical	Average
10 pk	5583.00	33.38	35.49	16.74	33.29	18	80.00	-27.68	vertical	Peak

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

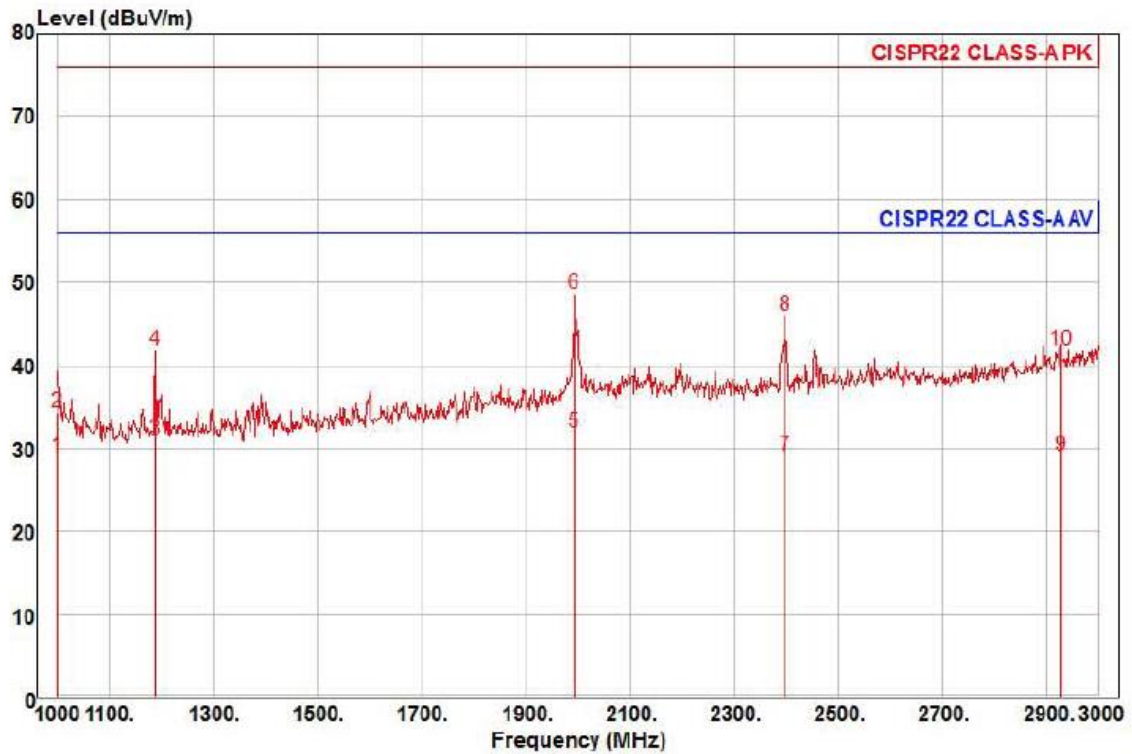


KES Co., Ltd.

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

Test report No.:
KES-E1-16T0262-R1
Page (62) of (93)

PoE Mode



Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNV-7084RP
Mode : POE
Memo :

	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	1000.00	35.92	22.50	6.64	36.20	225	56.00	-27.14	horizontal	Average
2	1000.00	41.47	22.50	6.64	36.20	225	76.00	-41.59	horizontal	Peak
3	1188.00	36.59	23.07	7.24	35.89	288	56.00	-24.99	horizontal	Average
4	1188.00	47.37	23.07	7.24	35.89	288	76.00	-34.21	horizontal	Peak
5 pp	1994.00	30.76	25.99	9.63	34.54	321	56.00	-24.16	horizontal	Average
6 pk	1994.00	47.52	25.99	9.63	34.54	321	76.00	-27.40	horizontal	Peak
7	2398.00	25.50	27.22	10.59	34.26	163	56.00	-26.95	horizontal	Average
8	2398.00	42.42	27.22	10.59	34.26	163	76.00	-30.03	horizontal	Peak
9	2928.00	21.60	29.42	11.95	33.89	122	56.00	-26.92	horizontal	Average
10	2928.00	34.32	29.42	11.95	33.89	122	76.00	-34.20	horizontal	Peak

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



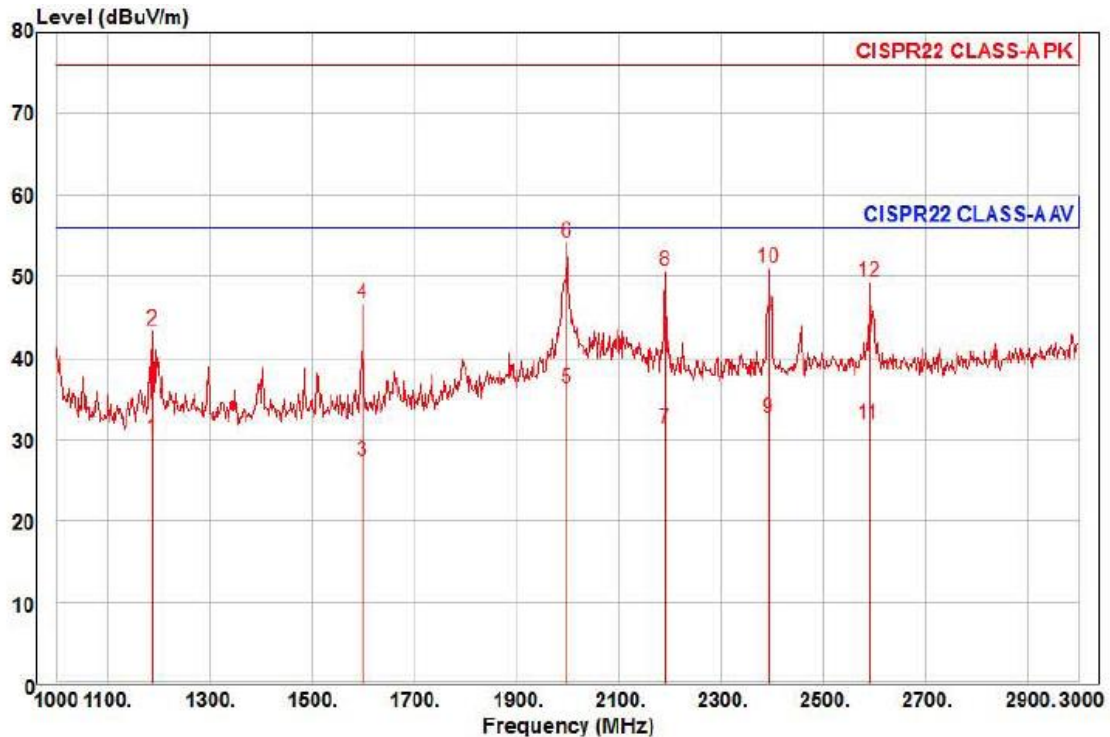
KES Co., Ltd.

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

Test report No.:

KES-E1-16T0262-R1

Page (63) of (93)



Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNV-7084RP
Mode : POE
Memo :

	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	1188.00	35.76	23.07	7.24	35.89	163	56.00	-25.82	vertical	Average
2	1188.00	49.05	23.07	7.24	35.89	163	76.00	-32.53	vertical	Peak
3	1598.00	29.66	24.41	8.50	35.20	329	56.00	-28.63	vertical	Average
4	1598.00	49.05	24.41	8.50	35.20	329	76.00	-29.24	vertical	Peak
5 pp	1998.00	35.24	26.00	9.64	34.53	350	56.00	-19.65	vertical	Average
6 pk	1998.00	53.13	26.00	9.64	34.53	350	76.00	-21.76	vertical	Peak
7	2190.00	29.14	26.59	10.10	34.40	178	56.00	-24.57	vertical	Average
8	2190.00	48.44	26.59	10.10	34.40	178	76.00	-25.27	vertical	Peak
9	2394.00	29.03	27.21	10.58	34.26	356	56.00	-23.44	vertical	Average
10	2394.00	47.51	27.21	10.58	34.26	356	76.00	-24.96	vertical	Peak
11	2590.00	27.09	27.93	11.04	34.12	172	56.00	-24.06	vertical	Average
12	2590.00	44.40	27.93	11.04	34.12	172	76.00	-26.75	vertical	Peak

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



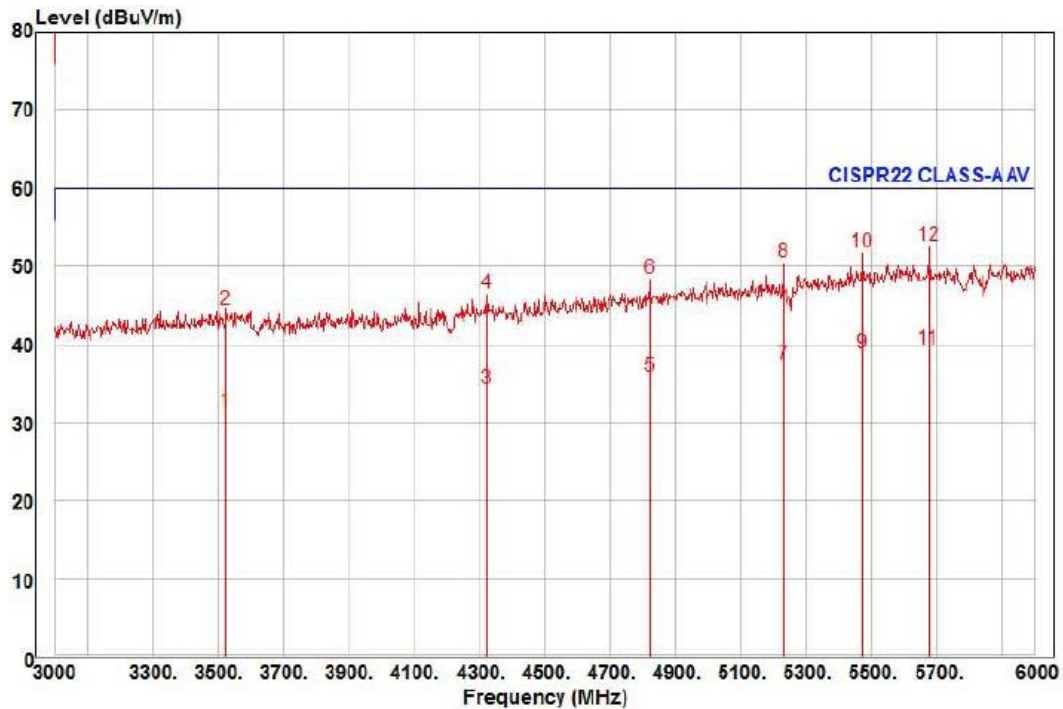
KES Co., Ltd.

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

Test report No.:

KES-E1-16T0262-R1

Page (64) of (93)



Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNV-7084RP
Mode : POE
Memo :

	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	3525.00	21.50	31.22	13.18	34.43	250	60.00	-28.53	horizontal	Average
2	3525.00	34.49	31.22	13.18	34.43	250	80.00	-35.54	horizontal	Peak
3	4323.00	21.64	32.41	14.65	34.40	106	60.00	-25.70	horizontal	Average
4	4323.00	33.85	32.41	14.65	34.40	106	80.00	-33.49	horizontal	Peak
5	4821.00	20.85	33.03	15.54	33.53	140	60.00	-24.11	horizontal	Average
6	4821.00	33.35	33.03	15.54	33.53	140	80.00	-31.61	horizontal	Peak
7	5229.00	20.31	34.31	16.12	33.24	237	60.00	-22.50	horizontal	Average
8	5229.00	33.28	34.31	16.12	33.24	237	80.00	-29.53	horizontal	Peak
9	5472.00	20.37	35.26	16.57	33.28	39	60.00	-21.08	horizontal	Average
10	5472.00	33.16	35.26	16.57	33.28	39	80.00	-28.29	horizontal	Peak
11 pp	5676.00	20.14	35.63	16.87	33.30	344	60.00	-20.66	horizontal	Average
12 pk	5676.00	33.43	35.63	16.87	33.30	344	80.00	-27.37	horizontal	Peak

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



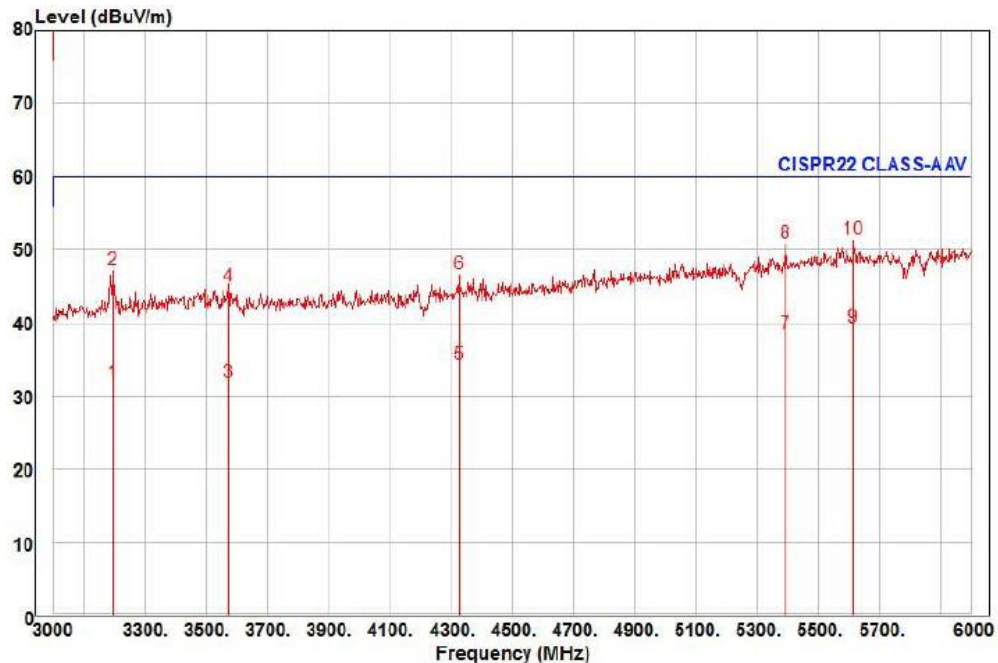
KES Co., Ltd.

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

Test report No.:

KES-E1-16T0262-R1

Page (65) of (93)



Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNV-7084RP
Mode : POE
Memo :

	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	3192.00	23.11	30.28	12.64	34.06	138	60.00	-28.03	vertical	Average
2	3192.00	38.31	30.28	12.64	34.06	138	80.00	-32.83	vertical	Peak
3	3573.00	21.75	31.35	13.24	34.49	89	60.00	-28.15	vertical	Average
4	3573.00	34.95	31.35	13.24	34.49	89	80.00	-34.95	vertical	Peak
5	4326.00	21.63	32.41	14.66	34.40	207	60.00	-25.70	vertical	Average
6	4326.00	34.05	32.41	14.66	34.40	207	80.00	-33.28	vertical	Peak
7	5394.00	20.40	34.95	16.44	33.27	198	60.00	-21.48	vertical	Average
8	5394.00	32.77	34.95	16.44	33.27	198	80.00	-29.11	vertical	Peak
9 pp	5616.00	20.36	35.54	16.79	33.30	128	60.00	-20.61	vertical	Average
10 pk	5616.00	32.36	35.54	16.79	33.30	128	80.00	-28.61	vertical	Peak

◆ Calculation - SAC #3

Result(PK/CAV) [dB(μ V/m)] = (Reading(PK/CAV)[dB(μ V)] + c.f[dB(1/m)])

Margin(PK/CAV)[dB] = Limit[dB(μ V/m)] - Result(PK/CAV) [dB(μ V/m)]

Reading(PK/CAV) : Reading value, Result(PK/CAV) : Reading value + Factor value

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

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

**KES Co., Ltd.**

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

Test report No.:
KES-E1-16T0262-R1
Page (68) of (93)

Test Data - Voltage Fluctuations**Maximum Flicker results**

	EUT values	Limit	Result
Pst	0.028	1.00	PASS
Plt	0.028	0.65	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.037	4.00	PASS
Tmax [s]	0.000	0.50	PASS

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

Test Setup Photos and Configuration

Conducted Voltage Emissions

■ AC Mode



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

Conducted Telecommunication Emissions

■ AC Mode



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

■ DC Mode



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

■ PoE Mode

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

Radiated Electric Field Emissions(Below 1 GHz)

■ AC Mode



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

■ DC Mode



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

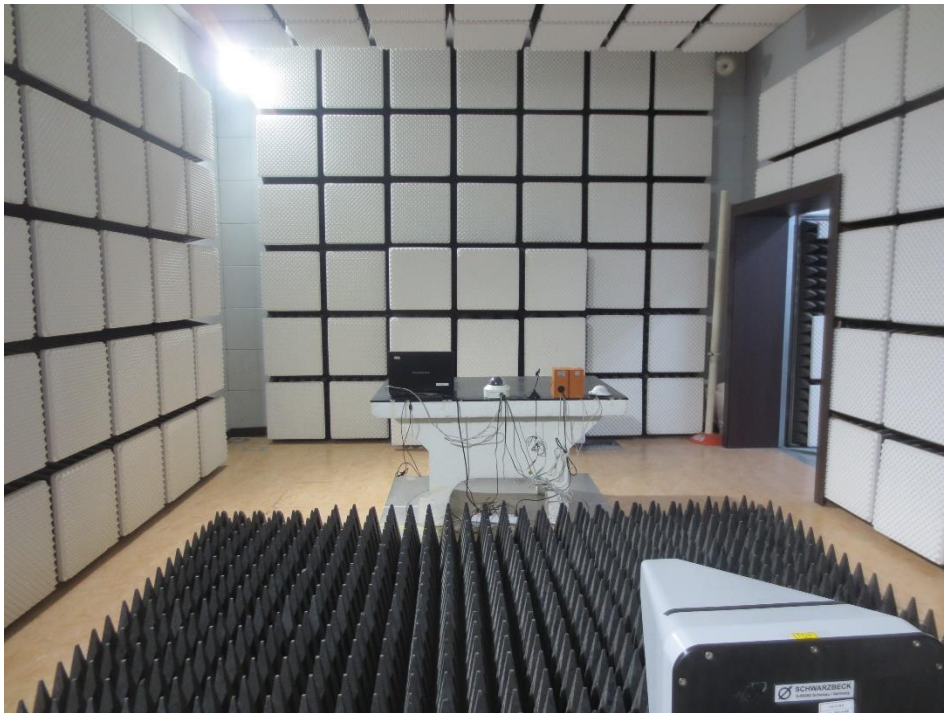
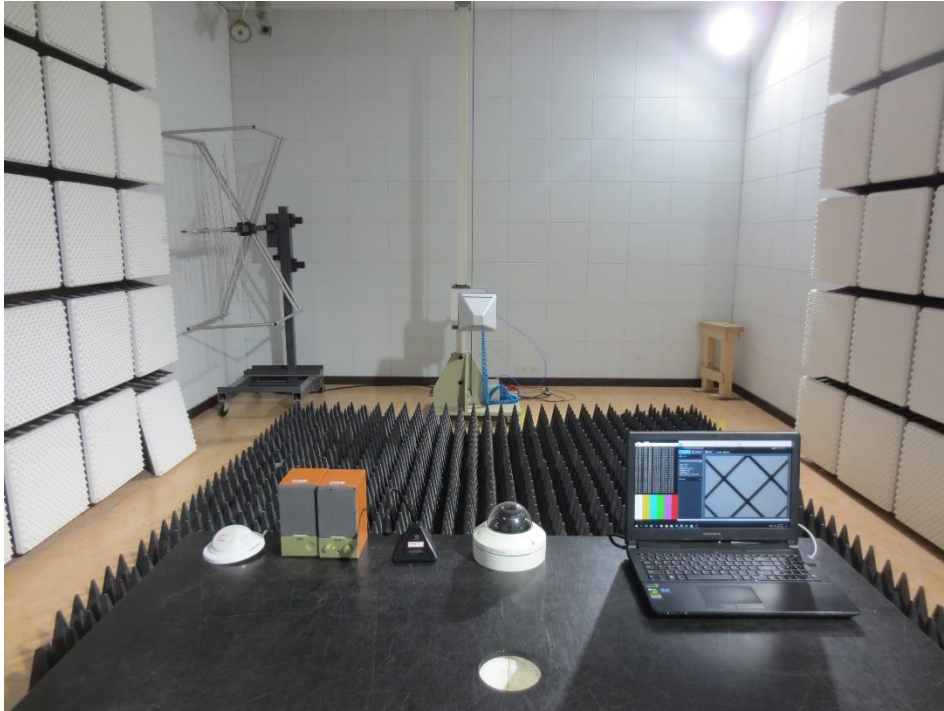
■ PoE Mode



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

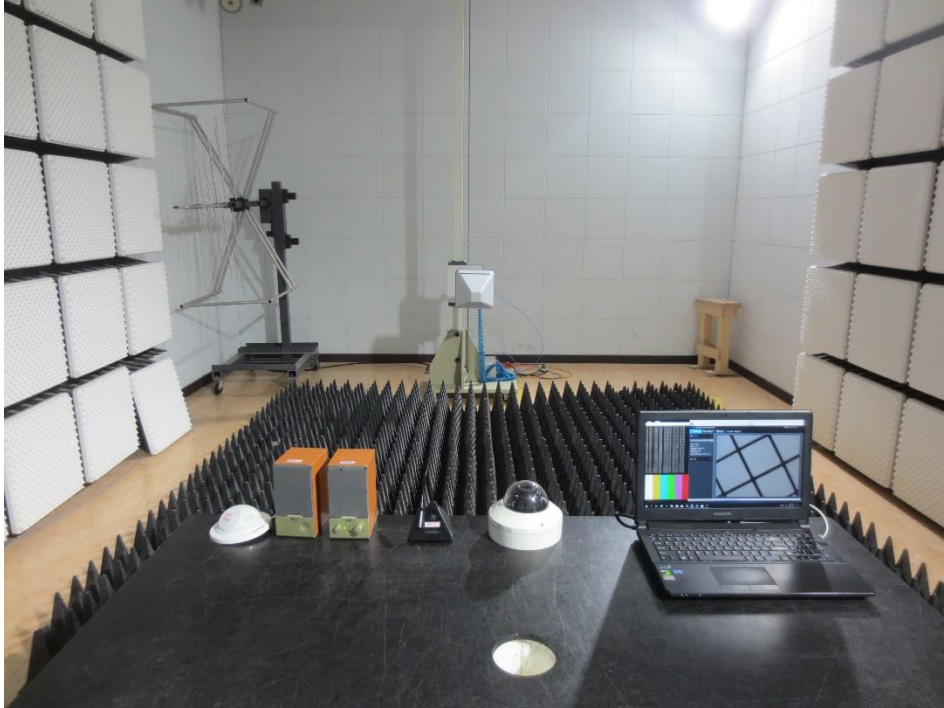
Radiated Electric Field Emissions(Above 1 GHz)

■ AC Mode



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

■ DC Mode



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

■ PoE Mode



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

Harmonic Current Emissions and Voltage Fluctuations and Flicker

N/A

Electrostatic Discharge

■ AC Mode



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

- DC Mode



- PoE Mode



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

Radiated Electric Field Immunity

■ AC Mode



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

■ DC Mode



■ PoE Mode



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

Electrical Fast Transients/Bursts

■ AC Mode



■ DC Mode



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

■ PoE Mode



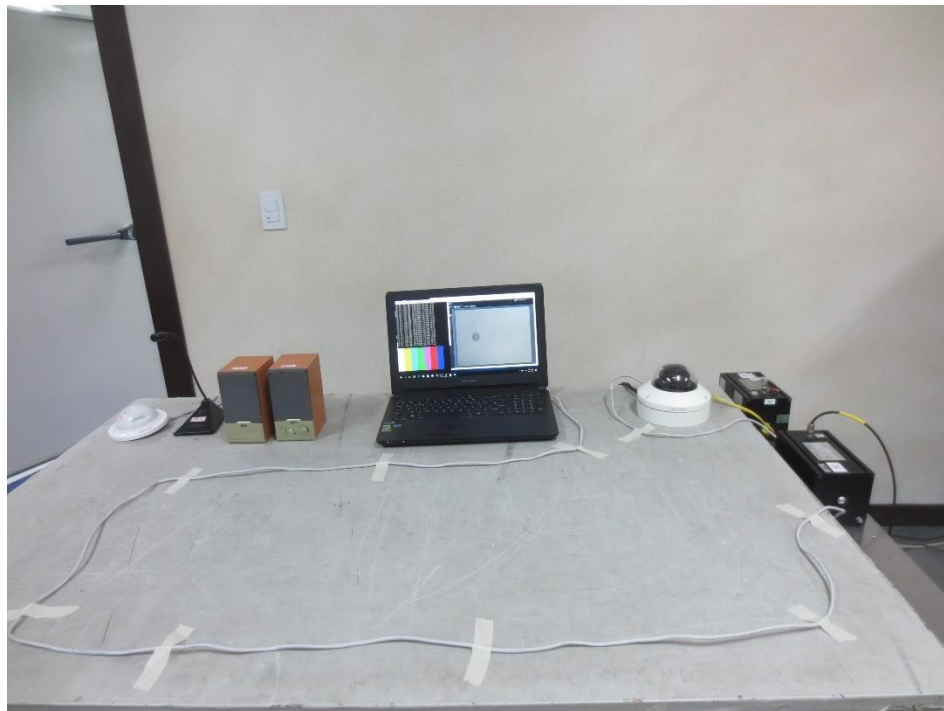
Surge Transients

■ AC Mode



Conducted Disturbance

■ AC Mode

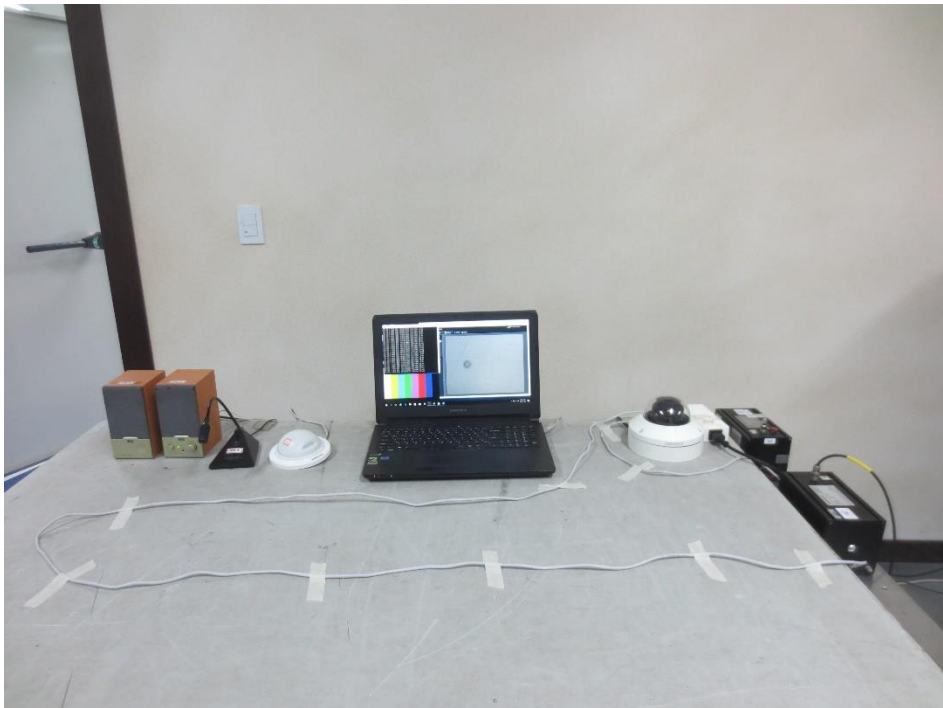


This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

■ DC Mode



■ PoE Mode



Voltage Dips and Short Interruptions



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

EUT External Photographs

(Top)



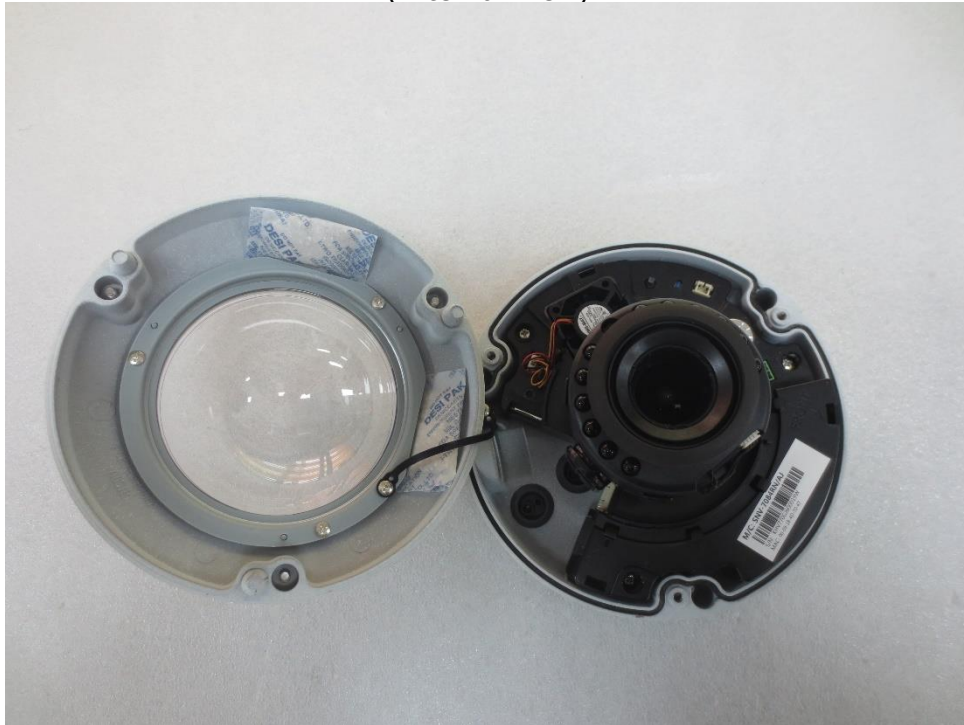
(Bottom)



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

EUT Internal Photographs

(Internal View)

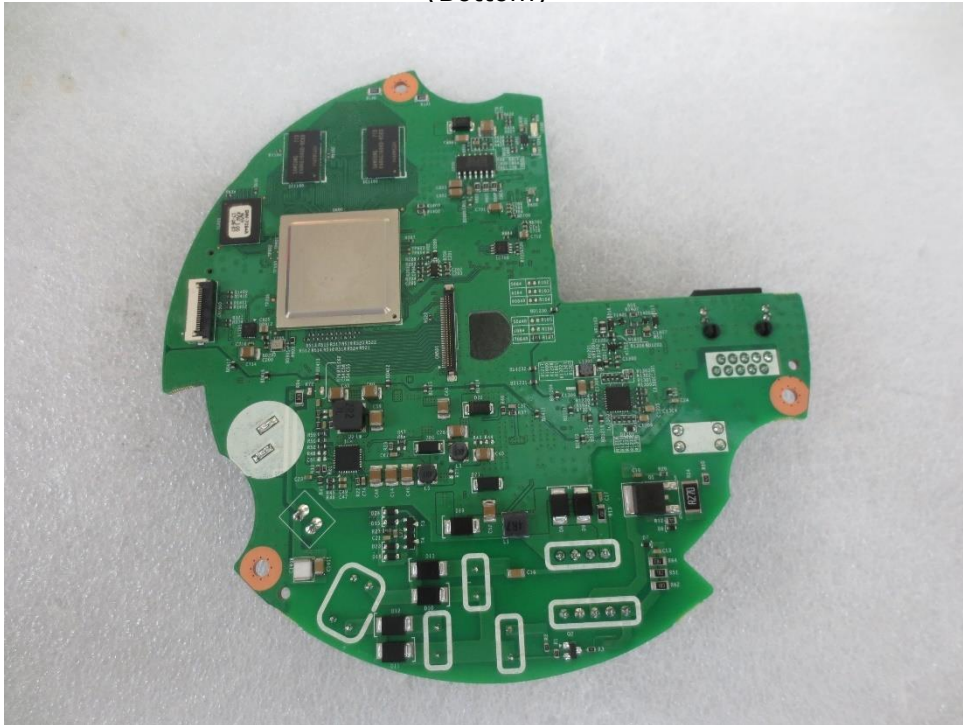


EUT Internal View – Main board

(Top)



(Bottom)



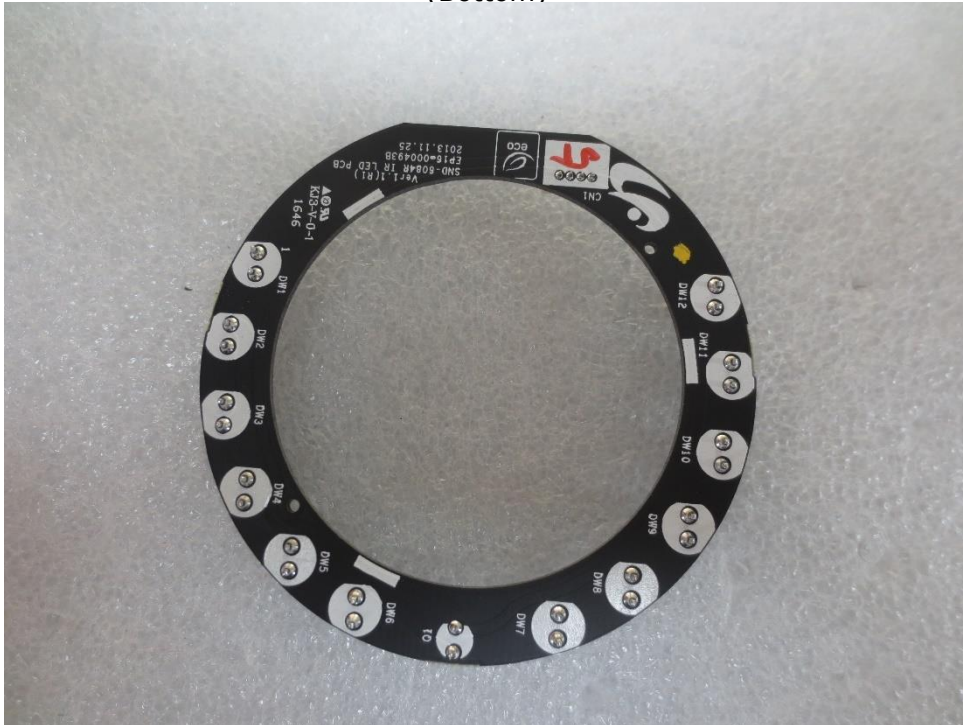
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

EUT Internal View – LED

(Top)



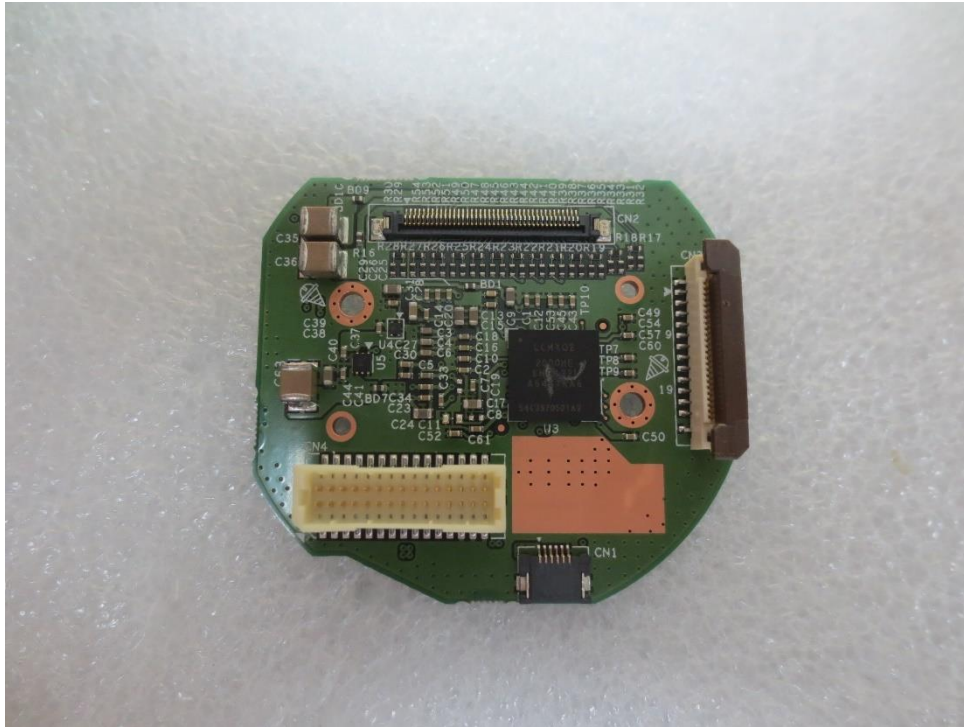
(Bottom)



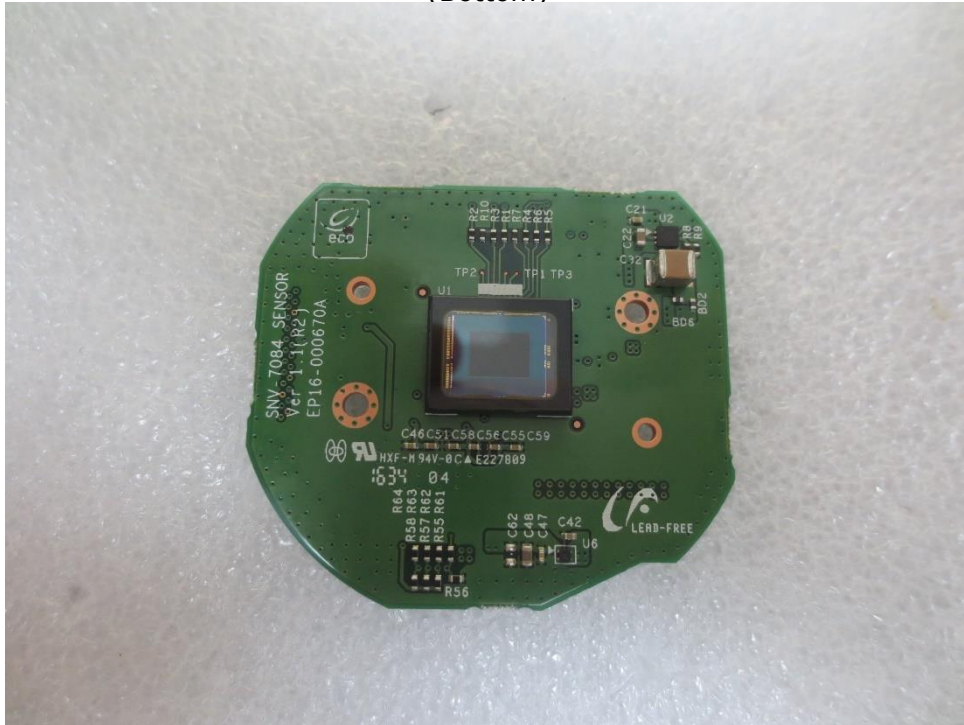
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

EUT Internal View – LENS board

(Top)

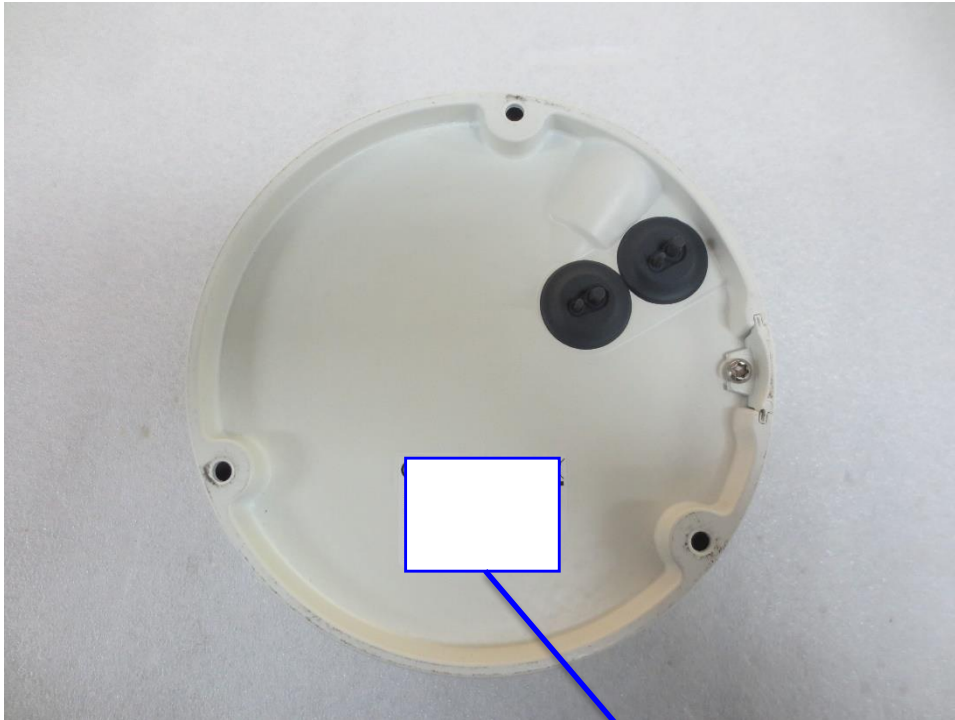


(Bottom)



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

Label and Location



NETWORK CAMERA

Model No : SNV-7084R

Manufacturer : HANWHA TECHWIN(TIANJIN)CO., LTD

Made in China

