

# EU Declaration of Conformity

# SAMSUNG



***We hereby declare that the product***

Type of equipment : NETWORK CAMERA  
Brand Name / Trade Mark : SAMSUNG  
Model number : XND-8080RVP  
Variant Model : -

***satisfies all the technical regulations applicable to the product within the scope of Council Directives 2014/30/EU***

EN 55022:2010 : Limits and methods of measurement of radio disturbance characteristics of information technology equipment  
EN 50581:2012 : Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances  
EN 50130-4:2011+A1:2014 : Product family standard: Immunity requirements for components of fire, intruder and social alarm systems  
EN 61000-4-2:2009 : Electrostatic discharge immunity test  
EN 61000-4-3:2006+A2:2010 : Radiated, radio-frequency, electromagnetic field immunity test  
EN 61000-4-4:2012 : Electrical fast transient/burst immunity test  
EN 61000-4-5:2014 : Surge immunity test  
EN 61000-4-6:2014 : Immunity to conducted disturbances, induced by radio-frequency fields  
EN 61000-4-11:2004 : Voltage dips, short interruptions and voltage variations immunity tests

***All essential testing suites have been carried out.***

Manufacturer : Hanwha Techwin (Tianjin) Co., Ltd.  
Manufacturer address : No. 11 Weiliu Rd, Micro-Electronic Industrial Park, TEDA, Tianjin, 300385, People's Republic of China  
Telephone / Fax : 82-02-729-2900 / 82-02-729-2904 (www.hanwhatechwin.com)  
Applicant : Hanwha Techwin Co., Ltd.  
Applicant address : 1204, Changwon-daero, Seongsan-gu, Changwon-si, Gyeongsangnam-do, Korea

***This declaration is issued under the sole responsibility of the manufacturer and his authorised representative.***

Authorized signatory

Name / Title : Jei Soon, Kang / Principal Research Engineer  
Date of issue : Dec. 19, 2016



## EMC TEST REPORT For CE

Test Report No. : KES-E1-16T0657  
Date of Issue : Dec, 19, 2016  
Product name : NETWORK CAMERA  
Model/Type No. : XND-8080RVP  
Variant Model : -  
Applicant : Hanwha Techwin Co., Ltd.  
Applicant Address : 1204, Changwon-daero, Seongsan-gu, Changwon-si,  
Gyeongsangnam-do, Korea  
Manufacturer : Hanwha Techwin (Tianjin) Co.,Ltd.  
Manufacturer Address : No.11 Weiliu Rd, Micro-Electronic Industrial  
Park, TEDA, Tianjin, 300385, People's Republic of China  
Date of Receipt : Nov, 23, 2016  
Test date : Dec, 12, 2016 – Dec. 14, 2016  
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Young Suk, Song  
EMC Test Engineer

Reviewed by

Dong-Hun, Jang  
EMC Technical Manager

**KES Co., Ltd.**

C-3701, Simin-daero 365-40,  
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-E1-16T0657  
Page (2) of (82)

**REPORT REVISION HISTORY**

Date	Test Report No.	Revision History
Dec. 19, 2016	KES-E1-16T0657	Issued

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## TABLE OF CONTENTS

1.0	General Product Description .....	4
1.1	Test Voltage & Frequency .....	7
1.2	Variant Model Differences.....	7
1.3	Device Modifications .....	7
1.4	Equipment Under Test.....	7
1.5	Support Equipments .....	7
1.6	External I/O Cabling .....	8
1.7	E.U.T Operating Mode(s).....	9
1.8	Configuration.....	10
1.9	Calibration Details of Equipment Used for Measurement.....	11
1.10	Test Facility .....	11
1.11	Laboratory Accreditations and Listings .....	11
2.0	Test Regulations.....	12
2.1	Conducted Emissions at Mains Power Ports.....	14
2.2	Conducted Emissions at Telecommunication Ports .....	15
2.3	Radiated Electric Field Emissions(Below 1 GHz) .....	16
2.4	Radiated Electric Field Emissions(Above 1 GHz).....	17
2.5	Harmonic Current Emissions.....	18
2.6	Voltage Fluctuations and Flicker .....	19
3.0	Criteria for compliance.....	20
3.1	Electrostatic Discharge.....	22
3.2	Radiated Electric Field Immunity .....	25
3.3	Electrical Fast Transients/Bursts .....	28
3.4	Surge Transients .....	31
3.5	Conducted Disturbance .....	35
3.6	Voltage Dips and Short Interruptions .....	39
APPENDIX A	– TEST DATA.....	41
	Conducted Emissions at Mains Power Ports.....	41
	Conducted Emissions at Telecommunication Ports .....	43
	Radiated Electric Field Emissions(Below 1 GHz) .....	47
	Radiated Electric Field Emissions(Above 1 GHz).....	49
	Harmonic Current Emissions and Voltage Fluctuations and Flicker .....	57
	Test Setup Photos and Configuration .....	60
	Conducted Voltage Emissions .....	60
	Conducted Telecommunication Emissions .....	61
	Radiated Electric Field Emissions(Below 1 GHz) .....	63
	Radiated Electric Field Emissions(Above 1 GHz).....	65
	Harmonic Current Emissions and Voltage Fluctuations and Flicker .....	67
	Electrostatic Discharge .....	68
	Radiated Electric Field Immunity .....	69
	Electrical Fast Transients/Bursts .....	70
	Surge Transients.....	72
	Conducted Disturbance.....	74
	Voltage Dips and Short Interruptions.....	76
	EUT External Photographs.....	77
	EUT Internal Photographs .....	78



## 1.0 General Product Description

### Main Specifications of E.U.T are:

Video	
Imaging Device	1/1.8" 6M CMOS
Total Pixels	3096(H) x 2094(V)
Effective Pixels	2616(H) x 1976(V)
Scanning System	Progressive Scan
Min. Illumination	Color : 0.1 lux(F1.3, 1/30sec) B/W : 0 Lux (F1.3, IR LED On)
S / N Ratio	50dB
Video Out	CVBS : 1.0 Vp-p / 75Ω composite, 720x480(N), 720x576(P), for installation USB : Micro USB type B, 1920 x 1080, for installation
Lens	
Focal Length (Zoom Ratio)	3.9~9.4mm(2.4x) motorized varifocal
Max. Aperture Ratio	F1.3
Angular Field of View	TBD
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, P-iris
Mount Type	DC Auto Iris, P-iris
Pan / Tilt / Rotate	
Pan / Tilt / Rotate range	0° ~ 354° / 0° ~ 85°(TBD) / 0° ~ 355°
Operational	
IR-LED	TBD
Viewable Length	(TBD)50m(164.04ft)
Camera Title	Off / On (Displayed up to 85 characters) - WW : English/Numeric/Special Characters - China : English/Numeric/Special/Chinese Characters - Common : Multi-line (Max 5), Color (Grey/Green/Red/Blue/Black/White), Transparency, Auto Scale by Resolution
Day & Night	Auto (ICR) / Color / B/W / External / Schedule
Backlight Compensation	Off / BLC / HLC(Masking/Dimming), WDR
Wide Dynamic Range	120dB
Contrast Enhancement	SSDR (Off / On)
Digital Noise Reduction	SSNR5 (2D+3D Noise Filter) (Off / On)
Digital Image Stabilization	Off / On (Built-in Gyro sensor)
Defog	Auto(input from fog detection) / Manual / Off
Motion Detection	Off/ On(8ea, 8point Polygonal zones), Hand over
Privacy Masking	Off / On (32ea, polygonal zones) - Color : Grey/Green/Red/Blue/Black/White - Mosaic
Gain Control	Off / Low / Medle / High / Manual
White Balance	ATW / AWC / Manual / Indoor / Outdoor((included Mercury & Sodium)
Contrast	level adjustment
LDC	On/Off (5 levels with Min/Max)
Electronic Shutter Speed	Minimum / Maximum / Anti flicker (2 ~ 1/12,000sec)
Digital PTZ	24X, 'Digital PTZ(Preset, Group)

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**KES Co., Ltd.**

C-3701, Simin-daero 365-40,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
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Test report No.:

KES-E1-16T0657

Page (5) of (82)

Flip / Mirror	Flip : On/Off Mirror : On/Off Hallway view : 90°/270°
Intelligent Video & Audio A	Tampering, Loitering, Directional Detection, Defocus Detection, Fog Detection, Virtual Line, Enter/Exit, Appear / Disappear, Audio Detection, Motion Detection, Digital Auto Tracking, Sound Classification
Alarm I/O	Input 1ea / Output 1ea
Remote Control Interface	-
RS-485 Protocol	-
Alarm Triggers	Alarm Input, Motion Detection, Video & Audio Analytics, Network Disconnect
Alarm events	File upload via FTP, E-Mail Notification via E-Mail local storage(SD/SDHC/SDXC) or NAS recording at Event Triggers External output DPTZ preset
Audio In	Selectable (Mic IN/Line IN), Supply voltage: 2.5VDC(4mA), Input impedance: approx. 2K Ohm
Audio out	Line out, Max output level: 1 Vrms
Fan / Heater	-
Pixel Counter	Support
<b>Network</b>	
Ethernet	RJ-45 (10/100BASE-T)
Video Compression Form	H.265/H.264 (MPEG-4 Part 10/AVC) : Main/Baseline/High , Motion JPEG
Resolution	2560 x 1920, 2560 x 1440, 1920 x 1080, 1600 x 1200, 1280 x 1024, 1280 x 960 1280 x 720, 1024 x 768, 800 x 600, 720 x 576, 720 x 480, 640 x 480, 320 x 240
Max. Framerate	H.265/H.264 : Max. 30fps at all resolutions Motion JPEG : Max. 30fps
Smart Codec	Manual Mode (area-based : 5EA)
WiseStream	Support
Video Quality Adjustment	H.264/H.265 : Target Bitrate Level Control MJPEG : Target Bitrate Level Control
Bitrate Control Method	H.264/H.265 : CBR or VBR, with WiseStream MJPEG : VBR
Streaming Capability	Multiple Streaming (Up to 10 Profiles)
Audio Compression Form	G.711 u-law /G.726 Selectable G.726 (ADPCM) 8KHz, G.711 8KHz G.726 : 16Kbps, 24Kbps, 32Kbps, 40Kbps AAC-LC : 48Kbps at 8/16/32/48KHz
Audio Communication	Bi-dierctional (2-Way)
IP	IPv4, IPv6
Protocol	TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP,RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, PPPoE, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, PIM-SM, UPnP, Bonjour

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**KES Co., Ltd.**

C-3701, Simin-daero 365-40,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
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Test report No.:

KES-EI-16T0657

Page (6) of (82)

Security	HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access Log 802.1X Authentication (EAP-TLS, EAP-LEAP)
Streaming Method	Unicast / Multicast
Max. User Access	20 users at Unicast Mode
Edge Storage	SD/SDHC/SDXC 2slot (up to 512 GB) - Continuous recording(1'st slot to 2'nd slot) - Motion Images recorded in the SD/SDHC/SDXC memory card can be downloaded. NAS(Network Attached Storage) Local PC for Instant Recording
Application Programming	ONVIF Profile S/G SUNAPI(HTTP API) Open Platform
Webpage Language	English, Korean, Chinese, French, Italian, Spanish, German, Japanese, Russian, Swedish, Danish, Portuguese, Czech, Polish, Turkish, Rumanian, Serbian, Dutch, Croatia, Hungary, Greek, Norsk, Finnish
Web Viewer	Supported OS: Windows 7, 8, 10, Mac OS X 10.10. 10.11 10.12 <b>Non-plugin Webviewer</b> Supported Browser: Google Chrome 54, MS Edge 38, Mozilla Firefox 49 , Apple Safari 9 (Mac OS X only) <b>Plug-in Webviewer</b> Supported Browser : MS Explore 11, Apple Safari 9 (Mac OS X only)
Central Management Soft	SmartViewer, SSM
<b>Environmental</b>	
Operating Temperature / Humidity	-10°C ~ +55°C (-14°F ~ +131°F) / Less than 90% RH
Storage Temperature / Humidity	-50°C ~ +60°C (-22°F ~ +140°F) / Less than 90% RH
Ingress Protection	IP67, IP66, NEMA 4X
Vandal Resistance	IK10
<b>Electrical</b>	
Input Voltage / Current	12VDC ± 10%, PoE(IEEE802.3af)
Power Consumption	TBD
<b>Mechanical</b>	
Color / Material	Ivory / Aluminum
Dimension (WxHxD)	TBD
Weight	TBD

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## 1.1 Test Voltage & Frequency

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

Voltage      ☐ 220 Vac   ☐ 230 Vac   ☐ 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	XND-8080RVP	-	Hanwha Techwin (Tianjin) Co.,Ltd.	E.U.T

## 1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
POE Adapter	PD-3001GC/AC	RD9356082016964 200	Power Dsine	-
Notebook	X56K	HN11N5151FJ0045 W	HANSUNG	-
Notebook Adapter	A12-120P1A	F180271552011758	CHICONY POWER TECHNOLOGY CO.,LTD.	-
Phone	A1530	-	APPLE	-
MIC	CMK-303	-	CAMAC	1.7 m
Speaker	BR10000A CUVE	-	BEIJING EDIFIER HI-TECH GROUP.	1.6 m
Alarm	-	-	-	-





## 1.6 External I/O Cabling

- DC 12 V Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA ( E.U.T )	RJ-45	Notebook	RJ-45	3.0	U
	3.5 mm	MIC	3.5 mm	1.7	U
	3.5 mm	Speaker	3.5 mm	1.6	U
	3 pin	Alarm	3 pin	3.0	U
Notebook	Audio in	Phone	Audio out	1.7	U

- POE Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA ( E.U.T )	RJ-45 (POE)	POE Adapter	RJ-45 (POE)	3.0	U
	3.5 mm	MIC	3.5 mm	1.7	U
	3.5 mm	Speaker	3.5 mm	1.6	U
	3 pin	Alarm	3 pin	3.0	U
Notebook	Audio in	Phone	Audio out	1.7	U
	RJ-45 (DATA)	POE Adapter	RJ-45 (DATA)	3.0	U

\* Unshielded=U, Shielded=S



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Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
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Test report No.:  
KES-E1-16T0657  
Page (9) of (82)

## 1.7 E.U.T Operating Mode(s)

operating
E.U.T Monitoring , Ping test, 1 kHz

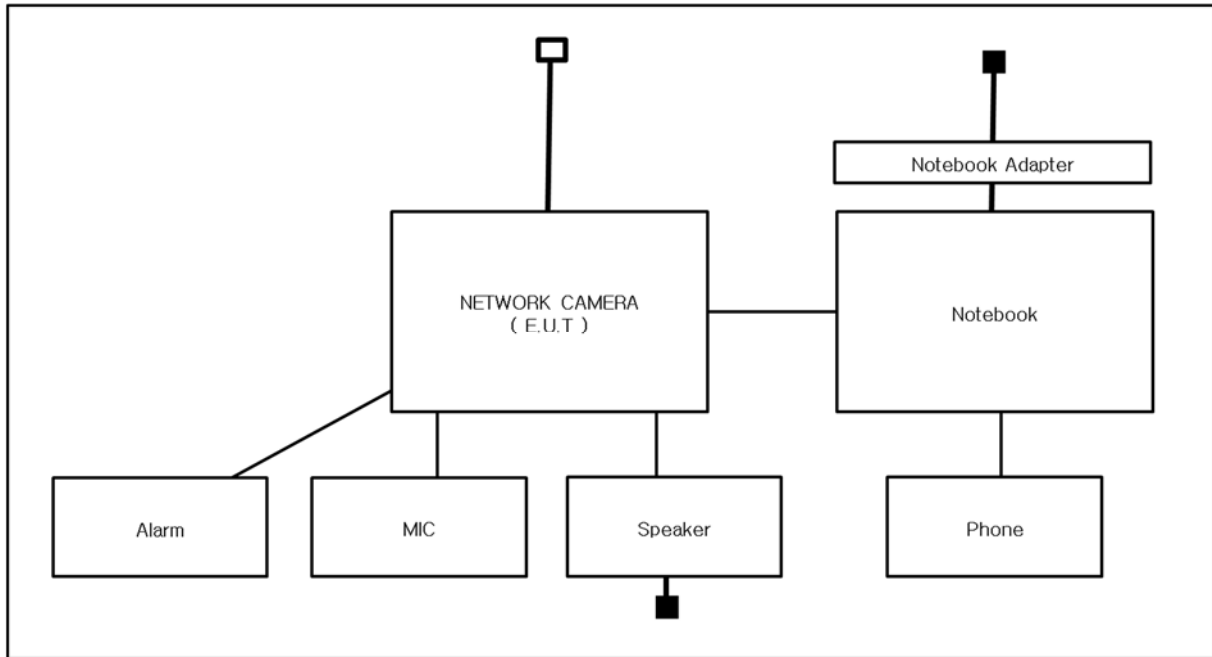
E.U.T Test operating S/W		
Name	Version	Manufacture Company
SmartViewer	-	Hanwha Techwin Co., Ltd.

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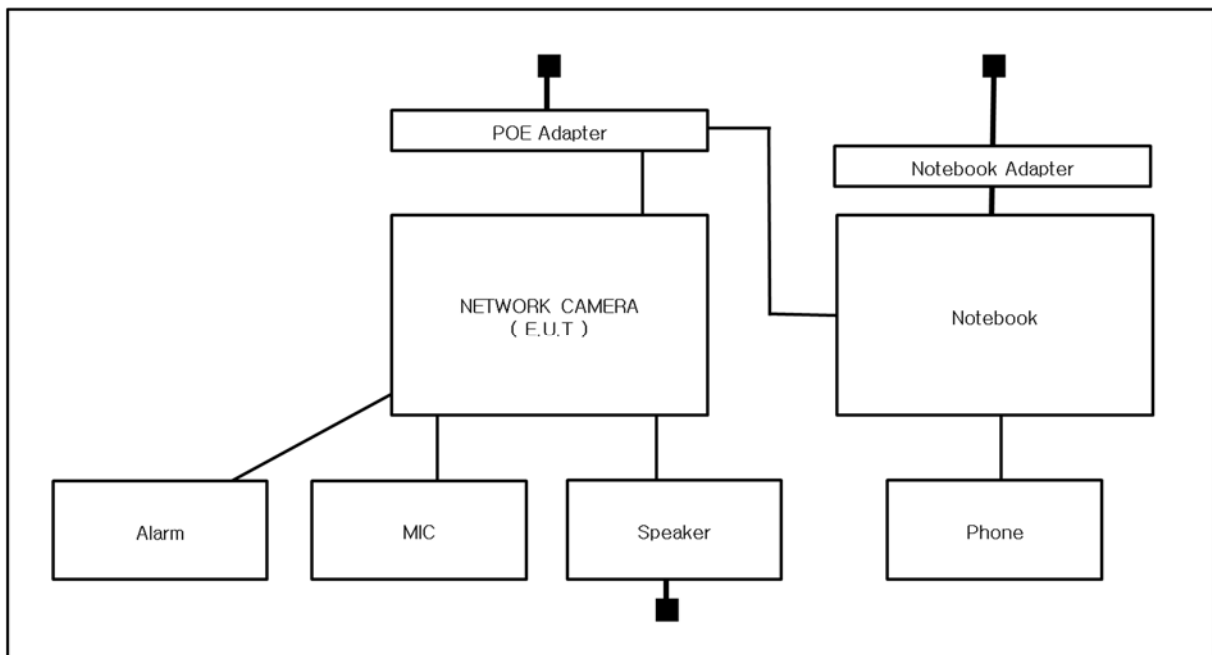
## 1.8 Configuration

■ AC Main  
□ DC Main

- DC 12 V Mode



- POE Mode









## 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, Yeosu-si, Gyeonggi-do, 12658, Korea. The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22.

## 1.11 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3 & 10 meter Open Area Test Sites and one conducted site to perform FCC Part 15/18 measurements.	
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
KOREA	MSIP	EMI (10 meter Open Area Test Site and two conducted sites) Radio(3 & 10 meter Open Area Test Sites and one conducted site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KR0100
Canada	IC	3 & 10 meter Open Area Test Sites and one conducted site	 4769B-1
Europe	CE	EMI (10 meter Open Area Test Site and two conducted sites) Radio(3 & 10 meter Open Area Test Sites and one conducted site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	
International	KOLAS	EMI (10 meter Open Area Test Site and two conducted sites) Radio(3 & 10 meter Open Area Test Sites and one conducted site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	

## 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 55022:2010

☒ Class A

☐ Class B

☐ EN 55024:2010 +A1:2015

☒ EN 50130-4:2011 +A1:2014

☐ EN 61000-3-2:2014

☐ EN 61000-3-3:2013

☐ EN 61326-1:2013





- 
- |   |                                  |                                  |
|---|----------------------------------|----------------------------------|
| <input type="checkbox"/> <b>VCCI V-3 / 2015.04</b>            | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> <b>AS/NZS CISPR22:2009 +A1:2010</b>  | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> <b>47 CFR Part 15, Subpart B</b>     |                                  |                                  |
| <input type="checkbox"/> CISPR 22:2009 +A1:2010               | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> ANSI C63.4-2009                      |                                  |                                  |
| <input type="checkbox"/> <b>IC Regulation ICES-003 : 2016</b> |                                  |                                  |
| <input type="checkbox"/> CAN/CSA CISPR 22-10                  | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> ANSI C63.4-2014                      |                                  |                                  |
| <br><input type="checkbox"/> <b>RE- Directive 2014/53/EU</b>  |                                  |                                  |
| <br><input type="checkbox"/> EN 301 489-1 V1.9.2              |                                  |                                  |
| <input type="checkbox"/> Equipment for fixed use              |                                  |                                  |
| <input type="checkbox"/> Equipment for vehicular use          |                                  |                                  |
| <input type="checkbox"/> Equipment for portable use           |                                  |                                  |
| <br><input type="checkbox"/> EN 301 489-3 V1.6.1              |                                  |                                  |
| <br><input type="checkbox"/> EN 301 489-17 V2.2.1             |                                  |                                  |
| <br><input type="checkbox"/> 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
<input type="checkbox"/>	EMI Test Receiver	ESR3	R & S	101783	05, 03, 2017
<input type="checkbox"/>	LISN	ENV216	R & S	101137	02, 04, 2017
<input type="checkbox"/>	LISN	ENV216	R & S	101786	05, 02, 2017
<input type="checkbox"/>	Electro wave Shieldroom	-	SEMITEC	-	-
<input type="checkbox"/>	EMI Test S/W	EMC32	R&S	9.12.00	-

### Test Conditions

Temperature: °C  
Relative Humidity: %

### Frequency Range of Measurement

150 kHz to 30 MHz

### Instrument Settings

IF Band Width: 9 kHz

### Test Results

The requirements are:

- ☐ PASS  
☐ NOT PASS  
☒ NOT APPLICABLE

### Remarks

N/A : Because the E.U.T power is 12 v (dc) power and PoE, limits are not specified.

## 2.2 Conducted Emissions at Telecommunication Ports

### Test Date

Dec, 12, 2016

### Test Location

Electro wave Shieldroom

### Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test Receiver	ESR3	R&S	101783	05, 03, 2017
<input checked="" type="checkbox"/>	LISN	ENV216	R&S	101137	02, 04, 2017
<input checked="" type="checkbox"/>	LISN	ENV216	R&S	101786	05, 02, 2017
<input checked="" type="checkbox"/>	8-Wire ISN CAT3	CAT3 8158	Schwarzbeck Mess	8158-0019	04, 01, 2017
<input checked="" type="checkbox"/>	8-Wire ISN CAT5	CAT5 8158	Schwarzbeck Mess	8158-0030	04, 01, 2017
<input type="checkbox"/>	8-Wire ISN CAT6	NTFM 8158	Schwarzbeck Mess	8158-0029	08, 11, 2017
<input checked="" type="checkbox"/>	Electro wave Shieldroom	-	SEMITEC	-	-
<input checked="" type="checkbox"/>	EMI Test S/W	EMC32	R&S	9.12.00	-

### Test Conditions

Temperature: 18,5 °C  
Relative Humidity: 39,6 %

### 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

Dec, 12, 2016

### Test Location

☐ Open Area Test Site #1      ☒ Open Area Test Site #2

### Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI TEST Receiver	ESR3	R&S	101781	05, 03, 2017
<input checked="" type="checkbox"/>	Trilog-Broadband ANT	VULB 9163	Schwarzbeck	9163-713	05, 15, 2017
<input checked="" type="checkbox"/>	Open Area Test Site	-	KES	-	-
<input checked="" type="checkbox"/>	Antenna Mast	-	DAEIL EMC	-	-
<input checked="" type="checkbox"/>	Turn Table	-	DAEIL EMC	-	-
<input checked="" type="checkbox"/>	EMI Test S/W	-	-	-	-

### Test Conditions

Temperature: 2,8 °C  
Relative Humidity: 63,0 %

### 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

Dec, 12, 2016

### Test Location

Semi Anechoic Chamber #2

### Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	05, 07, 2017
<input checked="" type="checkbox"/>	EMI Test Receiver	ESU26	R&S	100552	04, 24, 2017
<input checked="" type="checkbox"/>	Broadband Coaxial Preamplifier	BBV 9718	Schwarzbeck Mess - Elektronik	9718-246	10, 14, 2017
<input checked="" type="checkbox"/>	Semi Anechoic Chamber #2	-	SEMITEC	-	-
<input checked="" type="checkbox"/>	Antenna Mast	-	AUDIX	-	-
<input checked="" type="checkbox"/>	Turn Table	-	AUDIX	-	-
<input checked="" type="checkbox"/>	EMI Test S/W	e3	AUDIX	8.083b	-

### Test Conditions

Temperature: 18,5 °C

Relative Humidity: 39,6 %

### Frequency Range of Measurement

1 GHz to 6 GHz

### Instrument Settings

IF Band Width: 1 MHz

### Test Results

The requirements are:

- ☒ PASS  
☐ NOT PASS  
☐ NOT APPLICABLE

### Remarks

See Appendix A for test data.





## 2.5 Harmonic Current Emissions

### Test Date

N/A

### Test Location

Electro wave Shieldroom

### Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input type="checkbox"/>	AC Source	ACS 500 N	EM TEST	V1024106760	08, 08, 2017
<input type="checkbox"/>	Digital Power Analyzer	DPA 500 N	EM TEST	V1024106759	08, 08, 2017
<input type="checkbox"/>	EMI Test S/W	dpa.control	EM TEST AG	5.4.8.0	-

### 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

N/A

### Test Location

Electro wave Shieldroom

### Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input type="checkbox"/>	AC Source	ACS 500 N	EM test	V1024106760	08, 08, 2017
<input type="checkbox"/>	Digital Power Analyzer	DPA 500 N	EM test	V1024106759	08, 08, 2017
<input type="checkbox"/>	EMI Test S/W	dpa.control	EM TEST AG	5.4.8.0	-

### Test Conditions

Temperature: °C

Relative Humidity: %

### Test Results

The requirements are:

- ☐ PASS  
☐ NOT PASS  
☒ NOT APPLICABLE

### Remarks

N/A : Because the E.U.T power is 12 v (dc) power and PoE, limits are not specified.

### 3.0 Criteria for compliance

Criteria for compliance was based on the following guidelines:

EN 50130-4:2011 +A1:2014 Alarm systems-Part 4: Electromagnetic compatibility Product family standard: Immunity requirements for components of fire, intruder and social alarm systems

The variety and the diversity of the apparatus within the scope of this document makes it difficult to define precise criteria for the evaluation of the immunity test results.

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

A functional description and a definition of performance by the manufacture and noted in the test report, based on the following criteria:

#### Electrostatic discharge

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing that is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change.

#### Radiated electromagnetic fields

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing which could be interpreted by associated equipment as a change, and no such

Flickering of indicators occurs at a field strength of 3 V/m.

For components of CCTV systems, where the picture is allowed at 10 V/m, providing.

(a) there is no permanent damage or change to EUT

(e.g. no corruption of memory or changes to programmable setting etc.)

(b) at 3 V/m, any deterioration of the picture is so minor that the system could still be used; and

(c) there is no observable deterioration of the picture at 1 V/m.

---

### Fast transient burst / slow high energy voltage surge

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing

That there is no residual is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change.

### Conducted RF immunity

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing

That there is no residual is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change,  
and no such flickering of indicators oeuvres at  $U = 130 \text{ dB}\mu\text{V}$ .

For component of CCTV systems, where the status is monitored by observing the TV picture,  
then deterioration of the picture is allowed at  $U = 140 \text{ dB}\mu\text{V}$ , providing:

- (a) there is no permanent damage or change to the EUT  
(e.g. no corruption of memory or changes to programmable settings etc.)
- (b) at  $U = 130 \text{ dB}\mu\text{V}$ , any deterioration of the picture is so minor that the system could still be used; and
- (c) there in no observable deterioration of the picture at  $U = 120 \text{ dB}\mu\text{V}$ .

### Voltage dip/interruption / Voltage variation

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change. The EUT shall meet the acceptance criteria for the functional test, after the conditioning.

## 3.1 Electrostatic Discharge

### Reference Standard

EN 61000-4-2:2009

### Test Date

Dec, 13, 2016

### Test Location

EMS-ESD: Electro wave Shieldroom

### Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	ESD SIMULATOR	ESS-2000	Noise Ken	ESS05X4620	02, 24, 2017
<input checked="" type="checkbox"/>	HCP	-	Noise Ken	-	-
<input checked="" type="checkbox"/>	VCP	-	Noise Ken	-	-
<input checked="" type="checkbox"/>	EMS Test S/W	N/A	N/A	N/A	-

### Test Conditions

Temperature: 17,1 °C  
Relative Humidity: 36,2 %  
Atmospheric Pressure: 101,1 kPa

### Test Specifications

Discharge Factor:  $\geq 1$  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:	<b>Contact</b> <input type="checkbox"/> 2 kV <input type="checkbox"/> 4 kV <input checked="" type="checkbox"/> 6 kV <input type="checkbox"/> 8 kV <input type="checkbox"/> 15 kV	<b>Air</b> <input checked="" type="checkbox"/> 2 kV <input checked="" type="checkbox"/> 4 kV <input type="checkbox"/> 6 kV <input checked="" type="checkbox"/> 8 kV <input type="checkbox"/> 15 kV	<b>HCP</b> <input type="checkbox"/> 2 kV <input type="checkbox"/> 4 kV <input checked="" type="checkbox"/> 6 kV <input type="checkbox"/> 8 kV <input type="checkbox"/> 15 kV	<b>VCP</b> <input type="checkbox"/> 2 kV <input type="checkbox"/> 4 kV <input checked="" type="checkbox"/> 6 kV <input type="checkbox"/> 8 kV <input type="checkbox"/> 15 kV
--------------------	---	---	---	---

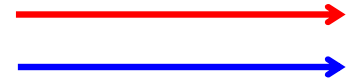
Notes: HCP: Horizontal coupling plane  
VCP: Vertical coupling plane

Required Performance Criteria: ☒ Complied



### Location of Discharge:

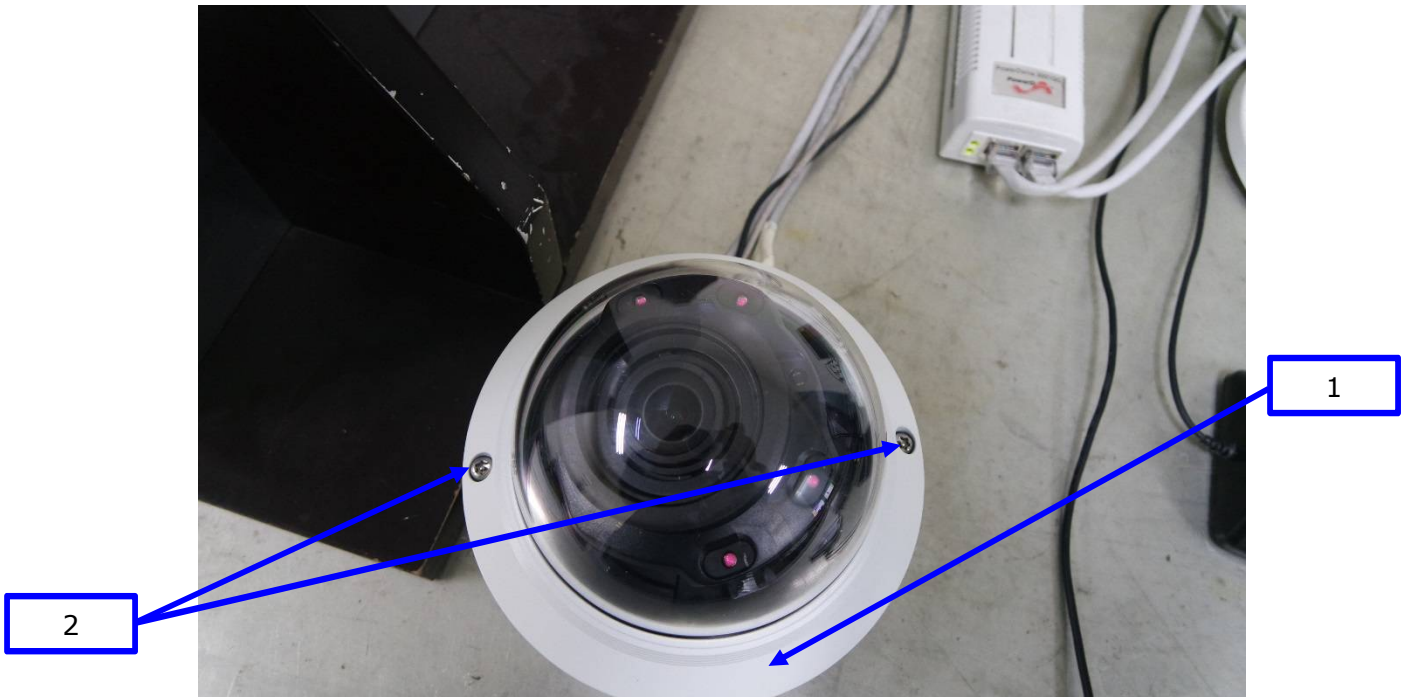
Air
Contact



- DC 12 V Mode



- POE Mode



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## Test Data

### - DC 12 V Mode

#### Indirect Discharge

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

#### Direct Discharge

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

### - POE Mode

#### Indirect Discharge

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

#### Direct Discharge

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

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

## Test Results

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

## Remarks

PASS Required Performance Criteria.



## 3.2 Radiated Electric Field Immunity

### Reference Standard

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

### Test Date

Dec, 07, 2016

### Test Location

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

### Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	Signal Generator	ESG-3000A	HP	US37040210	11, 01, 2017
<input checked="" type="checkbox"/>	Amplifier	ITA0300-200	Infinitech	-	11, 01, 2017
<input checked="" type="checkbox"/>	Amplifier	ITA0750-200	Infinitech	-	11, 01, 2017
<input checked="" type="checkbox"/>	Amplifier	ITA1500-100	Infinitech	-	11, 01, 2017
<input checked="" type="checkbox"/>	Amplifier	ITA2500-100	Infinitech	-	11, 01, 2017
<input checked="" type="checkbox"/>	GPIO INTERFACE CONTROL	SYSTEM CONTROL UNIT	Infinitech	-	-
<input checked="" type="checkbox"/>	POWER SUPPLY	SYSTEM POWER SUPPLY	Infinitech	-	-
<input checked="" type="checkbox"/>	Power Meter	E4419B	Agilent	MY45101506	06, 27, 2017
<input checked="" type="checkbox"/>	Average Power Sensor	E9301A	Agilent	-	06, 27, 2017
<input checked="" type="checkbox"/>	Average Power Sensor	E9301A	Agilent	MY41495698	11, 17, 2017
<input checked="" type="checkbox"/>	Stacked Double Log-Per-Antenna	STPL9128 D	SCHWARZBECK	9128D038	-
<input checked="" type="checkbox"/>	Amplifier	TK-PA8/3W	TESTEK	150008	06, 27, 2017
<input checked="" type="checkbox"/>	COUPLER	ZARC-25-63-S+	Mini-Circuits	FM14101424	06, 27, 2017
<input checked="" type="checkbox"/>	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM, INC	781	05, 07, 2017
<input checked="" type="checkbox"/>	NTSC/PAL/SECAM PATTERN GENERATOR	408NPS	LEADER	577240	02, 04, 2017

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C-3701, Simin-daero 365-40,  
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-EI-16T0657

Page (26) of (82)

<input checked="" type="checkbox"/>	DTV MODULATOR	TVB599A	TELEVIEW	23.53.20.15.09.0 0.0022	11, 01, 2017
<input checked="" type="checkbox"/>	TELEPHONE ANALYZER	DD-5601-CID JUNG	JUNG JIN	520304038	11, 01, 2017
<input checked="" type="checkbox"/>	MICROPHONE	MP201	BSWA	512175	11, 30, 2016
<input checked="" type="checkbox"/>	MICROPHONE	MP201	BSWA	520963	11, 11, 2017
<input checked="" type="checkbox"/>	SOUND ACOUSTIC TESTER	TST-1000	TESTEK	150045	11, 08, 2017
<input checked="" type="checkbox"/>	Semi Anechoic Chamber #2	-	SEMITEC	-	
<input checked="" type="checkbox"/>	EMS Test S/W	KTI_RS2012	KOREA TECHNOLOGY INSTITUTE CO., LTD	2.1.1	

**Test Conditions**

Temperature: 17,1 °C  
Relative Humidity: 36,2 %  
Atmospheric Pressure: 100,1 kPa

**Test Specifications**

Antenna Polarization: Horizontal & vertical unless indicated otherwise

Antenna Distance: ☒ 3 m

Field Strength: ☐ 1 V/m ☐ 3 V/m  
☒ 10 V/m

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

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

Frequency step: ☒ 1 % step

Dwell Time: ☐ 1 s ☒ 3 s

# of Sides Radiated: ☒ 4

Required Performance Criteria: ☒ Complied

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C-3701, Simin-daero 365-40,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
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Test report No.:  
KES-E1-16T0657  
Page (27) of (82)

**Test Data**

- DC 12 V Mode

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

- POE Mode

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

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

**Test Results**

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

**Remarks**

PASS Required Performance Criteria.

### 3.3 Electrical Fast Transients/Bursts

#### Reference Standard

EN 61000-4-4:2012

#### Test Date

Dec, 14, 2016

#### Test Location

EMS-EFT: Electro wave Shieldroom

#### Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	Ultra Compact Simulator	UCS 500 N5	EM TEST	V0936105120	06, 27, 2017
<input checked="" type="checkbox"/>	Capacitive Coupling Clamp	HFK	EM TEST	070925	06, 27, 2017
<input checked="" type="checkbox"/>	Motor Variac	MV2616	EM TEST	V0936105123	06, 27, 2017
<input checked="" type="checkbox"/>	EMS Test S/W	iec.control	EM TEST AG	5.0.9.0	-

#### Test Conditions

Temperature: 17,6 °C  
Relative Humidity: 36,9 %  
Atmospheric Pressure: 100,8 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 klz ☒ 100 klz

Duration of Test Voltage: ☒ ≥ 1 min

Required Performance Criteria: ☒ Complied



## Test Data

- DC 12 V Mode

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

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

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

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

☒ Signal ports and telecommunication ports – Coupling Clamp used

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



- POE Mode

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

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

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

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

☒ Signal ports and telecommunication ports – Coupling Clamp used

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

Note: “Blank” = Not performed

Observations:

Complied – No degradation of function

**Test Results**

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

**Remarks**

PASS Required Performance Criteria.



### 3.4 Surge Transients

**Reference Standard**

EN 61000-4-5:2014

**Test Date**

Dec, 14, 2016

**Test Location**

EMS-Surge: Electro wave Shieldroom

**Test Equipment**

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	Ultra Compact Simulator	UCS 500 N5	EM TEST	V0936105120	06, 27, 2017
<input checked="" type="checkbox"/>	Motor Variac	MV2616	EM TEST	V0936105123	06, 27, 2017
<input type="checkbox"/>	CDN	CNV 504N	EM TEST	V0936105121	06, 27, 2017
<input checked="" type="checkbox"/>	CDN	CNV 508N1	EM TEST	P1551168979	04, 27, 2017
<input checked="" type="checkbox"/>	EMS Test S/W	iec.control	EM TEST AG	5.0.9.0	-

**Test Conditions**

Temperature: 17,6 °C  
Relative Humidity: 36,9 %  
Atmospheric Pressure: 100,8 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

- DC 12 V Mode

☐ Line to Line – Differential Mode

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

☒ Line to Earth – Common Mode

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

## Signal Lines

☒ Line to Earth – Common Mode

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



- POE Mode

☐ Line to Line – Differential Mode

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

☐ Line to Earth – Common Mode

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

**Signal Lines**

☒ Line to Earth – Common Mode

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

Note: “Blank” = Not performed

Observations:  
Complied – No degradation of function

**Test Results**

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

**Remarks**

PASS Required Performance Criteria.

## 3.5 Conducted Disturbance

### Reference Standard

EN 61000-4-6:2014

### Test Date

Dec, 14, 2016

### Test Location

EMS-CS: Electro wave Shieldroom

### Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	Continuous Wave Generator	CWS 500N1	EM TEST	V0936105119	08, 08, 2017
<input checked="" type="checkbox"/>	6 dB Attenuator	ATT6	EM TEST	1208-34	08, 08, 2017
<input checked="" type="checkbox"/>	CDN	CDN-M2/M3N	EM TEST	0909-06	08, 08, 2017
<input type="checkbox"/>	CDN	CDN-T2-RJ11	EM TEST	0909-07	08, 08, 2017
<input type="checkbox"/>	CDN	CDN-T4	EM TEST	0909-08	08, 08, 2017
<input type="checkbox"/>	CDN	CDN-T8RJ45	EM TEST	0909-09	08, 08, 2017
<input type="checkbox"/>	CDN	CDN-AF2	EM TEST	0909-10	08, 08, 2017
<input type="checkbox"/>	CDN	CDN-AF4	EM TEST	0909-11	08, 08, 2017
<input checked="" type="checkbox"/>	EM Injection Clamp	EM 101	Liithi	35943	02, 04, 2017
<input checked="" type="checkbox"/>	EMS Test S/W	icd.control	EM TEST AG	5.3.7	-

### Test Conditions

Temperature: 17,6 °C  
Relative Humidity: 36,9 %  
Atmospheric Pressure: 100,8 kPa



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C-3701, Simin-daero 365-40,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
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Test report No.:  
KES-E1-16T0657  
Page (36) of (82)

### Test Specifications

Frequency range: ☒ 150 kHz to 100 MHz ☐ 150 kHz to 80 MHz

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

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

Frequency step: ☒ 1 % step

Dwell Time: ☒ 1 s ☐ 3 s

Required Performance Criteria: ☒ Complied

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## Test Data

- DC 12 V Mode

☐ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
-	CDN ( <input type="checkbox"/> M2, <input type="checkbox"/> M3)	-

☒ Input d.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
L1 - L2	CDN ( <input checked="" type="checkbox"/> M2, <input type="checkbox"/> M3)	Complied

☒ Signal ports and telecommunication ports

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

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C-3701, Simin-daero 365-40,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
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Test report No.:  
KES-E1-16T0657  
Page (38) of (82)

**- POE Mode**

☐ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
-	CDN ( <input type="checkbox"/> M2, <input type="checkbox"/> M3)	-

☐ Input d.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
-	CDN ( <input type="checkbox"/> M2, <input type="checkbox"/> M3)	-

☒ Signal ports and telecommunication ports

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

**Remarks**

PASS Required Performance Criteria.





### 3.6 Voltage Dips and Short Interruptions

#### Reference Standard

EN 61000-4-11:2004

#### Test Date

N/A

#### Test Location

EMS-Voltage dip: Electro wave Shieldroom

#### Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input type="checkbox"/>	Ultra Compact Simulator	UCS 500 N5	EM TEST	V0936105120	06, 27, 2017
<input type="checkbox"/>	Motor Variac	MV2616	EM TEST	V0936105123	06, 27, 2017
<input type="checkbox"/>	EMS Test S/W	iec.control	EM TEST AG	5.0.9.0	-

#### Test Conditions

Temperature:

°C

Relative Humidity:

%

Atmospheric Pressure:

kPa



## Test Specifications & Observations/Remarks

(Test Voltage : 50 Hz)

<u>Test Level</u>	<u>Duration [in period/ms (50 Hz)]</u>	<u>Results</u>
<input type="checkbox"/> 20 % dip	<input type="checkbox"/> 250 /5000	_____
<input type="checkbox"/> 30 % dip	<input type="checkbox"/> 25 /500	_____
<input type="checkbox"/> 60 % dip	<input type="checkbox"/> 10 /200	_____
<input type="checkbox"/> 100 % dip	<input type="checkbox"/> 250 /5000	_____

- Voltage variations

<input type="checkbox"/> Unom + 10 %	<input type="checkbox"/> 253 V (ac)	_____
<input type="checkbox"/> Unom - 15 %	<input type="checkbox"/> 195.5 V (ac)	_____

Observations:  
Complied – No degradation 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

#### ◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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



**KES Co., Ltd.**

C-3701, Simin-daero 365-40,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
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Test report No.:  
KES-E1-16T0657  
Page (42) of (82)

**[NEUTRAL]**

N/A

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

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The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

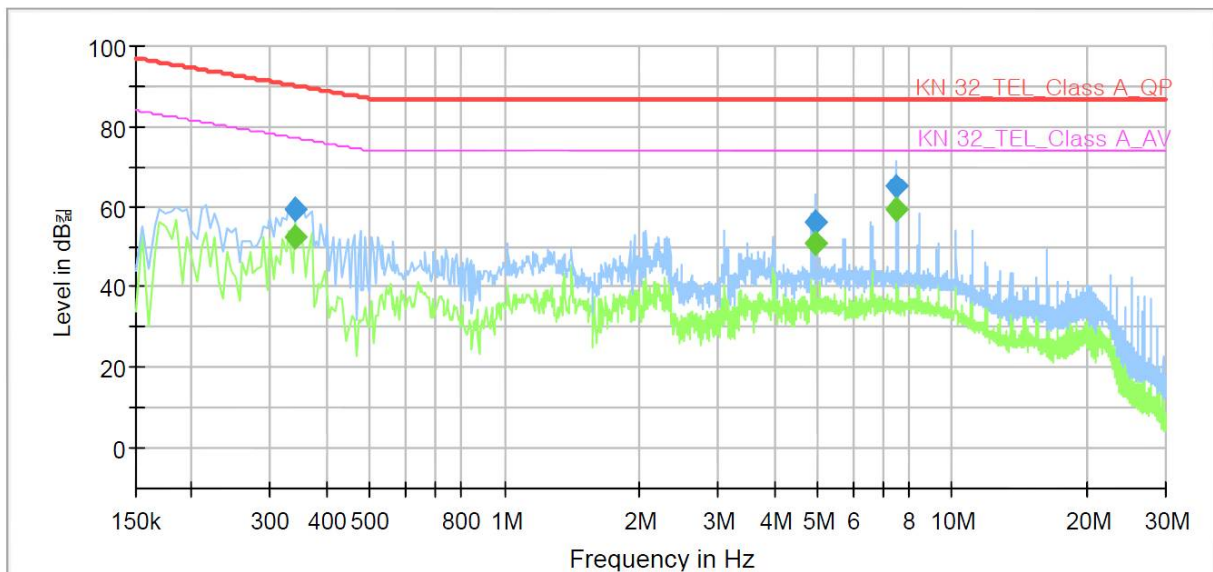
## Conducted Emissions at Telecommunication Ports

- DC 12 V Mode

[10 Mbps]

### Common Information

Test Description:	Telecommunication Emission
Model No.:	XND-8080RVP
Mode	DC 12V_10M
Operator Name:	KES



### Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.340000	---	52.31	77.20	24.89	1000.0	9.000	Single Line	10.1
0.340000	59.06	---	90.20	31.14	1000.0	9.000	Single Line	10.1
4.945000	---	50.61	74.00	23.39	1000.0	9.000	Single Line	10.1
4.945000	56.31	---	87.00	30.69	1000.0	9.000	Single Line	10.1
7.500000	---	59.18	74.00	14.82	1000.0	9.000	Single Line	10.0
7.500000	65.10	---	87.00	21.90	1000.0	9.000	Single Line	10.0

#### ◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

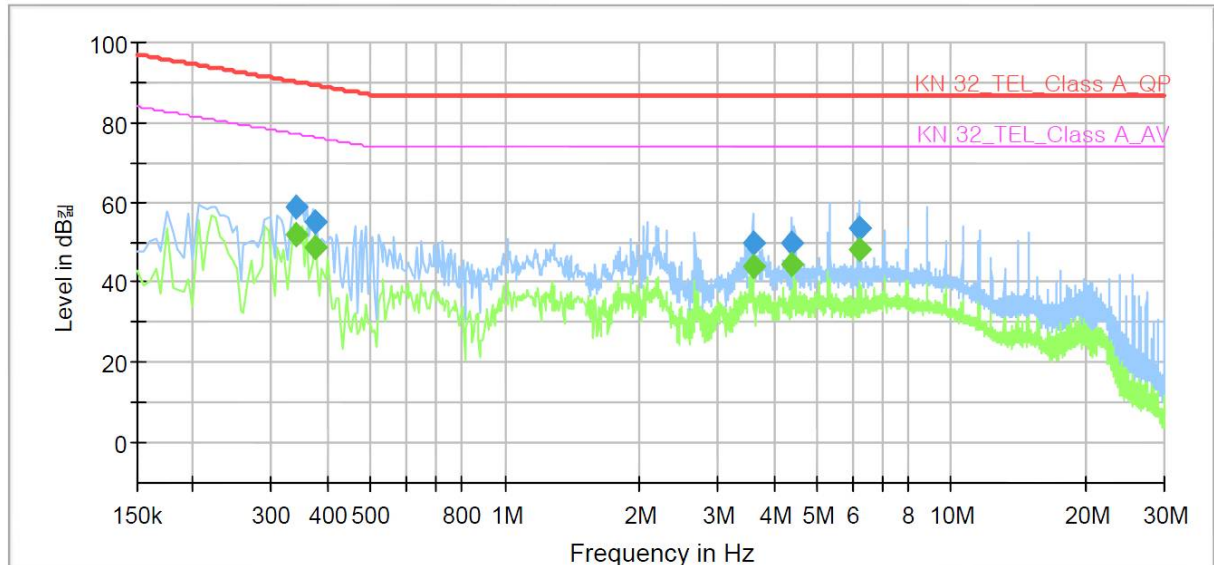
Corr. : Correction values (ISN FACTOR+ Cable Loss)



[100 Mbps]

## Common Information

Test Description: Telecommunication Emission  
Model No.: XND-8080RVP  
Mode: DC 12V\_100M  
Operator Name: KES



## Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.340000	---	51.79	77.20	25.41	1000.0	9.000	Single Line	9.6
0.340000	58.50	---	90.20	31.70	1000.0	9.000	Single Line	9.6
0.375000	---	48.52	76.39	27.87	1000.0	9.000	Single Line	9.6
0.375000	55.29	---	89.39	34.10	1000.0	9.000	Single Line	9.6
3.585000	---	43.79	74.00	30.21	1000.0	9.000	Single Line	9.7
3.585000	49.79	---	87.00	37.21	1000.0	9.000	Single Line	9.7
4.400000	---	44.32	74.00	29.68	1000.0	9.000	Single Line	9.6
4.400000	49.82	---	87.00	37.18	1000.0	9.000	Single Line	9.6
6.195000	---	47.93	74.00	26.07	1000.0	9.000	Single Line	9.6
6.195000	53.66	---	87.00	33.34	1000.0	9.000	Single Line	9.6

### ◆ 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)



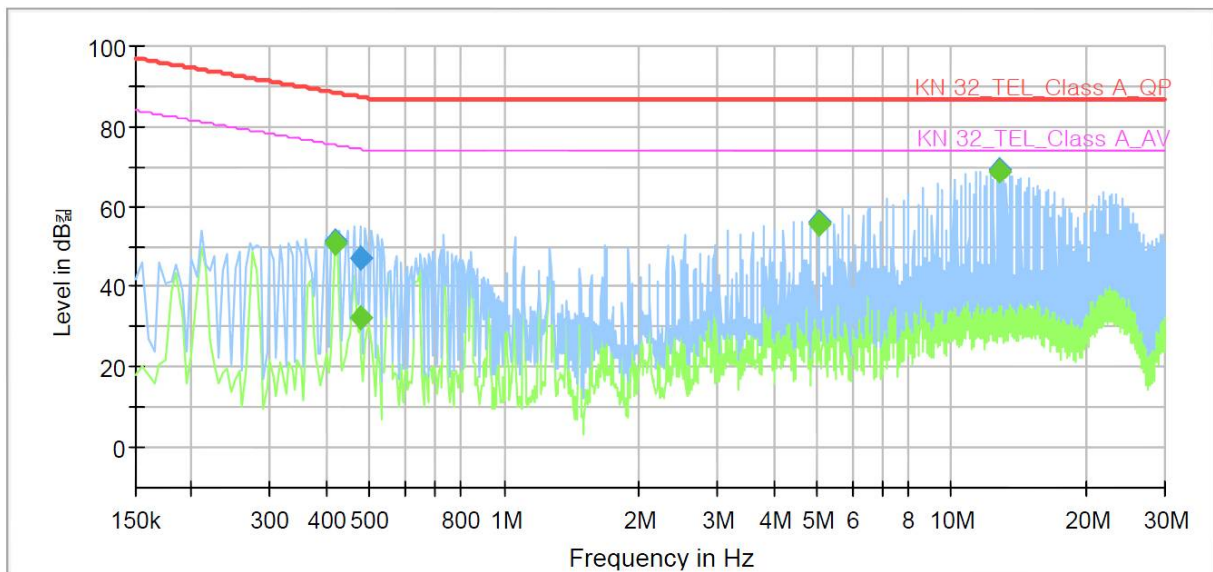


- POE Mode

[10 Mbps]

## Common Information

Test Description: Telecommunication Emission  
Model No.: XND-8080RVP  
Mode: POE\_10M  
Operator Name: KES



## Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.420000	---	50.72	75.45	24.73	1000.0	9.000	Single Line	10.1
0.420000	51.25	---	88.45	37.20	1000.0	9.000	Single Line	10.1
0.475000	---	32.20	74.43	42.23	1000.0	9.000	Single Line	10.1
0.475000	47.06	---	87.43	40.37	1000.0	9.000	Single Line	10.1
5.060000	---	55.34	74.00	18.66	1000.0	9.000	Single Line	10.1
5.060000	56.24	---	87.00	30.76	1000.0	9.000	Single Line	10.1
12.865000	---	68.97	74.00	5.03	1000.0	9.000	Single Line	10.1
12.865000	69.08	---	87.00	17.92	1000.0	9.000	Single Line	10.1

### ◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

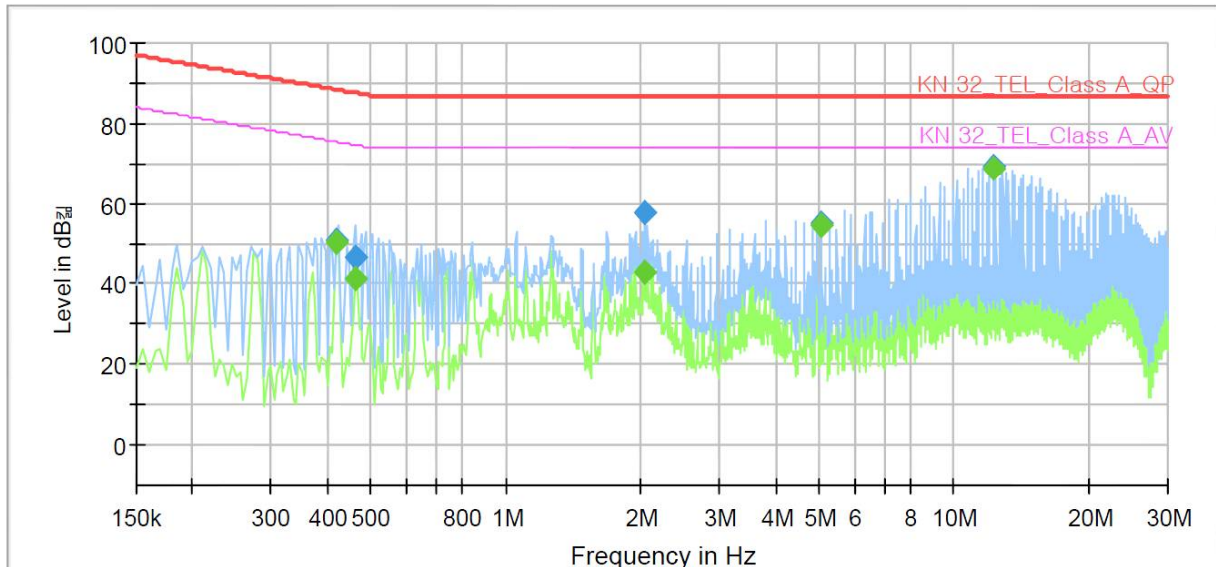
Corr. : Correction values (ISN FACTOR+ Cable Loss)



**[100 Mbps]**

**Common Information**

Test Description: Telecommunication Emission  
Model No.: XND-8080RVP  
Mode: POE\_100M  
Operator Name: KES



**Final Result**

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.420000	---	50.30	75.45	25.15	1000.0	9.000	Single Line	9.6
0.420000	50.86	---	88.45	37.59	1000.0	9.000	Single Line	9.6
0.460000	---	41.08	74.69	33.61	1000.0	9.000	Single Line	9.6
0.460000	46.74	---	87.69	40.95	1000.0	9.000	Single Line	9.6
2.045000	---	42.90	74.00	31.10	1000.0	9.000	Single Line	9.7
2.045000	57.56	---	87.00	29.44	1000.0	9.000	Single Line	9.7
5.060000	---	54.31	74.00	19.69	1000.0	9.000	Single Line	9.6
5.060000	55.08	---	87.00	31.92	1000.0	9.000	Single Line	9.6
12.230000	---	68.85	74.00	5.15	1000.0	9.000	Single Line	9.5
12.230000	69.11	---	87.00	17.89	1000.0	9.000	Single Line	9.5

◆ 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)





## Radiated Electric Field Emissions(Below 1 GHz)

- DC 12 V Mode

Frequency	Amplitude	ANT	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin
[MHz]	[dB $\mu$ V]	Polar. (H/V)	[m]	ANT. [dB/m]	Cable [dB]	[dB $\mu$ V/m]	[dB $\mu$ V/m]	[dB]
152.26	12.30	V	1.31	8.28	3.60	24.18	40.00	15.82
189.01	10.25	H	2.25	10.26	4.00	24.51	40.00	15.49
325.80	12.39	H	1.95	13.98	5.40	31.77	47.00	15.23
352.94	15.35	V	3.01	14.61	5.67	35.63	47.00	11.37
427.65	12.87	H	1.55	16.09	6.52	35.48	47.00	11.52
454.81	12.25	V	2.01	16.47	6.82	35.54	47.00	11.46
524.33	11.37	H	1.69	17.64	7.20	36.21	47.00	10.79
598.38	8.31	V	2.38	19.26	7.82	35.39	47.00	11.61

\* H : Horizontal, V : Vertical

### ◆ Calculation

Corrected Amplitude [dB $\mu$ V] = Amplitude[dBuV] + Correction Factor [dB]

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

Correction Factor : ANT FACTOR + Cable loss

**KES Co., Ltd.**

C-3701, Simin-daero 365-40,  
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-E1-16T0657  
Page (48) of (82)

**- POE Mode**

Frequency	Amplitude	ANT	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin
[MHz]	[dBμV]	Polar. (H/V)	[m]	ANT. [dB/m]	Cable [dB]	[dBμV/m]	[dBμV/m]	[dB]
160.92	11.25	V	2.30	8.60	3.70	23.55	40.00	16.45
189.03	10.09	H	2.01	10.26	4.00	24.35	40.00	15.65
300.58	11.38	H	1.58	13.39	5.16	29.93	47.00	17.07
300.60	10.95	V	1.36	13.39	5.16	29.50	47.00	17.50
350.99	13.50	V	3.02	14.56	5.65	33.71	47.00	13.29
400.48	10.07	H	1.25	15.71	6.18	31.96	47.00	15.04
449.93	8.32	V	2.01	16.40	6.80	31.52	47.00	15.48

\* H : Horizontal, V : Vertical

**◆ Calculation**

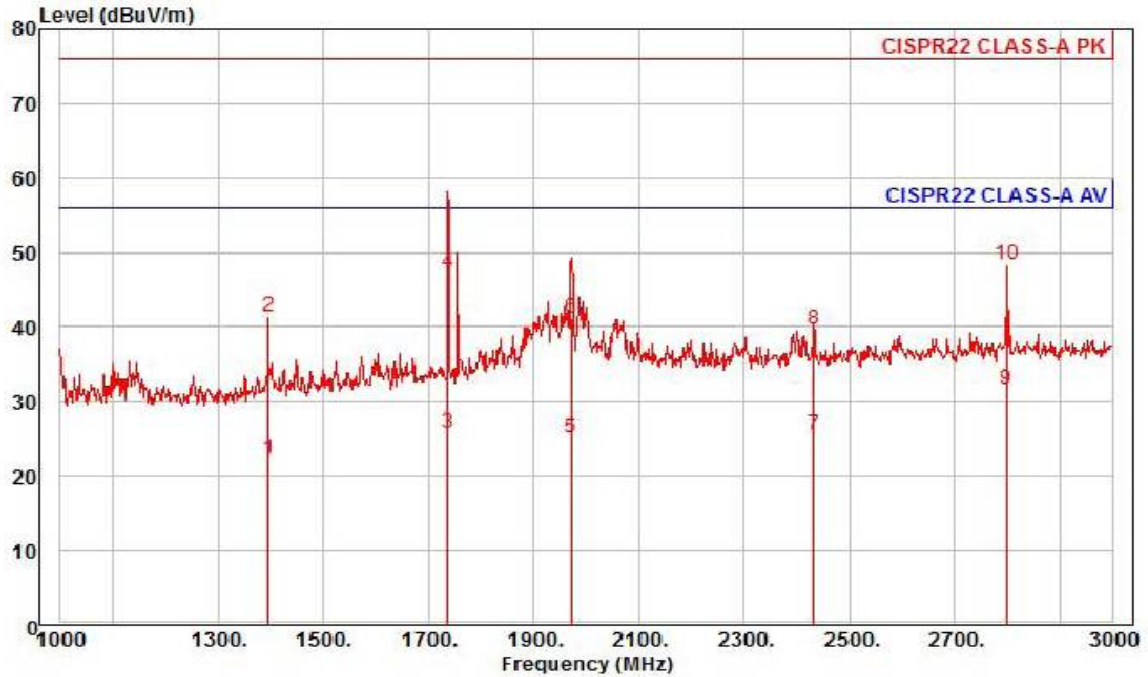
Corrected Amplitude [dBμV] = Amplitude[dBuV] + Correction Factor [dB]

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

Correction Factor : ANT FACTOR + Cable loss

## Radiated Electric Field Emissions(Above 1 GHz)

- DC 12 V Mode



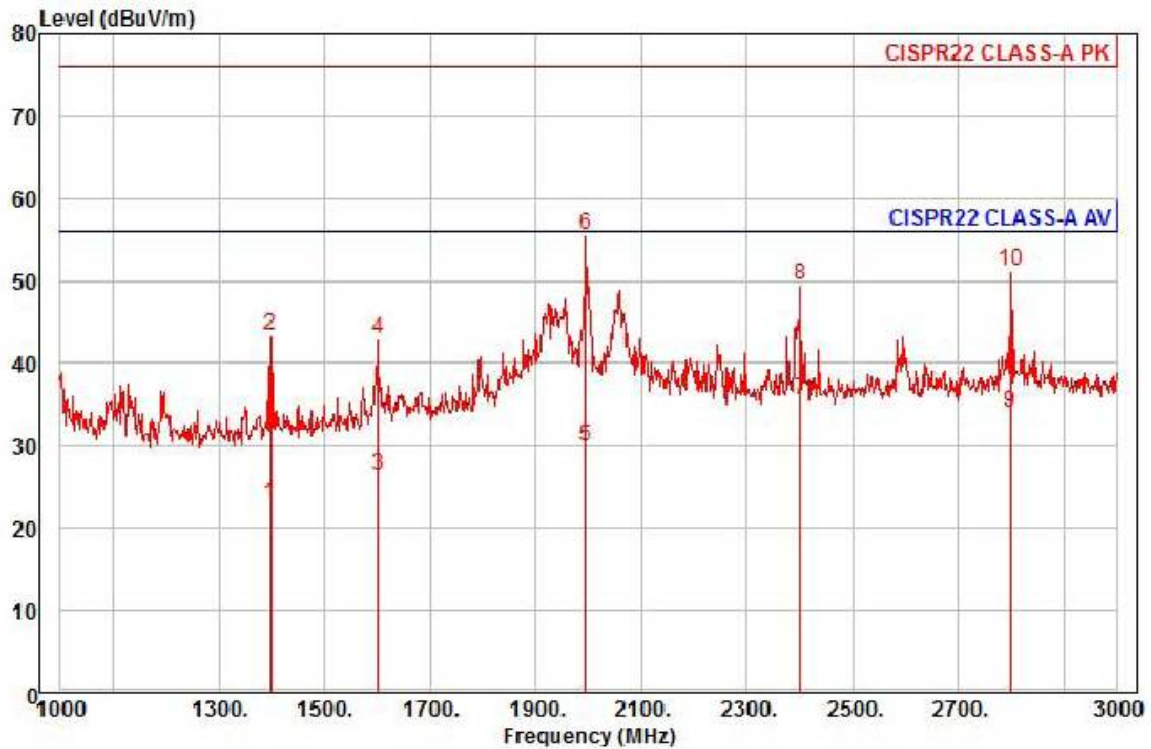
Site : chamber  
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal  
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto  
Project :  
Model : XND-8080RVP  
Mode : DC 12 V  
Memo : 1 ~ 3 GHz

	Read	Ant	Cable	Preamp	TPos	Limit	Over		
Freq	Level	Factor	Loss	Factor		Line	Limit	Pol/Phase	Remark
MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1396.00	28.11	25.48	7.71	307	56.00	-33.84	horizontal	Average
2	1396.00	47.29	25.48	7.71	307	76.00	-34.66	horizontal	Peak
3	1736.00	29.60	26.83	8.66	81	56.00	-30.20	horizontal	Average
4	1736.00	51.08	26.83	8.66	81	76.00	-28.72	horizontal	Peak
5	1972.00	27.36	27.77	9.26	86	56.00	-31.01	horizontal	Average
6	1972.00	43.55	27.77	9.26	86	76.00	-34.82	horizontal	Peak
7	2432.00	25.62	28.94	10.39	127	56.00	-30.51	horizontal	Average
8	2432.00	39.73	28.94	10.39	127	76.00	-36.40	horizontal	Peak
9 pp	2800.00	30.33	29.84	11.23	271	56.00	-24.48	horizontal	Average
10 pk	2800.00	47.29	29.84	11.23	271	76.00	-27.52	horizontal	Peak

### ◆ Calculation

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

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



Site : chamber  
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical  
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto  
Project :  
Model : XND-8080RVP  
Mode : DC 12 V  
Memo : 1 ~ 3 GHz

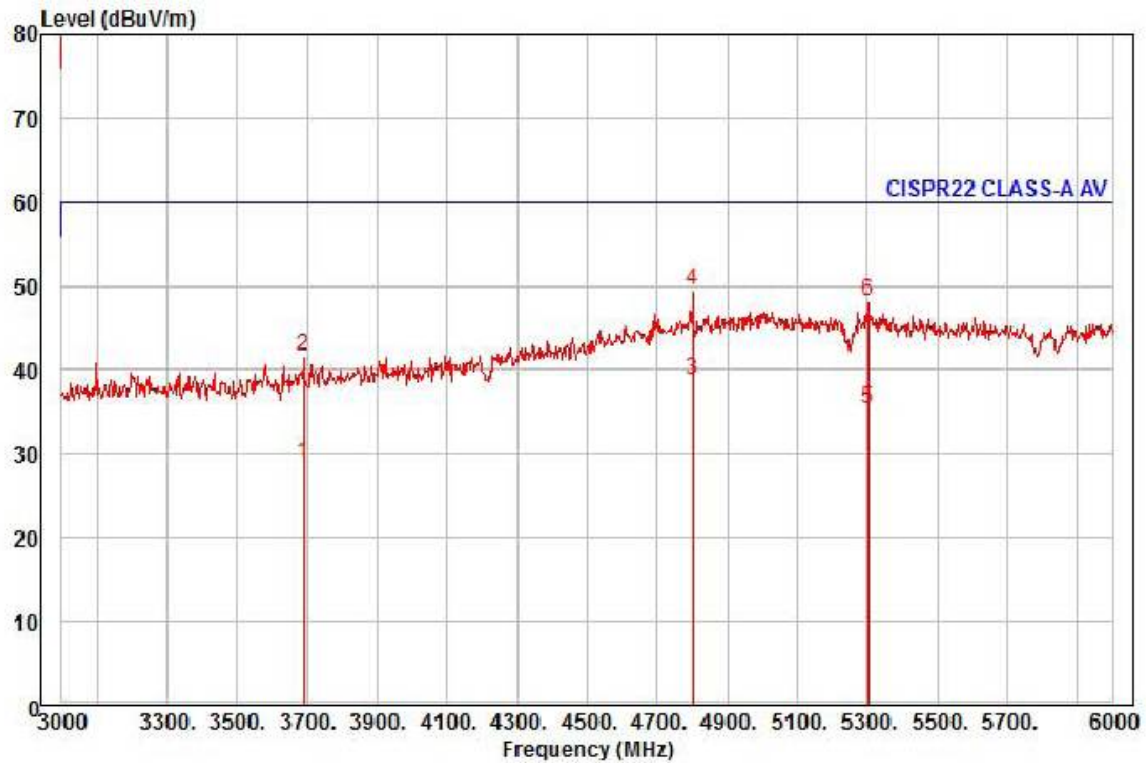
	Read	Ant	Cable	Preamp	TPos	Limit	Over		
Freq	Level	Factor	Loss	Factor		Line	Limit	Pol/Phase	Remark
MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1398.00	28.76	25.49	7.72	39.13	270	56.00	-33.16	vertical
2	1398.00	49.39	25.49	7.72	39.13	270	76.00	-32.53	vertical
3	1600.00	30.95	26.29	8.31	39.22	179	56.00	-29.67	vertical
4	1600.00	47.56	26.29	8.31	39.22	179	76.00	-33.06	vertical
5	1994.00	32.15	27.86	9.32	39.41	337	56.00	-26.08	vertical
6 pp	1994.00	57.90	27.86	9.32	39.41	337	76.00	-20.33	vertical
7 av	2400.00	35.74	28.86	10.32	39.42	35	56.00	-20.50	vertical
8	2400.00	49.64	28.86	10.32	39.42	35	76.00	-26.60	vertical
9	2800.00	32.87	29.84	11.23	39.88	187	56.00	-21.94	vertical
10	2800.00	50.14	29.84	11.23	39.88	187	76.00	-24.67	vertical

#### ◆ Calculation

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

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





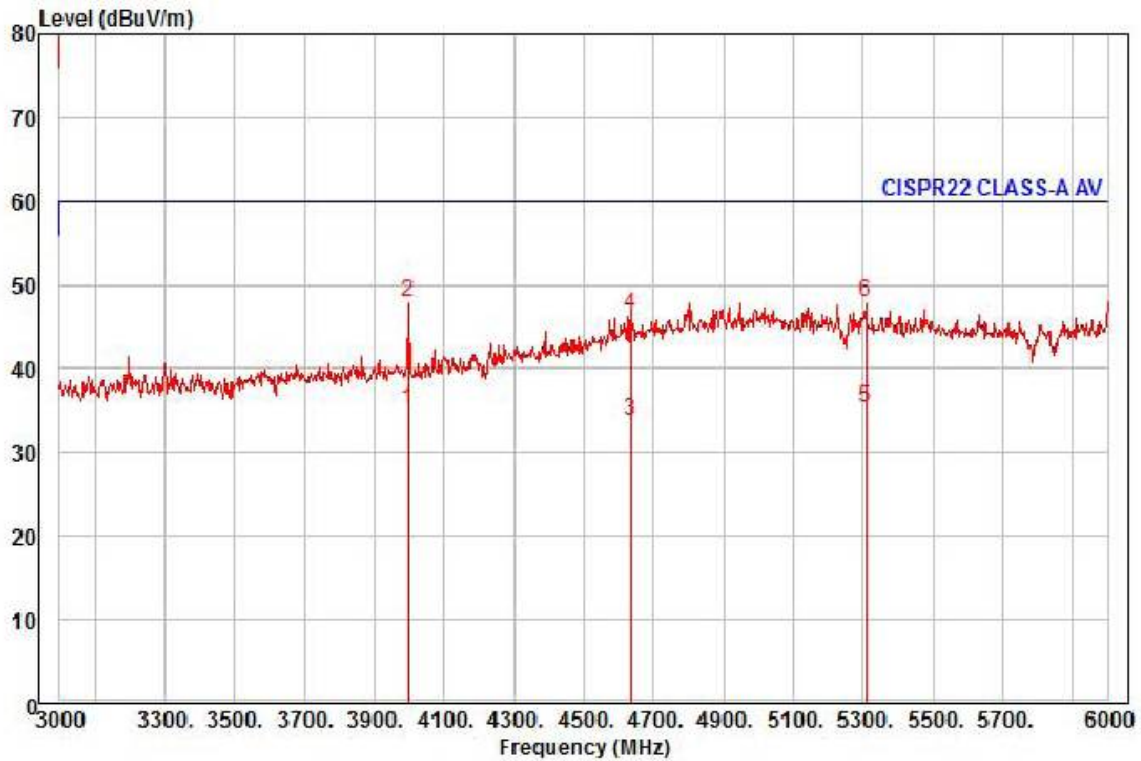
Site : chamber  
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal  
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto  
Project :  
Model : XND-8080RVP  
Mode : DC 12 V  
Memo : 3 ~ 6 GHz

	Read Freq	Ant Level	Ant Factor	Cable Loss	Preamp Factor	TPos deg	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3690.00	25.17	31.49	12.97	40.81	185	60.00	-31.18	horizontal	Average
2	3690.00	38.00	31.49	12.97	40.81	185	80.00	-38.35	horizontal	Peak
3 pp	4800.00	27.59	36.58	15.10	40.47	114	60.00	-21.20	horizontal	Average
4 pk	4800.00	38.29	36.58	15.10	40.47	114	80.00	-30.50	horizontal	Peak
5	5301.00	23.08	37.11	15.87	40.77	177	60.00	-24.71	horizontal	Average
6	5301.00	35.90	37.11	15.87	40.77	177	80.00	-31.89	horizontal	Peak

◆ Calculation

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

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



Site : chamber

Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical

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

Project :

Model : XND-8080RVP

Mode : DC 12 V

Memo : 3 ~ 6 GHz

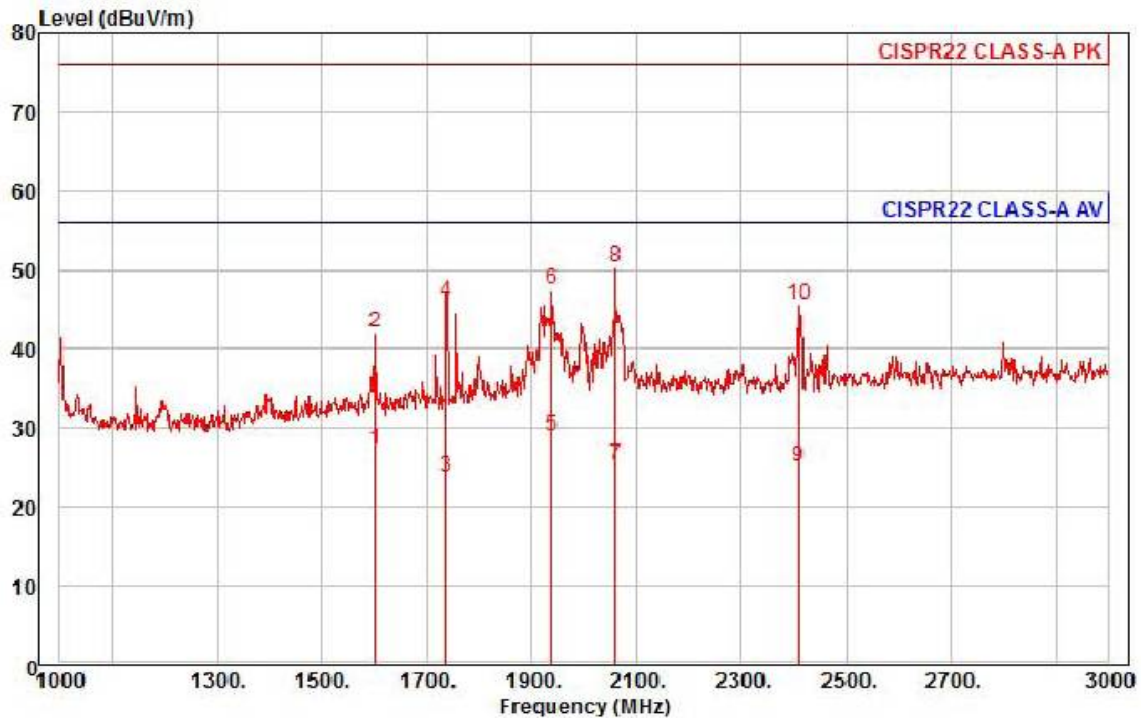
		Read	Ant	Cable	Preamp	TPos	Limit	Over		
	Freq	Level	Factor	Loss	Factor		Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3999.00	30.30	32.01	13.56	40.70	158	60.00	-24.83	vertical	Average
2	3999.00	43.05	32.01	13.56	40.70	158	80.00	-32.08	vertical	Peak
3	4635.00	24.08	35.64	14.73	40.64	318	60.00	-26.19	vertical	Average
4	4635.00	36.73	35.64	14.73	40.64	318	80.00	-33.54	vertical	Peak
5 pp	5307.00	23.06	37.10	15.88	40.78	120	60.00	-24.74	vertical	Average
6 pk	5307.00	35.85	37.10	15.88	40.78	120	80.00	-31.95	vertical	Peak

#### ◆ Calculation

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

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

- POE Mode



Site : chamber  
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal  
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto  
Project :  
Model : XND-8080RVP  
Mode : POE  
Memo : 1 ~ 3 GHz

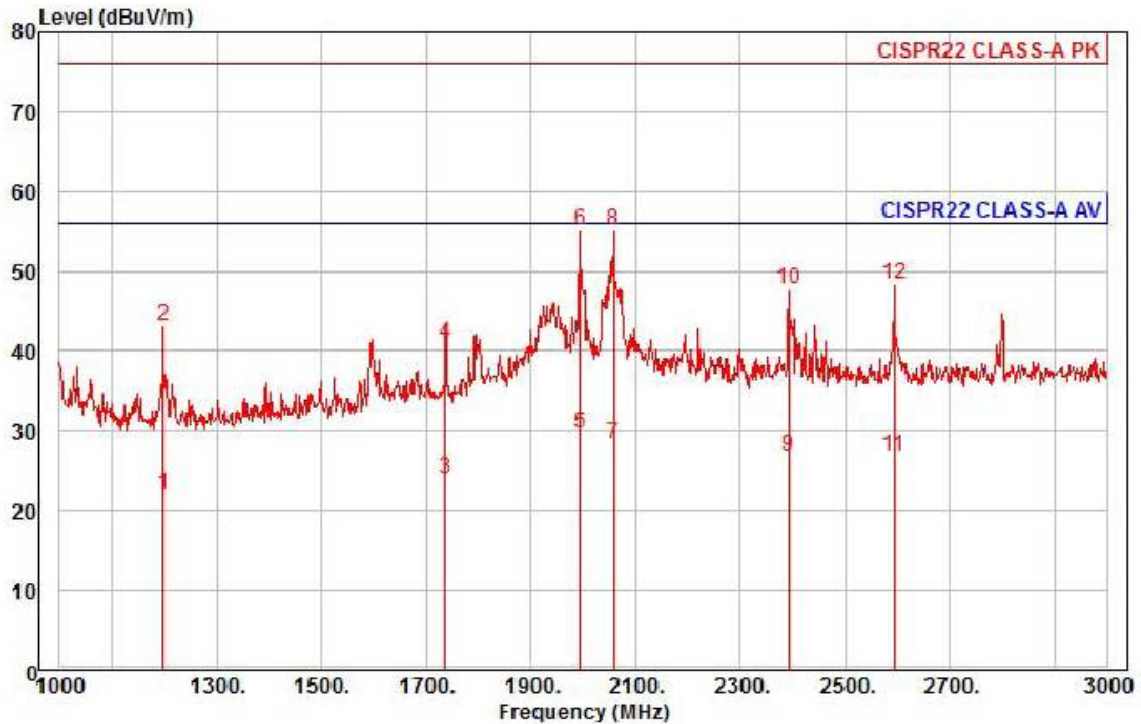
	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1600.00	31.86	26.29	8.31	39.22	150	56.00	-28.76	horizontal	Average
2	1600.00	46.63	26.29	8.31	39.22	150	76.00	-33.99	horizontal	Peak
3	1736.00	27.49	26.83	8.66	39.29	166	56.00	-32.31	horizontal	Average
4	1736.00	49.90	26.83	8.66	39.29	166	76.00	-29.90	horizontal	Peak
5 av	1938.00	31.60	27.63	9.18	39.38	180	56.00	-26.97	horizontal	Average
6	1938.00	50.06	27.63	9.18	39.38	180	76.00	-28.51	horizontal	Peak
7	2060.00	27.21	28.03	9.48	39.41	144	56.00	-30.69	horizontal	Average
8 pp	2060.00	52.28	28.03	9.48	39.41	144	76.00	-25.62	horizontal	Peak
9	2410.00	25.28	28.88	10.34	39.43	235	56.00	-30.93	horizontal	Average
10	2410.00	45.86	28.88	10.34	39.43	235	76.00	-30.35	horizontal	Peak

◆ Calculation

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

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





Site : chamber

Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical

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

Project :

Model : XND-8080RVP

Mode : POE

Memo : 1 ~ 3 GHz

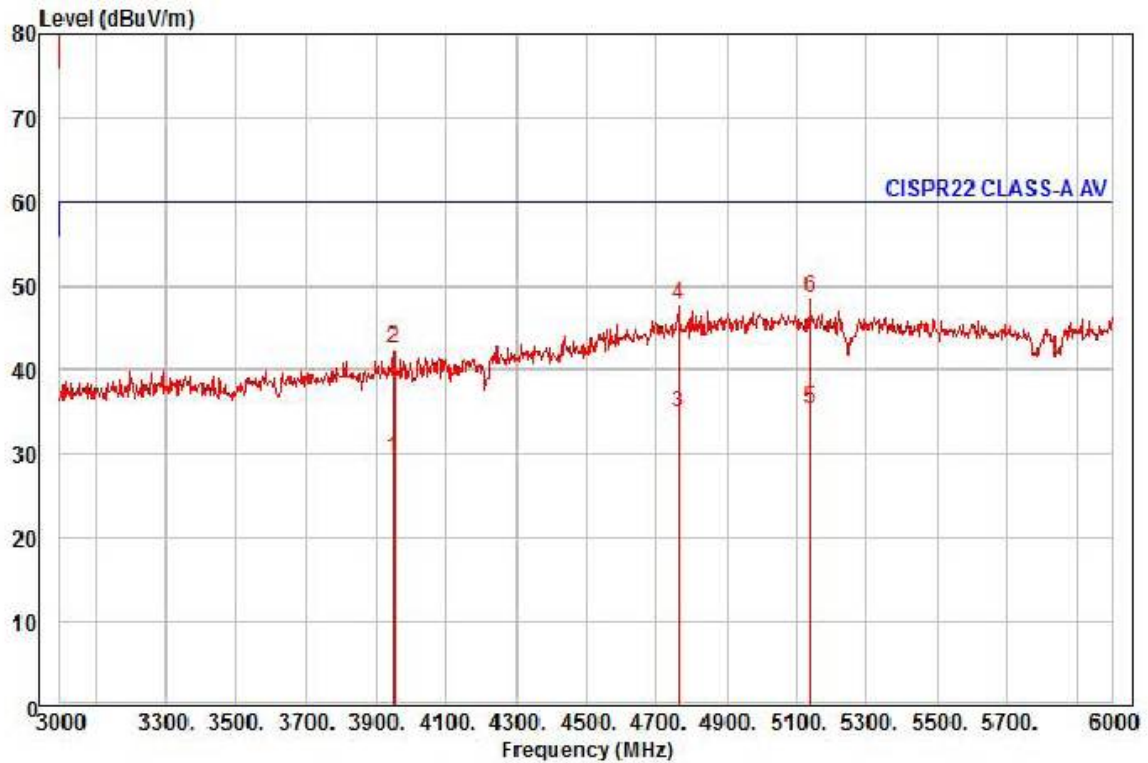
	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1198.00	29.79	24.70	7.13	39.61	328	56.00	-33.99	vertical	Average
2	1198.00	50.86	24.70	7.13	39.61	328	76.00	-32.92	vertical	Peak
3	1736.00	27.68	26.83	8.66	39.29	120	56.00	-32.12	vertical	Average
4	1736.00	44.80	26.83	8.66	39.29	120	76.00	-35.00	vertical	Peak
5 av	1994.00	31.86	27.86	9.32	39.41	306	56.00	-26.37	vertical	Average
6	1994.00	57.39	27.86	9.32	39.41	306	76.00	-20.84	vertical	Peak
7	2058.00	30.26	28.02	9.47	39.41	231	56.00	-27.66	vertical	Average
8 pp	2058.00	57.11	28.02	9.47	39.41	231	76.00	-20.81	vertical	Peak
9	2392.00	27.04	28.84	10.30	39.42	6	56.00	-29.24	vertical	Average
10	2392.00	48.02	28.84	10.30	39.42	6	76.00	-28.26	vertical	Peak
11	2594.00	26.40	29.34	10.73	39.64	171	56.00	-29.17	vertical	Average
12	2594.00	47.97	29.34	10.73	39.64	171	76.00	-27.60	vertical	Peak

#### ◆ Calculation

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

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





Site : chamber  
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal  
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto  
Project :  
Model : XND-8080RVP  
Mode : POE  
Memo : 3 ~ 6 GHz

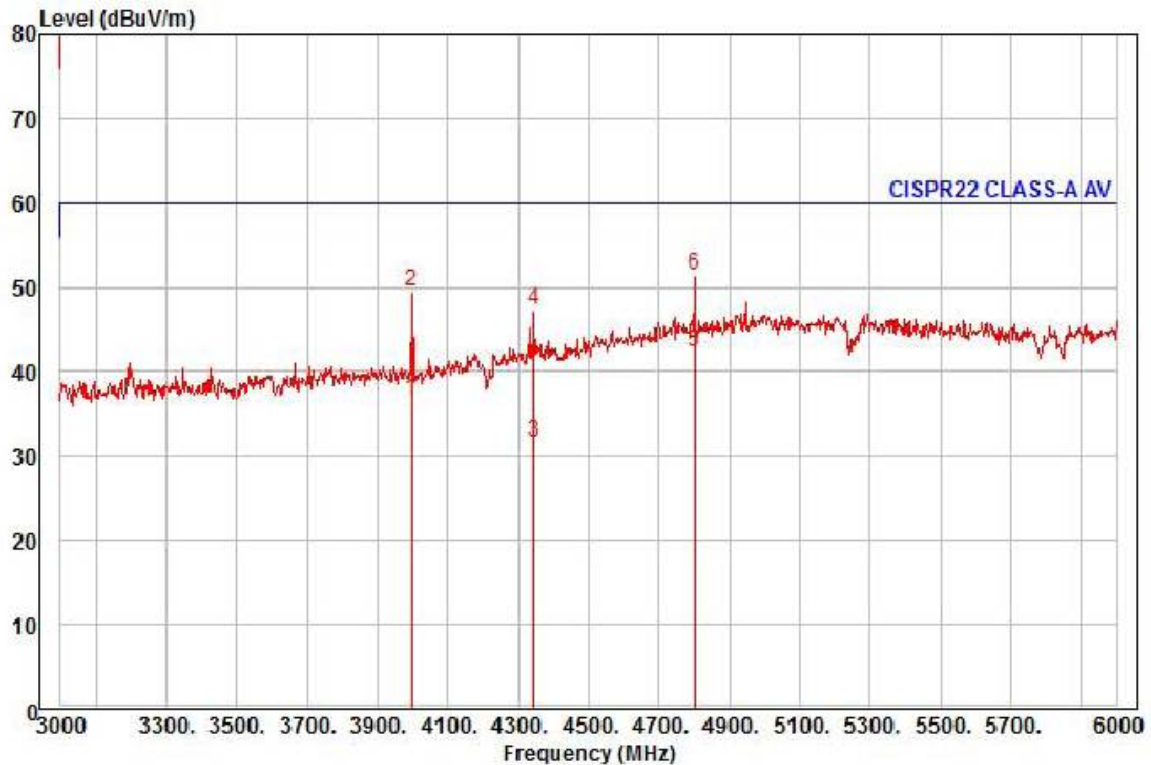
	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3951.00	24.81	31.93	13.47	40.72	81	60.00	-30.51	horizontal	Average
2	3951.00	37.88	31.93	13.47	40.72	81	80.00	-37.44	horizontal	Peak
3	4764.00	24.07	36.37	15.02	40.51	117	60.00	-25.05	horizontal	Average
4	4764.00	36.91	36.37	15.02	40.51	117	80.00	-32.21	horizontal	Peak
5 pp	5139.00	22.87	37.44	15.59	40.50	241	60.00	-24.60	horizontal	Average
6 pk	5139.00	36.11	37.44	15.59	40.50	241	80.00	-31.36	horizontal	Peak

#### ◆ Calculation

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

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

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The results shown in this test report refer only to the sample(s) tested unless otherwise stated.



Site : chamber  
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical  
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto  
Project :  
Model : XND-8080RVP  
Mode : POE  
Memo : 3 ~ 6 GHz

	Read	Ant	Cable	Preamp	TPos	Limit	Over		
Freq	Level	Factor	Loss	Factor		Line	Limit	Pol/Phase	Remark
MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3999.00	31.84	32.01	13.56	40.70	143	60.00	-23.29	vertical Average
2	3999.00	44.57	32.01	13.56	40.70	143	80.00	-30.56	vertical Peak
3	4344.00	24.29	33.97	14.18	40.75	171	60.00	-28.31	vertical Average
4	4344.00	39.90	33.97	14.18	40.75	171	80.00	-32.70	vertical Peak
5 pp	4800.00	31.02	36.58	15.10	40.47	233	60.00	-17.77	vertical Average
6 pk	4800.00	40.25	36.58	15.10	40.47	233	80.00	-28.54	vertical Peak

#### ◆ Calculation

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

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

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Test Data - Voltage Fluctuations

**Maximum Flicker results**

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



---

## **Test Setup Photos and Configuration**

### **Conducted Voltage Emissions**

N/A

N/A



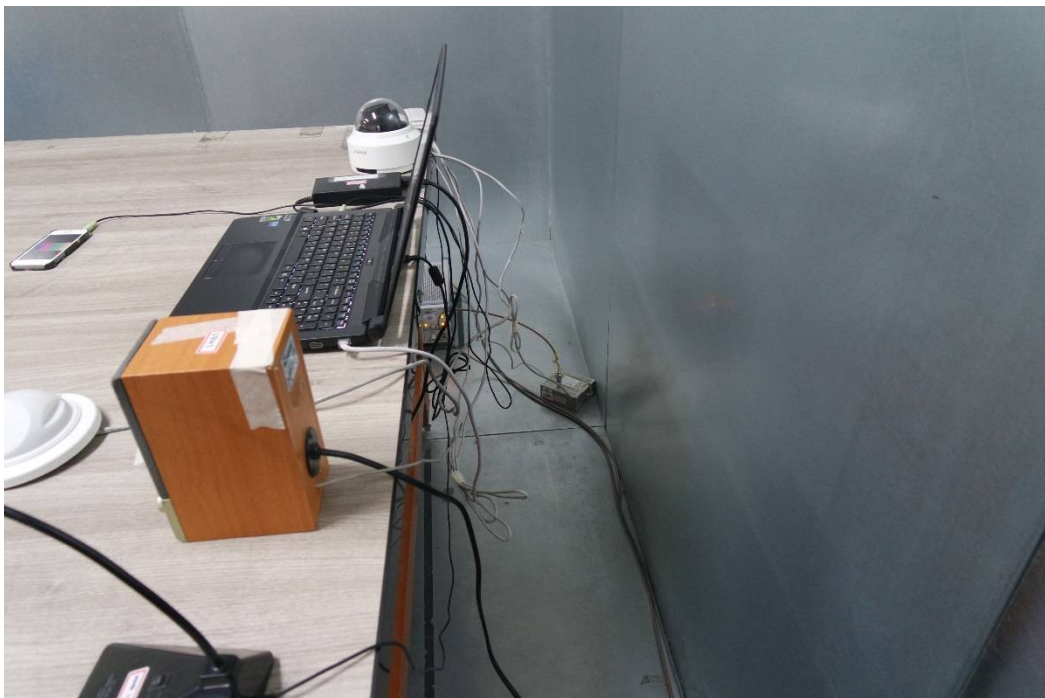
## Conducted Telecommunication Emissions

- DC 12 V Mode



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- POE Mode



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## Radiated Electric Field Emissions(Below 1 GHz)

- DC 12 V Mode



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- POE Mode



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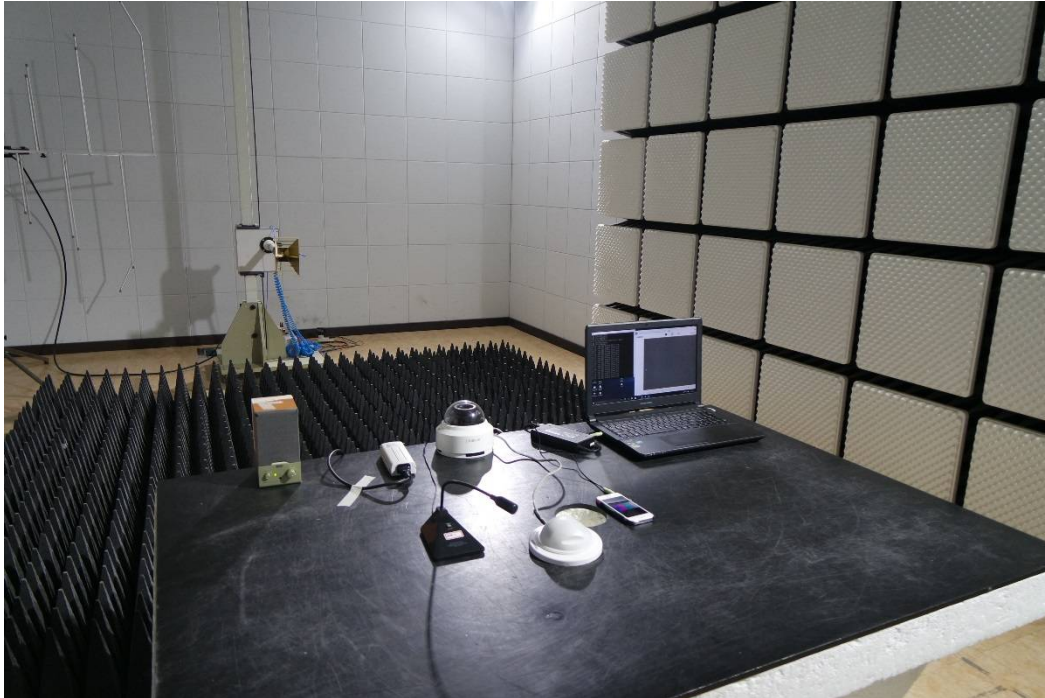
## Radiated Electric Field Emissions(Above 1 GHz)

- DC 12 V Mode



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- POE Mode



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**KES Co., Ltd.**

C-3701, Simin-daero 365-40,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
[www.kes.co.kr](http://www.kes.co.kr)

Test report No.:  
KES-E1-16T0657  
Page (67) of (82)

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## **Harmonic Current Emissions and Voltage Fluctuations and Flicker**

N/A

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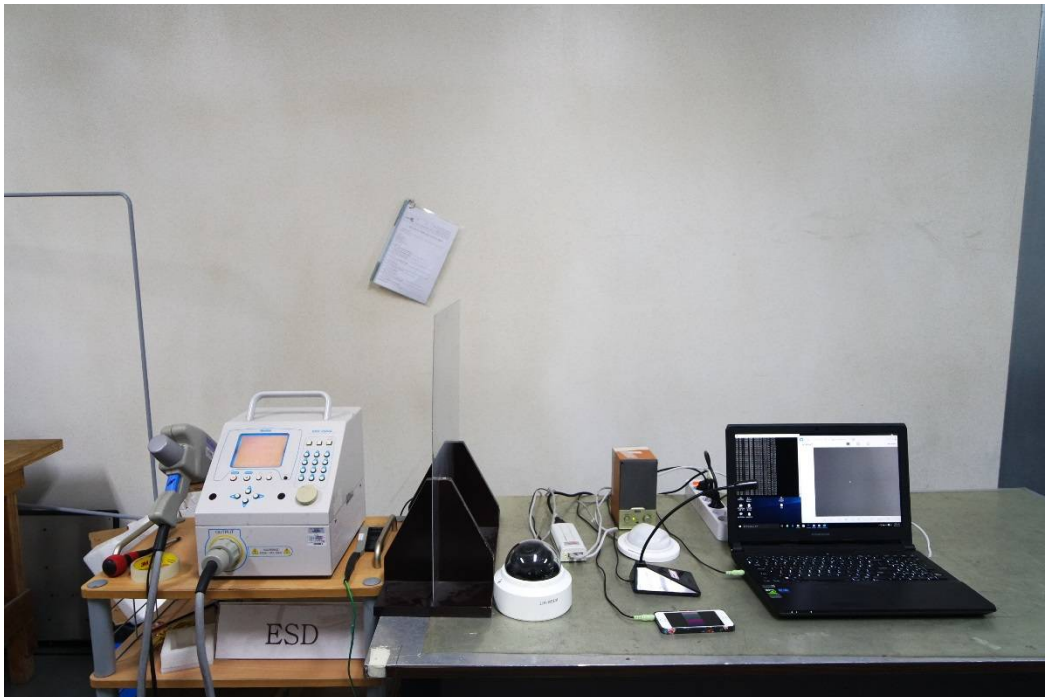


## Electrostatic Discharge

### - DC 12 V Mode



### - POE Mode



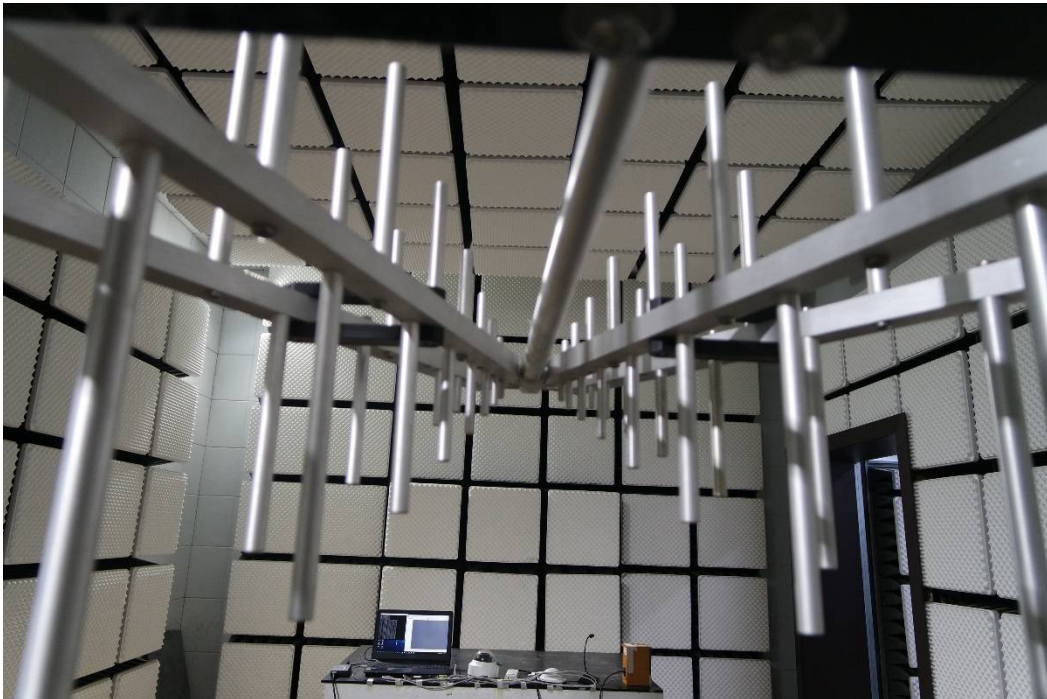
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## Radiated Electric Field Immunity

- DC 12 V Mode



- POE Mode



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## Electrical Fast Transients/Bursts

- DC 12 V Mode

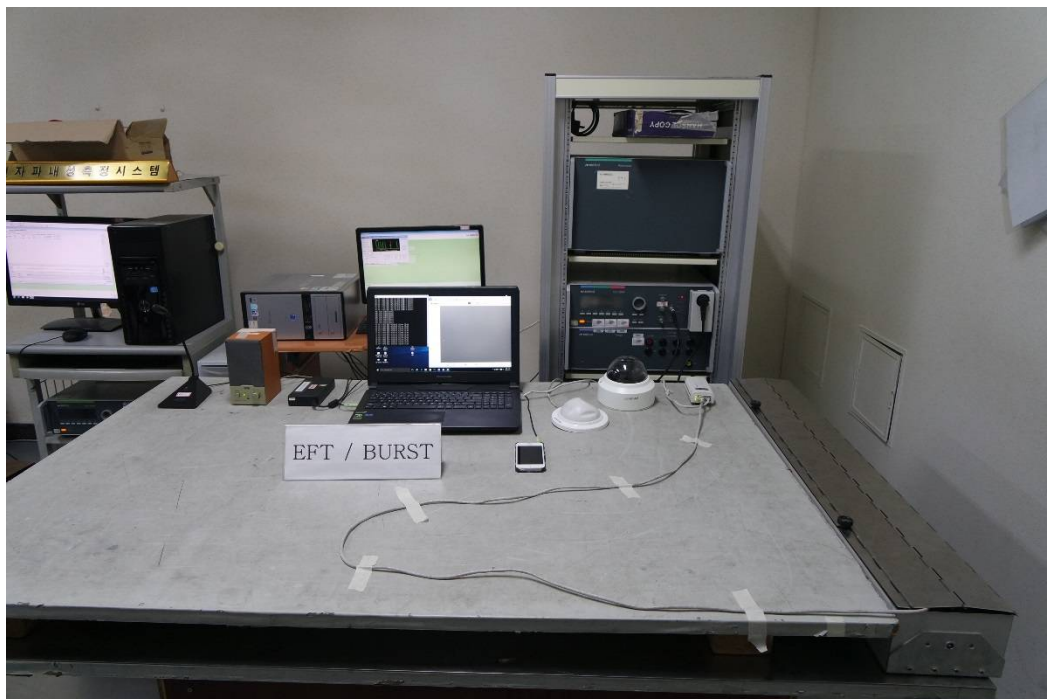


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- POE Mode

N/A



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## Surge Transients

- DC 12 V Mode



N/A

- POE Mode

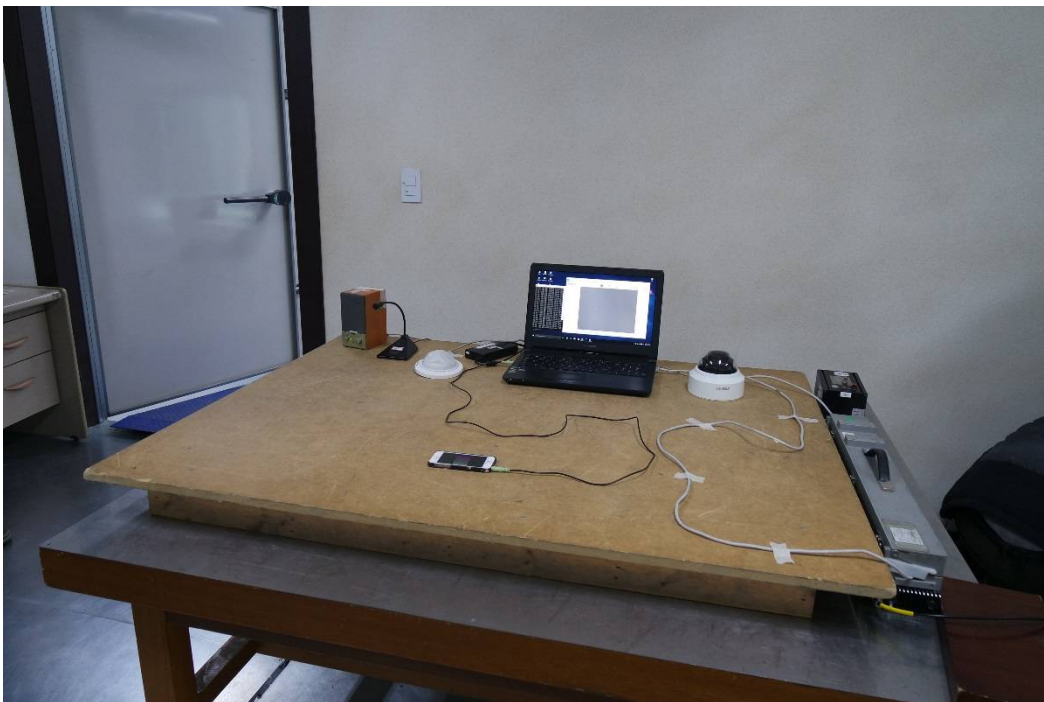
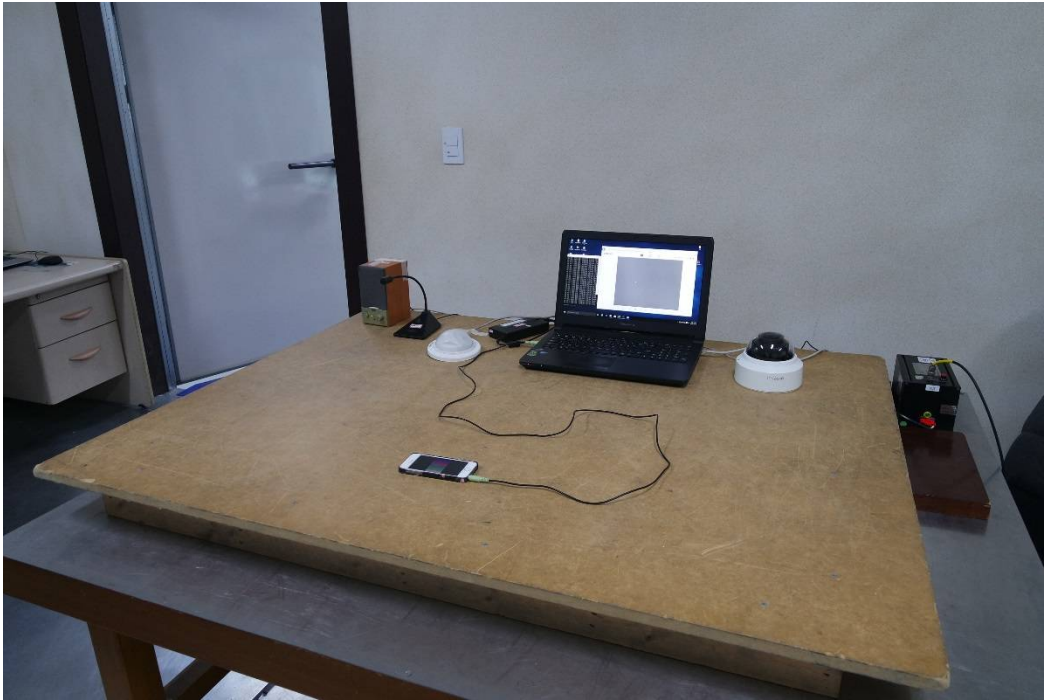
N/A



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## Conducted Disturbance

- DC 12 V Mode



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- POE Mode

N/A



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

Test report No.:  
KES-E1-16T0657  
Page (76) of (82)

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## **Voltage Dips and Short Interruptions**

N/A

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## EUT External Photographs

(Top)



(Bottom)



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## EUT Internal Photographs

(Internal View)



## EUT Internal View – Main Board

(Top)



(Bottom)

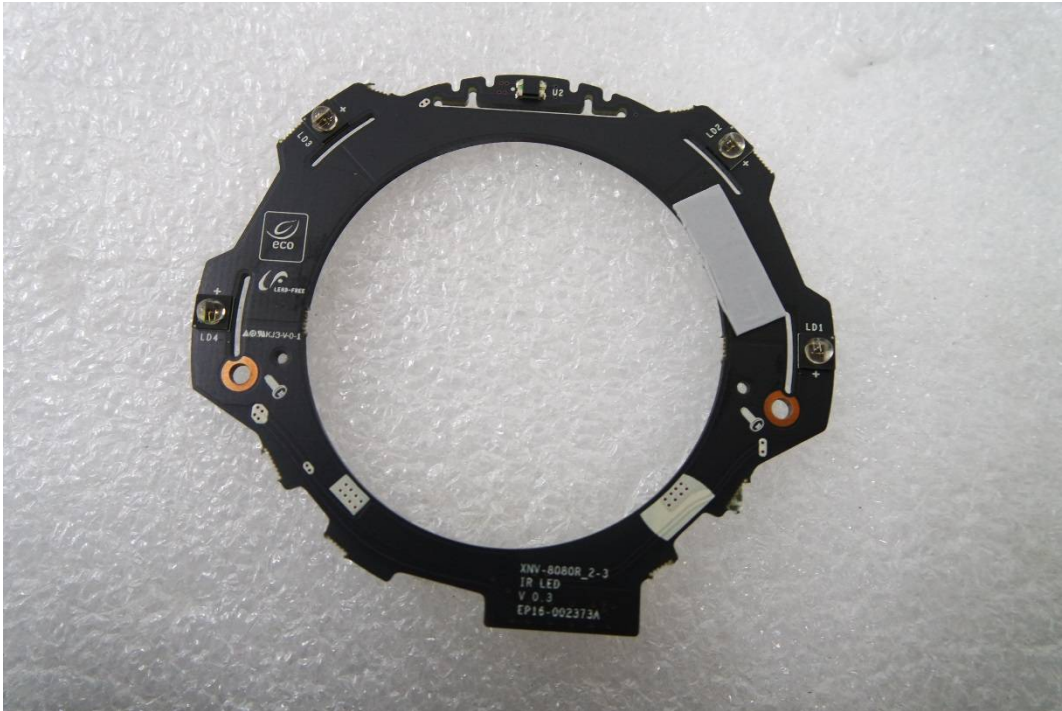


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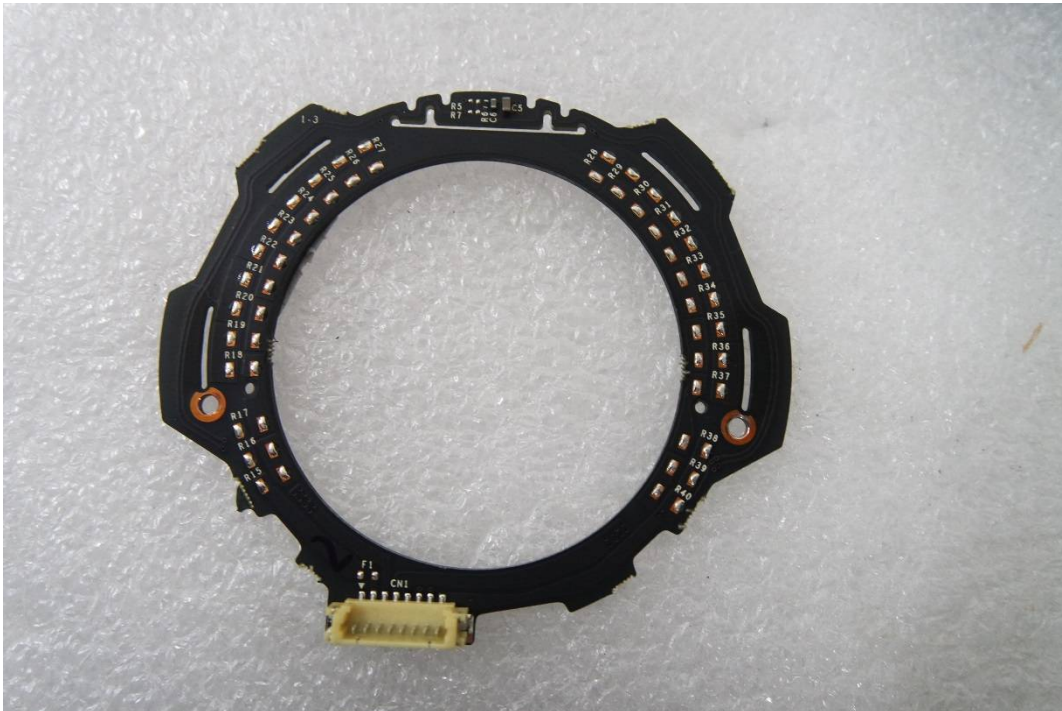


## EUT Internal View – Sub Board

(Top)



(Bottom)



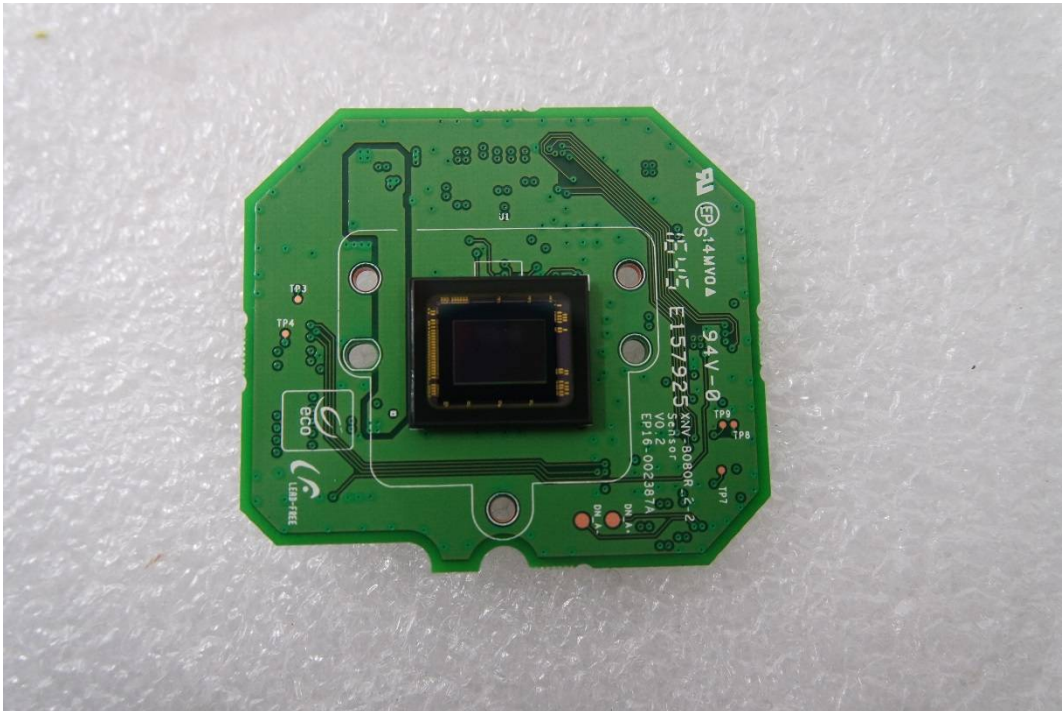
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## EUT Internal View – Lens Board

(Top)

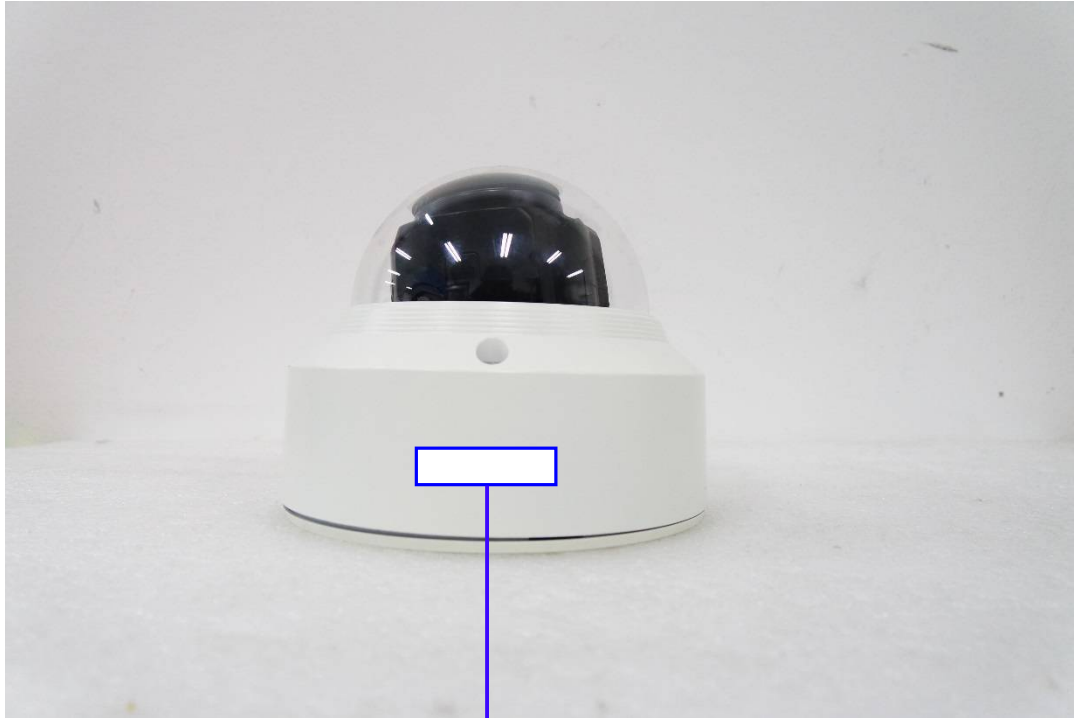


(Bottom)



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## Label and Location



### **NETWORK CAMERA**

Model No : XND-8080RVP

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

Made in of China

