



EMC TEST REPORT For CE

Test Report No. : KES-E1-18T0489-R1
Date of Issue : May. 15, 2019
Product name : NETWORK CAMERA
Model/Type No. : XNZ-6320
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 : Jul. 30, 2018
Test date : Aug. 13, 2018 ~ Aug. 16, 2018
Test Results : ☒ In Compliance ☐ Not in Compliance

Tested by

Reviewed by


Young Suk, Song
EMC Test Engineer


Dong-Hun, Jang
EMC Technical Manager

This test report is not related to KOLAS.

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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Aug. 20, 2018	KES-E1-18T0489	Issued
May. 15, 2019	KES-E1-18T0489-R1	Re-issue due to regulations update

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1.0 General Product Description

Main Specifications of EUT are:

Video	XNZ-6320
Digital Noise Reduction	SSNR5 (2D+3D Noise Filter) (Off / On)
Digital Image Stabilization	Off / On (built-in Gyro)
Defog	Auto/Manual/Off
Motion Detection	Off / On(8ea, Polygonal)
Privacy Masking	Off / On (24 Zones of Rectangle zone) - Color : Grey/Green/Red/Blue/Black/White - Zoom ratio option for mask mode - Mosaic option
Gain Control	Off / Low / Middle / High
White Balance	ATW / AWC / Manual / Indoor / Outdoor (included Mercury & Sodium)
Electronic Shutter Speed	Minimum / Maximum / Anti flicker (1 ~ 1/12,000sec)
Digital Zoom	32x
Image Rotation	Flip/Mirror : On/Off
Video&Audio Analytics	Tampering, Loitering, Directional Detection, Fog Detection, Virtual Line, Enter/Exit, Appear / Disappear, Audio Detection, Face Detection, Motion Detection, Sound Classification, Shock Detection
Serial Interface	RS-485/RS-422 - Samsung-T, Pelco-D/P, Panasonic, Bosch, AD, GE, Vicon, Honeywell
Alarm I/O	Input 1ea / Output 2ea (Relay)
Alarm Triggers	Alarm Input, Motion Detection, Video & Audio Analytics, Network Disconnect
Alarm events	File upload via FTP and E-Mail Notification via E-Mail, TCP and HTTP local storage(SD/SDHC/SDXC) or NAS recording at Alarm Triggers External output Preset
Audio In	Selectable (Mic IN/Line IN) Supply voltage: 2.5VDC(4mA), Input impedance: approx. 2K Ohm
Audio out	Line out (3.5mm jack), Max output level: 1 Vrms
Pixel counter	support
Network	
Ethernet	RJ-45 (10/100BASE-T), SFP(100BASE-FX)
Video Compression Format	H.264 (MPEG-4 Part 10/AVC), H.265, Motion JPEG
Resolution	1920x1080, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360, 320x240
Max. Framerate	H.264/H.265 : Max 60fps at all resolutions Motion JPEG : Max. 30fps at all resolutions
Smart Codec	Manual mode (Area-Based : 5ea)
WiseStream-II	support
Video Quality Adjustment	H.264 / H.265 / MJPEG : Target Bitrate Level Control
Bitrate Control Method	H.264 / H.265 : CBR or VBR Motion JPEG : VBR
Streaming Capability	Multiple Streaming (Up to 10 Profiles)
Audio Compression Format	G.711 u-law /G.726 Selectable G.726 (ADPCM) 8KHz, G.711 8KHz G.726 : 16Kbps, 24Kbps, 32Kbps, 40Kbps AAC-LC : 48Kbps at 16KHz
Audio Communication	Bi-directional (2-Way)



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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
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	Micro SD/SDHC/SDXC 2slot (up to 512 GB) - Continuous recording(1'st slot to 2'nd slot) - Motion Images recorded in the Micro SD/SDHC/SDXC memory card can be downloaded. NAS(Network Attached Storage) Local PC for Instant Recording
Application Programming Interface	ONVIF Profile S/G SUNAPI 2.0(HTTP API) Wisenet Open Platform
Webpage Language	English, Korean, Chinese, French, Italian, Spanish, German, Japanese, Russian, Swedish, Portuguese, Czech, Polish, Turkish, Dutch, Hungarian, Greek
Web Viewer	Supported OS : Windows 7, 8.1, 10, Mac OS X 10.10, 10.11, 10.12 Recommended Browser : Google Chrome, Supported Browser : IE11, MS Edge, Mozilla Firefox(Window 64bit only), Apple Safari 10 (Mac OS X only)
Central Management Software	SmartViewer, SSM
Environmental	
Operating Temperature / Humidity	-10°C ~ +55°C(+14°F ~ +131°F) / Less than 90% RH
Storage Temperature / Humidity	-30°C ~ +60°C (-22°F ~ +140°F) / Less than 90% RH
Ingress Protection	-
Vandal Resistance	-
Electrical	
Input Voltage / Current	12VDC±10%, PoE(IEEE 802.3af, class3)
Power Consumption	Max.6.7W(DC12V), Max.7W(PoE)
Mechanical	
Color / Material	Black / Plastic+Metal
Dimension (WxHxD)	96 x 76 x 143.5mm
Weight	578g

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1.1 Test Voltage & Frequency

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

Voltage ☐ 230Vac ☐ 100 Vac ☐ 24 Vac ☒ 12 Vdc ☒ PoE

Frequency ☐ 50 Hz ☐ 60 Hz ☐ Hz

1.2 Variant Model Differences

Not applicable

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
NETWORK CAMERA	XNZ-6320	-	Hanwha Techwin (Tianjin) Co.,Ltd	EUT

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1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
POE Adaptor	POE36U-1AT-R	-	PHIHONG	-
OPTICAL Converter	SFC200MF	-	SolTech	
OPTICAL Converter Adaptor	PA-120150SN	-	Perfect Power	
Cellular phone	SHV-E210L	R33D713KA3F	SAMSUNG	
Notebook	X56K	HN11N5151FJ0045W	HANSUNG	-
Notebook Adaptor	A12-120P1A	F180271552011758	CHICONY POWER TECHNOLOGY CO.,LTD.	-
Speaker	BR10000A CUVE	-	BEIJING EDIFIER HI-TECH GROUP.	-
Controller	SPC-1010	C50E67WD601003	SamSung Techwin Co.,Ltd	-
Controller Adaptor	RS-AB1000	-	Dongguan Jinhuaasheng Power Technology Co.,Ltd	-
Alarm1	SIP-1201DD D0	-	SAMSUNG TECHWIN CO., LTD.	-
Alarm2	-	-	-	-
Micro SD Card	-	-	-	4GB

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1.6 External I/O Cabling

■ DC_RJ-45 MODE

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (EUT)	RJ-45	Notebook	RJ-45	3.0	S
	3.5 mm	Notebook	3.5 mm	1.6	U
	3.5 mm	Speaker	3.5 mm	1.7	U
	2Pin	Alarm 1	2Pin	3.0	U
	2Pin	Alarm 2	2Pin	3.0	U
	2Pin	Controller	2Pin	3.2	U
	-	Micro SD Card	-	-	-
Notebook	3.5 mm	Cellular phone	3.5 mm	1.5	U

* Unshielded=U, Shielded=S

■ DC_OPTICAL MODE

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (EUT)	RJ-45	POE Adaptor	RJ-45	3.0	U
	OPTICAL	OPTICAL Converter	OPTICAL	3.5	
	3.5 mm	Notebook	3.5 mm	1.6	U
	3.5 mm	Speaker	3.5 mm	1.7	U
	2Pin	Alarm 1	2Pin	3.0	U
	2Pin	Alarm 2	2Pin	3.0	U
	2Pin	Controller	2Pin	3.2	U
	-	Micro SD Card	-	-	-
OPTICAL Converter	RJ-45	Notebook	RJ-45	3.0	S
Notebook	3.5 mm	Cellular phone	3.5 mm	1.5	U

* Unshielded=U, Shielded=S

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■ POE_RJ-45 MODE

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (EUT)	RJ-45	POE Adaptor	RJ-45	3.0	S
	3.5 mm	Notebook	3.5 mm	1.6	U
	3.5 mm	Speaker	3.5 mm	1.7	U
	2Pin	Alarm 1	2Pin	3.0	U
	2Pin	Alarm 2	2Pin	3.0	U
	2Pin	Controller	2Pin	3.2	U
	-	Micro SD Card	-	-	-
POE Adaptor	RJ-45	Notebook	RJ-45	3.2	S
Notebook	3.5 mm	Cellular phone	3.5 mm	1.5	U

* Unshielded=U, Shielded=S

■ POE_OPTICAL MODE

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (EUT)	RJ-45	POE Adaptor	RJ-45	3.0	S
	OPTICAL	OPTICAL Converter	OPTICAL	3.5	U
	3.5 mm	Notebook	3.5 mm	1.6	U
	3.5 mm	Speaker	3.5 mm	1.7	U
	2Pin	Alarm 1	2Pin	3.0	U
	2Pin	Alarm 2	2Pin	3.0	U
	2Pin	Controller	2Pin	3.2	U
	-	Micro SD Card	-	-	-
OPTICAL Converter	RJ-45	Notebook	RJ-45	3.0	S
Notebook	3.5 mm	Cellular phone	3.5 mm	1.5	U

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1.7 EUT Operating Mode(s)

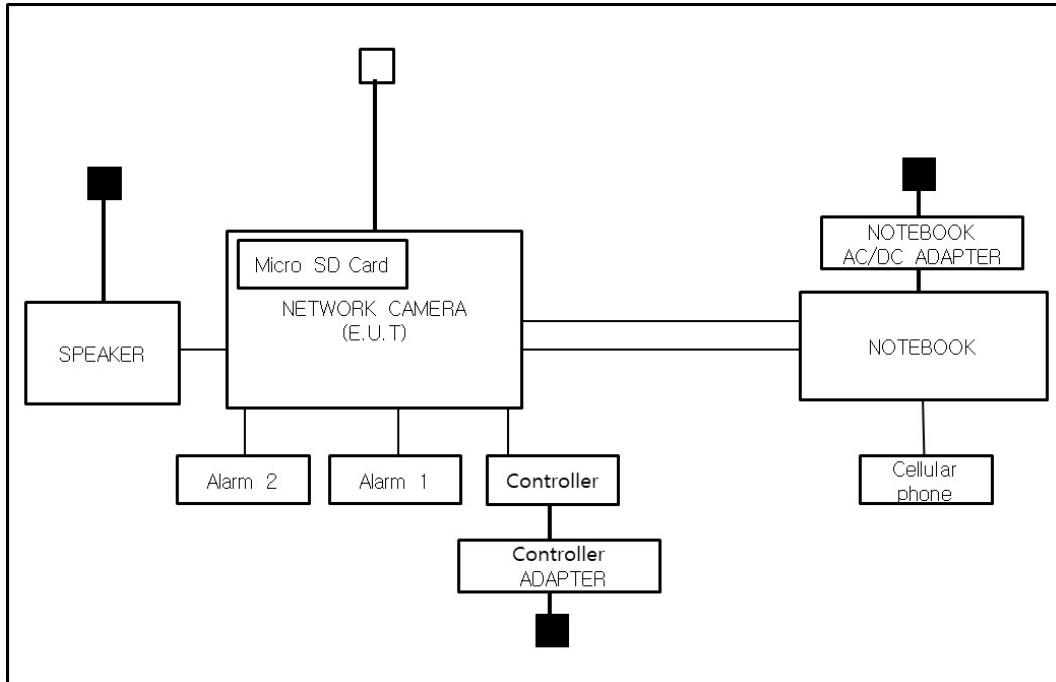
Test Mode	operating
DC 12 V	EUT Monitoring, Ping Test
POE	EUT Monitoring, Ping Test

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

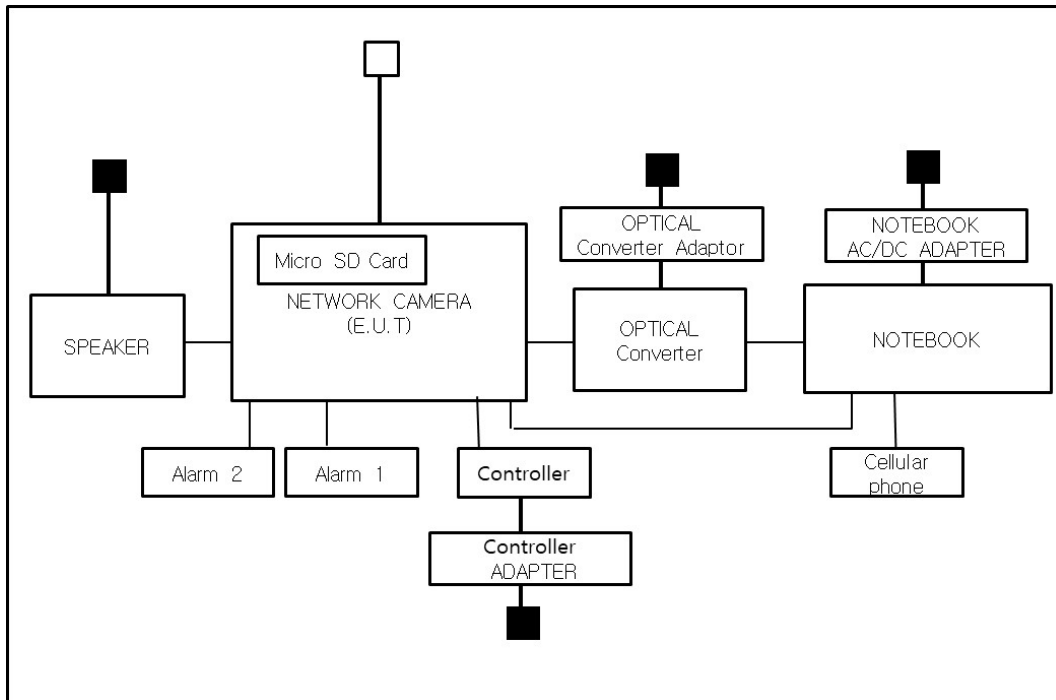
1.8 Configuration

■ AC Main
 □ DC Main

■ DC_RJ-45 MODE

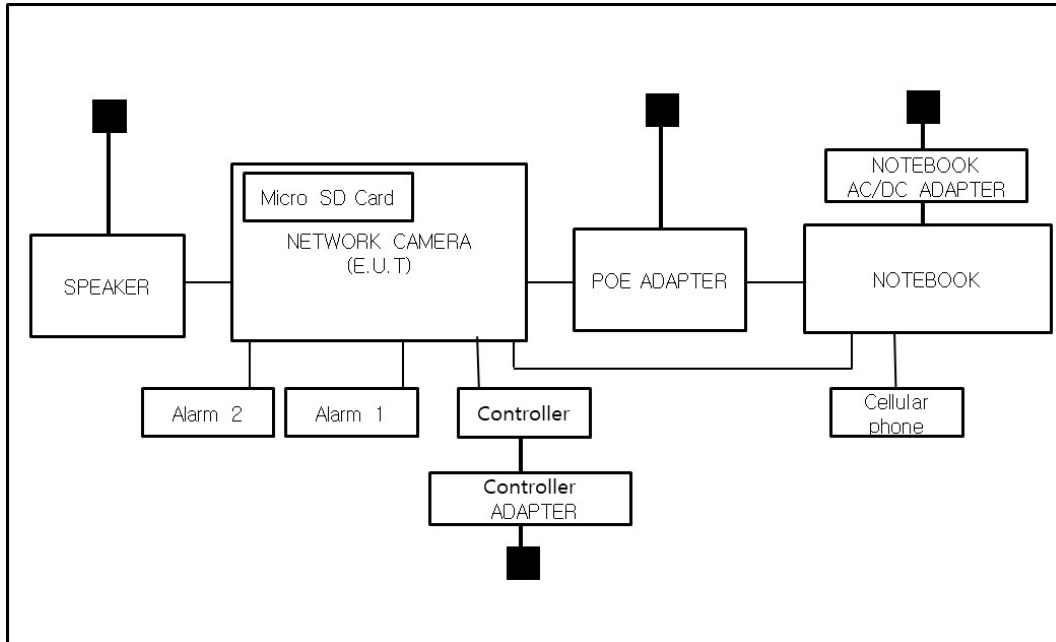


■ DC_OPTICAL MODE

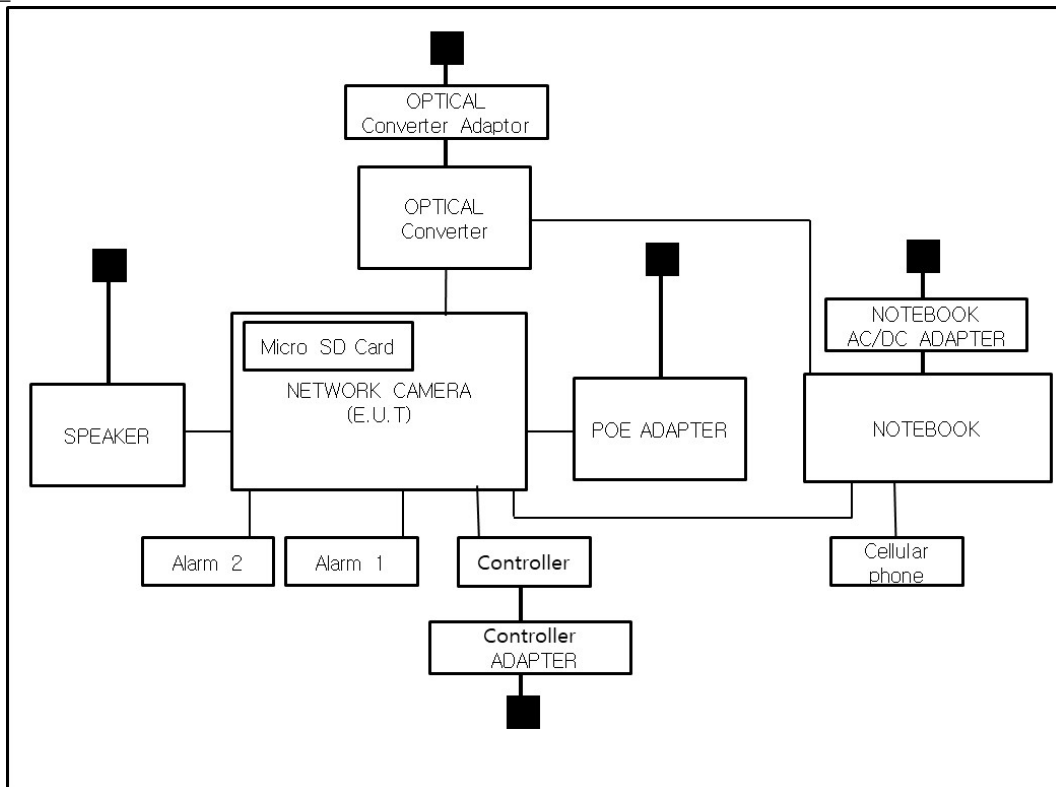


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■ POE_RJ-45 MODE



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

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2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **EMC – Directive 2014/30/EU**

☐ EN 61000-6-3:2011

☐ EN 61000-6-1:2007

☐ EN 61000-6-4:2007 +A1:2011

☐ EN 61000-6-2:2005

☐ EN 55011:2007 +A1:2010

☐ Group 1
☐ Class A

☐ Group 2
☐ Class B

☐ EN 55014-1:2006 +A2:2011

☐ EN 55014-2:1997 +A2:2008

☐ EN 55015:2013

☐ EN 61547:2009

☒ EN 55032: 2012/AC:2013

☒ Class A

☐ Class B

☐ EN 55024:2010 +A1:2015

☒ EN 50130-4:2011 +A1:2014

☐ EN 61000-3-2:2014

☐ EN 61000-3-3:2013

☐ EN 61326-1:2013



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



2.1 Conducted Emissions at Mains Power Ports

Test Date

N/A

Test Location

Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☐	EMI Test S/W	EMC32	R & S	9.12.00	-
☐	EMI TEST RECEIVER	ESR3	R & S	101781	04, 25, 2019
☐	LISN	ENV216	R & S	101787	01, 05, 2019
☐	LISN	ESH2-Z5	R & S	100450	04, 25, 2019
☐	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 27, 2018

Test Conditions

Temperature:

°C

Relative Humidity:

% R.H.

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

2.2 Conducted Emissions at Telecommunication Ports

Test Date

Aug. 13, 2008

Test Location

Electro wave Shieldroom #6

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	04, 25, 2019
☒	LISN	ENV216	R & S	101787	01, 05, 2019
☒	LISN	ESH2-Z5	R & S	100450	04, 25, 2019
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 27, 2018
☒	8-WIRE ISN CAT3,5	ENY81	R & S	100174	01, 07, 2019
☒	8-WIRE ISN CAT6	ENY81-CAT6	R & S	101665	01, 07, 2019

Test Conditions

Temperature: 25,6 °C
Relative Humidity: 48,5 % R.H.

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

Aug. 13, 2018

Test Location

☐ OPEN AREA TEST SITE #2 ☒ SEMI ANECHOIC CHAMBER #4(10m)

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESU26	R & S	100551	04, 11, 2019
☒	AMPLIFIER	SCU 01	R & S	100603	11, 27, 2018
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	714	11, 28, 2018

Test Conditions

Temperature: 26,8 °C
Relative Humidity: 48,5 % R.H.

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

Aug. 13, 2018

Test Location

SEMI ANECHOIC CHAMBER #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESR7	R & S	101190	08, 06, 2019
☒	PREAMPLIFIER	8449B	AGILENT	3008A01967	05, 31, 2019
☐	ATTENUATOR	8491A	HP	35496	03, 21, 2019
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	05, 02, 2019

Test Conditions

Temperature: 24,2 °C
Relative Humidity: 58,3 % R.H.

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

Aug. 13, 2018

Test Location

Electro wave Shieldroom #3

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, 08, 2019
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: 24,8 °C

Relative Humidity: 47,5 % R.H.

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

RemarksSee Appendix A for test data.



2.6 Voltage Fluctuations and Flicker

Test Date

Aug. 13, 2018

Test Location

Electro wave Shieldroom #3

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, 08, 2019
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: 24,8 °C
Relative Humidity: 47,5 % R.H.

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

Aug. 14, 2018

Test Location

EMS-ESD: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	ESD SIMULATOR	ESS-2000	Noise Ken	ESS01Z0454	10, 11, 2018
☒	HCP	-	KES	-	-
☒	VCP	-	KES	-	-

Test Conditions

Temperature: 24,1 °C
Relative Humidity: 48,3 % R.H.
Atmospheric Pressure: 99,8 kPa

Test Specifications

Discharge Factor: ≥ 1 s

Discharge Impedance: 330 ohm / 150 pF

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

Polarity: Positive and Negative

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

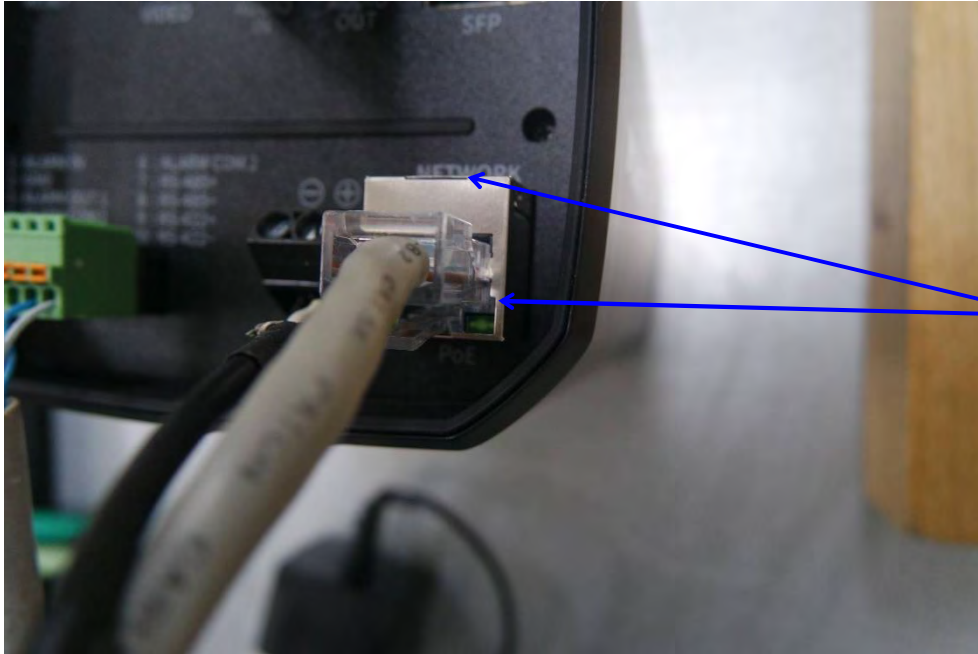
Discharge Voltage:	Contact ☐ 2 kV ☐ 4 kV ☒ 6 kV ☐ 8 kV ☐ 15 kV	Air ☒ 2 kV ☒ 4 kV ☐ 6 kV ☒ 8 kV ☐ 15 kV	HCP ☐ 2 kV ☐ 4 kV ☒ 6 kV ☐ 8 kV ☐ 15 kV	VCP ☐ 2 kV ☐ 4 kV ☒ 6 kV ☐ 8 kV ☐ 15 kV
--------------------	---	---	---	---

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

Required Performance Criteria: ☒ Complied

Location of Discharge:

Air
Contact



1



2

Test Data

■ DC_RJ-45 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	Ports	Contact Discharge	Complied	-
2	Screw	Contact Discharge	Complied	-

■ DC_OPTICAL 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	Ports	Contact Discharge	Complied	-
2	Screw	Contact Discharge	Complied	-

■ POE_RJ-45 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	Ports	Contact Discharge	Complied	-
2	Screw	Contact Discharge	Complied	-

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■ POE_OPTICAL 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	Ports	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

RemarksN/A

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3.2 Radiated Electric Field Immunity

Reference Standard

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

Test Date

Aug. 15, 2018

Test Location

EMS-RS: ☐ SEMI ANECHOIC CHAMBER #2 ☒ SEMI ANECHOIC CHAMBER #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	EMC32	R & S	10.10.02	-
☒	SIGNAL GENERATOR	SMB 100A	R & S	177586	08, 06, 2019
☒	BROADBAND AMPLIFIER	BBA100	R & S	101239	08, 06, 2019
☒	BROADBAND AMPLIFIER	100S1G6M1	AR	579931	08, 06, 2019
☒	POWER METER	NRP2	R & S	103475	08, 06, 2019
☒	AVG POWER SENSOR	NRP-Z91	R & S	102526	08, 06, 2019
☒	AVG POWER SENSOR	NRP-Z91	R & S	102527	08, 06, 2019
☒	STACKED DOUBLE LOG-PER- ANTENNA	STPL9128 E	Schwarzbeck	9128ES-121	-
☒	DIRECTIONAL COUPLER	KYDC-D1070-DX40	KY TELECOM	KY150001	08, 06, 2019
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM, INC	781	05, 02, 2019

Test Conditions

Temperature: 24,3 °C
Relative Humidity: 57,5 % R.H.
Atmospheric Pressure: 100,0 kPa



Test Specifications

Antenna Polarization: Horizontal & vertical unless indicated otherwise

Antenna Distance: ☒ 3 m

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

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

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

Frequency step: ☒ 1 % step

Dwell Time: ☒ 1 s ☐ 3 s

of Sides Radiated: ☒ 4

Required Performance Criteria: ☒ Complied



Test Data

■ DC_RJ-45 MODE

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

■ DC_OPTICAL MODE

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

■ POE_RJ-45 MODE

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

■ POE_OPTICAL 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

N/A

3.3 Electrical Fast Transients/Bursts

Reference Standard

EN 61000-4-4:2012

Test Date

Aug. 14, 2018

Test Location

EMS-EFT: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	EM TEST	5.4.7	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	11, 27, 2018
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 27, 2018
☒	CAPACITIVE COUPLING CLAMP	HFK	EM TEST	P1633183115	11, 27, 2018

Test Conditions

Temperature: 24,1 °C
Relative Humidity: 48,3 % R.H.
Atmospheric Pressure: 99,8 kPa

Test Specifications

Pulse Amplitude & Polarity: (AC Power Lines)	☐ ± 1.0 kV ☐ ± 4.0 kV	☐ ± 2.0 kV
Pulse Amplitude & Polarity: (Other supply / Signal Lines)	☐ ± 0.5 kV ☐ ± 2.0 kV	☒ ± 1.0 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_RJ-45 MODE

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

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

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

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

☒ Signal ports and telecommunication ports – Coupling Clamp used

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
RJ-45	Complied	Complied
Alarm 1	Complied	Complied
Alarm 2	Complied	Complied
Controller	Complied	Complied

■ DC_OPTICAL MODE

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

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

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

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

☒ Signal ports and telecommunication ports – Coupling Clamp used

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
Alarm 1	Complied	Complied
Alarm 2	Complied	Complied
Controller	Complied	Complied

■ POE_RJ-45 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 1	Complied	Complied
Alarm 2	Complied	Complied
Controller	Complied	Complied

■ POE_OPTICAL 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)
Alarm 1	Complied	Complied
Alarm 2	Complied	Complied
Controller	Complied	Complied

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

Test Results
☒ PASS Required Performance Criteria

☐ NOT PASS Required Performance Criteria

Remarks

N/A

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3.4 Surge Transients

Reference Standard

EN 61000-4-5:2014

Test Date

Aug. 14, 2018

Test Location

EMS-Surge: Electro wave Shieldroom #7

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	EM TEST	5.4.7	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N7	EM TEST	P1608172950	11, 27, 2018
☒	MOTOR VARIAC	MV2616	EM TEST	P1552169719	11, 27, 2018
☒	CDN	CNV 508N1	EM TEST	P1610176296	11, 28, 2018
☐	CDN	CNV 504N7.3	EM TEST	P1744207079	12, 18, 2018

Test Conditions

Temperature: 24,1 °C
Relative Humidity: 48,3 % R.H.
Atmospheric Pressure: 99,8 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_RJ-45 MODE

☐ Line to Line – Differential Mode

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

☐ Line to Earth – Common Mode

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

Signal Lines

☒ Line to Earth – Common Mode

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

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■ POE_RJ-45 MODE

☐ Line to Line – Differential Mode

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

☐ Line to Earth – Common Mode

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

Signal Lines☒ Line to Earth – Common Mode

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

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

Test Results☒ PASS Required Performance Criteria☐ NOT PASS Required Performance Criteria**Remarks**N/A

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3.5 Conducted Disturbance

Reference Standard

EN 61000-4-6:2014

Test Date

Aug. 16, 2018

Test Location

EMS-CS: Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	icd.control	EM TEST	5.3.11	-
☒	CONTINUOUS WAVE SIMULATOR	CWS 500N1.4	EM TEST	P1602169880	11, 27, 2018
☒	ATTENUATOR	ATT 6/80	EM TEST	P1614178148	11, 27, 2018
☒	CDN	CDN M016	TESEQ	43694	11, 27, 2018
☐	CDN	CDN M016	TESEQ	43697	11, 27, 2018
☒	CDN	CDN T800	TESEQ	42800	11, 27, 2018
☒	EM CLAMP	KEMZ 801A	TESEQ	44099	11, 28, 2018

Test Conditions

Temperature: 25,1 °C
Relative Humidity: 49,3 % R.H.
Atmospheric Pressure: 99,8 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

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Test Data

■ DC_RJ-45 MODE

☐ Input a.c. power ports

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

☒ Input d.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
L – N	CDN	Complied

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
RJ-45	CDN	Complied
Alarm 1	Clamp	Complied
Alarm 2	Clamp	Complied
Controller	Clamp	Complied

■ DC_OPTICAL MODE

☐ Input a.c. power ports

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

☒ Input d.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
L – N	CDN	Complied

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
Alarm 1	Clamp	Complied
Alarm 2	Clamp	Complied
Controller	Clamp	Complied

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■ POE_RJ-45 MODE

☐ Input a.c. power ports

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

☐ Input d.c. power ports

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

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
RJ-45	CDN	Complied
Alarm 1	Clamp	Complied
Alarm 2	Clamp	Complied
Controller	Clamp	Complied

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■ POE_OPTICAL MODE☐ Input a.c. power ports

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

☐ Input d.c. power ports

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

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
Alarm 1	Clamp	Complied
Alarm 2	Clamp	Complied
Controller	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**N/A

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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
☐	EMS Test S/W	iec.control	AMETEK CTS	7.1.2	-
☐	ULTRA COMPACT SIMULATOR	UCS 500 N5	EM TEST	V0936105120	06, 26, 2019
☐	MOTOR VARIAC	MV2616	EM TEST	V0936105123	06, 26, 2019

Test Conditions

Temperature:

°C

Relative Humidity:

% R.H.

Atmospheric Pressure:

kPa

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Test Specifications & Observations/Remarks

(Test Voltage :)

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

- Voltage variations

☐ Unom + 10 %	☐ 253.0 V (ac)	—
☐ Unom - 15 %	☐ 195.5 V (ac)	—

Observations:

Complied – No degradation of function

Test Results

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

RemarksN/A

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APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

[HOT]

N/A

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[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 + Pulse Limiter FACTOR))

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Conducted Emissions at Telecommunication Ports

■ DC_RJ-45 MODE

[10 Mbps]

Common Information

Test Description:

Telecommunication Emission

Model No.:

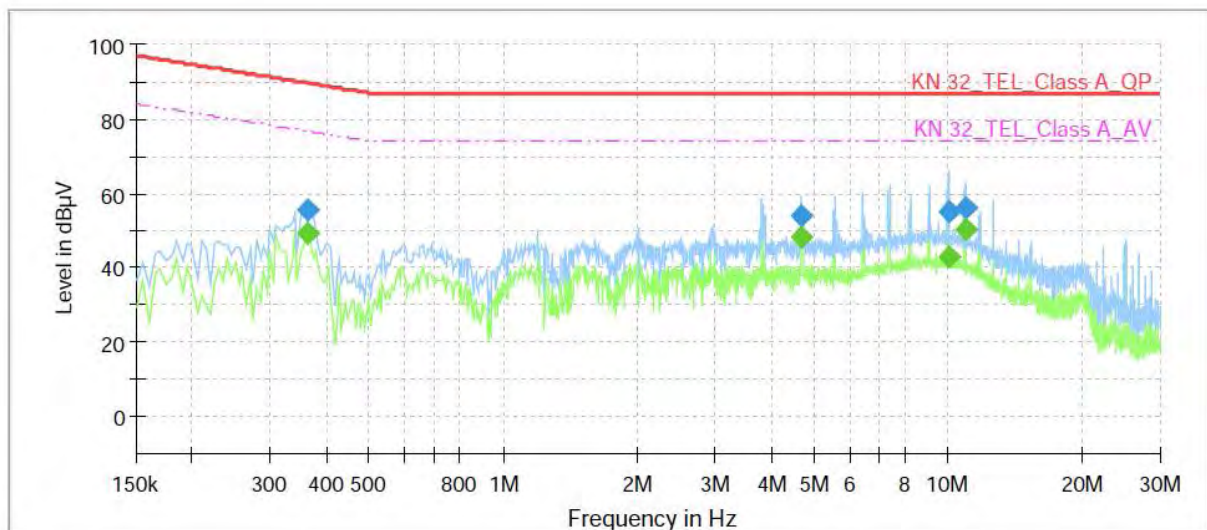
XNZ-6320

Mode

DC_RJ-45_10M

Operator Name:

KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.365000	---	49.37	76.61	27.24	1000.0	9.000	Single Line	19.6
0.365000	55.35	---	89.61	34.26	1000.0	9.000	Single Line	19.6
4.675000	---	48.42	74.00	25.58	1000.0	9.000	Single Line	19.5
4.675000	54.10	---	87.00	32.90	1000.0	9.000	Single Line	19.5
10.010000	---	42.84	74.00	31.16	1000.0	9.000	Single Line	19.8
10.010000	54.87	---	87.00	32.13	1000.0	9.000	Single Line	19.8
10.925000	---	50.04	74.00	23.96	1000.0	9.000	Single Line	19.8
10.925000	55.89	---	87.00	31.11	1000.0	9.000	Single Line	19.8

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[1 000 Mbps]

Common Information

Test Description:

Model No.:

Mode

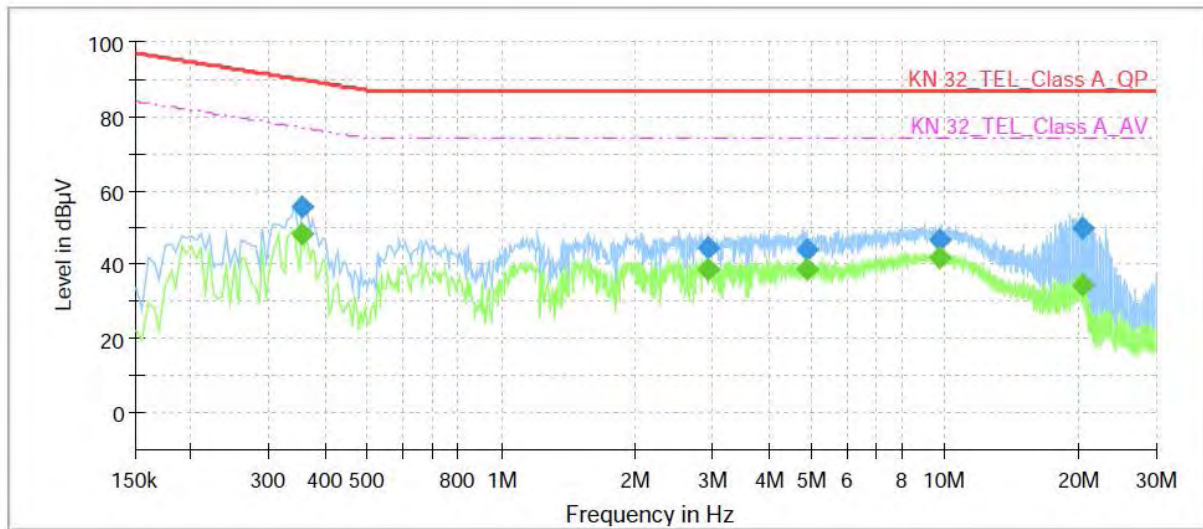
Operator Name:

Telecommunication Emission

XNZ-6320

DC_RJ-45_1000M

KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.355000	---	48.19	76.84	28.65	1000.0	9.000	Single Line	19.7
0.355000	55.44	---	89.84	34.40	1000.0	9.000	Single Line	19.7
2.925000	---	38.58	74.00	35.42	1000.0	9.000	Single Line	20.0
2.925000	44.72	---	87.00	42.28	1000.0	9.000	Single Line	20.0
4.880000	---	38.57	74.00	35.43	1000.0	9.000	Single Line	19.6
4.880000	44.14	---	87.00	42.86	1000.0	9.000	Single Line	19.6
9.750000	---	41.84	74.00	32.16	1000.0	9.000	Single Line	19.8
9.750000	46.75	---	87.00	40.25	1000.0	9.000	Single Line	19.8
20.455000	---	34.33	74.00	39.67	1000.0	9.000	Single Line	20.2
20.455000	49.89	---	87.00	37.11	1000.0	9.000	Single Line	20.2

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■ POE_RJ-45 MODE

[10 Mbps]

Common Information

Test Description:

Telecommunication Emission

Model No.:

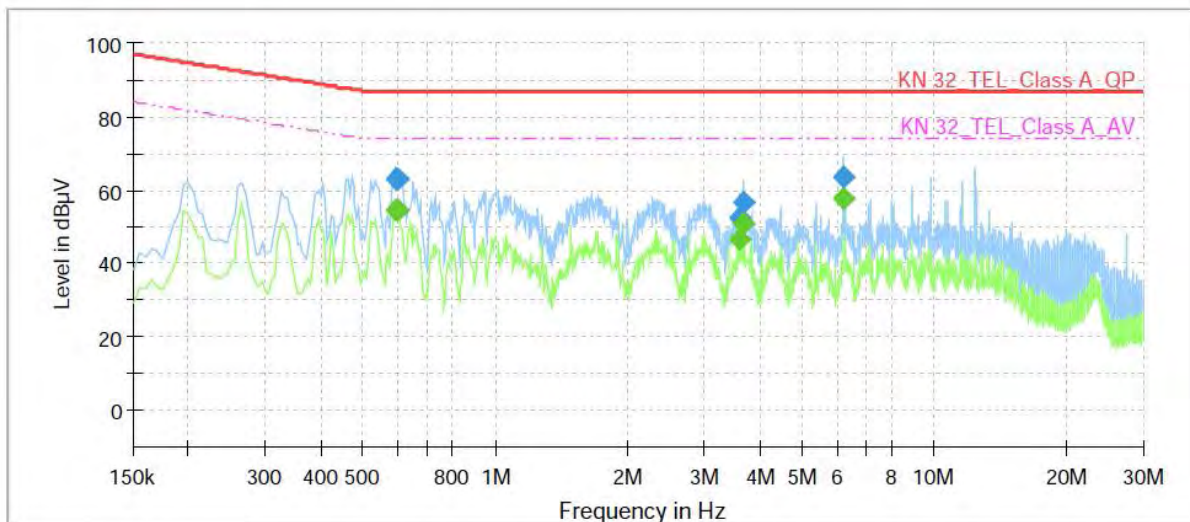
XNZ-6320

Mode

POE_RJ-45_10M

Operator Name:

KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.595000	---	54.32	74.00	19.68	1000.0	9.000	Single Line	19.7
0.595000	63.02	---	87.00	23.98	1000.0	9.000	Single Line	19.7
0.600000	---	54.28	74.00	19.72	1000.0	9.000	Single Line	19.7
0.600000	63.02	---	87.00	23.98	1000.0	9.000	Single Line	19.7
3.585000	---	46.63	74.00	27.37	1000.0	9.000	Single Line	19.7
3.585000	52.59	---	87.00	34.41	1000.0	9.000	Single Line	19.7
3.695000	---	50.59	74.00	23.41	1000.0	9.000	Single Line	19.7
3.695000	56.62	---	87.00	30.38	1000.0	9.000	Single Line	19.7
6.250000	---	57.64	74.00	16.36	1000.0	9.000	Single Line	19.4
6.250000	63.75	---	87.00	23.25	1000.0	9.000	Single Line	19.4



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Test report No.:

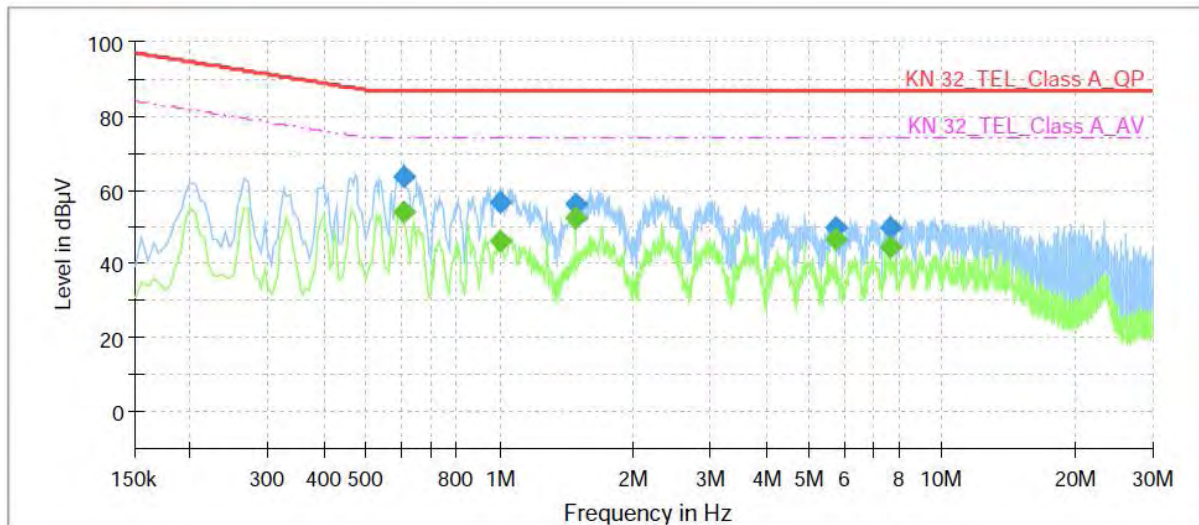
KES-E1-18T0489-R1

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[1 000 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: XNZ-6320
Mode: POE_RJ-45_1000M
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.605000	---	54.16	74.00	19.84	1000.0	9.000	Single Line	19.8
0.605000	63.39	---	87.00	23.61	1000.0	9.000	Single Line	19.8
1.005000	---	46.00	74.00	28.00	1000.0	9.000	Single Line	20.0
1.005000	56.46	---	87.00	30.54	1000.0	9.000	Single Line	20.0
1.490000	---	52.19	74.00	21.81	1000.0	9.000	Single Line	20.1
1.490000	56.13	---	87.00	30.87	1000.0	9.000	Single Line	20.1
5.745000	---	46.76	74.00	27.24	1000.0	9.000	Single Line	19.5
5.745000	49.81	---	87.00	37.19	1000.0	9.000	Single Line	19.5
7.660000	---	44.60	74.00	29.40	1000.0	9.000	Single Line	19.6
7.660000	49.64	---	87.00	37.36	1000.0	9.000	Single Line	19.6

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

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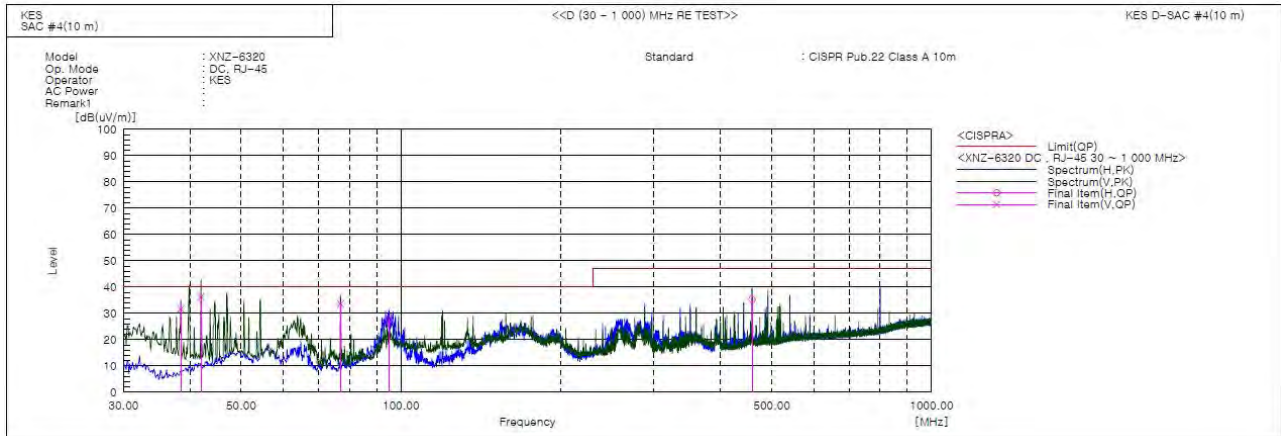
Test report No.:

KES-E1-18T0489-R1

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Radiated Electric Field Emissions(Below 1 GHz)

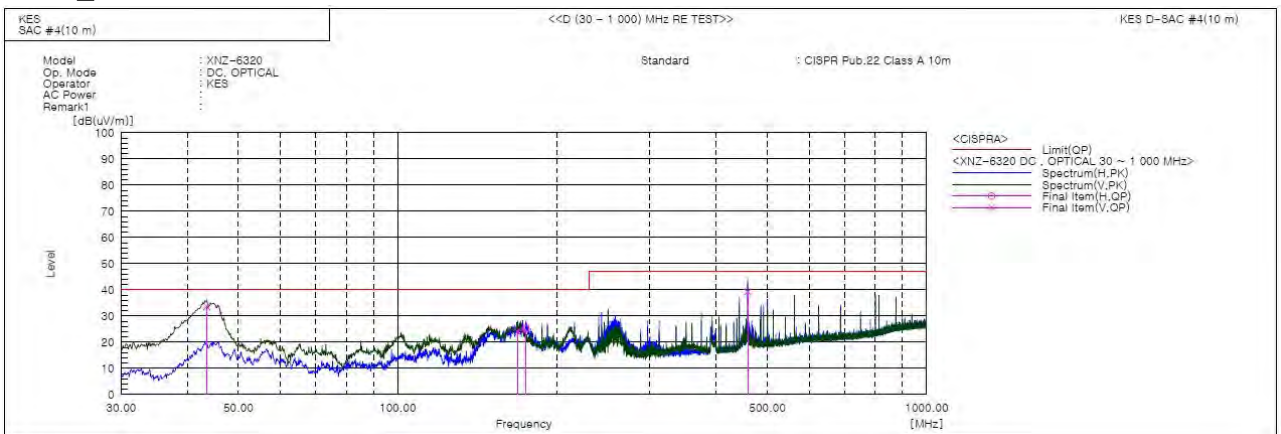
■ DC_RJ-45 MODE



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	38.488	V	62.4	-30.7	31.7	40.0	8.3	395.0	132.0	
2	42.004	V	65.5	-29.2	36.3	40.0	3.7	395.0	136.0	
3	76.924	V	67.7	-34.1	33.6	40.0	6.4	384.0	132.0	
4	94.990	H	57.3	-29.6	27.7	40.0	12.3	396.0	154.0	
5	458.983	H	55.3	-20.0	35.3	47.0	11.7	200.0	117.0	

■ DC_OPTICAL MODE



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	43.580	V	62.4	-28.7	33.7	40.0	6.3	103.0	222.0	
2	168.589	V	55.3	-31.2	24.1	40.0	15.9	155.0	176.0	
3	174.894	H	56.0	-30.9	25.1	40.0	14.9	387.0	123.0	
4	458.983	V	59.2	-20.0	39.2	47.0	7.8	102.0	202.0	

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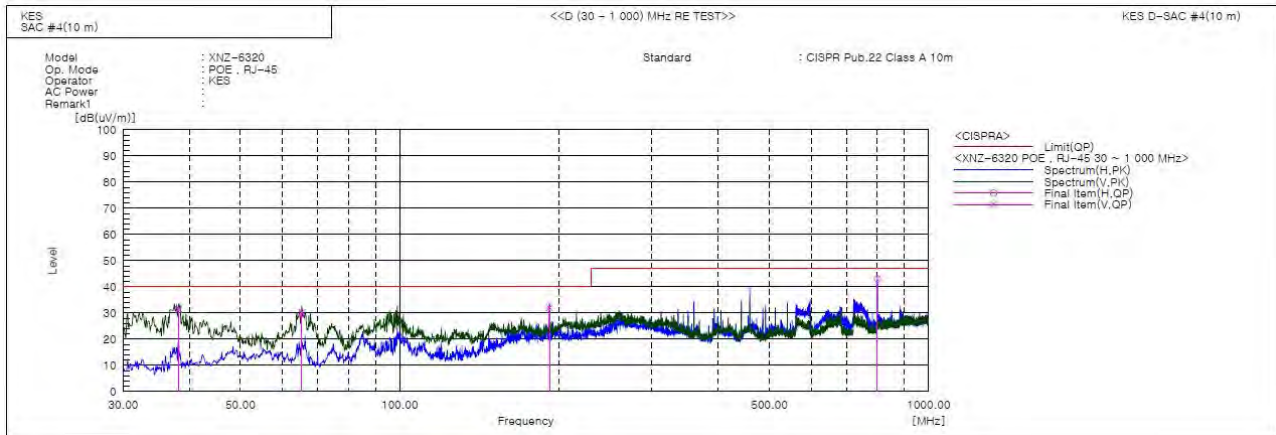
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Test report No.:

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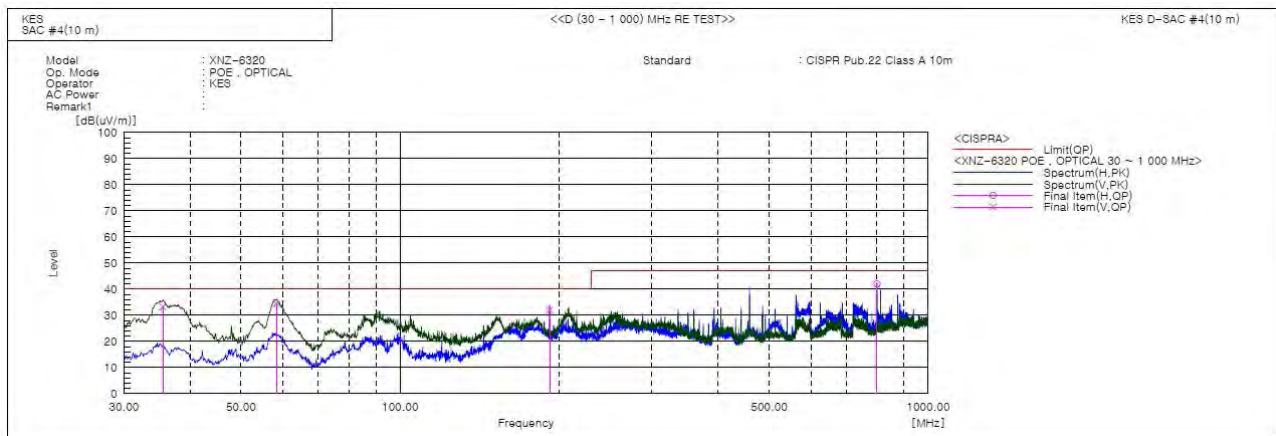
POE_RJ-45 MODE



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	38.208	V	62.3	-30.8	31.5	40.0	8.5	100.0	263.0	
2	65.306	V	61.2	-31.0	30.2	40.0	9.8	100.0	242.0	
3	191.990	V	60.2	-28.2	32.0	40.0	8.0	109.0	200.0	
4	800.032	H	57.0	-14.0	43.0	47.0	4.0	352.0	284.0	

POE_OPTICAL MODE



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	35.545	V	65.2	-32.0	33.2	40.0	6.8	100.0	266.0	
2	58.351	V	63.6	-29.2	34.4	40.0	5.6	100.0	166.0	
3	191.977	V	60.1	-28.2	31.9	40.0	8.1	122.0	196.0	
4	800.030	H	56.0	-14.0	42.0	47.0	5.0	362.0	325.0	

◆ Calculation – SEMI ANECHOIC CHAMBER #4(10 m)

Result(QP) [dB(μV/m)] = (Reading(QP)[dB(μV)] + c.f[dB(1/m)])

Margin(QP)[dB] = Limit[dB(μV/m)] - Result(QP) [dB(μV/m)]

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

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

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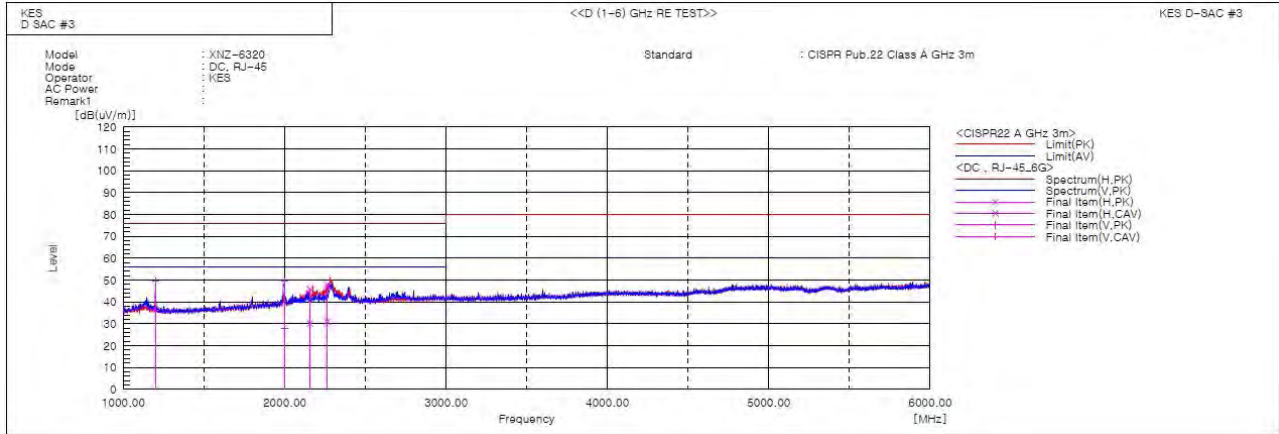
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Radiated Electric Field Emissions(Above 1 GHz)

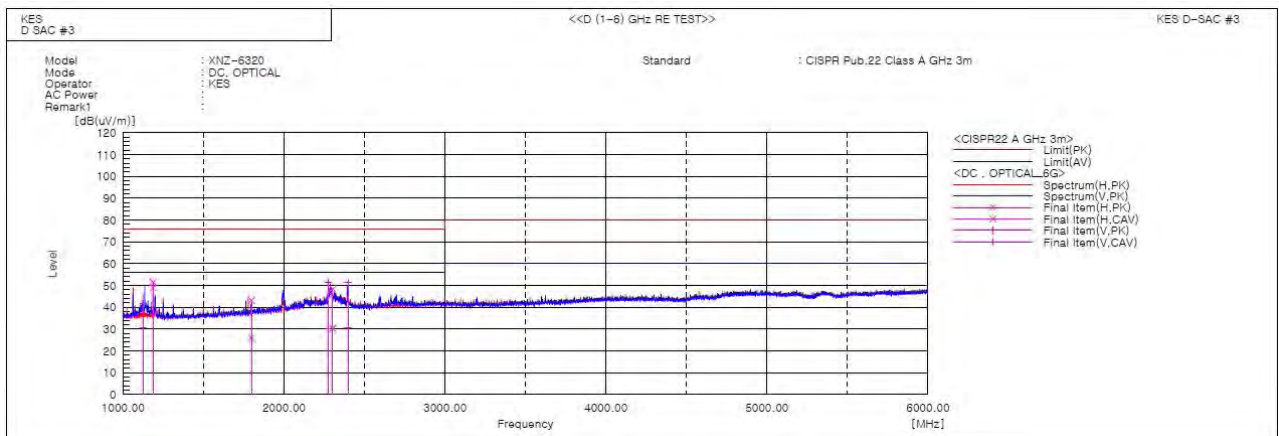
DC_RJ-45 MODE



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result CAV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1200.180	V	56.6	43.4	-7.2	49.4	36.2	76.0	56.0	26.6	19.8	100.0	280.7	
2	2001.759	V	51.6	29.8	-2.1	49.5	27.7	76.0	56.0	26.5	28.3	100.0	204.7	
3	2157.834	H	47.0	31.5	-1.3	45.7	30.2	76.0	56.0	30.3	25.8	100.0	66.0	
4	2264.204	H	48.7	32.0	-0.9	47.8	31.1	76.0	56.0	28.2	24.9	100.0	313.2	

DC_OPTICAL MODE



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result CAV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1124.632	V	49.3	38.3	-7.5	41.8	30.8	76.0	56.0	34.2	25.2	100.0	308.1	
2	1187.500	H	58.7	56.1	-7.2	51.5	48.9	76.0	56.0	24.5	7.1	100.0	341.0	
3	1797.856	H	46.7	29.5	-3.5	43.2	26.0	76.0	56.0	32.8	30.0	100.0	312.3	
4	2302.406	H	49.1	31.0	-0.7	48.4	30.3	76.0	56.0	27.6	25.7	100.0	73.9	
5	2276.142	V	52.3	31.2	-0.8	51.5	30.4	76.0	56.0	24.5	25.6	100.0	212.2	
6	2397.909	V	51.6	30.9	-0.4	51.2	30.5	76.0	56.0	24.8	25.5	100.0	287.4	

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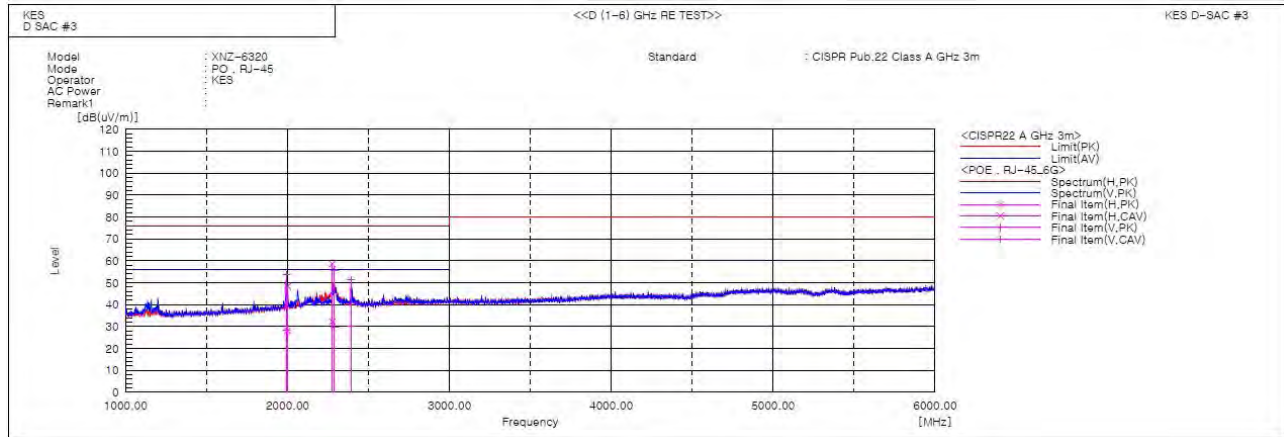
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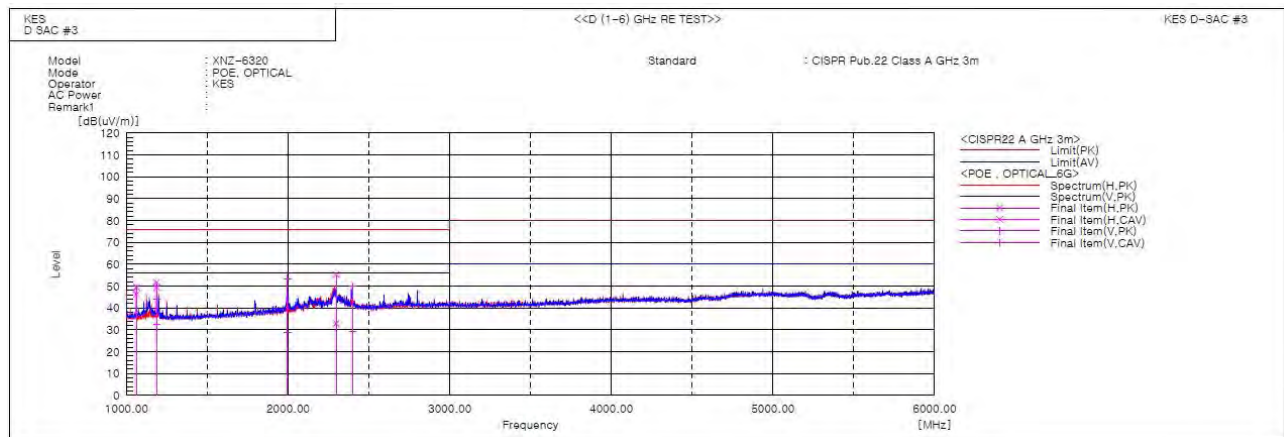
POE_RJ-45 MODE



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result CAV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1992.790	V	55.8	30.5	-2.1	53.7	28.4	76.0	56.0	22.3	27.6	100.0	214.9	
2	2000.079	H	50.4	30.3	-2.1	48.3	28.2	76.0	56.0	27.7	27.8	100.0	354.6	
3	2290.067	V	56.6	30.3	-0.8	55.8	29.5	76.0	56.0	20.2	26.5	100.0	78.8	
4	2277.912	H	59.4	33.1	-0.8	58.6	32.3	76.0	56.0	17.4	23.7	100.0	51.3	
5	2391.311	V	51.9	30.8	-0.4	51.5	30.4	76.0	56.0	24.5	25.6	100.0	282.0	

POE_OPTICAL MODE



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result CAV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1062.730	H	57.1	54.0	-7.7	49.4	46.3	76.0	56.0	26.6	9.7	100.0	75.0	
2	1187.480	H	59.0	56.5	-7.2	51.8	49.3	76.0	56.0	24.2	6.7	100.0	359.5	
3	1187.722	V	51.1	39.5	-7.2	43.9	32.3	76.0	56.0	32.1	23.7	100.0	273.5	
4	1996.030	V	55.5	30.8	-2.1	53.4	28.7	76.0	56.0	22.6	27.3	100.0	200.0	
5	2297.458	H	55.9	33.6	-0.7	55.2	32.9	76.0	56.0	20.8	23.1	100.0	321.4	
6	2400.228	V	50.4	29.7	-0.4	50.0	29.3	76.0	56.0	26.0	26.7	100.0	281.4	

Calculation

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

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

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

■ DC_RJ-45 MODE

Average harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	24.436E-3			
2	1.490E-3			PASS
3	15.888E-3	0.768	2.07	PASS
4	1.711E-3			PASS
5	16.225E-3	1.581	1.03	PASS
6	1.428E-3			PASS
7	16.354E-3	2.360	693.00E-3	PASS
8	1.390E-3			PASS
9	15.500E-3	4.305	360.00E-3	PASS
10	1.415E-3			PASS
11	15.080E-3	5.077	297.00E-3	PASS
12	1.327E-3			PASS
13	14.673E-3	7.763	189.00E-3	PASS
14	1.368E-3			PASS
15	14.006E-3	10.375	135.00E-3	PASS
16	1.238E-3			PASS
17	13.549E-3	11.375	119.11E-3	PASS
18	1.196E-3			PASS
19	12.946E-3	12.147	106.58E-3	PASS
20	1.233E-3			PASS
21	12.091E-3	12.539	96.43E-3	PASS
22	1.075E-3			PASS
23	11.498E-3	13.059	88.05E-3	PASS
24	1.077E-3			PASS
25	10.773E-3	13.300	81.00E-3	PASS
26	1.016E-3			PASS
27	10.013E-3	13.351	75.00E-3	PASS
28	967.074E-6			PASS
29	9.184E-3	13.152	69.83E-3	PASS
30	933.743E-6			PASS
31	8.381E-3	12.830	65.32E-3	PASS
32	857.314E-6			PASS
33	7.749E-3	12.628	61.36E-3	PASS
34	912.069E-6			PASS
35	6.790E-3	11.735	57.86E-3	PASS
36	802.108E-6			PASS
37	6.062E-3	11.076	54.73E-3	PASS
38	782.382E-6			PASS
39	5.478E-3	10.550	51.92E-3	PASS
40	796.816E-6			PASS

Harmonic currents less than 0.6% of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.



Test Data - Harmonics (continued)

Maximum harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	24.886E-3			
2	2.320E-3			PASS
3	17.284E-3	0.376	4.60	PASS
4	2.183E-3			PASS
5	16.507E-3	0.724	2.28	PASS
6	2.723E-3			PASS
7	16.875E-3	1.096	1.54	PASS
8	1.979E-3			PASS
9	15.840E-3	1.980	800.00E-3	PASS
10	1.689E-3			PASS
11	15.269E-3	2.313	660.00E-3	PASS
12	1.569E-3			PASS
13	14.883E-3	3.544	420.00E-3	PASS
14	1.572E-3			PASS
15	14.294E-3	4.765	300.00E-3	PASS
16	1.456E-3			PASS
17	13.677E-3	5.167	264.70E-3	PASS
18	1.393E-3			PASS
19	13.096E-3	5.529	236.84E-3	PASS
20	1.431E-3			PASS
21	12.229E-3	5.707	214.28E-3	PASS
22	1.321E-3			PASS
23	11.620E-3	5.939	195.66E-3	PASS
24	1.307E-3			PASS
25	10.937E-3	6.076	180.00E-3	PASS
26	1.191E-3			PASS
27	10.153E-3	6.092	166.66E-3	PASS
28	1.273E-3			PASS
29	9.310E-3	5.999	155.18E-3	PASS
30	1.147E-3			PASS
31	8.504E-3	5.858	145.16E-3	PASS
32	1.113E-3			PASS
33	7.911E-3	5.802	136.36E-3	PASS
34	1.168E-3			PASS
35	6.935E-3	5.393	128.58E-3	PASS
36	1.004E-3			PASS
37	6.210E-3	5.106	121.62E-3	PASS
38	1.019E-3			PASS
39	5.593E-3	4.848	115.38E-3	PASS
40	937.538E-6			PASS

Harmonic currents less than 0.6% of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.



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Test report No.:

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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 [%]	0.047	4.00	PASS
Tmax [s]	0.000	0.50	PASS

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■ DC_OPTICAL MODE

Average harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	24.278E-3			
2	1.445E-3			PASS
3	15.028E-3	0.726	2.07	PASS
4	1.726E-3			PASS
5	15.842E-3	1.544	1.03	PASS
6	1.391E-3			PASS
7	16.257E-3	2.346	693.00E-3	PASS
8	1.373E-3			PASS
9	14.971E-3	4.159	360.00E-3	PASS
10	1.447E-3			PASS
11	14.551E-3	4.899	297.00E-3	PASS
12	1.359E-3			PASS
13	14.275E-3	7.553	189.00E-3	PASS
14	1.393E-3			PASS
15	13.567E-3	10.049	135.00E-3	PASS
16	1.262E-3			PASS
17	13.137E-3	11.029	119.11E-3	PASS
18	1.232E-3			PASS
19	12.562E-3	11.787	106.58E-3	PASS
20	1.245E-3			PASS
21	11.696E-3	12.129	96.43E-3	PASS
22	1.108E-3			PASS
23	11.154E-3	12.668	88.05E-3	PASS
24	1.135E-3			PASS
25	10.496E-3	12.958	81.00E-3	PASS
26	1.028E-3			PASS
27	9.731E-3	12.975	75.00E-3	PASS
28	988.595E-6			PASS
29	8.905E-3	12.753	69.83E-3	PASS
30	935.546E-6			PASS
31	8.127E-3	12.441	65.32E-3	PASS
32	848.517E-6			PASS
33	7.526E-3	12.264	61.36E-3	PASS
34	908.033E-6			PASS
35	6.521E-3	11.271	57.86E-3	PASS
36	798.889E-6			PASS
37	5.762E-3	10.529	54.73E-3	PASS
38	767.168E-6			PASS
39	5.221E-3	10.056	51.92E-3	PASS
40	786.236E-6			PASS

Harmonic currents less than 0.6% of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.



Test Data - Harmonics (continued)

Maximum harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	24.452E-3			
2	1.931E-3			PASS
3	15.741E-3	0.342	4.60	PASS
4	2.227E-3			PASS
5	15.974E-3	0.701	2.28	PASS
6	1.614E-3			PASS
7	16.408E-3	1.065	1.54	PASS
8	1.560E-3			PASS
9	15.270E-3	1.909	800.00E-3	PASS
10	1.637E-3			PASS
11	14.758E-3	2.236	660.00E-3	PASS
12	1.565E-3			PASS
13	14.372E-3	3.422	420.00E-3	PASS
14	1.572E-3			PASS
15	13.704E-3	4.568	300.00E-3	PASS
16	1.407E-3			PASS
17	13.254E-3	5.007	264.70E-3	PASS
18	1.350E-3			PASS
19	12.677E-3	5.352	236.84E-3	PASS
20	1.407E-3			PASS
21	11.811E-3	5.512	214.28E-3	PASS
22	1.257E-3			PASS
23	11.241E-3	5.745	195.66E-3	PASS
24	1.252E-3			PASS
25	10.612E-3	5.896	180.00E-3	PASS
26	1.187E-3			PASS
27	9.812E-3	5.888	166.66E-3	PASS
28	1.155E-3			PASS
29	9.004E-3	5.802	155.18E-3	PASS
30	1.071E-3			PASS
31	8.229E-3	5.669	145.16E-3	PASS
32	0.999E-3			PASS
33	7.617E-3	5.586	136.36E-3	PASS
34	1.050E-3			PASS
35	6.613E-3	5.143	128.58E-3	PASS
36	923.003E-6			PASS
37	5.868E-3	4.825	121.62E-3	PASS
38	847.433E-6			PASS
39	5.328E-3	4.618	115.38E-3	PASS
40	932.220E-6			PASS

Harmonic currents less than 0.6% of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.



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Test report No.:

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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 [%]	0.091	4.00	PASS
Tmax [s]	0.000	0.50	PASS

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Test Setup Photos and Configuration

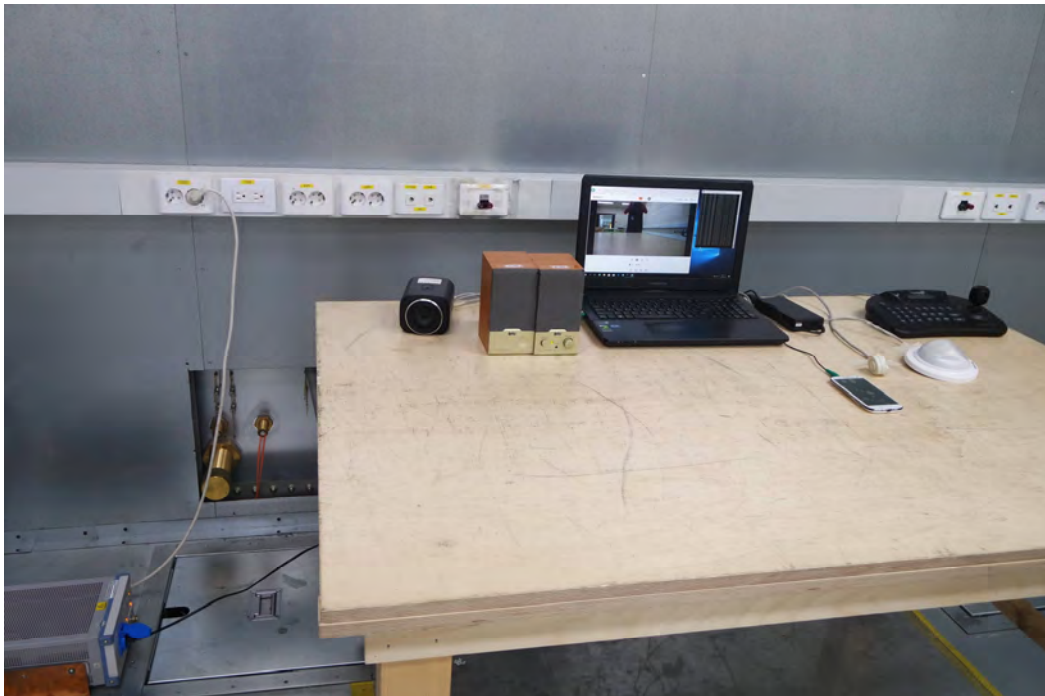
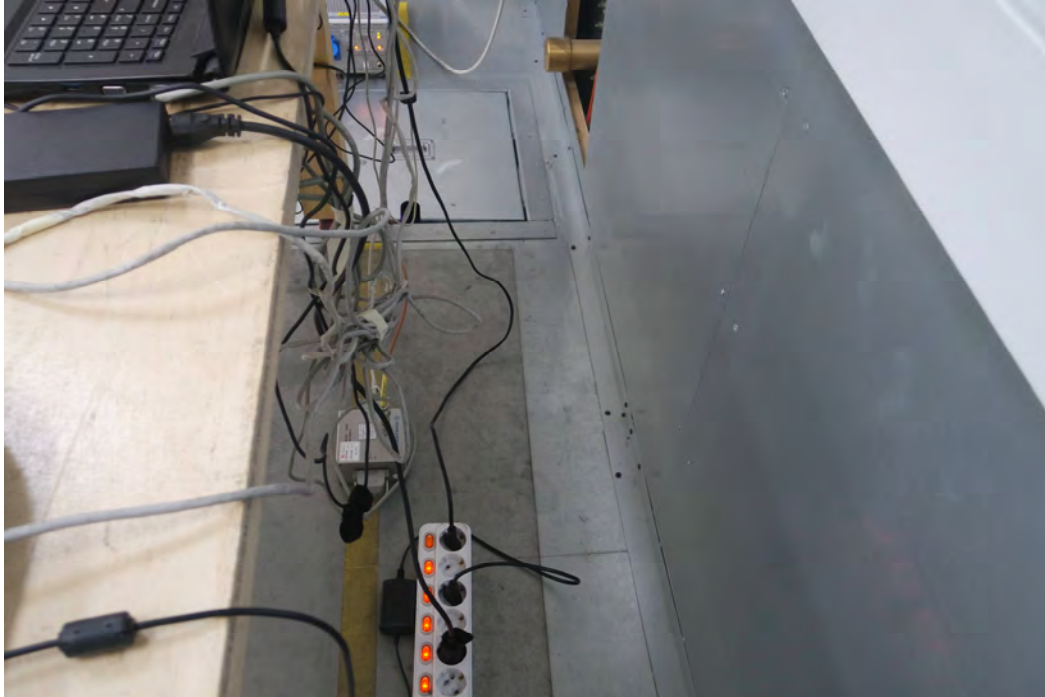
Conducted Voltage Emissions

N/A

N/A

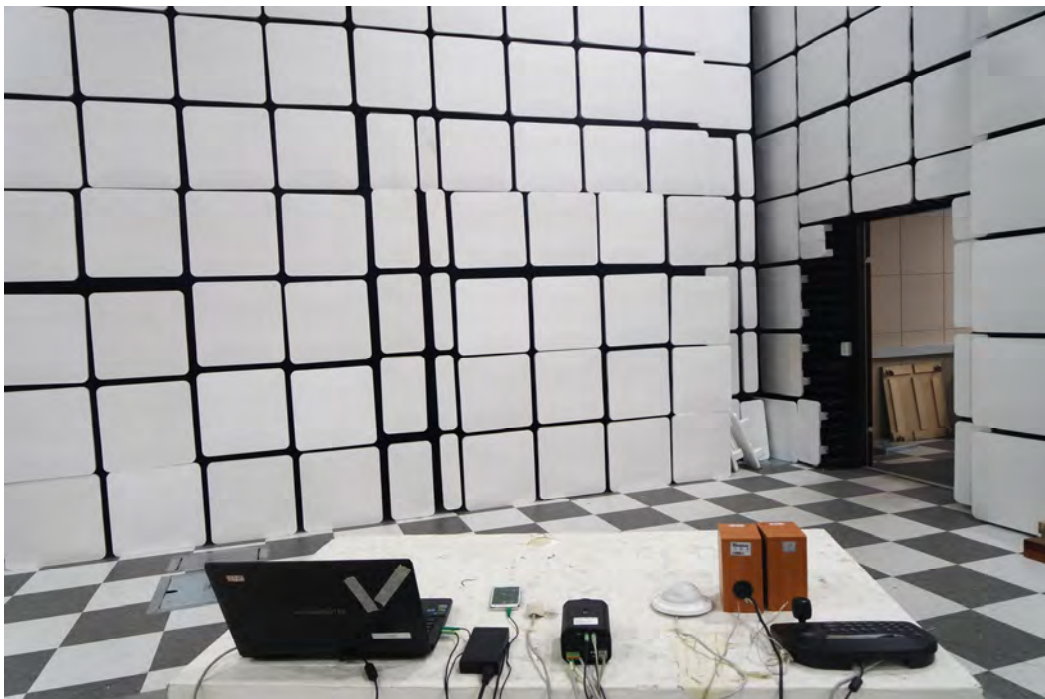
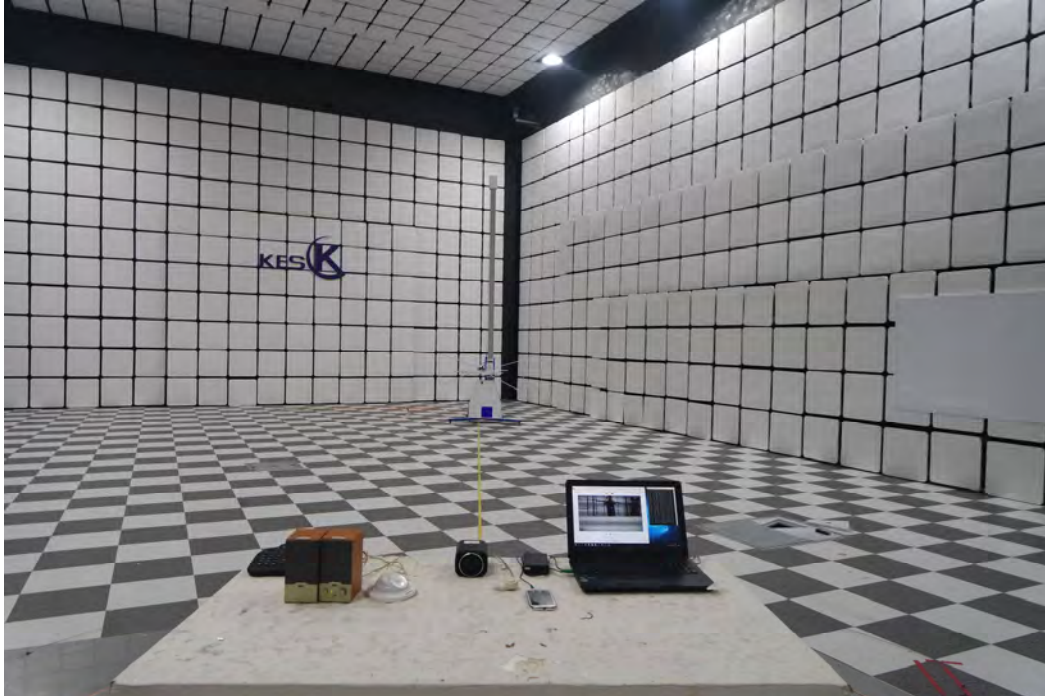
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Conducted Telecommunication Emissions



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Radiated Electric Field Emissions(Below 1 GHz)



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Radiated Electric Field Emissions(Above 1 GHz)



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Harmonic Current Emissions and Voltage Fluctuations and Flicker



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Electrostatic Discharge



Radiated Electric Field Immunity



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Electrical Fast Transients/Bursts



Surge Transients



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Conducted Disturbance



Voltage Dips and Short Interruptions

N/A

EUT External Photographs

(Top)



(Bottom)



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EUT Internal Photographs

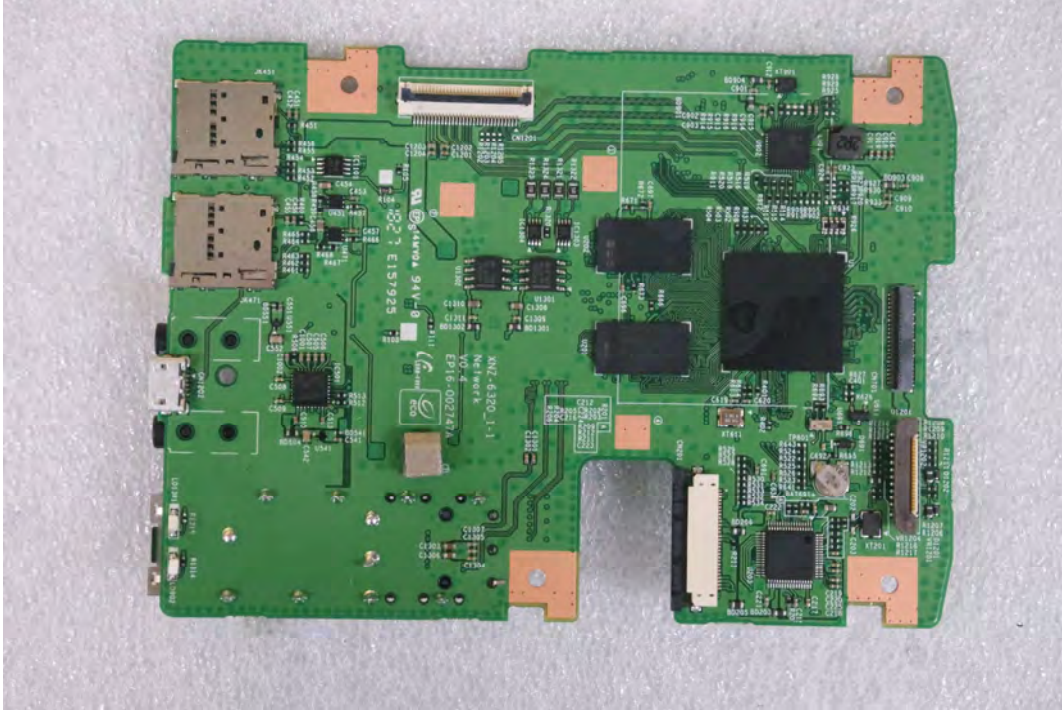
(Internal View)



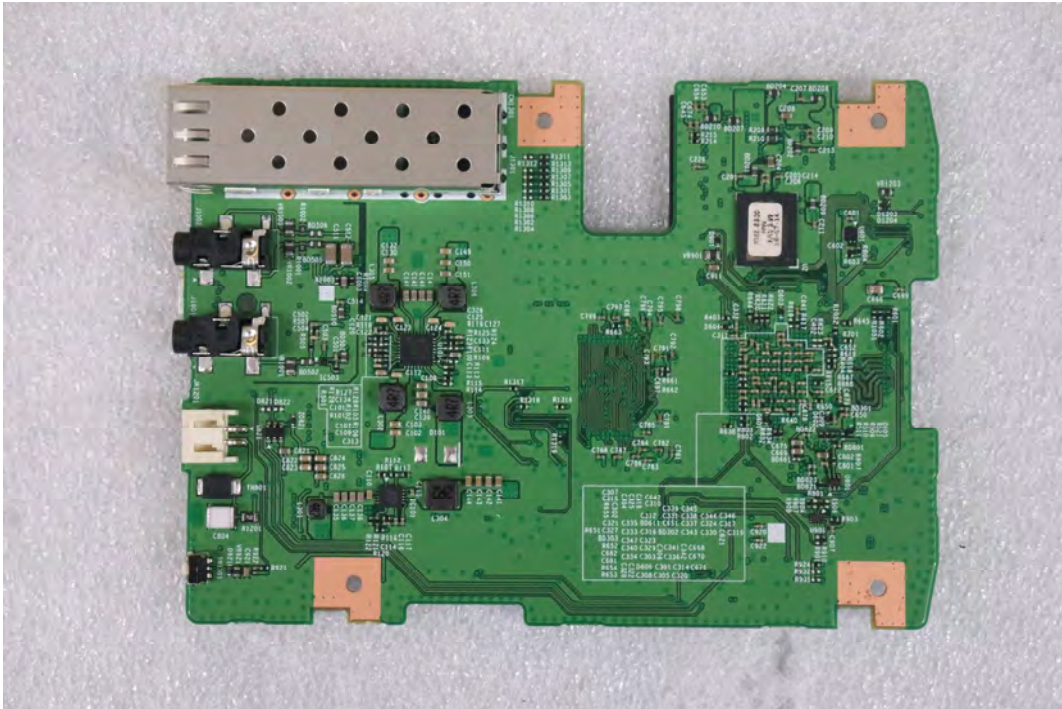
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EUT Internal View – Main Board

(Top)



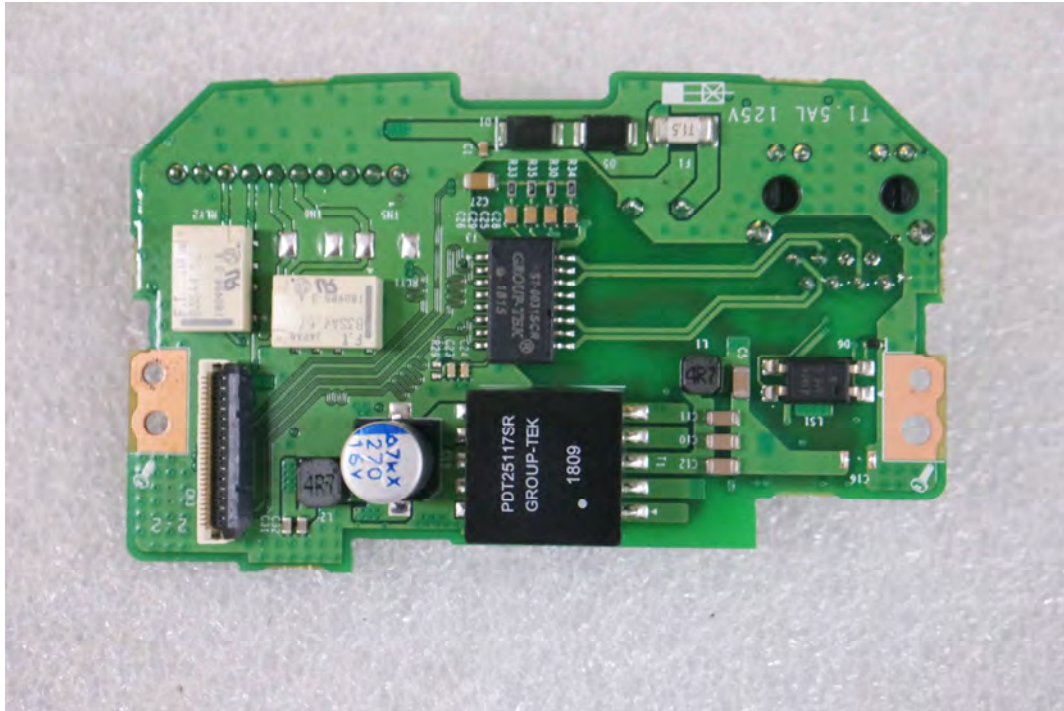
(Bottom)



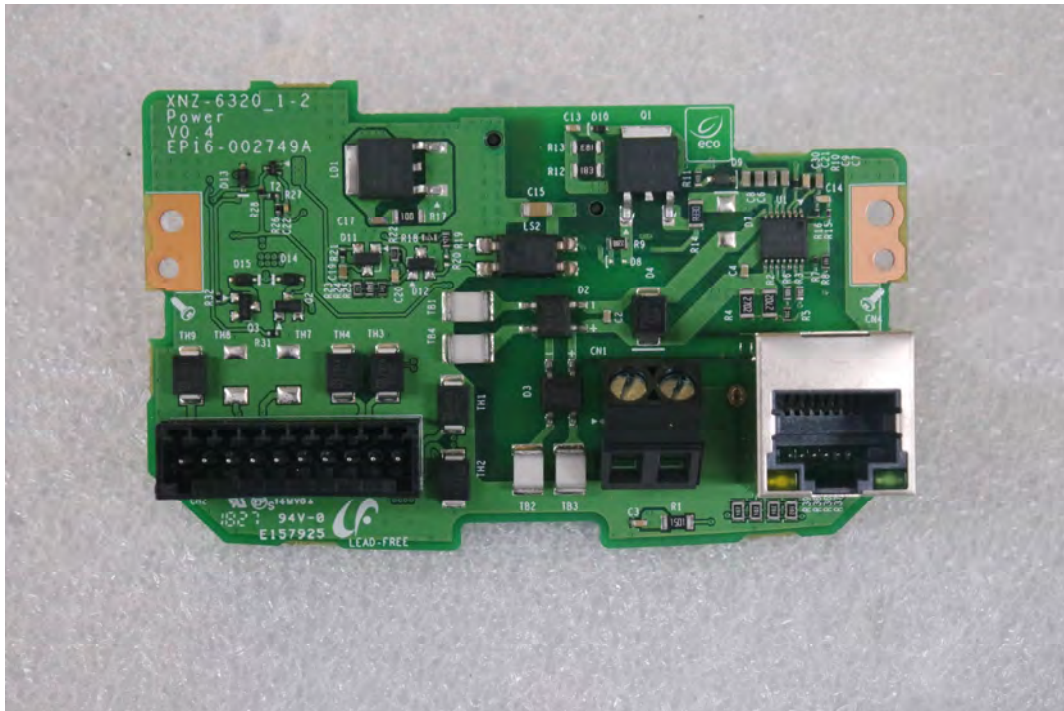
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EUT Internal View – SUB Board

(Top)



(Bottom)



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EUT Internal View – Lens

(Top)



(Bottom)



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Label and Location



NETWORK CAMERA

Model No : XNZ-6320

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

Made in China

