

**KES Co., Ltd.**

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

Report No.:

KES-EM-21T1202-R1

Page (1) of (54)

EMC TEST REPORT For RCM

Test Report No. : KES-EM-21T1202-R1
Date of Issue : Feb. 24, 2023
Product name : NETWORK CAMERA
Model/Type No. : XNZ-6320A
Variant Model : -
Applicant : Hanwha Vision Co., Ltd
Applicant Address : 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si,
Gyeonggi-do, Republic of Korea
Manufacturer : 1. HANWHA VISION VIETNAM COMPANY LIMITED
2. D-TECH CO.,LTD.
Manufacturer Address : 1. Lot O-2, Que Vo Industrial Zone extended area,
Nam Son commune, Bac Ninh city, Bac Ninh province, Vietnam
2. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi- do,
Korea (Suwon Industrial Complex)
Date of Receipt : Nov. 12, 2021
Test date : Nov. 24, 2021 ~ Nov. 26, 2021
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Sung Keun, Park
EMC Test Engineer

Reviewed by

Dong-Hun, Jang
EMC Technical Manager

Tested by Young Suk, Song
(Retired person)
Proxy signature : Sung Keun, Park

This test report is not related to KS Q ISO/IEC 17025 and KOLAS.

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

**KES Co., Ltd.**

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

Report No.:

KES-EM-21T1202-R1

Page (2) of (54)

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Dec. 21, 2021	KES-EM-21T1202	Issued
Feb. 24, 2023	KES-EM-21T1202-R1	Change the Applicant and manufacturer at the request of the customer

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

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



TABLE OF CONTENTS

1.0	General Product Description.....	4
1.1	Test Voltage & Frequency	6
1.2	Variant Model Differences	6
1.3	Device Modifications	6
1.4	Equipment Under Test.....	6
1.5	Support Equipments	7
1.6	External I/O Cabling	8
1.7	EUT Operating Mode(s)	12
1.8	Configuration.....	13
1.9	Remarks when standards applied	14
1.10	Calibration Details of Equipment Used for Measurement	15
1.11	Test Facility	15
1.12	Laboratory Accreditations and Listings	15
2.0	Test Regulations.....	15
2.1	Conducted Emissions at Mains Power Ports	17
2.2	Conducted Emissions at Telecommunication Ports.....	18
2.3	Radiated Electric Field Emissions(Below 1 GHz)	19
2.4	Radiated Electric Field Emissions(Above 1 GHz)	20
APPENDIX A – TEST DATA.....		21
Conducted Emissions at Mains Power Ports.....		21
Conducted Emissions at Telecommunication Ports		27
Radiated Electric Field Emissions(Below 1 GHz)		29
Radiated Electric Field Emissions(Above 1 GHz).....		33
Test Setup Photos and Configuration		37
Conducted Emissions at Mains Power Ports.....		37
Conducted Emissions at Telecommunication Ports		38
Radiated Electric Field Emissions(Below 1 GHz)		42
Radiated Electric Field Emissions(Above 1 GHz).....		46
EUT External Photographs		50
EUT Internal Photographs		51



1.0 General Product Description

Main Specifications of EUT are:

Video	
Imaging Device	1/2.8" 2MP CMOS
Effective Pixels	1944(H)x1212(V)
Min. Illumination	Color: 0.05Lux (1/30sec, F1.6) B/W: 0.005 Lux (1/30sec, F1.6)
Video Out	CVBS: 1.0 Vp-p / 75Ω composite, 720x480(N), 720x576(P) for installation USB: Micro USB Type B, 1280x720 for installation
Lens	
Focal Length (Zoom Ratio)	4.44 ~ 142.6mm(Optical 32X)
Max. Aperture Ratio	F1.6(Wide)~F4.4(Tele)
Angular Field of View	H: 64.66°(Wide)~2.29°(Tele) / V: 38.08°(Wide)~1.30°(Tele)
Min. Object Distance	Wide 1.5m(4.92ft) ,Tele 2m(6.56ft)
Focus Control	Auto, One shot AF
Lens Type	DC auto Iris
Operational	
Camera Title	Displayed up to 85 characters
Day & Night	Auto(ICR)
Backlight Compensation	BLC, HLC, WDR, SDR
Wide Dynamic Range	120dB
Digital Noise Reduction	SSNR V
Digital Image Stabilization	Support
Defog	Support
Motion Detection	8ea, 8point polygonal zones
Privacy Masking	32ea, rectangular zones - Color: Grey/Green/Red/Blue/Black/White - Mosaic
Gain Control	OFF/ LOW/ MID/ HIGH
White Balance	ATW / AWC / Manual / Indoor / Outdoor / Mercury / Sodium
Electronic Shutter Speed	Minimum / Maximum / Anti flicker (2~1/12,000sec)
Video Rotation	Flip, Mirror
Analytics	Defocus detection, Directional detection, Fog detection, Face detection, Motion detection, Appear/Disappear, Enter/Exit, Loitering, Tampering, Virtual line, Audio detection, Sound classification, Shock detection
Serial Interface	RS-485/422(Samsung-T, Pelco-D/P, Panasonic, Bosch, AD, GE, Vicon, Honeywell)
Alarm I/O	Input 1ea / Output 2ea
Alarm Triggers	Analytics, Network disconnect, Alarm input
Alarm Events	File upload via FTP and e-mail Notification via e-mail SD/SDHC/SDXC or NAS recording at event triggers Alarm output PTZ Preset
Audio In	Selectable(mic in/line in) Supply voltage: 2.5VDC(4mA), Input impedance: 2K Ohm
Audio Out	Line out, Max.output level: 1Vrms
Network	
Ethernet	RJ-45(10/100BASE-T), SFP(100BASE-FX)
Video Compression	H.265/H.264: Main/Baseline/High, MJPEG
Resolution	1920x1080, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600,

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

**KES Co., Ltd.**

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

Report No.:

KES-EM-21T1202-R1

Page (5) of (54)

	800x448, 720x576, 720x480, 640x480, 640x360, 320x240
Max. Framerate	H.265/H.264: Max. 60fps/50fps(60Hz/50Hz) MJPEG: Max. 30fps/25fps(60Hz/50Hz)
Smart Codec	Manual(5ea area), WiseStream II
Bitrate Control	H.264/H.265: CBR or VBR MJPEG: VBR
Streaming	Unicast(20 users) / Multicast Multiple streaming(Up to 10 profiles)
Audio Compression	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
Protocol	IPv4, IPv6, TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP, RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, PIM-SM, UPnP, Bonjour, LLDP, SRTP
Security	HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access Log 802.1X Authentication(EAP-TLS, EAP-LEAP)
Edge Storage	Micro SD/SDHC/SDXC 2 slot 512GB
Application Programming Interface	ONVIF Profile S/G/T SUNAPI(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	None
Memory	1024MB RAM, 256MB Flash
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
Electrical	
Input Voltage	PoE(IEEE802.3af, Class3), 12VDC
Power Consumption	PoE: Max 7.5W, Typical 4.5W 12VDC: Max 7.0W, Typical 4.0W
Mechanical	
Color / Material	Dark grey / Aluminum
Product dimensions / weight	96 x 76 x 143.5mm, 578g
DORI (EN62676-4 standard)	
Detect (25PPM/ 8PPF)	Wide: 64.2m(199.1ft) / Tele: 1921.3m(6303.4ft)
Observe (63PPM/ 19PPF)	Wide: 24.3m(79.6ft) / Tele: 768.5m(2521.4ft)
Recognize (125PPM/ 38PPF)	Wide: 12.1m(39.8ft) / Tele: 384.3m(1260.7ft)
Identify (250PPM/ 76PPF)	Wide: 6.1m(19.9ft) / Tele: 192.1m(630.3ft)

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



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.

☒ AC 240 V, 50 Hz (DC Adapter) ☒ PoE

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-6320A	-	HANWHA VISION VIETNAM COMPANY LIMITED	EUT

**KES Co., Ltd.**

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

Report No.:

KES-EM-21T1202-R1

Page (7) of (54)

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Adaptor	2ACB022F	-	Channel Well Technology (Guangzhou) Co., Ltd.	-
PoE Adaptor	PT-PSE106GBR-AH-S	-	Dongguan PROCET Network Technology Co., Ltd	-
Notebook	Latitude 5300	8C47BE45C060	DELL INC.	-
Notebook Adaptor	HA65NM130	-	Chicony Power Technology(Suzhou)Co., Ltd.	-
Gender	-	-	-	-
Converter	FIBERFLY-5001NZ	-	KTS OPTONICS CO., LTD.	-
Converter Adaptor	SAW06D-050-1000KD	-	SHENZHEN SHI YINGYUAN ELECTRONICS CO.,LTD	-
Smartphone	LG-SU760	108KPQJ0186212	LG	-
Headset	K550	-	Britz®	-
Alarm1	-	-	-	-
Alarm2	-	-	-	-
Controller1	SPC-1010	-	SamSung Techwin Co.,Ltd.	-
Controller1 Adaptor	AP-12005A	-	A-power.	-
Controller2	SPC-1010	-	SamSung Techwin Co.,Ltd.	-
Controller2 Adaptor	AP-12005A	-	A-power.	-
Micro SD Card	-	-	SanDisk	-
Optical Module1	SFP-SM	-	Interlink Telecom Co., Limited	-
Optical Module2	SFP-SM	-	Interlink Telecom Co., Limited	-

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

**KES Co., Ltd.**

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

Report No.:

KES-EM-21T1202-R1

Page (8) of (54)

1.6 External I/O Cabling

■ DC Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (EUT)	2 Pin	Adaptor	2 Pin	1.2	U
	RJ-45	Notebook	RJ-45	3.0	S
	3.5 mm	Headset	3.5 mm	1.7	U
	3.5 mm		3.5 mm	1.7	U
	RS-485	Controller1	RS-485	3.0	U
	RS-422	Controller2	RS-422	3.0	U
	SLOT	Micro SD Card	SLOT	-	-
	2 Pin	Alarm1	2 Pin	3.0	U
	2 Pin	Alarm2	2 Pin	3.0	U
Notebook	DC Jack	Notebook Adaptor	DC Jack	1.2	U
	3.5 mm	Gender	3.5 mm	0.1	U
Gender	3.5 mm	Smartphone	3.5 mm	1.0	U
Controller1	DC Jack	Controller1 Adaptor	DC Jack	1.6	U
Controller2	DC Jack	Controller2 Adaptor	DC Jack	1.6	U

* Unshielded=U, Shielded=S

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



■ DC_Optical Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (EUT)	2 Pin	Adaptor	2 Pin	1.2	U
	SFP	Optical Module1	SFP	-	-
	3.5 mm	Headset	3.5 mm	1.7	U
	3.5 mm		3.5 mm	1.7	U
	RS-485	Controller1	RS-485	3.0	U
	RS-422	Controller2	RS-422	3.0	U
	SLOT	Micro SD Card	SLOT	-	-
	2 Pin	Alarm1	2 Pin	3.0	U
	2 Pin	Alarm2	2 Pin	3.0	U
Notebook	DC Jack	Notebook Adaptor	DC Jack	1.2	U
	3.5 mm	Gender	3.5 mm	0.1	U
	RJ-45	Converter	RJ-45	1.5	U
Gender	3.5 mm	Smartphone	3.5 mm	1.0	U
Controller1	DC Jack	Controller1 Adaptor	DC Jack	1.6	U
Controller2	DC Jack	Controller2 Adaptor	DC Jack	1.6	U
Optical Module1	Optical	Optical Module2	Optical	5.0	U
Converter	SFP	Optical Module2	SFP	-	-
	DC Jack	Converter Adaptor	DC Jack	1.4	U

* Unshielded=U, Shielded=S

**KES Co., Ltd.**

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

Report No.:

KES-EM-21T1202-R1

Page (10) of (54)

■ PoE Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (EUT)	RJ-45 (PoE)	PoE Adaptor	RJ-45 (PoE)	3.0	S
	3.5 mm	Headset	3.5 mm	1.7	U
	3.5 mm		3.5 mm	1.7	U
	RS-485	Controller1	RS-485	3.0	U
	RS-422	Controller2	RS-422	3.0	U
	SLOT	Micro SD Card	SLOT	-	-
	2 Pin	Alarm1	2 Pin	3.0	U
	2 Pin	Alarm2	2 Pin	3.0	U
Notebook	DC Jack	Notebook Adaptor	DC Jack	1.2	U
	3.5 mm	Gender	3.5 mm	0.1	U
	RJ-45 (LAN)	PoE Adaptor	RJ-45 (LAN)	3.0	S
Gender	3.5 mm	Smartphone	3.5 mm	1.0	U
Controller1	DC Jack	Controller1 Adaptor	DC Jack	1.6	U
Controller2	DC Jack	Controller2 Adaptor	DC Jack	1.6	U

* Unshielded=U, Shielded=S

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

**KES Co., Ltd.**

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

Report No.:

KES-EM-21T1202-R1

Page (11) of (54)

■ PoE_Optical Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (EUT)	RJ-45 (PoE)	PoE Adaptor	RJ-45 (PoE)	3.0	S
	SFP	Optical Module1	SFP	-	-
	3.5 mm	Headset	3.5 mm	1.7	U
	3.5 mm		3.5 mm	1.7	U
	RS-485	Controller1	RS-485	3.0	U
	RS-422	Controller2	RS-422	3.0	U
	SLOT	Micro SD Card	SLOT	-	-
	2 Pin	Alarm1	2 Pin	3.0	U
	2 Pin	Alarm2	2 Pin	3.0	U
Notebook	DC Jack	Notebook Adaptor	DC Jack	1.2	U
	3.5 mm	Gender	3.5 mm	0.1	U
	RJ-45	Converter	RJ-45	1.5	U
Gender	3.5 mm	Smartphone	3.5 mm	1.0	U
Controller1	DC Jack	Controller1 Adaptor	DC Jack	1.6	U
Controller2	DC Jack	Controller2 Adaptor	DC Jack	1.6	U
Optical Module1	Optical	Optical Module2	Optical	5.0	U
Converter	SFP	Optical Module2	SFP	-	-
	DC Jack	Converter Adaptor	DC Jack	1.4	U

* Unshielded=U, Shielded=S

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



KES Co., Ltd.

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

Report No.:

KES-EM-21T1202-R1

Page (12) of (54)

1.7 EUT Operating Mode(s)

operating
EUT Monitoring, Ping Test

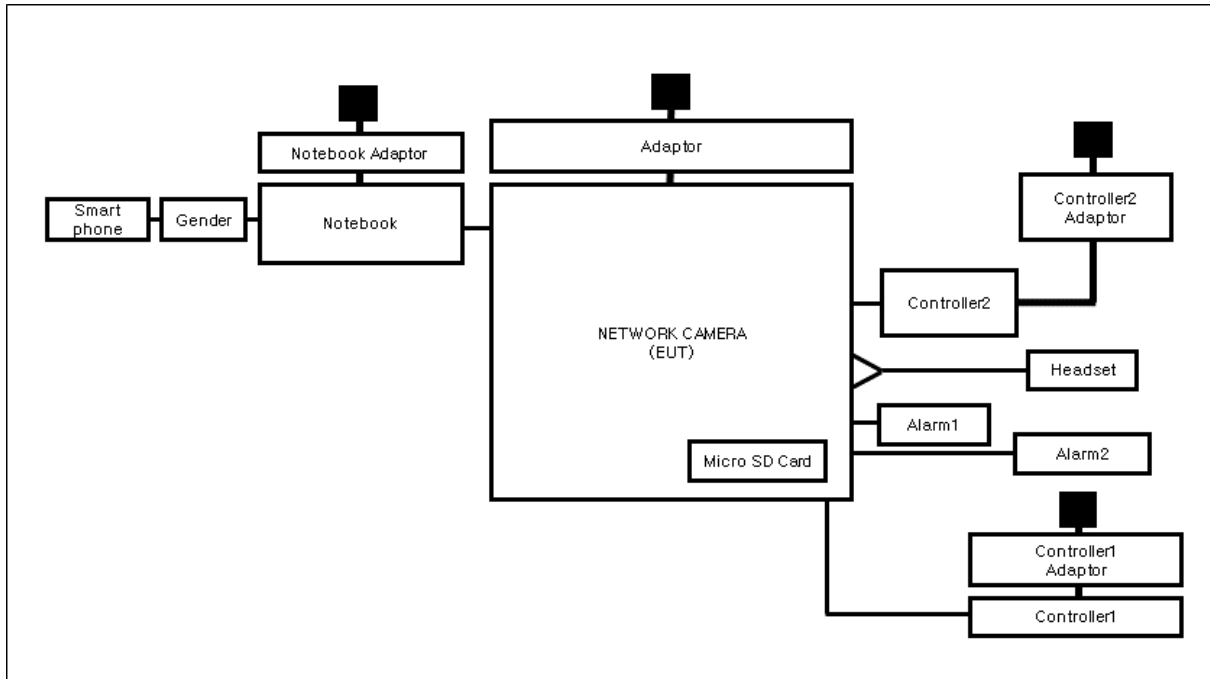
EUT Test operating S/W		
Name	Version	Manufacture Company
Web Viewer	-	Hanwha Vision Co., Ltd

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

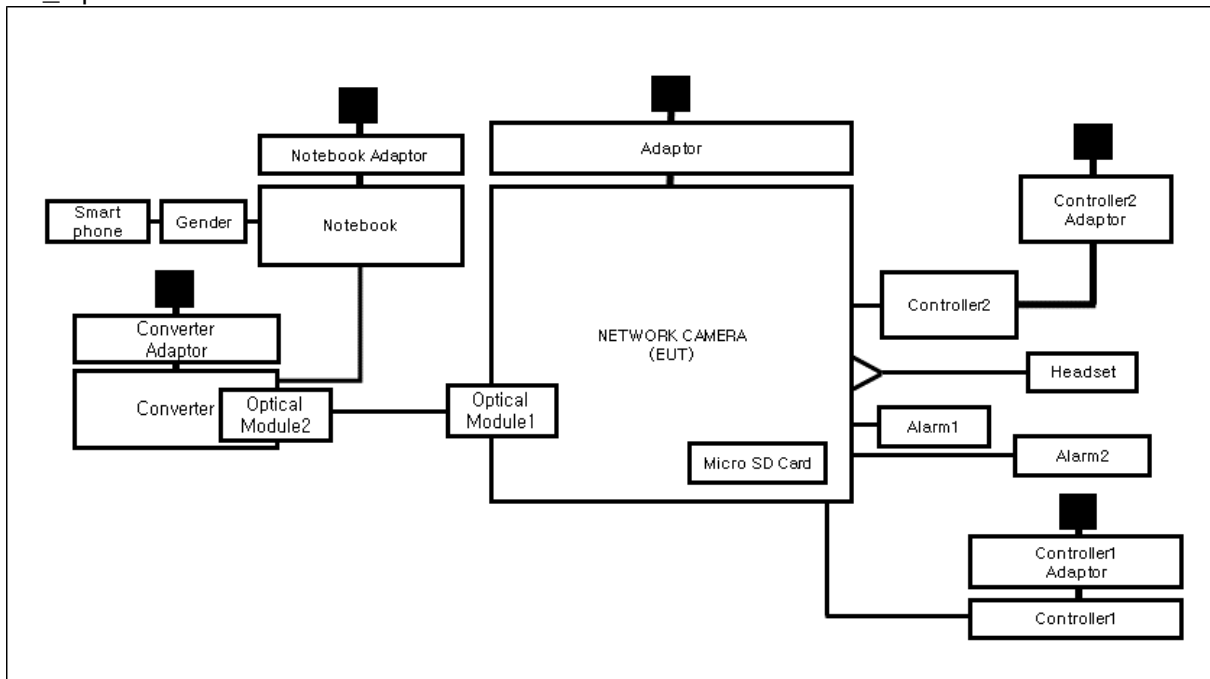
1.8 Configuration

■ AC Main
 □ DC Main

■ DC Mode

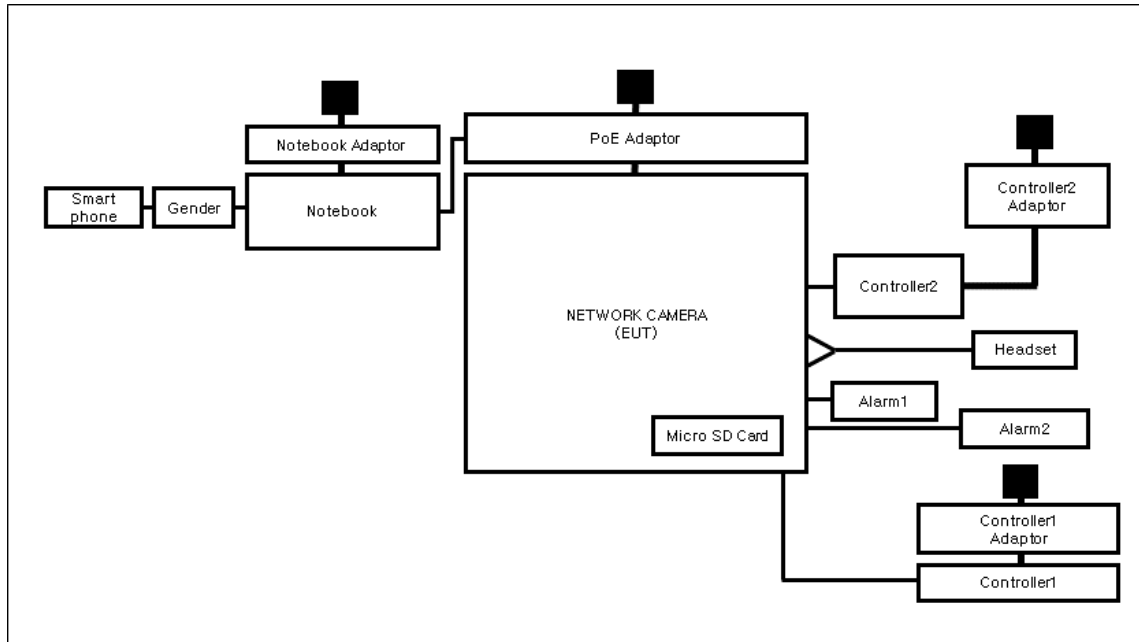


■ DC_Optical Mode

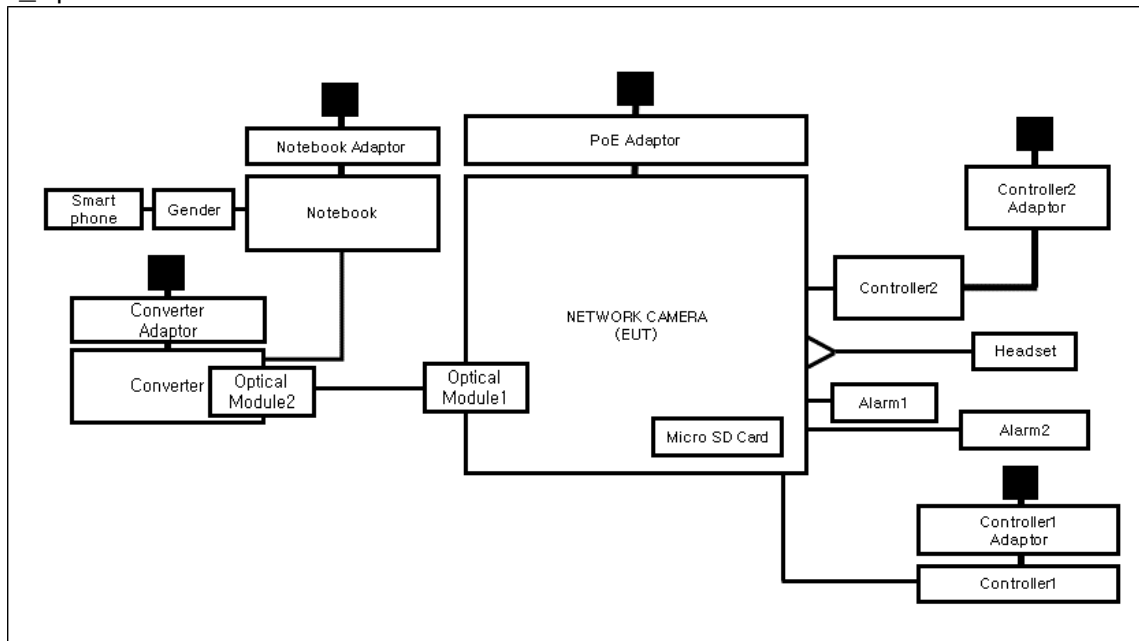


This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
 The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
 The authenticity of the test report, contact kes@kes.co.kr

■ PoE Mode



■ PoE_Optical Mode



1.9 Remarks when standards applied

- When connecting optical ports, RJ-45 ports were tested by mode as they did not communicate data.
- USB, VIDEO port is not tested because it is an unused port.
- Power-related ports are not tested because power and data communication are used together in PoE mode.
- Power-related ports were tested because only power was used in PoE_optical mode.

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

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, Republic of. The sites are constructed in conformance with the requirements of ANSI C63.4a-2017 and CISPR 16-1-4:2019

1.12 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
KOREA	RRA	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KR0100
International	KOLAS	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KT489
USA	FCC	3 m & 10 m Semi-Anechoic Chamber Conducted test site to perform FCC Part 15/18 measurements.	 KR0100
Canada	ISED	3 m & 10 m Semi-Anechoic Chamber and Conducted test site	 23298
JAPAN	VCCI	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site)	 C-20136, T-20137, R-20181, G-20176
Europe	TÜV SÜD	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 CARAT 001633 0004



KES Co., Ltd.

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

Report No.:

KES-EM-21T1202-R1

Page (16) of (54)

2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **AS/NZS CISPR32:2015**

☒ Class A

☐ Class B

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



2.1 Conducted Emissions at Mains Power Ports

Test Date

Nov. 25, 2021

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	101783	01, 15, 2022
☒	LISN	ENV216	R & S	101787	12, 29, 2021
☒	LISN	ESH2-Z5	R & S	100450	12, 29, 2021
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 29, 2021

Test Conditions

Temperature: (22,8 ± 0,2) °C

Relative Humidity: (43,7 ± 0,3) % 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.



2.2 Conducted Emissions at Telecommunication Ports

Test Date

Nov. 25, 2021

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	101783	01, 15, 2022
☒	LISN	ENV216	R & S	101787	12, 29, 2021
☒	LISN	ESH2-Z5	R & S	100450	12, 29, 2021
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 29, 2021
☐	8-WIRE ISN CAT3,5	ENY81	R & S	100174	12, 30, 2021
☒	ISN	ISN S8	SCHWARZBECK	ISN-S8-0019	03, 10, 2022
☐	CDN	CDNS502A	TESEQ	40431	12, 29, 2021

Test Conditions

Temperature: (22,8 ± 0,1) °C

Relative Humidity: (43,7 ± 0,3) % 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.
- For Ethernet interfaces, measurements are required at the highest data rate supported by the interface.

**KES Co., Ltd.**

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

Report No.:

KES-EM-21T1202-R1

Page (19) of (54)

2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Nov. 24, 2021 / Nov. 25, 2021

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, 01, 2022
☒	AMPLIFIER	SCU 01	R & S	100603	11, 24, 2022
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	12, 08, 2022
☒	ATTENUATOR	8491A	HP	32173	03, 10, 2022

Test Conditions

Test Date: Nov. 24, 2021

Nov. 25, 2021

Temperature: (23,1 ± 0,2) °C

(22,6 ± 0,3) °C

Relative Humidity: (44,0 ± 0,2)% R.H.

(44,0 ± 0,4)% 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.

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

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

The authenticity of the test report, contact kes@kes.co.kr

**KES Co., Ltd.**

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

Report No.:

KES-EM-21T1202-R1

Page (20) of (54)

2.4 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Nov. 26, 2021

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, 03, 2022
☒	PREAMPLIFIER	8449B	AGILENT	3008A01967	04, 07, 2022
☐	ATTENUATOR	8491A	HP	35496	03, 10, 2022
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 11, 2022

Test Conditions

Temperature: (23,2 ± 0,2) °C

Relative Humidity: (43,1 ± 0,3) % 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

RemarksSee Appendix A for test data.

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

APPENDIX A – TEST DATA

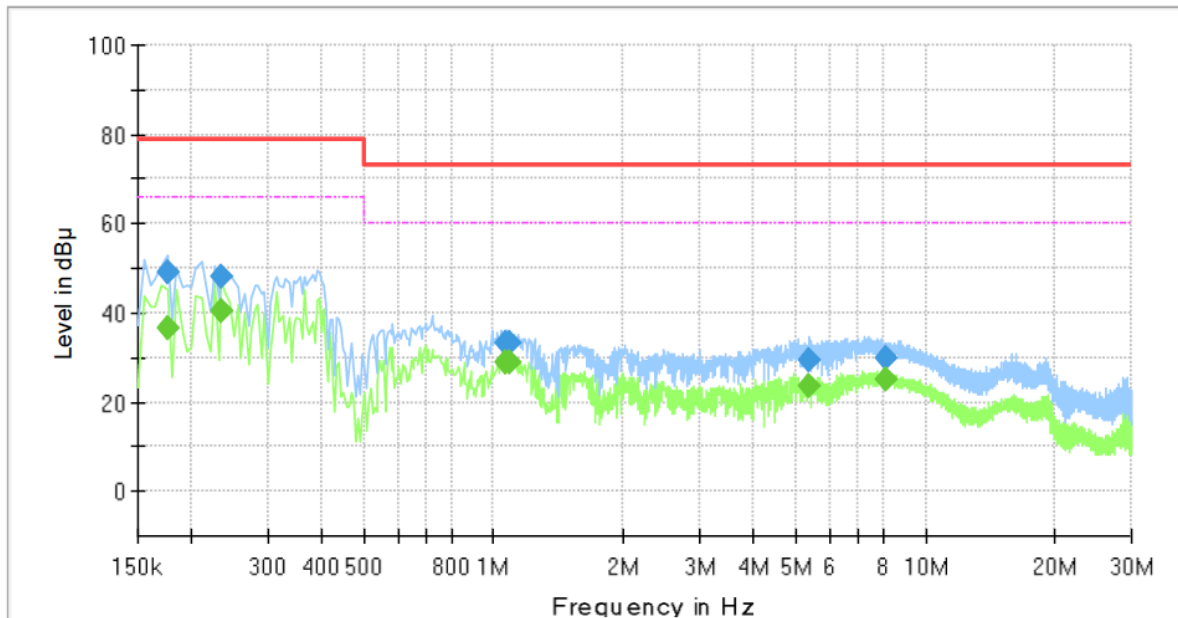
Conducted Emissions at Mains Power Ports

■ DC Mode

HOT LINE

Common Information

Test Description:	Conducted Emission
Model No.:	XNZ-6320A
Phase:	L1
Mode:	DC
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.175000	---	36.66	66.00	29.34	1000.0	9.000	L1	19.5
0.175000	49.02	---	79.00	29.98	1000.0	9.000	L1	19.5
0.235000	---	40.66	66.00	25.34	1000.0	9.000	L1	19.5
0.235000	48.11	---	79.00	30.89	1000.0	9.000	L1	19.5
1.070000	---	28.88	60.00	31.12	1000.0	9.000	L1	20.1
1.070000	33.19	---	73.00	39.81	1000.0	9.000	L1	20.1
1.095000	---	29.09	60.00	30.91	1000.0	9.000	L1	20.1
1.095000	33.10	---	73.00	39.90	1000.0	9.000	L1	20.1
5.395000	---	23.48	60.00	36.52	1000.0	9.000	L1	19.6
5.395000	29.61	---	73.00	43.39	1000.0	9.000	L1	19.6
8.095000	---	25.14	60.00	34.86	1000.0	9.000	L1	19.7
8.095000	29.90	---	73.00	43.10	1000.0	9.000	L1	19.7

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

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

The authenticity of the test report, contact kes@kes.co.kr



KES Co., Ltd.

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

Report No.:

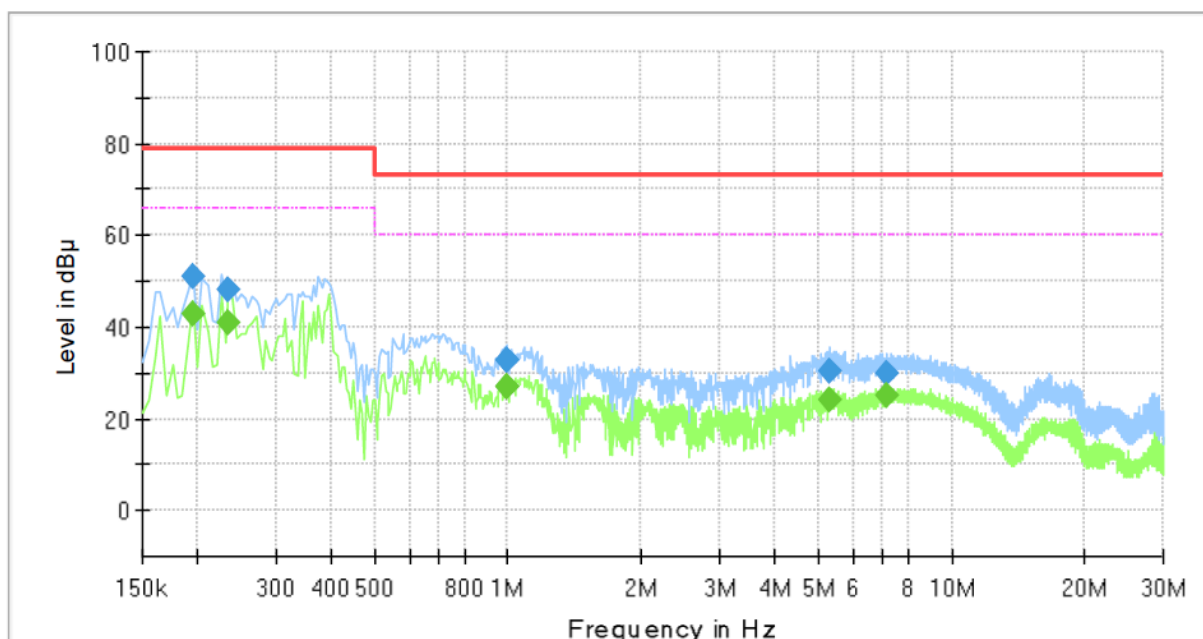
KES-EM-21T1202-R1

Page (22) of (54)

NEUTRAL LINE

Common Information

Test Description: Conducted Emission
Model No.: XNZ-6320A
Phase: N
Mode: DC
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.195000	---	42.60	66.00	23.40	1000.0	9.000	N	19.5
0.195000	50.82	---	79.00	28.18	1000.0	9.000	N	19.5
0.235000	---	40.93	66.00	25.07	1000.0	9.000	N	19.5
0.235000	48.25	---	79.00	30.75	1000.0	9.000	N	19.5
0.990000	---	27.11	60.00	32.89	1000.0	9.000	N	20.1
0.990000	32.66	---	73.00	40.34	1000.0	9.000	N	20.1
1.000000	---	27.09	60.00	32.91	1000.0	9.000	N	20.1
1.000000	32.52	---	73.00	40.48	1000.0	9.000	N	20.1
5.290000	---	23.88	60.00	36.12	1000.0	9.000	N	19.6
5.290000	30.34	---	73.00	42.66	1000.0	9.000	N	19.6
7.160000	---	24.96	60.00	35.04	1000.0	9.000	N	19.6
7.160000	30.04	---	73.00	42.96	1000.0	9.000	N	19.6

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

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

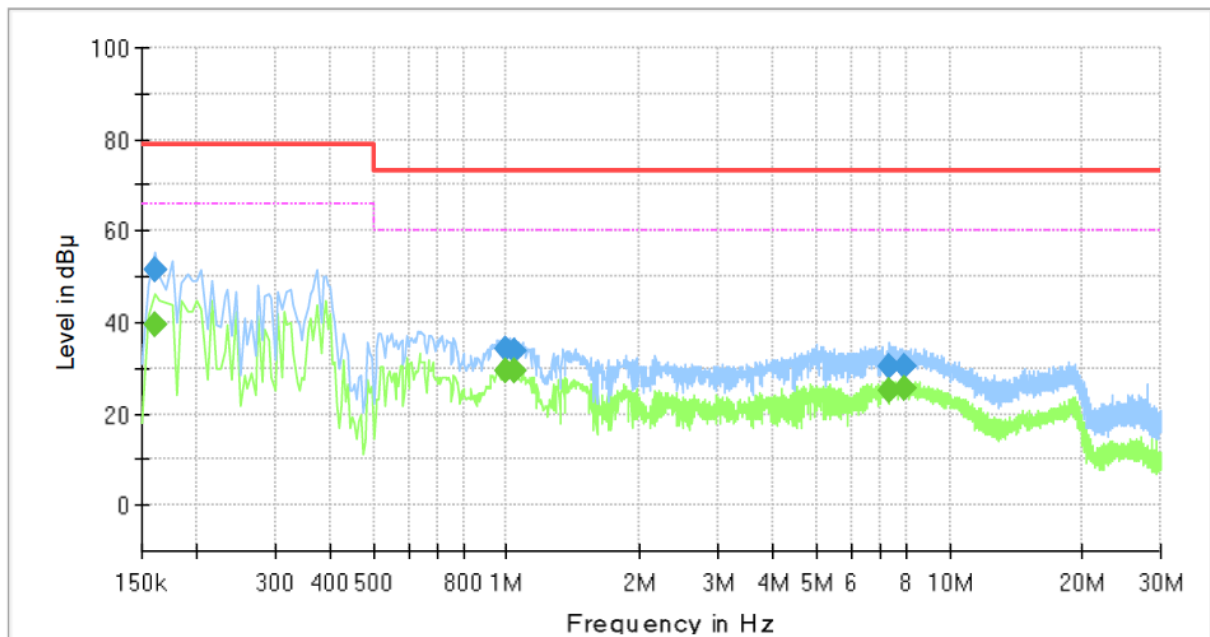
The authenticity of the test report, contact kes@kes.co.kr

■ DC_Optical Mode

HOT LINE

Common Information

Test Description:	Conducted Emission
Model No.:	XNZ-6320A
Phase:	DC_Optical
Mode:	L1
Operator Name:	KES



Final_Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.160000	---	39.47	66.00	26.53	1000.0	9.000	L1	19.5
0.160000	51.55	---	79.00	27.45	1000.0	9.000	L1	19.5
0.990000	---	29.40	60.00	30.60	1000.0	9.000	L1	20.1
0.990000	34.19	---	73.00	38.81	1000.0	9.000	L1	20.1
1.040000	---	29.55	60.00	30.45	1000.0	9.000	L1	20.1
1.040000	33.95	---	73.00	39.05	1000.0	9.000	L1	20.1
7.340000	---	25.22	60.00	34.78	1000.0	9.000	L1	19.6
7.340000	30.43	---	73.00	42.57	1000.0	9.000	L1	19.6
7.865000	---	25.32	60.00	34.68	1000.0	9.000	L1	19.6
7.865000	30.25	---	73.00	42.75	1000.0	9.000	L1	19.6

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

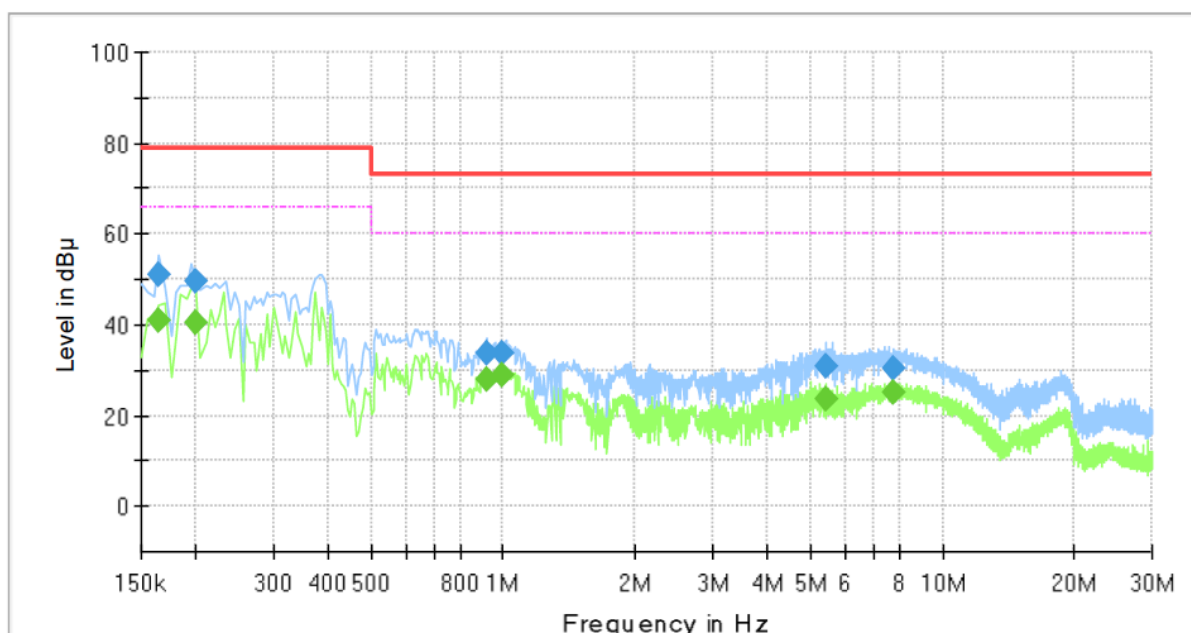
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

The authenticity of the test report, contact kes@kes.co.kr

NEUTRAL LINE

Common Information

Test Description:	Conducted Emission
Model No.:	XNZ-6320A
Phase:	DC_Optical
Mode:	N
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.165000	---	40.80	66.00	25.20	1000.0	9.000	N	19.4
0.165000	50.87	---	79.00	28.13	1000.0	9.000	N	19.4
0.200000	---	40.35	66.00	25.65	1000.0	9.000	N	19.5
0.200000	49.78	---	79.00	29.22	1000.0	9.000	N	19.5
0.915000	---	27.83	60.00	32.17	1000.0	9.000	N	20.1
0.915000	33.50	---	73.00	39.50	1000.0	9.000	N	20.1
1.000000	---	29.05	60.00	30.95	1000.0	9.000	N	20.1
1.000000	33.87	---	73.00	39.13	1000.0	9.000	N	20.1
5.440000	---	23.67	60.00	36.33	1000.0	9.000	N	19.6
5.440000	30.63	---	73.00	42.37	1000.0	9.000	N	19.6
7.770000	---	25.18	60.00	34.82	1000.0	9.000	N	19.6
7.770000	30.42	---	73.00	42.58	1000.0	9.000	N	19.6

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

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

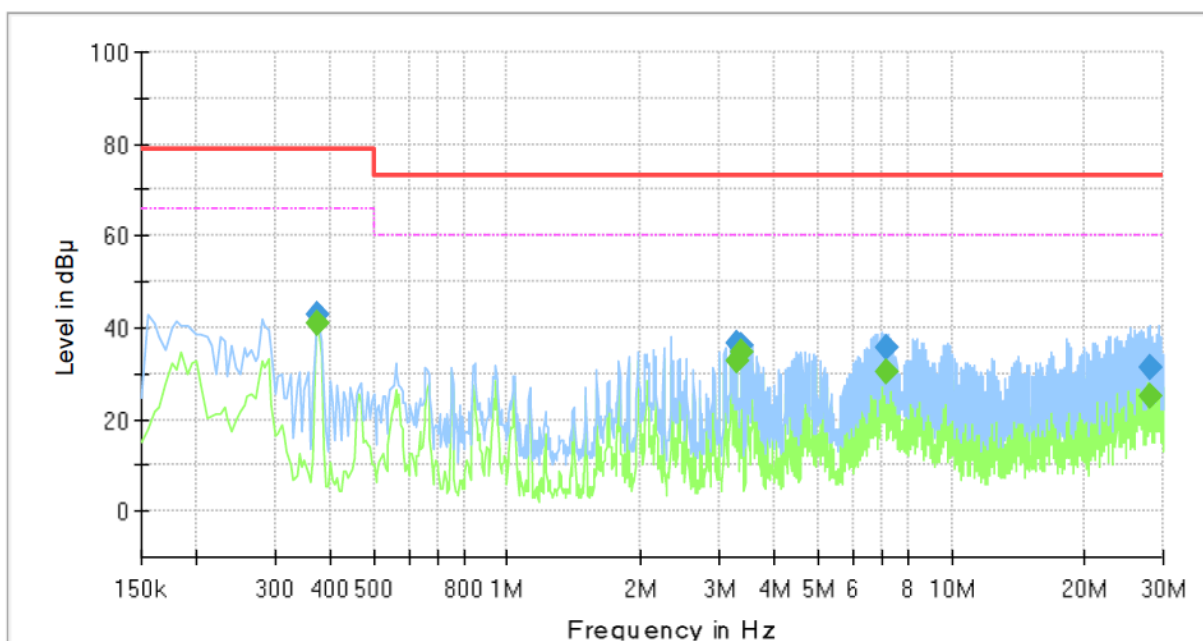
The authenticity of the test report, contact kes@kes.co.kr

PoE_Optical Mode

HOT LINE

Common Information

Test Description:	Conducted Emission
Model No.:	XNZ-6320A
Phase:	L1
Mode:	PoE_Optical
Operator Name:	KES



Final_Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.375000	---	40.98	66.00	25.02	1000.0	9.000	L1	19.6
0.375000	42.79	---	79.00	36.21	1000.0	9.000	L1	19.6
3.285000	---	32.86	60.00	27.14	1000.0	9.000	L1	20.1
3.285000	36.57	---	73.00	36.43	1000.0	9.000	L1	20.1
3.380000	---	34.81	60.00	25.19	1000.0	9.000	L1	20.1
3.380000	35.99	---	73.00	37.01	1000.0	9.000	L1	20.1
7.135000	---	30.36	60.00	29.64	1000.0	9.000	L1	19.6
7.135000	35.53	---	73.00	37.47	1000.0	9.000	L1	19.6
28.170000	---	25.25	60.00	34.75	1000.0	9.000	L1	20.3
28.170000	31.12	---	73.00	41.88	1000.0	9.000	L1	20.3

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

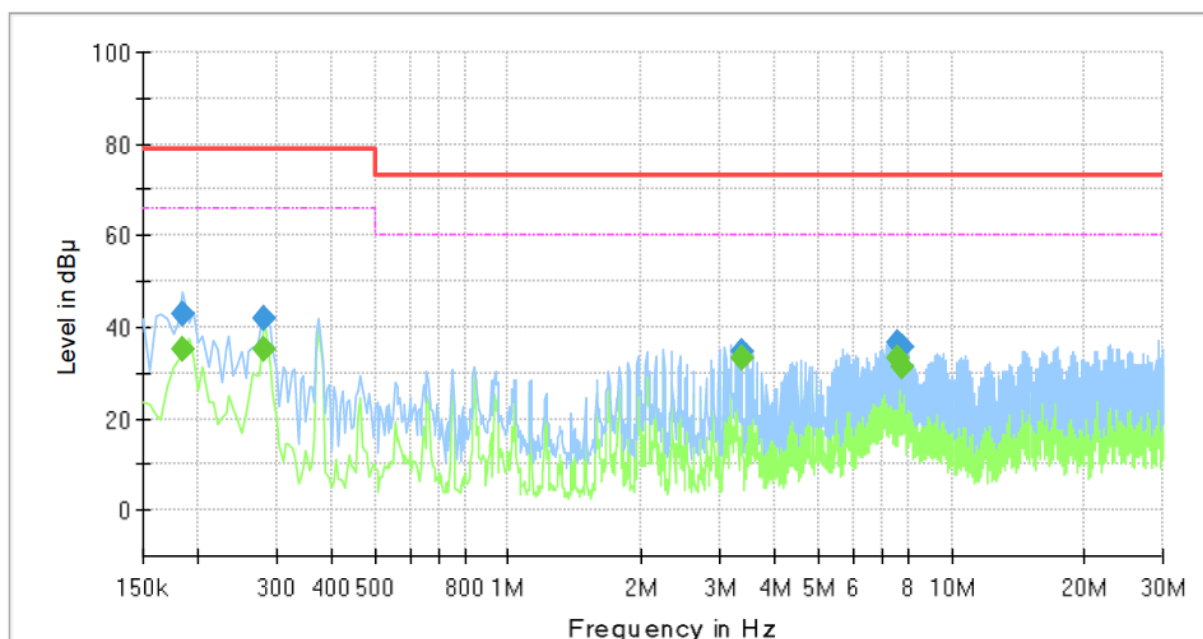
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

The authenticity of the test report, contact kes@kes.co.kr

NEUTRAL LINE

Common Information

Test Description:	Conducted Emission
Model No.:	XNZ-6320A
Phase:	N
Mode:	PoE_Optical
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.185000	---	35.34	66.00	30.66	1000.0	9.000	N	19.4
0.185000	42.73	---	79.00	36.27	1000.0	9.000	N	19.4
0.280000	---	35.32	66.00	30.68	1000.0	9.000	N	19.5
0.280000	41.71	---	79.00	37.29	1000.0	9.000	N	19.5
3.370000	---	33.28	60.00	26.72	1000.0	9.000	N	20.1
3.370000	34.56	---	73.00	38.44	1000.0	9.000	N	20.1
7.575000	---	33.08	60.00	26.92	1000.0	9.000	N	19.6
7.575000	36.44	---	73.00	36.56	1000.0	9.000	N	19.6
7.765000	---	31.55	60.00	28.45	1000.0	9.000	N	19.6
7.765000	35.86	---	73.00	37.14	1000.0	9.000	N	19.6

◆ Calculation

$$\text{QuasiPeak [dBuV]} / \text{CAverage [dBuV]} = \text{Reading Value [dBuV]} + \text{Corr. [dB]}$$

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

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

The authenticity of the test report, contact kes@kes.co.kr

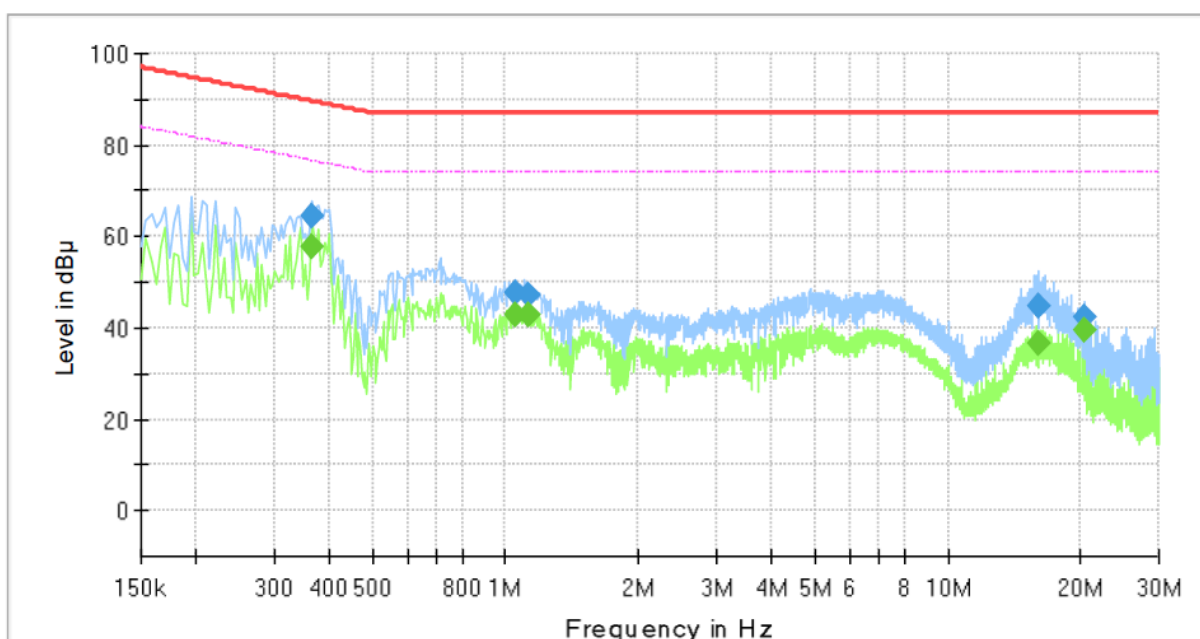
Conducted Emissions at Telecommunication Ports

■ DC Mode

[100 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	XNZ-6320A
Mode :	DC
Speed :	100 Mbps
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.366000	---	57.69	76.59	18.90	1000.0	9.000	Single Line	19.6
0.366000	64.60	---	89.59	24.99	1000.0	9.000	Single Line	19.6
1.058000	---	42.63	74.00	31.37	1000.0	9.000	Single Line	20.0
1.058000	47.65	---	87.00	39.35	1000.0	9.000	Single Line	20.0
1.126000	---	42.76	74.00	31.24	1000.0	9.000	Single Line	20.0
1.126000	47.30	---	87.00	39.70	1000.0	9.000	Single Line	20.0
16.074000	---	36.41	74.00	37.59	1000.0	9.000	Single Line	19.9
16.074000	44.76	---	87.00	42.24	1000.0	9.000	Single Line	19.9
20.258000	---	39.35	74.00	34.65	1000.0	9.000	Single Line	20.2
20.258000	42.17	---	87.00	44.83	1000.0	9.000	Single Line	20.2

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

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

The authenticity of the test report, contact kes@kes.co.kr



KES Co., Ltd.

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

Report No.:

KES-EM-21T1202-R1

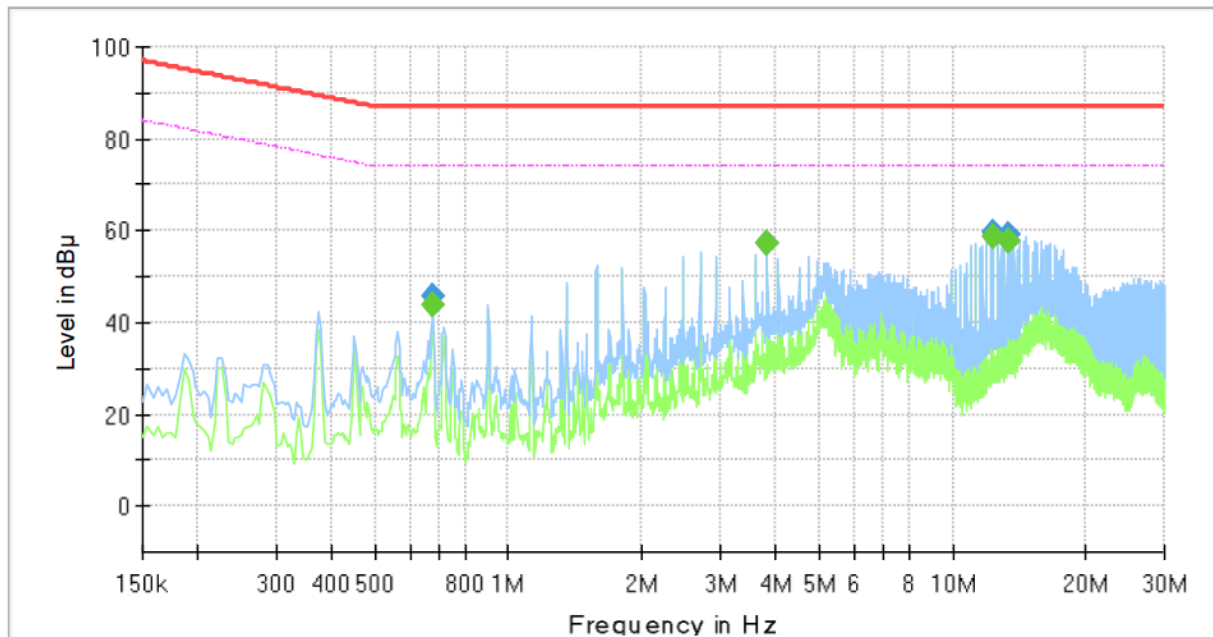
Page (28) of (54)

■ PoE Mode

[100 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: XNZ-6320A
Mode : PoE
Speed : 100 Mbps
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.678000	---	43.85	74.00	30.15	1000.0	9.000	Single Line	19.8
0.678000	45.49	---	87.00	41.51	1000.0	9.000	Single Line	19.8
3.830000	---	57.09	74.00	16.91	1000.0	9.000	Single Line	19.8
3.830000	57.29	---	87.00	29.71	1000.0	9.000	Single Line	19.8
12.390000	---	58.72	74.00	15.28	1000.0	9.000	Single Line	19.9
12.390000	59.83	---	87.00	27.17	1000.0	9.000	Single Line	19.9
13.290000	---	57.59	74.00	16.41	1000.0	9.000	Single Line	19.9
13.290000	59.00	---	87.00	28.00	1000.0	9.000	Single Line	19.9

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

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

The authenticity of the test report, contact kes@kes.co.kr



KES Co., Ltd.

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

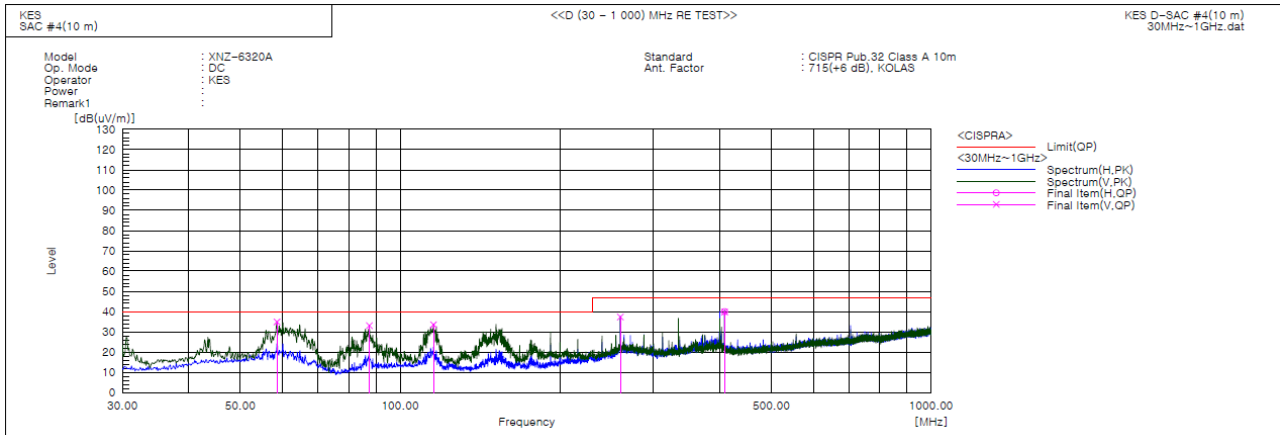
Report No.:

KES-EM-21T1202-R1

Page (29) of (54)

Radiated Electric Field Emissions(Below 1 GHz)

■ DC 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	58.615	V	56.7	-21.8	34.9	40.0	5.1	112.0	82.0	
2	87.473	V	58.2	-25.1	33.1	40.0	6.9	142.0	75.0	
3	115.603	V	56.7	-23.1	33.6	40.0	6.4	117.0	272.0	
4	259.890	V	56.2	-18.9	37.3	47.0	9.7	251.0	188.0	
5	408.421	H	54.1	-14.1	40.0	47.0	7.0	231.0	171.0	
6	408.433	V	53.9	-14.1	39.8	47.0	7.2	400.0	142.0	

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

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

The authenticity of the test report, contact kes@kes.co.kr



KES Co., Ltd.

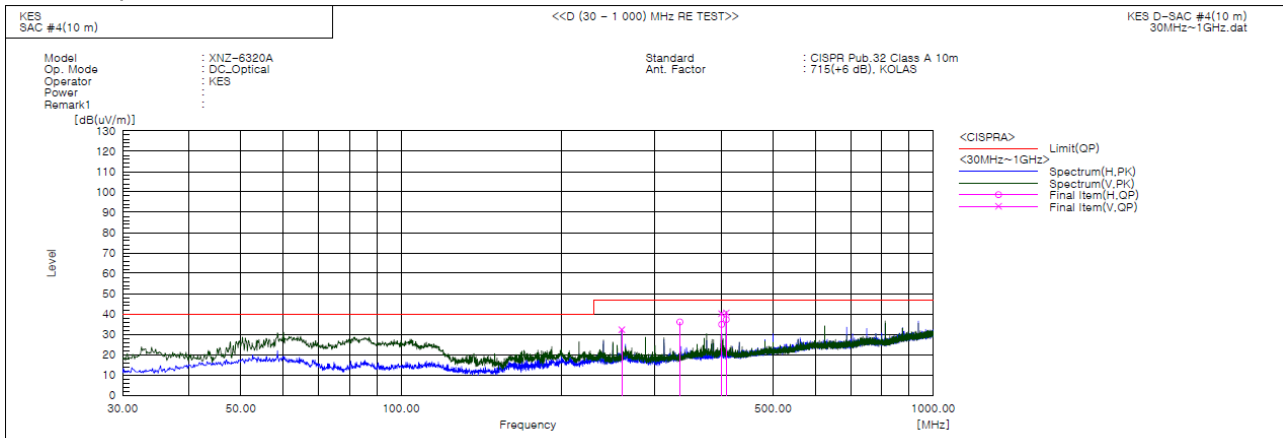
3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-EM-21T1202-R1

Page (30) of (54)

DC_Optical Mode



Final Result

No.	Frequency	(P)	Reading	c.f	Result	Limit	Margin	Height	Angle	Remark
	[MHz]		QP		QP	QP	QP			
			[dB(uV)]	[dB(1/m)]	[dB(uV/m)]	[dB(uV/m)]	[dB]	[cm]	[deg]	
1	259.890	V	51.2	-18.9	32.3	47.0	14.7	146.0	190.0	
2	334.095	H	51.8	-15.8	36.0	47.0	11.0	246.0	97.0	
3	400.055	V	54.2	-14.0	40.2	47.0	6.8	105.0	167.0	
4	400.258	H	48.8	-14.0	34.8	47.0	12.2	356.0	195.0	
5	408.421	V	54.4	-13.9	40.5	47.0	6.5	100.0	197.0	
6	408.434	H	51.1	-13.9	37.2	47.0	9.8	179.0	127.0	

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

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

The authenticity of the test report, contact kes@kes.co.kr



KES Co., Ltd.

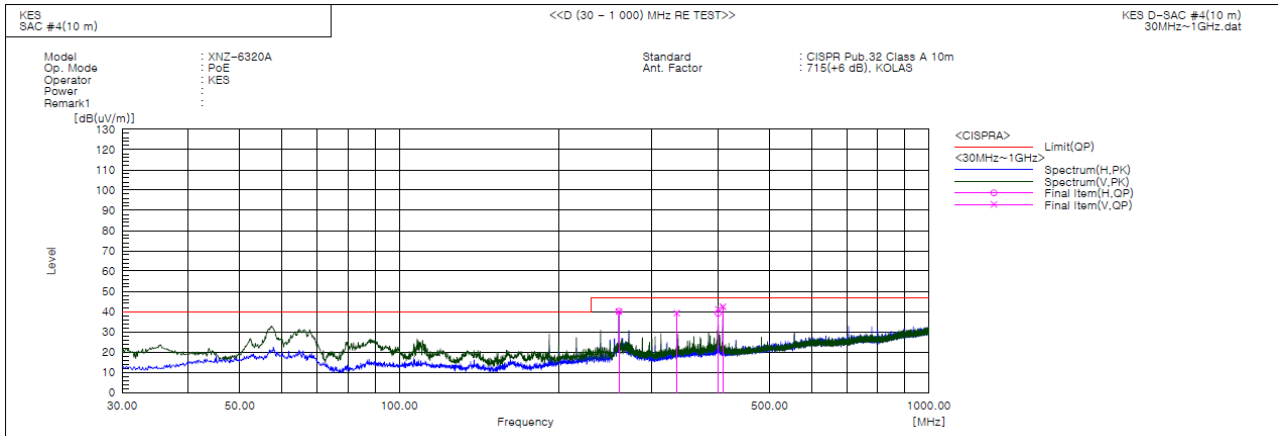
3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-EM-21T1202-R1

Page (31) of (54)

PoE Mode



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c.f [dB(1/m)]	Result QP [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	259.890	V	58.9	-18.9	40.0	47.0	7.0	109.0	324.0	
2	259.896	H	59.1	-18.9	40.2	47.0	6.8	199.0	39.0	
3	334.095	V	55.1	-15.8	39.3	47.0	7.7	112.0	340.0	
4	400.055	V	55.2	-14.0	41.2	47.0	5.8	100.0	166.0	
5	400.058	H	53.2	-14.0	39.2	47.0	7.8	221.0	257.0	
6	408.421	V	56.3	-13.9	42.4	47.0	4.6	116.0	158.0	

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



KES Co., Ltd.

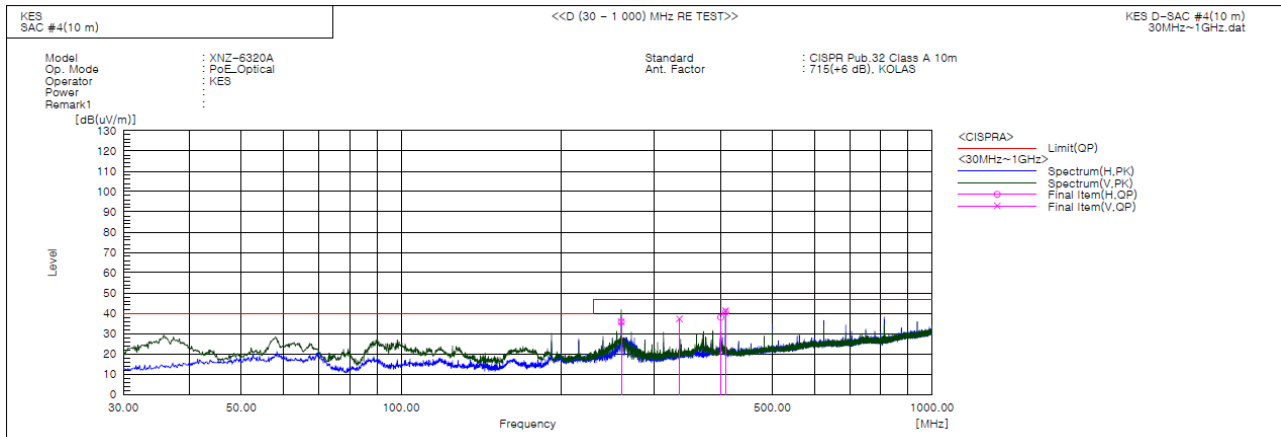
3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-EM-21T1202-R1

Page (32) of (54)

PoE_Optical Mode



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c.f [dB(1/m)]	Result QP [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	259.890	V	54.8	-18.9	35.9	47.0	11.1	400.0	261.0	
2	259.899	H	54.7	-18.9	35.8	47.0	11.2	231.0	19.0	
3	334.095	V	53.0	-15.8	37.2	47.0	9.8	109.0	347.0	
4	400.055	H	52.0	-14.0	38.0	47.0	9.0	221.0	263.0	
5	408.421	H	54.4	-13.9	40.5	47.0	6.5	190.0	120.0	
6	408.425	V	55.2	-13.9	41.3	47.0	5.7	100.0	151.0	

◆ Calculation

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

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

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

The authenticity of the test report, contact kes@kes.co.kr



KES Co., Ltd.

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

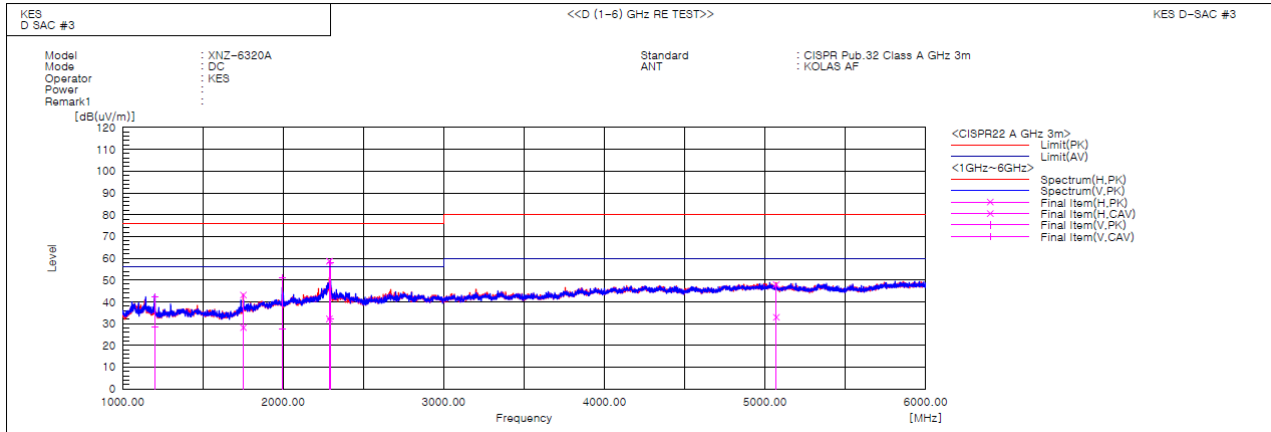
Report No.:

KES-EM-21T1202-R1

Page (33) of (54)

Radiated Electric Field Emissions(Above 1 GHz)

■ DC 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	1200.451	V	50.9	37.1	-8.5	42.4	28.6	76.0	56.0	33.6	27.4	100.0	6.2	
2	1751.220	H	46.8	31.9	-3.7	43.1	28.2	76.0	56.0	32.9	27.8	100.0	353.7	
3	1993.510	V	52.0	28.5	-1.1	50.9	27.4	76.0	56.0	25.1	28.6	100.0	165.6	
4	2287.000	H	58.8	32.4	-0.2	58.6	32.2	76.0	56.0	17.4	23.8	100.0	72.4	
5	2296.241	V	58.2	32.1	-0.1	58.1	32.0	76.0	56.0	17.9	24.0	100.0	57.7	
6	5070.000	H	39.2	24.2	8.7	47.9	32.9	80.0	60.0	32.1	27.1	100.0	39.0	

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

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

The authenticity of the test report, contact kes@kes.co.kr



KES Co., Ltd.

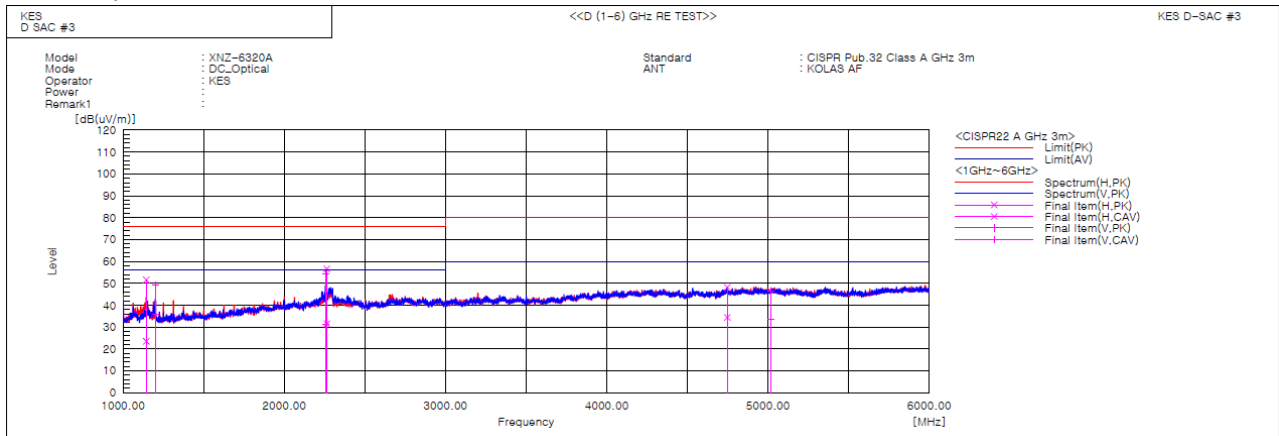
3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-EM-21T1202-R1

Page (34) of (54)

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	1144.241	H	60.5	32.4	-8.9	51.6	23.5	76.0	56.0	24.4	32.5	100.0	347.1	
2	1199.000	V	57.7	44.5	-8.5	49.2	36.0	76.0	56.0	26.8	20.0	100.0	349.7	
3	2255.050	V	54.4	31.5	-0.3	54.1	31.2	76.0	56.0	21.9	24.8	100.0	326.4	
4	2263.200	H	56.8	31.8	-0.3	56.5	31.5	76.0	56.0	19.5	24.5	100.0	53.3	
5	4747.500	H	40.4	26.7	7.7	48.1	34.4	80.0	60.0	31.9	25.6	100.0	63.7	
6	5019.000	V	37.8	24.8	8.8	46.6	33.6	80.0	60.0	33.4	26.4	100.0	330.1	

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

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

The authenticity of the test report, contact kes@kes.co.kr



KES Co., Ltd.

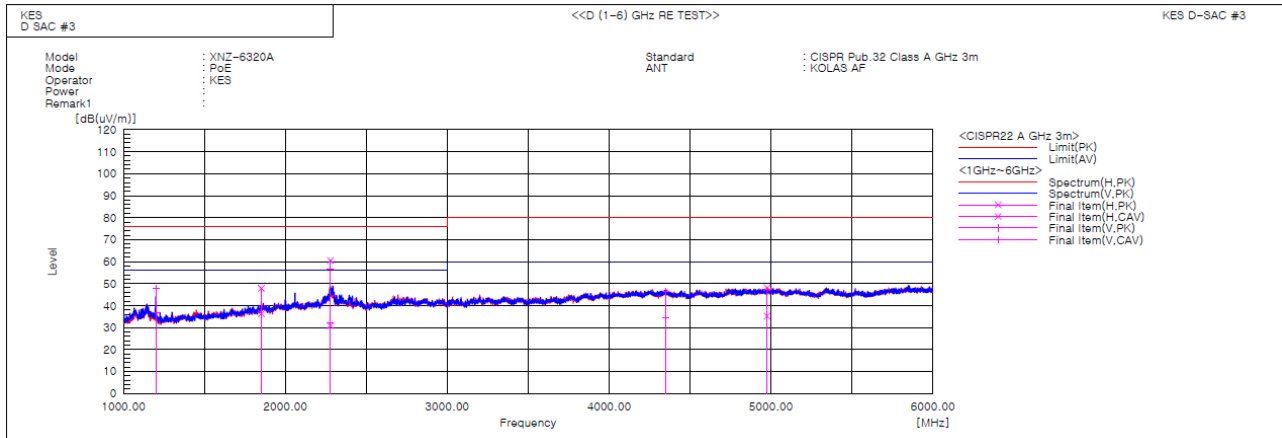
3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-EM-21T1202-R1

Page (35) of (54)

■ PoE Mode



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	1199.240	V	56.1	45.2	-8.5	47.6	36.7	76.0	56.0	28.4	19.3	100.0	25.9	
2	1851.050	H	50.3	38.6	-2.4	47.9	36.2	76.0	56.0	28.1	19.8	100.0	265.6	
3	2277.000	V	56.7	32.4	-0.2	56.5	32.2	76.0	56.0	19.5	23.8	100.0	329.9	
4	2278.031	H	60.7	31.1	-0.2	60.5	30.9	76.0	56.0	15.5	25.1	100.0	53.5	
5	4351.000	V	39.6	27.2	7.0	46.6	34.2	80.0	60.0	33.4	25.8	100.0	115.4	
6	4975.025	H	39.3	26.4	8.8	48.1	35.2	80.0	60.0	31.9	24.8	100.0	319.5	

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

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

The authenticity of the test report, contact kes@kes.co.kr



KES Co., Ltd.

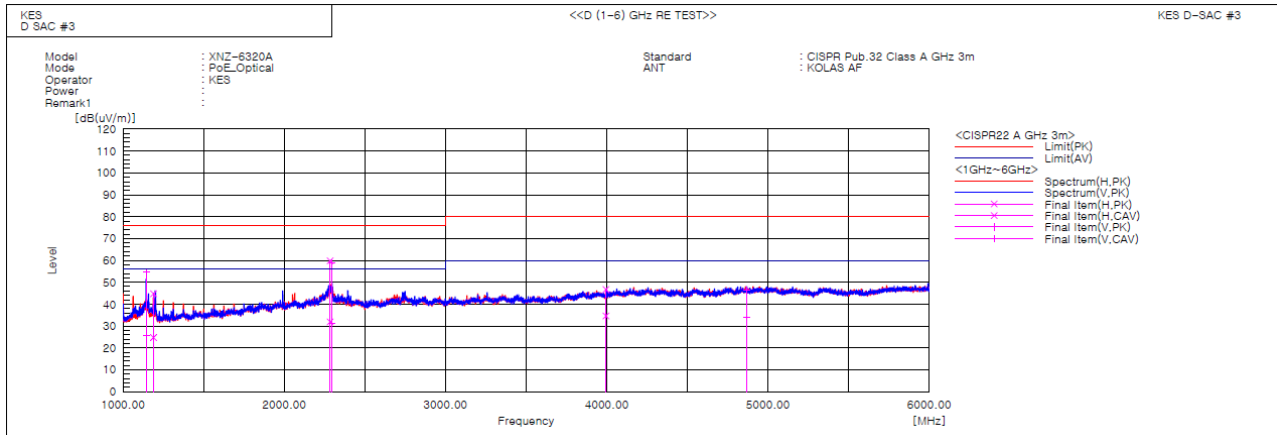
3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-EM-21T1202-R1

Page (36) of (54)

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	1143.005	V	63.7	34.9	-9.0	54.7	25.9	76.0	56.0	21.3	30.1	100.0	5.8	
2	1188.052	H	53.4	33.4	-8.6	44.8	24.8	76.0	56.0	31.2	31.2	100.0	354.1	
3	2284.056	H	60.0	32.1	-0.2	59.8	31.9	76.0	56.0	16.2	24.1	100.0	63.1	
4	2297.000	V	59.2	31.2	-0.1	59.1	31.1	76.0	56.0	16.9	24.9	100.0	300.8	
5	3994.214	H	40.9	28.7	5.9	46.8	34.6	80.0	60.0	33.2	25.4	100.0	354.9	
6	4869.000	V	38.0	25.6	8.4	46.4	34.0	80.0	60.0	33.6	26.0	100.0	357.8	

◆ Calculation

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

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

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

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

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

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

The authenticity of the test report, contact kes@kes.co.kr

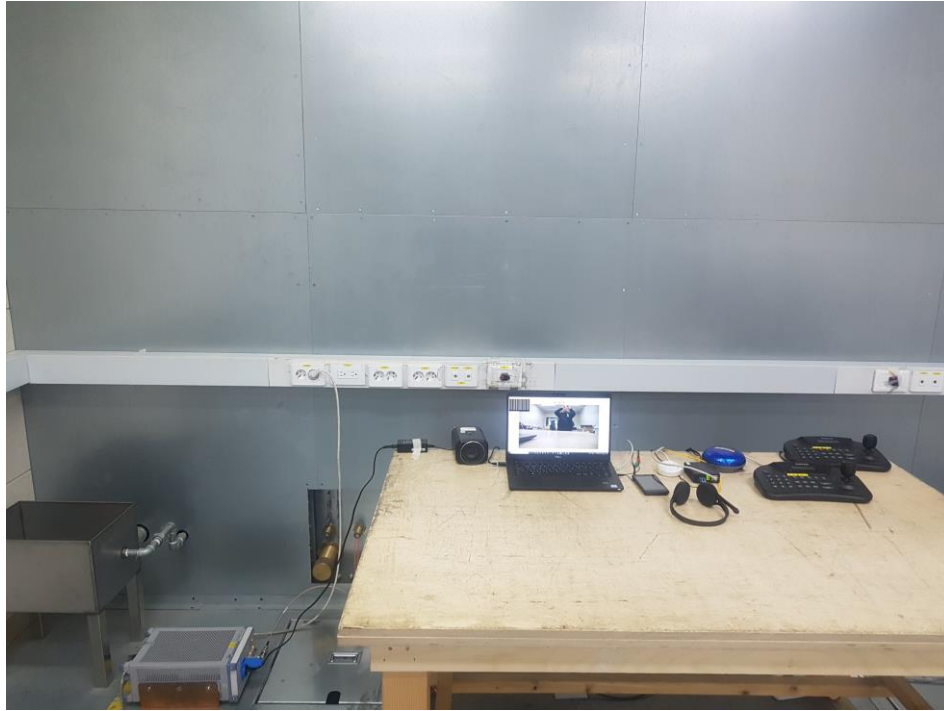
Test Setup Photos and Configuration

Conducted Emissions at Mains Power Ports

■ DC Mode



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

■ DC_Optical Mode

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

■ PoE_Optical Mode

Conducted Emissions at Telecommunication Ports

■ DC Mode



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

■ PoE Mode

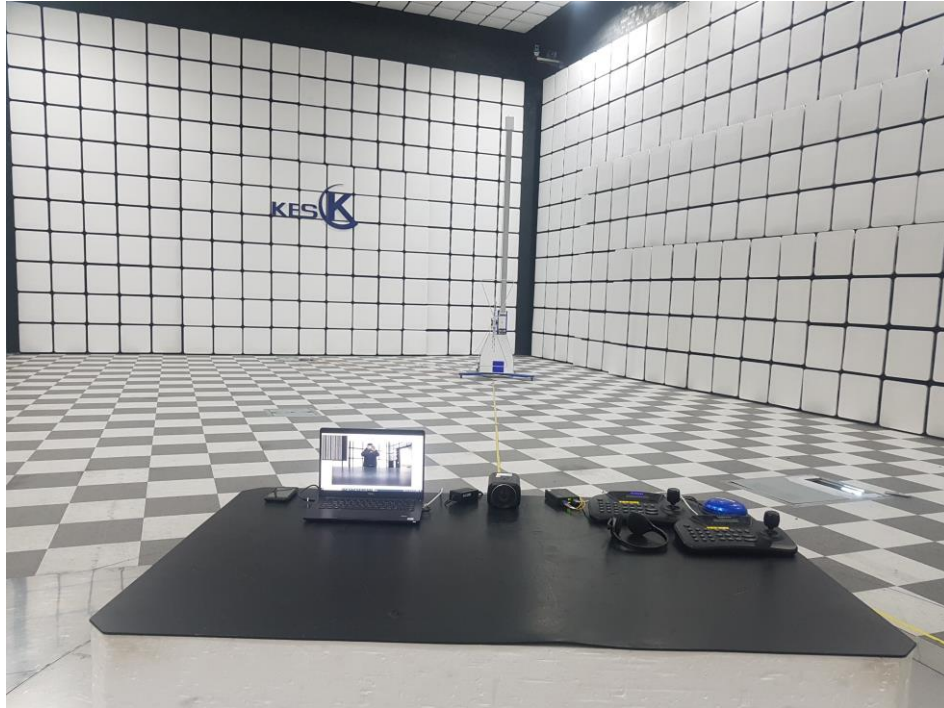


Radiated Electric Field Emissions(Below 1 GHz)

■ DC Mode



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

■ DC_Optical Mode

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

■ PoE Mode

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

■ PoE_Optical Mode

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

Radiated Electric Field Emissions(Above 1 GHz)

■ DC Mode



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

■ DC_Optical Mode

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

■ PoE Mode



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

■ PoE_Optical Mode

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

EUT External Photographs

(Top)



(Bottom)



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

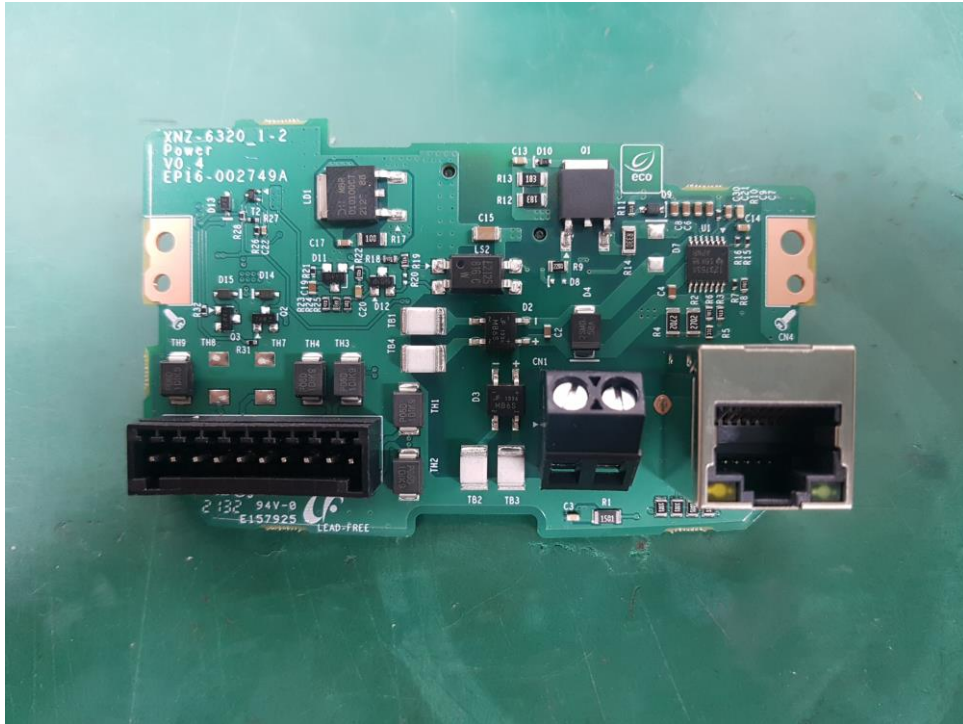
EUT Internal Photographs

(Internal View)

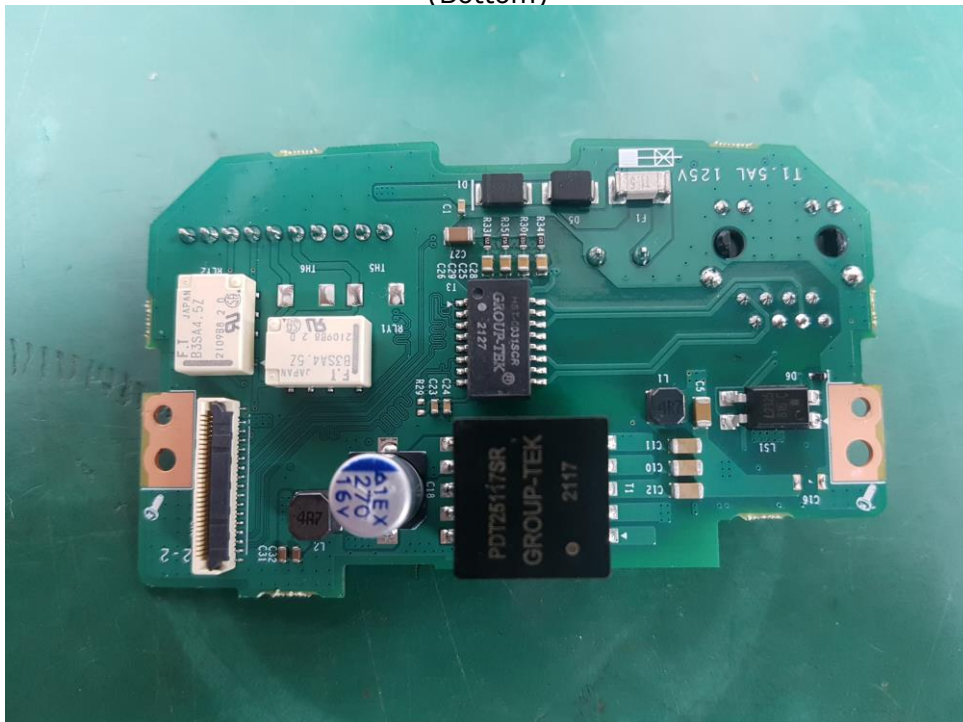


EUT Internal View – Board 1

(Top)



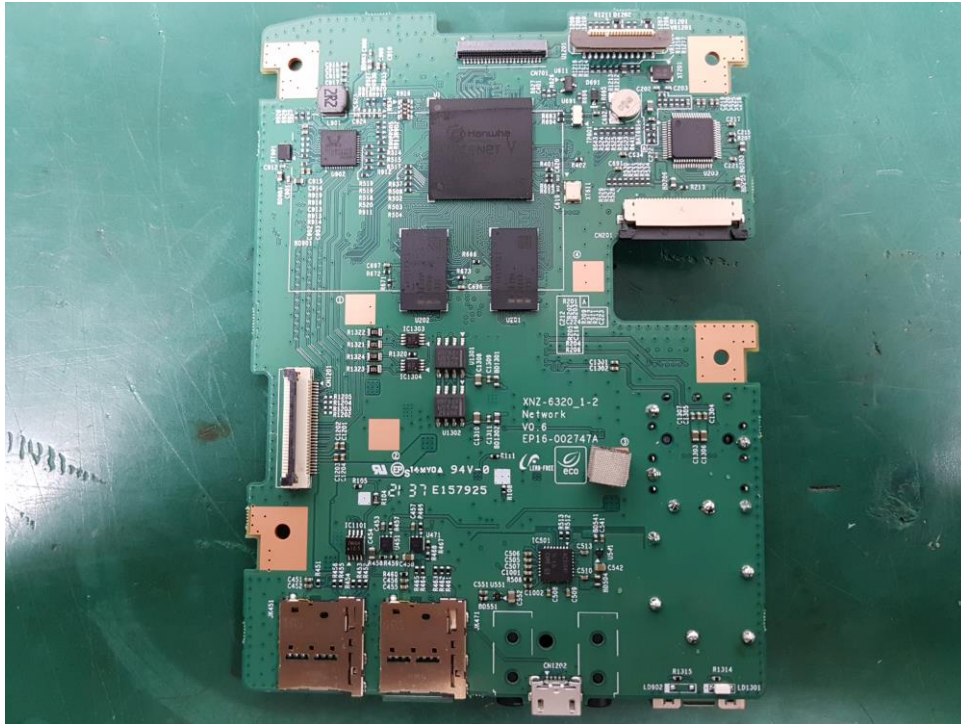
(Bottom)



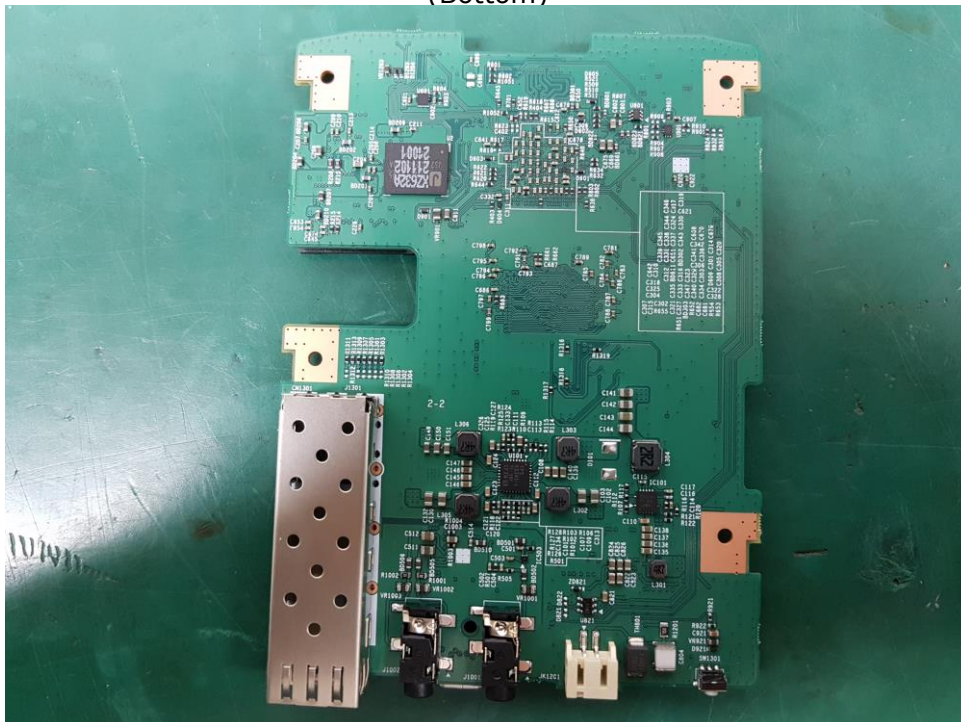
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact kes@kes.co.kr

EUT Internal View – Board 2

(Top)



(Bottom)



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



주식회사 케이이에스 (KES Co.,Ltd)