

EMC TEST REPORT For CE

Test Report No. : KES-E1-18T0013-R2

Date of Issue : May. 15, 2019

Product name : Network Camera

Model/Type No. : QNP-6230

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 : Dec. 19, 2017

Test date : Dec. 28, 2017 ~ Dec. 29, 2017

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

Tested by

Kang Hyeon, Kim
EMC Test Engineer

Reviewed by

Dong-Hun, Jang
EMC Technical Manager

This test report is not related to KOLAS.

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Test report No.:

KES-E1-18T0013-R2

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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Jan. 04, 2018	KES-E1-18T0013	Issued
Jun. 27, 2018	KES-E1-18T0013-R1	Re-issue due to manufacturer change
May. 15, 2019	KES-E1-18T0013-R2	Changed customer's address, factory addition, variant model addition and application standard due to customer request.

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1.0 General Product Description

Main Specifications of E.U.T are:

Video	QNP-6230P	
Imaging Device	1/2.8" 2.4M CMOS	
Total Pixels	1981(H) x 1288(V), 2.55M	
Effective Pixels	1944(H) x 1212(V), 2.35M	
Scanning System	Progressive	
Min. Illumination	Color : 0.2 Lux (1/30sec, F1.6) B/W : 0.01 Lux (1/30sec, F1.6)	
S / N Ratio	50dB	
Lens		
Focal Length (Zoom Ratio)	4.44 ~ 102.2mm(Optical 23X)	
Max. Aperture Ratio	F1.6 (Wide) / F3.6 (Tele)	
Angular Field of View	H : 61.8°(Wide) ~ 3.08°(Tele) / V : 36.2°(Wide) ~ 1.73°(Tele)	
Min. Object Distance	Wide 1.5m ,Tele 2m	
Focus Control	Auto / Manual / One shot AF	
Lens Type	DC Auto Iris	
Mount Type	Board-in type	
Pan/Tilt/Rotate		
Pan Range	360° Endless	
Pan Speed	Preset : 500°/sec, Manual : 0.024°/sec ~ 200°/sec	
Tilt Range	210°(-15° ~195°)	
Tilt Speed	Preset : 500°/sec, Manual : 0.024°/sec ~200°/sec	
Sequence	Preset (300 ea), Swing, Group (6 ea), Trace, Tour (1 ea), Auto Run, Schedule	
Preset Accuracy	±0.2°	
Azimuth	Yes (E/W/S/N/NE/NW/SE/SW)	
Auto Tracking	N/A	
Operational		
Camera Title	Off / On (Displayed up to 85 characters) - W/W : English/Numeric/Special Characters - China : English/Numeric/Special/Chinese Characters - Common : Multi-line (Max 5), Color (Grey/Green/Red/Blue/Black/White), Transparency, Auto Scale by Resolution	
Day & Night	Auto (ICR) / Color / B/W / Schedule	
Backlight Compensation	Off / BLC / HLC / WDR	

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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	QNP-6230	-	Hanwha Techwin (Tianjin) Co.,Ltd	E.U.T

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
PoE Adaptor	POE36U-1AT-R	-	PHIHONG	-
Notebook	LG15N54	410NZXE015458	LG	-
Notebook Adaptor	ADP-90WH B	84ZW19F1747	DELTA ELECTRONICS(JIANGSU) LTD.	-
Speaker	BR10000A CUVE	-	BEIJING EDIFIER HI-TECH GROUP.	-
MIC	CMK-303	-	CAMAC	-
Alarm	-	-	-	-
Controller	SPC-1010	-	SamSung Techwin Co.,Ltd.	-

1.6 External I/O Cabling

■ AC 24 V 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	U
	3.5 mm	Speaker	3.5 mm	1.6	U
	3.5 mm	MIC	3.5 mm	1.7	U
	2 Pin	Alarm	2 Pin	4.0	U
	RS-485 (3 Pin)	Controller	RS-485 (3 Pin)	3.5	U

* Unshielded=U, Shielded=S

■ 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	U
	3.5 mm	Speaker	3.5 mm	1.6	U
	3.5 mm	MIC	3.5 mm	1.7	U
	2 Pin	Alarm	2 Pin	4.0	U
	RS-485 (3 Pin)	Controller	RS-485 (3 Pin)	3.5	U
PoE Adaptor	RJ-45 (Data)	Notebook	RJ-45 (Data)	3.0	U

* Unshielded=U, Shielded=S

1.7 E.U.T Operating Mode(s)

Test Mode	operating
AC 24 V	E.U.T Monitoring, Ping Test
PoE	E.U.T Monitoring, Ping Test

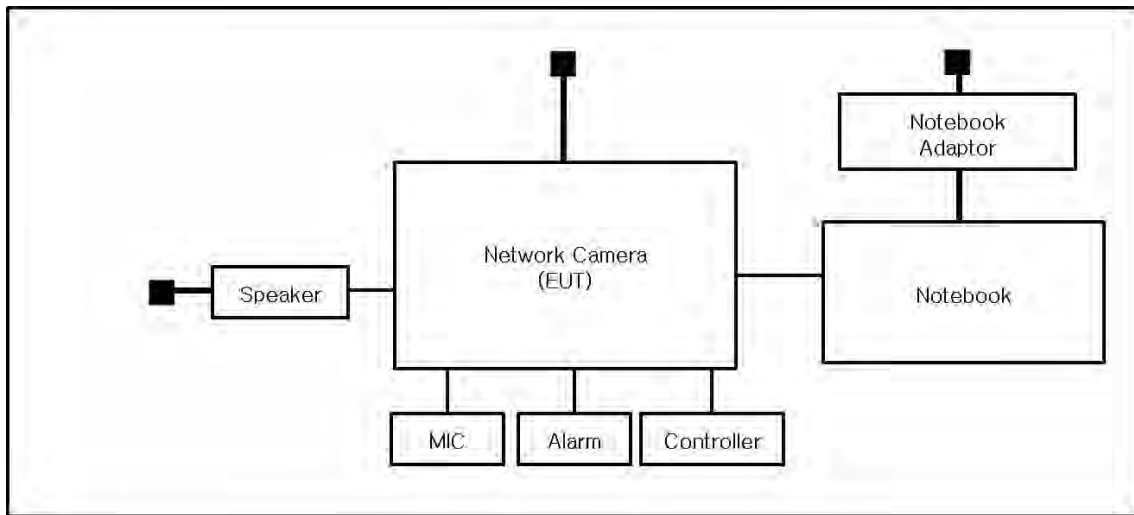
E.U.T Test operating S/W		
Name	Version	Manufacture Company
Webviewer	-	Hanwha Techwin Co., Ltd.

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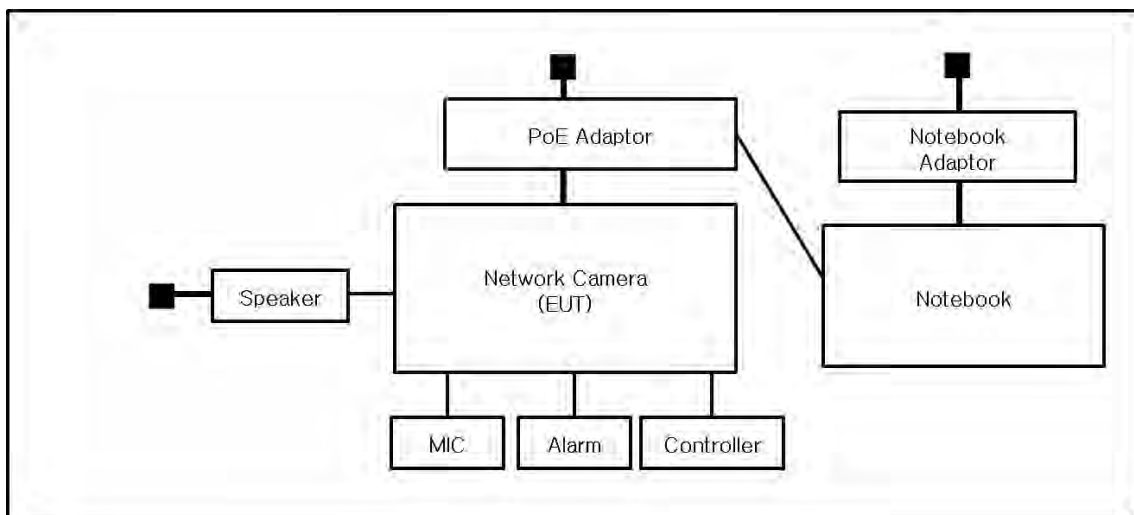
1.8 Configuration

■ AC Main
 □ DC Main

■ AC 24 V Mode



■ PoE Mode



1.9 Remarks when standards applied

N/A

1.10 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less.

1.11 Test Facility

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

1.12 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
KOREA	RRA	EMI (3 m & 10 m Semi-Anechoic 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-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, 10 m Open Area and Conducted test site to perform FCC Part 15/18 measurements.	 KR0100
Canada	ISED	3 m & 10 m Semi-Anechoic Chamber and Conducted test site	 23298-1
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-Anechoic 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

☐ Group 2

☐ Class A

☐ Class B

☐ EN 55014-1:2006 +A2:2011

☐ EN 55014-2:1997 +A2:2008

☐ EN 55015:2013

☐ EN 61547:2009

☒ EN 55032:2012/AC:2013

☒ Class A

☐ Class B

☐ EN 55024:2010 +A1:2015

☒ EN 50130-4:2011

☐ EN 61000-3-2:2014

☐ EN 61000-3-3:2013

☐ EN 61326-1:2013



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- | | | |
|---|----------------------------------|----------------------------------|
| ☐ 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 | | |

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2.1 Conducted Emissions at Mains Power Ports

Test Date

Dec. 28, 2017

Test Location

Electro wave Shieldroom #3

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	04, 27, 2018
☒	LISN	ENV216	R & S	101137	01, 11, 2018
☒	LISN	ENV216	R & S	101786	04, 27, 2018
☒	PULSE LIMITER	ESH3-Z2	R & S	101914	11, 27, 2018
☐	LISN	NNBM8124	SCHWARZBECK	8124-1002	08, 07, 2018
☐	LISN	NNBM8124	SCHWARZBECK	8124-1003	08, 07, 2018

Test Conditions

Temperature: 21,9 °C
Relative Humidity: 41,8 % 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

Dec. 28, 2017

Test Location

Electro wave Shieldroom #3

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

Test Conditions

Temperature: 21,9 °C

Relative Humidity: 41,8 % 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

Dec. 28, 2017

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, 18, 2018
☒	AMPLIFIER	SCU 01	R & S	100603	11, 27, 2018
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	716	11, 28, 2018

Test Conditions

Temperature: 20,9 °C

Relative Humidity: 42,3 % 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

Dec. 28, 2017

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, 07, 2018
☒	PREAMPLIFIER	8449B	AGILENT	3008A01967	05, 31, 2018
☐	ATTENUATOR	8491A	HP	32173	03, 24, 2018
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	05, 02, 2019

Test Conditions

Temperature: 22,3 °C

Relative Humidity: 43,0 % 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

N/A

Test Location

Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☐	EMI Test S/W	dpa.control	EM TEST	5.4.11.0	-
☐	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	08, 09, 2018
☐	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Relative Humidity: °C
 % 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

Remarks

N/A : Because the E.U.T power is PoE and AC 24 V, limits are not specified.

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

Dec. 29, 2017

Test Location

EMS-ESD: Electro wave Shieldroom #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	ESD SIMULATOR	ESS-2000	Noise Ken	ESS01Z0454	10, 11, 2018
☒	HCP	-	(주) 케이 이 에스	-	-
☒	VCP	-	(주) 케이 이 에스	-	-

Test Conditions

Temperature: 22,3 °C
Relative Humidity: 42,3 % R.H.
Atmospheric Pressure: 100,9 kPa



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Test Specifications

Discharge Factor: ≥ 1 s

Discharge Impedance: 330 ohm / 150 pF

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

Polarity: Positive and Negative

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

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

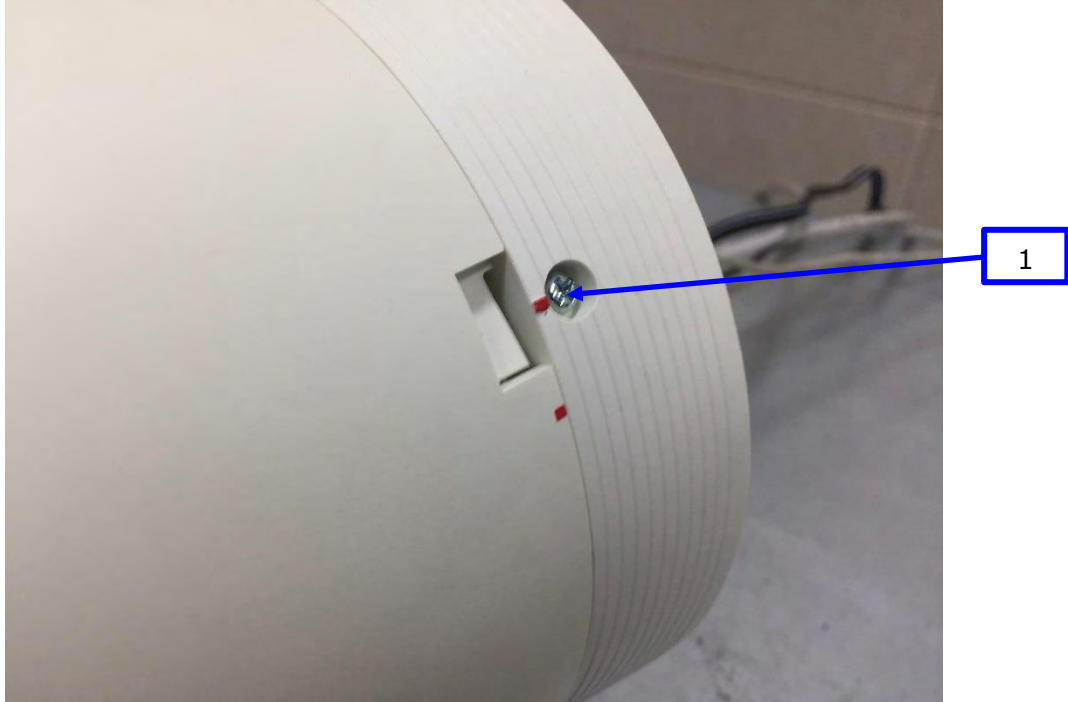
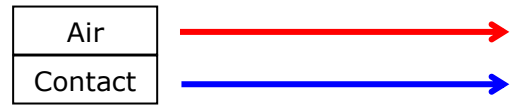
Notes: HCP: Horizontal coupling plane

VCP: Vertical coupling plane

Required Performance Criteria: ☒ Complied

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Location of Discharge:



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Test Data

■ AC 24 V, PoE Mode

Indirect Discharge

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

Direct Discharge

No.	Test Point	Discharge Method	Observations	Remarks
1	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

RemarksPASS Required Performance Criteria.

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3.2 Radiated Electric Field Immunity

Reference Standard

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

Test Date

Dec. 29, 2017

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, 07, 2018
☒	BROADBAND AMPLIFIER	BBA100	R & S	101239	08, 07, 2018
☒	BROADBAND AMPLIFIER	100S1G6M1	AR	579931	08, 07, 2018
☒	POWER METER	NRP2	R & S	103475	08, 07, 2018
☒	AVG POWER SENSOR	NRP-Z91	R & S	102526	08, 07, 2018
☒	AVG POWER SENSOR	NRP-Z91	R & S	102527	08, 07, 2018
☒	STACKED DOUBLE LOG-PER- ANTENNA	STPL9128 E	Schwarzbeck	9128ES-121	-
☒	DIRECTIONAL COUPLER	KYDC-D1070-DX40	KY TELECOM	KY150001	08, 07, 2018
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM, INC	781	05, 02, 2019

Test Conditions

Temperature: 21,7 °C
Relative Humidity: 42,0 % R.H.
Atmospheric Pressure: 100,8 kPa



Test Specifications

Antenna Polarization: Horizontal & vertical unless indicated otherwise

Antenna Distance: ☒ 3 m

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

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

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

Frequency step: ☒ 1 % step

Dwell Time: ☒ 1 s ☐ 3 s

of Sides Radiated: ☒ 4

Required Performance Criteria: ☒ Complied

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www.kes.co.kr

Test report No.:
KES-E1-18T0013-R2
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Test Data

■ AC 24 V, PoE Mode

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

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

Test Results

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

Remarks

PASS Required Performance Criteria.

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3.3 Electrical Fast Transients/Bursts

Reference Standard

EN 61000-4-4:2012

Test Date

Dec. 29, 2017

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: 22,3 °C
Relative Humidity: 42,3 % R.H.
Atmospheric Pressure: 100,9 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 kHz	☒ 100 kHz
Duration of Test Voltage:	☒ ≥ 1 min	
Required Performance Criteria:	☒ Complied	

Test Data

■ AC 24 V Mode

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

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

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

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

☒ Signal ports and telecommunication ports – Coupling Clamp used

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

■ PoE Mode

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

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

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

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

☒ Signal ports and telecommunication ports – Coupling Clamp used

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

PASS Required Performance Criteria.



3.4 Surge Transients

Reference Standard

EN 61000-4-5:2014

Test Date

Dec. 29, 2017

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: 22,3 °C
Relative Humidity: 42,9 % R.H.
Atmospheric Pressure: 100,9 kPa



Test Specifications

AC Power Lines

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

Surge Amplitude :

Common Mode

☐ (0,5 / 1,0 / 2,0) kV

Differential Mode

☒ (0,5 / 1,0) kV

Number of Surges:

☒ 5 surges per angle

Angle:

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

Polarity:

☒ Positive & Negative

Repetition Rate:

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

Required Performance Criteria: ☒ Complied

Other supply / Signal Lines

Source Impedance:

42 ohm for common Mode

Surge Amplitude:

Common Mode

☒ (0,5 / 1,0) kV

Number of Surges:

☒ 5 Surges

Polarity:

☒ Positive & Negative

Repetition Rate:

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

Required Performance Criteria: ☒ Complied



Test Data

■ AC 24 V Mode

☒ Line to Line – Differential Mode

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

☐ Line to Earth – Common Mode

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

Signal Lines

☒ Line to Earth – Common Mode

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

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■ PoE 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
Alarm	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**PASS Required Performance Criteria.

3.5 Conducted Disturbance

Reference Standard

EN 61000-4-6:2014

Test Date

Dec. 29, 2017

Test Location

EMS-CS: Electro wave Shieldroom #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	icd.control	EM TEST	5.3.11	-
☒	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 T800	TESEQ	42800	11, 27, 2018
☒	EM CLAMP	KEMZ 801A	TESEQ	44099	11, 28, 2018

Test Conditions

Temperature: 22,0 °C
Relative Humidity: 40,3 % R.H.
Atmospheric Pressure: 100,9 kPa

Test Specifications

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

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

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

Frequency step: ☒ 1 % step

Dwell Time: ☒ 1 s ☐ 3 s

Required Performance Criteria: ☒ Complied

Test Data

■ AC 24 V Mode

☐ Input a.c. power ports

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

☐ Input d.c. power ports

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

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
RJ-45	CDN T8RJ45	Complied
Alarm	CDN T8RJ45	Complied
controller	CDN T8RJ45	Complied

■ PoE Mode

☐ Input a.c. power ports

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

☐ Input d.c. power ports

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

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
RJ-45	CDN T8RJ45	Complied
Alarm	CDN T8RJ45	Complied
controller	CDN T8RJ45	Complied

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

Observations:

Complied – No degradation of function

Test Results

☒ PASS Required Performance Criteria

☐ NOT PASS Required Performance Criteria

Remarks

PASS Required Performance Criteria.



3.6 Voltage Dips and Short Interruptions

Reference Standard

EN 61000-4-11:2004

Test Date

Dec. 29, 2017

Test Location

EMS-Voltage dip: 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

Test Conditions

Temperature: 22,3 °C
Relative Humidity: 42,3 % R.H.
Atmospheric Pressure: 100,9 kPa

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Test report No.:

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Test Specifications & Observations/Remarks

(Test Voltage : V)

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

- Voltage variations

☒ Unom + 10 %	☒ 253.0 V (ac)	<u>Complied</u>
☒ Unom - 15 %	☒ 195.5 V (ac)	<u>Complied</u>

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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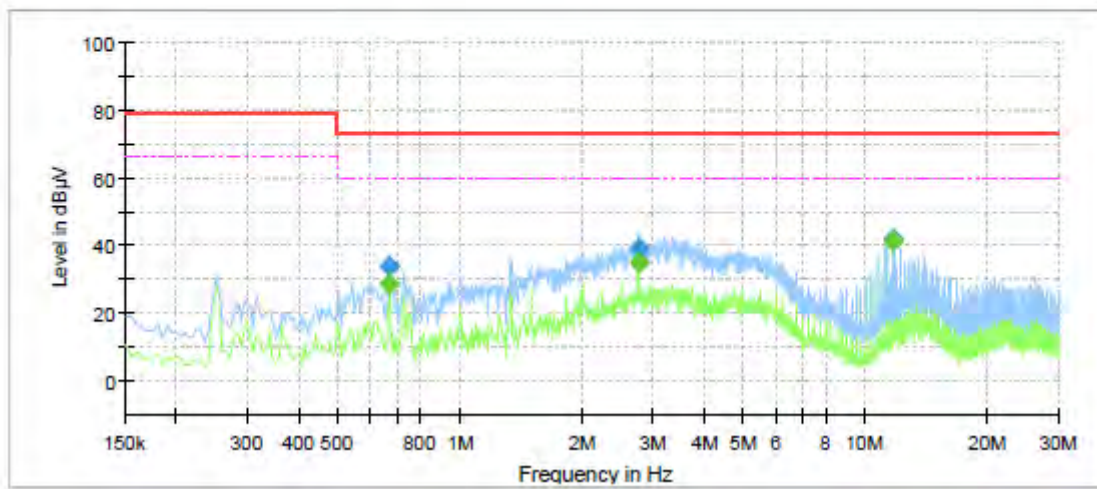
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

[HOT]

Common Information

Test Description: Conducted Emission
Model No.: QNP-6230P
Mode
Operator Name: KES



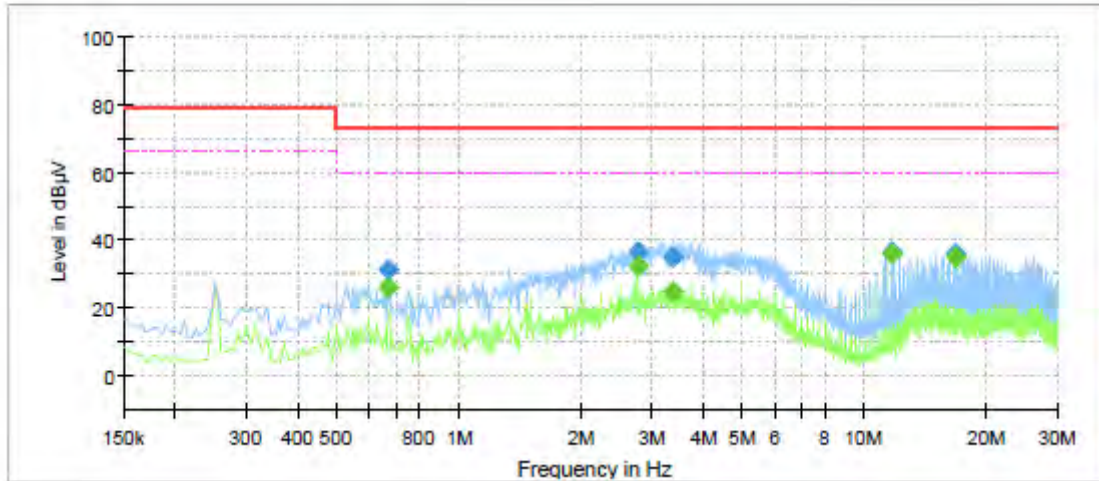
Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.670000	---	28.58	60.00	31.42	1000.0	9.000	L1	19.9
0.670000	33.81	---	73.00	39.19	1000.0	9.000	L1	19.9
2.760000	---	34.70	60.00	25.30	1000.0	9.000	L1	20.2
2.760000	39.09	---	73.00	33.91	1000.0	9.000	L1	20.2
11.785000	---	41.52	60.00	18.48	1000.0	9.000	L1	20.2
11.785000	42.01	---	73.00	30.99	1000.0	9.000	L1	20.2

[NEUTRAL]

Common Information

Test Description: Conducted Emission
Model No.: QNP-6230P
Mode
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.670000	---	26.17	60.00	33.83	1000.0	9.000	N	19.9
0.670000	31.23	---	73.00	41.77	1000.0	9.000	N	19.9
2.760000	---	32.21	60.00	27.79	1000.0	9.000	N	20.2
2.760000	36.60	---	73.00	36.40	1000.0	9.000	N	20.2
3.360000	---	25.06	60.00	34.94	1000.0	9.000	N	20.1
3.360000	34.85	---	73.00	38.15	1000.0	9.000	N	20.1
11.785000	---	35.90	60.00	24.10	1000.0	9.000	N	20.2
11.785000	36.42	---	73.00	36.58	1000.0	9.000	N	20.2
16.800000	---	34.76	60.00	25.24	1000.0	9.000	N	20.2
16.800000	35.82	---	73.00	37.18	1000.0	9.000	N	20.2

◆ 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))

Conducted Emissions at Telecommunication Ports

■ AC 24 V Mode

[10 Mbps]

Common Information

Test Description:

Model No.:

Mode

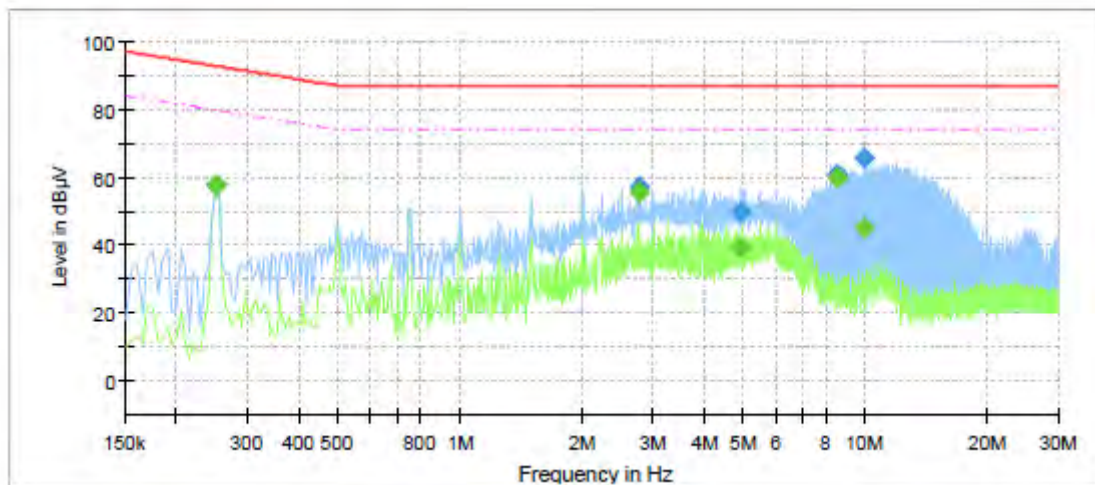
Operator Name:

Telecommunication Emission

QNP-6230P

AC 10

KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.250000	---	57.65	79.76	22.11	1000.0	9.000	Single Line	19.9
0.250000	57.61	---	92.76	35.15	1000.0	9.000	Single Line	19.9
2.760000	---	55.81	74.00	18.19	1000.0	9.000	Single Line	20.2
2.760000	57.00	---	87.00	30.00	1000.0	9.000	Single Line	20.2
4.950000	---	39.29	74.00	34.71	1000.0	9.000	Single Line	19.8
4.950000	49.56	---	87.00	37.44	1000.0	9.000	Single Line	19.8
8.525000	---	59.63	74.00	14.37	1000.0	9.000	Single Line	19.9
8.525000	61.01	---	87.00	25.99	1000.0	9.000	Single Line	19.9
10.000000	---	44.93	74.00	29.07	1000.0	9.000	Single Line	20.1
10.000000	65.42	---	87.00	21.58	1000.0	9.000	Single Line	20.1

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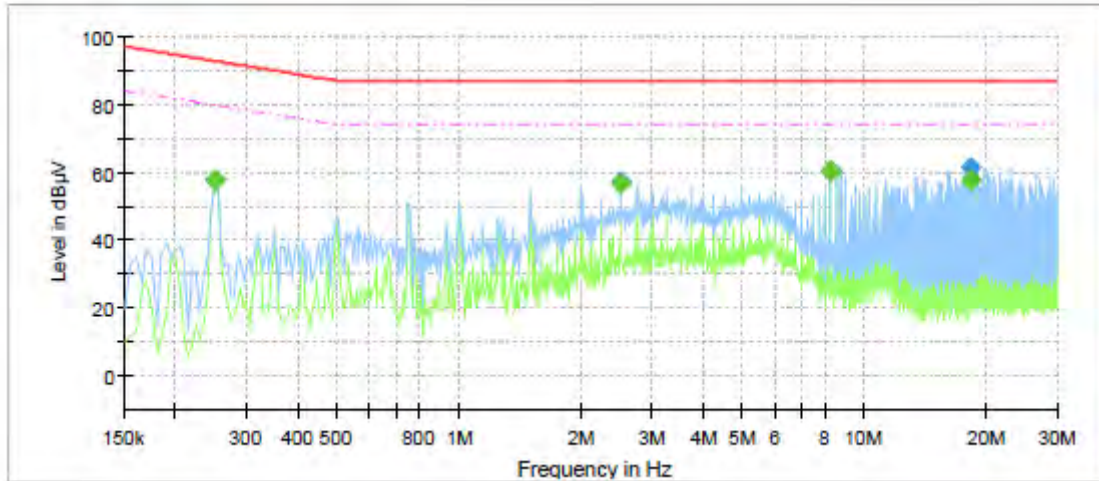
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[100 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	QNP-6230P
Mode	AC 100
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.250000	---	57.82	79.76	21.94	1000.0	9.000	Single Line	19.9
0.250000	57.77	---	92.76	34.99	1000.0	9.000	Single Line	19.9
2.510000	---	56.42	74.00	17.58	1000.0	9.000	Single Line	20.2
2.510000	57.11	---	87.00	29.89	1000.0	9.000	Single Line	20.2
8.275000	---	60.36	74.00	13.64	1000.0	9.000	Single Line	19.8
8.275000	60.59	---	87.00	26.41	1000.0	9.000	Single Line	19.8
18.305000	---	57.73	74.00	16.27	1000.0	9.000	Single Line	20.3
18.305000	61.31	---	87.00	25.69	1000.0	9.000	Single Line	20.3

◆ 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))

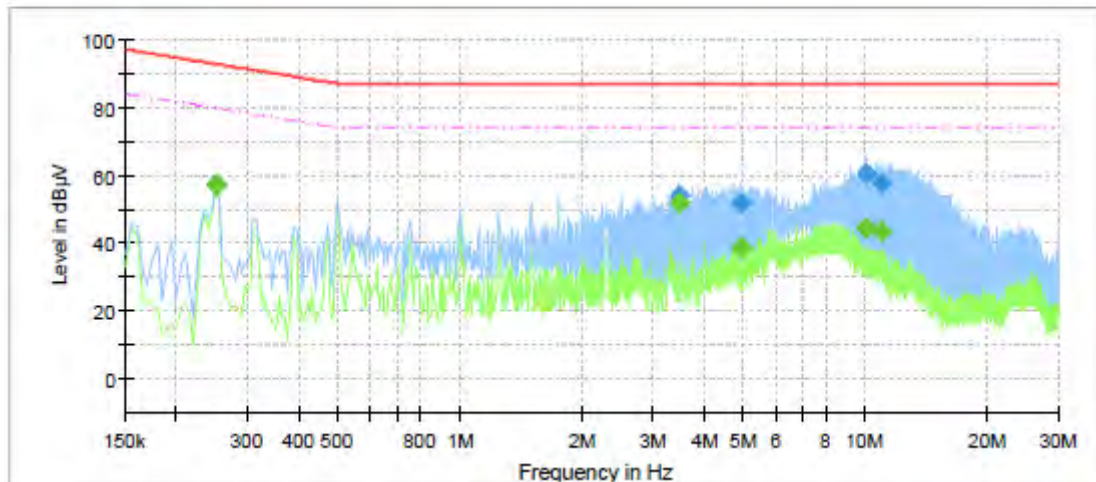
■ PoE Mode

[10 Mbps]

Common Information

Test Description:
Model No.:
Mode
Operator Name:

Telecommunication Emission
QNP-6230P
POE 10
KES



Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.250000	---	57.20	79.76	22.56	1000.0	9.000	Single Line	19.9
0.250000	57.19	---	92.76	35.57	1000.0	9.000	Single Line	19.9
3.505000	---	51.81	74.00	22.19	1000.0	9.000	Single Line	20.0
3.505000	54.13	---	87.00	32.87	1000.0	9.000	Single Line	20.0
4.955000	---	38.58	74.00	35.42	1000.0	9.000	Single Line	19.8
4.955000	51.81	---	87.00	35.19	1000.0	9.000	Single Line	19.8
10.010000	---	44.60	74.00	29.40	1000.0	9.000	Single Line	20.1
10.010000	60.46	---	87.00	26.54	1000.0	9.000	Single Line	20.1
11.010000	---	43.39	74.00	30.61	1000.0	9.000	Single Line	20.1
11.010000	57.49	---	87.00	29.51	1000.0	9.000	Single Line	20.1

[100 Mbps]

Common Information

Test Description:

Model No.:

Mode

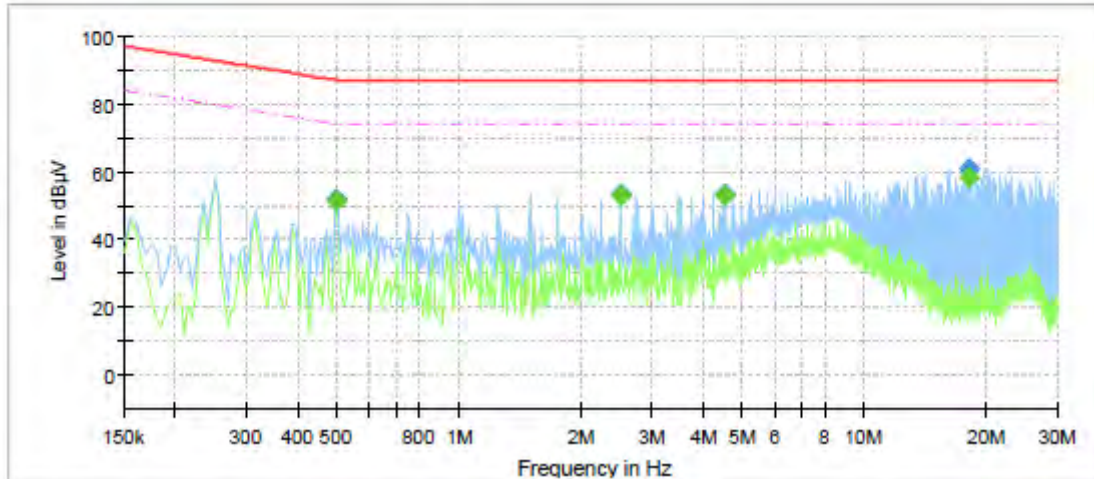
Operator Name:

Telecommunication Emission

QNP-6230P

POE 100

KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.500000	---	51.24	74.00	22.76	1000.0	9.000	Single Line	20.0
0.500000	51.81	---	87.00	35.19	1000.0	9.000	Single Line	20.0
2.505000	---	52.77	74.00	21.23	1000.0	9.000	Single Line	20.2
2.505000	53.26	---	87.00	33.74	1000.0	9.000	Single Line	20.2
4.510000	---	52.86	74.00	21.14	1000.0	9.000	Single Line	19.9
4.510000	53.61	---	87.00	33.39	1000.0	9.000	Single Line	19.9
18.245000	---	58.11	74.00	15.89	1000.0	9.000	Single Line	20.3
18.245000	60.92	---	87.00	26.08	1000.0	9.000	Single Line	20.3

◆ 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 (ISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))



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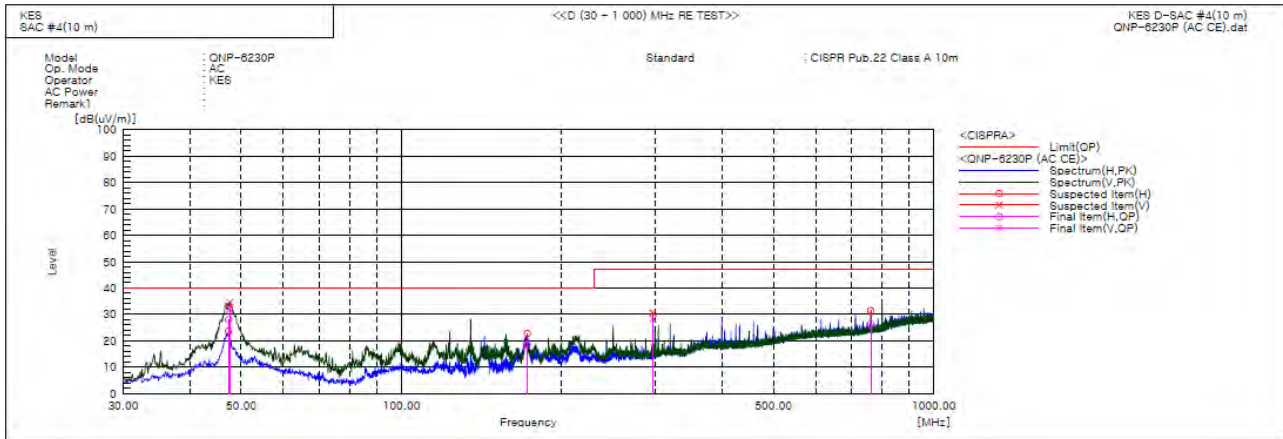
Test report No.:

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Radiated Electric Field Emissions(Below 1 GHz)

■ AC 24 V 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	47.339	H	55.9	-27.9	28.0	40.0	12.0	400.0	15.0	
2	172.469	H	48.7	-30.3	18.4	40.0	21.6	400.0	174.0	
3	761.865	H	39.2	-12.9	26.3	47.0	20.7	100.0	109.0	
4	47.581	V	59.8	-27.9	31.9	40.0	8.1	150.0	40.0	
5	296.993	V	52.2	-24.0	28.2	47.0	18.8	100.0	188.0	

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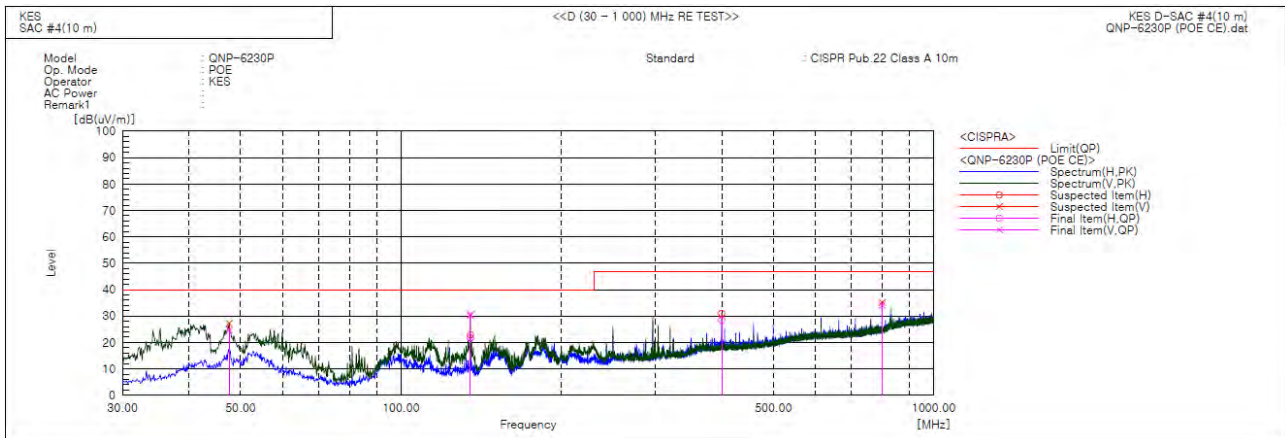
3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
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Test report No.:

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■ PoE 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	135.003	H	53.7	-31.9	21.8	40.0	18.2	400.0	315.0	
2	400.055	H	48.9	-20.4	28.5	47.0	18.5	200.0	119.0	
3	47.581	V	52.6	-27.9	24.7	40.0	15.3	150.0	346.0	
4	135.003	V	62.5	-31.9	30.6	40.0	9.4	100.0	284.0	
5	800.059	V	46.6	-12.5	34.1	47.0	12.9	150.0	191.0	

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

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

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

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

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



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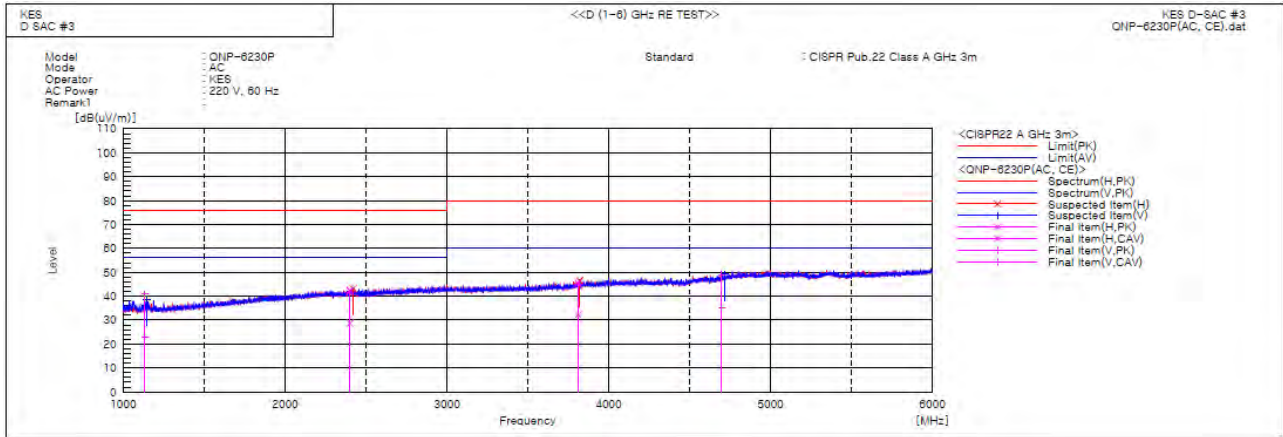
Test report No.:

KES-E1-18T0013-R2

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Radiated Electric Field Emissions(Above 1 GHz)

■ AC 24 V 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	1133.173	V	49.8	32.1	-9.0	40.8	23.1	76.0	56.0	35.2	32.9	100.0	199.5	
2	2401.924	H	42.1	28.5	0.2	42.3	28.7	76.0	56.0	33.7	27.3	100.0	40.3	
3	3810.622	H	40.5	27.2	5.0	45.5	32.2	80.0	60.0	34.5	27.8	100.0	234.1	
4	4697.264	V	40.1	26.7	8.7	48.8	35.4	80.0	60.0	31.2	24.6	100.0	172.2	

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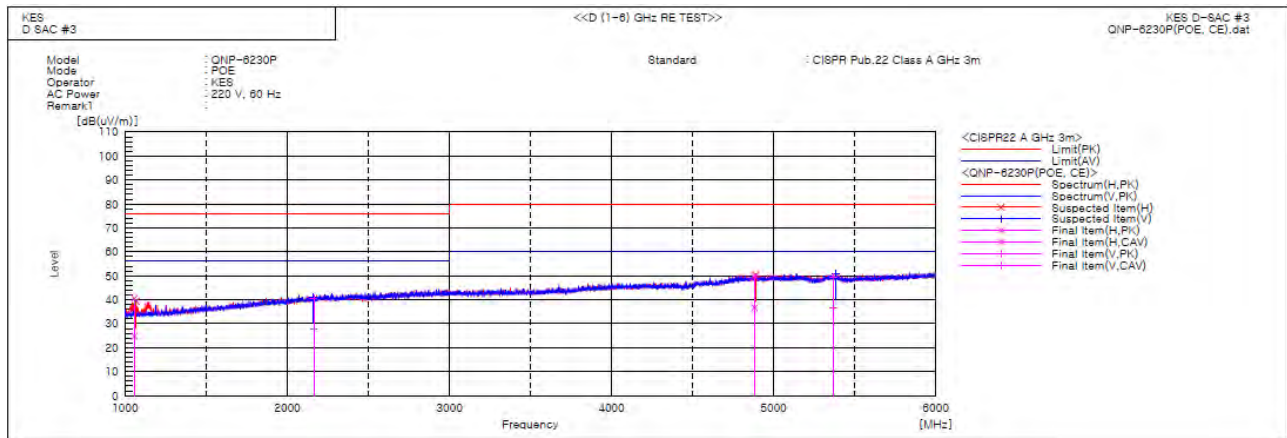
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■ PoE Mode



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	1056.932	H	50.2	34.4	-9.6	40.6	24.8	76.0	56.0	35.4	31.2	100.0	189.2	
2	2164.429	V	41.5	28.6	-0.8	40.7	27.8	76.0	56.0	35.3	28.2	100.0	171.4	
3	4883.231	H	39.6	26.6	10.1	49.7	36.7	80.0	60.0	30.3	23.3	100.0	342.5	
4	5368.903	V	39.2	26.4	10.3	49.5	36.7	80.0	60.0	30.5	23.3	100.0	186.4	

◆ Calculation

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

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

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

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

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Test Data - Voltage Fluctuations

Maximum Flicker results

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

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Test Setup Photos and Configuration

Conducted Voltage Emissions



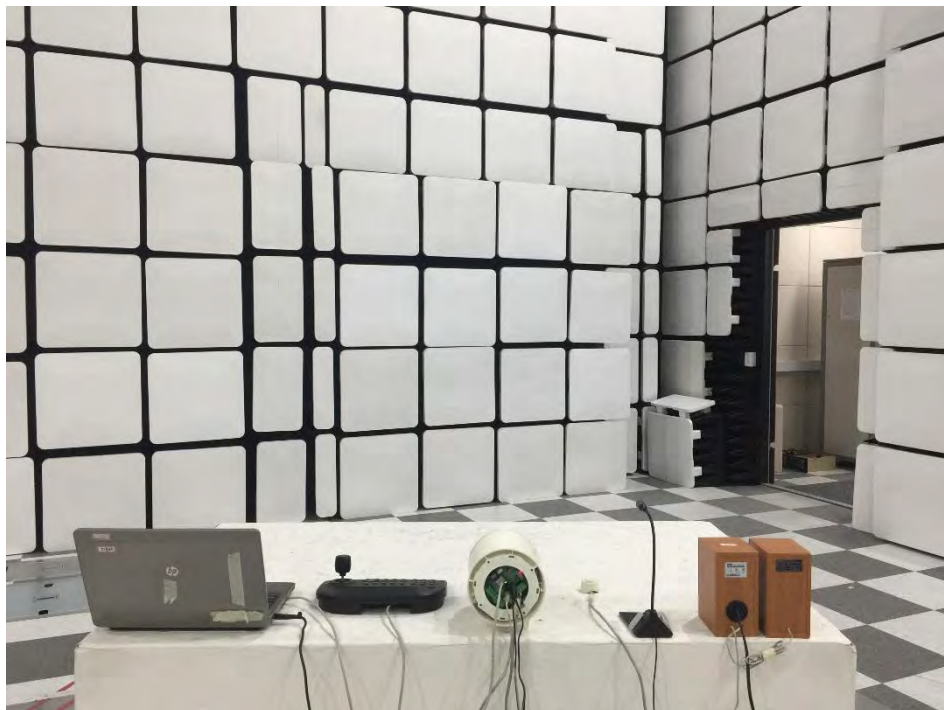
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Conducted Telecommunication Emissions



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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

N/A

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Electrostatic Discharge



Radiated Electric Field Immunity



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Electrical Fast Transients/Bursts



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Surge Transients



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Conducted Disturbance



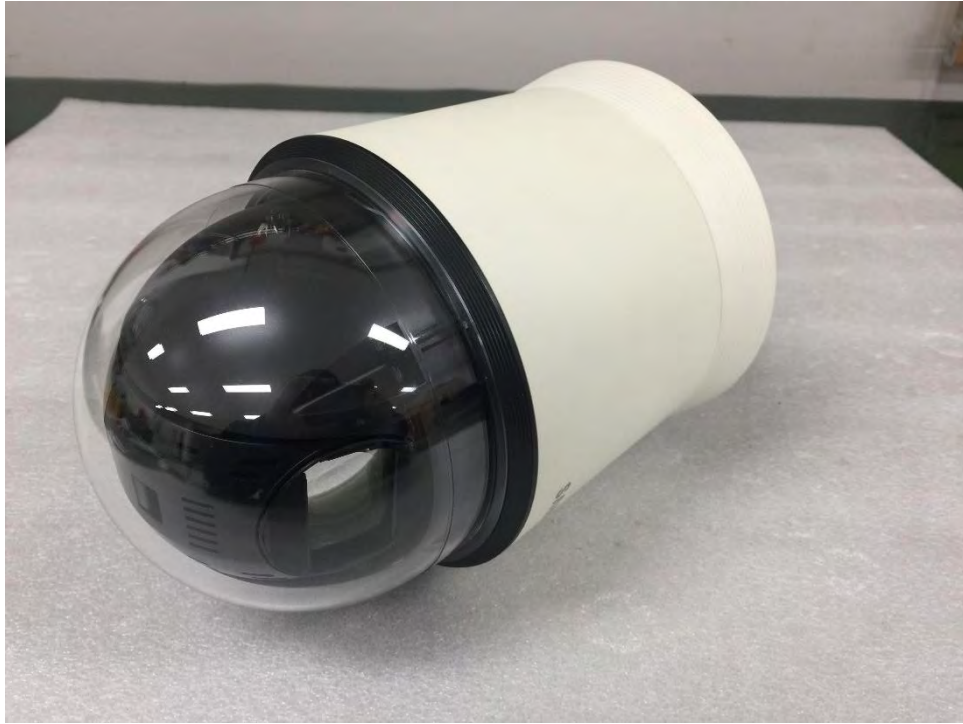
Voltage Dips and Short Interruptions



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EUT External Photographs

(Top)



(Bottom)



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EUT Internal Photographs

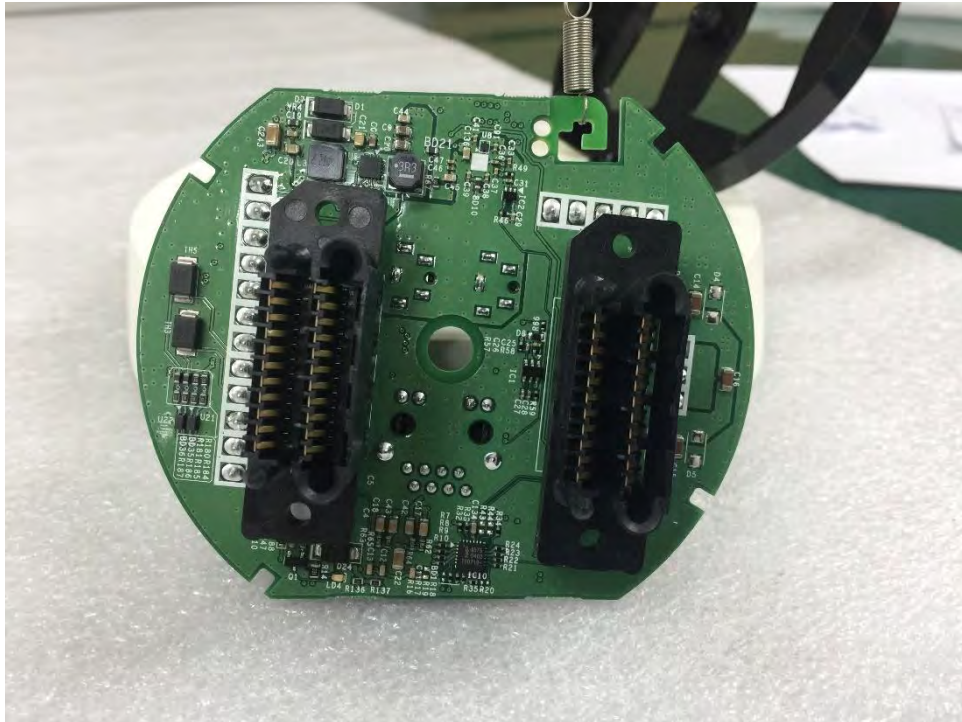
(Internal View)



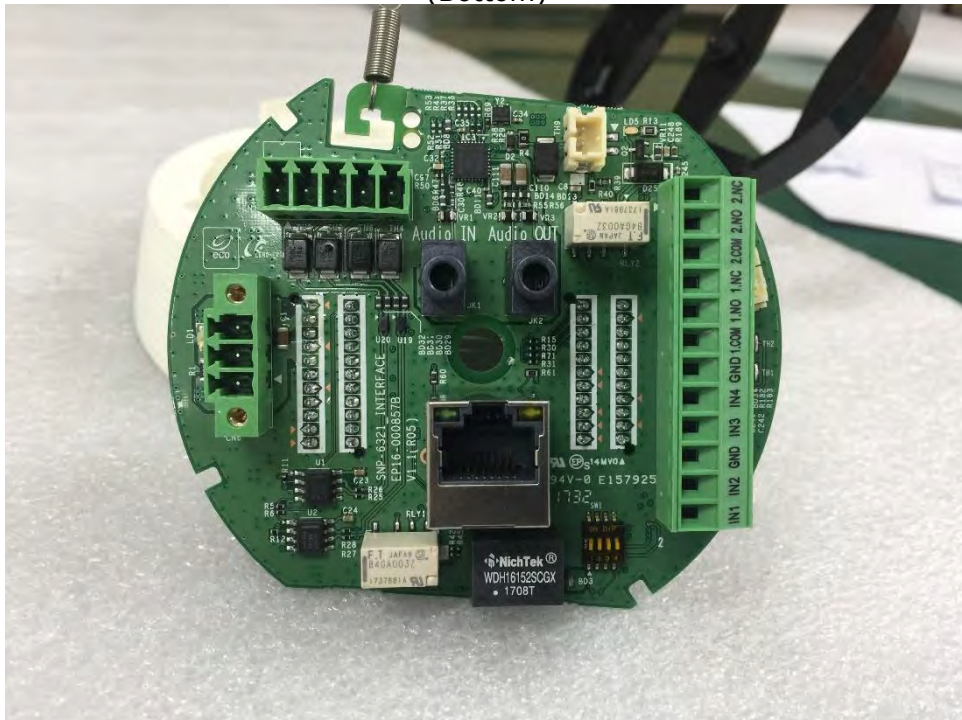
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EUT Internal View – board 1

(Top)



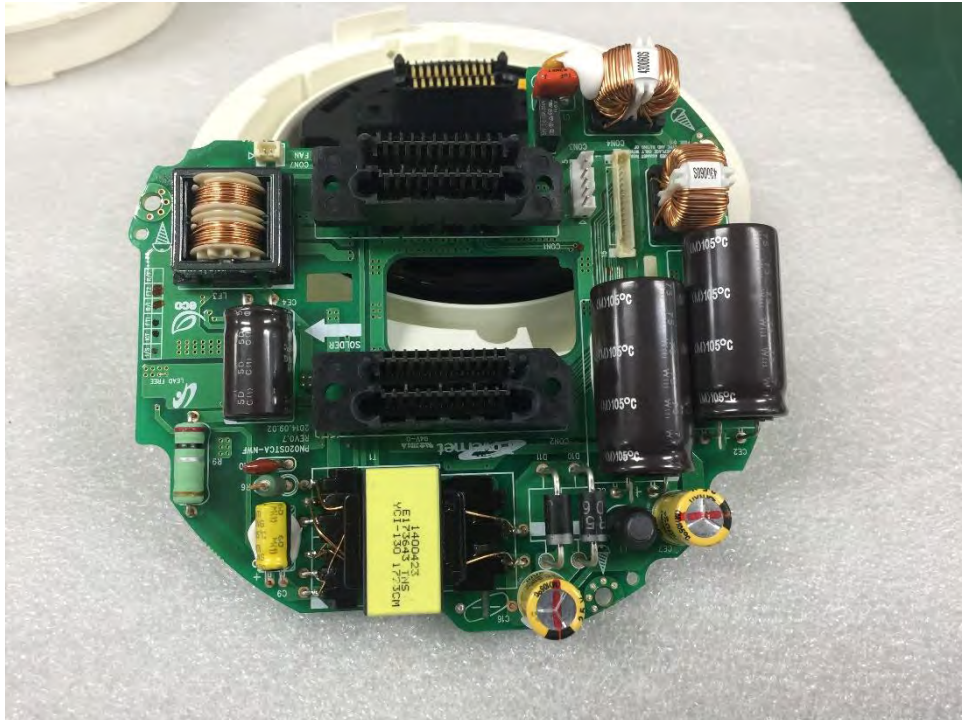
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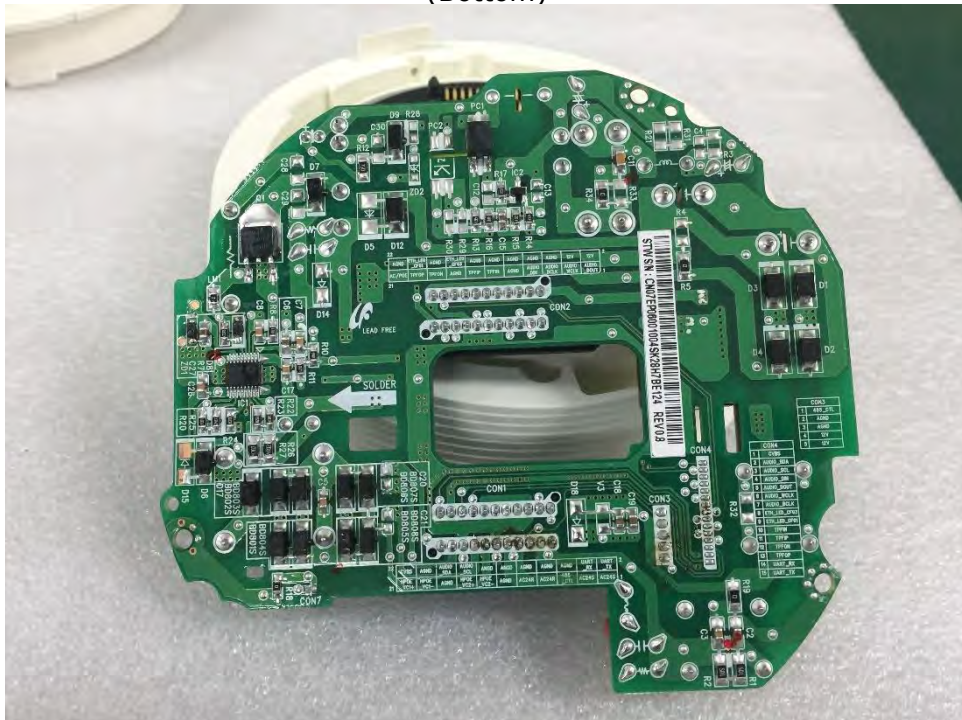
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EUT Internal View – board 2

(Top)



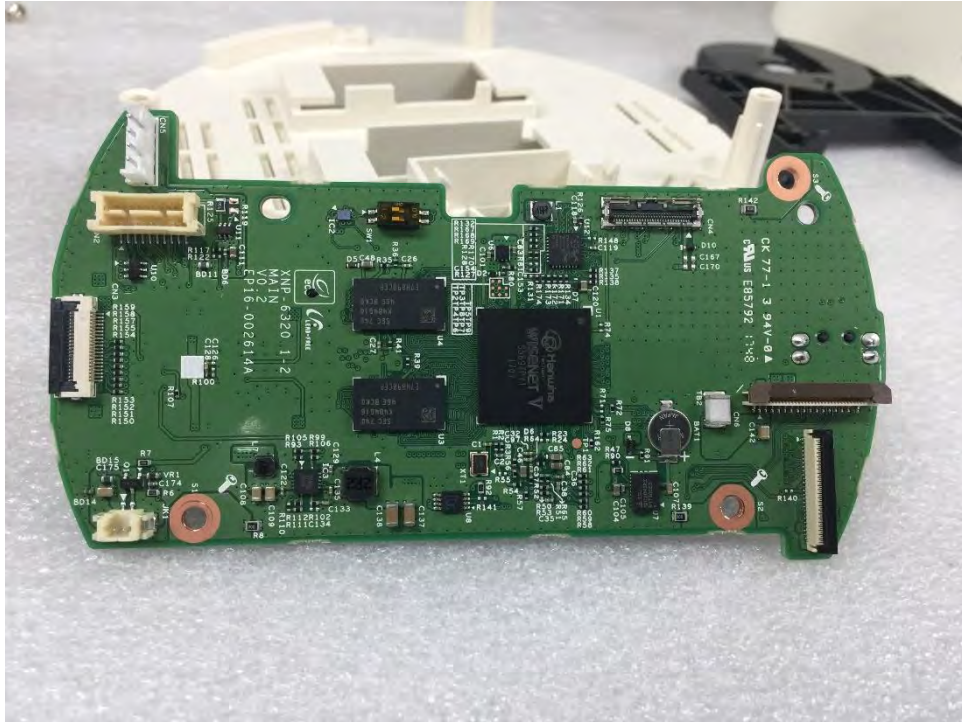
(Bottom)



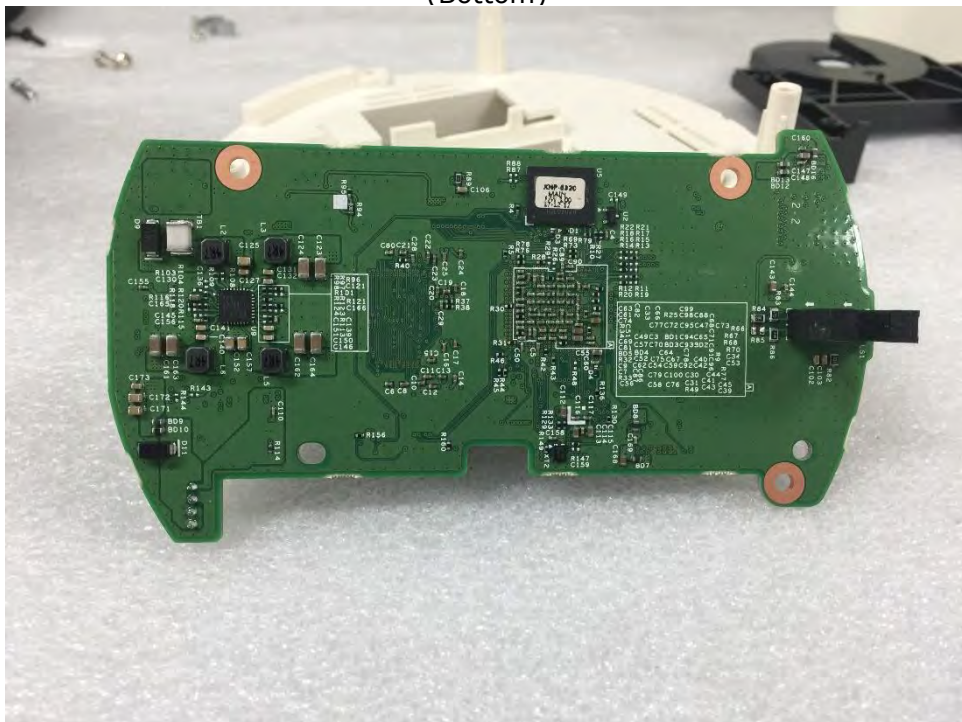
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EUT Internal View – board 3

(Top)



(Bottom)



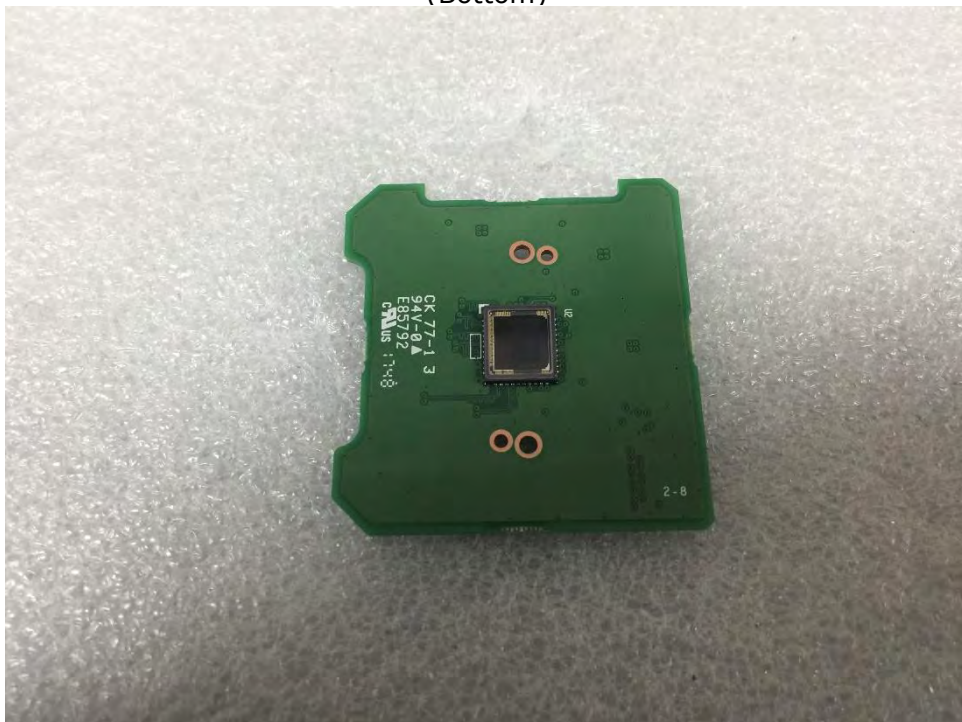
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EUT Internal View – board 4

(Top)



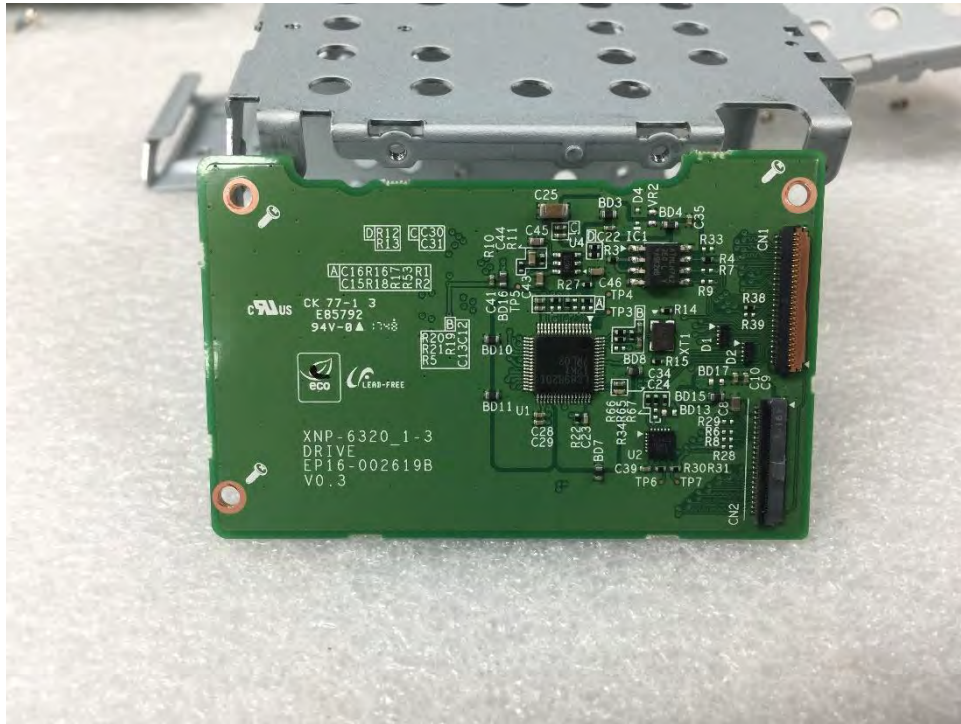
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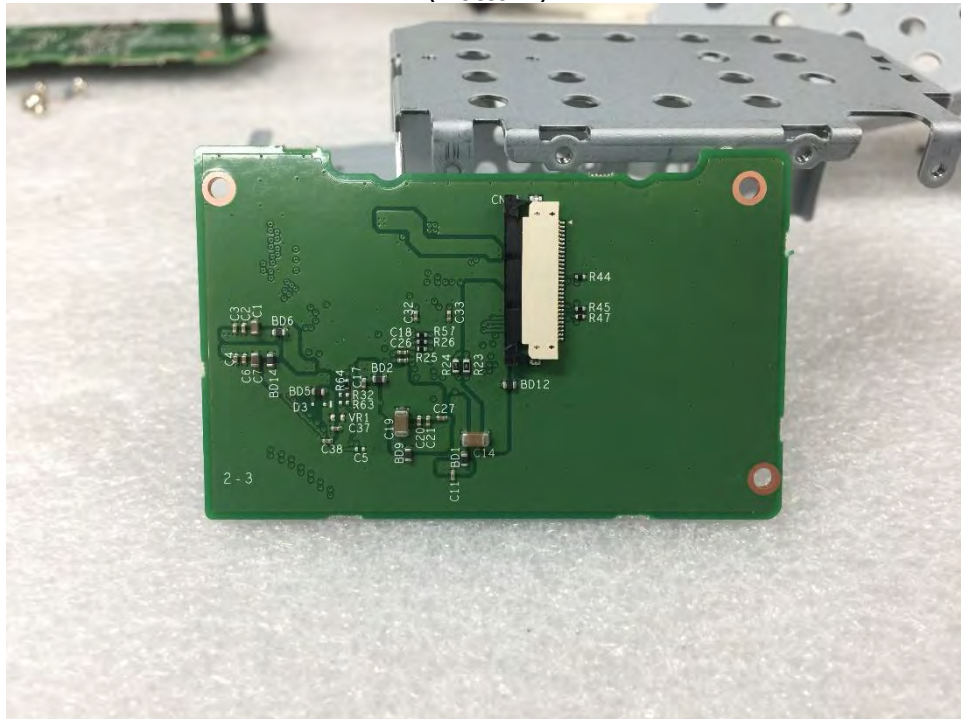
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EUT Internal View – board 5

(Top)



(Bottom)



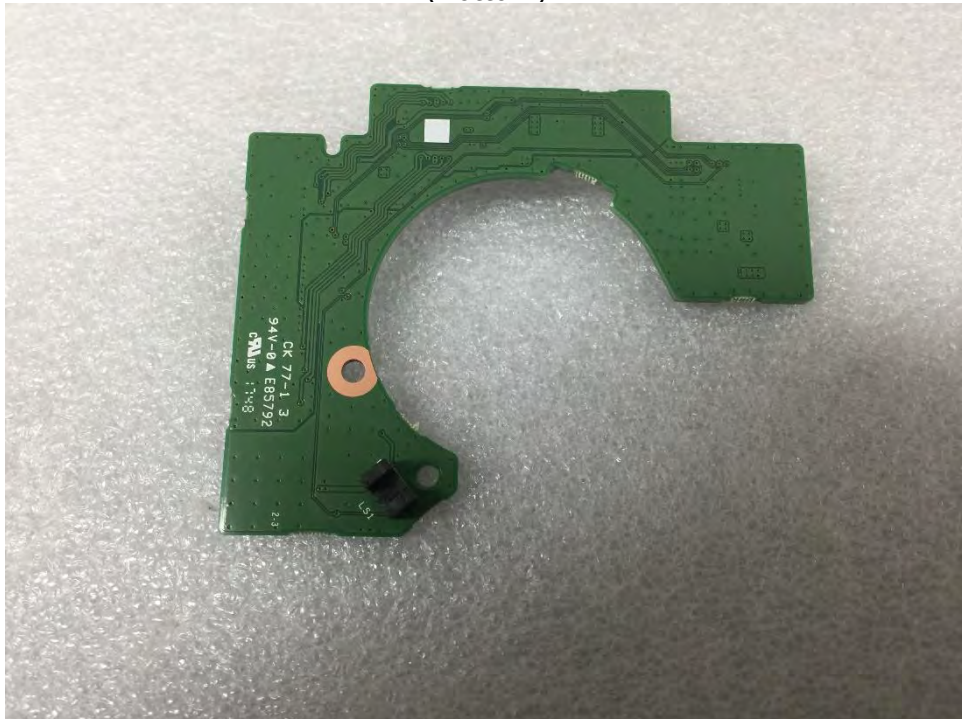
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EUT Internal View – board 6

(Top)



(Bottom)



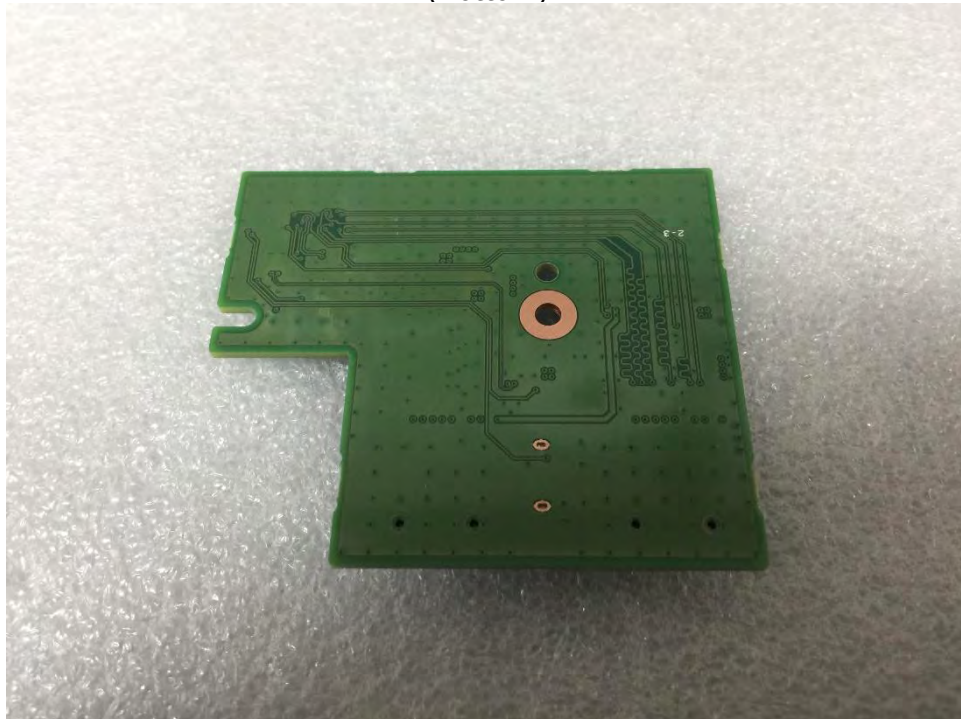
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EUT Internal View – board 7

(Top)



(Bottom)



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Label and Location



Network Camera

Model No : QNP-6230

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

Made in China

