



EMC TEST REPORT For CE

Test Report No. : KES-E1-17T0761
Date of Issue : Nov. 17, 2017
Product name : NETWORK CAMERA
Model/Type No. : SNB-8000P
Variant Model : -
Applicant : Hanwha Techwin Co., Ltd.
Applicant Address : 1204, Changwon-daero, Seongsan-gu Changwon-si,
Gyeongsangnam-do, Korea
Manufacturer : Hanwha Techwin (Tianjin) Co.,Ltd.
Manufacturer Address : No.11 Weiliu Rd, Micro-Electronic Industrial Park, TEDA,
Tianjin, 300385, People's Republic of China
Date of Receipt : Nov. 07, 2017
Test date : Nov. 13, 2017 ~ Nov. 15, 2017
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

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EMC Test Engineer

Reviewed by

Dong-Hun, Jang
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This test report is not related to KOLAS.

**KES Co., Ltd.**

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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Nov. 17, 2017	KES-E1-17T0761	Issued

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1.0 General Product Description

Main Specifications of E.U.T are:

Video	
Imaging Device	1/1.8" 6M CMOS
Total Pixels	6M -> 3096 x 2094
Effective Pixels	2616(H) x 1976(V) (QXGA)
Scanning System	Progressive
Min. Illumination	Color : 0.2 Lux (1/20, F1.2, 50IRE), 0.005 Lux (2sec, F1.2, 50IRE) Color : 0.1 Lux (1/20, F1.2, 30IRE), 0.0025 Lux (2sec, F1.2, 30IRE) B/W : 0.02 Lux (1/20, F1.2, 50IRE), 0.0005 Lux (2sec, F1.2, 50IRE) B/W : 0.01 Lux (1/20, F1.2, 30IRE), 0.00025 Lux (2sec, F1.2, 30IRE)
S / N Ratio	50dB ↑
Video Out	CVBS : 1.0 Vp-p / 75Ω composite, 720x480(N), 720x576(P), for installation - DIP connector type
Lens	
Focus Control	Simple Focus / Manual - Remote control via network ,Button control (Manual, Simple Focus)
Lens Type	Manual / DC Auto Iris, P-Iris
Mount Type	C/CS Mount
Operational	
Camera Title	Off / On (Displayed up to 15 characters)
Day & Night	Auto (ICR) / Color / B/W / External / Schedule
Backlight Compensation	Off / BLC
Wide Dynamic Range (contrast Enhancement)	60dB
Contrast Enhancement	SSDR (Samsung Super Dynamic Range) (Off / On)
Digital Noise Reduction	SSNRIII(2D+3D Noise Filter)
Digital Image Stabilization	-
Defog	-
Motion Detection	Off / On (4ea, Rectangular zones)
Privacy Masking	Off / On (32ea, Rectangular zones)
Gain Control	Off / Low / Middle / High
White Balance	ATW / AWC / Manual / Indoor / Outdoor (Include Mercury)
Electronic Shutter Speed	Minimum / Maximum / Anti flicker (2 ~ 1/12,000sec)
Digital PTZ	16x, Digital PTZ(Preset,Group)
Flip / Mirror	Off / On
Intelligent Video Analytics	Tampering, Audio Detection, People Counting (coming '15.MAR)
Alarm I/O	Input 1ea / Output 1ea
Audio In	Selectable (Mic IN/Line IN) (Built- IN Mic) Supply voltage:2.5V DC(4mA), Input Impedance : approx 2K ohm
Audio out	Line out (3.5mm stereo mini jack) Max output Level : 1Vrms
Serial Interface	RS-485 - Samsung-T/E, Pelco-D/P, Sungjin, Panasonic, vicon, Honeywell, AD, GE, Bosch
Alarm Triggers	Motion detection, Tampering, Audio Detection, Alarm Input, Network Disconnection
Alarm events	File upload via FTP and E-Mail Notification via E-Mail, TCP and HTTP local storage(SD/SDHC/SDXC) or NAS recording at Network disconnected & Event (Alarm Triggers) External output

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Network	
Ethernet	RJ-45 (10/100BASE-T)
Video Compression Format	H.264 (MPEG-4 Part 10/AVC), Motion JPEG
Resolution	5M Mode 2592x1944 / 1920x1080 / 1600x1200 / 1280x1024 / 1280x960 / 1280x720 / 1024x768 / 800x600 / 720x576 / 720x480 / 640x480 / 320x240 2M Mode 1920x1080 / 1600x1200 / 1280x1024 / 1280x960 / 1280x720 / 1024x768 / 800x600 / 720x576 / 720x480 / 640x480 / 320x240
Max. Framerate	5M Mode H.264: 20 fps for all resolution MJPEG: 2592x1944 : 10 fps 1920x1080 / 1600x1200 / 1280x1024 / 1280x960 / 1280x720 / 1024x768 : 15 fps 800x600 / 720x576 / 720x480 / 640x480 / 320x240 : 20 fps 2M Mode H.264: 30 fps for all resolution MJPEG: 1920x1080 / 1600x1200 / 1280x1024 / 1280x960 / 1280x720 / 1024x768 : 15 fps 800x600 / 720x576 / 720x480 / 640x480 / 320x240 : 20 fps
Smart Codec	-
Video Quality Adjustment	H.264 : Compression Level, Target Bitrate Level Control MJPEG : Quality Level Control
Bitrate Control Method	H.264 : CBR or VBR, Motion JPEG : VBR
Streaming Capability	Multiple Streaming (Up to 6 Profiles)
Audio Compression Format	G.711 u-law / G.726 Selectable G.726 (ADPCM) 8KHz, G.711 8KHz G.726 : 16Kbps, 24Kbps, 32Kbps, 40Kbps
Audio Communication	Bi-directional
IP	IPv4, IPv6
Protocol	TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP, RTSP, NTP, HTTP, HTTPS, SSL, DHCP, PPPoE, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, PIM-SM, UPnP, Bonjour
Security	HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access Log 802.1x Authentication
Streaming Method	Unicast / Multicast
Max. User Access	10 users at Unicast Mode
Edge Storage	micro SD/SDHC/SDXC (64GB) - motion Images recorded in the SDX/SDHC/SD memory card can be downloaded. NAS(Network Attached Storage)
Application Programming Interface	ONVIF Profile S SUNAPI(HTTP API) SVNP 2.0 Samsung Camera Application Platform
Webpage Language	English, French, German, Spanish, Italian, Chinese, Korean, Russian, Japanese, Swedish, Danish, Portuguese, Turkish, Polish, Czech, Rumanian, Serbian, Dutch, Croatia, Hungary, Greek, Finnish, Norwegian
Web Viewer	Supported OS : Windows XP / VISTA / 7 / 8, MAC OS X 10.7 Supported Browser : Microsoft Internet Explorer (Ver. 8~11) Mozilla Firefox (Ver. 9~19) Google Chrome (Ver. 15~25) Apple Safari (Ver. 6.0.2(Mac OS X 10.8, 10.7 Only), 5.1.7) * Mac OS X Only
Central Management Software	SmartViewer, SSM

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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 / Current	AC24V±10%, DC12V±10%,PoE(IEEE802.3af,Class3)
Power Consumption	Max. 12.65W (AC 24V, 50~60Hz) Max. 10.68W (DC 12V) Max. 12.14W (PoE, Class3)
Mechanical	
Color / Material	FRONT (BLACK) , BODY (IVORY) / FRONT(Aluminium), BODY(Aluminium)
Dimension (WxHxD)	W73.1 x H66.6 x D147.0
Weight	566g

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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	SNB-8000P	-	Hanwha Techwin (Tianjin) Co.,Ltd	E.U.T

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
PoE Adaptor	GS728TPP	-	NETGEAR, INC.	-
Notebook	X56K	HN11N5151FJ0045W	Hansung computer co., ltd.	-
Notebook Adaptor	A12-120P1A	F180271552011758	CHICONY POWER TECHNOLOGY CO.,LTD.	-
Controller	SPC-1010	C50E67WG10100F	SamSung Techwin Co.,Ltd.	-
Controller Adaptor	RS-AB1000	-	Dongguan Jinhua Sheng Power Technology Co.,Ltd.	-
Alarm	SIP-1201DD D0	-	SAMSUNG TECHWIN CO., LTD.	-
Speaker	BR10000A CUVE	-	BEIJING EDIFIER HI-TECH GROUP.	-
MIC	CMK-303	-	CAMAC	-
Micro SD Card	-	-	SanDisk	32 GB



1.6 External I/O Cabling

AC 24 V, DC 12 V Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (E.U.T)	RJ-45	Notebook	RJ-45	4.0	U
	RS-485 (2 Pin)	Controller	RS-485 (2 Pin)	3.5	U
	3 Pin	Alarm	3 Pin	4.0	U
	3.5 mm	Speaker	3.5 mm	1.6	U
	3.5 mm	MIC	3.5 mm	1.7	U
	Micro SD SLOT	Micro SD Card	Micro SD SLOT	-	-

PoE Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CAMERA (E.U.T)	RJ-45 (PoE)	PoE Adaptor	RJ-45 (PoE)	4.0	U
	RS-485 (2 Pin)	Controller	RS-485 (2 Pin)	3.5	U
	3 Pin	Alarm	3 Pin	4.0	U
	3.5 mm	Speaker	3.5 mm	1.6	U
	3.5 mm	MIC	3.5 mm	1.7	U
	Micro SD SLOT	Micro SD Card	Micro SD SLOT	-	-
PoE Adaptor	RJ-45 (Data)	Notebook	RJ-45 (Data)	3.0	U

* Unshielded=U, Shielded=S



1.7 E.U.T Operating Mode(s)

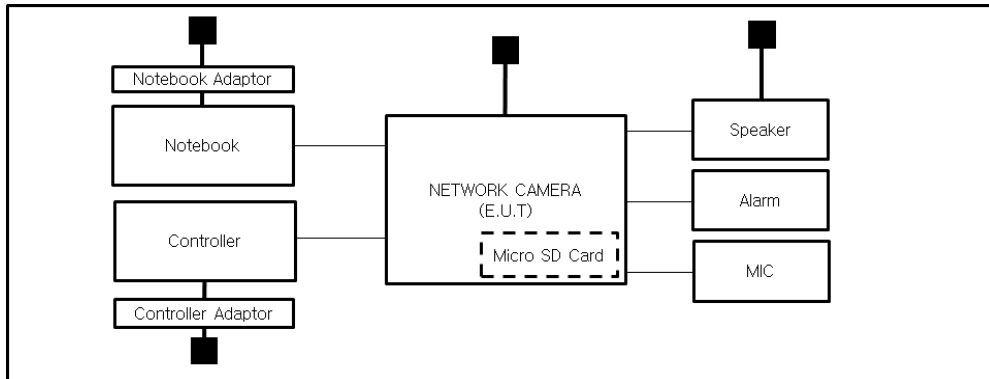
Test mode	operating
AC 24 V	E.U.T Monitoring, Ping test
DC 12 V	
PoE	

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

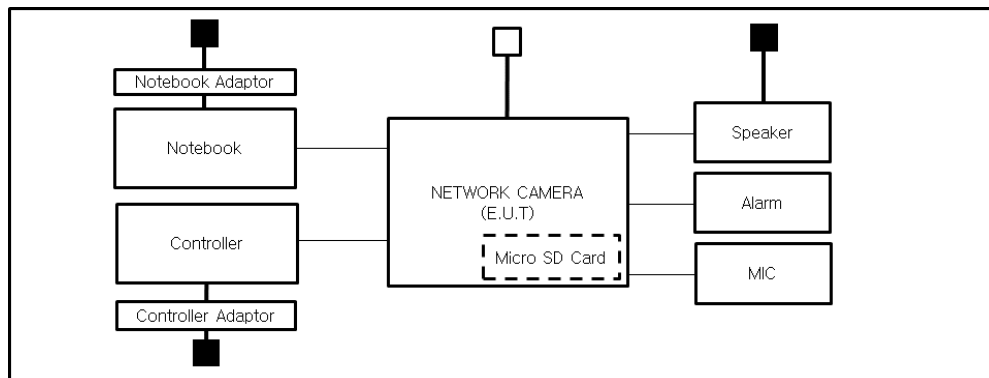
1.8 Configuration

■ AC Main
□ DC Main

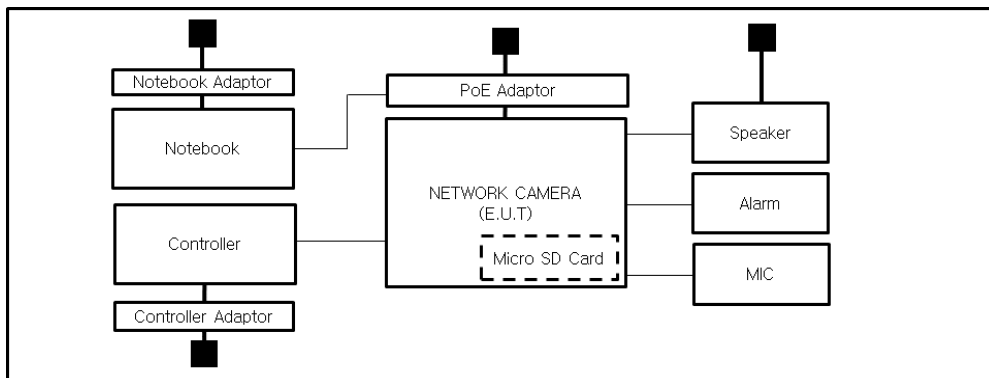
AC 24 V Mode



DC 12 V Mode



PoE Mode



1.9 Remarks when standards applied

N/A

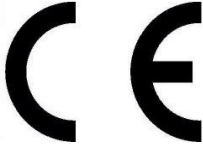
1.10 Calibration Details of Equipment Used for Measurement

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 and CISPR Publication 32.

1.12 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3 & 10 meter Open Area Test Sites and one conducted site to perform FCC Part 15/18 measurements.	
JAPAN	VCCI	Mains Ports Conducted Interference Measurement, Telecommunication Ports Conducted Disturbance Measurement and Radiation 10 meter site, Facility for measuring radiated disturbance above 1 GHz	 R-4308, C-4798, T-2311, G-914
KOREA	MSIP	EMI (10 meter Open Area Test Site and two conducted sites) Radio(3 & 10 meter Open Area Test Sites and one conducted site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KR0100
Canada	IC	3 & 10 meter Open Area Test Sites and one conducted site	 4769B-1
Europe	CE	EMI (10 meter Open Area Test Site and two conducted sites) Radio(3 & 10 meter Open Area Test Sites and one conducted site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	
International	KOLAS	EMI (10 meter Open Area Test Site and two conducted sites) Radio(3 & 10 meter Open Area Test Sites and one conducted site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	

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2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **EMC – Directive 2014/30/EU**

☐ EN 61000-6-3:2011

☐ EN 61000-6-1:2007

☐ EN 61000-6-4:2007 +A1:2011

☐ EN 61000-6-2:2005

☐ EN 55011:2007 +A1:2010

☐ Group 1
☐ Class A

☐ Group 2
☐ Class B

☐ EN 55014-1:2006 +A2:2011

☐ EN 55014-2:1997 +A2:2008

☐ EN 55015:2013

☐ EN 61547:2009

☒ EN 55032:2012/AC:2013

☒ Class A

☐ Class B

☐ EN 55024:2010 +A1:2015

☒ EN 50130-4:2011

☐ EN 61000-3-2:2014

☐ EN 61000-3-3:2013

☐ EN 61326-1:2013



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



2.1 Conducted Emissions at Mains Power Ports

Test Date

Nov. 13, 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	02, 03, 2018
☒	LISN	ENV216	R & S	101786	04, 27, 2018
☒	PULSE LIMITER	ESH3-Z2	R & S	101914	12, 13, 2017
☐	LISN	NNBM8124	SCHWARZBECK	8124-1002	08, 07, 2018
☐	LISN	NNBM8124	SCHWARZBECK	8124-1003	08, 07, 2018

Test Conditions

Temperature: 18,3 °C
Relative Humidity: 52,0 %

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. 13, 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	02, 03, 2018
☒	LISN	ENV216	R & S	101786	04, 27, 2018
☒	PULSE LIMITER	ESH3-Z2	R & S	101914	12, 13, 2017
☒	8-WIRE ISN CAT3	CAT3 8158	SCHWARZBECK	8158-0019	03, 29 2018
☒	8-WIRE ISN CAT5	CAT5 8158	SCHWARZBECK	8158-0030	03, 29, 2018
☐	8-WIRE ISN CAT6	NTFM 8158	SCHWARZBECK	8158-0029	08, 10, 2018
☐	ISN	ISN S8	SCHWARZBECK	ISN-S8-0019	05, 12, 2018
☐	CDN	CDNS502A	TESEQ	40431	01, 11, 2018

Test Conditions

Temperature: 18,3 °C
Relative Humidity: 52,0 %

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.

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2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Nov. 13, 2017

Test Location

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

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI TEST RECEIVER	ESVS10	R & S	826008/014	04, 18, 2018
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	714	11, 28, 2018

Test Conditions

Temperature: 10,4 °C
Relative Humidity: 51,0 %

Frequency Range of Measurement

30 MHz to 1 GHz

Instrument Settings

IF Band Width: 120 kHz

Test Results

The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.

2.4 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Nov. 14, 2017

Test Location

SEMI ANECHOIC CHAMBER #2

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	e3	AUDIX	8.083b	-
☒	EMI TEST RECEIVER	ESU26	R & S	100552	04, 19, 2018
☒	PREAMPLIFIER	8449B	AGILENT	3008A01729	05, 31, 2018
☐	ATTENUATOR	8491A	HP	35496	03, 24, 2018
☒	LOG-PERIODIC ANTENNA	STLP 9149	SCHWARZBECK	9149-255	05, 17, 2018

Test Conditions

Temperature: 18,7 °C

Relative Humidity: 52,9 %

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.

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

Nov. 13, 2017

Test Location

EMS-ESD: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	ESD SIMULATOR	ESS-2000	Noise Ken	ESS05X4620	02, 24, 2018
☒	HCP	-	Noise Ken	-	-
☒	VCP	-	Noise Ken	-	-

Test Conditions

Temperature: 18,3 °C
Relative Humidity: 52,0 %
Atmospheric Pressure: 100,0 kPa



Test Specifications

Discharge Factor: ≥ 1 s

Discharge Impedance: 330 ohm / 150 pF

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

Polarity: Positive and Negative

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

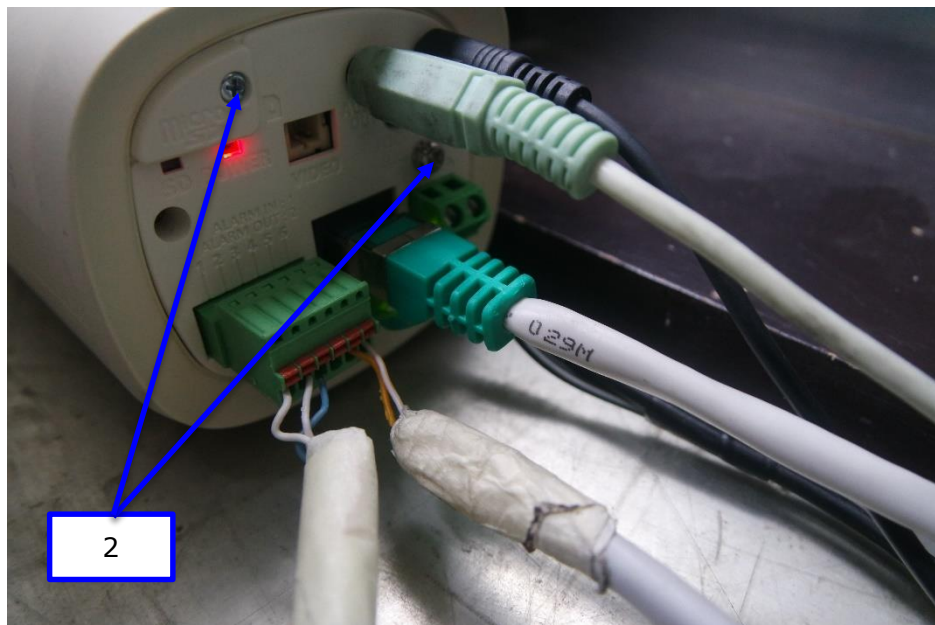
Discharge Voltage:	Contact	Air	HCP	VCP
	☐ 2 kV	☒ 2 kV	☐ 2 kV	☐ 2 kV
	☐ 4 kV	☒ 4 kV	☐ 4 kV	☐ 4 kV
	☒ 6 kV	☐ 6 kV	☒ 6 kV	☒ 6 kV
	☐ 8 kV	☒ 8 kV	☐ 8 kV	☐ 8 kV
	☐ 15 kV	☐ 15 kV	☐ 15 kV	☐ 15 kV

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

Required Performance Criteria: ☒ Complied

Location of Discharge:

Air
Contact



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**Test Data**

AC 24 V Mode

Indirect Discharge

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

Direct Discharge

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

DC 12 V Mode

Indirect Discharge

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

Direct Discharge

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

PoE Mode

Indirect Discharge

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

Direct Discharge

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



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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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3.2 Radiated Electric Field Immunity

Reference Standard

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

Test Date

Nov. 14, 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	KTI_RS2012	KOREA TECHNOLOGY INSTITUTE CO., LTD	2.1.1	-
☒	SIGNAL GENERATOR	ESG-3000A	HP	US37040210	01, 11, 2018
☒	AMPLIFIER	ITA0300-200	Infinitech	-	01, 11, 2018
☒	AMPLIFIER	ITA0750-200	Infinitech	-	01, 11, 2018
☒	AMPLIFIER	ITA1500-100	Infinitech	-	01, 11, 2018
☒	AMPLIFIER	ITA2500-100	Infinitech	-	01, 11, 2018
☒	POWER METER	E4419B	Agilent	MY45101506	06, 26, 2018
☒	AVERAGE POWER SENSOR	E9301A	Agilent	-	06, 26, 2018
☒	AVERAGE POWER SENSOR	E9301A	Agilent	MY41495698	06, 26, 2018
☒	HYBRID LOG-PERIODIC ANTENNA	HLP-2603	TDK	100400	-

Test Conditions

Temperature: 18,7 °C
Relative Humidity: 52,9 %
Atmospheric Pressure: 100,1 kPa



Test Specifications

Antenna Polarization: Horizontal & vertical unless indicated otherwise

Antenna Distance: ☒ 3 m

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

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

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

Frequency step: ☒ 1 % step

Dwell Time: ☒ 1 s ☐ 3 s

of Sides Radiated: ☒ 4

Required Performance Criteria: ☒ Complied

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Test Data

AC 24 V Mode

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

DC 12 V Mode

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

PoE Mode

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

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

Test Results

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

Remarks

PASS Required Performance Criteria.



3.3 Electrical Fast Transients/Bursts

Reference Standard

EN 61000-4-4:2012

Test Date

Nov. 15, 2017

Test Location

EMS-EFT: Electro wave Shieldroom #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	AMETEK CTS	7.1.2	-
☒	ULTRA COMPACT SIMULATOR	UCS 500 N5	EM TEST	V0936105120	06, 26, 2018
☒	MOTOR VARIAC	MV2616	EM TEST	V0936105123	06, 26, 2018
☒	CAPACITIVE COUPLING CLAMP	HFK	EM TEST	070925	06, 26, 2018

Test Conditions

Temperature: 19,0 °C
Relative Humidity: 49,5 %
Atmospheric Pressure: 100,2 kPa

Test Specifications

Pulse Amplitude & Polarity:
(AC Power Lines) ☐ ± 1.0 kV ☒ ± 2.0 kV
☐ ± 4.0 kV

Pulse Amplitude & Polarity:
(Other supply / Signal Lines) ☐ ± 0.5 kV ☒ ± 1.0 kV
☐ ± 2.0 kV

Burst Period: ☒ 300 ms ☐ 2 s

Repetition Rate: ☐ 5 kHz ☒ 100 kHz

Duration of Test Voltage: ☒ ≥ 1 min

Required Performance Criteria: ☒ Complied

Test Data

AC 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
3 Pin	Complied	Complied
RS-485	Complied	Complied

DC 12 V Mode

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

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

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

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

☒ Signal ports and telecommunication ports – Coupling Clamp used

Mode of Application	Observations	
	(+) Burst (kV)	(-) Burst (kV)
RJ-45	Complied	Complied
3 Pin	Complied	Complied
RS-485	Complied	Complied

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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 (PoE)	Complied	Complied
3 Pin	Complied	Complied
RS-485	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

Nov. 15, 2017

Test Location

EMS-Surge: Electro wave Shieldroom #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	AMETEK CTS	7.1.2	-
☒	ULTRA COMPACT SIMULATOR	UCS 500 N5	EM TEST	V0936105120	10, 16, 2018
☒	MOTOR VARIAC	MV2616	EM TEST	V0936105123	06, 26, 2018
☒	CDN	CNV 508N1	EM TEST	P1551168979	04, 26, 2018
☐	CDN	CNV 508T5	EM TEST	P1549168422	04, 26, 2018

Test Conditions

Temperature: 19,0 °C
Relative Humidity: 49,5 %
Atmospheric Pressure: 100,2 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

Signal Lines☒ Line to Earth – Common Mode

Mode of Application	Observations	
	(+) Surge (kV)	(-) Surge (kV)
RJ-45	Complied	Complied
3 Pin	Complied	Complied
RS-485	Complied	Complied

DC 12 V Mode

☐ 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
3 Pin	Complied	Complied
RS-485	Complied	Complied

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PoE Mode

☐ 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 (PoE)	Complied	Complied
3 Pin	Complied	Complied
RS-485	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

Nov. 14, 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	5.3.7	-
☒	CONTINUOUS WAVE SIMULATOR	CWS 500N1	EM TEST	V0936105119	08, 07, 2018
☒	ATTENUATOR	ATT6	EM TEST	1208-34	08, 07, 2018
☒	CDN	CDN-M2/M3N	EM TEST	0909-06	08, 07, 2018
☒	CDN	CDN T8RJ45	EM TEST	0909-09	08, 07, 2018
☒	EM INJECTION CLAMP	EM 101	Liithi	35943	02, 03, 2018

Test Conditions

Temperature: 18,7 °C
Relative Humidity: 52,9 %
Atmospheric Pressure: 100,1 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	Complied

☐ Input d.c. power ports

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

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
RJ-45	CDN T8RJ45	Complied
3 Pin	Clamp	Complied
RJ-485	Clamp	Complied

DC 12 V Mode

☐ Input a.c. power ports

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

☒ Input d.c. power ports

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

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
RJ-45	CDN T8RJ45	Complied
3 Pin	Clamp	Complied
RJ-485	Clamp	Complied

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PoE Mode

☐ Input a.c. power ports

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

☐ Input d.c. power ports

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

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
RJ-45 (PoE)	CDN T8RJ45	Complied
3 Pin	Clamp	Complied
RJ-485	Clamp	Complied

Notes: CDN = Coupling Decoupling Network

“blank” = Not performed

Observations:

Complied – No degradation of function

Test Results

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

Remarks

PASS Required Performance Criteria.



3.6 Voltage Dips and Short Interruptions

Reference Standard

EN 61000-4-11:2004

Test Date

Nov. 15, 2017

Test Location

EMS-Voltage dip: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	AMETEK CTS	7.1.2	-
☒	ULTRA COMPACT SIMULATOR	UCS 500 N5	EM TEST	V0936105120	06, 26, 2018
☒	MOTOR VARIAC	MV2616	EM TEST	V0936105123	06, 26, 2018

Test Conditions

Temperature: 19,0 °C
Relative Humidity: 49,5 %
Atmospheric Pressure: 100,2 kPa



Test Specifications & Observations/Remarks

AC 24 V Mode

(Test Voltage : 230 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

Remarks

The test has been tested using the AC / AC Adaptor

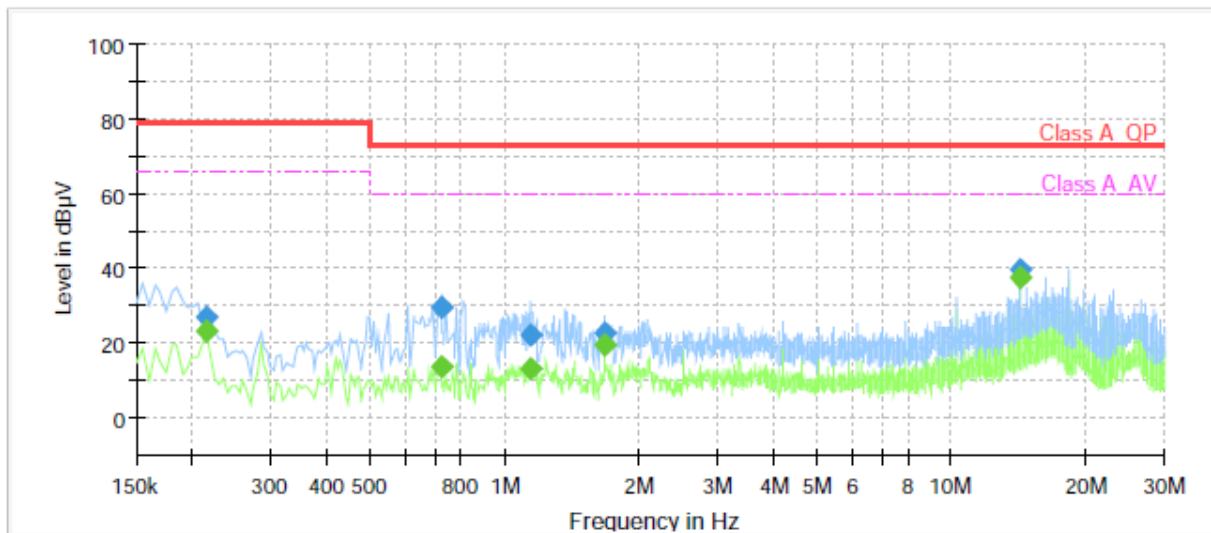
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

AC 24 V Mode
[HOT]

Common Information

Test Description:	Conducted Emission
Model No.:	SNB-8000P
Mode	AC 24 V _ H
Operator Name:	KES



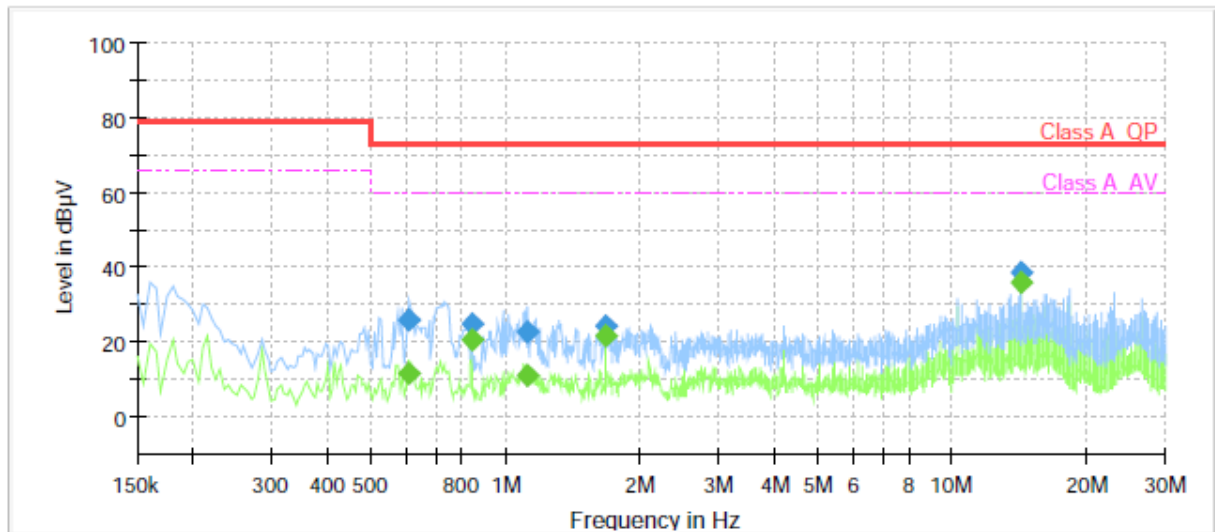
Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.215000	---	23.16	66.00	42.84	1000.0	9.000	L1	19.4
0.215000	26.89	---	79.00	52.11	1000.0	9.000	L1	19.4
0.720000	---	13.68	60.00	46.32	1000.0	9.000	L1	19.7
0.720000	29.75	---	73.00	43.25	1000.0	9.000	L1	19.7
1.145000	---	13.18	60.00	46.82	1000.0	9.000	L1	19.8
1.145000	22.40	---	73.00	50.60	1000.0	9.000	L1	19.8
1.675000	---	19.36	60.00	40.64	1000.0	9.000	L1	19.9
1.675000	23.02	---	73.00	49.98	1000.0	9.000	L1	19.9
14.335000	---	37.46	60.00	22.54	1000.0	9.000	L1	19.9
14.335000	39.75	---	73.00	33.25	1000.0	9.000	L1	19.9

[NEUTRAL]

Common Information

Test Description: Conducted Emission
Model No.: SNB-8000P
Mode: AC 24 V _ N
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.610000	---	11.48	60.00	48.52	1000.0	9.000	N	19.6
0.610000	25.96	---	73.00	47.04	1000.0	9.000	N	19.6
0.840000	---	20.88	60.00	39.12	1000.0	9.000	N	19.7
0.840000	25.15	---	73.00	47.85	1000.0	9.000	N	19.7
1.125000	---	11.06	60.00	48.94	1000.0	9.000	N	19.8
1.125000	22.99	---	73.00	50.01	1000.0	9.000	N	19.8
1.680000	---	21.87	60.00	38.13	1000.0	9.000	N	19.9
1.680000	24.38	---	73.00	48.62	1000.0	9.000	N	19.9
14.335000	---	36.18	60.00	23.82	1000.0	9.000	N	19.9
14.335000	38.59	---	73.00	34.41	1000.0	9.000	N	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 (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

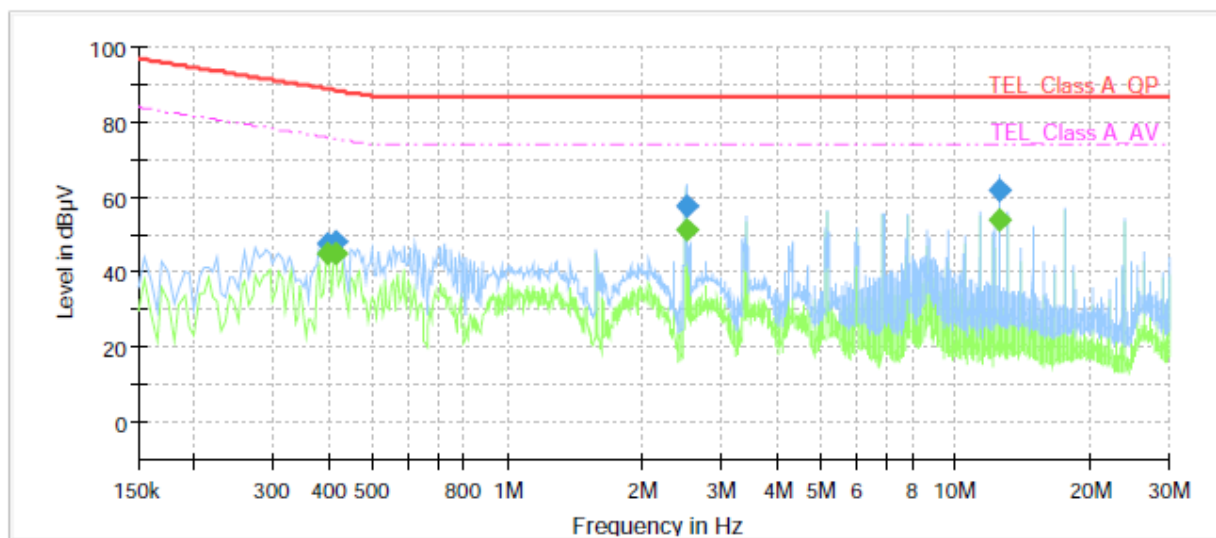
Conducted Emissions at Telecommunication Ports

AC 24 V Mode

[10 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	SNB-8000P
Mode	AC 24 V _ 10 Mbps
Operator Name:	KES



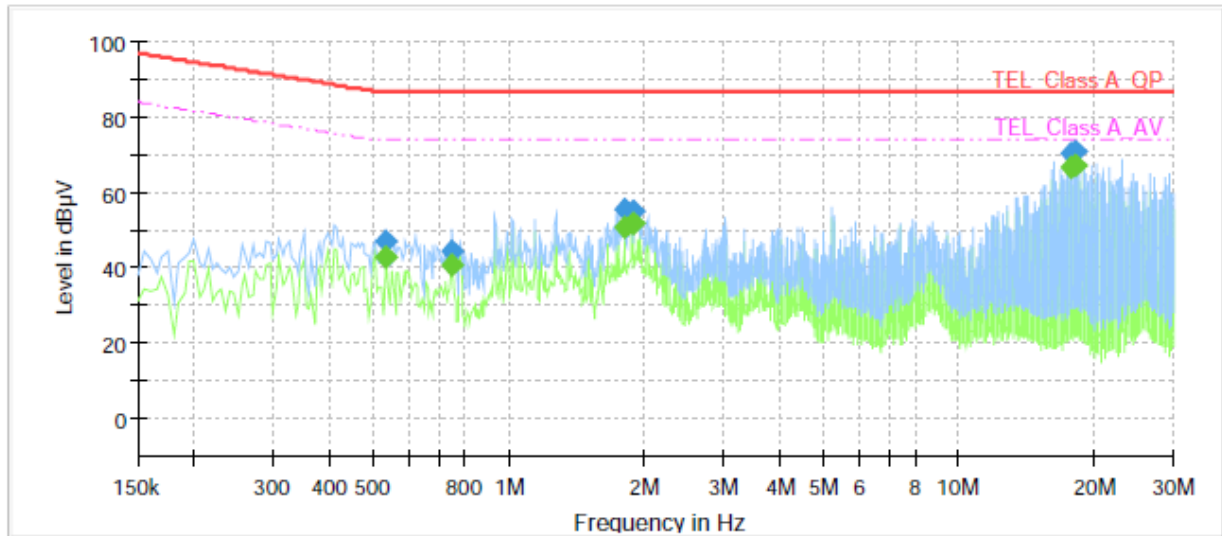
Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.395000	---	44.79	75.96	31.17	1000.0	9.000	Single Line	19.9
0.395000	47.60	---	88.96	41.36	1000.0	9.000	Single Line	19.9
0.415000	---	45.05	75.55	30.50	1000.0	9.000	Single Line	19.9
0.415000	48.26	---	88.55	40.29	1000.0	9.000	Single Line	19.9
2.500000	---	51.52	74.00	22.48	1000.0	9.000	Single Line	20.0
2.500000	57.57	---	87.00	29.43	1000.0	9.000	Single Line	20.0
12.500000	---	53.88	74.00	20.12	1000.0	9.000	Single Line	19.8
12.500000	61.79	---	87.00	25.21	1000.0	9.000	Single Line	19.8

[100 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: SNB-8000P
Mode: AC 24 V _ 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)
0.535000	---	42.71	74.00	31.29	1000.0	9.000	Single Line	19.4
0.535000	46.88	---	87.00	40.12	1000.0	9.000	Single Line	19.4
0.750000	---	40.61	74.00	33.39	1000.0	9.000	Single Line	19.4
0.750000	44.67	---	87.00	42.33	1000.0	9.000	Single Line	19.4
1.810000	---	50.80	74.00	23.20	1000.0	9.000	Single Line	19.6
1.810000	55.37	---	87.00	31.63	1000.0	9.000	Single Line	19.6
1.885000	---	51.83	74.00	22.17	1000.0	9.000	Single Line	19.6
1.885000	54.93	---	87.00	32.07	1000.0	9.000	Single Line	19.6
17.695000	---	66.93	74.00	7.07	1000.0	9.000	Single Line	19.5
17.695000	70.28	---	87.00	16.72	1000.0	9.000	Single Line	19.5
18.245000	---	67.29	74.00	6.71	1000.0	9.000	Single Line	19.5
18.245000	70.83	---	87.00	16.17	1000.0	9.000	Single Line	19.5



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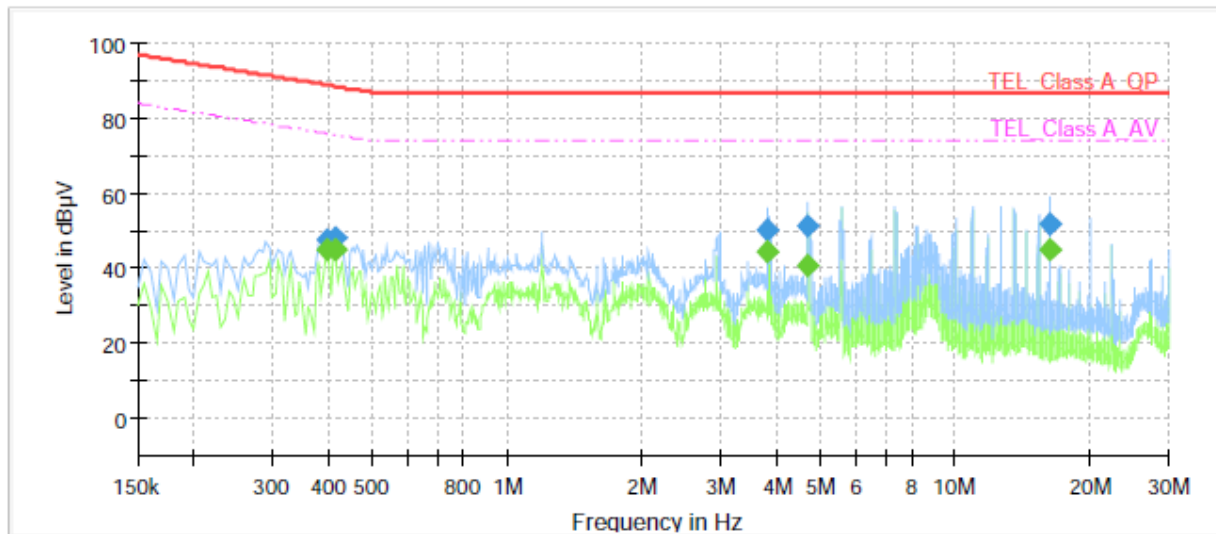
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DC 12 V Mode
[10 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: SNB-8000P
Mode: DC 12 V _ 10 Mbps
Operator Name: KES



Final Result

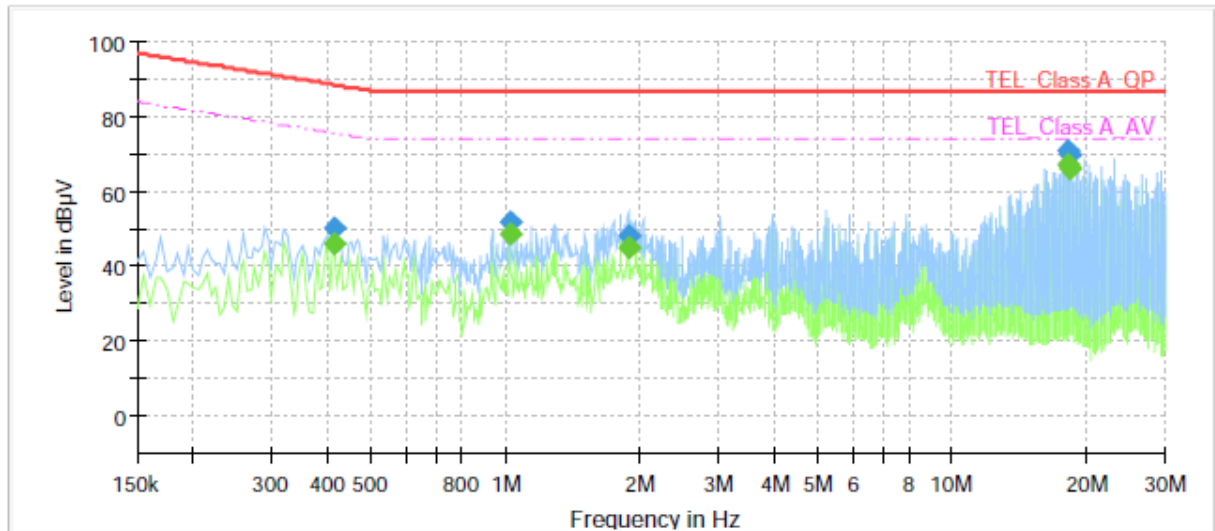
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.395000	---	44.90	75.96	31.06	1000.0	9.000	Single Line	19.9
0.395000	47.66	---	88.96	41.30	1000.0	9.000	Single Line	19.9
0.415000	---	45.13	75.55	30.42	1000.0	9.000	Single Line	19.9
0.415000	48.33	---	88.55	40.22	1000.0	9.000	Single Line	19.9
3.805000	---	44.43	74.00	29.57	1000.0	9.000	Single Line	20.0
3.805000	50.19	---	87.00	36.81	1000.0	9.000	Single Line	20.0
4.675000	---	40.76	74.00	33.24	1000.0	9.000	Single Line	20.0
4.675000	51.19	---	87.00	35.81	1000.0	9.000	Single Line	20.0
16.250000	---	45.18	74.00	28.82	1000.0	9.000	Single Line	20.0
16.250000	52.11	---	87.00	34.89	1000.0	9.000	Single Line	20.0

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[100 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	SNB-8000P
Mode	DC 12 V _ 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)
0.415000	---	46.02	75.55	29.53	1000.0	9.000	Single Line	19.4
0.415000	50.12	---	88.55	38.43	1000.0	9.000	Single Line	19.4
1.025000	---	48.62	74.00	25.38	1000.0	9.000	Single Line	19.5
1.025000	52.06	---	87.00	34.94	1000.0	9.000	Single Line	19.5
1.885000	---	44.83	74.00	29.17	1000.0	9.000	Single Line	19.6
1.885000	48.25	---	87.00	38.75	1000.0	9.000	Single Line	19.6
18.245000	---	67.28	74.00	6.72	1000.0	9.000	Single Line	19.5
18.245000	70.81	---	87.00	16.19	1000.0	9.000	Single Line	19.5
18.305000	---	66.19	74.00	7.81	1000.0	9.000	Single Line	19.5
18.305000	69.78	---	87.00	17.22	1000.0	9.000	Single Line	19.5



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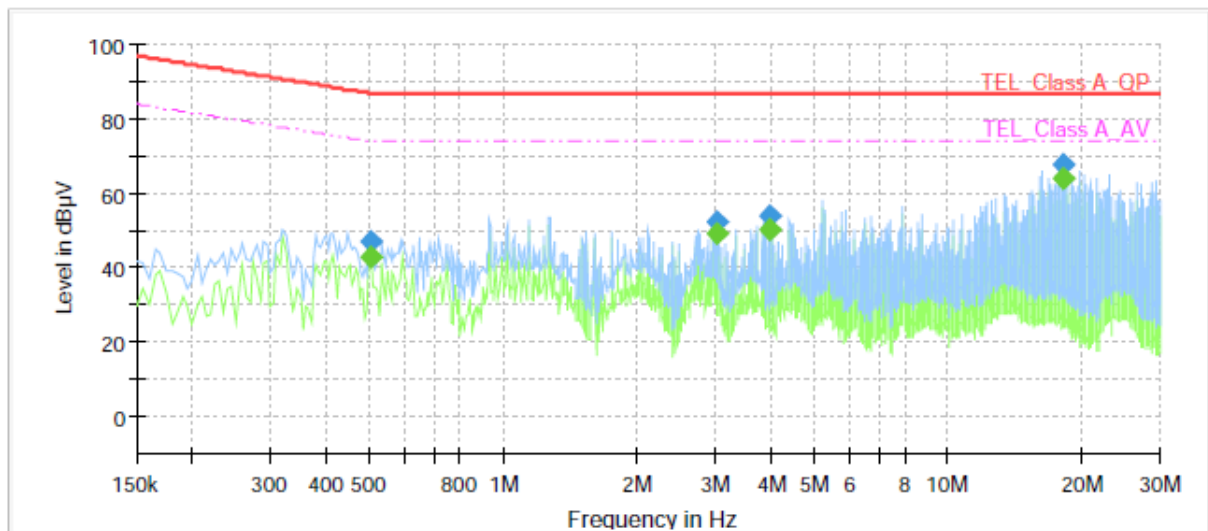
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PoE Mode
[10 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: SNB-8000P
Mode: PoE_ 10 Mbps
Operator Name: KES



Final Result

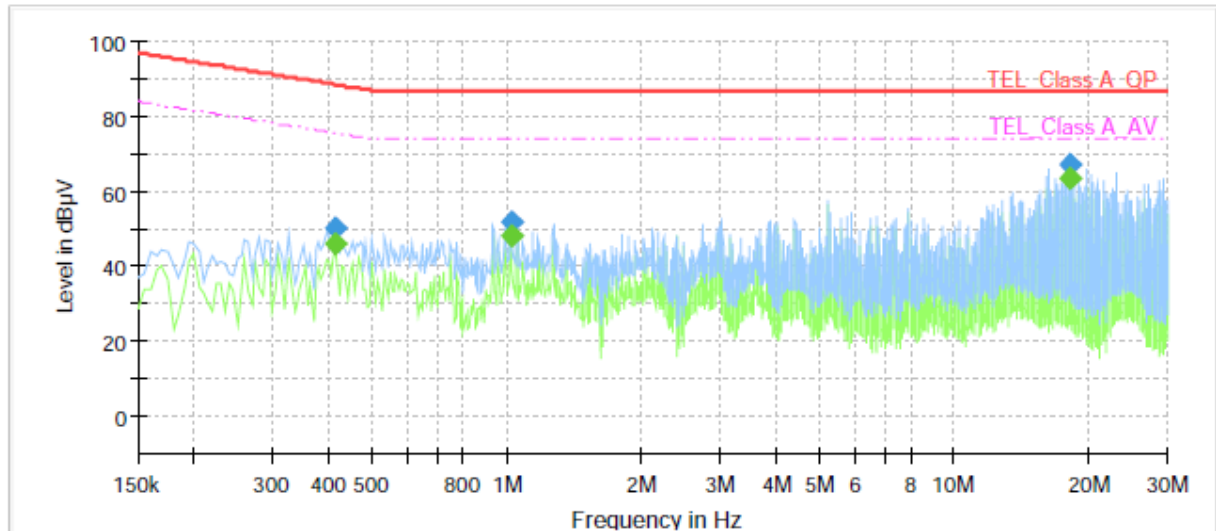
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.505000	---	43.12	74.00	30.88	1000.0	9.000	Single Line	19.9
0.505000	46.87	---	87.00	40.13	1000.0	9.000	Single Line	19.9
3.040000	---	49.16	74.00	24.84	1000.0	9.000	Single Line	20.0
3.040000	52.66	---	87.00	34.34	1000.0	9.000	Single Line	20.0
3.955000	---	50.53	74.00	23.47	1000.0	9.000	Single Line	20.0
3.955000	53.95	---	87.00	33.05	1000.0	9.000	Single Line	20.0
18.245000	---	64.05	74.00	9.95	1000.0	9.000	Single Line	20.0
18.245000	67.56	---	87.00	19.44	1000.0	9.000	Single Line	20.0

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[100 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	SNB-8000P
Mode	PoE_ 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)
0.415000	---	45.88	75.55	29.67	1000.0	9.000	Single Line	19.4
0.415000	50.03	---	88.55	38.52	1000.0	9.000	Single Line	19.4
1.025000	---	48.09	74.00	25.91	1000.0	9.000	Single Line	19.5
1.025000	51.86	---	87.00	35.14	1000.0	9.000	Single Line	19.5
18.245000	---	63.27	74.00	10.73	1000.0	9.000	Single Line	19.5
18.245000	66.98	---	87.00	20.02	1000.0	9.000	Single Line	19.5

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

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

AC 24 V Mode

Frequency	Amplitude	ANT Polar. (H/V)	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin
[MHz]	[dB μ V]		[m]	ANT. [dB /m]	Cable [dB]	[dB μ V/m]	[dB μ V/m]	
50.39	8.90	V	1.02	13.13	1.91	23.94	40.00	16.06
90.23	11.10	H	3.98	9.80	2.56	23.46	40.00	16.54
94.23	14.80	V	1.00	10.56	2.63	27.99	40.00	12.01
141.09	14.60	V	1.01	7.59	3.30	25.49	40.00	14.51
195.93	11.50	H	4.00	11.28	3.95	26.73	40.00	13.27
221.97	8.30	H	3.99	12.11	4.27	24.68	40.00	15.32

* H : Horizontal, V : Vertical

DC 12 V Mode

Frequency	Amplitude	ANT Polar. (H/V)	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin
[MHz]	[dB μ V]		[m]	ANT. [dB /m]	Cable [dB]	[dB μ V/m]	[dB μ V/m]	
50.48	10.40	V	1.01	13.12	1.91	25.43	40.00	14.57
94.36	12.70	V	1.00	10.58	2.63	25.91	40.00	14.09
101.93	8.40	H	3.98	11.36	2.74	22.50	40.00	17.50
139.04	15.00	H	3.99	7.61	3.27	25.88	40.00	14.12
142.62	13.00	V	1.02	7.64	3.32	23.96	40.00	16.04
195.15	11.60	H	4.00	11.18	3.94	26.72	40.00	13.28

* H : Horizontal, V : Vertical

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PoE Mode

Frequency	Amplitude	ANT Polar. (H/V)	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin [dB]
[MHz]	[dBμV]		[m]	ANT. [dB /m]	Cable [dB]	[dBμV/m]	[dBμV/m]	
48.25	9.90	V	1.02	13.17	1.86	24.93	40.00	15.07
90.35	13.20	V	1.01	9.83	2.57	25.60	40.00	14.40
95.12	9.40	H	3.98	10.72	2.64	22.76	40.00	17.24
142.73	14.90	V	1.00	7.64	3.32	25.86	40.00	14.14
173.62	14.00	H	4.00	8.90	3.71	26.61	40.00	13.39
196.17	10.50	H	3.99	11.31	3.95	25.76	40.00	14.24

* H : Horizontal, V : Vertical

◆ Calculation – OPEN AREA TEST SITE #2

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

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

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

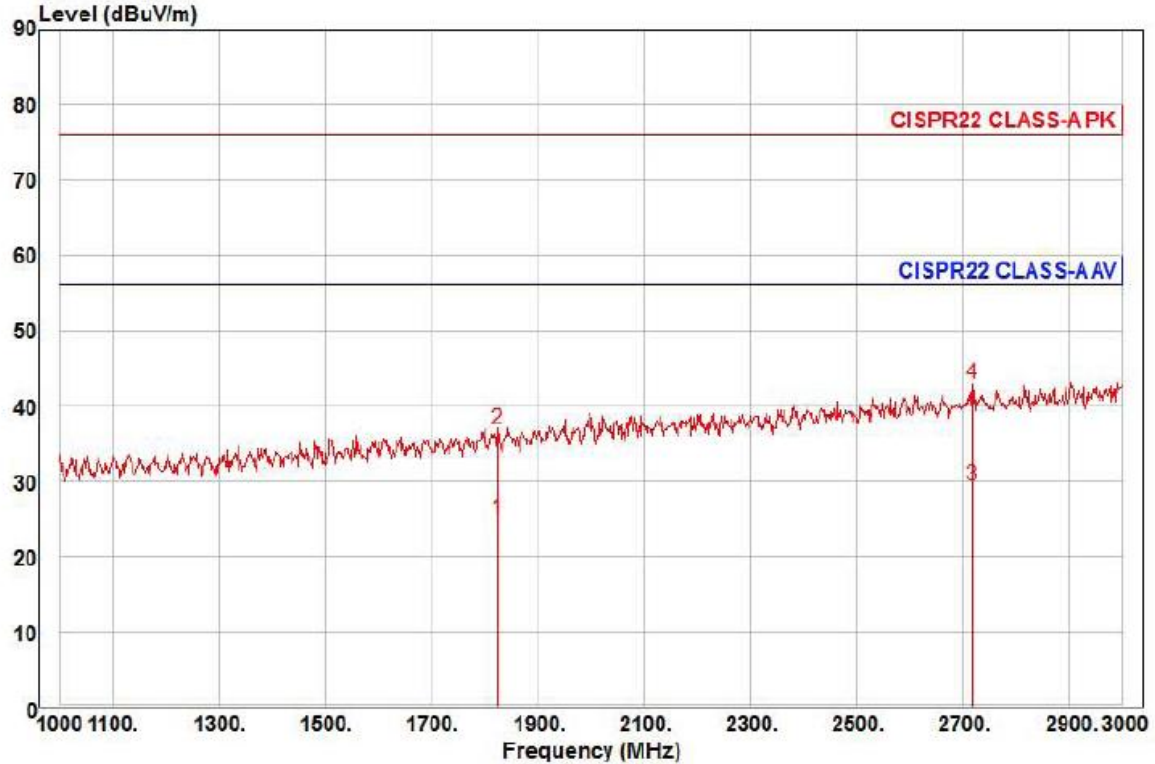
Limit(QP) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value

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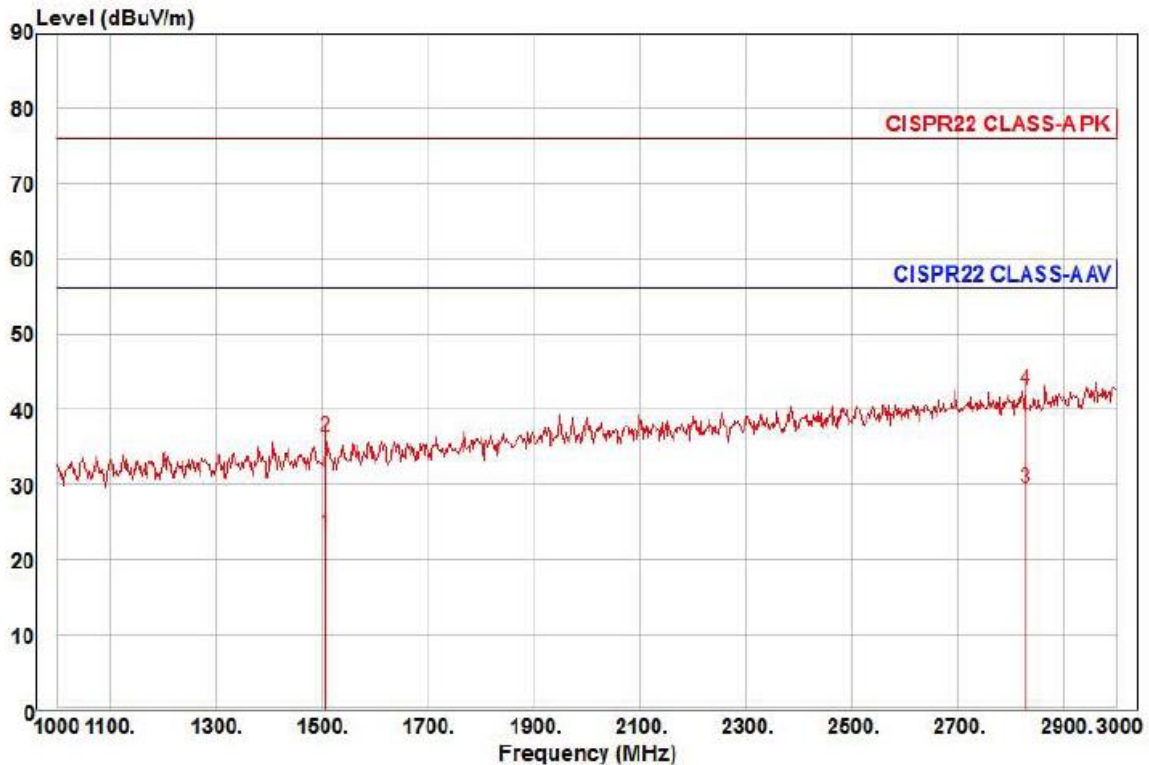
Radiated Electric Field Emissions(Above 1 GHz)

AC 24 V Mode



Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNB-8000P
Mode : AC 24 V
Memo :

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1824.00	25.26	25.31	9.16	34.82	340	56.00	-31.09	horizontal	Average
2	1824.00	37.24	25.31	9.16	34.82	340	76.00	-39.11	horizontal	Peak
3 pp	2718.00	23.49	28.49	11.38	34.03	142	56.00	-26.67	horizontal	Average
4 pk	2718.00	37.19	28.49	11.38	34.03	142	76.00	-32.97	horizontal	Peak



Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNB-8000P
Mode : AC 24 V
Memo :

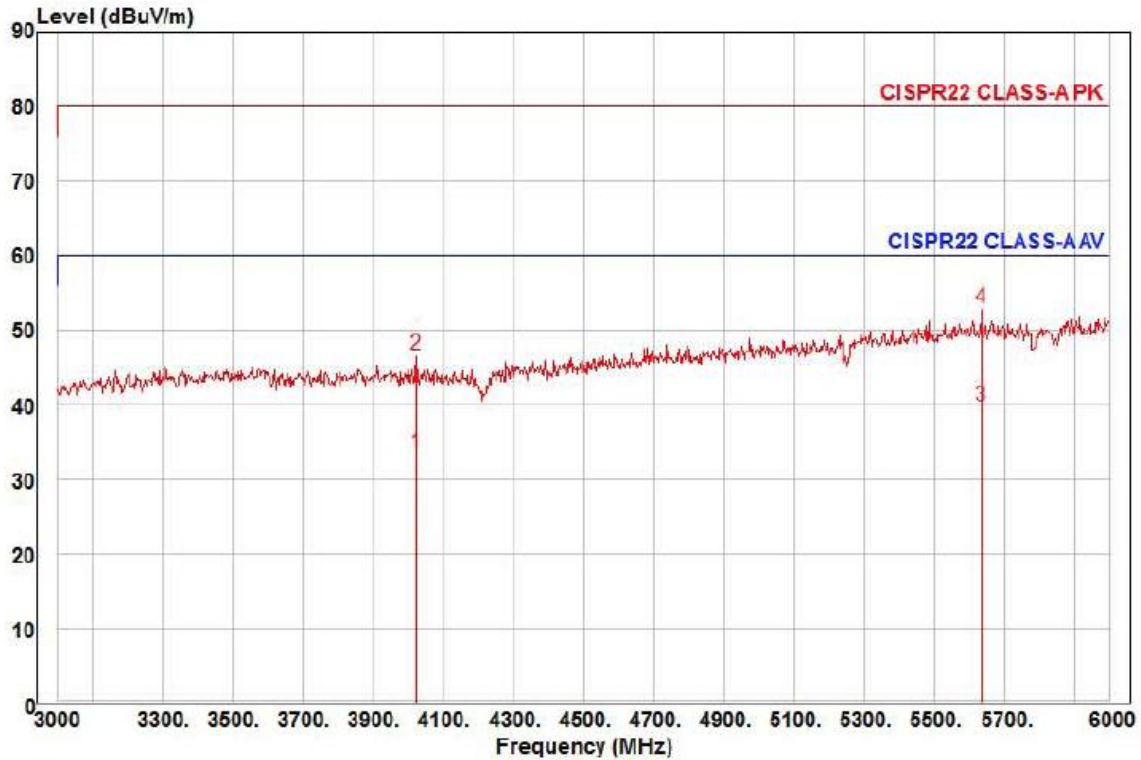
	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1508.00	26.37	24.05	8.24	35.35	244	56.00	-32.69	vertical	Average
2	1508.00	39.28	24.05	8.24	35.35	244	76.00	-39.78	vertical	Peak
3 pp	2828.00	22.65	28.98	11.68	33.96	326	56.00	-26.65	vertical	Average
4 pk	2828.00	35.79	28.98	11.68	33.96	326	76.00	-33.51	vertical	Peak



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Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNB-8000P
Mode : AC 24 V
Memo :

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	4023.00	21.92	32.49	14.11	34.93	76	60.00	-26.41	horizontal	Average
2	4023.00	35.03	32.49	14.11	34.93	76	80.00	-33.30	horizontal	Peak
3 pp	5634.00	20.79	35.57	16.81	33.30	50	60.00	-20.13	horizontal	Average
4 pk	5634.00	33.92	35.57	16.81	33.30	50	80.00	-27.00	horizontal	Peak

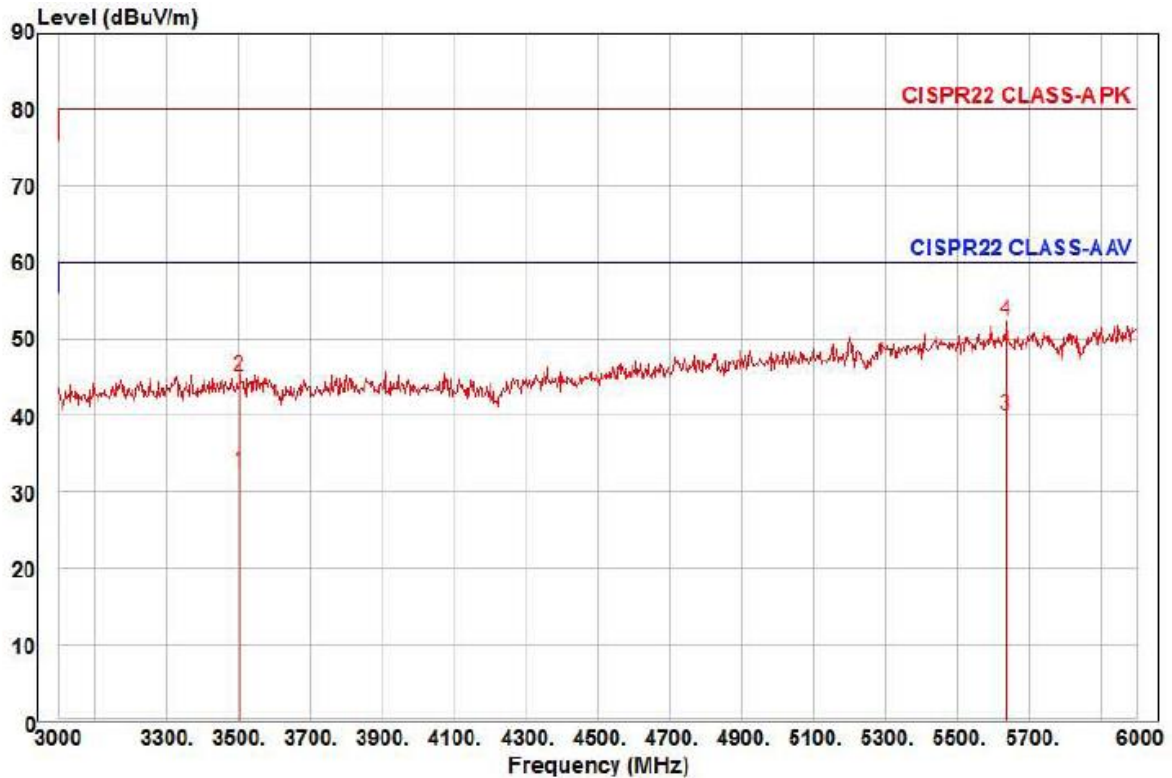
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Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNB-8000P
Mode : AC 24 V
Memo :

		Read	Ant	Cable	Preamp	TPos	Limit	Over		
	Freq	Level	Factor	Loss	Factor		Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3504.00	22.74	31.16	13.15	34.41	192	60.00	-27.36	vertical	Average
2	3504.00	35.29	31.16	13.15	34.41	192	80.00	-34.81	vertical	Peak
3 pp	5637.00	20.86	35.58	16.82	33.30	204	60.00	-20.04	vertical	Average
4 pk	5637.00	33.31	35.58	16.82	33.30	204	80.00	-27.59	vertical	Peak

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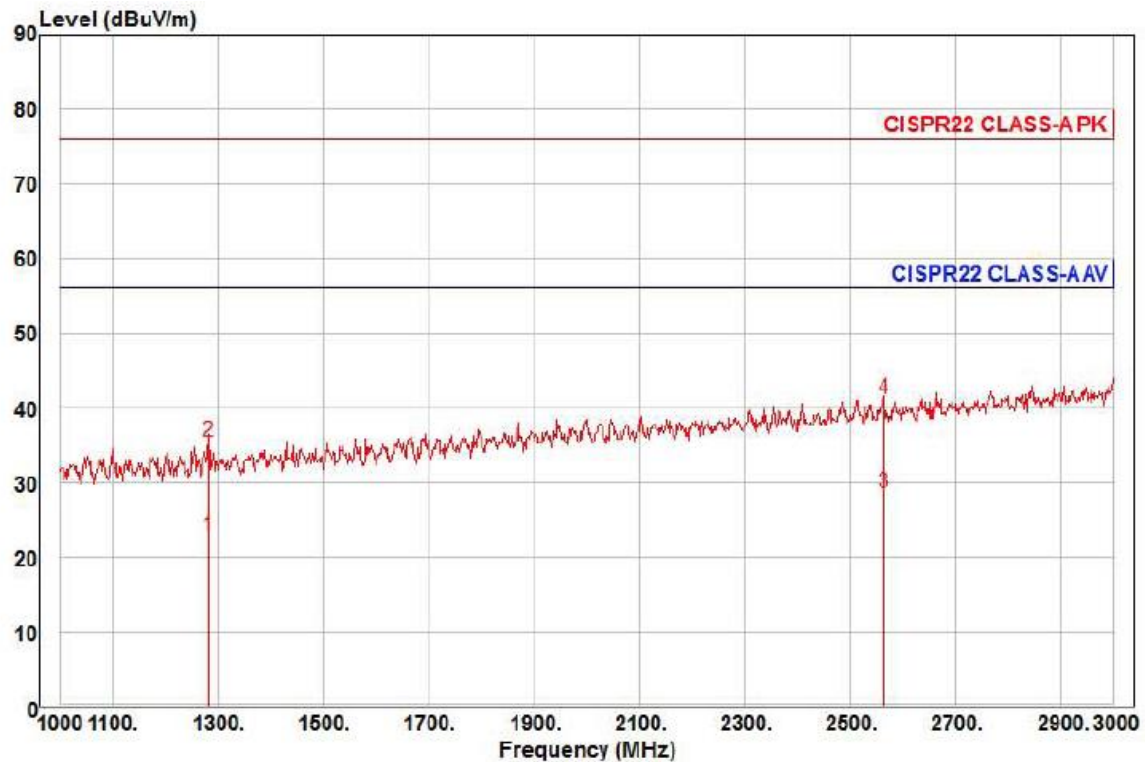


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DC 12 V Mode



Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNB-8000P
Mode : DC 12 V
Memo :

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1282.00	27.50	23.36	7.55	35.73	46	56.00	-33.32	horizontal	Average
2	1282.00	40.35	23.36	7.55	35.73	46	76.00	-40.47	horizontal	Peak
3 pp	2564.00	24.04	27.81	10.98	34.14	94	56.00	-27.31	horizontal	Average
4 pk	2564.00	36.57	27.81	10.98	34.14	94	76.00	-34.78	horizontal	Peak

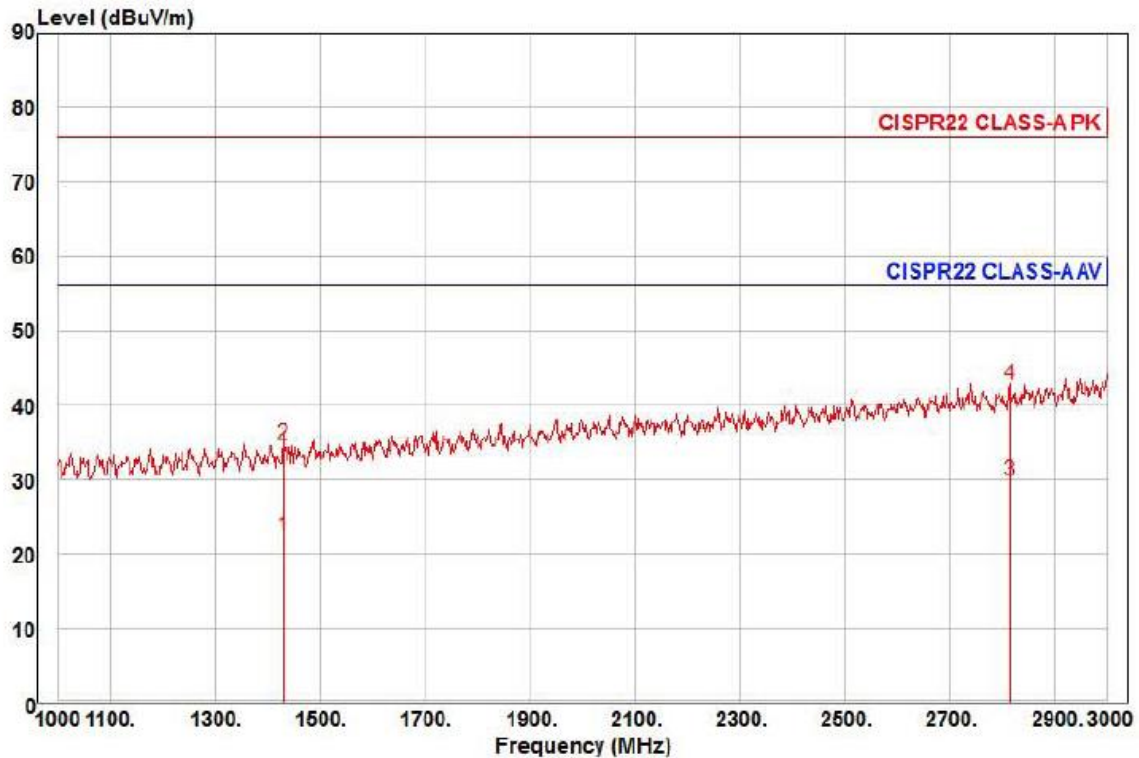
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Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNB-8000P
Mode : DC 12 V
Memo :

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1428.00	26.00	23.80	8.01	35.49	343	56.00	-33.68	vertical	Average
2	1428.00	38.31	23.80	8.01	35.49	343	76.00	-41.37	vertical	Peak
3 pp	2814.00	23.26	28.92	11.64	33.97	60	56.00	-26.15	vertical	Average
4 pk	2814.00	36.22	28.92	11.64	33.97	60	76.00	-33.19	vertical	Peak

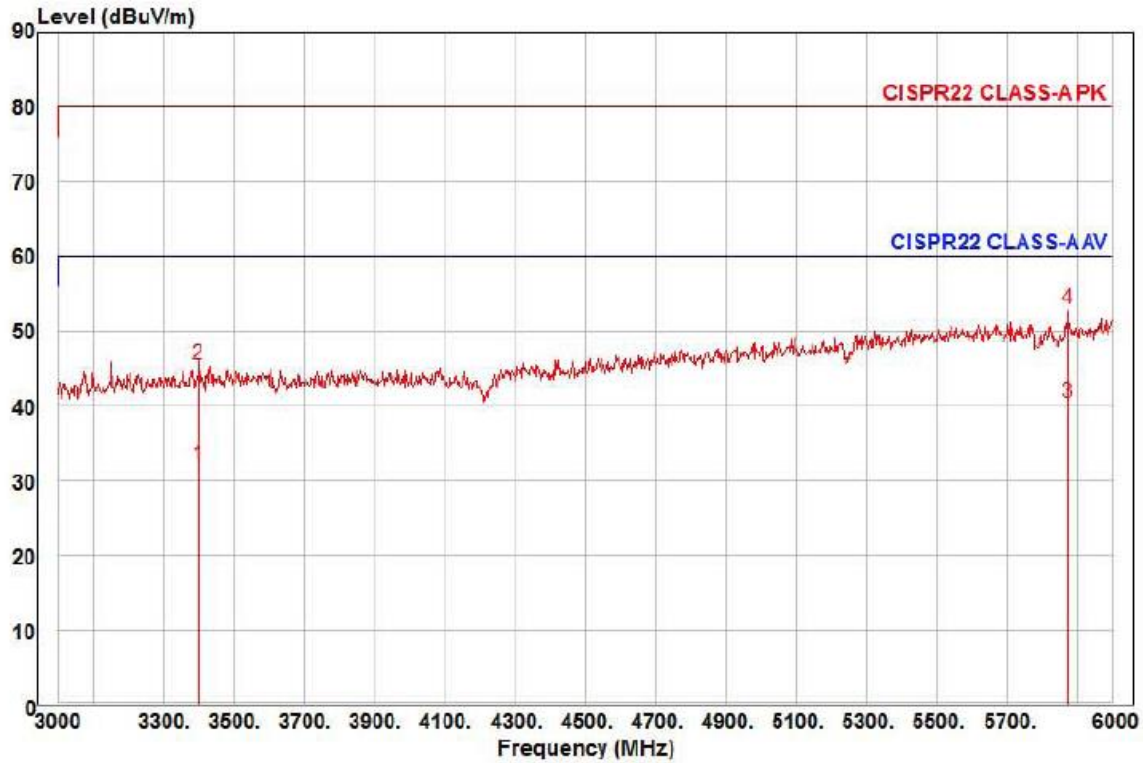
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Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNB-8000P
Mode : DC 12 V
Memo :

	Freq	Read Level	Ant Factor	Cable Loss	Preamplifier Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3399.00	22.39	30.87	13.02	34.29	240	60.00	-28.01	horizontal	Average
2	3399.00	35.80	30.87	13.02	34.29	240	80.00	-34.60	horizontal	Peak
3 pp	5871.00	20.48	35.93	17.26	33.33	277	60.00	-19.66	horizontal	Average
4 pk	5871.00	33.17	35.93	17.26	33.33	277	80.00	-26.97	horizontal	Peak

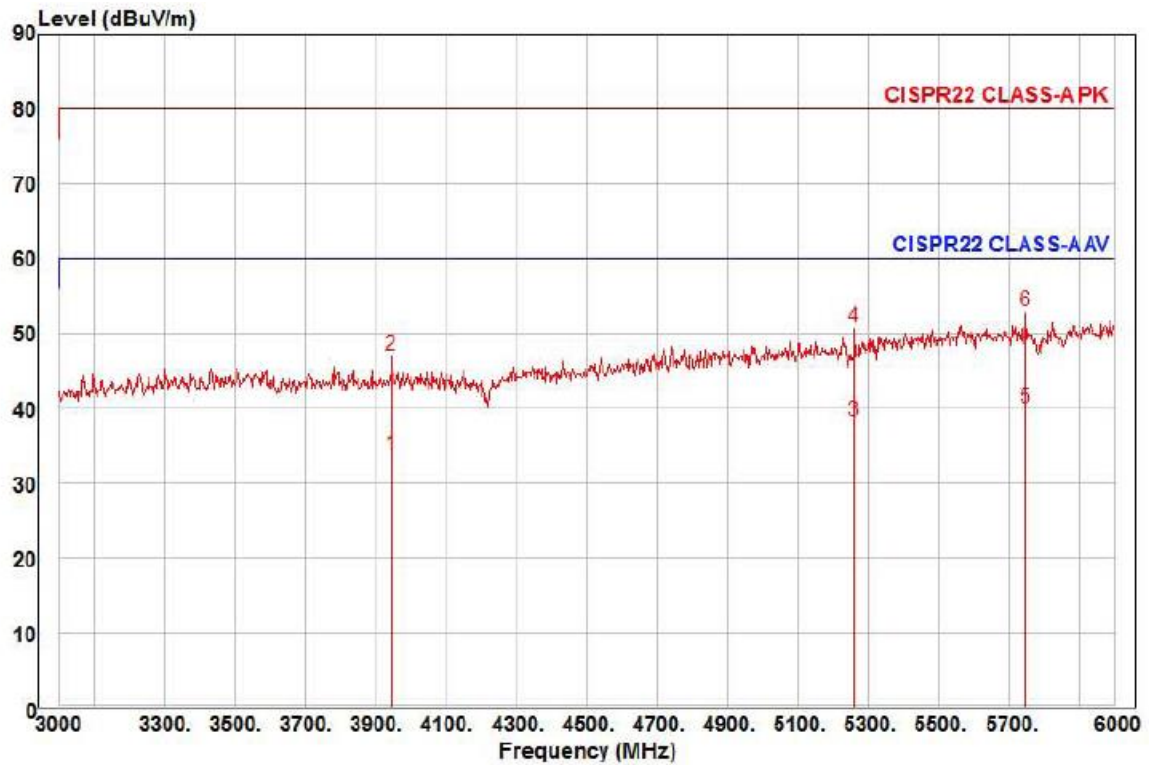
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Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNB-8000P
Mode : DC 12 V
Memo :

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3945.00	22.27	32.35	13.95	34.91	144	60.00	-26.34	vertical	Average
2	3945.00	35.76	32.35	13.95	34.91	144	80.00	-32.85	vertical	Peak
3	5262.00	20.83	34.44	16.18	33.25	16	60.00	-21.80	vertical	Average
4	5262.00	33.35	34.44	16.18	33.25	16	80.00	-29.28	vertical	Peak
5 pp	5748.00	20.54	35.74	16.97	33.31	44	60.00	-20.06	vertical	Average
6 pk	5748.00	33.64	35.74	16.97	33.31	44	80.00	-26.96	vertical	Peak

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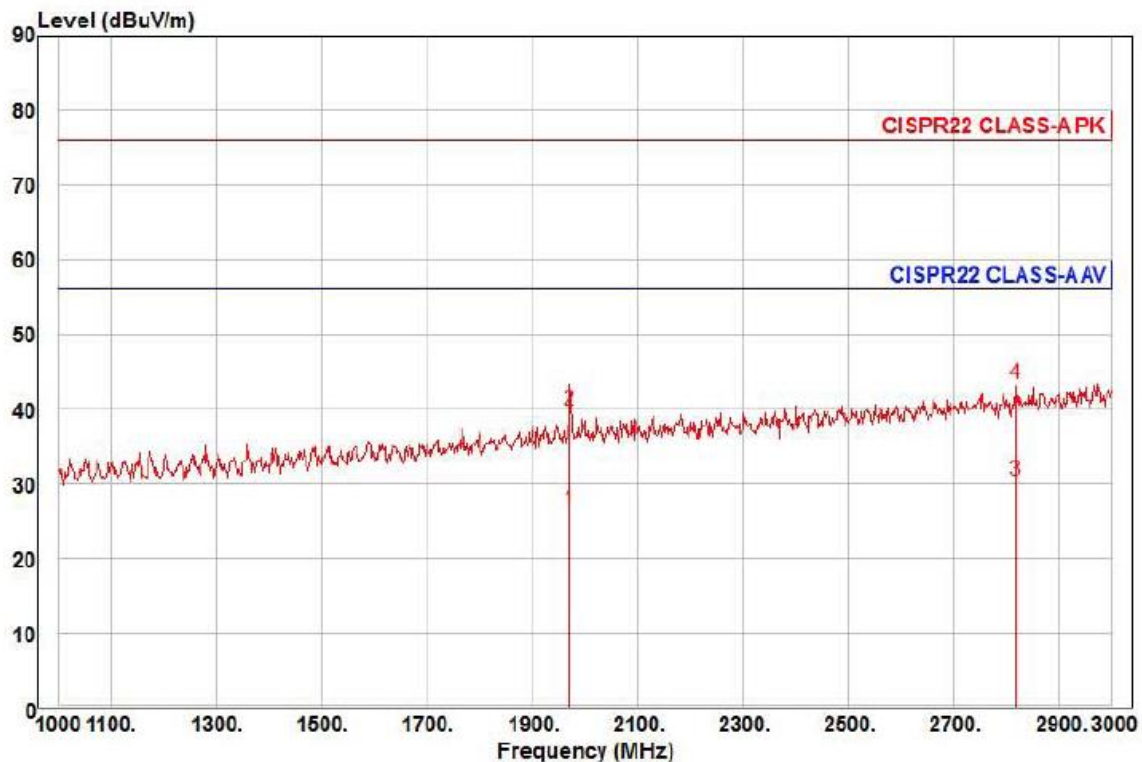


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PoE Mode



Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNB-8000P
Mode : PoE
Memo :

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1972.00	25.51	25.90	9.57	34.58	78	56.00	-29.60	horizontal	Average
2	1972.00	38.84	25.90	9.57	34.58	78	76.00	-36.27	horizontal	Peak
3 pp	2818.00	23.85	28.94	11.65	33.97	68	56.00	-25.53	horizontal	Average
4 pk	2818.00	36.77	28.94	11.65	33.97	68	76.00	-32.61	horizontal	Peak

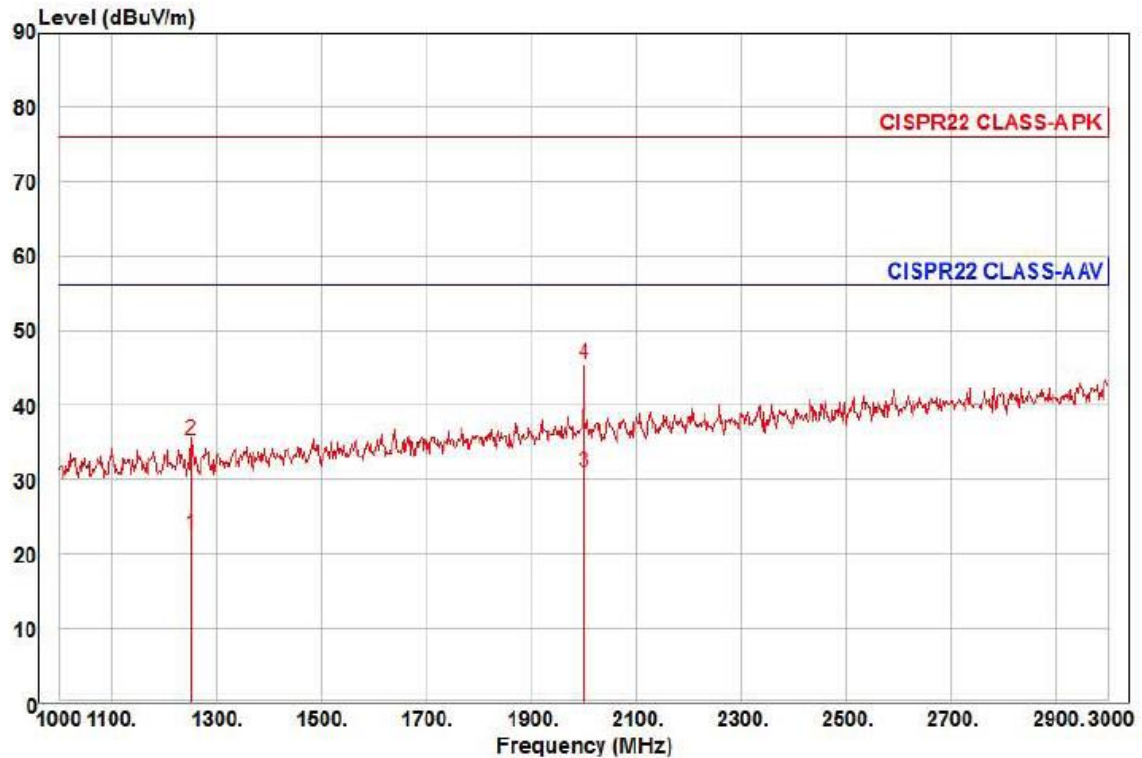
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Test report No.:
KES-E1-17T0761
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Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNB-8000P
Mode : PoE
Memo :

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1252.00	27.58	23.27	7.45	35.78	204	56.00	-33.48	vertical	Average
2	1252.00	40.29	23.27	7.45	35.78	204	76.00	-40.77	vertical	Peak
3 pp	2000.00	29.79	26.01	9.65	34.53	295	56.00	-25.08	vertical	Average
4 pk	2000.00	44.44	26.01	9.65	34.53	295	76.00	-30.43	vertical	Peak

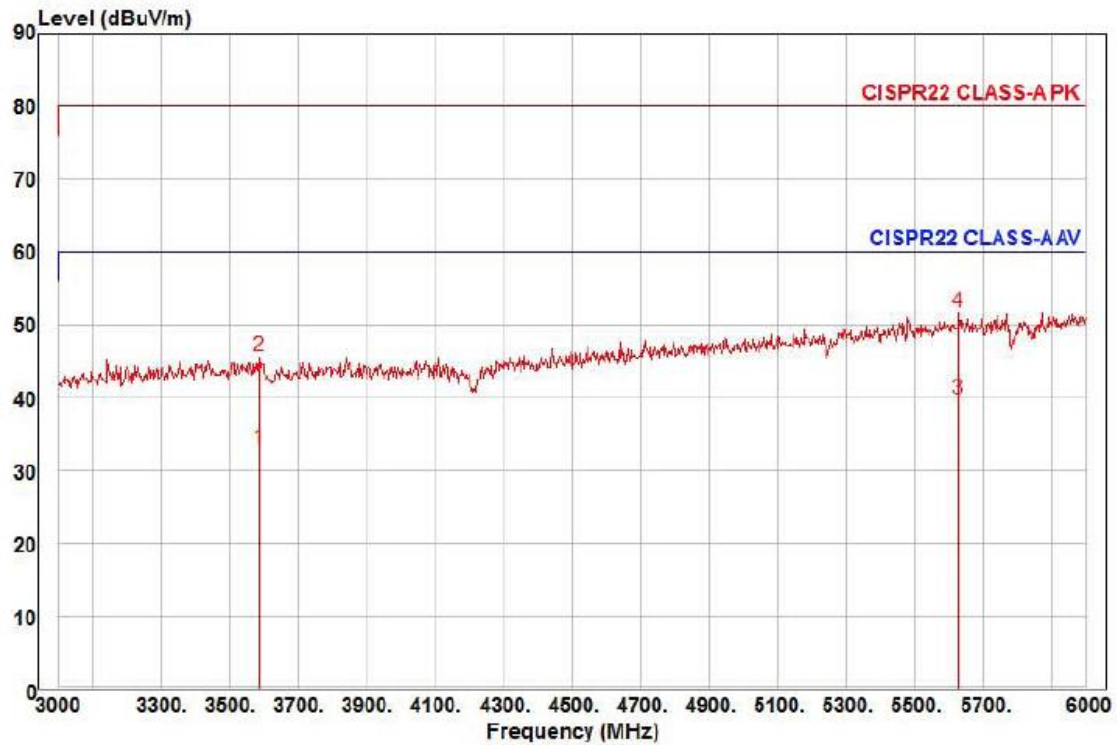
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Test report No.:
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Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNB-8000P
Mode : PoE
Memo :

	Freq	Read Level	Ant Factor	Cable Loss	Preamplifier Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3585.00	22.77	31.38	13.25	34.50	50	60.00	-27.10	horizontal	Average
2	3585.00	35.64	31.38	13.25	34.50	50	80.00	-34.23	horizontal	Peak
3 pp	5628.00	20.69	35.56	16.81	33.30	124	60.00	-20.24	horizontal	Average
4 pk	5628.00	32.70	35.56	16.81	33.30	124	80.00	-28.23	horizontal	Peak

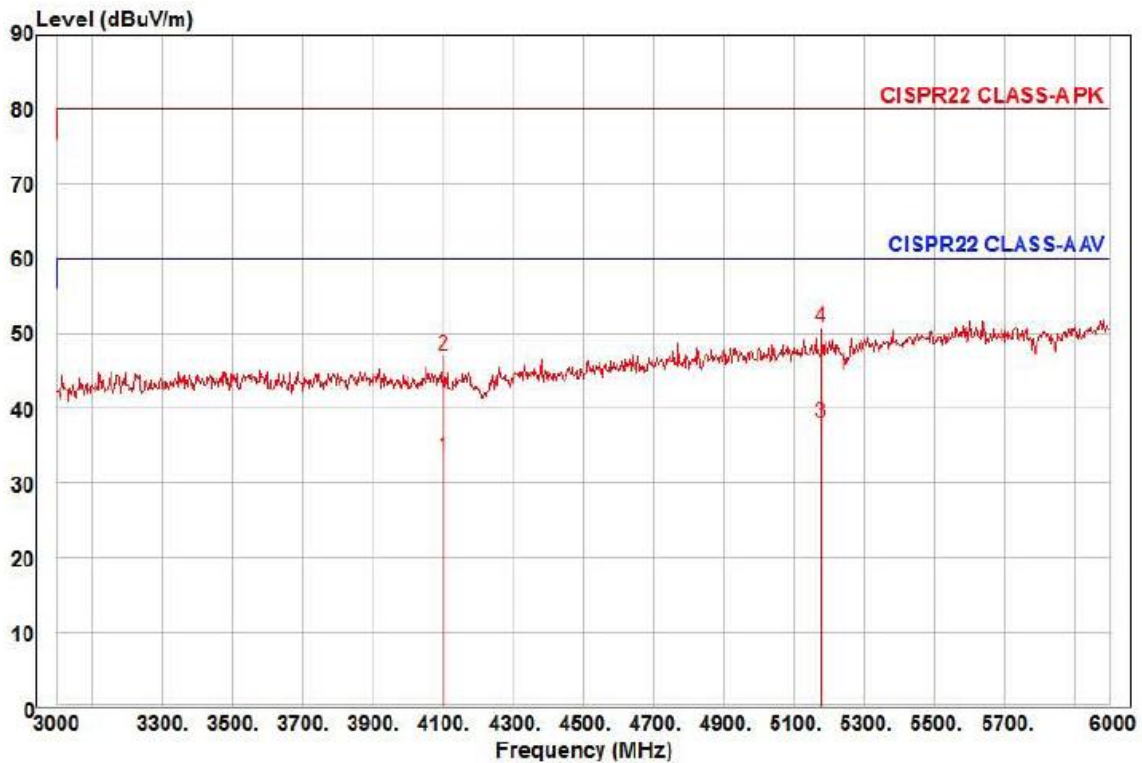
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Test report No.:
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Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNB-8000P
Mode : PoE
Memo :

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	4104.00	21.62	32.47	14.24	34.79	179	60.00	-26.46	vertical	Average
2	4104.00	35.09	32.47	14.24	34.79	179	80.00	-32.99	vertical	Peak
3 pp	5178.00	21.20	34.11	16.03	33.23	48	60.00	-21.89	vertical	Average
4 pk	5178.00	33.92	34.11	16.03	33.23	48	80.00	-29.17	vertical	Peak

◆ Calculation - SAC #3

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

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Test report No.:
KES-E1-17T0761
Page (64) of (80)

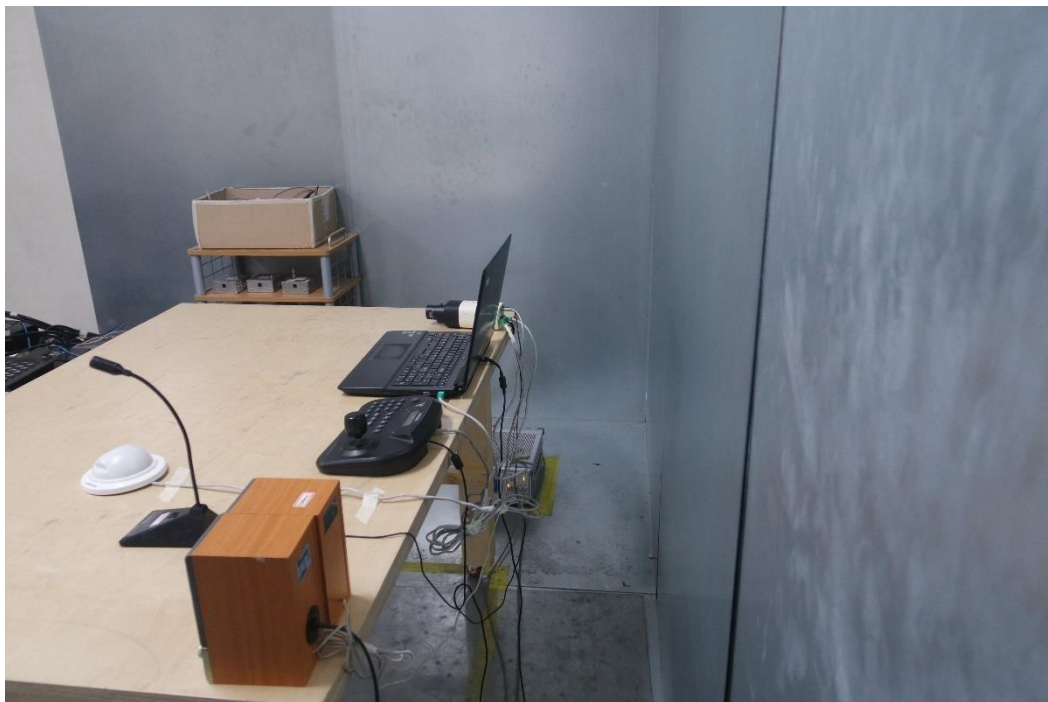
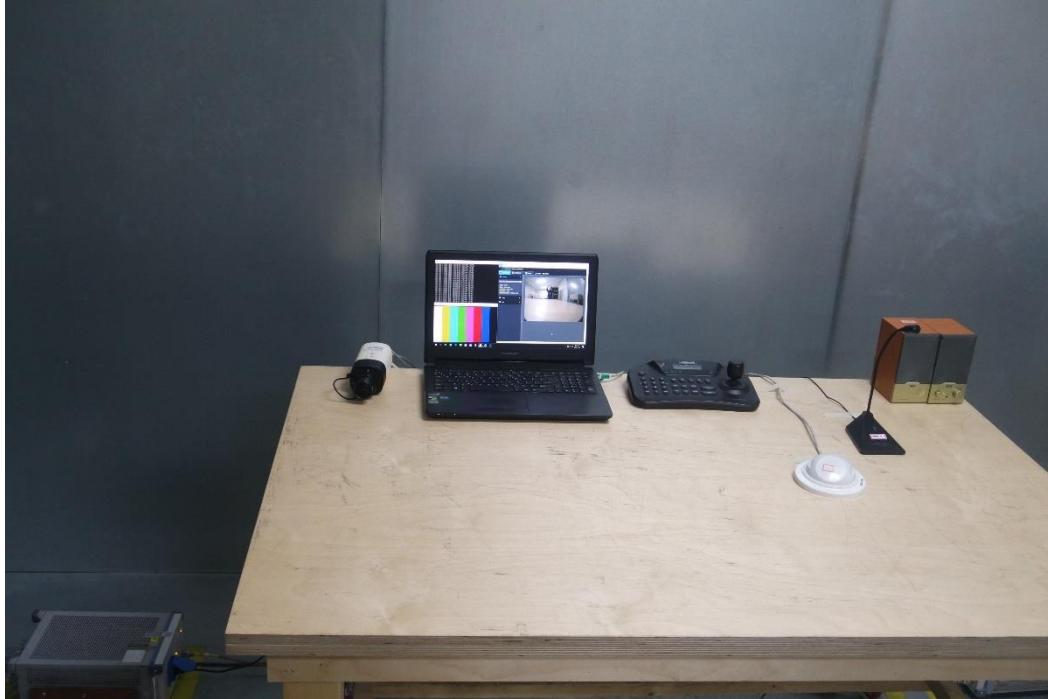
Harmonic Current Emissions and Voltage Fluctuations and Flicker

N/A

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Test Setup Photos and Configuration

Conducted Voltage Emissions



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Conducted Telecommunication Emissions



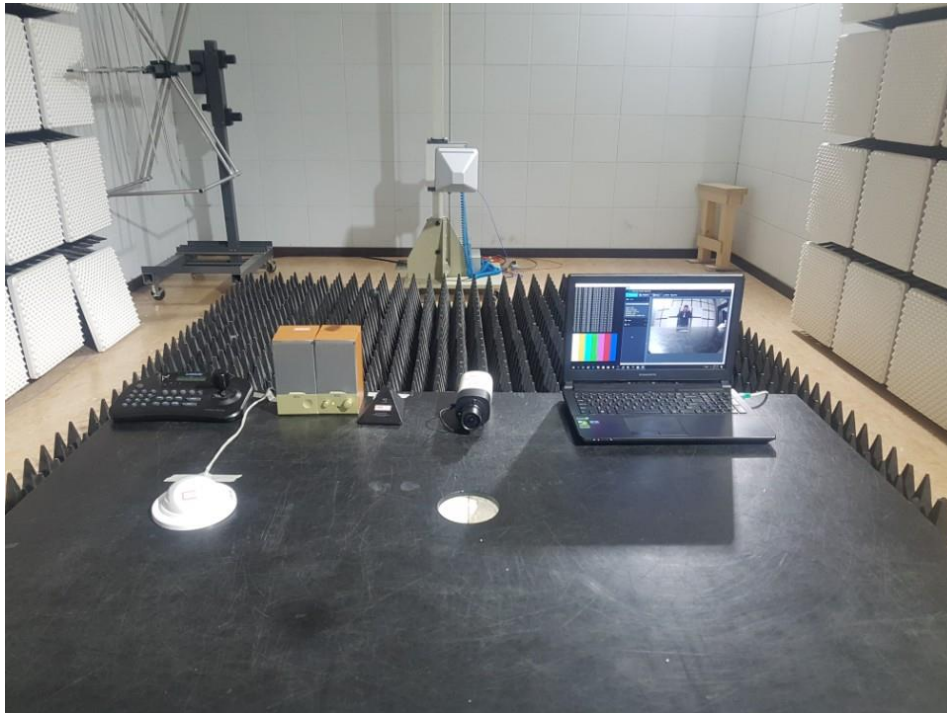
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Radiated Electric Field Emissions(Below 1 GHz)



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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



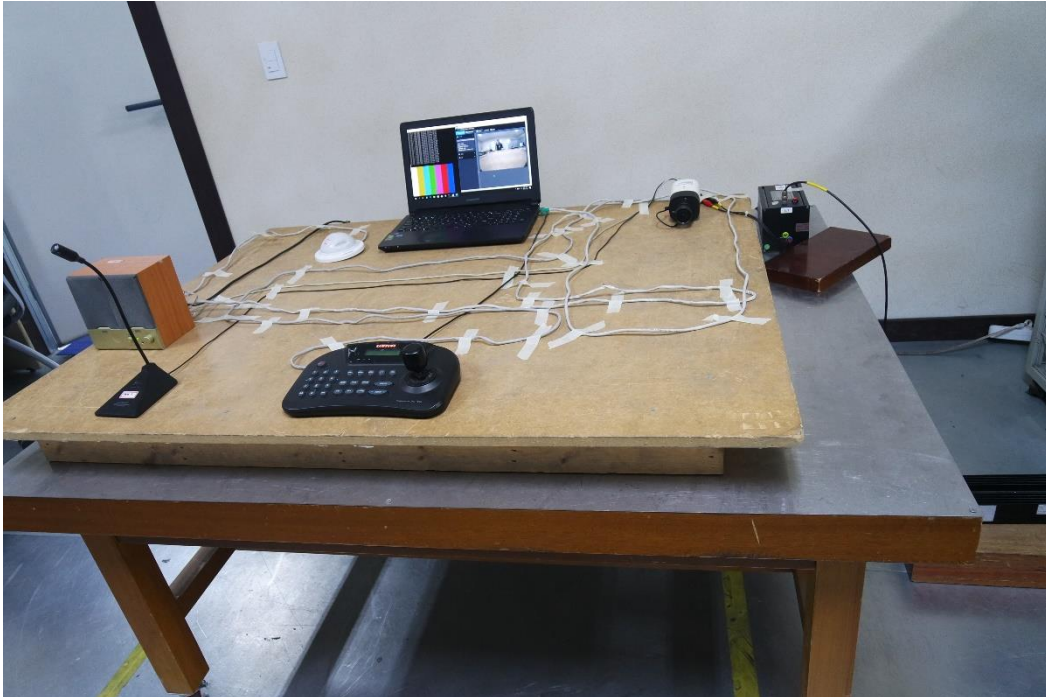
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Surge Transients



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Conducted Disturbance



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Voltage Dips and Short Interruptions



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EUT External Photographs

(Top)



(Bottom)



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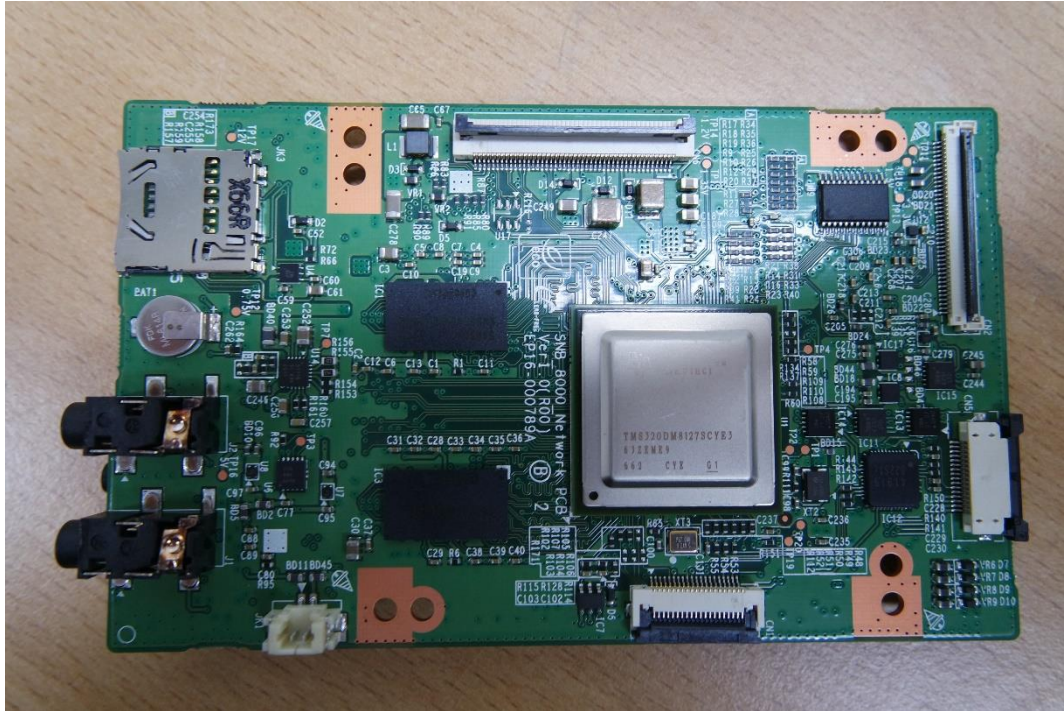
EUT Internal Photographs

(Internal View)

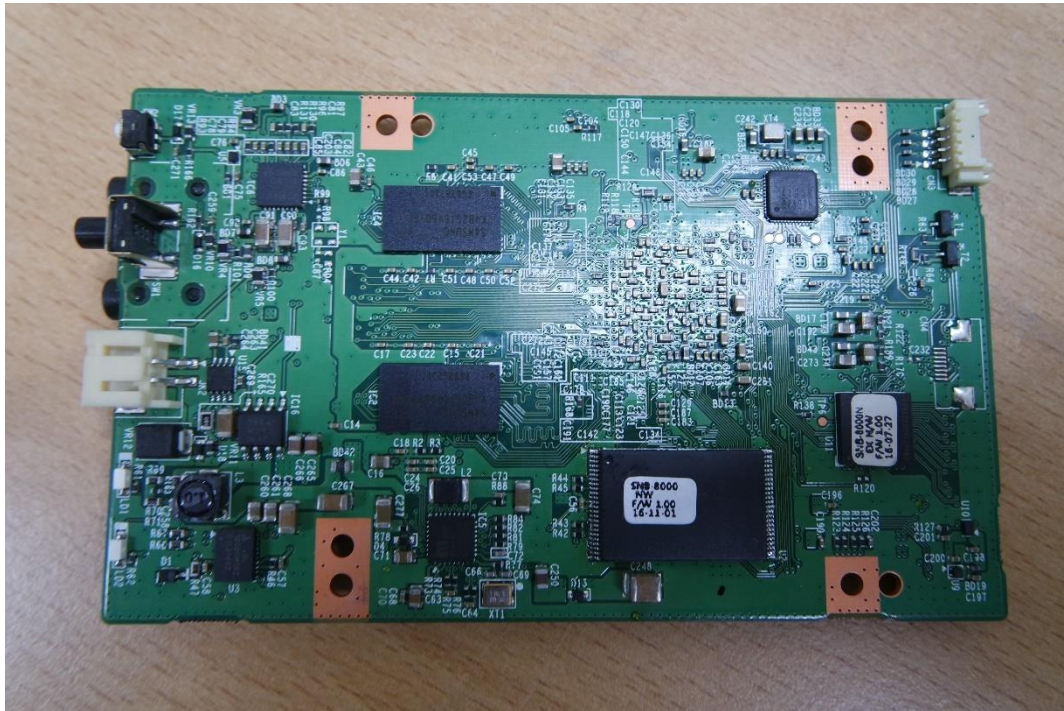


EUT Internal View – Main Board

(Top)



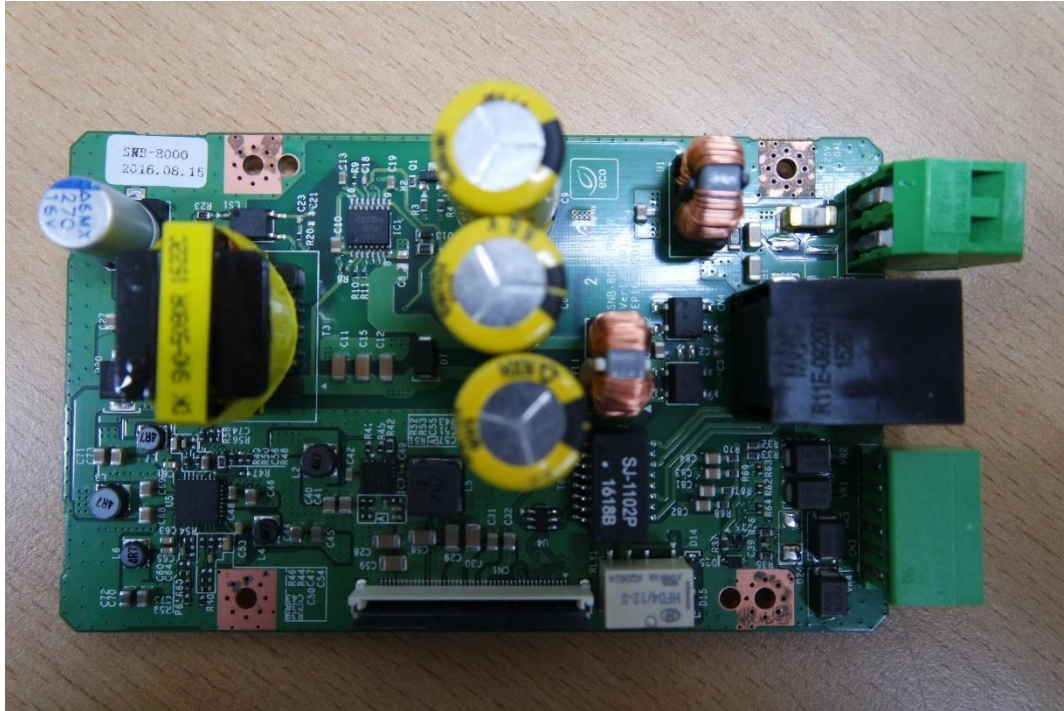
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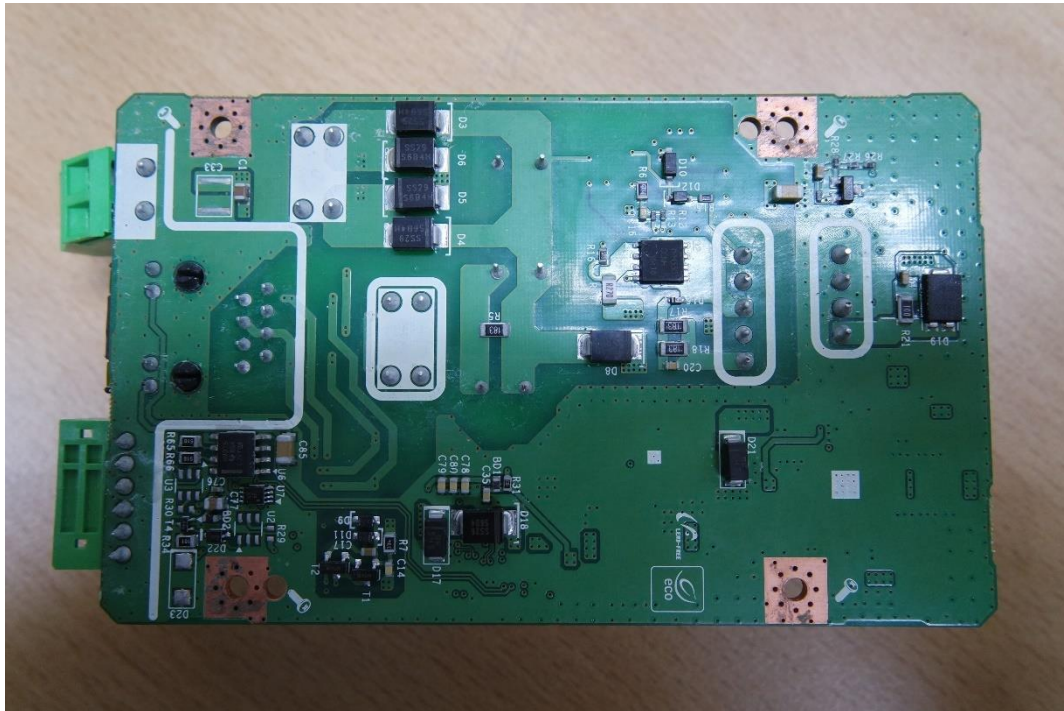
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EUT Internal View – Power Board

(Top)



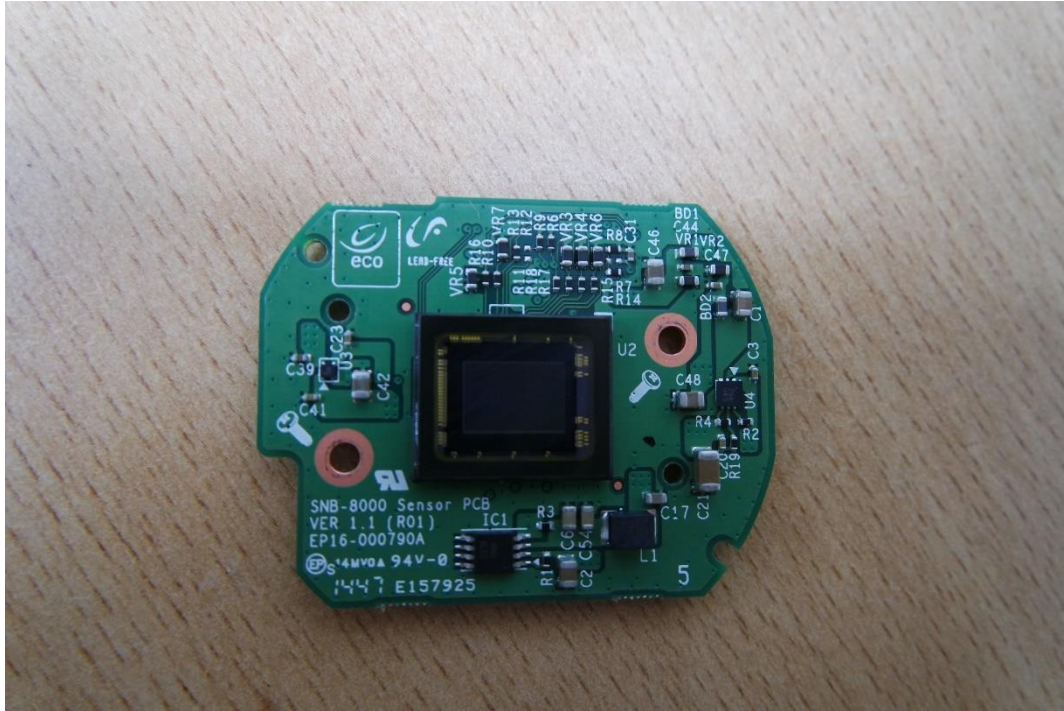
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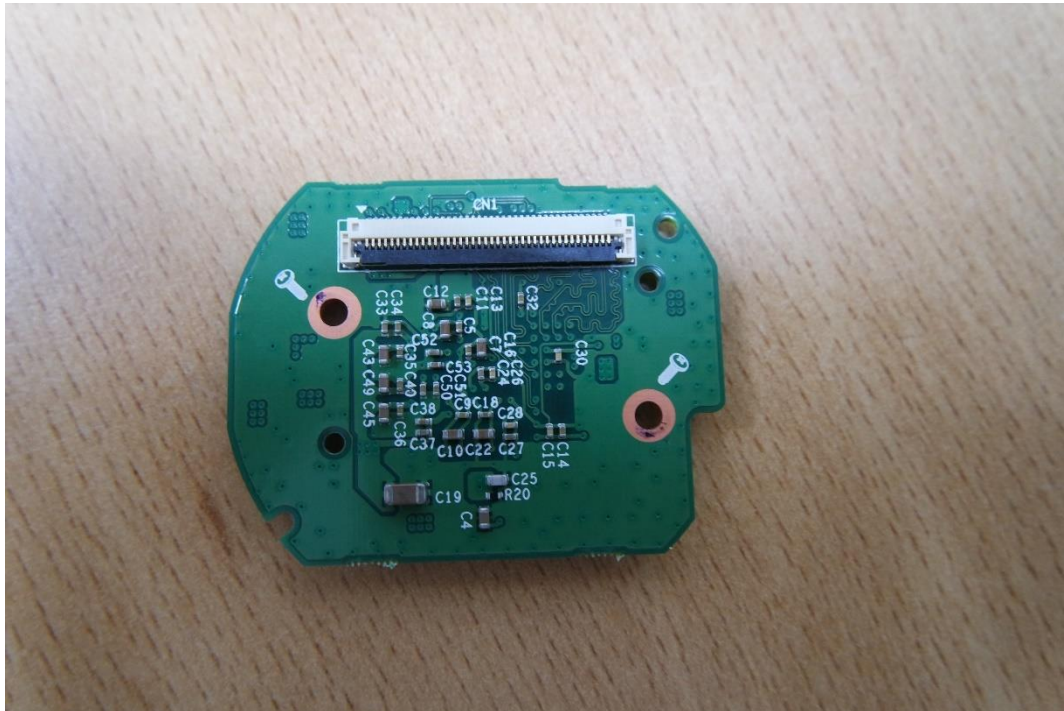
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EUT Internal View – CCD Board

(Top)

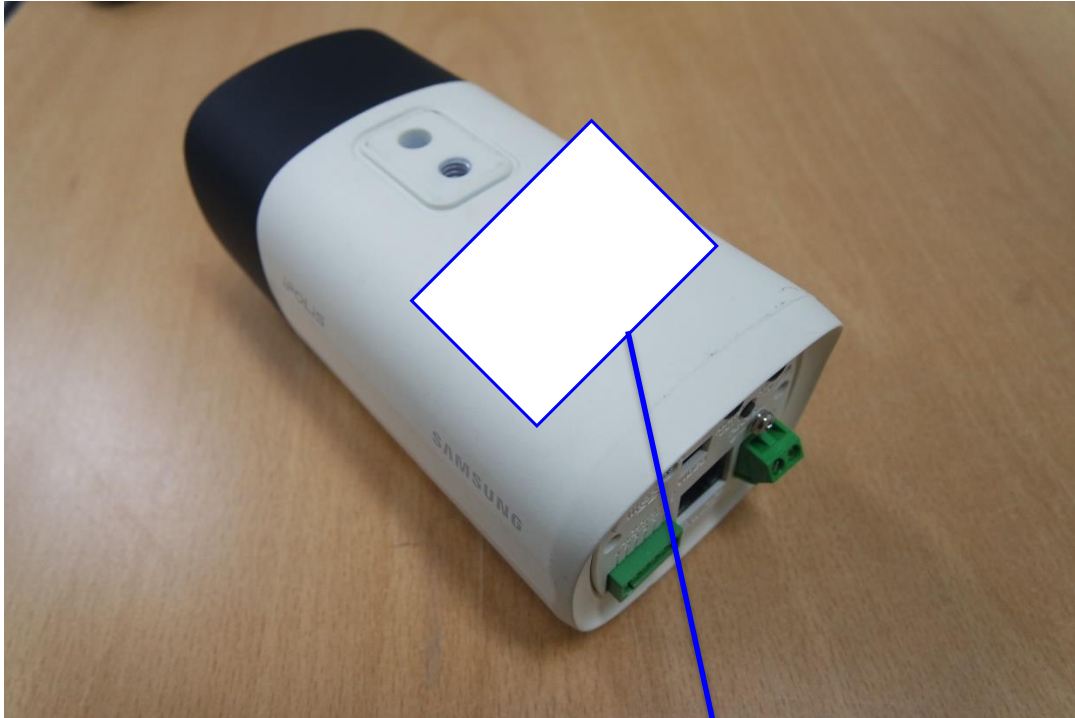


(Bottom)



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Label and Location



NETWORK CAMERA

Model No : SNB-8000P

Manufacturer : Hanwha Techwin Co., Ltd.

Made in China

