



EMC TEST REPORT For CE

Test Report No. : KES-E1-17T0593-R1
Date of Issue : May. 15, 2019
Product name : NETWORK STORAGE
Model/Type No. : SRB-160S
Variant Model : -
Applicant : Hanwha Techwin Co., Ltd.
Applicant Address : 6, Pangyo-ro 319 Beon-gil, Bundang-gu, Seongnam-si,
Gyeonggi-do, 13488, KOREA
Manufacturer : C-PRO ELECTRONICS
Manufacturer Address : #4F,5F, 214, Galmachi-ro, Jungwon-gu, Seongnam-si,
Gyeonggi-do, Korea.
Date of Receipt : Aug. 25, 2017
Test date : Sep. 04, 2017 ~ Sep. 05, 2017
Test Results : ☒ In Compliance ☐ Not in Compliance

Tested by

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EMC Test Engineer

Reviewed by

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This test report is not related to KOLAS.

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Report No.:

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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Sep. 06, 2017	KES-E1-17T0593	Issued
May. 15, 2019	KES-E1-17T0593-R1	Re-issue due to changed customer's address

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1.0 General Product Description

Main Specifications of E.U.T are:

General	
OS	Linux
Network Protocols	iSCSI(IP-SAN), DHCP, HTTP, TCP/IP, UDP/IP, SNMP v1/v2c/v3, SMTP, DNS, NTP
Supported RAID Level	RAID0, RAID10, RAID5, RAID5+Hot Standby, RAID6
Maximum iSCSI Volume	8
Network Bonding	Failover and Load Balancing
One-Touch Button Setup	Creates an RAID5 volume and iSCSI target node(s)
Hardware	
CPU	ARM v7 Quad Core 1.6GHz
Floating Point	Yes
RAM Size	DDR3 2.0 GB (Expandable up to 8GB)
Internal HDD	3.5" SATA (III)/ SATA (II) x 16 (HDDs not included)
	Hardware RAID PCI Express to SATA Solution
Hot Swappable HDD	Yes
Dimension	482(W) x 133(H) x 548(D) mm
Weight	15.2kg (without HDDs)
LAN	1 Gbps RJ-45 Port x 4
Power Source(520W, Redunant)	
Frequency	50~60Hz
AC Voltage	100~240VAC
Current	8.5/4A at 100/240V
MTBF	Over 100,000 hours (25 °C, Full Load)
Environment and Packing	
Environment	RoHS Compliant, Lead Free
EMC/Safety	KC, FCC, CE

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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 STORAGE	SRB-160S	-	C-PRO ELECTRONICS	E.U.T

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Notebook	LG15N54	410NZGK015231	LG	-
Notebook Adaptor	PA-1900-14	OGNEH63348701F3 55(1.0)	LITE-ON TECHNOLOGY (CHANGZHOU)CO., LTD.	-

1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK STORAGE (E.U.T)	RJ-45	Notebook	RJ-45	3.0	U

* Unshielded=U, Shielded=S

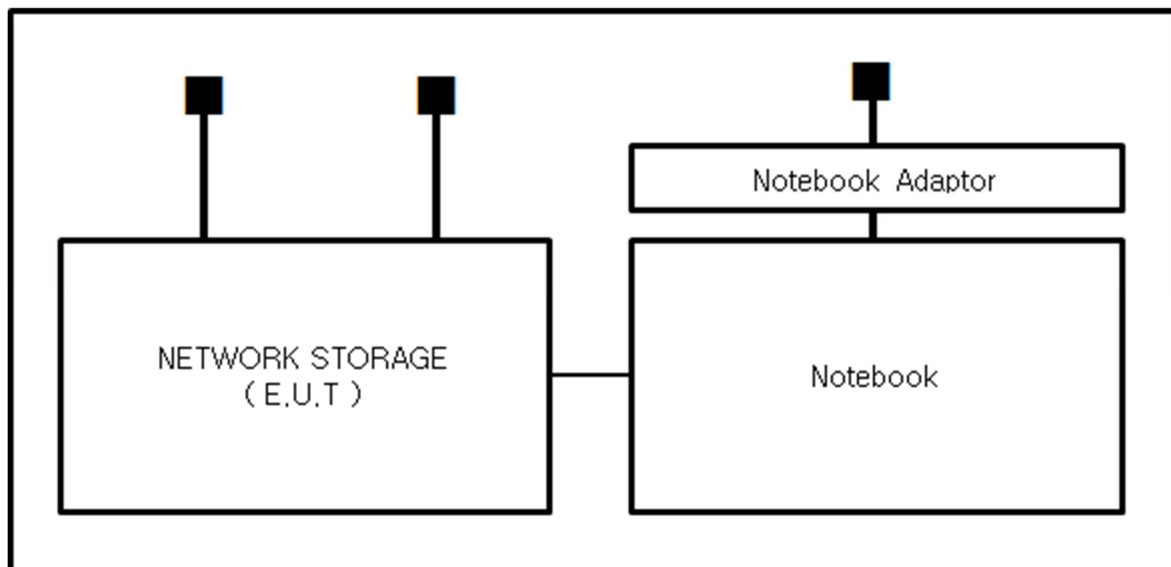
1.7 E.U.T Operating Mode(s)

Test mode	operating
OP	PINGTEST and data transmission and reception were repeated in the notebook Computer.

E.U.T Test operating S/W		
Name	Version	Manufacture Company
-	-	-

1.8 Configuration

■ AC Main
 □ DC Main



1.9 Remarks when standards applied

- N/A

1.10 Calibration Details of Equipment Used for Measurement

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

1.11 Test Facility

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

1.12 Laboratory Accreditations and Listings

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



2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **EMC – Directive 2014/30/EU**

☐ EN 61000-6-3:2011

☐ EN 61000-6-1:2007

☐ EN 61000-6-4:2007 +A1:2011

☐ EN 61000-6-2:2005

☐ EN 55011:2007 +A1:2010

☐ Group 1
☐ Class A

☐ Group 2
☐ Class B

☐ EN 55014-1:2006 +A2:2011

☐ EN 55014-2:1997 +A2:2008

☐ EN 55015:2013

☐ EN 61547:2009

☒ EN 55032:2012/AC:2013

☒ Class A

☐ Class B

☐ EN 55024:2010 +A1:2015

☒ EN 50130-4:2011 +A1:2014

☒ EN 61000-3-2:2014

☒ EN 61000-3-3:2013

☐ EN 61326-1:2013



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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

Sep. 04, 2017

Test Location

Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EMC32	R & S	9.12.00	-
☒	EMI TEST RECEIVER	ESR3	R & S	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	12, 13, 2017

Test Conditions

Temperature: 24,7 °C

Relative Humidity: 51,7 %

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

Sep. 04, 2017

Test Location

Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EMC32	R & S	9.12.00	-
☒	EMI TEST RECEIVER	ESR3	R & S	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

Test Conditions

Temperature: 24,7 °C

Relative Humidity: 51,7 %

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

Sep. 04, 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 S/W	-	-	-	-
☒	EMI TEST RECEIVER	ESVS10	R & S	826008/014	04, 18, 2018
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	714	11, 28, 2018

Test Conditions

Temperature: 25,1 °C
Relative Humidity: 60,0 %

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

Sep. 04, 2017

Test Location

SEMI ANECHOIC CHAMBER #2

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: 24,0 °C

Relative Humidity: 50,5 %

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

Sep. 04, 2017

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

Temperature: 24,7 °C

Relative Humidity: 51,7 %

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

See Appendix A for test data.



2.6 Voltage Fluctuations and Flicker

Test Date

Sep. 04, 2017

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, 08, 2018
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	-

Test Conditions

Temperature: 24,7 °C

Relative Humidity: 51,7 %

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

See Appendix A for test data.

3.0 Criteria for compliance

Criteria for compliance was based on the following guidelines:

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

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

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

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

Electrostatic discharge

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

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

Radiated electromagnetic fields

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

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

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

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

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

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

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

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

Fast transient burst / slow high energy voltage surge

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

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

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

Conducted RF immunity

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

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

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

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

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

Voltage dip/interruption / Voltage variation

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

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



3.1 Electrostatic Discharge

Reference Standard

EN 61000-4-2:2009

Test Date

Sep. 05, 2017

Test Location

EMS-ESD: Electro wave Shieldroom

Test Equipment

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

Test Conditions

Temperature: 22,8 °C
Relative Humidity: 50,9 %
Atmospheric Pressure: 99,6 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

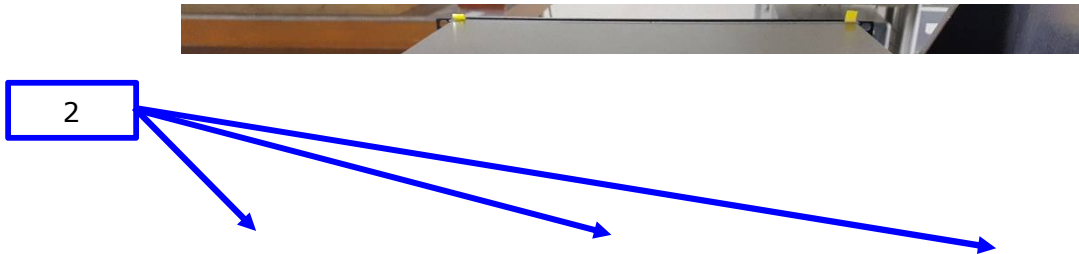
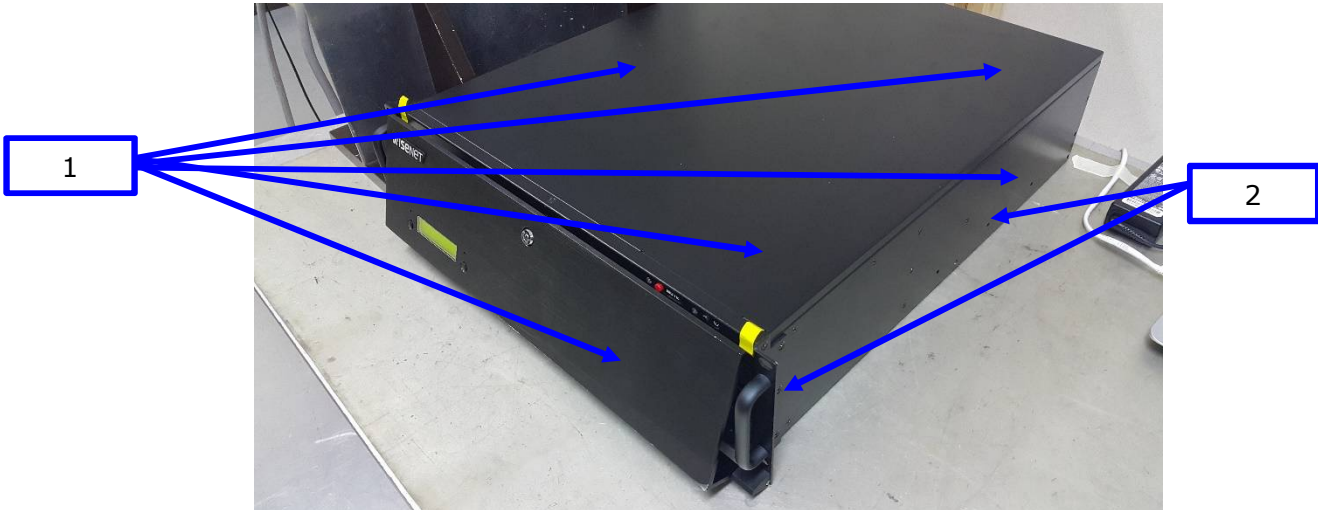
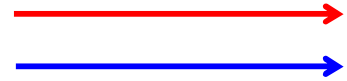
Notes: HCP: Horizontal coupling plane

VCP: Vertical coupling plane

Required Performance Criteria: ☒ Complied

Location of Discharge:

Air
Contact



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Test Data

Indirect Discharge

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

Direct Discharge

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

Sep. 05, 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: 24,3 °C
Relative Humidity: 52,2 %
Atmospheric Pressure: 99,1 kPa



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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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KES-E1-17T0593-R1

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Test Data

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

Sep. 05, 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	EM TEST	5.3.9	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N5T	EM TEST	P1317117973	02, 08, 2018
☒	MOTOR VARIAC	MV2616	EM TEST	V0936105123	02, 08, 2018
☒	CAPACITIVE COUPLING CLAMP	HFK	EM TEST	070925	06, 26, 2018

Test Conditions

Temperature: 22,8 °C
 Relative Humidity: 50,9 %
 Atmospheric Pressure: 99,6 kPa

Test Specifications

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

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

Burst Period: ☒ 300 ms ☐ 2 s

Repetition Rate: ☐ 5 klz ☒ 100 klz

Duration of Test Voltage: ☒ ≥ 1 min

Required Performance Criteria: ☒ Complied

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Test Data☒ Input a.c. power ports – Coupling/Decoupling Network used

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

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

Sep. 05, 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	EM TEST	5.3.9	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N5T	EM TEST	P1317117973	02, 08, 2018
☒	MOTOR VARIAC	MV2616	EM TEST	V0936105123	02, 08, 2018
☒	CDN	CNV 508N1	EM TEST	P1551168979	04, 26, 2018
☐	CDN	CNV 508T5	EM TEST	P1549168422	04, 26, 2018

Test Conditions

Temperature: 22,8 °C
Relative Humidity: 50,9 %
Atmospheric Pressure: 99,6 kPa



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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

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Test Data☒ 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)
L – PE	Complied	Complied
N – PE	Complied	Complied

Signal Lines☒ Line to Earth – Common Mode

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

Note: “Blank” = Not performed

Observations:

Complied – No degradation of function

Test Results☒ PASS Required Performance Criteria☐ NOT PASS Required Performance Criteria**Remarks**PASS Required Performance Criteria.



3.5 Conducted Disturbance

Reference Standard

EN 61000-4-6:2014

Test Date

Sep. 05, 2017

Test Location

EMS-CS: Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	icd.control	EM TEST	5.3.7	-
☒	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: 22,8 °C
Relative Humidity: 50,9 %
Atmospheric Pressure: 99,6 kPa



Test Specifications

- Frequency range: ☒ 150 kHz to 100 MHz ☐ 150 kHz to 80 MHz
- Voltage Level: ☐ 1 Vrms ☐ 3 Vrms
☒ 10 Vrms
- Modulation: ☒ AM, 80 %, 1 kHz sine wave
☒ PM, 1 Hz (0,5 s ON : 0,5 s OFF)
- Frequency step: ☒ 1 % step
- Dwell Time: ☒ 1 s ☐ 3 s
- Required Performance Criteria: ☒ Complied

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Test Data☒ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
L - N - PE	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 T8	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

RemarksPASS Required Performance Criteria.



3.6 Voltage Dips and Short Interruptions

Reference Standard

EN 61000-4-11:2004

Test Date

Sep. 05, 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	EM TEST	5.3.9	-
☒	ULTRA COMPACT SIMULATOR	UCS 500N5T	EM TEST	P1317117973	02, 08, 2018
☒	MOTOR VARIAC	MV2616	EM TEST	V0936105123	02, 08, 2018

Test Conditions

Temperature: 22,8 °C
Relative Humidity: 50,9 %
Atmospheric Pressure: 99,6 kPa



Test Specifications & Observations/Remarks

- AC 24 V Mode

(Test Voltage : 50 Hz)

<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

PASS Required Performance Criteria.

APPENDIX A – TEST DATA

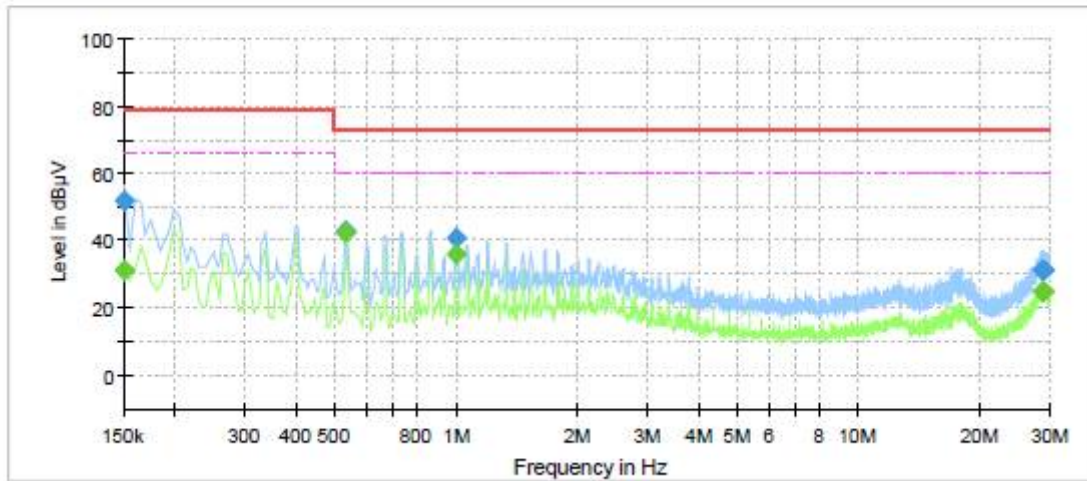
Conducted Emissions at Mains Power Ports

■ POWER1 Mode

[HOT]

Common Information

Test Description:	Conducted Emission
Model No.:	SRB-160S
Mode	POWER1_H
Operator Name:	KES



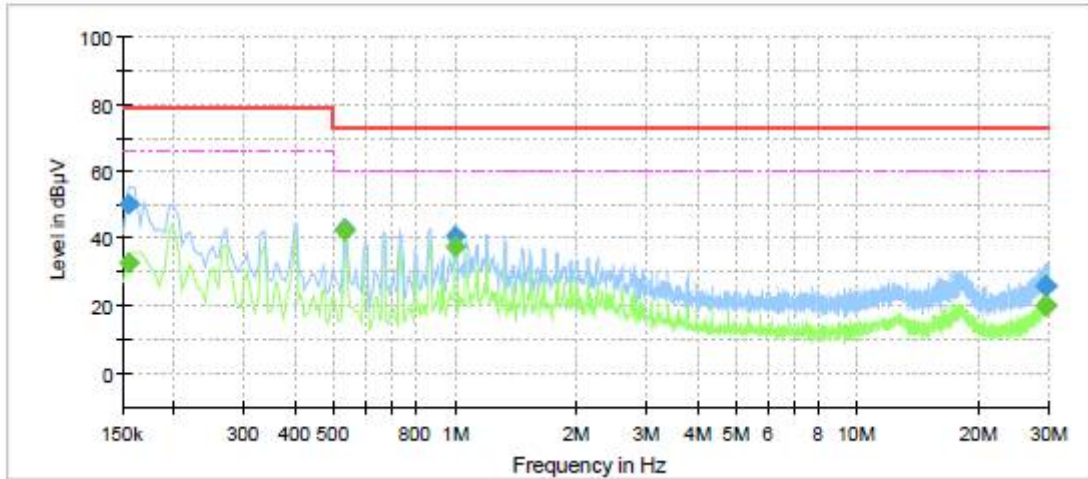
Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.150000	---	31.13	66.00	34.87	1000.0	9.000	L1	19.4
0.150000	51.65	---	79.00	27.35	1000.0	9.000	L1	19.4
0.535000	---	42.33	60.00	17.67	1000.0	9.000	L1	19.6
0.535000	43.01	---	73.00	29.99	1000.0	9.000	L1	19.6
1.000000	---	35.80	60.00	24.20	1000.0	9.000	L1	19.8
1.000000	40.95	---	73.00	32.05	1000.0	9.000	L1	19.8
28.845000	---	25.02	60.00	34.98	1000.0	9.000	L1	20.1
28.845000	31.17	---	73.00	41.83	1000.0	9.000	L1	20.1
28.990000	---	25.10	60.00	34.90	1000.0	9.000	L1	20.1
28.990000	31.33	---	73.00	41.67	1000.0	9.000	L1	20.1

[NEUTRAL]

Common Information

Test Description:	Conducted Emission
Model No.:	SRB-160S
Mode	POWER1_N
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	33.05	66.00	32.95	1000.0	9.000	N	19.4
0.155000	50.55	---	79.00	28.45	1000.0	9.000	N	19.4
0.535000	---	42.10	60.00	17.90	1000.0	9.000	N	19.6
0.535000	42.70	---	73.00	30.30	1000.0	9.000	N	19.6
1.005000	---	37.57	60.00	22.43	1000.0	9.000	N	19.8
1.005000	40.74	---	73.00	32.26	1000.0	9.000	N	19.8
29.245000	---	19.98	60.00	40.02	1000.0	9.000	N	20.2
29.245000	26.14	---	73.00	46.86	1000.0	9.000	N	20.2
29.725000	---	19.98	60.00	40.02	1000.0	9.000	N	20.2
29.725000	26.07	---	73.00	46.93	1000.0	9.000	N	20.2

POWER2 Mode

[HOT]

Common Information

Test Description:

Model No.:

Mode

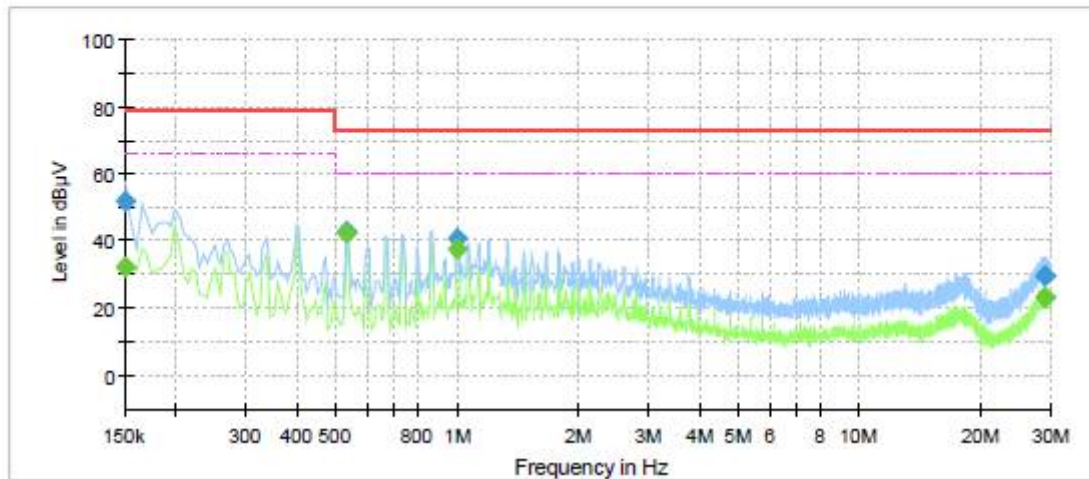
Operator Name:

Conducted Emission

SRB-160S

POWER2_H

KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.150000	---	32.36	66.00	33.64	1000.0	9.000	L1	19.4
0.150000	51.63	---	79.00	27.37	1000.0	9.000	L1	19.4
0.535000	---	42.41	60.00	17.59	1000.0	9.000	L1	19.6
0.535000	43.09	---	73.00	29.91	1000.0	9.000	L1	19.6
1.005000	---	37.61	60.00	22.39	1000.0	9.000	L1	19.8
1.005000	40.83	---	73.00	32.17	1000.0	9.000	L1	19.8
28.910000	---	23.45	60.00	36.55	1000.0	9.000	L1	20.1
28.910000	29.72	---	73.00	43.28	1000.0	9.000	L1	20.1
29.125000	---	23.57	60.00	36.43	1000.0	9.000	L1	20.1
29.125000	29.73	---	73.00	43.27	1000.0	9.000	L1	20.1

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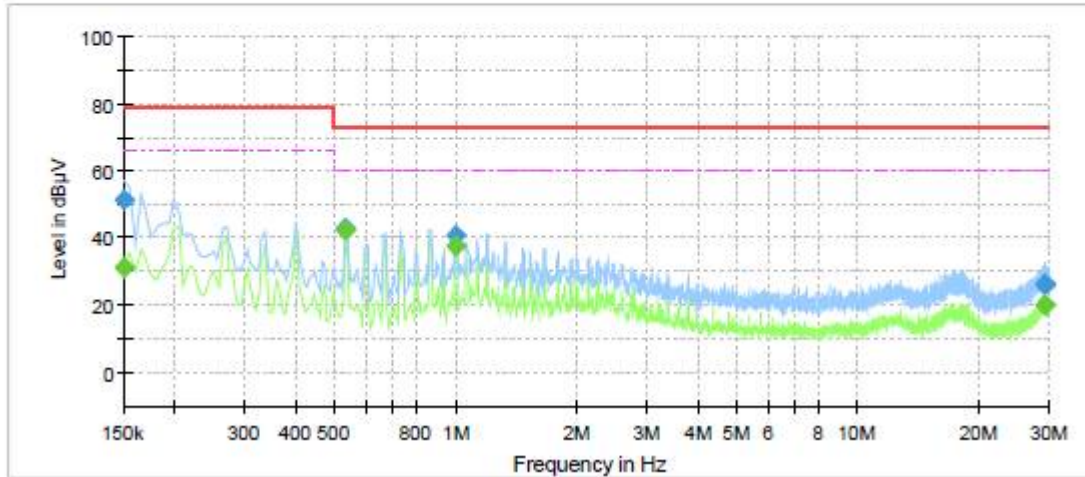
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[NEUTRAL]

Common Information

Test Description:	Conducted Emission
Model No.:	SRB-160S
Mode	POWER2_N
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.150000	---	31.44	66.00	34.56	1000.0	9.000	N	19.4
0.150000	51.17	---	79.00	27.83	1000.0	9.000	N	19.4
0.535000	---	42.10	60.00	17.90	1000.0	9.000	N	19.6
0.535000	42.70	---	73.00	30.30	1000.0	9.000	N	19.6
1.005000	---	37.59	60.00	22.41	1000.0	9.000	N	19.8
1.005000	40.69	---	73.00	32.31	1000.0	9.000	N	19.8
29.225000	---	20.02	60.00	39.98	1000.0	9.000	N	20.2
29.225000	26.15	---	73.00	46.85	1000.0	9.000	N	20.2
29.255000	---	20.12	60.00	39.88	1000.0	9.000	N	20.2
29.255000	26.25	---	73.00	46.75	1000.0	9.000	N	20.2

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

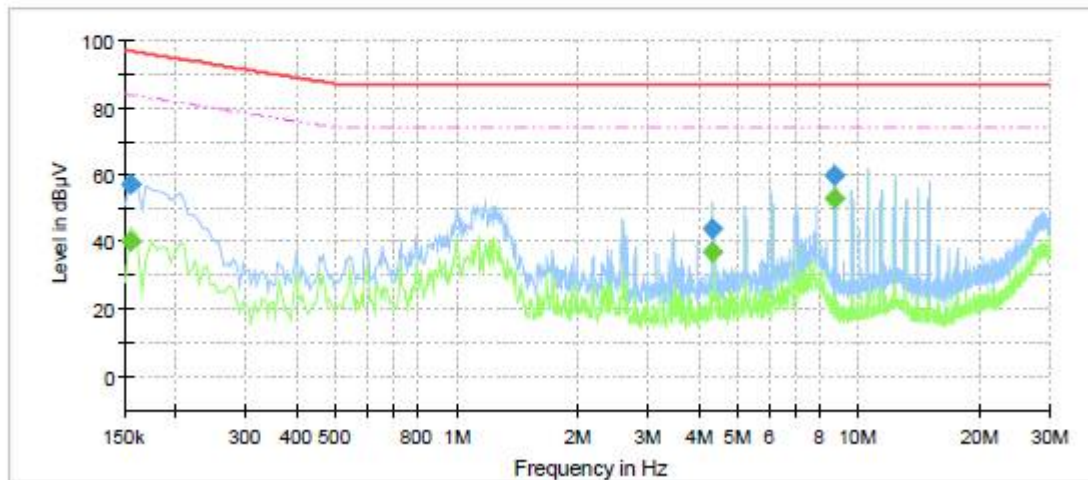
Corr. : Correction values (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

Conducted Emissions at Telecommunication Ports

[10 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	SRB-160S
Mode	10 Mbps
Operator Name:	KES



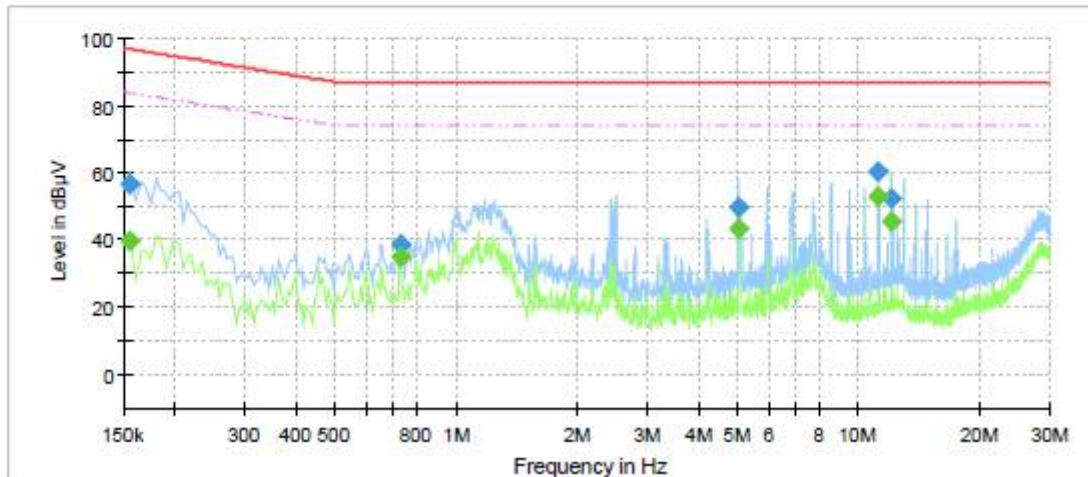
Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	40.00	83.73	43.73	1000.0	9.000	Single Line	20.0
0.155000	56.97	---	96.73	39.76	1000.0	9.000	Single Line	20.0
4.350000	---	37.06	74.00	36.94	1000.0	9.000	Single Line	20.0
4.350000	43.68	---	87.00	43.32	1000.0	9.000	Single Line	20.0
8.750000	---	52.97	74.00	21.03	1000.0	9.000	Single Line	19.8
8.750000	59.78	---	87.00	27.22	1000.0	9.000	Single Line	19.8

[100 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	SRB-160S
Mode	100 Mbps
Operator Name:	KES



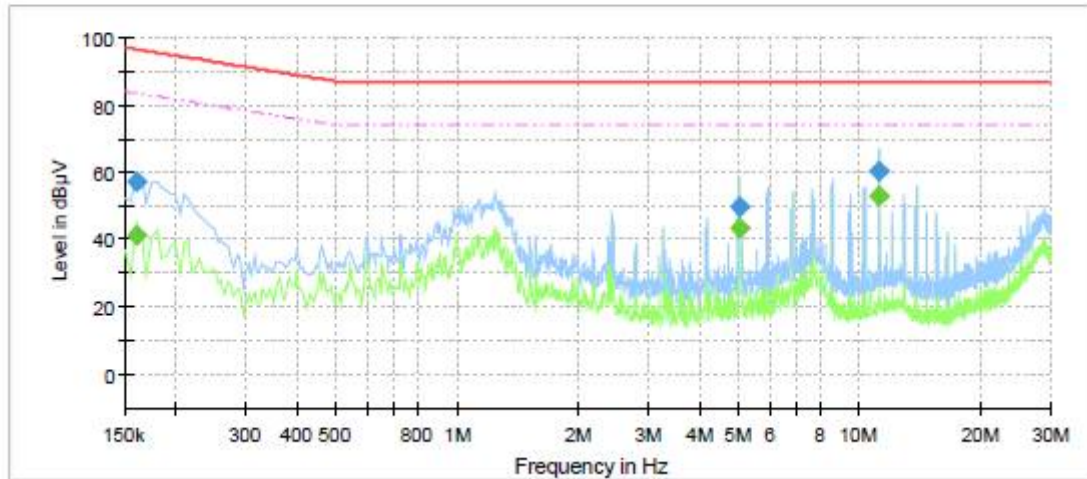
Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	56.72	---	96.73	40.01	1000.0	9.000	Single Line	19.4
0.155000	---	39.63	83.73	44.10	1000.0	9.000	Single Line	19.4
0.730000	38.80	---	87.00	48.20	1000.0	9.000	Single Line	19.4
0.730000	---	34.76	74.00	39.24	1000.0	9.000	Single Line	19.4
5.055000	49.92	---	87.00	37.08	1000.0	9.000	Single Line	19.5
5.055000	---	43.57	74.00	30.43	1000.0	9.000	Single Line	19.5
11.250000	60.17	---	87.00	26.83	1000.0	9.000	Single Line	19.3
11.250000	---	53.10	74.00	20.90	1000.0	9.000	Single Line	19.3
12.175000	52.43	---	87.00	34.57	1000.0	9.000	Single Line	19.3
12.175000	---	45.30	74.00	28.70	1000.0	9.000	Single Line	19.3

[1 000 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	SRB-160S
Mode	1 000 Mbps
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.160000	---	41.23	83.46	42.23	1000.0	9.000	Single Line	19.4
0.160000	57.05	---	96.46	39.41	1000.0	9.000	Single Line	19.4
5.055000	---	43.51	74.00	30.49	1000.0	9.000	Single Line	19.4
5.055000	49.70	---	87.00	37.30	1000.0	9.000	Single Line	19.4
11.250000	---	53.12	74.00	20.88	1000.0	9.000	Single Line	19.2
11.250000	60.26	---	87.00	26.74	1000.0	9.000	Single Line	19.2

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



Radiated Electric Field Emissions(Below 1 GHz)

Frequency	Amplitude	ANT	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin [dB]
[MHz]	[dB μ V]	Polar. (H/V)	[m]	ANT. [dB/m]	Cable [dB]	[dB μ V/m]	[dB μ V/m]	
35.30	18.50	V	1.01	10.05	1.50	30.05	40.00	9.95
54.12	19.80	V	1.00	12.62	1.97	34.39	40.00	5.61
73.70	13.80	H	4.00	8.00	2.28	24.08	40.00	15.92
141.80	17.30	V	1.02	7.61	3.31	28.22	40.00	11.78
142.75	12.00	H	3.99	7.64	3.32	22.96	40.00	17.04
152.20	8.10	H	3.98	7.96	3.46	19.52	40.00	20.48

* H : Horizontal, V : Vertical

◆ Calculation

Corrected Amplitude [dB μ V] = Amplitude[dBuV] + Correction Factor [dB]

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

Correction Factor : ANT FACTOR + Cable loss



KES Co., Ltd.

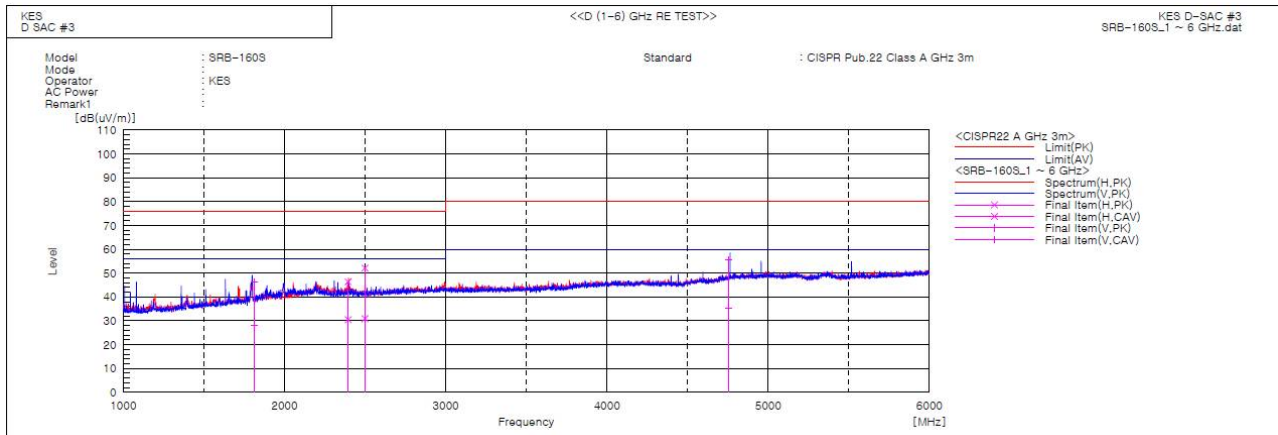
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Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
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Report No.:

KES-E1-17T0593-R1

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Radiated Electric Field Emissions(Above 1 GHz)



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	1812.737	V	49.5	31.2	-3.1	46.4	28.1	76.0	56.0	29.6	27.9	100.0	152.6	
2	2394.751	H	46.2	30.3	0.2	46.4	30.5	76.0	56.0	29.6	25.5	100.0	210.1	
3	2499.800	H	51.5	30.4	0.6	52.1	31.0	76.0	56.0	23.9	25.0	100.0	146.8	
4	4752.642	V	46.5	26.3	9.2	55.7	35.5	80.0	60.0	24.3	24.5	100.0	267.9	

◆ Calculation

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

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

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

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



Harmonic Current Emissions and Voltage Fluctuations and Flicker

■ POWER1 Mode

Average harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	182.591E-3			
2	4.103E-3			PASS
3	67.170E-3	2.920	2.30	PASS
4	4.841E-3			PASS
5	10.822E-3	0.949	1.14	PASS
6	3.909E-3			PASS
7	18.693E-3	2.428	770.00E-3	PASS
8	3.021E-3			PASS
9	6.534E-3	1.633	400.00E-3	PASS
10	2.309E-3			PASS
11	10.070E-3	3.051	330.00E-3	PASS
12	1.923E-3			PASS
13	7.449E-3	3.547	210.00E-3	PASS
14	2.106E-3			PASS
15	6.282E-3	4.188	150.00E-3	PASS
16	2.278E-3			PASS
17	5.842E-3	4.414	132.35E-3	PASS
18	2.404E-3			PASS
19	6.126E-3	5.173	118.42E-3	PASS
20	2.448E-3			PASS
21	4.588E-3			PASS
22	2.469E-3			PASS
23	3.784E-3			PASS
24	2.422E-3			PASS
25	3.405E-3			PASS
26	2.348E-3			PASS
27	3.727E-3			PASS
28	2.369E-3			PASS
29	2.893E-3			PASS
30	2.257E-3			PASS
31	2.555E-3			PASS
32	2.103E-3			PASS
33	2.594E-3			PASS
34	1.981E-3			PASS
35	2.523E-3			PASS
36	1.860E-3			PASS
37	2.105E-3			PASS
38	1.730E-3			PASS
39	1.894E-3			PASS
40	1.706E-3			PASS

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



Test Data - Harmonics (continued)

Maximum harmonic current results				
Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	184.148E-3			
2	4.686E-3			PASS
3	67.560E-3	1.958	3.45	PASS
4	5.389E-3	0.835	645.00E-3	PASS
5	11.886E-3	0.695	1.71	PASS
6	4.410E-3			PASS
7	19.373E-3	1.677	1.15	PASS
8	3.340E-3			PASS
9	7.328E-3	1.221	600.00E-3	PASS
10	2.569E-3			PASS
11	10.425E-3	2.106	495.00E-3	PASS
12	2.202E-3			PASS
13	7.625E-3	2.421	315.00E-3	PASS
14	2.402E-3			PASS
15	6.981E-3	3.103	225.00E-3	PASS
16	2.560E-3			PASS
17	6.046E-3	3.045	198.52E-3	PASS
18	2.737E-3			PASS
19	6.443E-3	3.627	177.63E-3	PASS
20	2.792E-3			PASS
21	5.355E-3	3.332	160.71E-3	PASS
22	2.753E-3			PASS
23	4.047E-3			PASS
24	2.708E-3			PASS
25	3.880E-3			PASS
26	2.637E-3			PASS
27	4.074E-3			PASS
28	2.626E-3			PASS
29	3.294E-3			PASS
30	2.500E-3			PASS
31	2.937E-3			PASS
32	2.408E-3			PASS
33	2.759E-3			PASS
34	2.201E-3			PASS
35	2.686E-3			PASS
36	2.048E-3			PASS
37	2.487E-3			PASS
38	1.946E-3			PASS
39	2.198E-3			PASS
40	1.936E-3			PASS

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

**KES Co., Ltd.**

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KES-E1-17T0593-R1
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Test Data - Voltage Fluctuations**Maximum Flicker results**

	EUT values	Limit	Result
Pst	0.028	1.00	PASS
Plt	0.028	0.65	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.086	4.00	PASS
Tmax [s]	0.000	0.50	PASS

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■ POWER2 Mode

Average harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	181.897E-3			
2	3.047E-3			PASS
3	68.177E-3	2.964	2.30	PASS
4	3.620E-3			PASS
5	9.716E-3	0.852	1.14	PASS
6	2.960E-3			PASS
7	17.991E-3	2.337	770.00E-3	PASS
8	2.336E-3			PASS
9	5.770E-3	1.443	400.00E-3	PASS
10	1.856E-3			PASS
11	10.108E-3	3.063	330.00E-3	PASS
12	1.526E-3			PASS
13	7.576E-3	3.608	210.00E-3	PASS
14	1.643E-3			PASS
15	6.190E-3	4.126	150.00E-3	PASS
16	1.724E-3			PASS
17	6.163E-3	4.657	132.35E-3	PASS
18	1.886E-3			PASS
19	6.740E-3	5.692	118.42E-3	PASS
20	1.984E-3			PASS
21	4.802E-3			PASS
22	1.961E-3			PASS
23	4.285E-3			PASS
24	1.949E-3			PASS
25	3.749E-3			PASS
26	1.879E-3			PASS
27	4.362E-3			PASS
28	1.894E-3			PASS
29	3.021E-3			PASS
30	1.860E-3			PASS
31	2.641E-3			PASS
32	1.743E-3			PASS
33	2.967E-3			PASS
34	1.683E-3			PASS
35	2.762E-3			PASS
36	1.615E-3			PASS
37	1.968E-3			PASS
38	1.501E-3			PASS
39	1.749E-3			PASS
40	1.468E-3			PASS

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



Test Data - Harmonics (continued)

Maximum harmonic current results				
Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	183.192E-3			
2	3.835E-3			PASS
3	68.488E-3	1.985	3.45	PASS
4	4.438E-3			PASS
5	10.648E-3	0.623	1.71	PASS
6	3.638E-3			PASS
7	18.433E-3	1.596	1.15	PASS
8	2.871E-3			PASS
9	6.371E-3	1.062	600.00E-3	PASS
10	2.224E-3			PASS
11	10.280E-3	2.077	495.00E-3	PASS
12	1.829E-3			PASS
13	7.719E-3	2.450	315.00E-3	PASS
14	2.002E-3			PASS
15	6.470E-3	2.875	225.00E-3	PASS
16	2.055E-3			PASS
17	6.416E-3	3.232	198.52E-3	PASS
18	2.305E-3			PASS
19	7.172E-3	4.038	177.63E-3	PASS
20	2.353E-3			PASS
21	5.119E-3	3.185	160.71E-3	PASS
22	2.351E-3			PASS
23	4.546E-3			PASS
24	2.388E-3			PASS
25	4.068E-3			PASS
26	2.352E-3			PASS
27	4.750E-3			PASS
28	2.306E-3			PASS
29	3.175E-3			PASS
30	2.220E-3			PASS
31	2.831E-3			PASS
32	2.081E-3			PASS
33	3.200E-3			PASS
34	2.015E-3			PASS
35	2.929E-3			PASS
36	1.943E-3			PASS
37	2.170E-3			PASS
38	1.793E-3			PASS
39	1.909E-3			PASS
40	1.755E-3			PASS

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

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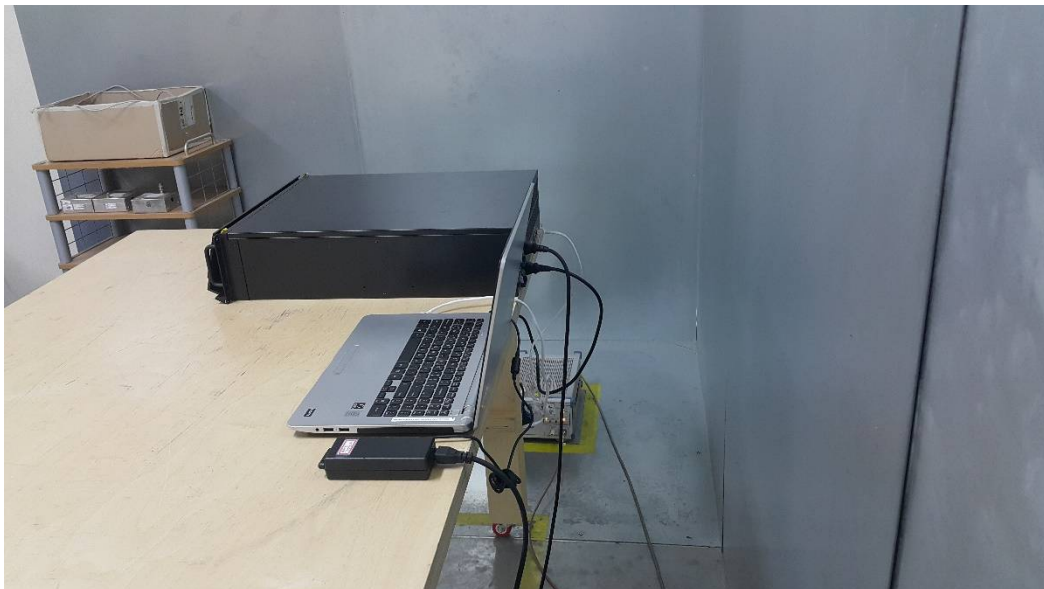
Test Data - Voltage Fluctuations**Maximum Flicker results**

	EUT values	Limit	Result
Pst	0.028	1.00	PASS
Plt	0.028	0.65	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.040	4.00	PASS
Tmax [s]	0.000	0.50	PASS

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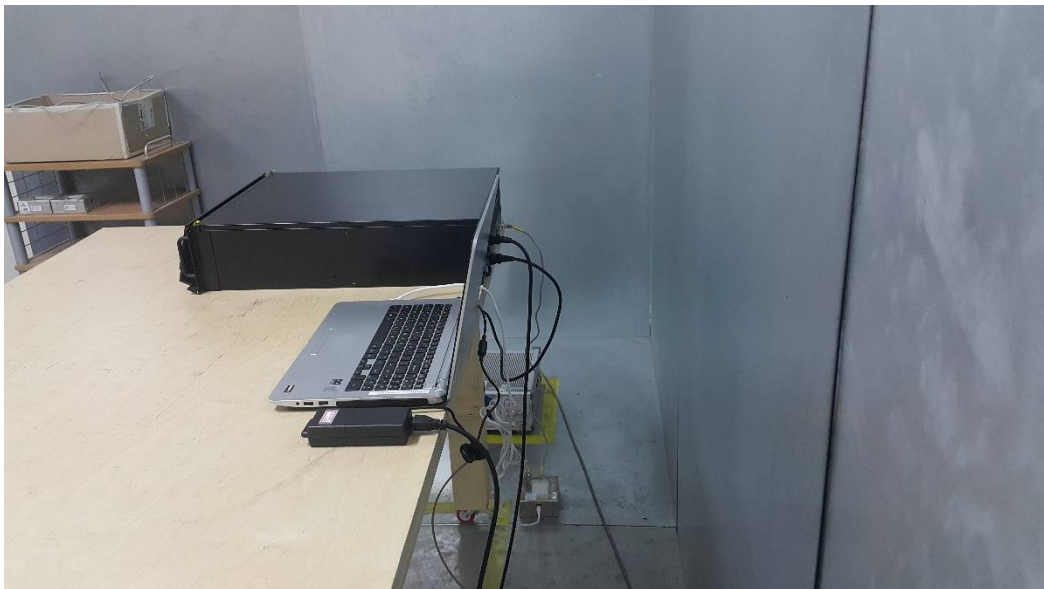
Test Setup Photos and Configuration

Conducted Voltage Emissions



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Conducted Telecommunication Emissions



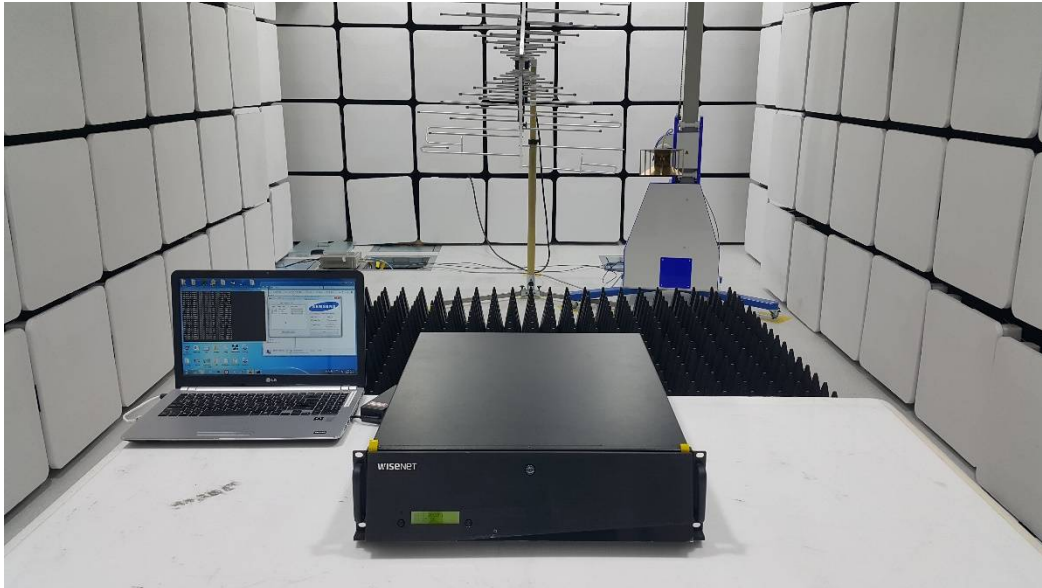
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Radiated Electric Field Emissions(Below 1 GHz)



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Radiated Electric Field Emissions(Above 1 GHz)



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Harmonic Current Emissions and Voltage Fluctuations and Flicker

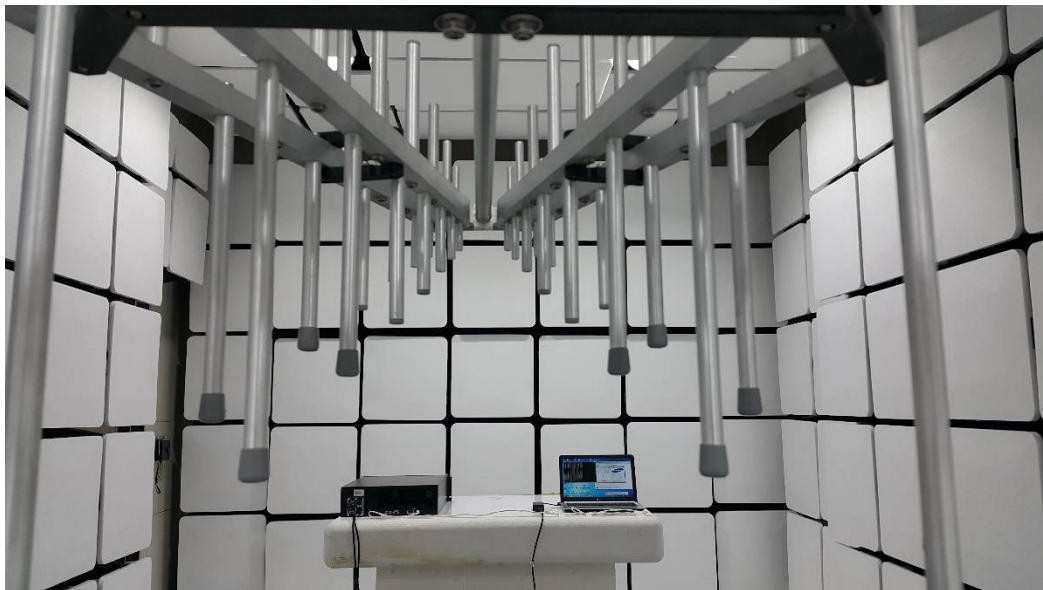


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Electrostatic Discharge

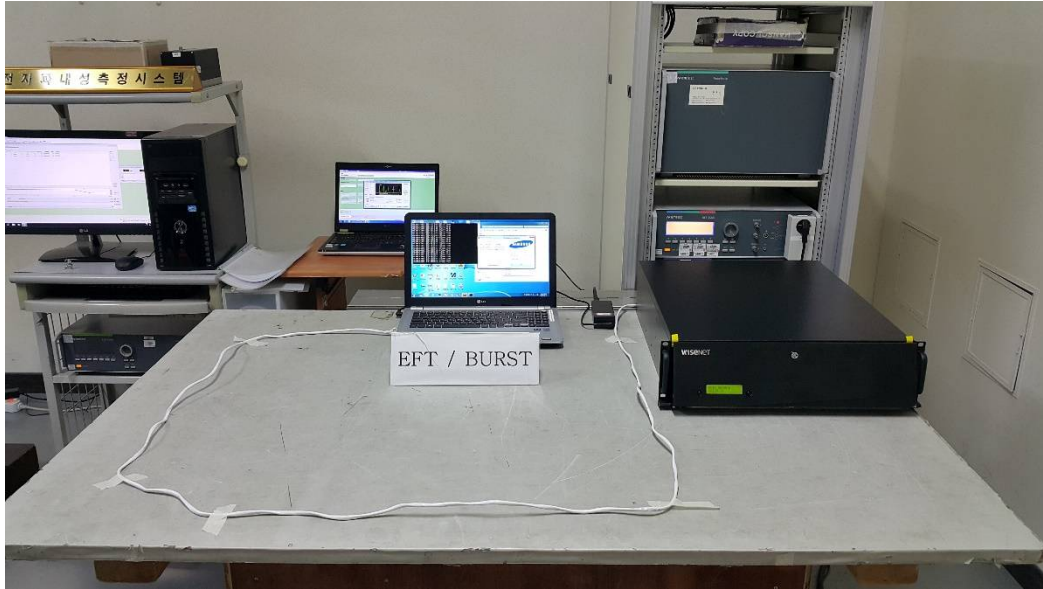


Radiated Electric Field Immunity



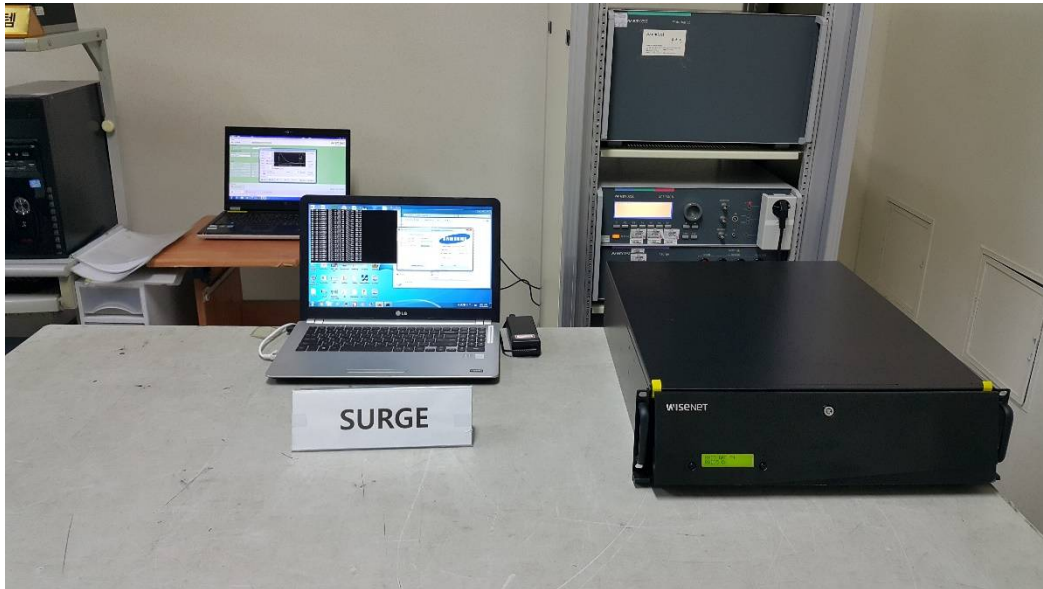
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Electrical Fast Transients/Bursts



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Surge Transients



Conducted Disturbance



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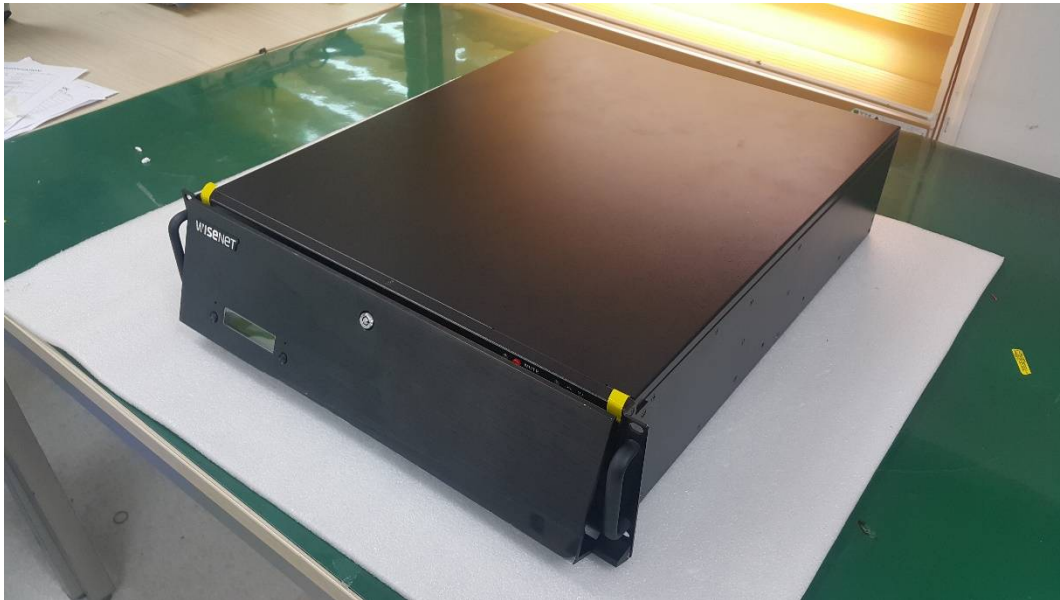
Voltage Dips and Short Interruptions



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EUT External Photographs

(Top)



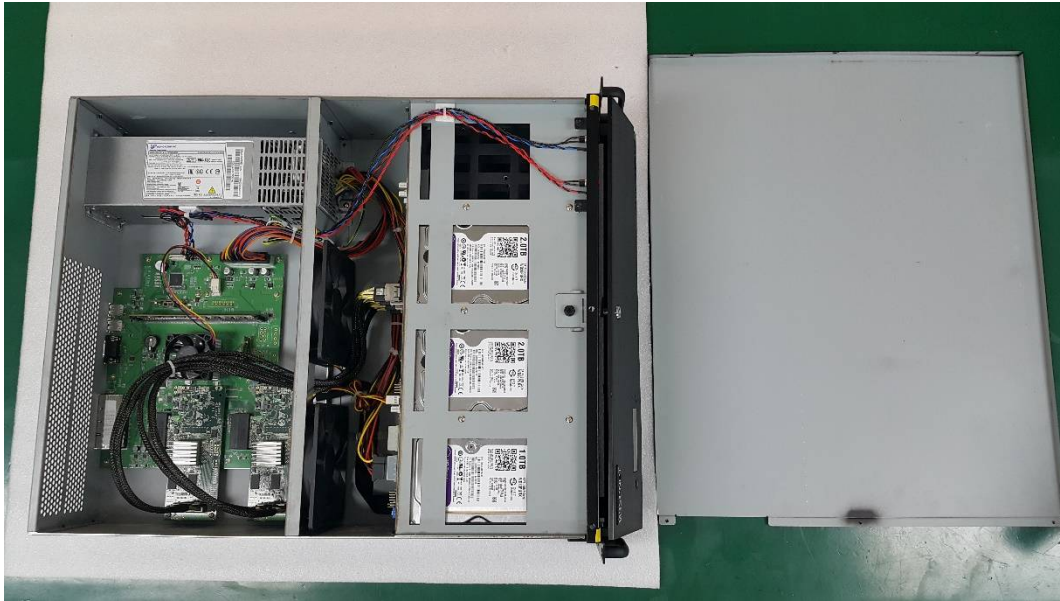
(Bottom)



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EUT Internal Photographs

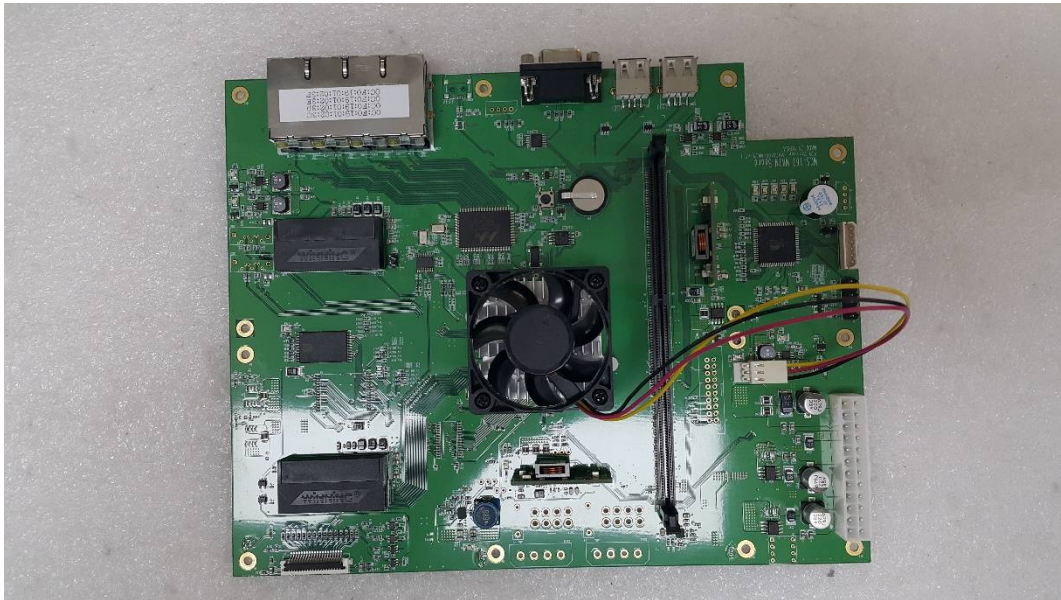
(Internal View)



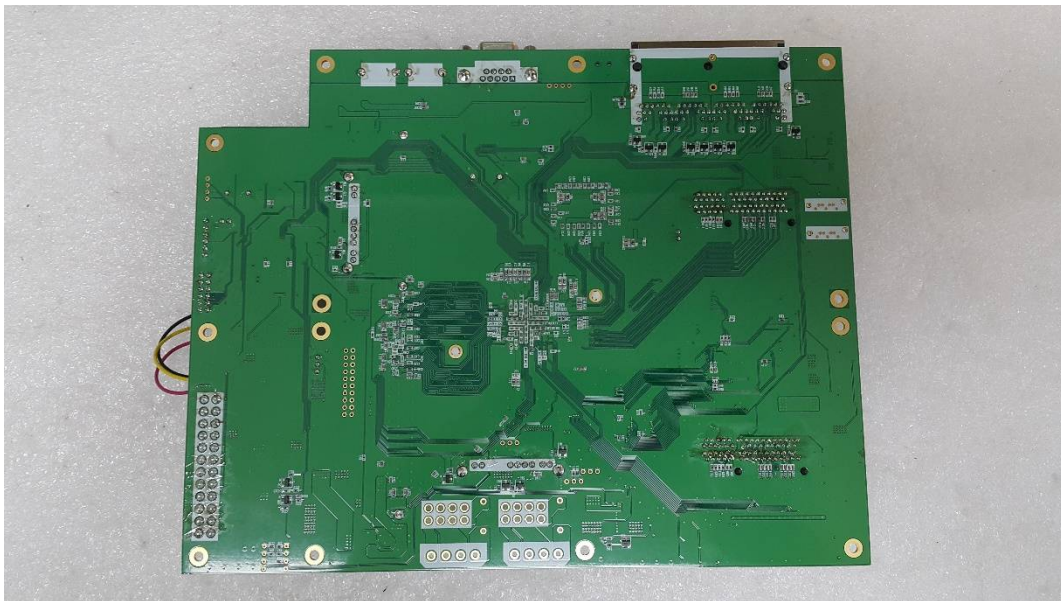
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EUT Internal View – Main board

(Top)



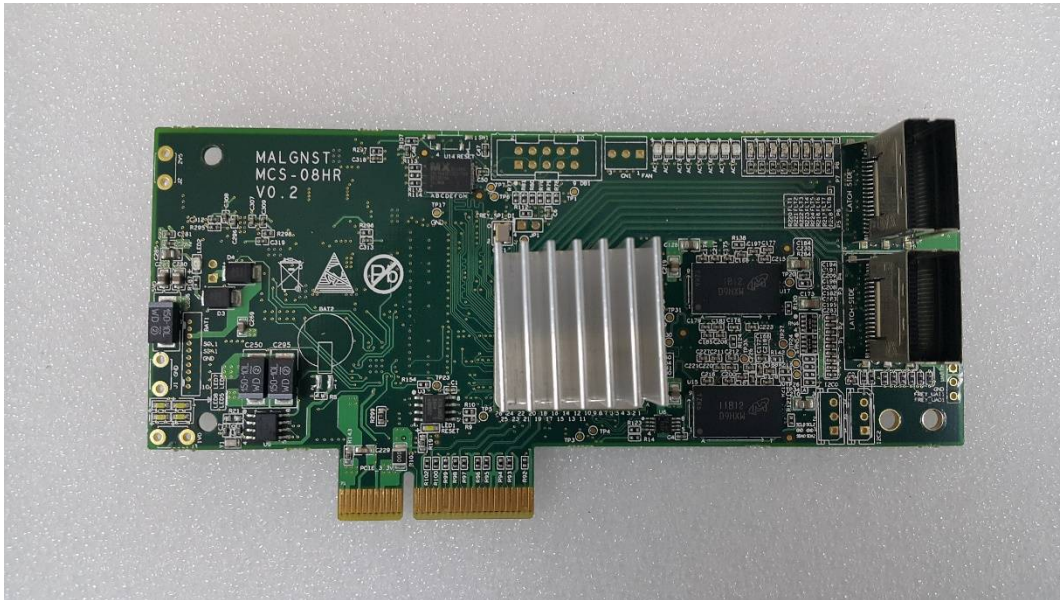
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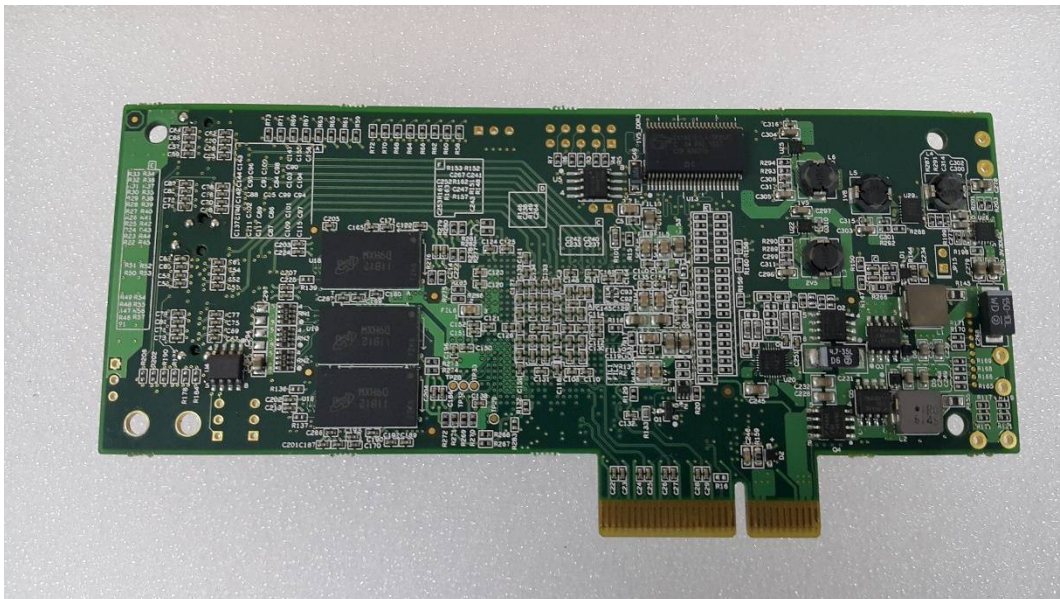
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EUT Internal View – Sub board 1

(Top)



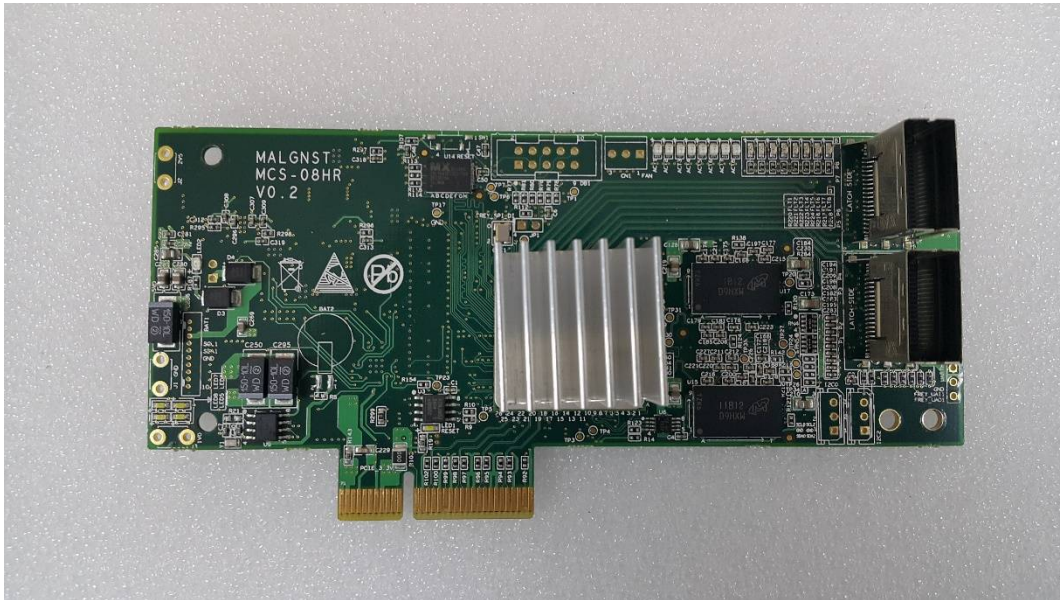
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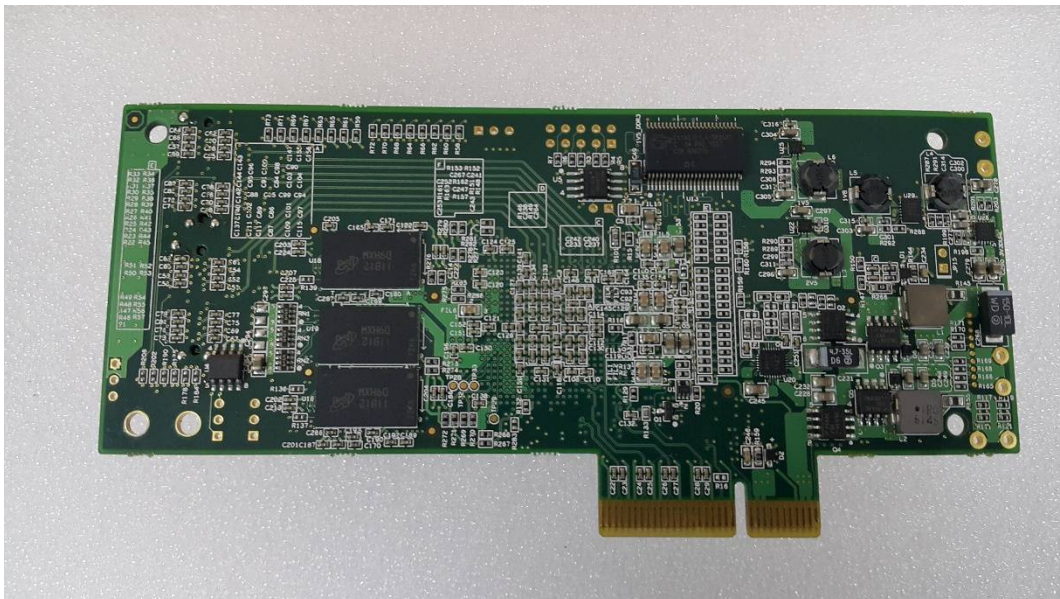
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EUT Internal View – Sub board 2

(Top)



(Bottom)

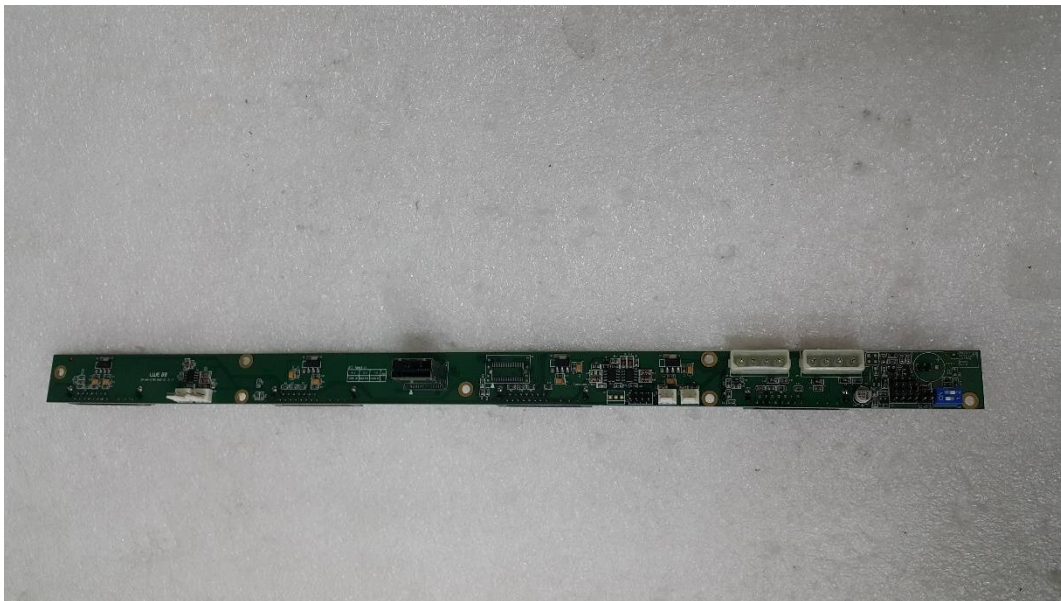


EUT Internal View – HDD board 1

(Top)



(Bottom)

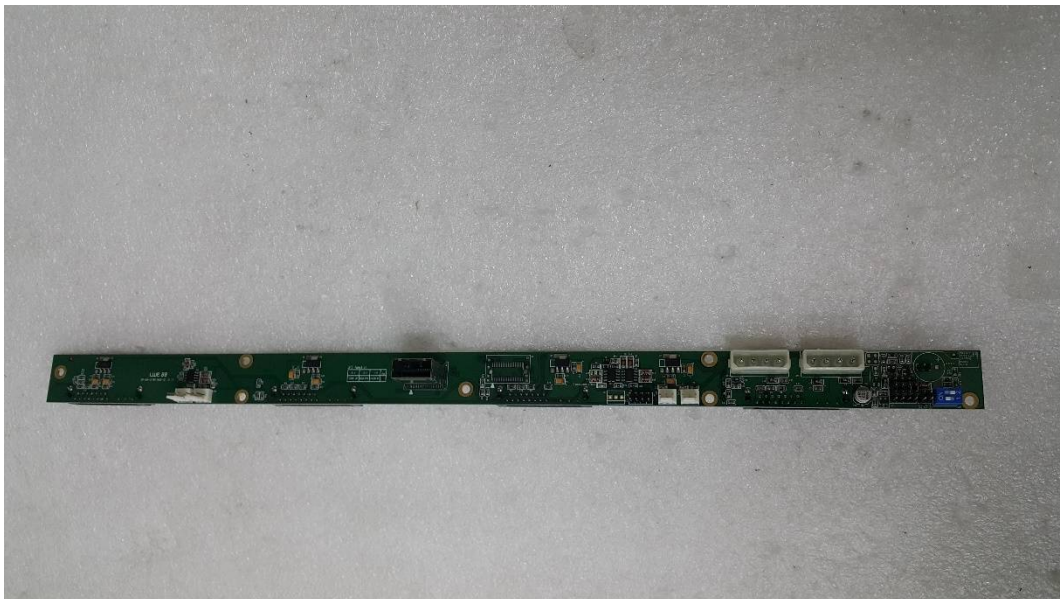


EUT Internal View – HDD board 2

(Top)



(Bottom)

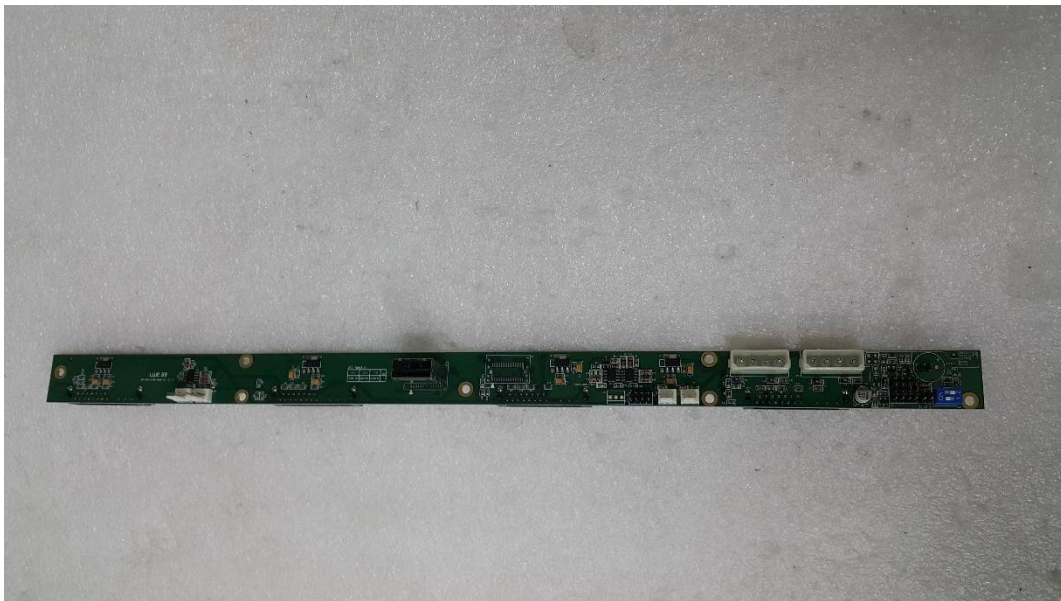


EUT Internal View – HDD board 3

(Top)



(Bottom)

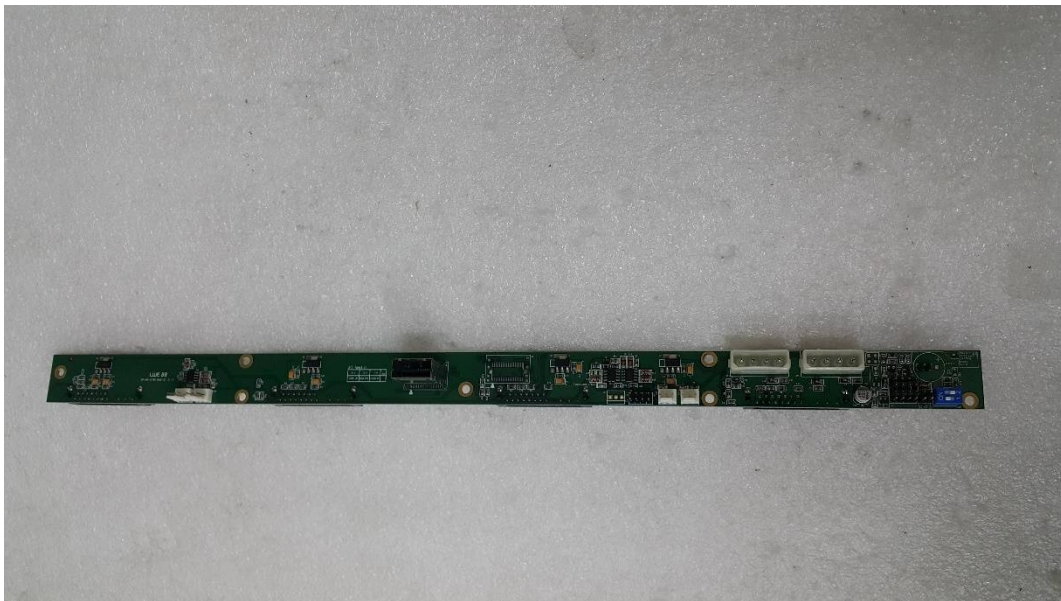


EUT Internal View – HDD board 4

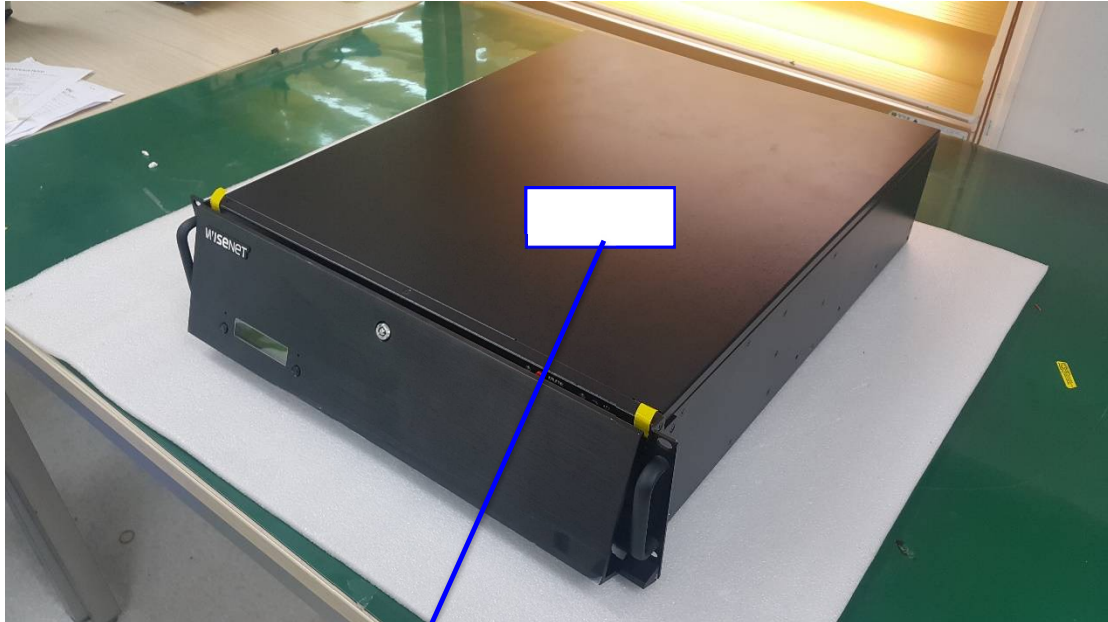
(Top)



(Bottom)



Label and Location



CCTV CAMERA

Model No : SRB-160S

Manufacturer : C-PRO ELECTRONICS

Made in Korea

