



EMC TEST REPORT For CE

Test Report No. : KES-E1-16T0283-R2
Date of Issue : Aug. 17, 2021
Product name : NETWORK CONTROLLER
7
Model/Type No. : SPC-7000
Variant Model : -
Applicant : Hanwha Techwin Co., Ltd.
Applicant Address : 6, Pangyo-ro 319 Beon-gil, Bundang-gu, Seongnam-si,
Gyeonggi-do, 13488, KOREA
Manufacturer : 1. HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.
2. D-TECH CO.,LTD.
Manufacturer Address : 1. Lot O-2, Que Vo Industrial Zone extended area,
Nam Son commune, Bac Ninh city, Bac Ninh province, Vietnam
2. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi- do,
Korea (Suwon Industrial Complex)
Date of Receipt : Jun. 07, 2016
Test date : Jun. 21, 2016 – Jun. 22, 2016
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Young-Jun Jo
EMC Test Engineer

Reviewed by

Dong-Hun, Jang
EMC Technical Manager

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

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Test report No.:

KES-E1-16T0283-R2

Page (2) of (83)

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Jun. 29, 2016	KES-E1-16T0283	Issued
Jun. 27, 2018	KES-E1-16T0283-R1	Re-issue due to manufacturer change
Aug. 17, 2021	KES-E1-16T0283-R2	Delete Manufacturer on Customer Request

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TABLE OF CONTENTS

1.0	General Product Description	4
1.1	Test Voltage & Frequency	5
1.2	Variant Model Differences.....	5
1.3	Device Modifications	5
1.4	Equipment Under Test.....	5
1.5	Support Equipments	5
1.6	External I/O Cabling	6
1.7	E.U.T Operating Mode(s)	6
1.8	Configuration.....	7
1.9	Calibration Details of Equipment Used for Measurement	8
1.10	Test Facility	8
1.11	Laboratory Accreditations and Listings	8
2.0	Test Regulations.....	9
2.1	Conducted Emissions at Mains Power Ports	11
2.2	Conducted Emissions at Telecommunication Ports	12
2.3	Radiated Electric Field Emissions(Below 1 GHz)	13
2.4	Radiated Electric Field Emissions(Above 1 GHz)	14
2.5	Harmonic Current Emissions.....	15
2.6	Voltage Fluctuations and Flicker	16
3.0	Criteria for compliance.....	17
3.1	Electrostatic Discharge.....	19
3.2	Radiated Electric Field Immunity	23
3.3	Electrical Fast Transients/Bursts	26
3.4	Surge Transients	29
3.5	Conducted Disturbance	32
3.6	Voltage Dips and Short Interruptions	35
APPENDIX A	– TEST DATA.....	37
	Conducted Emissions at Mains Power Ports.....	37
	Conducted Emissions at Telecommunication Ports	41
	Radiated Electric Field Emissions(Below 1 GHz)	43
	Radiated Electric Field Emissions(Above 1 GHz).....	44
	Harmonic Current Emissions and Voltage Fluctuations and Flicker	52
	Test Setup Photos and Configuration	57
	Conducted Voltage Emissions	57
	Conducted Telecommunication Emissions	59
	Radiated Electric Field Emissions(Below 1 GHz)	60
	Radiated Electric Field Emissions(Above 1 GHz).....	62
	Harmonic Current Emissions and Voltage Fluctuations and Flicker	64
	Electrostatic Discharge	65
	Radiated Electric Field Immunity	66
	Electrical Fast Transients/Bursts	67
	Surge Transients	68
	Conducted Disturbance	69
	Voltage Dips and Short Interruptions.....	70
	EUT External Photographs	72
	EUT Internal Photographs	73



1.0 General Product Description

Main Specifications of E.U.T are:

LCD DISPLAY	5 inch TFT LCD
Communication Method	SSM, RJ-45
Operating temperature	0 ~ 40 °C
Humidity	10 ~ 70 %
Dimension	(459.1 x 59.1 x 177.9) mm
Weight	1.5 kg



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 ☐ 220 Vac ☒ 230 Vac ☐ 240 Vac ☐ PoE ☐ 12 Vdc
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 CONTROLLER	SPC-7000	-	HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.	E.U.T
AC/DC Adapter	KPL-048F-VI	-	Channel Well Technology(guangzhou)co.,Ltd.	-

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Notebook	RV518	HSVX91HC801452M	Samsung Electronics Co., Ltd.	-
Notebook AC/DC Adapter	CPA09-004A	-	Chicony Power Technology Co., Ltd.	-
PTZ Camera	-	-	-	-
PTZ Camera AC/DC Adapter	DRL-241500AC	-	Dream Electronics Co., Ltd.	-



1.6 External I/O Cabling

- USB Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CONTROLLER (E.U.T)	USB	Notebook	USB	1.2	U

- LAN Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK CONTROLLER (E.U.T)	RJ45	PTZ Camera	RJ45	3.5	U

* Unshielded=U, Shielded=S

1.7 E.U.T Operating Mode(s)

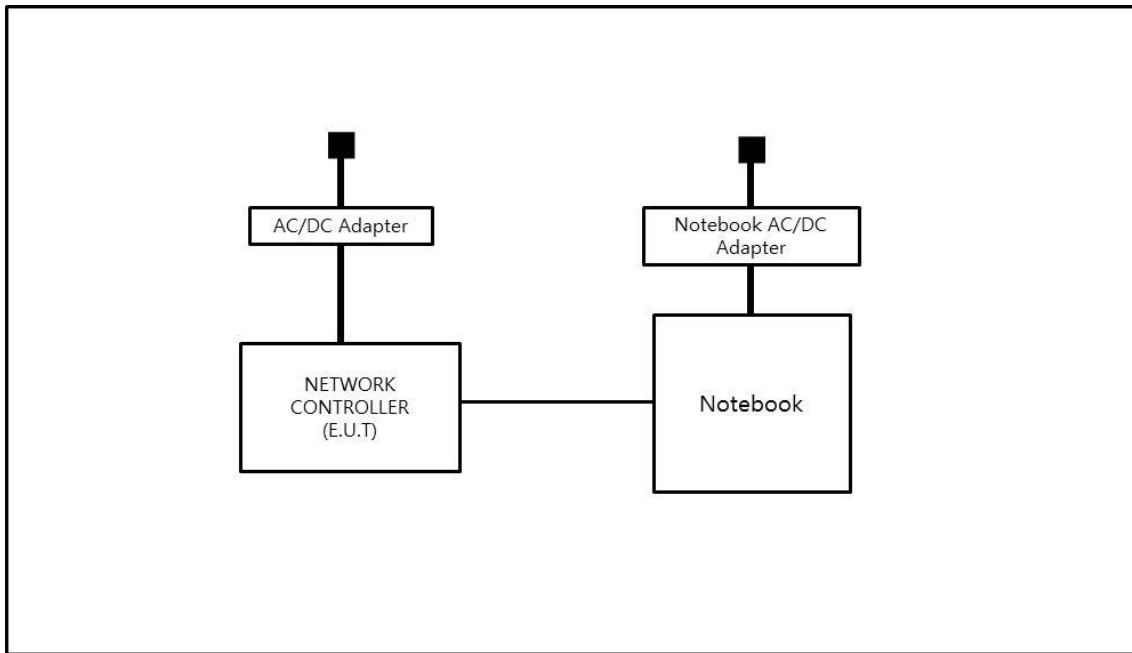
Equipment under test was operated during the measurement under the following conditions:

Test mode	Normal operating
USB	Notebook's game controller setting page check.
LAN	PTZ Camera Controlled

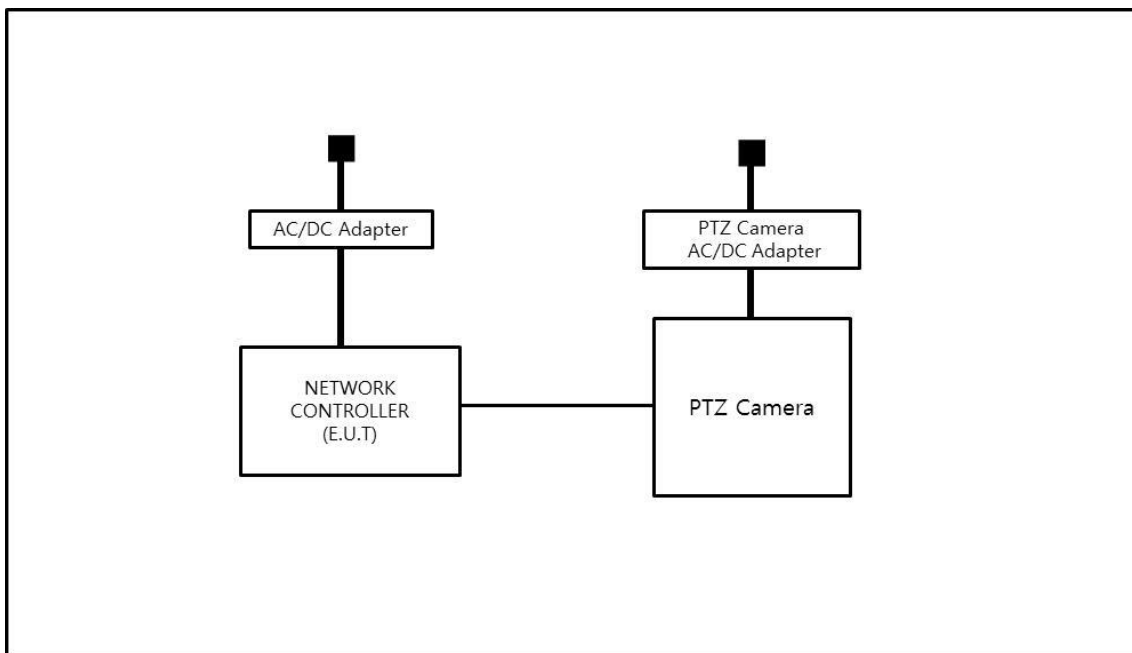
1.8 Configuration

■ AC Main
 □ DC Main

- USB Mode



- LAN Mode



1.9 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.

1.10 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 16-1-4:2019

1.11 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
KOREA	RRA	EMI (3 m & 10 m Semi-Anechoic Chamber , 10 m Open Area and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KR0100
International	KOLAS	EMI (3 m & 10 m Semi-Anechoic Chamber , and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KT489
USA	FCC	3 m & 10 m Semi-Anechoic Chamber, 10 m Open Area and Conducted test site to perform FCC Part 15/18 measurements.	 KR0100
Canada	ISED	3 m & 10 m Semi-Anechoic Chamber and Conducted test site	 23298-1
JAPAN	VCCI	Mains Ports Conducted Interference Measurement, Telecommunication Ports Conducted Disturbance Measurement and Radiation 10 meter site, Facility for measuring radiated disturbance above 1 GHz	 R-20056, C-20036, T-20040, G-20057
Europe	TÜV SÜD	EMI (3 m & 10 m Semi-Anechoic Chamber , 10 m Open Area and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 CARAT 001633 0004



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



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Test report No.:
KES-E1-16T0283-R2
Page (10) of (83)

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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

Jun. 21, 2016

Test Location

Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test Receiver	ESR3	R&S	101783	05, 03, 2017
☒	LISN	ENV216	R&S	101137	02, 04, 2017
☒	LISN	ENV216	R&S	101786	05, 02, 2017
☒	Electro wave Shieldroom	-	SEMITEC	-	-

Test Conditions

Temperature: 26,0 °C

Relative Humidity: 48,9 %

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

Jun. 21, 2016

Test Location

Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test Receiver	ESR3	R&S	101783	05, 03, 2017
☒	LISN	ENV216	R&S	101137	02, 04, 2017
☒	LISN	ENV216	R&S	101786	05, 02, 2017
☒	8-Wire ISN CAT3	CAT3 8158	Schwarzbeck Mess	8158-0019	04, 01, 2017
☒	8-Wire ISN CAT5	CAT5 8158	Schwarzbeck Mess	8158-0030	04, 01, 2017
☐	8-Wire ISN CAT6	NTFM 8158	Schwarzbeck Mess	8158-0029	08, 14, 2016
☒	Electro wave Shieldroom	-	SEMITEC	-	-

Test Conditions

Temperature: 26,0 °C

Relative Humidity: 48,9 %

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

Jun. 21, 2016

Test Location

☒ Open Area Test Site #1 ☐ Open Area Test Site #2

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test Receiver	ESU26	R&S	100551	04, 18, 2017
☒	Trilog-Broadband ANT	VULB 9163	Schwarzbeck	9163-715	04, 14, 2018
☒	Open Area Test Site	-	KES	-	-
☒	Antenna Mast	1070/1080	EMCO	-	-
☒	Turn Table	-	DAEIL EMC	-	-

Test Conditions

Temperature: 29,0 °C
Relative Humidity: 50,0 %

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

Jun. 21, 2016

Test Location

Semi Anchoic Chamber #2

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test Receiver	ESU26	R&S	100552	04, 24, 2017
☒	Broadband Coaxial Preamplifier	BBV 9718	Schwarzbeck Mess - Elektronik	9718-246	10, 23, 2016
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	05, 07, 2017
☒	Semi Anchoic Chamber #2	-	SEMITEC	-	-
☒	Antenna Mast	-	AUDIX	-	-
☒	Turn Table	-	AUDIX	-	-

Test Conditions

Temperature: 26,0 °C
Relative Humidity: 48,9 %

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.



2.5 Harmonic Current Emissions

Test Date

Jun. 21, 2016

Test Location

Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	AC Source	ACS 500 N	EM TEST	V1024106760	08, 13, 2016
☒	Digital Power Analyzer	DPA 500 N	EM TEST	V1024106759	08, 13, 2016

Test Conditions

Temperature: 26,0 °C
Relative Humidity: 48,9 %

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

Jun. 21, 2016

Test Location

Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	AC Source	ACS 500 N	EM test	V1024106760	08, 13, 2016
☒	Digital Power Analyzer	DPA 500 N	EM test	V1024106759	08, 13, 2016

Test Conditions

Temperature: 26,0 °C
Relative Humidity: 48,9 %

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



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Test report No.:
KES-E1-16T0283-R2
Page (18) of (83)

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

Jun. 22, 2016

Test Location

EMS-ESD: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	ESD SIMULATOR	ESS-2000	Noise Ken	ESS01Z0454	10, 23, 2016
☒	HCP	-	KES	-	-
☒	VCP	-	KES	-	-

Test Conditions

Temperature: 25,4 °C
Relative Humidity: 52,7 %
Atmospheric Pressure: 99,0 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

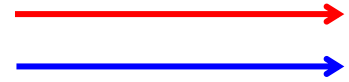
Required Performance Criteria: ☒ Complied

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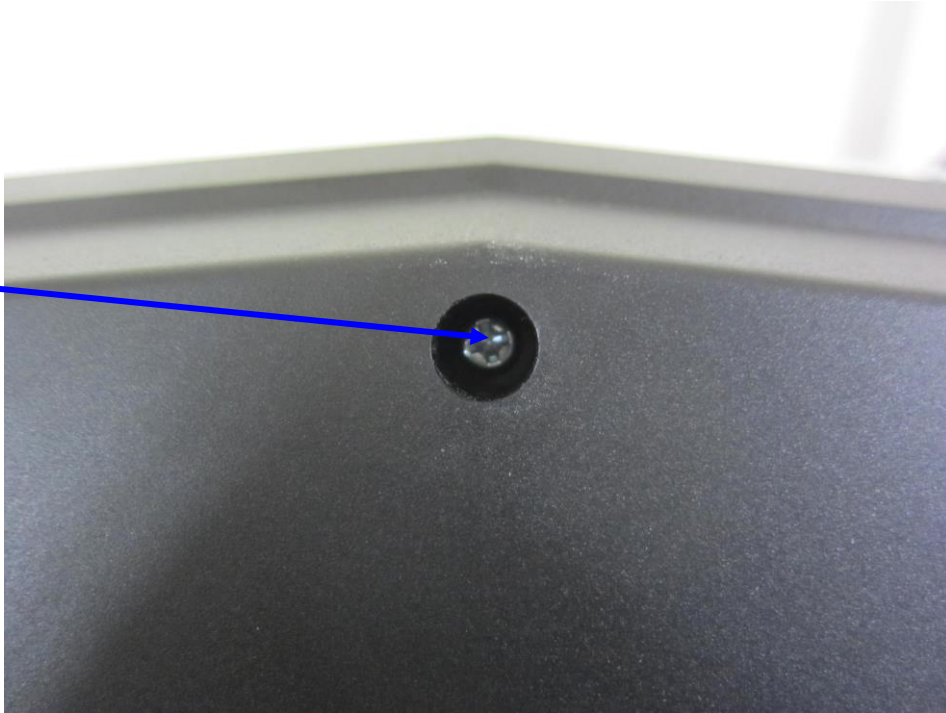
Location of Discharge:

- USB, LAN Mode

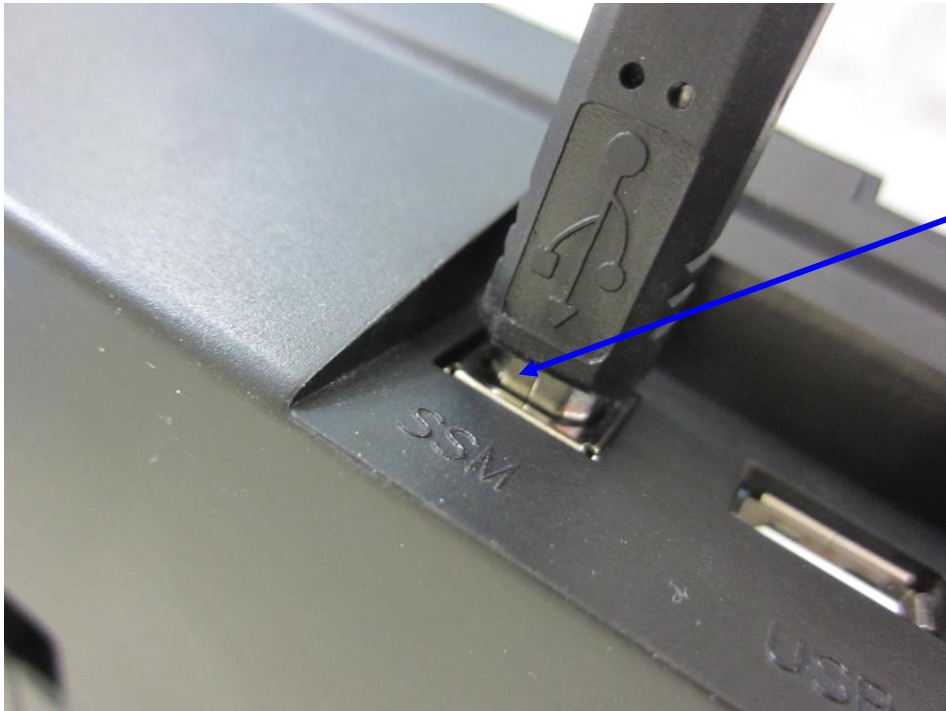
Air
Contact



1



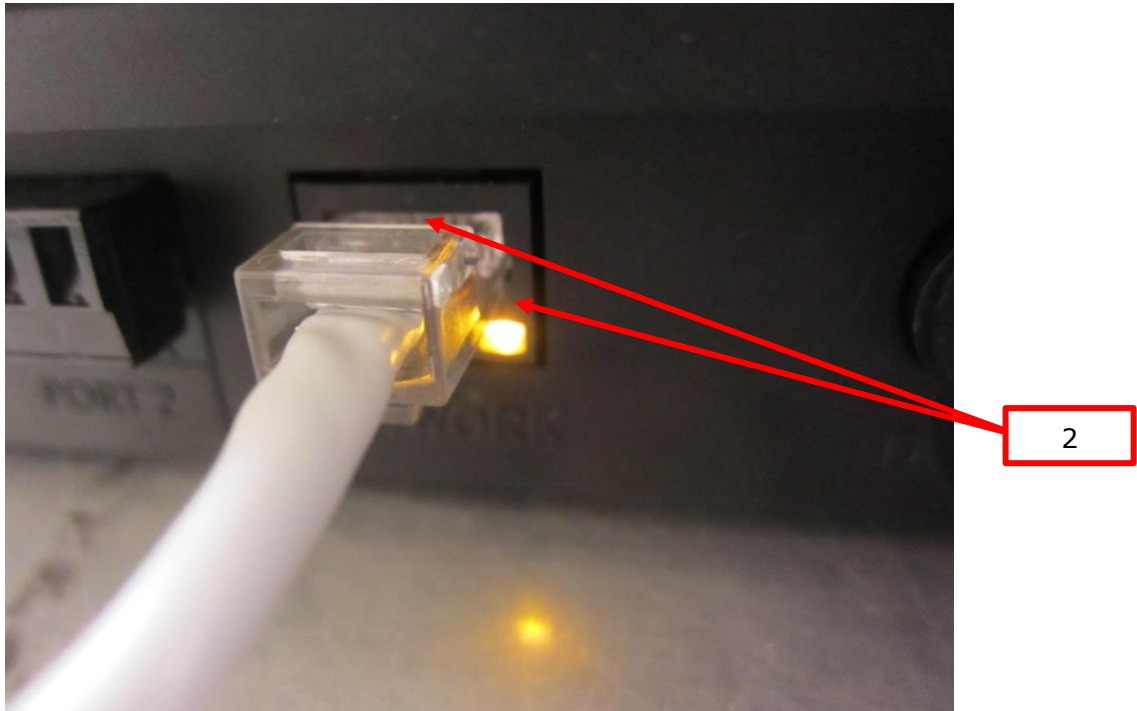
- USB Mode



2

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- LAN Mode





Test Data

- USB Mode

Indirect Discharge

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

Direct Discharge

No.	Test Point	Discharge Method	Performance	Remarks
			Observation	
1	Screw	Contact Discharge	Complied	-
2	USB Port	Contact Discharge	Complied	-

- LAN Mode

Indirect Discharge

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

Direct Discharge

No.	Test Point	Discharge Method	Performance	Remarks
			Observation	
1	Screw	Contact Discharge	Complied	-
2	RJ45 Port	Air Discharge	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.



3.2 Radiated Electric Field Immunity

Reference Standard

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

Test Date

Jun. 21, 2016

Test Location

EMS-RS: ☐ Semi Anchoic Chamber #1 ☒ Semi Anchoic Chamber #2

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	SIGNAL GENERATOR	SMB 100A	R&S	108252	08, 13, 2016
☒	BROADBAND AMPLIFIER	BBA100	R&S	101239	08, 13, 2016
☒	BROADBAND AMPLIFIER	100S1G6M1	AR	579931	08, 13, 2016
☒	POWER METER	NRP2	R&S	103475	08, 13, 2016
☒	AVG POWER SENSOR	NRP-Z91	R&S	102526	08, 13, 2016
☒	AVG POWER SENSOR	NRP-Z91	R&S	102527	08, 13, 2016
☒	Stacked Log.-Per.Antenna	STLP 9128 D	Schwarzbeck	9128D038	-
☒	DIRECTIONAL COUPLER	KYDC-D1070-DX40	KyTelecom Co., Ltd.	KY150001	09, 25, 2016
☒	Semi Anchoic Chamber #2		SEMITEC	-	-

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Test report No.:

KES-E1-16T0283-R2

Page (24) of (83)

Test Conditions

Temperature: 26,0 °C
Relative Humidity: 48,9 %
Atmospheric Pressure: 98,5 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 % stepDwell Time: ☐ 1 s ☒ 3 s# of Sides Radiated: ☒ 4Required Performance Criteria: ☒ Complied**Test Data**

- USB Mode

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

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Test report No.:

KES-E1-16T0283-R2

Page (25) of (83)

- LAN Mode

Side Exposed	Observation	
	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

Jun. 22, 2016

Test Location

EMS-EFT: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	Transient Test System	TRA3000F-S-D-V	EMC PARTNER AG	1524	03, 25, 2017
☒	MotorVariac	VAR-EXT1000	EMC PARTNER AG	1507	03, 25, 2017
☒	Capacitive Coupling Clamp	CN-EFT1000	EMC PARTNER AG	1528	03, 25, 2017

Test Conditions

Temperature: 25,4 °C
Relative Humidity: 52,7 %
Atmospheric Pressure: 99,0 kPa

Test Specifications

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

Pulse Amplitude & Polarity:
(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

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KES-E1-16T0283-R2

Page (27) of (83)

Test Data**- USB Mode**☒ 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)
-	-	-

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KES-E1-16T0283-R2

Page (28) of (83)

- LAN Mode☒ 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.

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3.4 Surge Transients

Reference Standard

EN 61000-4-5:2014

Test Date

Jun. 22, 2016

Test Location

EMS-Surge: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	Ultra Compact Simulator	UCS 500 N5	EM TEST	V0936105120	07, 14, 2016
☒	MotorVariac	MV2616	EM TEST	V0936105123	07, 14, 2016
☐	CDN	CNV 508T5	EM TEST	P1549168422	04, 27, 2017
☒	CDN	CNV 508N1	EM TEST	P1551168979	04, 27, 2017

Test Conditions

Temperature: 25,5 °C
Relative Humidity: 46,6 %
Atmospheric Pressure: 98,5 kPa

Test Specifications

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

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KES-E1-16T0283-R2

Page (30) of (83)

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**

- USB Mode

☒ Line to Line – Differential Mode

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

☒ Line to Earth – Common Mode

Mode of Application	OBSERVATIONS	
	(+) Surge (kV)	(-) Surge (kV)
L - PE	Complied	Complied
N - PE	Complied	Complied

Signal Lines☐ Line to Earth – Common Mode

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

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Test report No.:

KES-E1-16T0283-R2

Page (31) of (83)

- LAN Mode☒ Line to Line – Differential Mode

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

☒ Line to Earth – Common Mode

Mode of Application	OBSERVATIONS	
	(+) Surge (kV)	(-) Surge (kV)
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.

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3.5 Conducted Disturbance

Reference Standard

EN 61000-4-6:2014

Test Date

Jun. 22, 2016

Test Location

EMS-CS: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	Continuous Wave Generator	CWS 500N1	EM TEST	P1251106910	03, 25, 2017
☒	6 dB Attenuator	ATT6/75	EM TEST	1202-35	03, 25, 2017
☒	CDN	CDN-M2/M3N	EM TEST	0213-10	03, 25, 2017
☒	EM Injection Clamp	EM 101	Liithi	36152	03, 29, 2017
☐	NTSC/PAL/SECAM PATTERN GENERATOR	408NPS	LEADER	577240	02, 04, 2017
☐	DTV MODULATOR	TVB599A	TELEVIEW	23.53.20.15.09.00.0022	11, 02, 2016
☐	TELEPHONE ANALYZER	DD-5601-CID JUNG	JUNG JIN	520304038	11, 03, 2016
☐	MICROPHONE	MP201	BSWA	512175	11, 02, 2016
☐	SOUND ACOUSTIC TESTER	TST-1000	TESTEK	150045	11, 03, 2016

Test Conditions

Temperature: 25,2 °C
Relative Humidity: 52,9 %
Atmospheric Pressure: 99,1 kPa

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KES-E1-16T0283-R2

Page (33) of (83)

Test Specifications

Frequency range:

☒ 150 kHz to 100 MHz
☐ 150 kHz to 230 MHz

☐ 10 kHz to 30 MHz
☐ 10 kHz to 100 MHz

Voltage Level:

☐ 1 Vrms
☒ 10 Vrms

☐ 3 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**

- USB Mode

☒ Input a.c. power ports

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

☐ Input d.c. power ports

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

☐ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observation
-	EM Injection Clamp	-

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Test report No.:

KES-E1-16T0283-R2

Page (34) of (83)

- LAN Mode☒ Input a.c. power ports

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

☐ Input d.c. power ports

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

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observation
RJ-45	EM Injection 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.

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KES-E1-16T0283-R2

Page (35) of (83)

3.6 Voltage Dips and Short Interruptions

Reference Standard

EN 61000-4-11:2004

Test Date

Jun. 22, 2016

Test Location

EMS-Voltage dip: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	Transient Test System	TRA3000F-S-D-V	EMC PARTNER AG	1524	03, 25, 2017
☒	MotorVariac	VAR-EXT1000	EMC PARTNER AG	1507	03, 25, 2017

Test Conditions

Temperature: 25,4 °C
Relative Humidity: 52,7 %
Atmospheric Pressure: 99,0 kPa

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Test Specifications & Observations/Remarks

- USB Mode

Test Level	Duration [in period/ms (50 Hz)]	Results
☒ 20 % dip	☒ 250 /5000	<u>Complied</u>
☒ 30 % dip	☒ 25 /500	<u>Complied</u>
☒ 60 % dip	☒ 10 /200	<u>Complied</u>
☒ 100 % dip	☒ 250 /5000	<u>Complied</u>

- Voltage variations

☒ Unom + 10 %	☒ 253 V (ac)	<u>Complied</u>
☒ Unom - 15 %	☒ 195.5 V (ac)	<u>Complied</u>

- LAN Mode

Test Level	Duration [in period/ms (50 Hz)]	Results
☒ 20 % dip	☒ 250 /5000	<u>Complied</u>
☒ 30 % dip	☒ 25 /500	<u>Complied</u>
☒ 60 % dip	☒ 10 /200	<u>Complied</u>
☒ 100 % dip	☒ 250 /5000	<u>Complied</u>

- Voltage variations

☒ Unom + 10 %	☒ 253 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

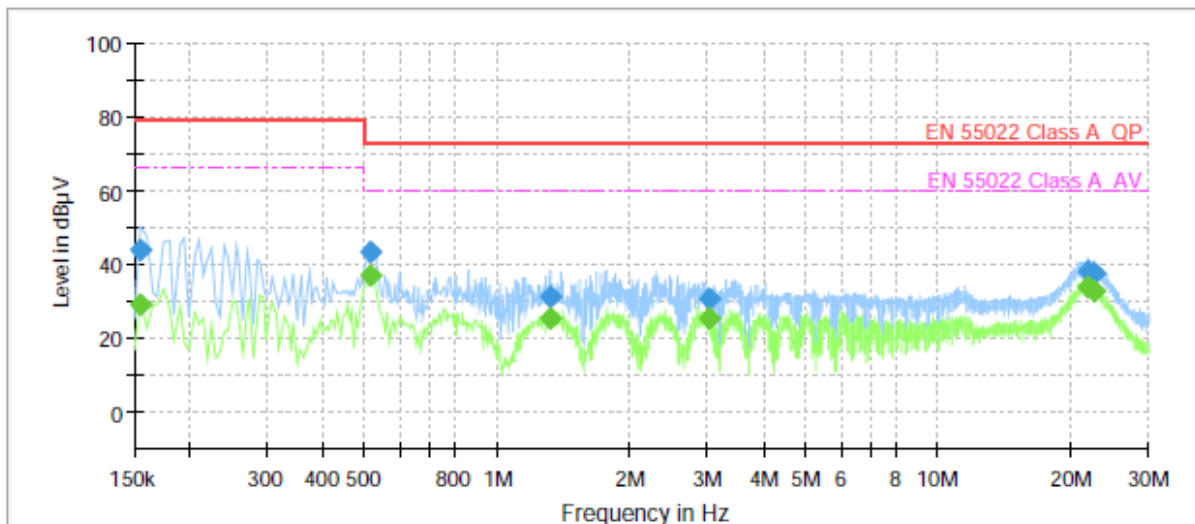
Conducted Emissions at Mains Power Ports

- USB Mode

[HOT]

Common Information

Test Description:	Conducted Emission
Model No.:	SPC-7000P
Mode	USB
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	---	28.94	66.00	37.06	1000.0	9.000	L1	9.7
0.155000	43.97	---	79.00	35.03	1000.0	9.000	L1	9.7
0.515000	---	37.04	60.00	22.96	1000.0	9.000	L1	9.7
0.515000	43.35	---	73.00	29.65	1000.0	9.000	L1	9.7
1.315000	---	25.64	60.00	34.36	1000.0	9.000	L1	9.7
1.315000	30.99	---	73.00	42.01	1000.0	9.000	L1	9.7
3.010000	---	25.44	60.00	34.56	1000.0	9.000	L1	9.8
3.010000	30.68	---	73.00	42.32	1000.0	9.000	L1	9.8
21.750000	---	33.80	60.00	26.20	1000.0	9.000	L1	10.2
21.750000	38.12	---	73.00	34.88	1000.0	9.000	L1	10.2
22.505000	---	32.98	60.00	27.02	1000.0	9.000	L1	10.2
22.505000	37.37	---	73.00	35.63	1000.0	9.000	L1	10.2

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Test report No.:

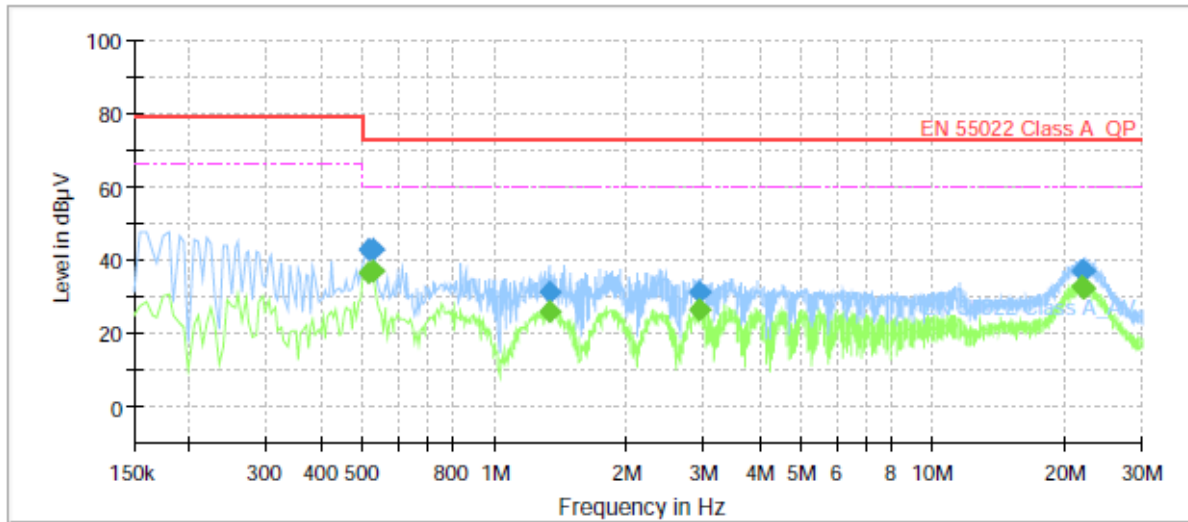
KES-E1-16T0283-R2

Page (38) of (83)

[NEUTRAL]

Common Information

Test Description: Conducted Emission
Model No.: SPC-7000P
Mode: USB
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.515000	---	36.74	60.00	23.26	1000.0	9.000	N	9.7
0.515000	43.09	---	73.00	29.91	1000.0	9.000	N	9.7
0.525000	---	37.06	60.00	22.94	1000.0	9.000	N	9.7
0.525000	42.82	---	73.00	30.18	1000.0	9.000	N	9.7
1.330000	---	25.89	60.00	34.11	1000.0	9.000	N	9.7
1.330000	31.02	---	73.00	41.98	1000.0	9.000	N	9.7
2.930000	---	26.64	60.00	33.36	1000.0	9.000	N	9.7
2.930000	31.09	---	73.00	41.91	1000.0	9.000	N	9.7
21.760000	---	32.88	60.00	27.12	1000.0	9.000	N	10.2
21.760000	37.16	---	73.00	35.84	1000.0	9.000	N	10.2
22.140000	---	32.49	60.00	27.51	1000.0	9.000	N	10.2
22.140000	36.91	---	73.00	36.09	1000.0	9.000	N	10.2

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Page (39) of (83)

- LAN Mode

[HOT]

Common Information

Test Description:

Model No.:

Mode

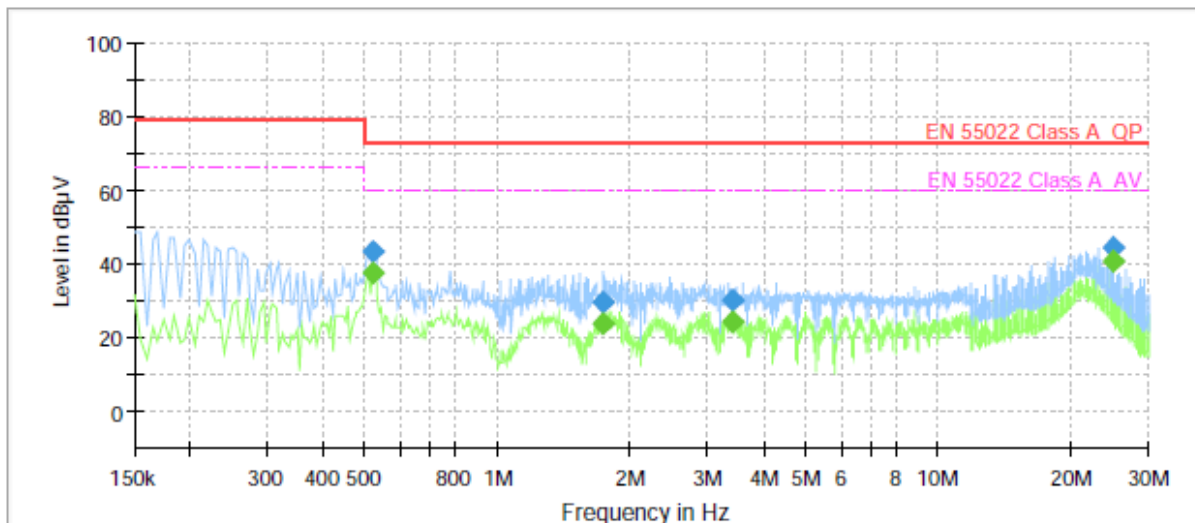
Operator Name:

Conducted Emission

SPC-7000P

RJ45.

KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.520000	---	37.44	60.00	22.56	1000.0	9.000	L1	9.7
0.520000	43.36	---	73.00	29.64	1000.0	9.000	L1	9.7
1.730000	---	23.79	60.00	36.21	1000.0	9.000	L1	9.7
1.730000	29.87	---	73.00	43.13	1000.0	9.000	L1	9.7
3.405000	---	24.17	60.00	35.83	1000.0	9.000	L1	9.8
3.405000	29.97	---	73.00	43.03	1000.0	9.000	L1	9.8
25.000000	---	40.82	60.00	19.18	1000.0	9.000	L1	10.2
25.000000	44.61	---	73.00	28.39	1000.0	9.000	L1	10.2

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KES-E1-16T0283-R2

Page (40) of (83)

[NEUTRAL]

Common Information

Test Description:

Model No.:

Mode

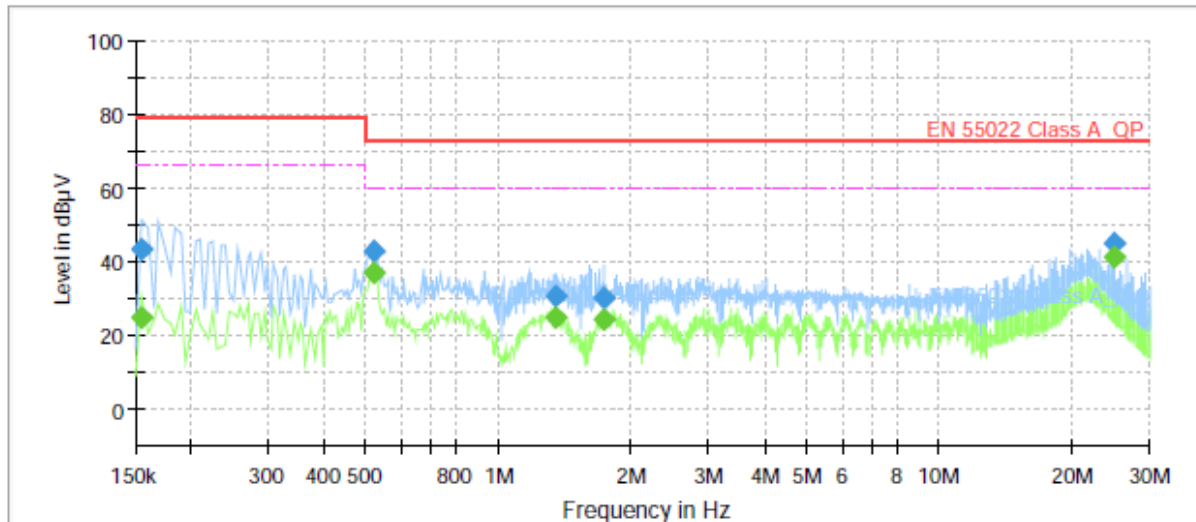
Operator Name:

Conducted Emission

SPC-7000P

RJ45.

KES



Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	24.93	66.00	41.07	1000.0	9.000	N	9.6
0.155000	43.49	---	79.00	35.51	1000.0	9.000	N	9.6
0.520000	---	37.18	60.00	22.82	1000.0	9.000	N	9.7
0.520000	43.10	---	73.00	29.90	1000.0	9.000	N	9.7
1.355000	---	24.96	60.00	35.04	1000.0	9.000	N	9.7
1.355000	30.71	---	73.00	42.29	1000.0	9.000	N	9.7
1.735000	---	24.23	60.00	35.77	1000.0	9.000	N	9.7
1.735000	30.37	---	73.00	42.63	1000.0	9.000	N	9.7
25.000000	---	41.06	60.00	18.94	1000.0	9.000	N	10.3
25.000000	44.86	---	73.00	28.14	1000.0	9.000	N	10.3

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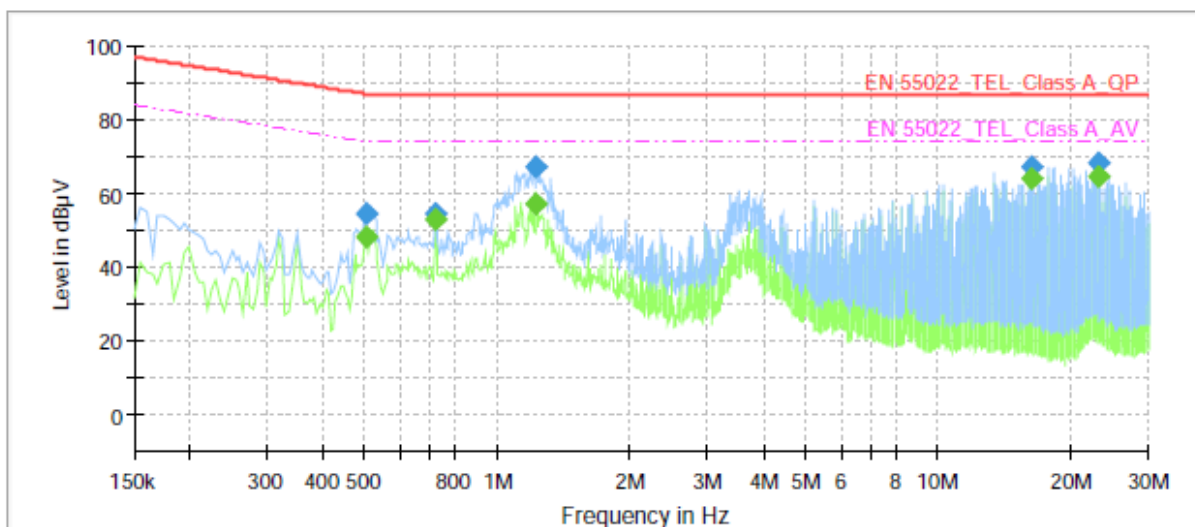
Conducted Emissions at Telecommunication Ports

- LAN Mode

[10 Mbps]

Common Information

Test Description: Telecommunication Emission
Model No.: SPC-7000P
Mode: RJ45_10Mbps
Operator Name: KES



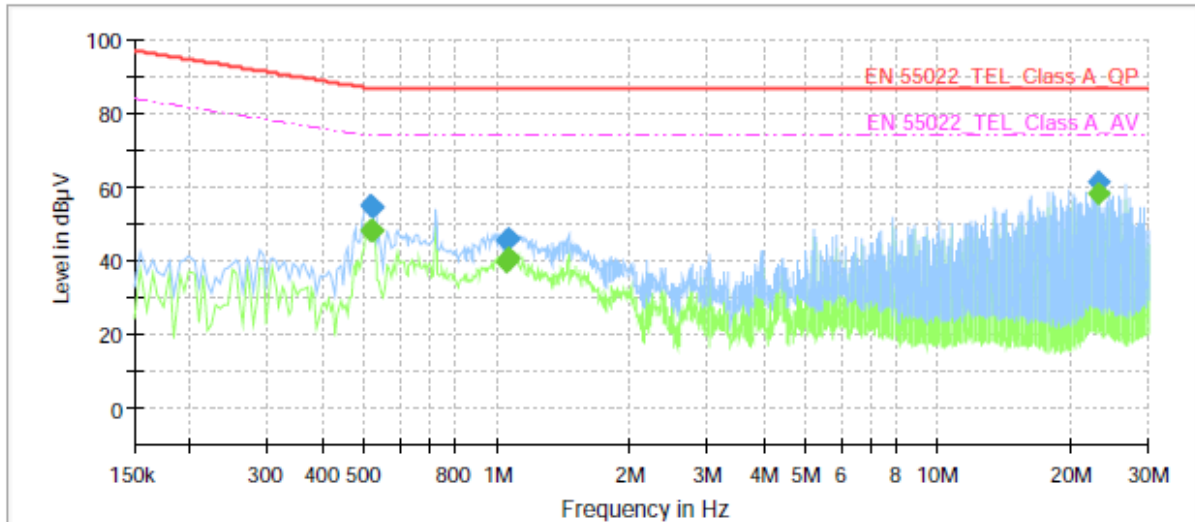
Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.505000	---	48.14	74.00	25.86	1000.0	9.000	Single Line	10.0
0.505000	54.64	---	87.00	32.36	1000.0	9.000	Single Line	10.0
0.725000	---	52.71	74.00	21.29	1000.0	9.000	Single Line	9.9
0.725000	54.37	---	87.00	32.63	1000.0	9.000	Single Line	9.9
1.225000	---	56.91	74.00	17.09	1000.0	9.000	Single Line	9.8
1.225000	67.40	---	87.00	19.60	1000.0	9.000	Single Line	9.8
16.230000	---	63.96	74.00	10.04	1000.0	9.000	Single Line	10.1
16.230000	67.41	---	87.00	19.59	1000.0	9.000	Single Line	10.1
23.130000	---	64.68	74.00	9.32	1000.0	9.000	Single Line	10.0
23.130000	68.09	---	87.00	18.91	1000.0	9.000	Single Line	10.0

[100 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	SPC-7000P
Mode	RJ45_100Mbps
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.515000	---	48.24	74.00	25.76	1000.0	9.000	Single Line	9.5
0.515000	55.13	---	87.00	31.87	1000.0	9.000	Single Line	9.5
0.520000	---	48.20	74.00	25.80	1000.0	9.000	Single Line	9.5
0.520000	54.60	---	87.00	32.40	1000.0	9.000	Single Line	9.5
1.045000	---	39.66	74.00	34.34	1000.0	9.000	Single Line	9.4
1.045000	45.63	---	87.00	41.37	1000.0	9.000	Single Line	9.4
1.055000	---	40.52	74.00	33.48	1000.0	9.000	Single Line	9.4
1.055000	45.87	---	87.00	41.13	1000.0	9.000	Single Line	9.4
23.130000	---	58.00	74.00	16.00	1000.0	9.000	Single Line	9.5
23.130000	61.28	---	87.00	25.72	1000.0	9.000	Single Line	9.5



Radiated Electric Field Emissions(Below 1 GHz)

- USB Mode

Frequency	Amplitude	ANT	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin
[MHz]	[dB μ V]	Polar. (H/V)	[m]	ANT. [dB/m]	Cable [dB]	[dB μ V/m]	[dB μ V/m]	[dB]
144.28	8.35	V	1.15	8.05	2.42	18.82	40.00	21.18
150.32	11.22	H	3.80	8.22	2.48	21.92	40.00	18.08
250.69	19.46	H	3.88	12.56	3.34	35.36	47.00	11.64
275.46	11.05	V	1.05	12.98	3.52	27.55	47.00	19.45
400.10	14.16	H	4.00	15.57	4.22	33.95	47.00	13.05
494.27	8.61	V	1.13	17.20	4.91	30.72	47.00	16.28

* H : Horizontal, V : Vertical

- LAN Mode

Frequency	Amplitude	ANT	ANT. Height	Correction Factor		Corrected Amplitude	Applicable Limit	Margin
[MHz]	[dB μ V]	Polar. (H/V)	[m]	ANT. [dB/m]	Cable [dB]	[dB μ V/m]	[dB μ V/m]	[dB]
150.21	26.16	H	4.00	8.22	2.47	36.85	40.00	3.15
225.11	13.97	V	1.28	12.01	3.10	29.08	40.00	10.92
275.46	21.05	H	3.81	12.98	3.52	37.55	47.00	9.45
325.49	10.31	V	1.52	13.95	3.80	28.06	47.00	18.94
496.33	16.84	H	4.00	17.24	4.92	39.00	47.00	8.00
560.13	14.75	V	1.19	18.48	5.32	38.55	47.00	8.45

* H : Horizontal, V : Vertical



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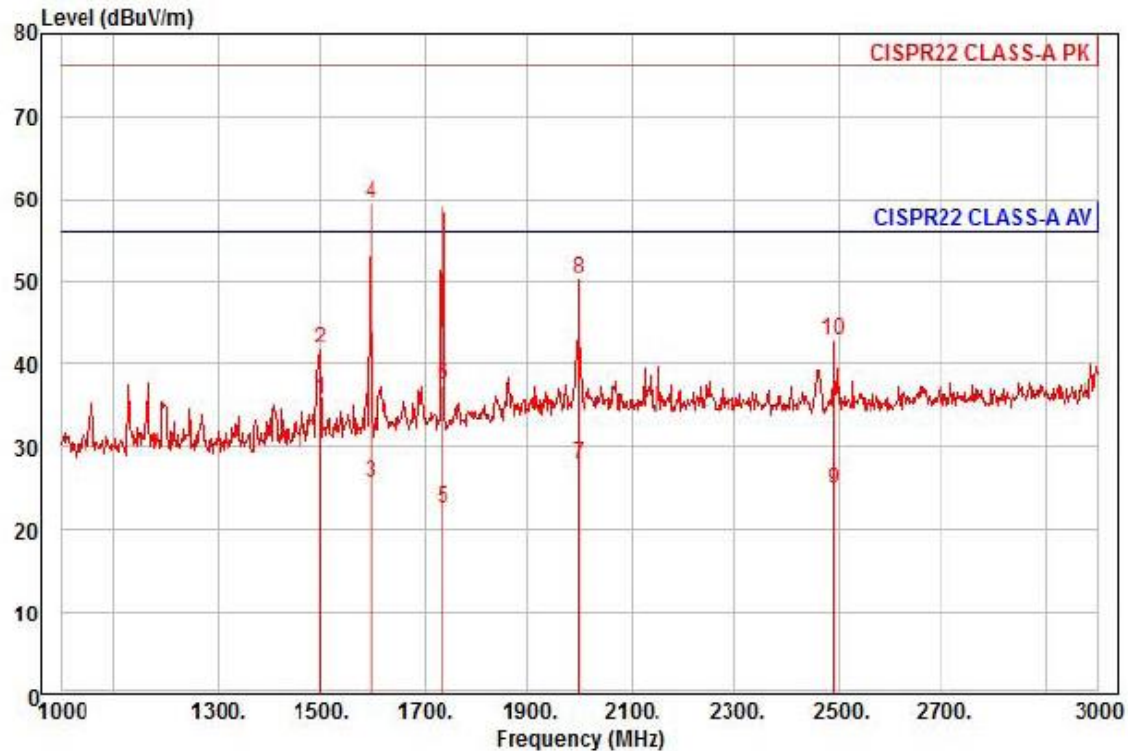
Test report No.:

KES-E1-16T0283-R2

Page (44) of (83)

Radiated Electric Field Emissions(Above 1 GHz)

- USB Mode



Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SPC-7000P
Mode : USB
Memo : 1 - 3 GHz

		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	av	1500.00	41.87	25.90	7.96	39.88	109	56.00	-20.15	horizontal Average
2		1500.00	47.85	25.90	7.96	39.88	109	76.00	-34.17	horizontal Peak
3		1598.00	31.00	26.28	8.24	39.83	146	56.00	-30.31	horizontal Average
4	pp	1598.00	64.79	26.28	8.24	39.83	146	76.00	-16.52	horizontal Peak
5		1736.00	26.82	26.83	8.62	39.76	195	56.00	-33.49	horizontal Average
6		1736.00	41.87	26.83	8.62	39.76	195	76.00	-38.44	horizontal Peak
7		1998.00	30.33	27.87	9.34	39.63	143	56.00	-28.09	horizontal Average
8		1998.00	52.79	27.87	9.34	39.63	143	76.00	-25.63	horizontal Peak
9		2492.00	25.65	29.09	10.10	39.92	209	56.00	-31.08	horizontal Average
10		2492.00	43.65	29.09	10.10	39.92	209	76.00	-33.08	horizontal Peak

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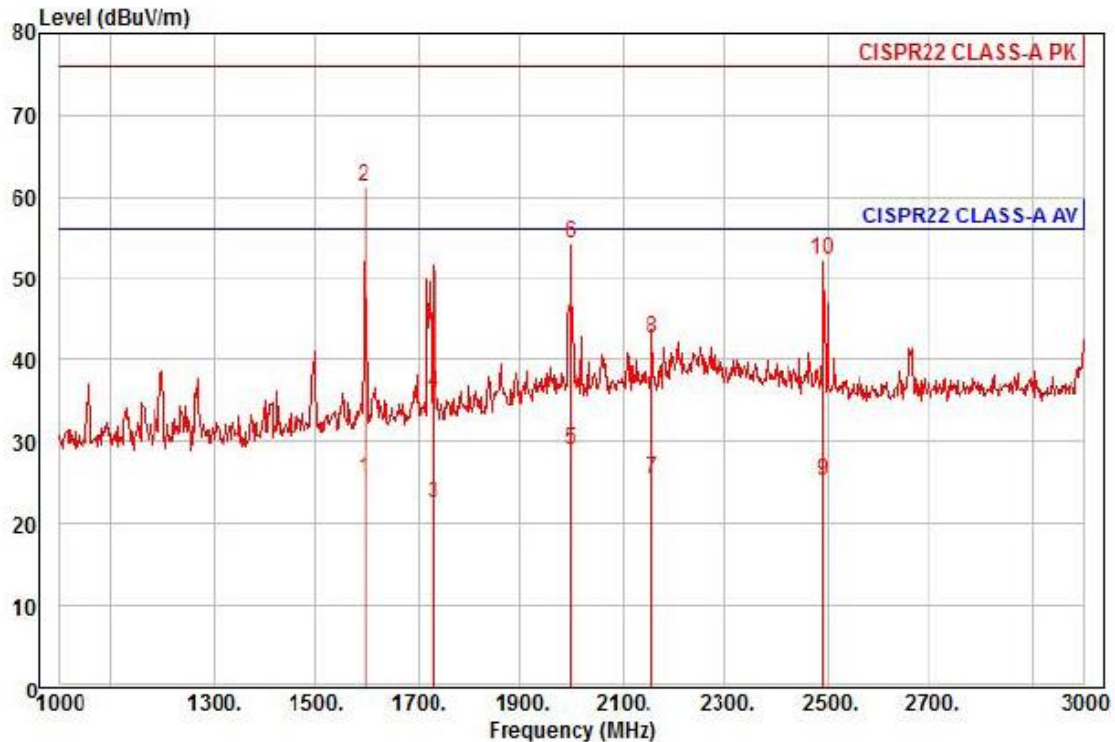
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Test report No.:

KES-E1-16T0283-R2

Page (45) of (83)



Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SPC-7000P
Mode : USB
Memo : 1 - 3 GHz

	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	1596.00	30.78	26.28	8.24	39.83	160	56.00	-30.53	vertical	Average
2 pp	1596.00	66.66	26.28	8.24	39.83	160	76.00	-14.65	vertical	Peak
3	1730.00	26.86	26.81	8.61	39.76	78	56.00	-33.48	vertical	Average
4	1730.00	40.30	26.81	8.61	39.76	78	76.00	-40.04	vertical	Peak
5 av	1998.00	31.36	27.87	9.34	39.63	102	56.00	-27.06	vertical	Average
6	1998.00	56.76	27.87	9.34	39.63	102	76.00	-21.66	vertical	Peak
7	2158.00	27.45	28.27	9.59	39.72	53	56.00	-30.41	vertical	Average
8	2158.00	44.68	28.27	9.59	39.72	53	76.00	-33.18	vertical	Peak
9	2492.00	25.97	29.09	10.10	39.92	138	56.00	-30.76	vertical	Average
10	2492.00	53.05	29.09	10.10	39.92	138	76.00	-23.68	vertical	Peak

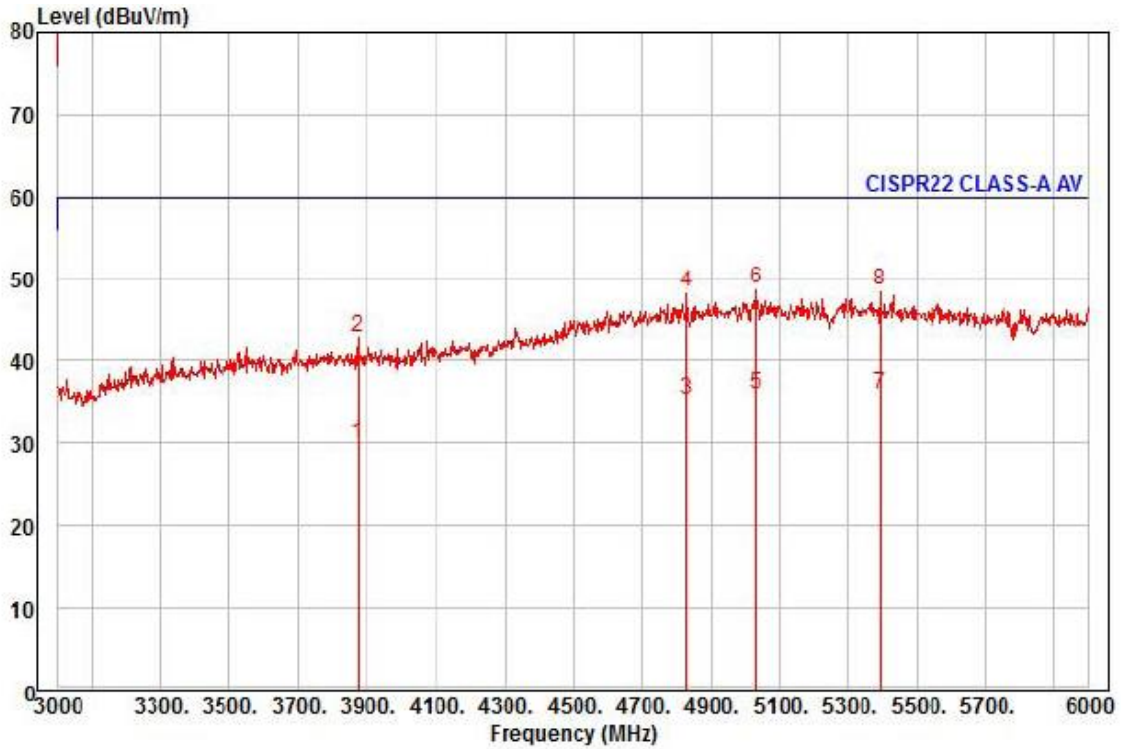
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KES-E1-16T0283-R2
Page (46) of (83)



Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SPC-7000P
Mode : USB
Memo : 3 - 6 GHz

	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	3873.00	25.29	31.80	13.26	40.38	238	60.00	-30.03	horizontal	Average
2	3873.00	38.24	31.80	13.26	40.38	238	80.00	-37.08	horizontal	Peak
3	4830.00	23.88	36.75	15.02	40.41	21	60.00	-24.76	horizontal	Average
4	4830.00	36.98	36.75	15.02	40.41	21	80.00	-31.66	horizontal	Peak
5 pp	5034.00	23.45	37.65	15.37	40.41	108	60.00	-23.94	horizontal	Average
6 pk	5034.00	36.12	37.65	15.37	40.41	108	80.00	-31.27	horizontal	Peak
7	5397.00	23.52	36.92	15.80	40.35	290	60.00	-24.11	horizontal	Average
8	5397.00	36.22	36.92	15.80	40.35	290	80.00	-31.41	horizontal	Peak

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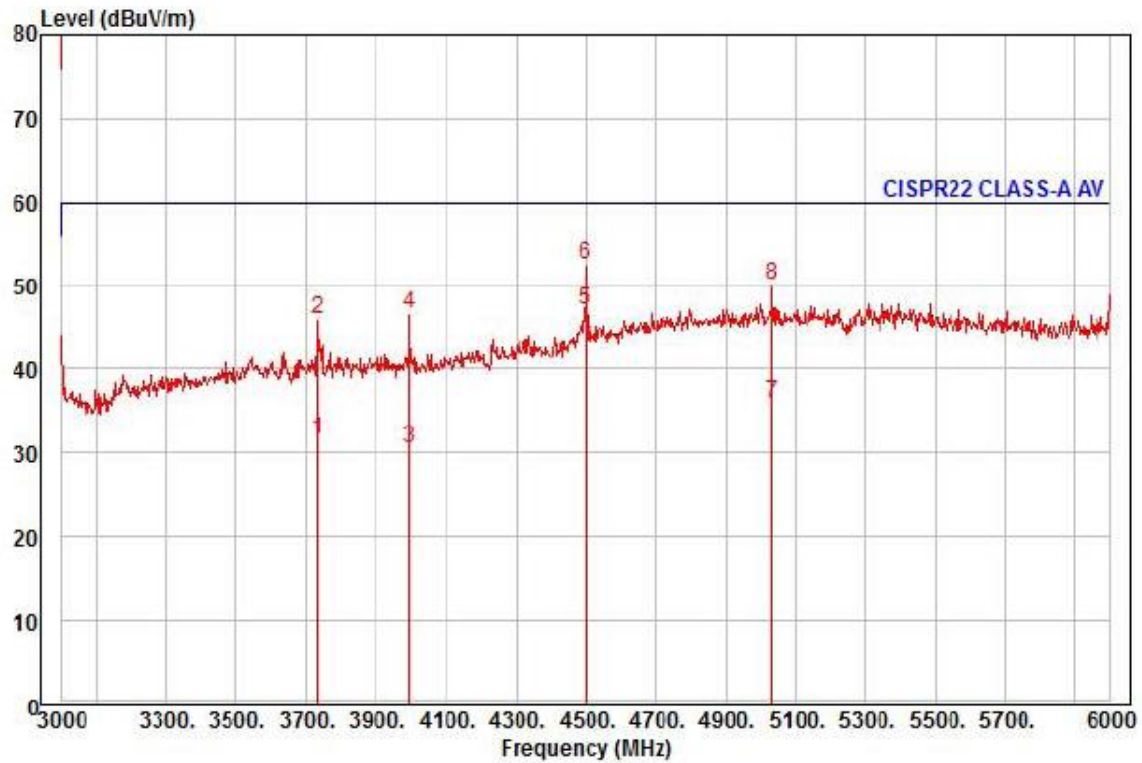
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Test report No.:

KES-E1-16T0283-R2

Page (47) of (83)



Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SPC-7000P
Mode : USB
Memo : 3 - 6 GHz

	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	3735.00	27.42	31.56	12.98	40.36	192	60.00	-28.40	vertical	Average
2	3735.00	41.82	31.56	12.98	40.36	192	80.00	-34.00	vertical	Peak
3	3996.00	25.35	32.00	13.50	40.41	189	60.00	-29.56	vertical	Average
4	3996.00	41.59	32.00	13.50	40.41	189	80.00	-33.32	vertical	Peak
5 pp	4500.00	38.21	34.86	14.43	40.41	241	60.00	-12.91	vertical	Average
6 pk	4500.00	43.58	34.86	14.43	40.41	241	80.00	-27.54	vertical	Peak
7	5034.00	23.44	37.65	15.37	40.41	154	60.00	-23.95	vertical	Average
8	5034.00	37.61	37.65	15.37	40.41	154	80.00	-29.78	vertical	Peak

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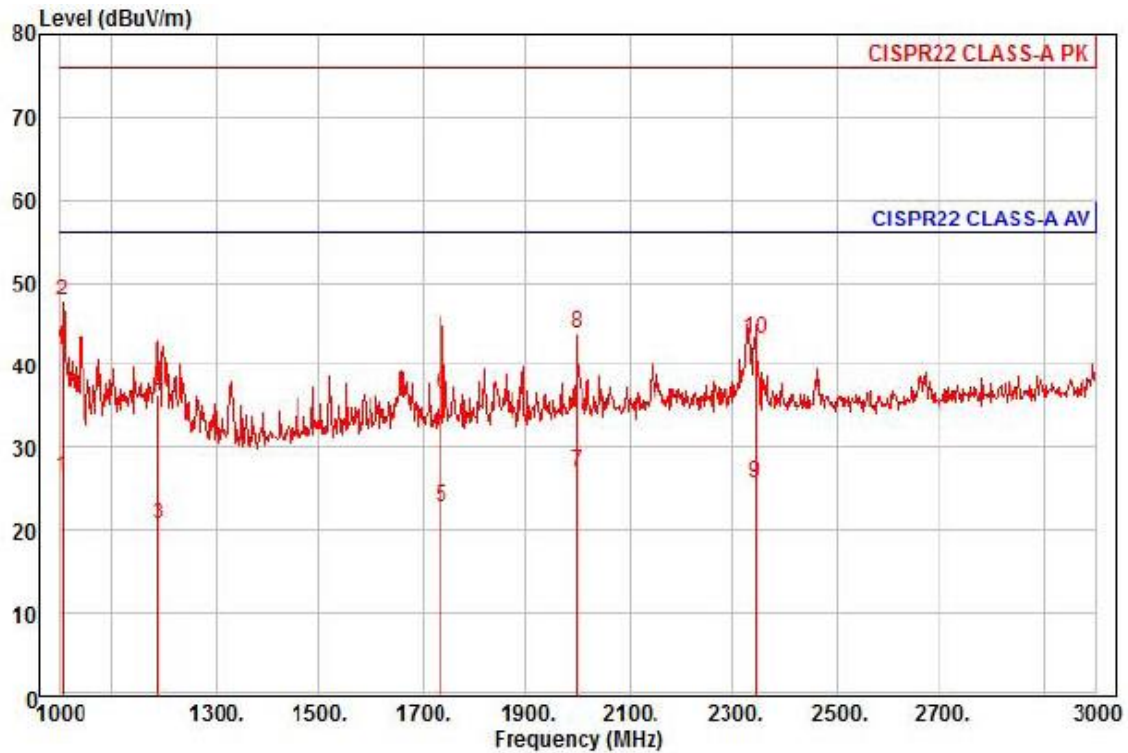


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Test report No.:
KES-E1-16T0283-R2
Page (48) of (83)

- LAN Mode



Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SPC-7000P
Mode : LAN
Memo : 1 - 3 GHz

	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	1004.00	36.09	23.93	6.52	40.12	334	56.00	-29.58	horizontal	Average
2 pp	1004.00	57.45	23.93	6.52	40.12	334	76.00	-28.22	horizontal	Peak
3	1190.00	29.12	24.66	7.06	40.03	7	56.00	-35.19	horizontal	Average
4	1190.00	44.71	24.66	7.06	40.03	7	76.00	-39.60	horizontal	Peak
5	1736.00	27.30	26.83	8.62	39.76	233	56.00	-33.01	horizontal	Average
6	1736.00	40.60	26.83	8.62	39.76	233	76.00	-39.71	horizontal	Peak
7 av	1998.00	29.53	27.87	9.34	39.63	10	56.00	-28.89	horizontal	Average
8	1998.00	46.14	27.87	9.34	39.63	10	76.00	-32.28	horizontal	Peak
9	2344.00	26.95	28.72	9.88	39.83	294	56.00	-30.28	horizontal	Average
10	2344.00	44.37	28.72	9.88	39.83	294	76.00	-32.86	horizontal	Peak

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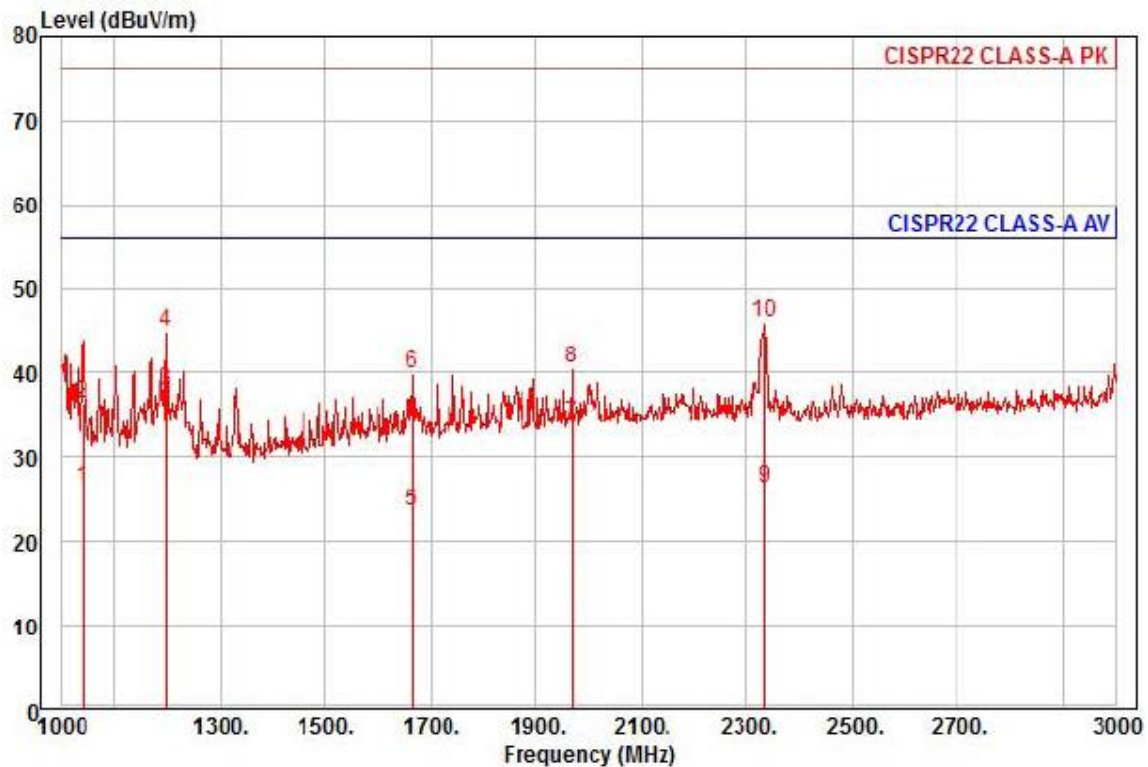
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Test report No.:

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Page (49) of (83)



Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SPC-7000P
Mode : LAN
Memo : 1 - 3 GHz

	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	1040.00	35.79	24.07	6.63	40.10	103	56.00	-29.61	vertical	Average
2	1040.00	45.87	24.07	6.63	40.10	103	76.00	-39.53	vertical	Peak
3 pp	1200.00	46.08	24.70	7.09	40.02	288	56.00	-18.15	vertical	Average
4	1200.00	53.07	24.70	7.09	40.02	288	76.00	-31.16	vertical	Peak
5	1666.00	28.42	26.55	8.43	39.79	3	56.00	-32.39	vertical	Average
6	1666.00	44.67	26.55	8.43	39.79	3	76.00	-36.14	vertical	Peak
7	1968.00	36.59	27.75	9.26	39.65	325	56.00	-22.05	vertical	Average
8	1968.00	43.28	27.75	9.26	39.65	325	76.00	-35.36	vertical	Peak
9	2334.00	27.60	28.70	9.86	39.82	132	56.00	-29.66	vertical	Average
10 pk	2334.00	47.22	28.70	9.86	39.82	132	76.00	-30.04	vertical	Peak

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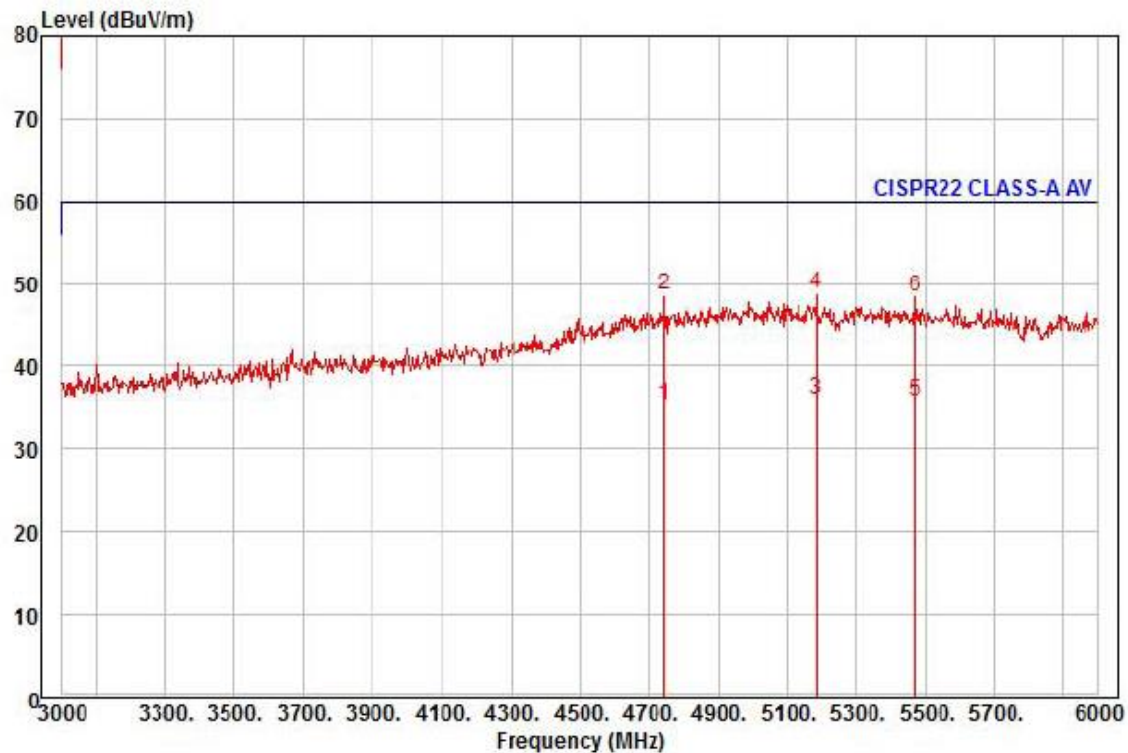
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Test report No.:

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Page (50) of (83)



Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SPC-7000P
Mode : LAN
Memo : 3 - 6 GHz

	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	4746.00	24.51	36.27	14.87	40.41	318	60.00	-24.76	horizontal	Average
2	4746.00	37.92	36.27	14.87	40.41	318	80.00	-31.35	horizontal	Peak
3 pp	5187.00	23.53	37.34	15.55	40.38	312	60.00	-23.96	horizontal	Average
4 pk	5187.00	36.31	37.34	15.55	40.38	312	80.00	-31.18	horizontal	Peak
5	5472.00	23.40	36.77	15.89	40.34	67	60.00	-24.28	horizontal	Average
6	5472.00	36.01	36.77	15.89	40.34	67	80.00	-31.67	horizontal	Peak

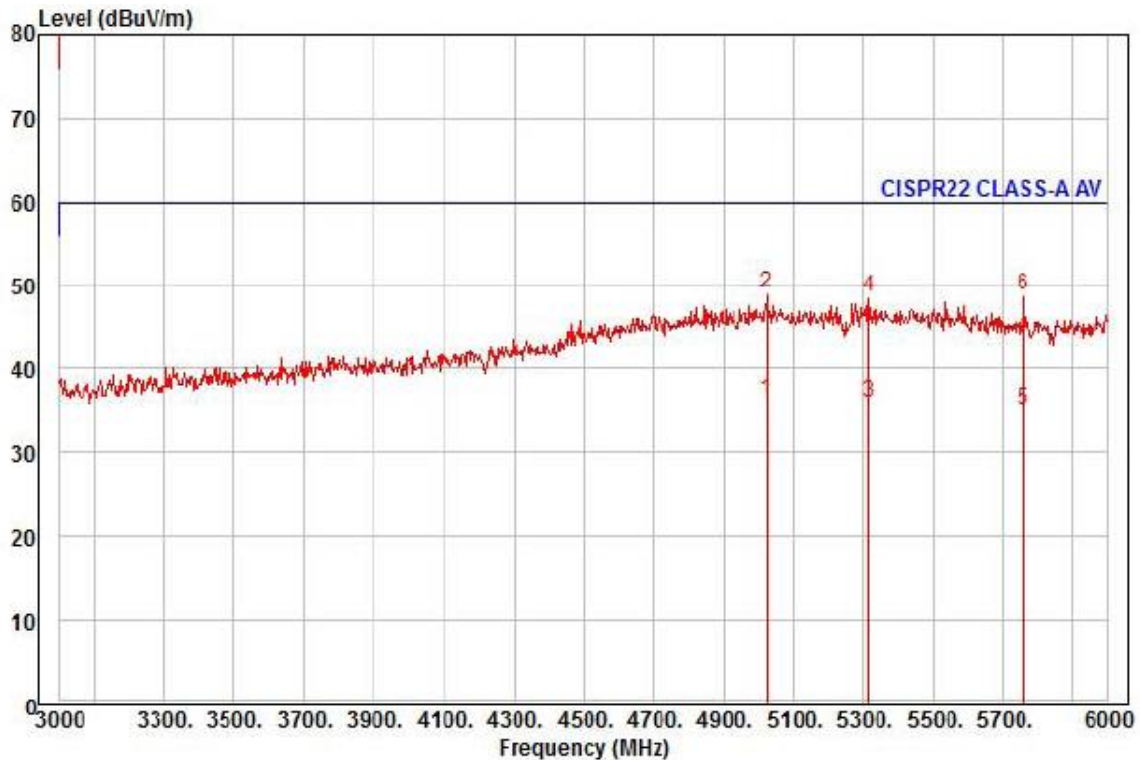
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Page (51) of (83)



Site : chamber
Condition: CISPR22 CLASS-A PK 3m HORN781(2015.05.07) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SPC-7000P
Mode : LAN
Memo : 3 - 6 GHz

		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	pp	5025.00	23.65	37.67	15.36	40.41	180	60.00	-23.73 vertical	Average
2	pk	5025.00	36.42	37.67	15.36	40.41	180	80.00	-30.96 vertical	Peak
3		5316.00	23.57	37.08	15.70	40.37	174	60.00	-24.02 vertical	Average
4		5316.00	36.23	37.08	15.70	40.37	174	80.00	-31.36 vertical	Peak
5		5760.00	22.91	36.18	16.41	40.30	338	60.00	-24.80 vertical	Average
6		5760.00	36.56	36.18	16.41	40.30	338	80.00	-31.15 vertical	Peak

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Harmonic Current Emissions and Voltage Fluctuations and Flicker

- USB Mode

Average harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	34.257E-3			
2	4.291E-3			PASS
3	22.183E-3	0.643	3.45	PASS
4	3.344E-3			PASS
5	21.865E-3	1.279	1.71	PASS
6	4.106E-3			PASS
7	21.556E-3	1.866	1.15	PASS
8	3.863E-3			PASS
9	21.248E-3	3.541	600.00E-3	PASS
10	3.126E-3			PASS
11	20.767E-3	4.195	495.00E-3	PASS
12	3.113E-3			PASS
13	20.175E-3	6.405	315.00E-3	PASS
14	3.281E-3			PASS
15	19.383E-3	8.615	225.00E-3	PASS
16	3.169E-3			PASS
17	18.726E-3	9.432	198.52E-3	PASS
18	3.075E-3			PASS
19	18.004E-3	10.136	177.63E-3	PASS
20	2.947E-3			PASS
21	16.896E-3	7.009	241.06E-3	PASS
22	2.717E-3			PASS
23	16.248E-3	7.381	220.12E-3	PASS
24	2.546E-3			PASS
25	15.293E-3	7.552	202.50E-3	PASS
26	2.380E-3			PASS
27	14.172E-3	7.559	187.49E-3	PASS
28	2.204E-3			PASS
29	13.465E-3	7.713	174.58E-3	PASS
30	1.981E-3			PASS
31	12.339E-3	7.556	163.31E-3	PASS
32	1.790E-3			PASS
33	11.300E-3	7.366	153.41E-3	PASS
34	1.641E-3			PASS
35	10.531E-3	7.280	144.65E-3	PASS
36	1.417E-3			PASS
37	9.344E-3	6.829	136.82E-3	PASS
38	1.237E-3			PASS
39	8.492E-3	6.542	129.80E-3	PASS
40	1.127E-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	34.799E-3			
2	5.168E-3	0.213	2.43	PASS
3	22.329E-3	0.431	5.17	PASS
4	5.005E-3	0.517	967.50E-3	PASS
5	22.201E-3	0.866	2.56	PASS
6	4.919E-3			PASS
7	21.886E-3	1.263	1.73	PASS
8	4.588E-3			PASS
9	21.415E-3	2.379	900.00E-3	PASS
10	4.815E-3			PASS
11	20.970E-3	2.824	742.50E-3	PASS
12	4.479E-3			PASS
13	20.329E-3	4.302	472.50E-3	PASS
14	4.033E-3			PASS
15	19.511E-3	5.781	337.50E-3	PASS
16	3.760E-3			PASS
17	18.975E-3	6.372	297.79E-3	PASS
18	3.651E-3			PASS
19	18.138E-3	6.807	266.44E-3	PASS
20	3.469E-3			PASS
21	17.171E-3	7.123	241.06E-3	PASS
22	3.180E-3			PASS
23	16.455E-3	7.476	220.12E-3	PASS
24	3.009E-3			PASS
25	15.493E-3	7.651	202.50E-3	PASS
26	2.839E-3			PASS
27	14.368E-3	7.663	187.49E-3	PASS
28	2.589E-3			PASS
29	13.614E-3	7.799	174.58E-3	PASS
30	2.388E-3			PASS
31	12.428E-3	7.610	163.31E-3	PASS
32	2.130E-3			PASS
33	11.467E-3	7.475	153.41E-3	PASS
34	1.921E-3			PASS
35	10.716E-3	7.408	144.65E-3	PASS
36	1.756E-3			PASS
37	9.462E-3	6.915	136.82E-3	PASS
38	1.521E-3			PASS
39	8.639E-3	6.655	129.80E-3	PASS
40	1.332E-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.



- LAN Mode

Average harmonic current results				
Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	34.580E-3			
2	4.517E-3			PASS
3	22.864E-3	0.663	3.45	PASS
4	3.026E-3			PASS
5	22.492E-3	1.315	1.71	PASS
6	4.365E-3			PASS
7	22.117E-3	1.915	1.15	PASS
8	3.920E-3			PASS
9	21.893E-3	3.649	600.00E-3	PASS
10	2.804E-3			PASS
11	21.425E-3	4.328	495.00E-3	PASS
12	2.852E-3			PASS
13	20.790E-3	6.600	315.00E-3	PASS
14	3.156E-3			PASS
15	19.883E-3	8.837	225.00E-3	PASS
16	3.119E-3			PASS
17	19.181E-3	9.662	198.52E-3	PASS
18	3.063E-3			PASS
19	18.425E-3	10.373	177.63E-3	PASS
20	2.887E-3			PASS
21	17.265E-3	7.162	241.06E-3	PASS
22	2.669E-3			PASS
23	16.593E-3	7.538	220.12E-3	PASS
24	2.490E-3			PASS
25	15.590E-3	7.699	202.50E-3	PASS
26	2.327E-3			PASS
27	14.462E-3	7.713	187.49E-3	PASS
28	2.203E-3			PASS
29	13.761E-3	7.882	174.58E-3	PASS
30	1.943E-3			PASS
31	12.573E-3	7.699	163.31E-3	PASS
32	1.766E-3			PASS
33	11.528E-3	7.515	153.41E-3	PASS
34	1.674E-3			PASS
35	10.773E-3	7.448	144.65E-3	PASS
36	1.380E-3			PASS
37	9.476E-3	6.926	136.82E-3	PASS
38	1.238E-3			PASS
39	8.608E-3	6.632	129.80E-3	PASS
40	1.158E-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	34.942E-3			
2	5.154E-3	0.212	2.43	PASS
3	22.981E-3	0.444	5.17	PASS
4	3.544E-3			PASS
5	22.788E-3	0.888	2.56	PASS
6	4.993E-3			PASS
7	22.271E-3	1.285	1.73	PASS
8	4.501E-3			PASS
9	22.096E-3	2.455	900.00E-3	PASS
10	3.315E-3			PASS
11	21.547E-3	2.902	742.50E-3	PASS
12	3.330E-3			PASS
13	20.925E-3	4.429	472.50E-3	PASS
14	3.684E-3			PASS
15	20.020E-3	5.932	337.50E-3	PASS
16	3.609E-3			PASS
17	19.287E-3	6.477	297.79E-3	PASS
18	3.506E-3			PASS
19	18.559E-3	6.965	266.44E-3	PASS
20	3.314E-3			PASS
21	17.349E-3	7.197	241.06E-3	PASS
22	3.053E-3			PASS
23	16.711E-3	7.592	220.12E-3	PASS
24	2.914E-3			PASS
25	15.720E-3	7.763	202.50E-3	PASS
26	2.750E-3			PASS
27	14.574E-3	7.773	187.49E-3	PASS
28	2.543E-3			PASS
29	13.956E-3	7.994	174.58E-3	PASS
30	2.263E-3			PASS
31	12.684E-3	7.767	163.31E-3	PASS
32	2.050E-3			PASS
33	11.668E-3	7.606	153.41E-3	PASS
34	1.917E-3			PASS
35	10.931E-3	7.557	144.65E-3	PASS
36	1.603E-3			PASS
37	9.573E-3	6.997	136.82E-3	PASS
38	1.458E-3			PASS
39	8.710E-3	6.710	129.80E-3	PASS
40	1.343E-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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www.kes.co.kr

Test report No.:

KES-E1-16T0283-R2

Page (56) of (83)

Test Data - Voltage Fluctuations

- USB Mode

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 [%]	0.032	4.00	PASS
Tmax [s]	0.000	0.50	PASS

- LAN Mode

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 [%]	0.034	4.00	PASS
Tmax [s]	0.000	0.50	PASS

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Test Setup Photos and Configuration

Conducted Voltage Emissions

- USB Mode



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- LAN Mode



Conducted Telecommunication Emissions

- LAN Mode



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Radiated Electric Field Emissions(Below 1 GHz)

- USB Mode



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- LAN Mode



Radiated Electric Field Emissions(Above 1 GHz)

- USB Mode



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- LAN Mode



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Harmonic Current Emissions and Voltage Fluctuations and Flicker

- USB Mode



- LAN Mode



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Electrostatic Discharge

- USB Mode



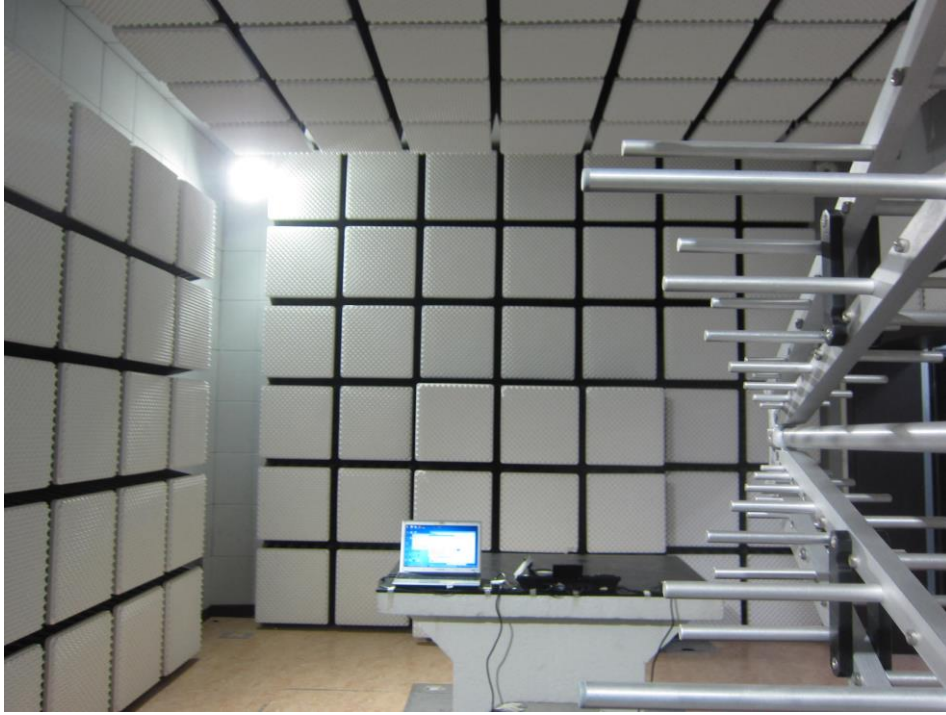
- LAN Mode



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Radiated Electric Field Immunity

- USB Mode



- LAN Mode



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Electrical Fast Transients/Bursts

- USB Mode



- LAN Mode



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Surge Transients

- USB Mode



- LAN Mode



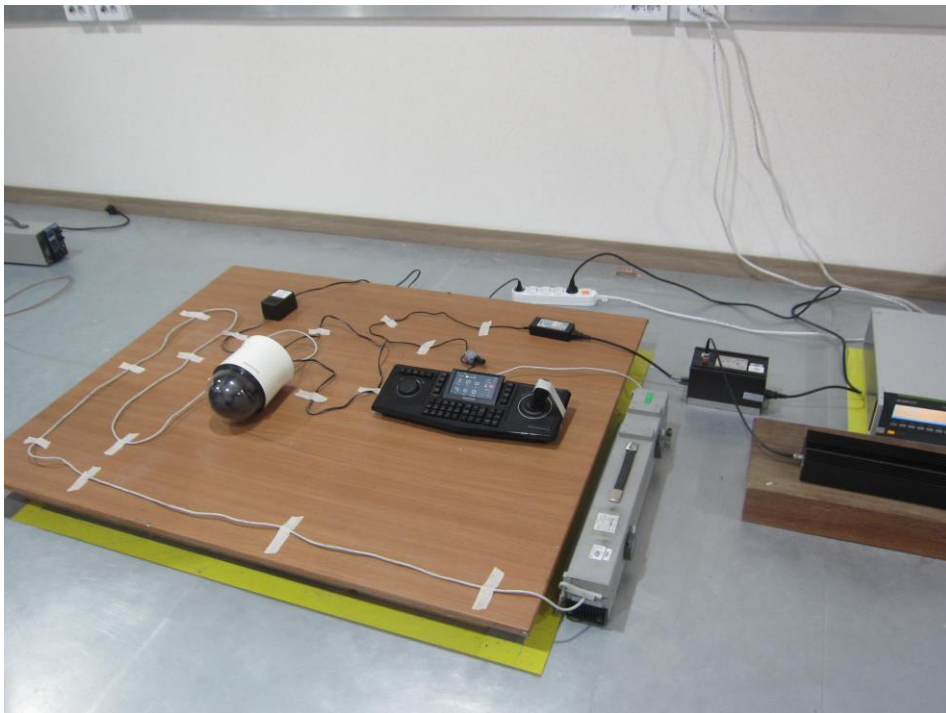
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Conducted Disturbance

- USB Mode



- LAN Mode



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Voltage Dips and Short Interruptions

- USB Mode



- LAN Mode



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Test report No.:

KES-E1-16T0283-R2

Page (71) of (83)

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EUT External Photographs

(Top)



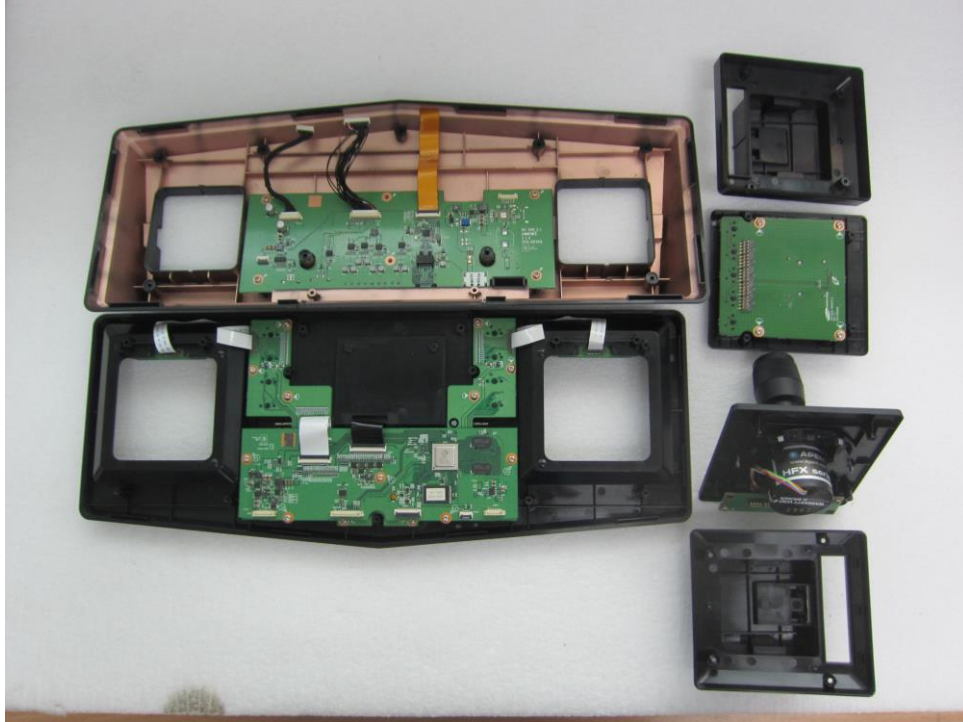
(Bottom)



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EUT Internal Photographs

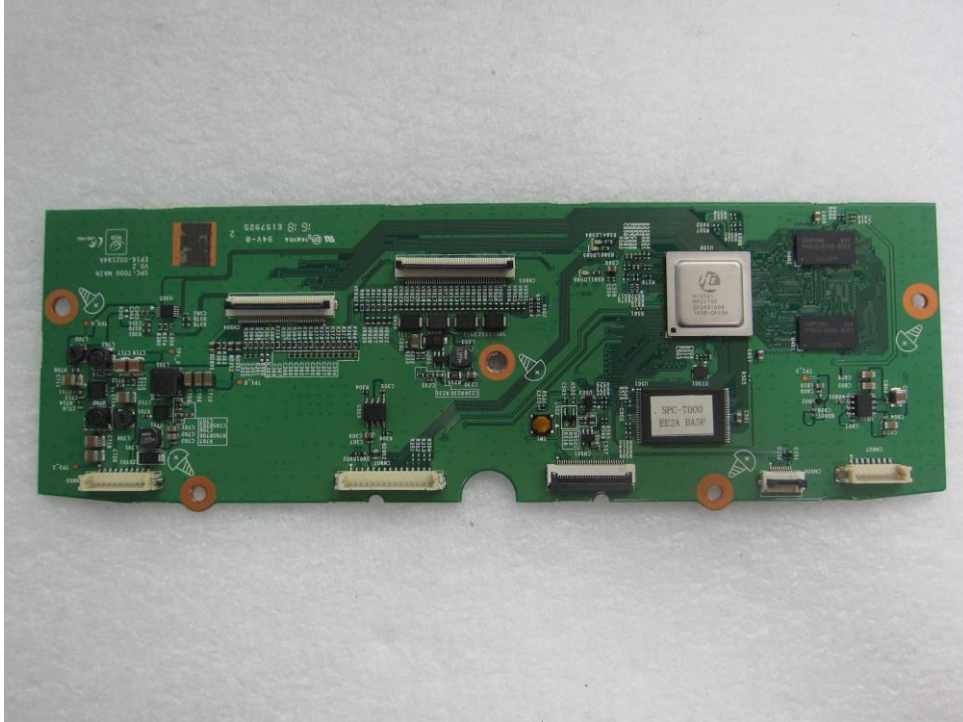
(Internal View)



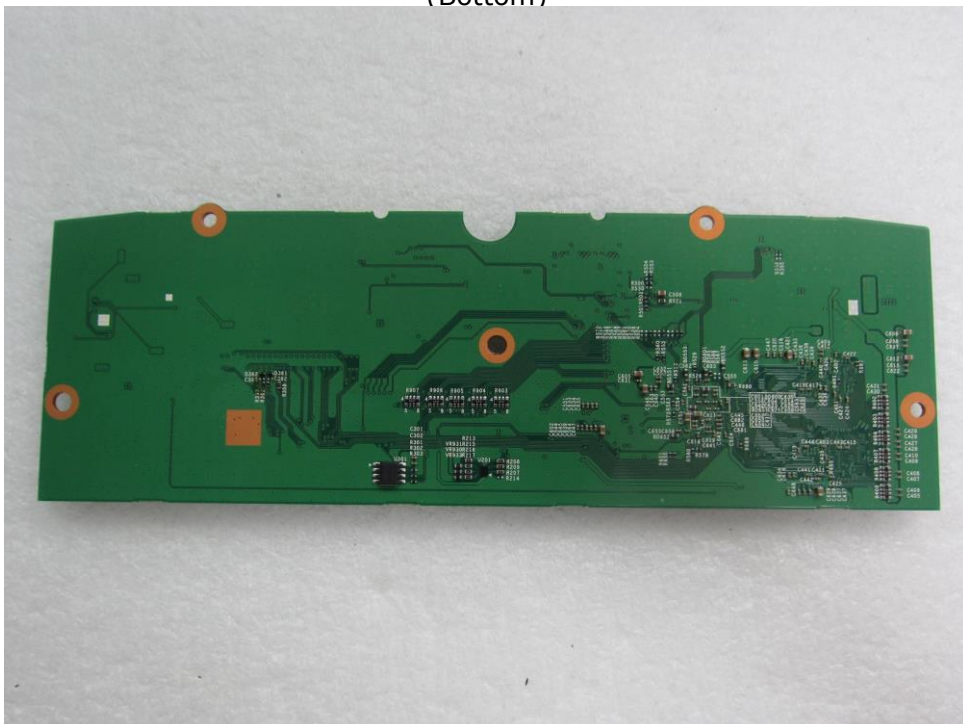
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EUT Internal View – Main Board

(Top)



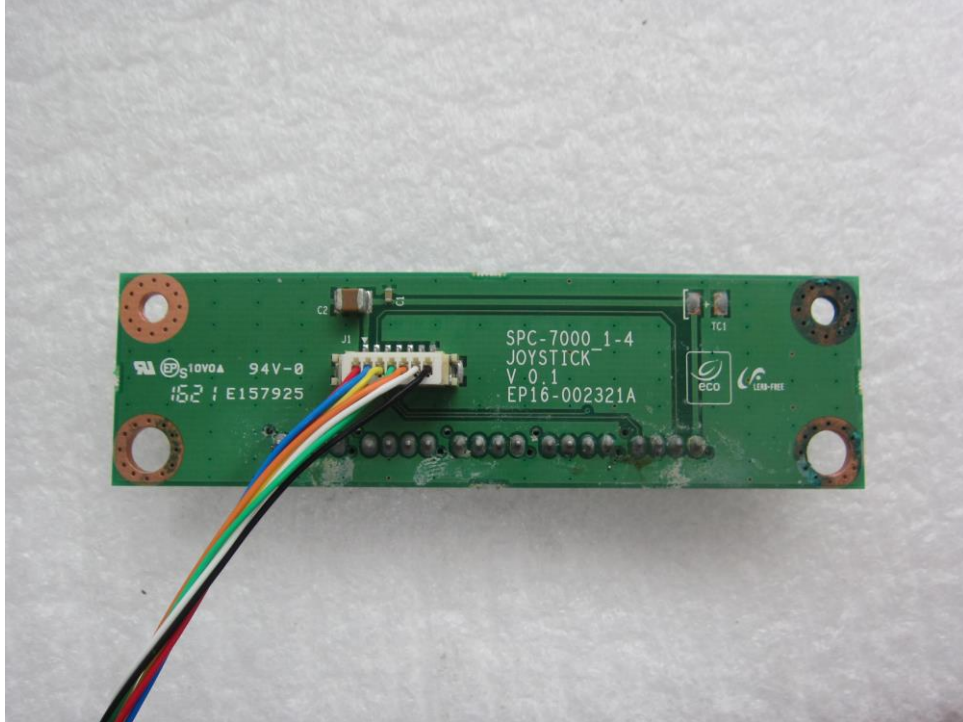
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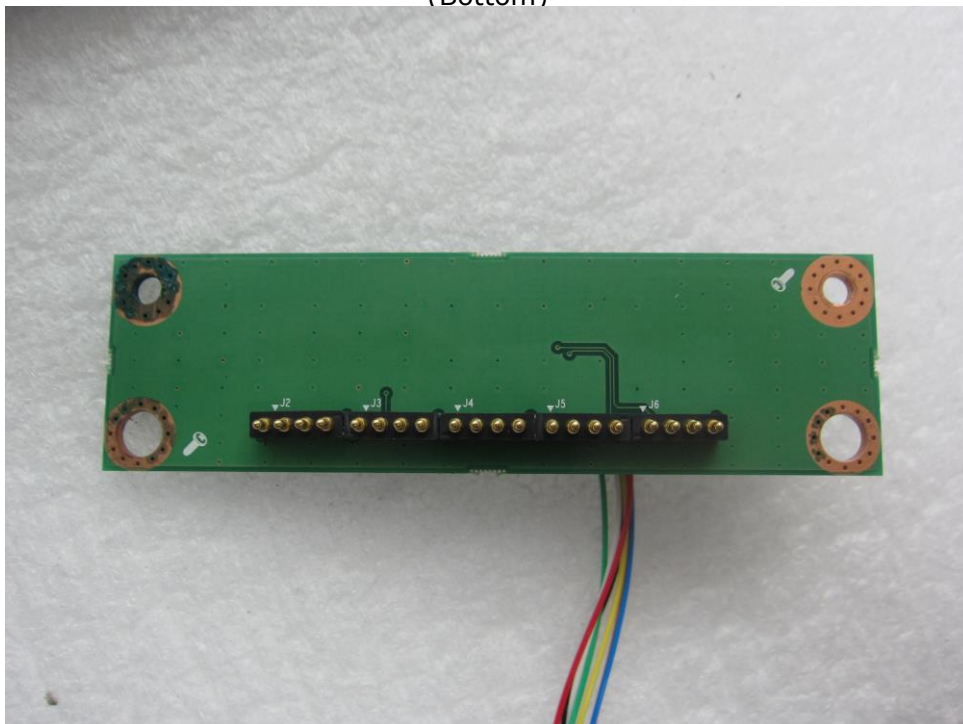
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EUT Internal View – Sub Board 1

(Top)



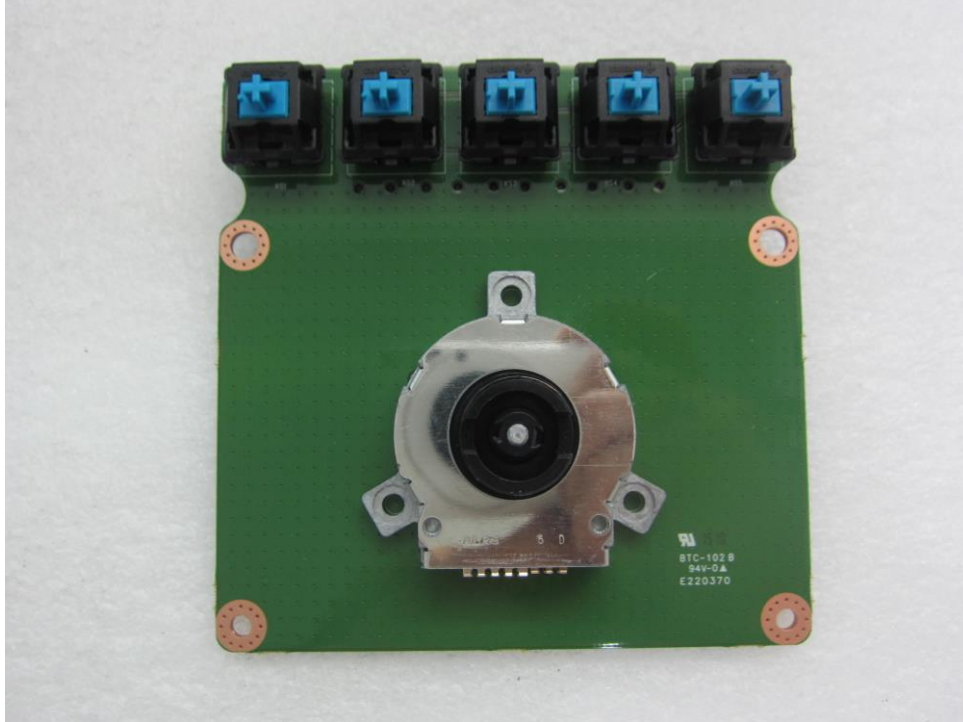
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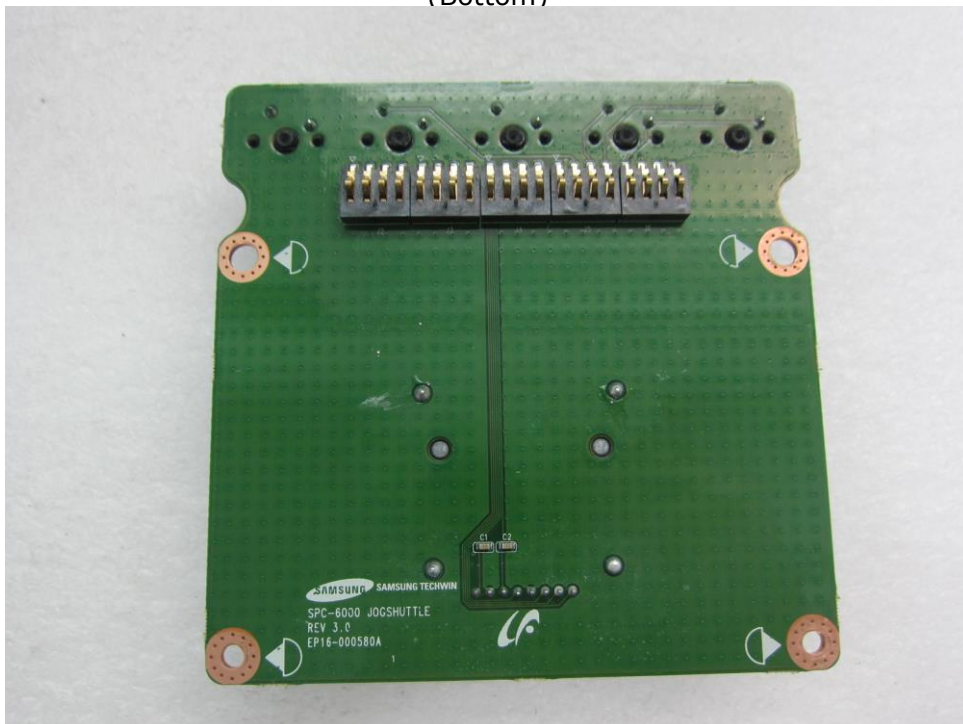
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EUT Internal View – Sub Board 2

(Top)



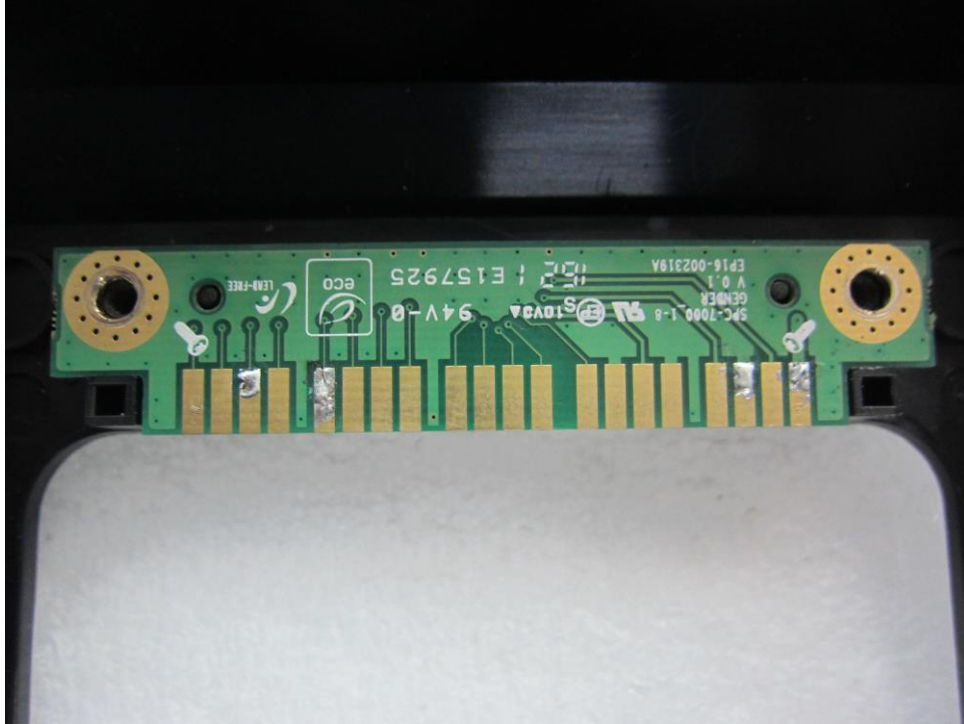
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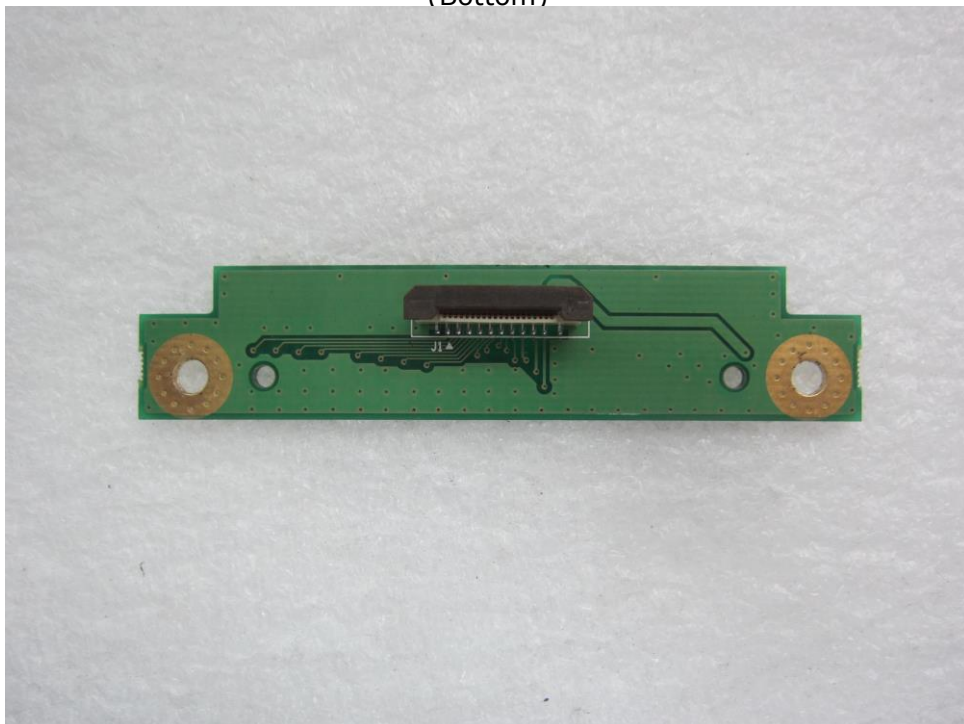
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EUT Internal View – Sub Board 3

(Top)

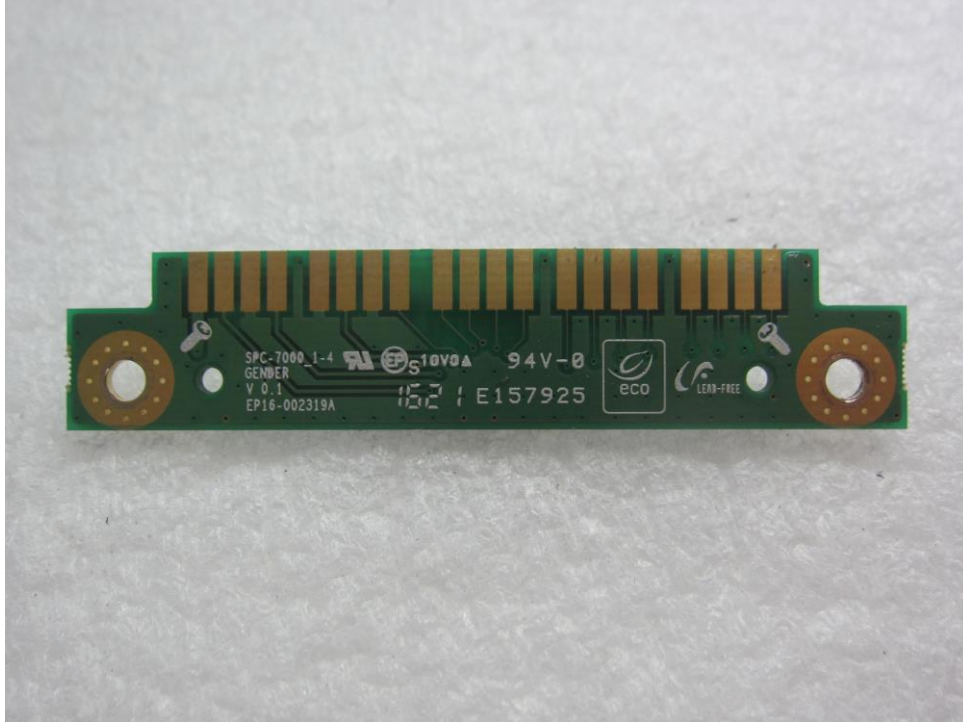


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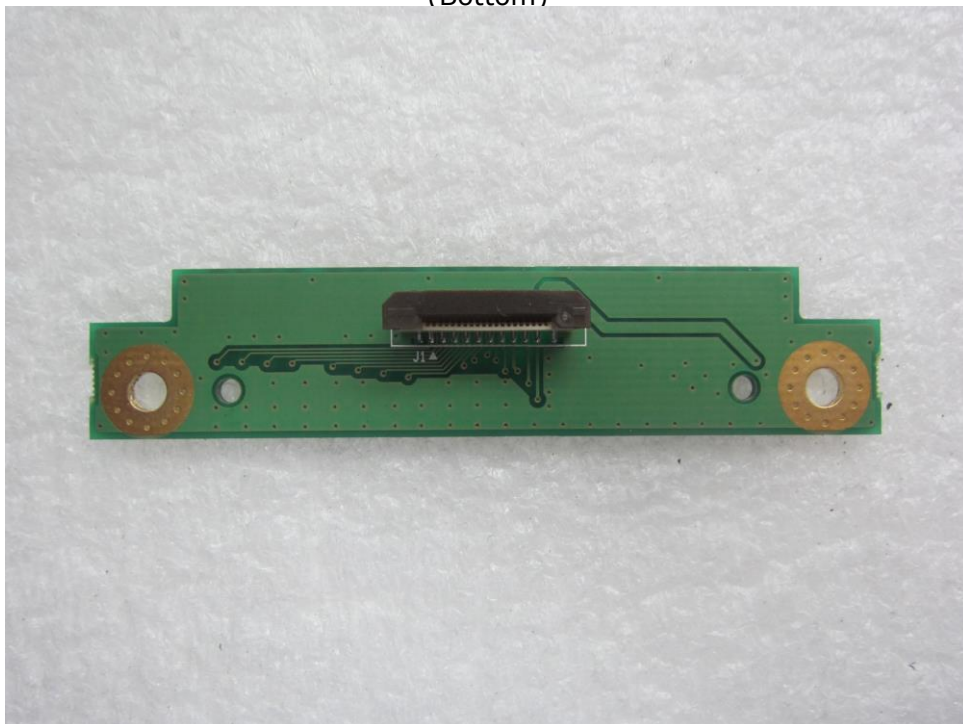


EUT Internal View – Sub Board 4

(Top)



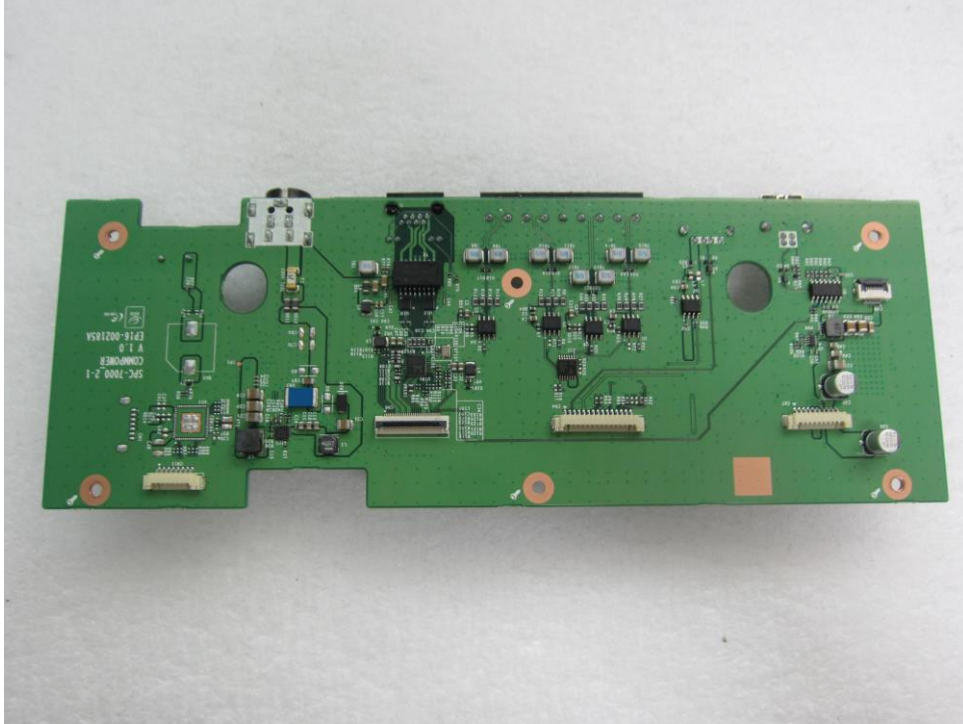
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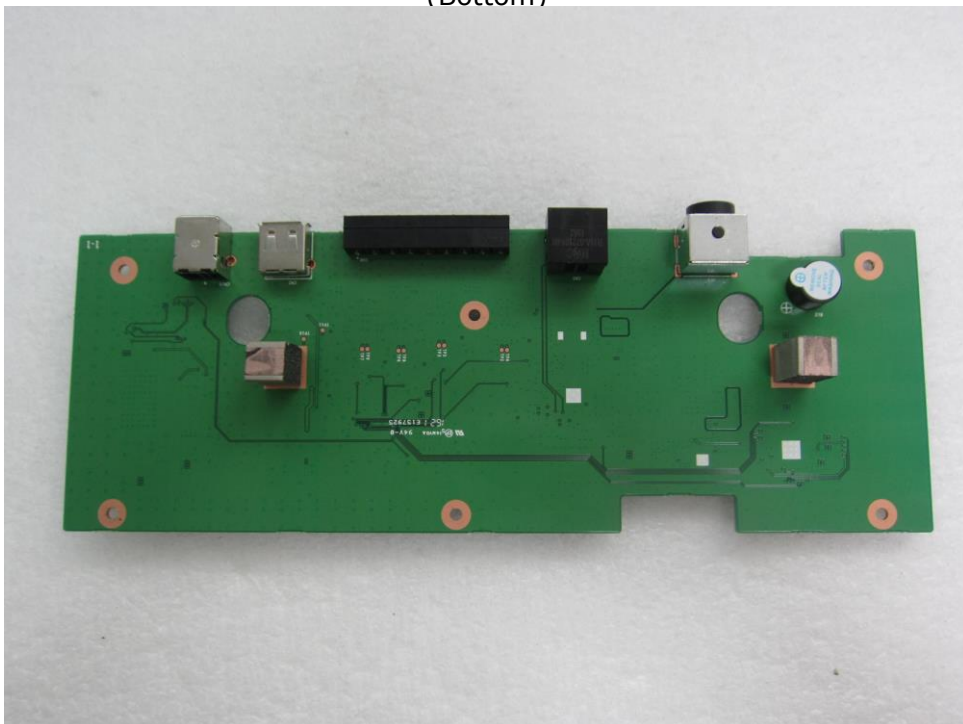
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EUT Internal View – Sub Board 5

(Top)



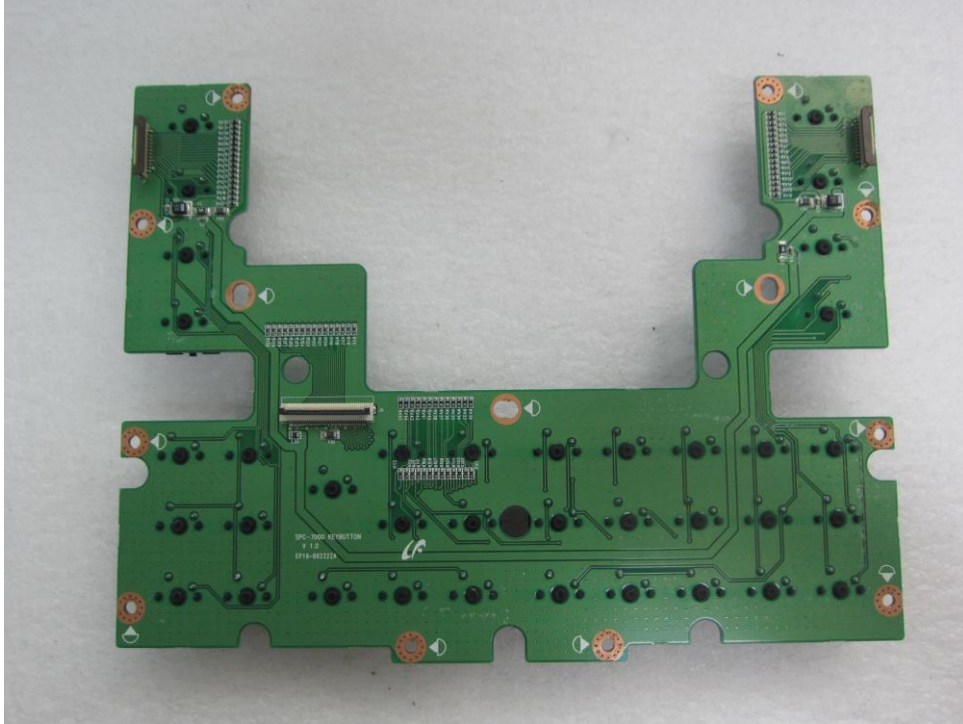
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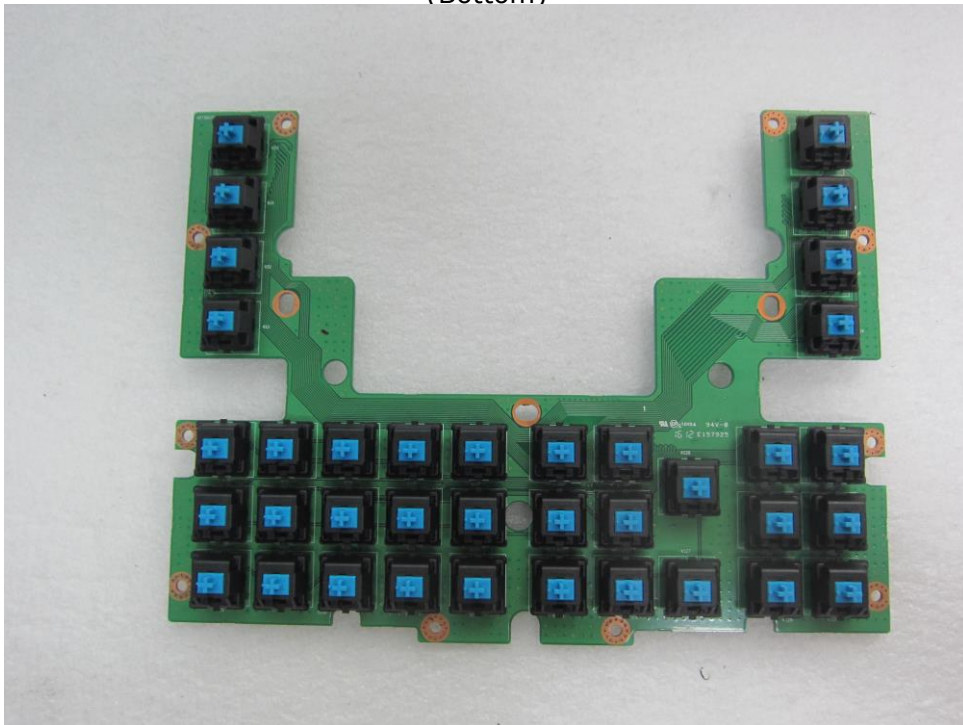
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EUT Internal View – Sub Board 6

(Top)



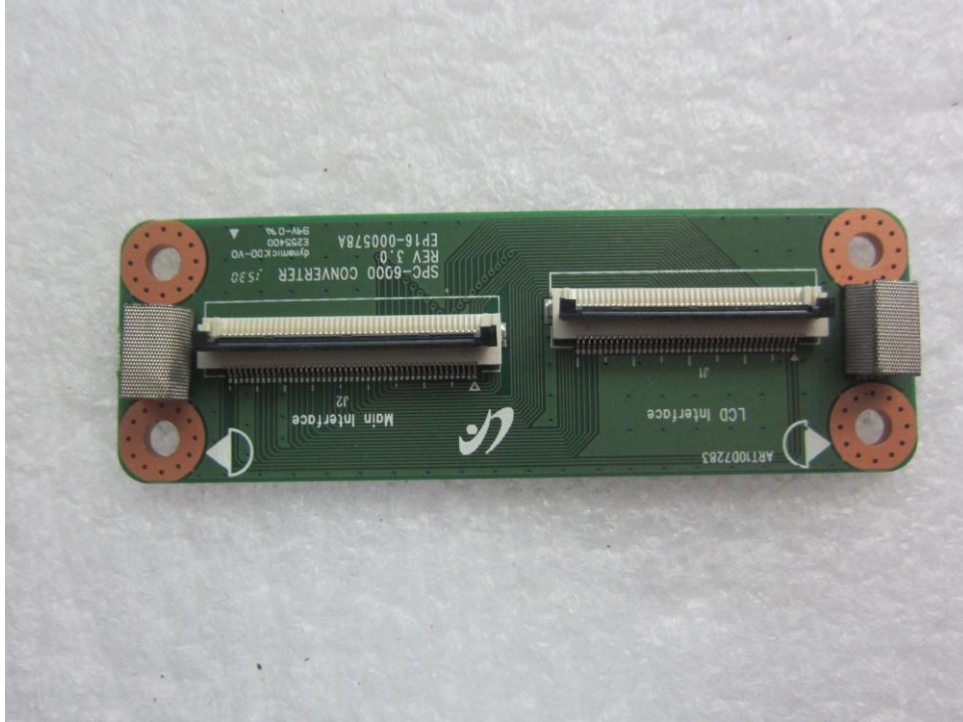
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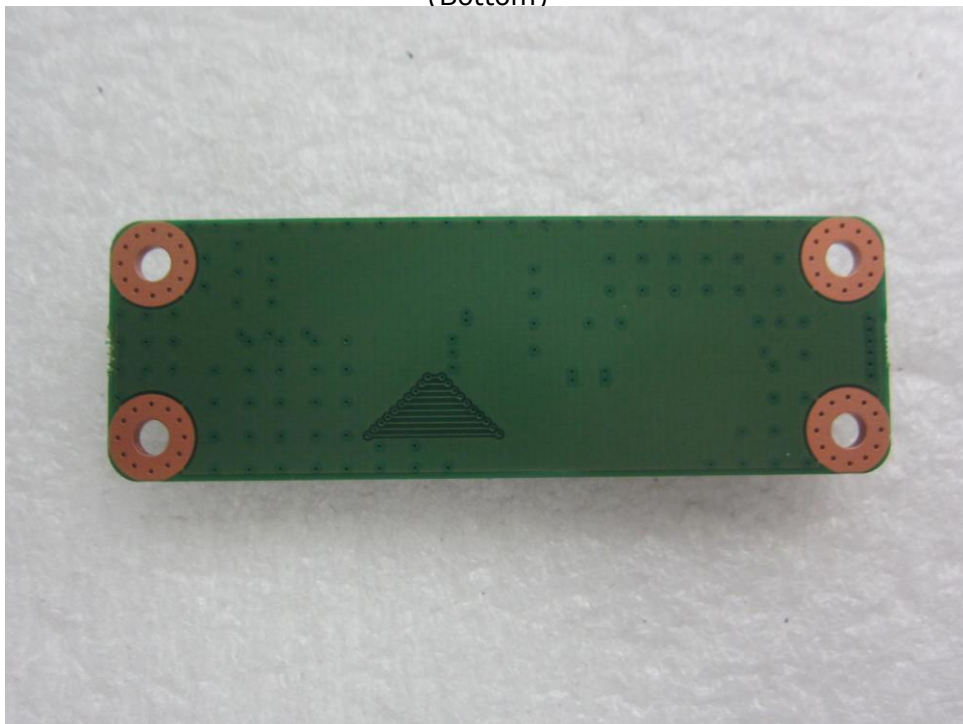
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EUT Internal View – Sub Board 7

(Top)



(Bottom)



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EUT Internal View – Adaptor

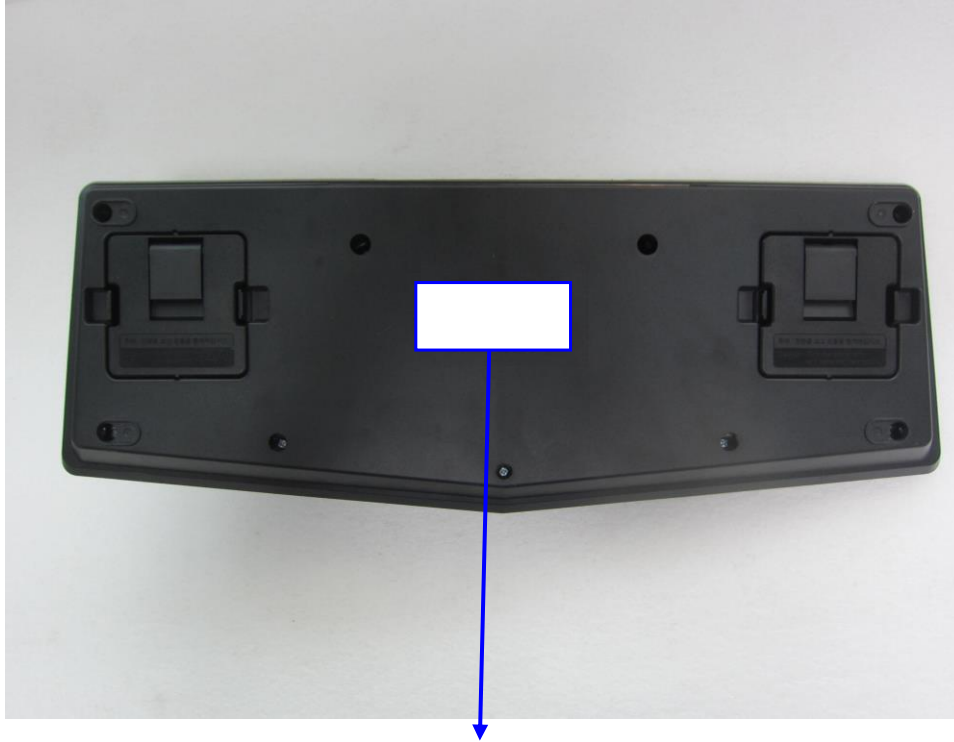
(Top)



(Bottom)



Label and Location



NETWORK CONTROLLER

Model No : SPC-7000

Manufacturer : HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.

Made in Vietnam