



EMC TEST REPORT

Test Report No. : KES-E1-18T0169
Date of Issue : Feb. 19, 2018
Product name : 16ch Video Network Encoder
Model/Type No. : SPE-1610
Variant Mode : -
Applicant : Hanwha Techwin Co., Ltd.
Applicant Address : 1204, Changwon-daero, Seongsan-gu, Changwon-si,
Gyeongsangnam-do, Korea
Manufacturer : Hanwha Techwin (Tianjin) Co., Ltd.
Manufacturer Address : No.11 Weiliu Rd, Micro-Electronic Industrial Park, TEDA,
Tianjin, 300385, People's Republic of China
Equipment authorization : ☐ Declaration of Conformity
☒ Verification
☐ Certification
Date of Receipt : Feb. 05, 2018
Test date : Feb. 08, 2018 ~ Feb. 12, 2018
Test Results : ☒ In Compliance ☐ Not in Compliance

Tested by

Sung Min Choi
EMC Test Engineer

Reviewed by

Dong-Hun, Jang
EMC Technical Manager

This test report is not related to KOLAS.

**KES Co., Ltd.**

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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Feb. 19, 2018	KES-E1-18T0169	Issued

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1.0 General Product Description

Main Specifications of EUT are:

Video In	4CH 1.0 Vp-p / 75Ω composite NTSC/PAL AHD(Max. 4M), CVI(2M), TVI(2M) Auto Detection.
Video Out	*HDMI Out(Fixed Resolution, 1280X720)
De-interlacing Filter	Built-in
Motion Detection	All Area, (8ea)
Privacy Masking	Off / On (4ea rectangular zones)
Alarm I/O	SPE-1610 : 16 Inputs / 4 Outputs SPE-410 : 4 Inputs / 2 Output
Alarm Trigger	Motion Detection, Alarm Input, Video Loss, Video Analytics(Tampering,) Network disconnect
Alarm Events	File Upload Via FTP, E-mail, Notification Via E-mail
Remote Control Interface	1ea RS-485(Half Duplex)
RS-485 Protocol	SAMSUNG-T, PELCO-P/D,
Coaxial Control	NTSC/PAL : Pelco-C (Coaxitron) AHD : ACP(AHD Coax Protocol)
Network	
Ethernet	1 RJ-45 10/100/1000 Base-T
Video Compression Format	H.264 (MPEG-4 Part 10/AVC) : Main / Baseline / High, JPEG
Resolution	4M, 1920x1080, 1280x720, 928x480(N), 704x480(N), 704x240(N), 352x240(N) 928x576(P), 704x576(P), 704x288(P), 352x288(P)
Max. Framerate	H.264 : - Main Stream 4MP : 15fps/CH, 1080p/720p/WD1/4CIF/CIF : 30fps/CH(N), 25fps/CH(P) - Sub Stream WD1/4CIF : 12fps/CH, 2CIF/CIF/QVGA/QCIF : 30fps/CH(N), 25fps/CH(P) JPEG : 2fps @ 1920x1080, 1280x720, 960H, D1

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Video Quality Adjustment	H.264, MPEG-4 : Compression Level, Target Bitrate Level Control JPEG : Quality Level Control
Bitrate Control Method	H.264, : CBR or VBR JPEG : VBR
Streaming Capability	
Audio I/O	4 Line Input / 1 Line Output
Audio Compression Format	G.711 u-law
Audio Communication	2-Way
IP	IPv4, IPv6
Protocol	TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP, RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, PPPoE, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, PIM-SM, UPnP, ONVIF, Bonjour
Security	HTTPS (SSL) Login Authentication, Digest Login Authentication IP Address Filtering, User Access Log, 802.1X Authentication (EAP-TLS, EAP-LEAP)
Streaming Method	Unicast / Multicast
Max. User Access	10 users at Unicast Mode
Webpage Languages	English, Korean, Chinese, Chinese Traditional French, Italian, Spanish, German, Japanese, Russian, Swedish, Portuguese, Czech, Polish, Turkish, Dutch,
Web Viewer	Supported OS : Windows 7, 8, 10, Mac OS X 10.10, 10.11, 10.12 Supported Browser : Google Chrome, MS Edge, Mozilla Firefox (Windows 64bit only), Apple Safari (Mac OS X only), MS Explore 11
Application Programming Interface	ONVIF profile S, SUNAPI (HTTP API)
Central Management Software	SmartViewer, SSM, WiseNet Mobile Viewer, NVR
Environmental	
Operating Temperature / Humidity	'-10°C ~ +50°C (+14°F ~ +122°F) / 20% ~ 80% RH
Electrical	
Input Voltage / Current	4ch : PoE(IEEE802.3af), DC12V
Power Consumption	SPE-410 : 12V/0.8A, SPE-1610 : 12V/1.8A
Mechanical	
Case Material	Metal
Dimension (WxHxD)	SPE-1610 : W370.0x H50.7 xD320 SPE-410 : W178.0x H34.0 xD128.0

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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 ☐ 230 Vac ☒ 120 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
16ch Video Network Encoder	SPE-1610	-	Hanwha Techwin (Tianjin) Co.,Ltd.	EUT
AC/DC Adaptor 1	FSP060-DIBAN2	9NA0605375	FSP GROUP INC.	EUT
Network Camera 1	SDC-89440BFN/UC	-	SAMSUNG	EUT
Network Camera 2	SDC-89440BFN/UC	-	SAMSUNG	EUT
Network Camera 3	SDC-89440BFN/UC	-	SAMSUNG	EUT
Network Camera 4	SDC-89440BFN/UC	-	SAMSUNG	EUT
Network Camera 5	SDC-89440BFN/UC	-	SAMSUNG	EUT
Network Camera 6	SDC-89440BFN/UC	-	SAMSUNG	EUT
Network Camera 7	SDC-89440BFN/UC	-	SAMSUNG	EUT
Network Camera 8	SDC-89440BFN/UC	-	SAMSUNG	EUT
Network Camera 9	SDC-89440BFN/UC	-	SAMSUNG	EUT
Network Camera 10	SDC-89440BFN/UC	-	SAMSUNG	EUT
Network Camera 11	SDC-C74041-CAM	-	SAMSUNG	EUT
Network Camera 12	SDC-C74041-CAM	-	SAMSUNG	EUT
Network Camera 13	SDC-C74041-CAM	-	SAMSUNG	EUT
Network Camera 14	SDC-9443BC	-	SAMSUNG	EUT
Network Camera 15	SDC-9443BC	-	SAMSUNG	EUT
Network Camera 16	SDC-9443BC	-	SAMSUNG	EUT
AC/DC Adaptor 5	FJ-SW1203000U	-	SHENZHEN FUJIA APPLIANCE CO.,LTD.	EUT
AC/DC Adaptor 6	FJ-SW1203000U	-	SHENZHEN FUJIA APPLIANCE CO.,LTD.	EUT

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1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Laptop	NT-R410Y	Z9YJ93CS300631H	SAMSUNG	-
AC/DC Adaptor 2	AD-6019	-	LI SHIN INTERNATIONAL ENTERPRISE CORP.	-
Monitor	LS23C340	ZXPCHTMFA02348F	SAMSUNG	-
AC/DC Adaptor 3	A2514_DPN	CN07BN4400591BS K28F5NK904	Samsung Electro- Mechanics Co.,Ltd	-
Controller	SPC-1010	C50E67WG10100F	SamSung Techwin Co.,Ltd.	-
AC/DC Adaptor 4	RS-AB1000	-	Dongguan Jinhuasheng Power Technology Co.,Ltd.	-
Speaker	BR10000A CUVE	-	BEIJING EDIFIER HI- TECH GROUP.	-
Mic 1	CMK-303	-	CAMAC	-
Mic 2	CMK-303	-	CAMAC	-
Mic 3	CMK-303	-	CAMAC	-
Mic 4	CMK-303	-	CAMAC	-
Alarm IN	-	-	-	-
Alarm OUT 1	-	-	-	-
Alarm OUT 2	-	-	-	-
Alarm OUT 3	-	-	-	-



1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
16ch Video Network Encoder (EUT)	RJ-45	Laptop	RJ-45	3.0	U
	HDMI	Monitor	D-SUB	1.4	U
	BNC	Network Camera 1	BNC	10	S
	BNC	Network Camera 2	BNC	10	S
	BNC	Network Camera 3	BNC	10	S
	BNC	Network Camera 4	BNC	10	S
	BNC	Network Camera 5	BNC	10	S
	BNC	Network Camera 6	BNC	10	S
	BNC	Network Camera 7	BNC	10	S
	BNC	Network Camera 8	BNC	10	S
	BNC	Network Camera 9	BNC	10	S
	BNC	Network Camera 10	BNC	10	S
	BNC	Network Camera 11	BNC	10	S
	BNC	Network Camera 12	BNC	10	V
	BNC	Network Camera 13	BNC	10	S
	BNC	Network Camera 14	BNC	10	S
	BNC	Network Camera 15	BNC	10	S
	BNC	Network Camera 16	BNC	10	S
	RS-485(4Pin)	Controller	RS-485(2Pin)	3.0	U
	3.5 mm	Speaker	3.5 mm	1.6	U
	3.5 mm	Mic 1	3.5 mm	1.7	U
	3.5 mm	Mic 2	3.5 mm	1.7	U
	3.5 mm	Mic 3	3.5 mm	1.7	U

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	3.5 mm	Mic 4	3.5 mm	1.7	V
	RS-485(4Pin)	Alarm IN	RS-485(2Pin)	3.0	U
	RS-485(2Pin)	Alarm OUT 1	RS-485(2Pin)	3.0	U
	RS-485(2Pin)	Alarm OUT 2	RS-485(2Pin)	3.0	U
	RS-485(2Pin)	Alarm OUT 3	RS-485(2Pin)	3.0	U

* Unshielded=U, Shielded=S

1.7 EUT Operating Mode(s)

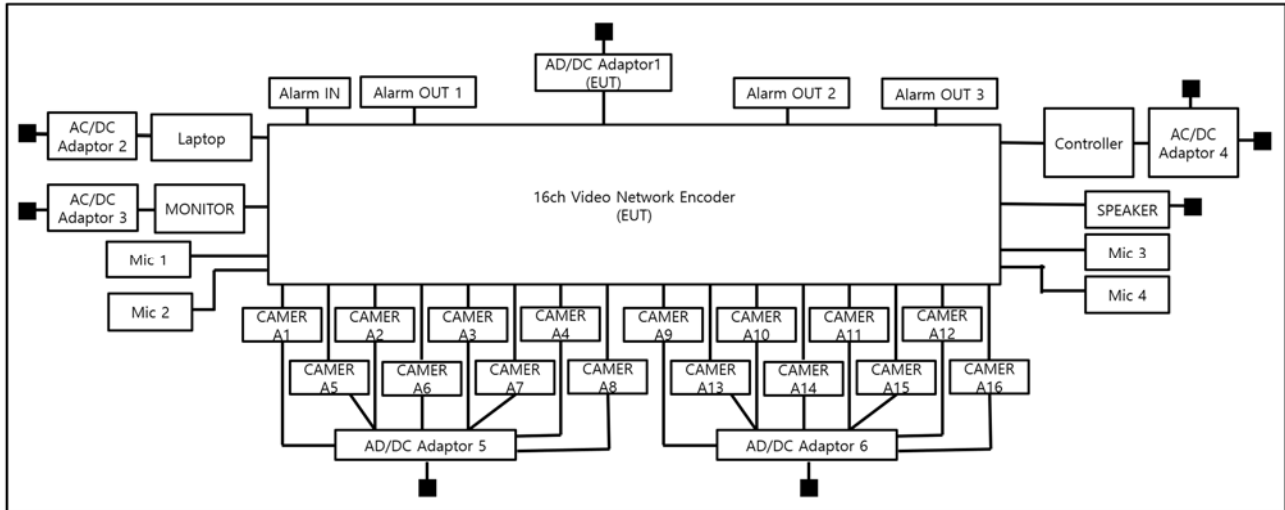
Test mode	operating
OP	EUT Monitoring, Ping Test

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

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1.8 Configuration

■ AC Main
 □ DC Main



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1.9 Remarks when standards applied

N/A

1.10 Calibration Details of Equipment Used for Measurement

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

1.11 Test Facility

The measurement facility is located at 473-21 Gayeo-ro, Yeosu-si, Gyeonggi-do, 12658, Korea. The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22.

1.12 Laboratory Accreditations and Listings

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

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2.0 Test Regulations

The emissions tests were performed according to following regulations:

☐ **EMC – Directive 2014/30/EU**

☐ EN 61000-6-3:2011

☐ EN 61000-6-1:2007

☐ EN 61000-6-4:2007 +A1:2011

☐ EN 61000-6-2:2005

☐ EN 55011:2007 +A1:2010

☐ Group 1
☐ Class A

☐ Group 2
☐ Class B

☐ EN 55014-1:2006 +A2:2011

☐ EN 55014-2:1997 +A2:2008

☐ EN 55015:2013

☐ EN 55032:2015

☐ Class A

☐ Class B

☐ EN 55024:2010

☐ EN 50130-4:2011 +A1:2014

☐ EN 61000-3-2:2014

☐ EN 61000-3-3:2013

☐ EN 61326-1:2013



☐ **VCCI V-3 / 2015.04**

☐ Class A

☐ Class B

☐ **AS/NZS:2013**

☐ Class A

☐ Class B

☒ **47 CFR Part 15, Subpart B**

☒ CISPR 22:2009 +A1:2010

☒ Class A

☐ Class B

☐ ANSI C63.4-2014

☐ Class A

☐ Class B

☒ **IC Regulation ICES-003 : 2016**

☒ CAN/CSA CISPR 22-10

☒ Class A

☐ Class B

☐ ANSI C63.4-2014

☐ **RE- Directive 2014/53/EU**

☐ EN 301 489-1 V1.9.2

- ☐ Equipment for fixed use
- ☐ Equipment for vehicular use
- ☐ Equipment for portable use

☐ EN 301 489-3 V1.6.1

☐ EN 301 489-17 V2.2.1

☐ EN 60945:2002



2.1 Conducted Emissions at Mains Power Ports

Test Date

Feb. 09, 2018

Test Location

Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EMC32	R & S	9.12.00	-
☒	EMI TEST RECEIVER	ESR3	R & S	101781	04, 27, 2018
☒	LISN	ENV216	R & S	101787	01, 05, 2019
☒	LISN	ESH2-Z5	R & S	100450	04, 27, 2018
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 27, 2018
☐	LISN	NNBM8124	SCHWARZBECK	8124-1002	08, 07, 2018
☐	LISN	NNBM8124	SCHWARZBECK	8124-1003	08, 07, 2018

Test Conditions

Temperature: 22,4 °C
Relative Humidity: 42,3 % R.H.

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.



2.2 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Feb. 12, 2018

Test Location

☐ OPEN AREA TEST SITE #2 ☒ SEMI ANECHOIC CHAMBER #4(10 m)

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESU26	R & S	100551	04, 18, 2018
☒	AMPLIFIER	SCU 01	R & S	100603	11, 27, 2018
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	716	11, 28, 2018

Test Conditions

Temperature: 21,5 °C
Relative Humidity: 41,2 % R.H.

Frequency Range of Measurement

30 MHz to 1 GHz

Instrument Settings

IF Band Width: 120 kHz

Test Results

The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.

2.3 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Feb. 08, 2018

Test Location

SEMI ANECHOIC CHAMBER #4(10m)

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESU26	R & S	100551	04, 17, 2018
☒	PREAMPLIFIER	8449B	AGILENT	3008A01742	01, 11, 2019
☐	ATTENUATOR	8491A	HP	32173	03, 24, 2018
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	05, 02, 2019

Test ConditionsTemperature: 21,4 °C
Relative Humidity: 44,5 % R.H.**Frequency Range of Measurement**

1 GHz to 6 GHz

Instrument Settings

IF Band Width: 1 MHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

RemarksSee Appendix A for test data.



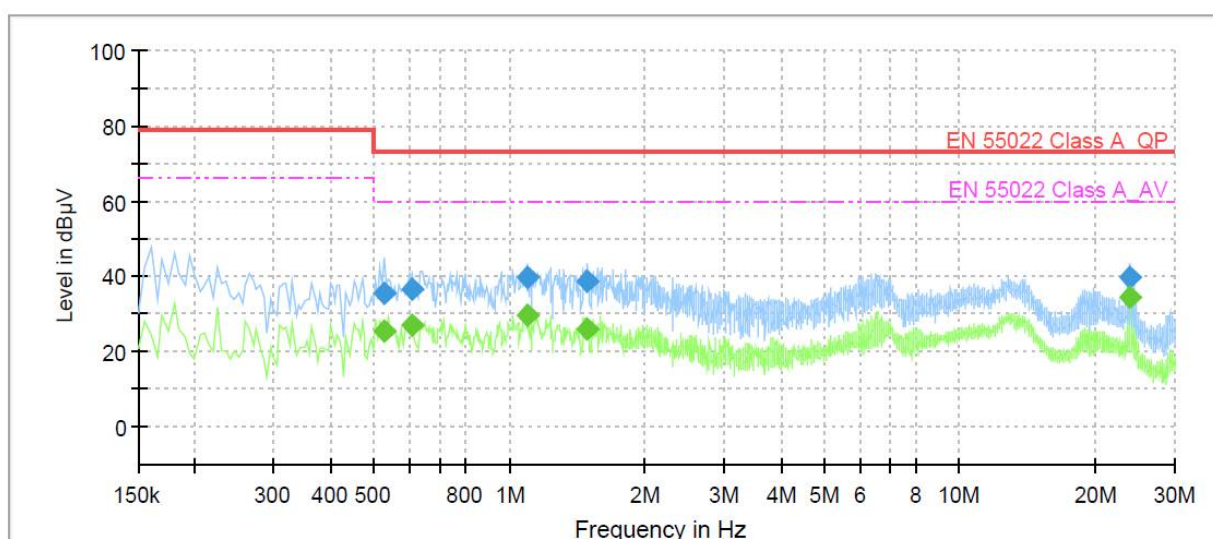
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

HOT LINE

Common Information

Test Description: Conducted Emission
Model No.: SPE-1610
Mode: H
Operator Name: KES



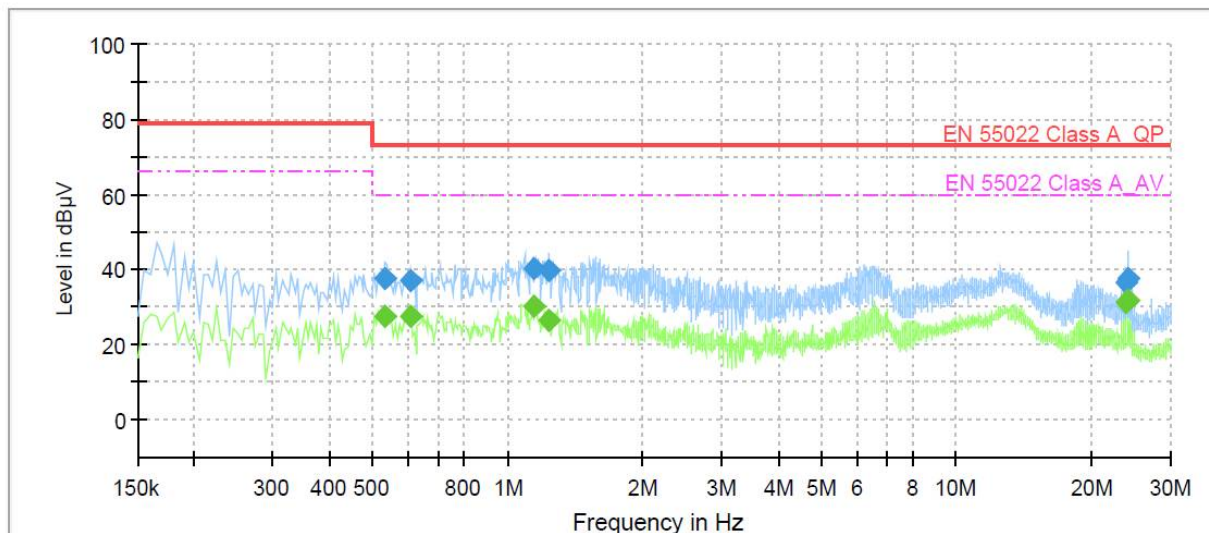
Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.525000	---	25.62	60.00	34.38	1000.0	9.000	L1	19.6
0.525000	35.24	---	73.00	37.76	1000.0	9.000	L1	19.6
0.610000	---	27.19	60.00	32.81	1000.0	9.000	L1	19.7
0.610000	36.67	---	73.00	36.33	1000.0	9.000	L1	19.7
1.090000	---	29.48	60.00	30.52	1000.0	9.000	L1	20.0
1.090000	39.75	---	73.00	33.25	1000.0	9.000	L1	20.0
1.495000	---	25.93	60.00	34.07	1000.0	9.000	L1	20.1
1.495000	38.70	---	73.00	34.30	1000.0	9.000	L1	20.1
23.980000	---	34.32	60.00	25.68	1000.0	9.000	L1	20.4
23.980000	39.77	---	73.00	33.23	1000.0	9.000	L1	20.4

NEUTRAL LINE

Common Information

Test Description:	Conducted Emission
Model No.:	SPE-1610
Mode	N
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.535000	---	27.37	60.00	32.63	1000.0	9.000	N	19.6
0.535000	37.36	---	73.00	35.64	1000.0	9.000	N	19.6
0.610000	---	27.61	60.00	32.39	1000.0	9.000	N	19.7
0.610000	37.07	---	73.00	35.93	1000.0	9.000	N	19.7
1.145000	---	30.15	60.00	29.85	1000.0	9.000	N	20.0
1.145000	40.02	---	73.00	32.98	1000.0	9.000	N	20.0
1.240000	---	26.68	60.00	33.32	1000.0	9.000	N	20.0
1.240000	39.57	---	73.00	33.43	1000.0	9.000	N	20.0
23.945000	---	31.11	60.00	28.89	1000.0	9.000	N	20.4
23.945000	36.41	---	73.00	36.59	1000.0	9.000	N	20.4
24.115000	---	31.78	60.00	28.22	1000.0	9.000	N	20.4
24.115000	37.58	---	73.00	35.42	1000.0	9.000	N	20.4

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

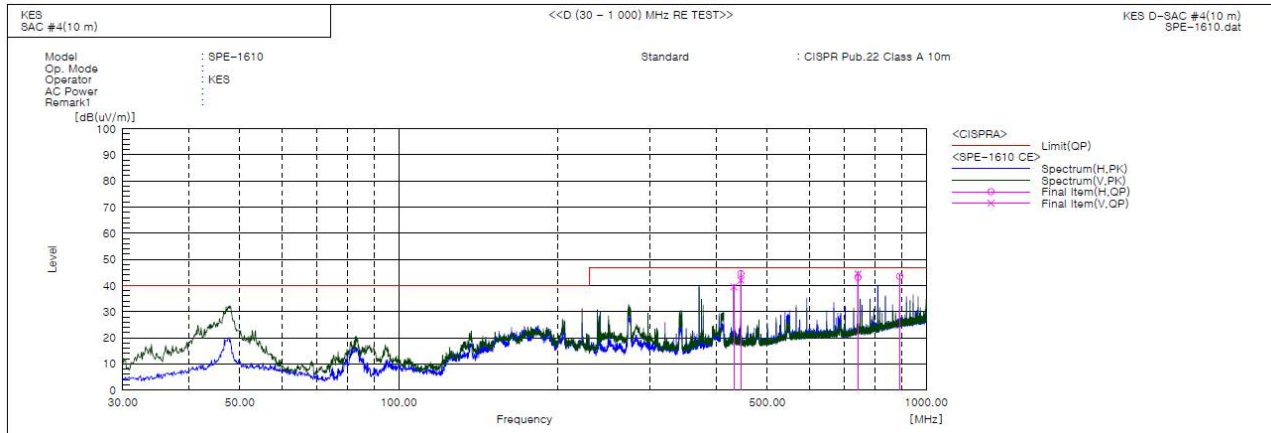


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Radiated Electric Field Emissions(Below 1 GHz)



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	431.944	V	60.2	-20.7	39.5	47.0	7.5	100.0	194.0	
2	445.507	H	64.9	-20.4	44.5	47.0	2.5	218.0	188.0	
3	445.524	V	62.4	-20.4	42.0	47.0	5.0	100.0	190.0	
4	742.586	H	57.9	-14.8	43.1	47.0	3.9	200.0	298.0	
5	742.586	V	59.2	-14.8	44.4	47.0	2.6	150.0	156.0	
6	890.996	H	55.1	-11.6	43.5	47.0	3.5	100.0	295.0	

◆ Calculation – SAC #4(10 m)

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

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

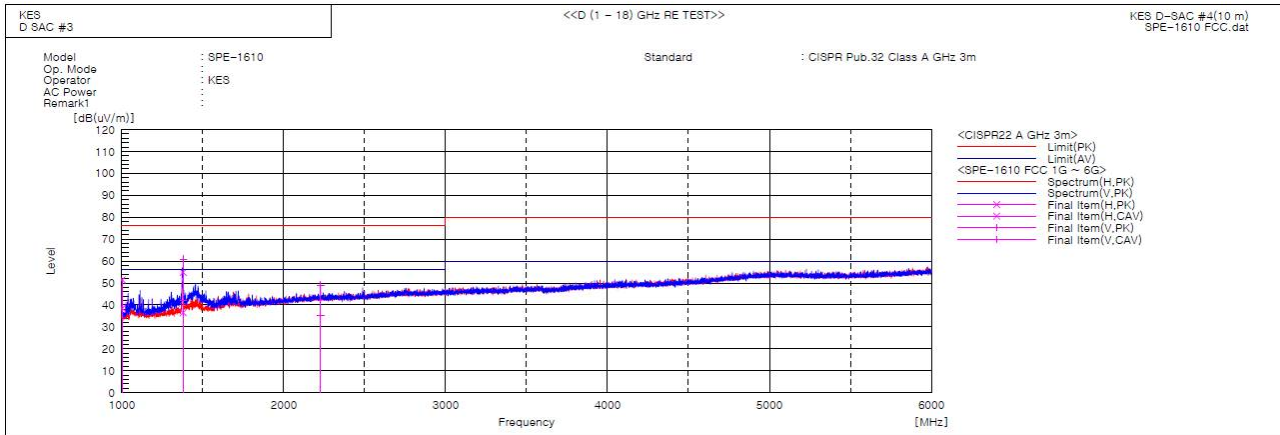
Reading(QP) : Reading value, Result(QP) : Reading value + Factor value

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

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Radiated Electric Field Emissions(Above 1 GHz)



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Result CAV [dB(μV/m)]	Limit PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1002.293	H	60.4	47.3	-8.9	51.5	38.4	76.0	56.0	24.5	17.6	100.0	341.0	
2	1378.881	V	66.2	47.2	-5.3	60.9	41.9	76.0	56.0	15.1	14.1	100.0	6.0	
3	1378.981	H	60.2	41.8	-5.3	54.9	36.5	76.0	56.0	21.1	19.5	100.0	224.0	
4	2227.469	V	46.6	32.7	2.5	49.1	35.2	76.0	56.0	26.9	20.8	100.0	30.0	

◆ 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

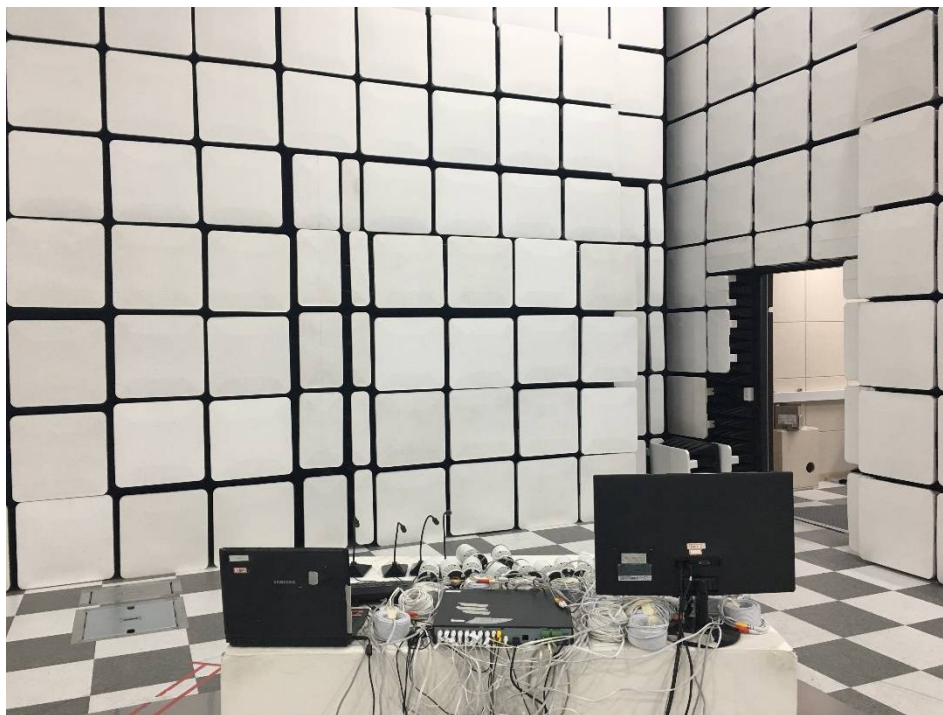
Test Setup Photos and Configuration

Conducted Voltage 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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EUT External Photographs

(Top)



(Bottom)



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EUT Internal Photographs

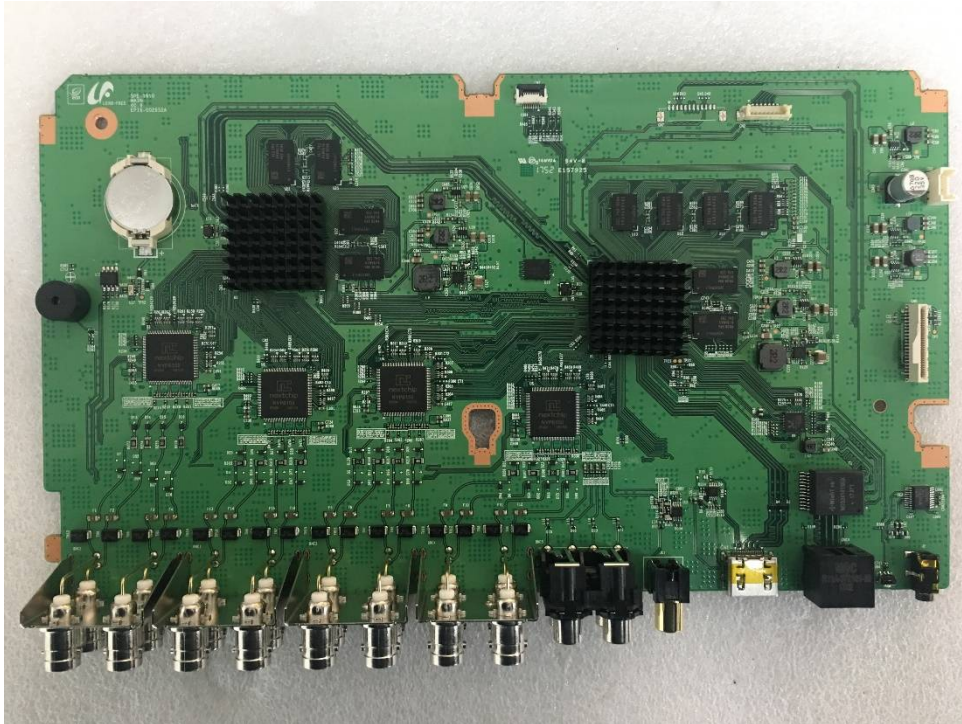
(Internal View)



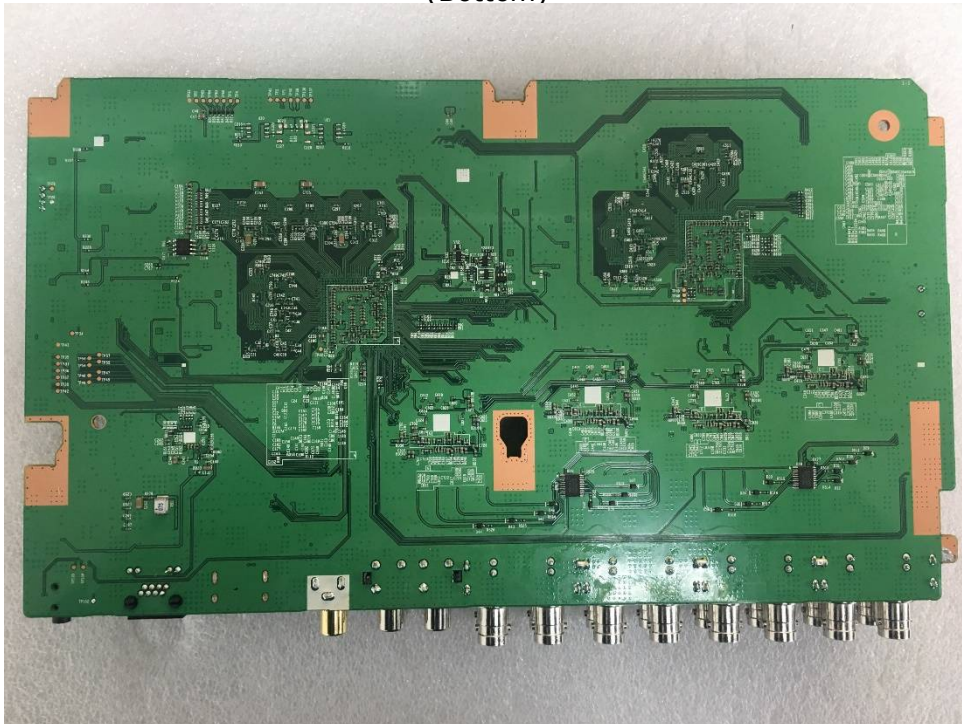
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EUT Internal View – board 1

(Top)



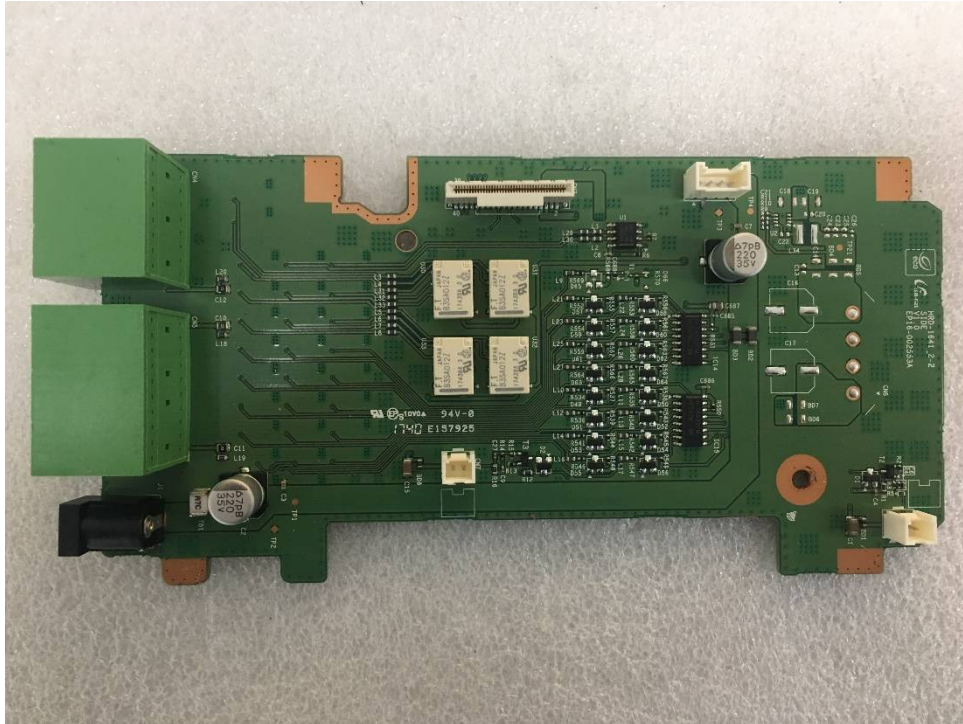
(Bottom)



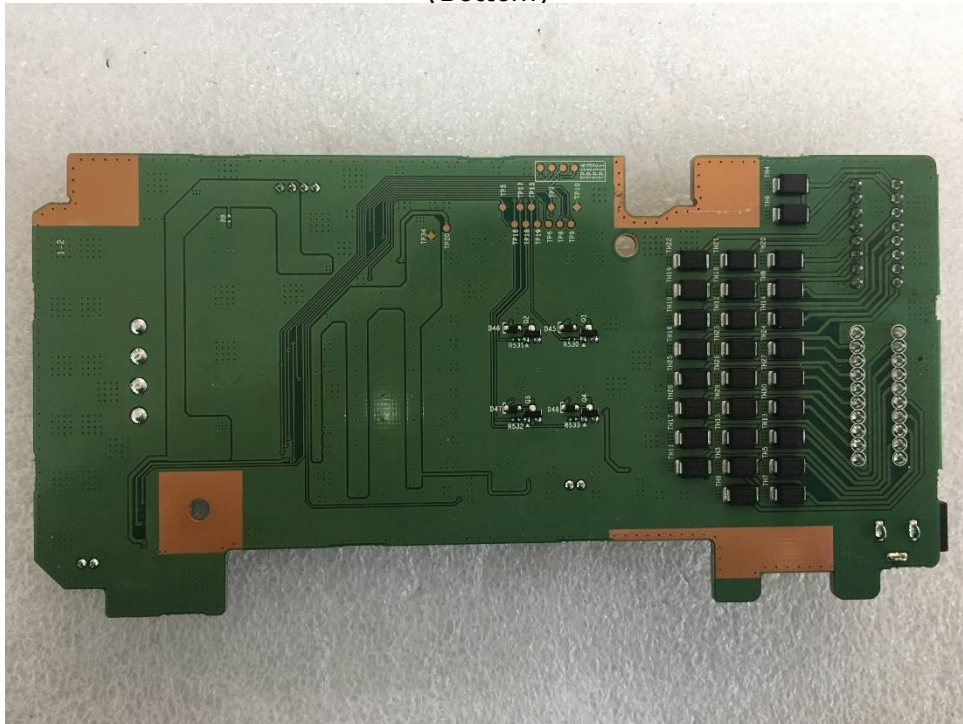
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EUT Internal View – board 2

(Top)



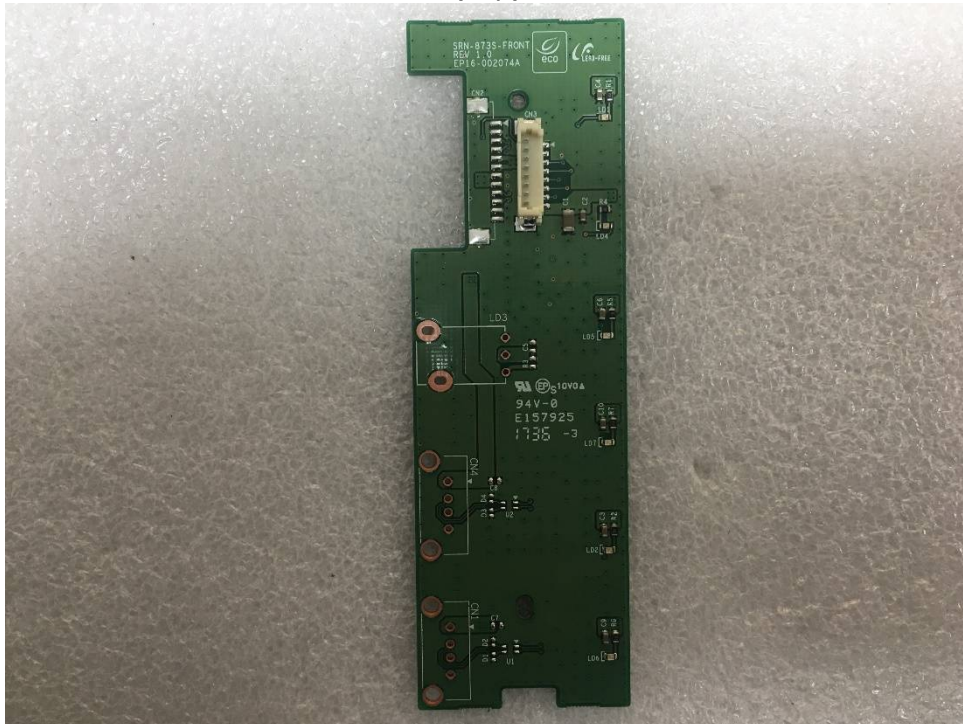
(Bottom)



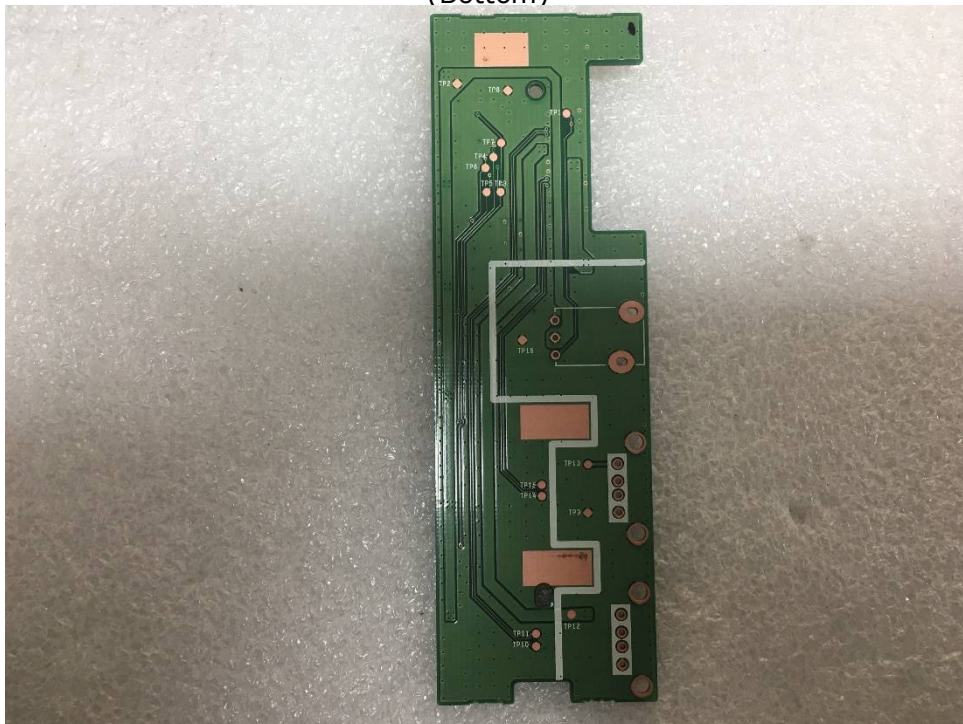
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EUT Internal View – board 3

(Top)

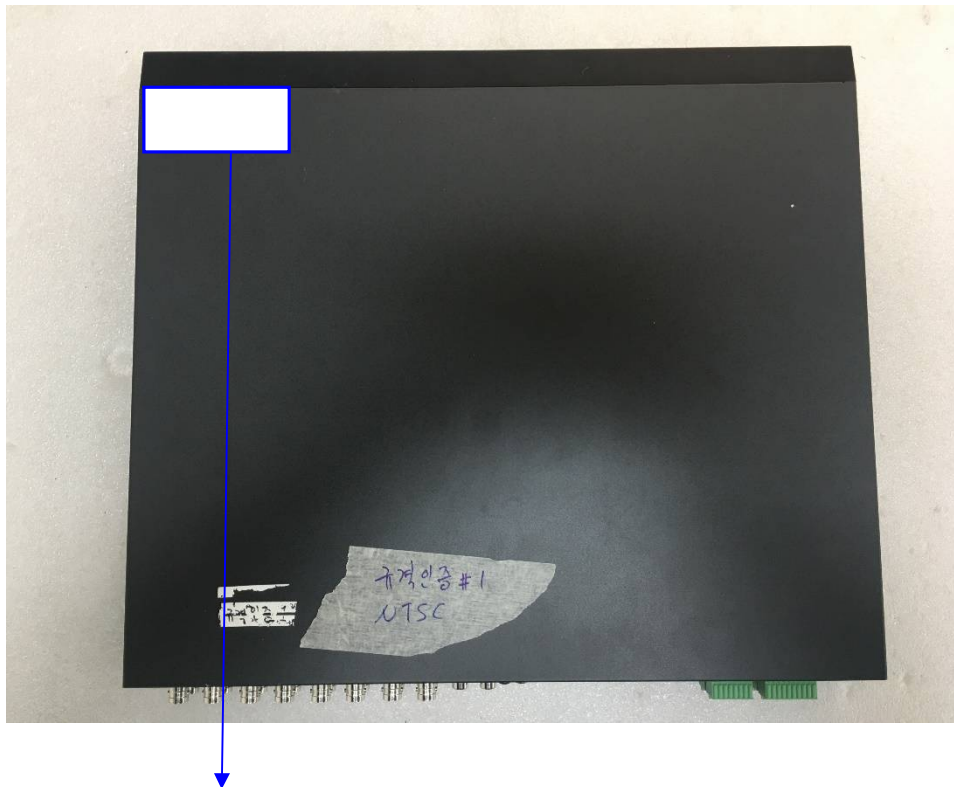


(Bottom)



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Label Photographs



This device complies with part 15 of the FCC Rules. Operation in subject to the following two conditions: (1) This device Sep not cause harmful interference, and (2) this device must accept any interference received, including interference that Sep cause undesired operation.

CAN ICES-3(A) / NMB-3(A)