



EMC TEST REPORT For CE

Test Report No. : KES-E1-17T0426
Date of Issue : Jul. 06, 2017
Product name : LED MONITOR
Model/Type No. : SMT-1935
Variant Model : -
Applicant : Hanwha Techwin Co., Ltd.
Applicant Address : 1204, Changwon-daero, Seongsan-gu, Changwon-si,
Gyeongsangnam-do, Korea
Manufacturer : Weihai Daewoo Electronics Co.,Ltd.
Manufacturer Address : No.26, HongKong Road, Economic & Technical
Development Zone, 264205 Weihai City, Shandong Province,
China
Date of Receipt : Jun. 15, 2017
Test date : Jun. 17, 2017 – Jun. 18, 2017
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

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Test report No.:
KES-E1-17T0426
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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Jul. 06, 2017	KES-E1-17T0426	Issued

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1.0 General Product Description

Main Specifications of E.U.T are:

Model Name		SMT-1935	Remark
Display		LED	
Screen Size		19"	
Max. Resolution		1280 x 1024	
Brightness		250cd/m2	
Contrast Ratio		1,000 : 1	
Aspect Ratio		4:3	
Display		LED	
Screen size		19	
Viewing Angle (H/V)		170°/160°	
Display Color		16.7Million	
Response Time		5ms	
Video System		NTSC / PAL	
Panel Life		30,000 hours	
Filter Type		3D Combfilter	
Interface			
Video	Connector	BNC types: (2 in/2 out)	
RGB	Connector	One(1) Analog RGB 15-pin D-sub	
	Input signal	0.7 Vp-p ±5 %	
HDMI	Connector	One(1) HDMI input (type A connector)	
Audio	Connector	Two(2) RCA type (2 stereo inputs)	
	Output signal	Speakers: two(2) x 1 W	
Application Support		Remote Controller	
On Screen Display		Samsung UI	
Functions		VESA™ DPM Compatible	
Language		English, Spanish, French, German, Italian, Portuguese, Russian Swedish, Turkish, Thai,Dutch,Danish,Arabic,Chinese, Japanese, Korea	
General			
Electrical	Input Voltage	AC100 ~ 240V (50/60Hz)	
	Power consumption	22w	
Environmental	Operating Temperature	0 ~ +40°C (+32°F ~ +104°F)	
	Humidity	20% – 90% (non-condensing)	
Mechanical	Dimensions with Stand (WxHxD)	412mm x 406.5mm x 217.4mm	
	Dimensions without Stand (WxHxD)	412mm x 347mm x 59.4mm	
	Weight	4.8kg	
	LCD Protection Glass	Yes	
	Cabinet Color	Black	
VESA Mounts Interface		100mm x 100mm	

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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
LED MONITOR	SMT-1935	-	Weihai Daewoo Electronics Co.,Ltd.	E.U.T
Remote Control	-	-	-	-

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Notebook	NT63025J	JK9091EF400432X	Samsung Electronics Co., Ltd.	-
Notebook Adaptor	A13-040N2A	CN60BA4400313AD 0N843KO243	Chicony Power Technology (suzhou)Co., Ltd.	-
DVD PLAYER	KRIZER FLAVO HDV-808PRO	2010070920	Shenzhen, YALIJIA Electronics Co., Ltd.	-
MONITOR	SMT-2233	-	Weihai Daewoo Electronics Co., Ltd.	
USB Memory	-	-	Sandisk	16 GB

1.6 External I/O Cabling

- D-SUB Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
LED MONITOR (E.U.T)	D-SUB	Notebook	D-SUB	1.5	S

* Unshielded=U, Shielded=S

- HDMI Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
LED MONITOR (E.U.T)	HDMI	Notebook	HDMI	1.6	S

* Unshielded=U, Shielded=S

- BNC Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
LED MONITOR (E.U.T)	BNC OUT	MONITOR	BNC IN	4.0	S
	BNC IN	DVD PLAYER	BNC OUT	4.0	S
	Audio IN		Audio OUT(R)	1.0	U
	Audio IN		Audio OUT(L)	1.0	U
USB Memory	USB		USB	-	-

* Unshielded=U, Shielded=S



1.7 E.U.T Operating Mode(s)

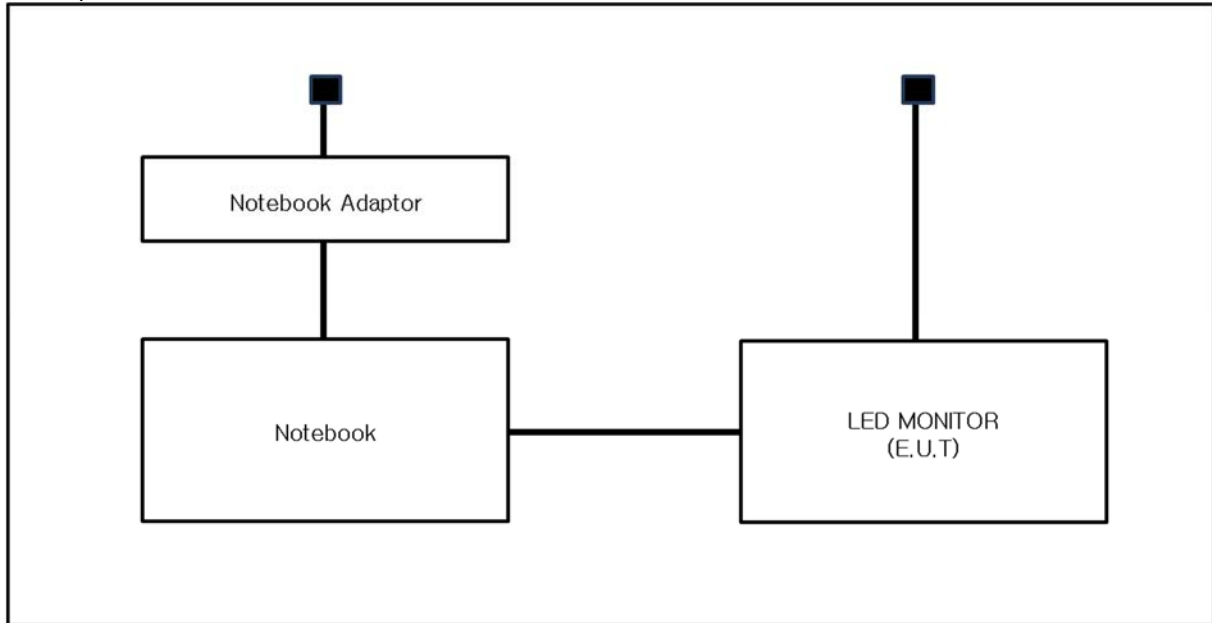
Test mode	operating
D-SUB	E.U.T Monitoring
HDMI	
BNC	The COLOR BAR stored in the USB is executed through the DVD PLAYER to check whether the COLOR BAR screen is normally output from the test equipment and whether 1 kHz tone sound is output normally

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

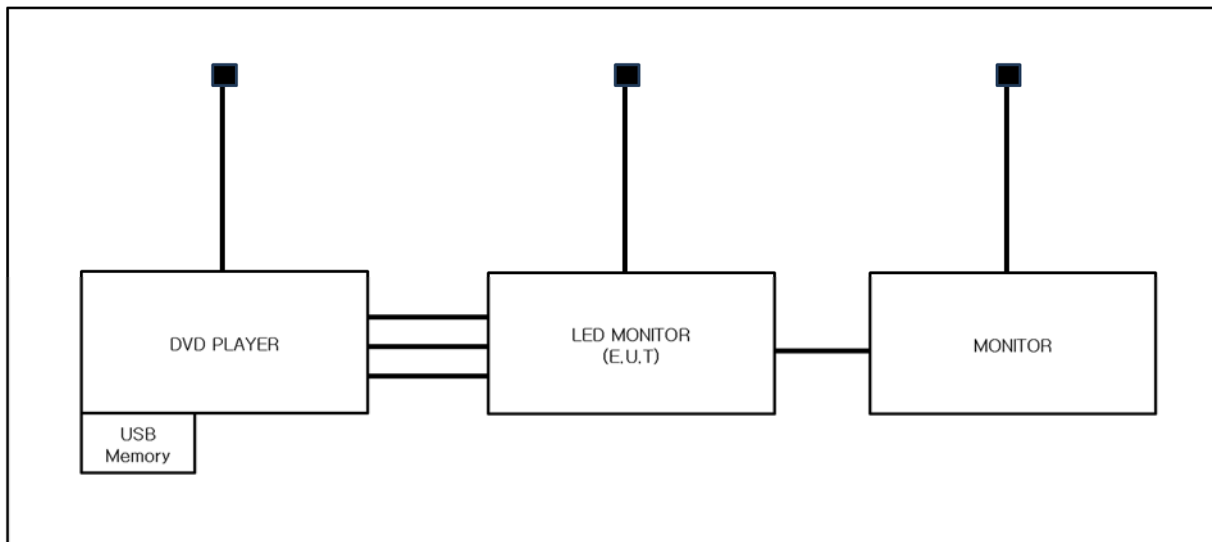
1.8 Configuration

■ AC Main
□ DC Main

- D-SUB, HDMI Mode



- BNC 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 and CISPR Publication 22.

1.11 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)	

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



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



2.1 Conducted Emissions at Mains Power Ports

Test Date

Jun. 17, 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

Test Conditions

Temperature: 21,4 °C

Relative Humidity: 44,9 %

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

N/A

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

Test Conditions

Temperature:

°C

Relative Humidity:

%

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

-



2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Jun. 17, 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	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESU26	R & S	100551	04, 18, 2018
☒	AMPLIFIER	SCU 01	R & S	100603	12, 13, 2017
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	716	11, 28, 2018

Test Conditions

Temperature: 24,2 °C
Relative Humidity: 47,4 %

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. 17, 2017

Test Location

SEMI ANECHOIC CHAMBER #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESR7	R & S	101190	08, 08, 2017
☒	PREAMPLIFIER	8449B	AGILENT	3008A01967	05, 31, 2018
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	05, 02, 2019

Test Conditions

Temperature: 23,0 °C

Relative Humidity: 46,2 %

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. 17, 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	5.4.8.0	-
☒	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	08, 08, 2017
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	08, 08, 2017

Test Conditions

21,4 °C
Relative Humidity: 44,9 %

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. 17, 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	5.4.8.0	-
☒	DIGITAL POWER ANALYZER	DPA 500N	EM TEST	V1024106759	08, 08, 2017
☒	POWER SOURCE	ACS 500N6	EM TEST	V1024106760	08, 08, 2017

Test Conditions

21,4 °C
Relative Humidity: 44,9 %

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 +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

Jun. 18, 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: 22,2 °C
Relative Humidity: 45,2 %
Atmospheric Pressure: 100,0 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

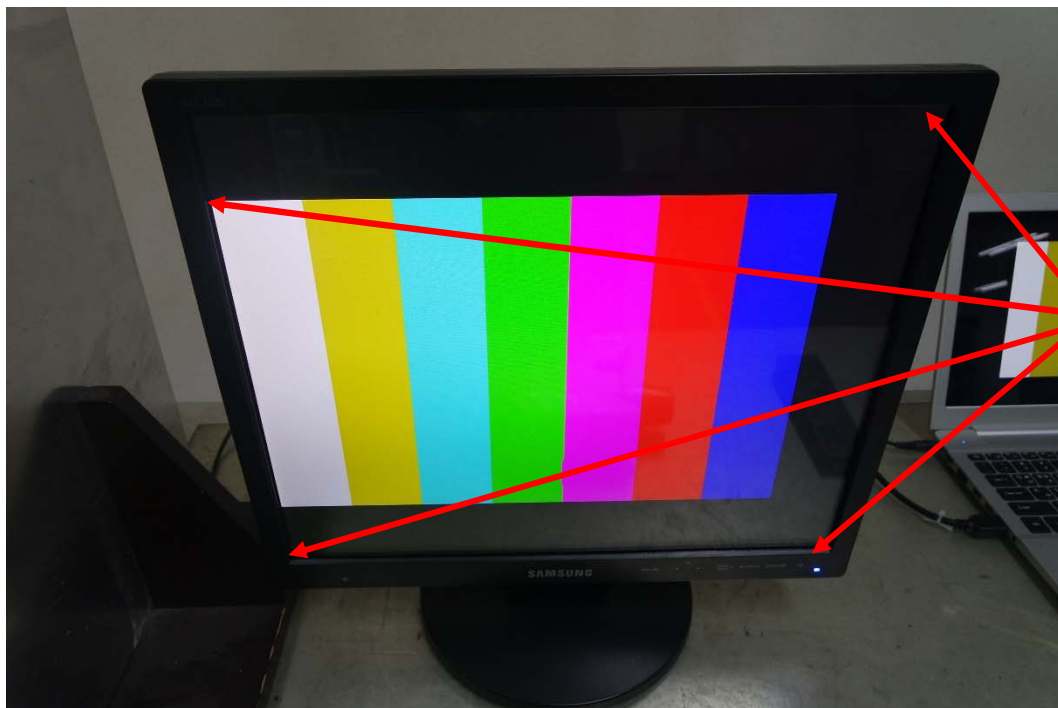
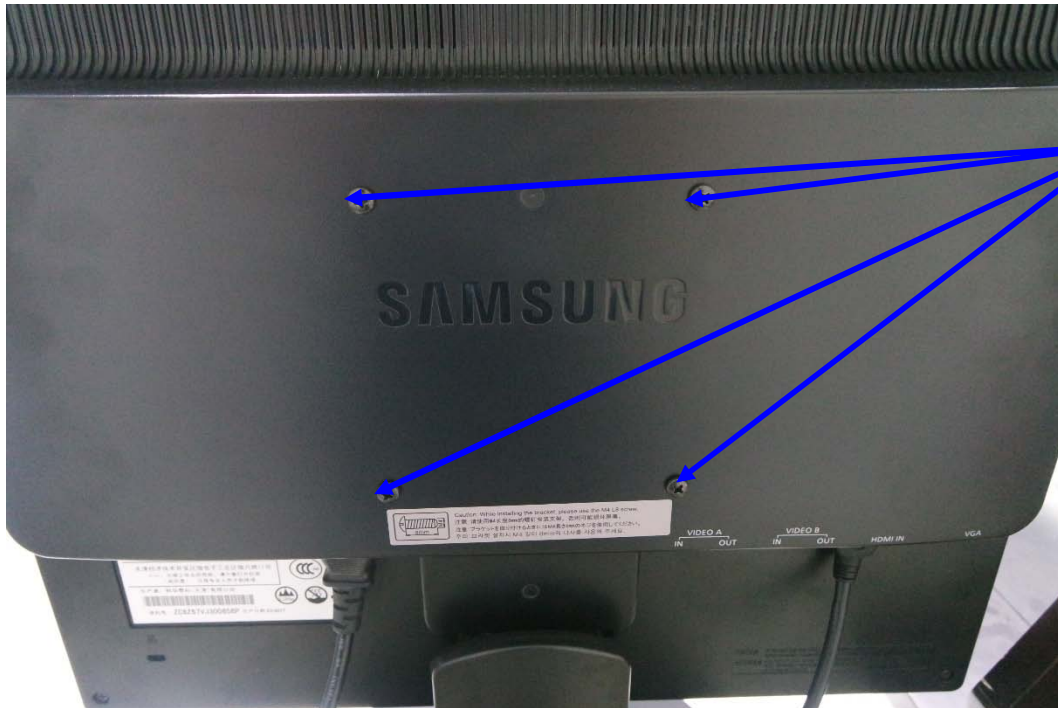
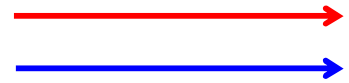
Notes: HCP: Horizontal coupling plane

VCP: Vertical coupling plane

Required Performance Criteria: ☒ B

Location of Discharge:

Air
Contact



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Test Data

- D-SUB Mode

Indirect Discharge

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

Direct Discharge

No.	Test Point	Discharge Method	Observations	Remarks
1	Screw	Contact D.	A	-
2	LED	Air D.	A	-

- HDMI Mode

Indirect Discharge

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

Direct Discharge

No.	Test Point	Discharge Method	Observations	Remarks
1	Screw	Contact D.	A	-
2	LED	Air D.	A	-

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- BNC Mode**Indirect Discharge**

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

Direct Discharge

No.	Test Point	Discharge Method	Observations	Remarks
1	Screw	Contact D.	A	-
2	LED	Air D.	A	-

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. 18, 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	08, 08, 2017
☒	SIGNAL GENERATOR	SMB 100A	R & S	177586	08, 08, 2017
☒	BROADBAND AMPLIFIER	BBA100	R & S	101239	08, 08, 2017
☒	BROADBAND AMPLIFIER	100S1G6M1	AR	579931	08, 08, 2017
☒	POWER METER	NRP2	R & S	103475	08, 08, 2017
☒	AVG POWER SENSOR	NRP-Z91	R & S	102526	08, 08, 2017
☒	AVG POWER SENSOR	NRP-Z91	R & S	102527	08, 08, 2017
☒	STACKED DOUBLE LOG-PER- ANTENNA	STPL9128 E	Schwarzbeck	9128ES-121	—

Test Conditions

Temperature: 23,5 °C
Relative Humidity: 46,1 %
Atmospheric Pressure: 99,7 kPa



Test Specifications

Antenna Polarization: Horizontal & vertical unless indicated otherwise

Antenna Distance: ☒ 3 m

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

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

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

Frequency step: ☒ 1 % step

Dwell Time: ☒ 1 s ☐ 3 s

of Sides Radiated: ☒ 4

Required Performance Criteria: ☒ A

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Test Data**- D-SUB Mode**

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

- HDMI Mode

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

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- BNC Mode

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

Note: "Blank" = Not performed

Observations:
Complied – No degradation of function

Test Results

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

Remarks

PASS Required Performance Criteria.

3.3 Electrical Fast Transients/Bursts

Reference Standard

EN 61000-4-4:2012

Test Date

Jun. 18, 2017

Test Location

EMS-EFT: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	EM TEST	5.0.9.0	-
☒	ULTRA COMPACT SIMULATOR	UCS 500 N5	EM TEST	V0936105120	06, 27, 2017
☒	MOTOR VARIAC	MV2616	EM TEST	V0936105123	06, 27, 2017
☒	CAPACITIVE COUPLING CLAMP	HFK	EM TEST	070925	06, 27, 2017

Test Conditions

Temperature: 22,2 °C
Relative Humidity: 45,2 %
Atmospheric Pressure: 100,0 kPa

Test Specifications

Pulse Amplitude & Polarity: (AC Power Lines)	☐ ± 1.0 kV ☐ ± 4.0 kV	☒ ± 2.0 kV
Pulse Amplitude & Polarity: (Other supply / Signal Lines)	☐ ± 0.5 kV ☐ ± 2.0 kV	☒ ± 1.0 kV
Burst Period:	☒ 300 ms	☐ 2 s
Repetition Rate:	☒ 5 klz	☐ 100 klz
Duration of Test Voltage:	☒ ≥ 1 min	
Required Performance Criteria:	☒ B	

Test Data**- D-SUB Mode**☒ Input a.c. power ports – Coupling/Decoupling Network used

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

☐ 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)
-	-	-

- HDMI Mode☒ Input a.c. power ports – Coupling/Decoupling Network used

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

☐ 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)
-	-	-



- BNC Mode

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

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

☐ 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)
BNC	A	A

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

Jun. 18, 2017

Test Location

EMS-Surge: Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMS Test S/W	iec.control	EM TEST	5.0.9.0	-
☒	ULTRA COMPACT SIMULATOR	UCS 500 N5	EM TEST	V0936105120	06, 27, 2017
☒	MOTOR VARIAC	MV2616	EM TEST	V0936105123	06, 27, 2017
☒	CDN	CNV 508N1	EM TEST	P1551168979	04, 26, 2018
☐	CDN	CNV 508T5	EM TEST	P1549168422	04, 26, 2018

Test Conditions

Temperature: 22,2 °C
Relative Humidity: 45,2 %
Atmospheric Pressure: 100,0 kPa



Test Specifications

AC Power Lines

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

Surge Amplitude :

Common Mode

☒ (0,5 / 1,0 / 2,0) kV

Differential Mode

☒ (0,5 / 1,0) kV

Number of Surges:

☒ 5 surges per angle

Angle:

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

Polarity:

☒ Positive & Negative

Repetition Rate:

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

Required Performance Criteria: ☒ B

Signal Lines

Source Impedance:

42 ohm for common mode

Surge Amplitude:

Common Mode

☒ (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: ☒ C



Test Data

- D-SUB Mode

☒ Line to Line – Differential Mode

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

☐ Line to Earth – Common Mode

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

Signal Lines

☐ Line to Earth – Common Mode

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

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- HDMI Mode☒ Line to Line – Differential Mode

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

☐ Line to Earth – Common Mode

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

Signal Lines☐ Line to Earth – Common Mode

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

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- BNC Mode☒ Line to Line – Differential Mode

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

☐ Line to Earth – Common Mode

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

Signal Lines☒ Line to Earth – Common Mode

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

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

Jun. 18, 2017

Test Location

EMS-CS: Electro wave Shieldroom

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, 08, 2017
☒	ATTENUATOR	ATT6	EM TEST	1208-34	08, 08, 2017
☒	CDN	CDN-M2/M3N	EM TEST	0909-06	08, 08, 2017
☐	CDN	CDN T8RJ45	EM TEST	0909-09	08, 08, 2017
☒	EM INJECTION CLAMP	EM 101	Liithi	35943	02, 03, 2018
☐	MICROPHONE	MP201	BSWA	520963	11, 11, 2017
☐	SOUND ACOUSTIC TESTER	TST-1000	TESTEK	150045	11, 08, 2018

Test Conditions

Temperature: 22,2 °C
Relative Humidity: 45,2 %
Atmospheric Pressure: 100,0 kPa



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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: ☒ A

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Test Data**- D-SUB Mode**☒ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
L – N – PE	CDN-M2/M3N	A

☐ Input d.c. power ports

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

☐ Signal ports and telecommunication ports

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

- HDMI Mode☒ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
L – N – PE	CDN-M2/M3N	A

☐ Input d.c. power ports

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

☐ Signal ports and telecommunication ports

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

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- BNC Mode☒ Input a.c. power ports

Coupling Location (Line Stressed)	Coupling Method	Observations
L – N – PE	CDN-M2/M3N	A

☐ Input d.c. power ports

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

☒ Signal ports and telecommunication ports

Coupling Location (Line Stressed)	Coupling Method	Observations
BNC	EM Injection Clamp	A

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

Observations:
Complied – No degradation of function

Test Results

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

Remarks

PASS Required Performance Criteria.



3.6 Voltage Dips and Short Interruptions

Reference Standard

EN 61000-4-11:2004

Test Date

Jun. 18, 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	5.0.9.0	-
☒	ULTRA COMPACT SIMULATOR	UCS 500 N5	EM TEST	V0936105120	06, 27, 2017
☒	MOTOR VARIAC	MV2616	EM TEST	V0936105123	06, 27, 2017

Test Conditions

Temperature: 22,2 °C
Relative Humidity: 45,2 %
Atmospheric Pressure: 100,0 kPa

**Test Specifications & Observations/Remarks****- D-SUB Mode**

<u>Test Level</u>	<u>Duration [in period/ms (50 Hz)]</u>	<u>Criteria</u>	<u>Results</u>
☒ 0 %Ut (>95 % dip)	☒ 0.5 / 10	<u>B</u>	<u>A</u>
☒ 30 %Ut (70 % dip)	☒ 25 / 500	<u>C</u>	<u>A</u>
☒ 0 %Ut (>95 % Interruptions)	☒ 250 / 5 000	<u>C</u>	<u>B</u>

- HDMI Mode

<u>Test Level</u>	<u>Duration [in period/ms (50 Hz)]</u>	<u>Criteria</u>	<u>Results</u>
☒ 0 %Ut (>95 % dip)	☒ 0.5 / 10	<u>B</u>	<u>A</u>
☒ 30 %Ut (70 % dip)	☒ 25 / 500	<u>C</u>	<u>A</u>
☒ 0 %Ut (>95 % Interruptions)	☒ 250 / 5 000	<u>C</u>	<u>B</u>

- BNC Mode

<u>Test Level</u>	<u>Duration [in period/ms (50 Hz)]</u>	<u>Criteria</u>	<u>Results</u>
☒ 0 %Ut (>95 % dip)	☒ 0.5 / 10	<u>B</u>	<u>A</u>
☒ 30 %Ut (70 % dip)	☒ 25 / 500	<u>C</u>	<u>A</u>
☒ 0 %Ut (>95 % Interruptions)	☒ 250 / 5 000	<u>C</u>	<u>B</u>



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Observations:

- A – No response observed from E.U.T
- B – Unit shuts down then automatically restarts when full voltage is restored.
- C – Unit shuts down then manually restarts when full voltage is restored or Loss of function.

Test Results

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

Remarks

Refer to the results

APPENDIX A – TEST DATA

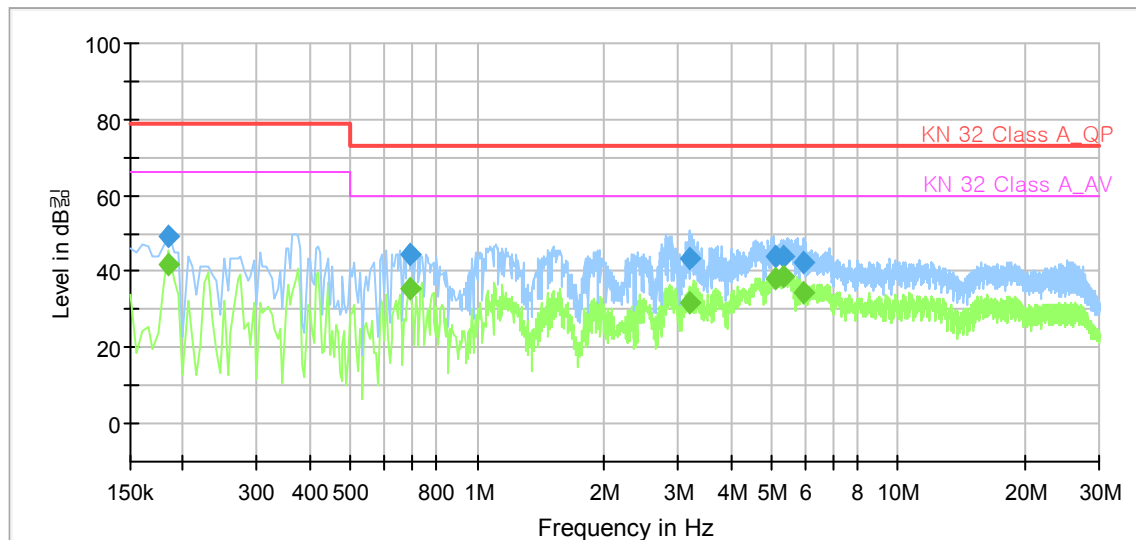
Conducted Emissions at Mains Power Ports

- D-SUB Mode

[HOT]

Common Information

Test Description: Conducted Emission
Model No.: SMT-1935
Mode: D-SUB_H
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.185000	---	41.91	66.00	24.09	1000.0	9.000	L1	20.9
0.185000	49.19	---	79.00	29.81	1000.0	9.000	L1	20.9
0.690000	---	35.64	60.00	24.36	1000.0	9.000	L1	20.4
0.690000	44.25	---	73.00	28.75	1000.0	9.000	L1	20.4
3.180000	---	32.04	60.00	27.96	1000.0	9.000	L1	19.7
3.180000	43.65	---	73.00	29.35	1000.0	9.000	L1	19.7
5.095000	---	38.28	60.00	21.72	1000.0	9.000	L1	19.8
5.095000	43.79	---	73.00	29.21	1000.0	9.000	L1	19.8
5.345000	---	38.55	60.00	21.45	1000.0	9.000	L1	19.8
5.345000	43.95	---	73.00	29.05	1000.0	9.000	L1	19.8
5.970000	---	34.50	60.00	25.50	1000.0	9.000	L1	19.8
5.970000	42.16	---	73.00	30.84	1000.0	9.000	L1	19.8

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

QuasiPeak / CAverage : The Final Value

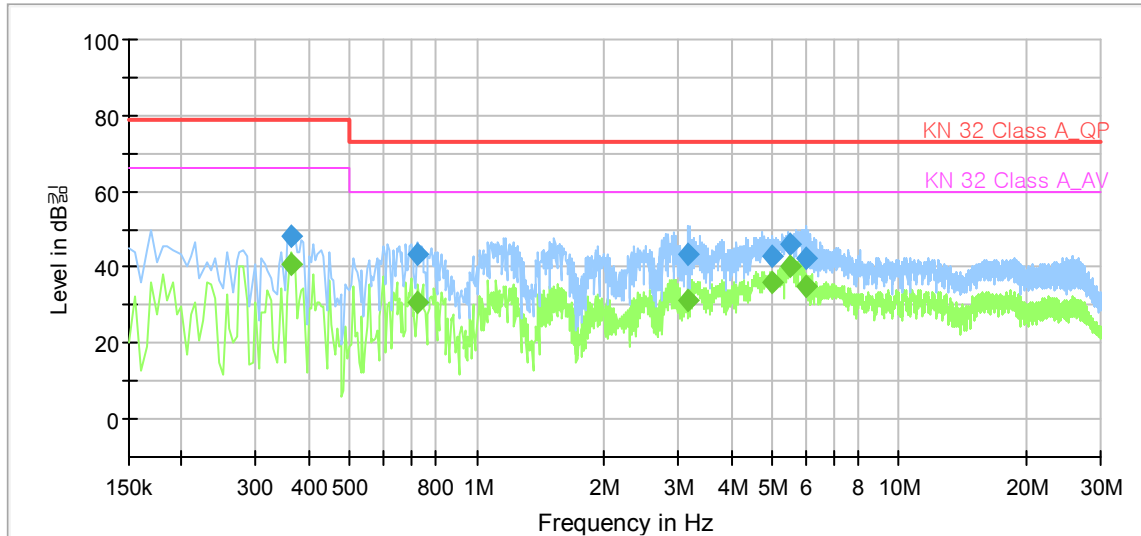
Reading Value : Not shown in the table.

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

[NEUTRAL]

Common Information

Test Description: Conducted Emission
Model No.: SMT-1935
Mode: D-SUB_N
Operator Name: KES



Final_Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.365000	---	40.61	66.00	25.39	1000.0	9.000	N	20.7
0.365000	48.21	---	79.00	30.79	1000.0	9.000	N	20.7
0.725000	---	30.56	60.00	29.44	1000.0	9.000	N	20.3
0.725000	43.63	---	73.00	29.37	1000.0	9.000	N	20.3
3.165000	---	31.39	60.00	28.61	1000.0	9.000	N	19.7
3.165000	43.39	---	73.00	29.61	1000.0	9.000	N	19.7
4.990000	---	36.01	60.00	23.99	1000.0	9.000	N	19.7
4.990000	43.12	---	73.00	29.88	1000.0	9.000	N	19.7
5.490000	---	40.10	60.00	19.90	1000.0	9.000	N	19.8
5.490000	45.81	---	73.00	27.19	1000.0	9.000	N	19.8
6.025000	---	34.69	60.00	25.31	1000.0	9.000	N	19.8
6.025000	42.61	---	73.00	30.39	1000.0	9.000	N	19.8

◆ 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))

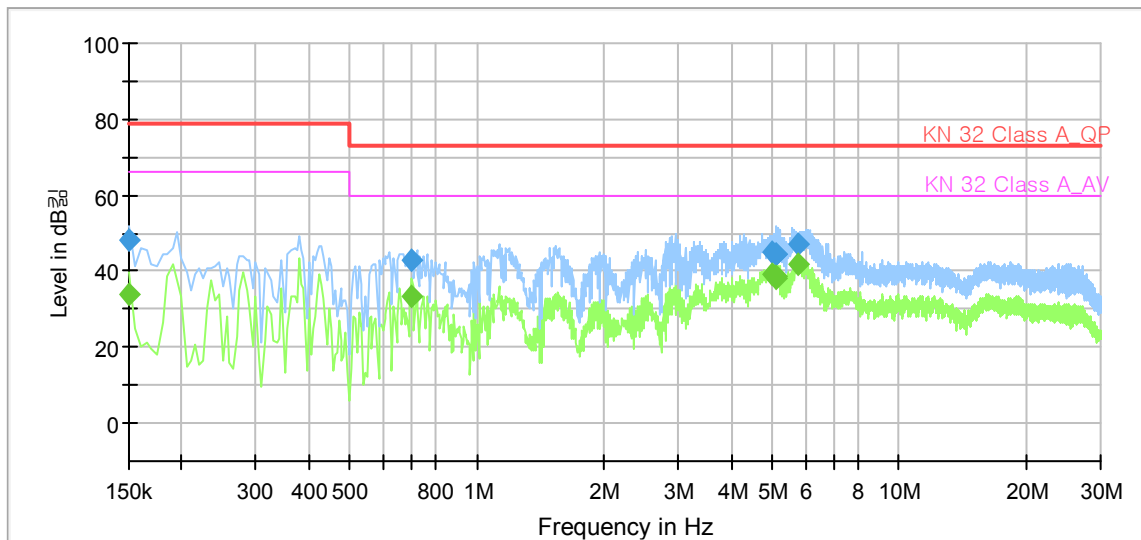


- HDMI Mode

[HOT]

Common Information

Test Description: Conducted Emission
Model No.: SMT-1935
Mode: HDMI_
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	---	33.81	66.00	32.19	1000.0	9.000	L1	21.1
0.150000	48.11	---	79.00	30.89	1000.0	9.000	L1	21.1
0.700000	---	33.21	60.00	26.79	1000.0	9.000	L1	20.4
0.700000	42.89	---	73.00	30.11	1000.0	9.000	L1	20.4
5.015000	---	38.93	60.00	21.07	1000.0	9.000	L1	19.7
5.015000	45.10	---	73.00	27.90	1000.0	9.000	L1	19.7
5.100000	---	38.44	60.00	21.56	1000.0	9.000	L1	19.8
5.100000	44.65	---	73.00	28.35	1000.0	9.000	L1	19.8
5.135000	---	37.92	60.00	22.08	1000.0	9.000	L1	19.8
5.135000	44.68	---	73.00	28.32	1000.0	9.000	L1	19.8
5.750000	---	41.64	60.00	18.36	1000.0	9.000	L1	19.8
5.750000	46.98	---	73.00	26.02	1000.0	9.000	L1	19.8

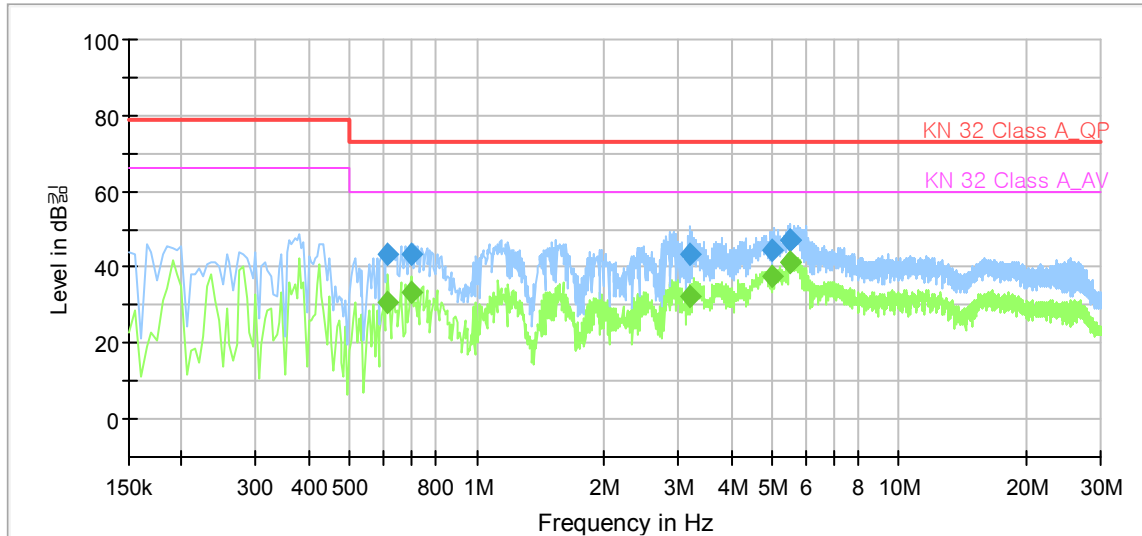
QuasiPeak[dBuV] / CAverage [dBuV] = Reading Value[dBuV] + Corr. [dB]
QuasiPeak / CAverage : The Final Value
Reading Value : Not shown in the table.
Corr. : Correction values (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))



[NEUTRAL]

Common Information

Test Description: Conducted Emission
Model No.: SMT-1935
Mode: HDMI_N
Operator Name: KES



Final_Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.615000	---	30.98	60.00	29.02	1000.0	9.000	N	20.4
0.615000	43.36	---	73.00	29.64	1000.0	9.000	N	20.4
0.700000	---	33.60	60.00	26.40	1000.0	9.000	N	20.4
0.700000	43.52	---	73.00	29.48	1000.0	9.000	N	20.4
3.210000	---	32.42	60.00	27.58	1000.0	9.000	N	19.7
3.210000	43.64	---	73.00	29.36	1000.0	9.000	N	19.7
5.005000	---	37.58	60.00	22.42	1000.0	9.000	N	19.7
5.005000	44.51	---	73.00	28.49	1000.0	9.000	N	19.7
5.500000	---	41.38	60.00	18.62	1000.0	9.000	N	19.8
5.500000	46.97	---	73.00	26.03	1000.0	9.000	N	19.8
5.510000	---	41.34	60.00	18.66	1000.0	9.000	N	19.8
5.510000	47.07	---	73.00	25.93	1000.0	9.000	N	19.8

◆ 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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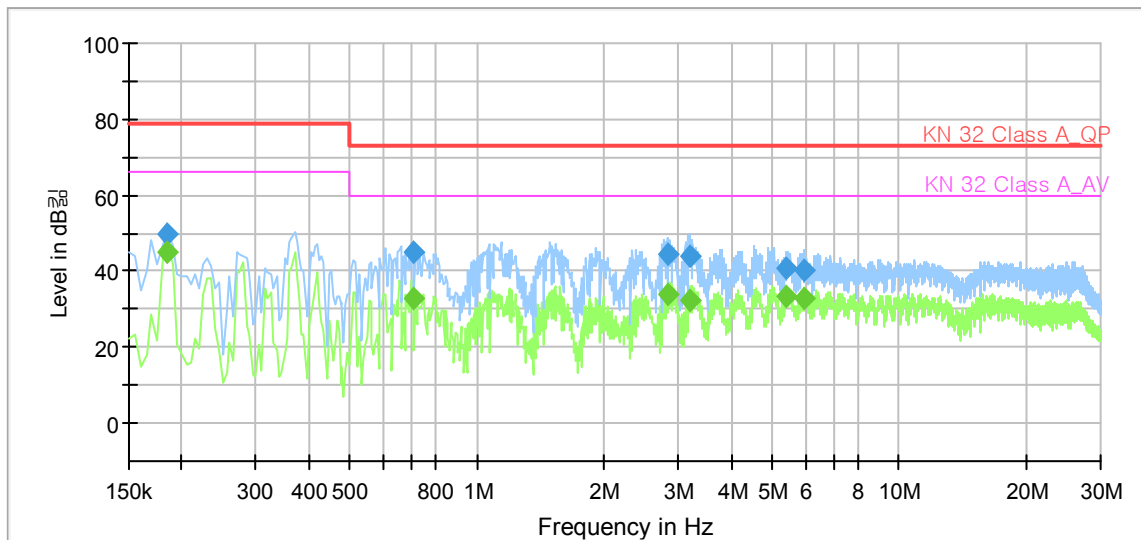
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- BNC Mode

[HOT]

Common Information

Test Description: Conducted Emission
Model No.: SMT-1935
Mode: BNC_H
Operator Name: KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.185000	---	45.17	66.00	20.83	1000.0	9.000	L1	20.9
0.185000	49.58	---	79.00	29.42	1000.0	9.000	L1	20.9
0.705000	---	33.02	60.00	26.98	1000.0	9.000	L1	20.4
0.705000	44.88	---	73.00	28.12	1000.0	9.000	L1	20.4
2.835000	---	33.91	60.00	26.09	1000.0	9.000	L1	19.8
2.835000	44.62	---	73.00	28.38	1000.0	9.000	L1	19.8
3.185000	---	32.57	60.00	27.43	1000.0	9.000	L1	19.7
3.185000	44.16	---	73.00	28.84	1000.0	9.000	L1	19.7
5.425000	---	33.54	60.00	26.46	1000.0	9.000	L1	19.8
5.425000	40.81	---	73.00	32.19	1000.0	9.000	L1	19.8
5.955000	---	33.01	60.00	26.99	1000.0	9.000	L1	19.8
5.955000	40.21	---	73.00	32.79	1000.0	9.000	L1	19.8

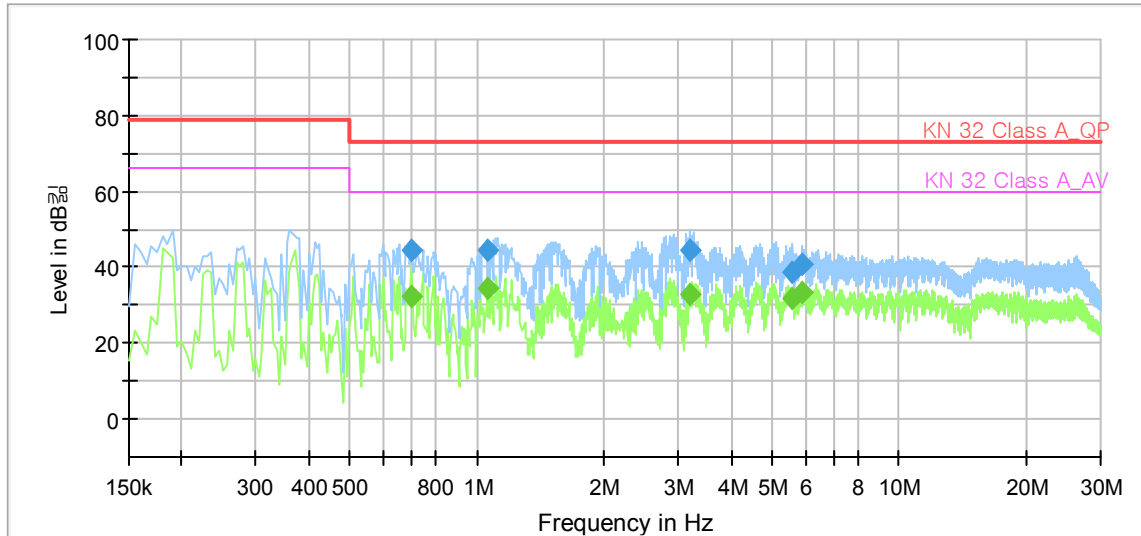
QuasiPeak[dBuV] / CAverage [dBuV] = Reading Value[dBuV] + Corr. [dB]
QuasiPeak / CAverage : The Final Value
Reading Value : Not shown in the table.
Corr. : Correction values (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

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[NEUTRAL]

Common Information

Test Description: Conducted Emission
Model No.: SMT-1935
Mode: BNC_N
Operator Name: KES



Final_Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.700000	---	32.43	60.00	27.57	1000.0	9.000	N	20.4
0.700000	44.30	---	73.00	28.70	1000.0	9.000	N	20.4
1.065000	---	34.19	60.00	25.81	1000.0	9.000	N	20.1
1.065000	44.32	---	73.00	28.68	1000.0	9.000	N	20.1
3.190000	---	32.64	60.00	27.36	1000.0	9.000	N	19.7
3.190000	44.52	---	73.00	28.48	1000.0	9.000	N	19.7
5.565000	---	31.81	60.00	28.19	1000.0	9.000	N	19.8
5.565000	38.54	---	73.00	34.46	1000.0	9.000	N	19.8
5.895000	---	33.29	60.00	26.71	1000.0	9.000	N	19.8
5.895000	40.75	---	73.00	32.25	1000.0	9.000	N	19.8

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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



Conducted Emissions at Telecommunication Ports

[10 Mbps]

N/A

◆ 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))



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[100 Mbps]

N/A

◆ 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))



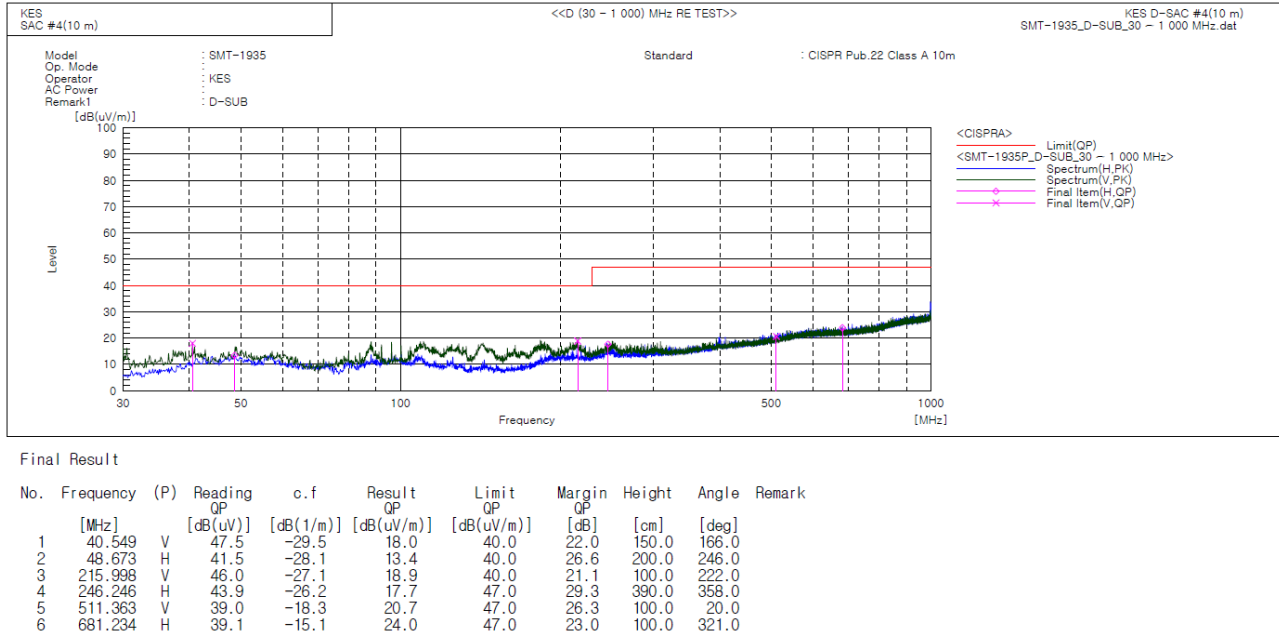
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Radiated Electric Field Emissions(Below 1 GHz)

- D-SUB Mode



◆ Calculation

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

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

Correction Factor : ANT FACTOR + Cable loss

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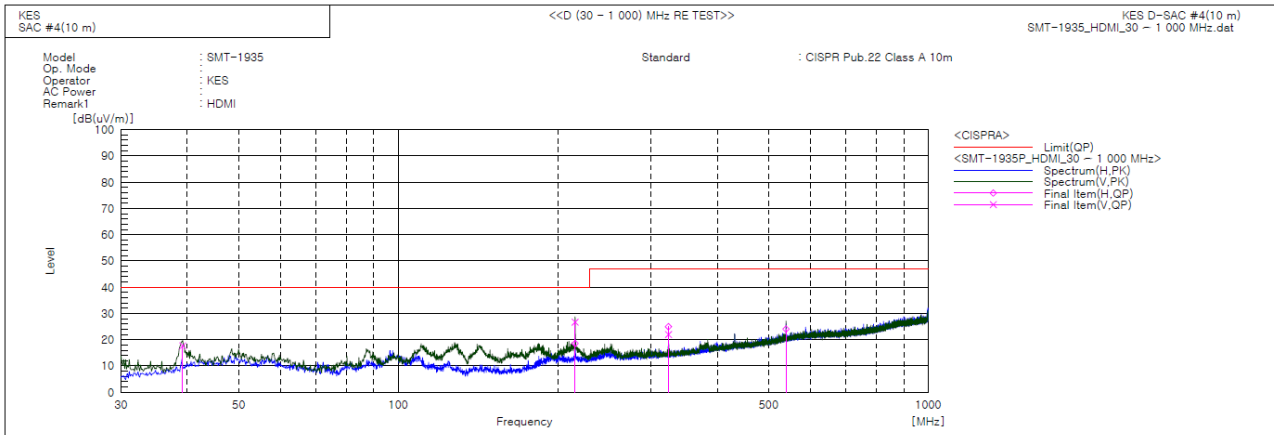


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- HDMI Mode



Final Result

No.	Frequency [MHz]	(P)	Reading OP [dB(uV)]	c.f [dB(1/m)]	Result OP [dB(uV/m)]	Limit OP [dB(uV/m)]	Margin OP [dB]	Height [cm]	Angle [deg]	Remark
1	39.215	V	47.8	-30.1	17.7	40.0	22.3	150.0	232.0	
2	215.750	V	53.8	-27.1	26.7	40.0	13.3	100.0	28.0	
3	215.755	H	45.7	-27.1	18.6	40.0	21.4	400.0	10.0	
4	323.649	H	48.9	-23.9	25.0	47.0	22.0	400.0	174.0	
5	323.668	V	45.9	-23.9	22.0	47.0	25.0	100.0	6.0	
6	539.371	H	41.4	-17.3	24.1	47.0	22.9	200.0	306.0	

◆ Calculation

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

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

Correction Factor : ANT FACTOR + Cable loss

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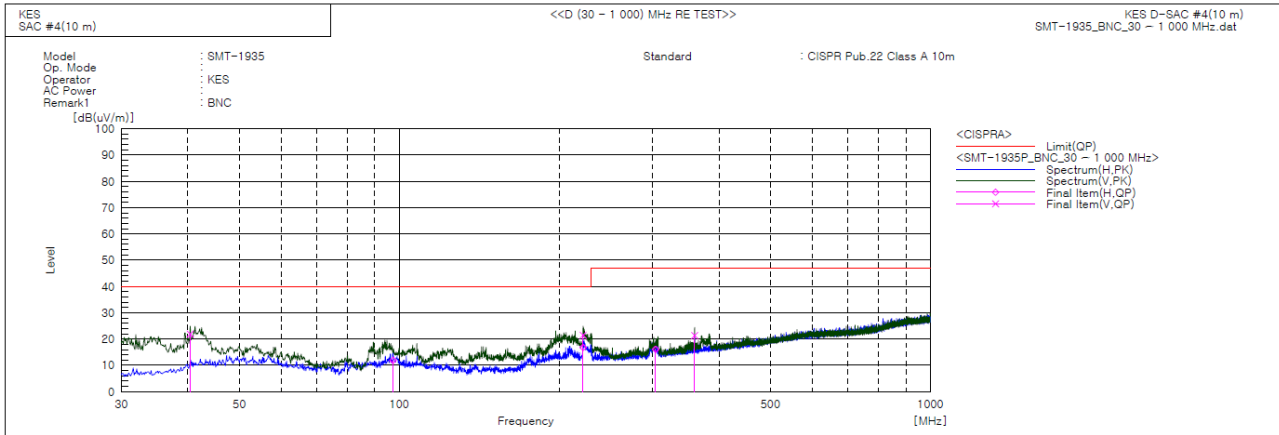
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- BNC Mode



Final Result

No.	Frequency [MHz]	(P)	Reading OP [dB(uV)]	c.f [dB(1/m)]	Result OP [dB(uV/m)]	Limit OP [dB(uV/m)]	Margin OP [dB]	Height [cm]	Angle [deg]	Remark
1	40.428	V	51.4	-29.5	21.9	40.0	18.1	150.0	342.0	
2	97.415	H	40.9	-29.0	11.9	40.0	28.1	400.0	357.0	
3	221.939	H	43.7	-26.9	16.8	40.0	23.2	400.0	169.0	
4	221.986	V	48.4	-26.9	21.5	40.0	18.5	128.0	244.0	
5	304.025	H	40.7	-24.6	16.1	47.0	30.9	200.0	350.0	
6	360.043	V	44.1	-22.7	21.4	47.0	25.6	100.0	345.0	

◆ Calculation

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

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

Correction Factor : ANT FACTOR + Cable loss

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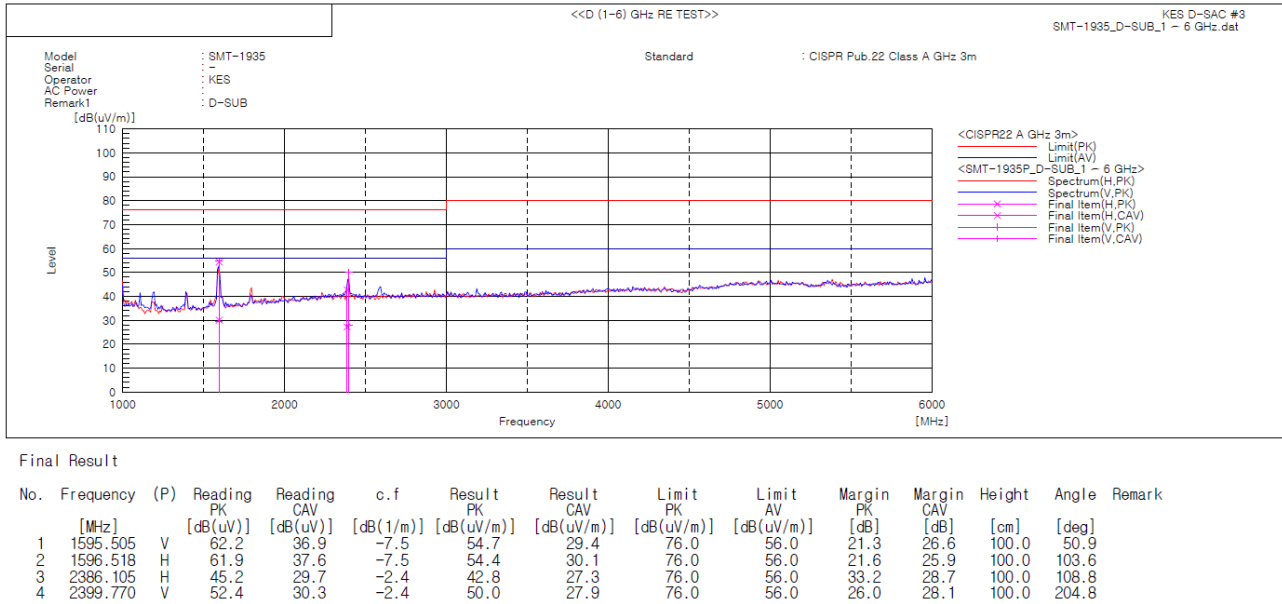
Test report No.:

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Radiated Electric Field Emissions(Above 1 GHz)

- D-SUB Mode



◆ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] - Preamp Factor [dB]) - Limit Line[dBuV]

Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor,
Cable Loss : Cable loss, Preamp Factor : Preamp Factor

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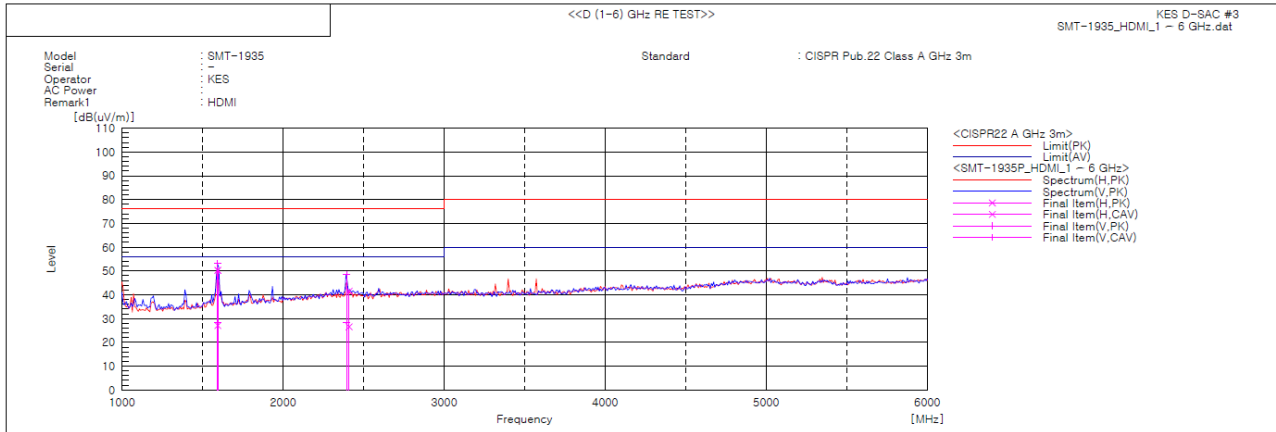


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- HDMI Mode



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result CAV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1594.565	V	60.7	35.9	-7.5	53.2	28.4	76.0	56.0	22.8	27.6	100.0	42.6	
2	1595.578	H	57.8	34.6	-7.5	50.3	27.1	76.0	56.0	25.7	28.9	100.0	122.5	
3	2396.297	V	50.9	30.9	-2.4	48.5	28.5	76.0	56.0	27.5	27.5	100.0	5.4	
4	2410.346	H	43.9	29.0	-2.4	41.5	26.6	76.0	56.0	34.5	29.4	100.0	76.5	

◆ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] - Preamp Factor [dB]) - Limit Line[dBuV]

Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor,
Cable Loss : Cable loss, Preamp Factor : Preamp Factor

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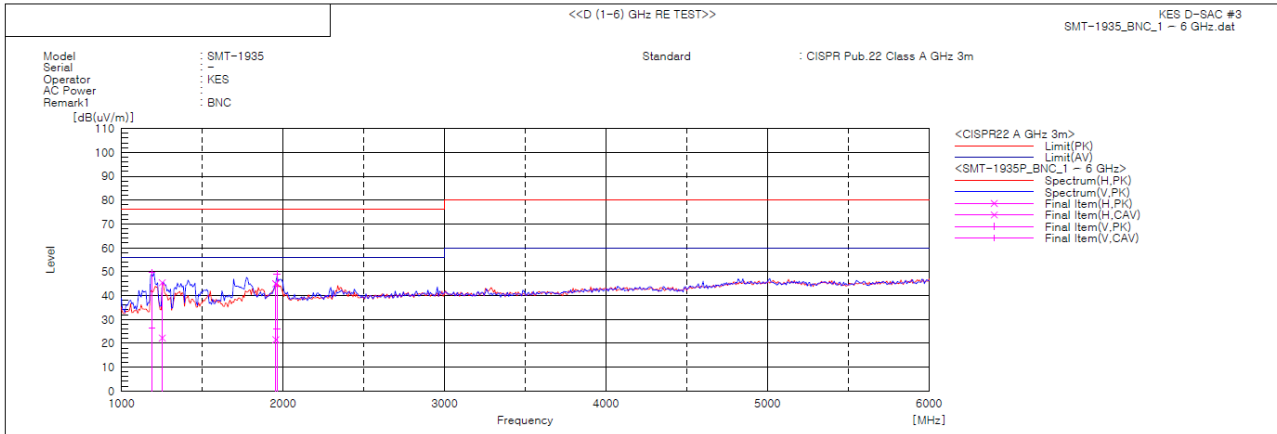
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Test report No.:

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- BNC Mode



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result CAV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1189.513	V	59.9	36.7	-10.3	49.6	26.4	76.0	56.0	26.4	29.6	100.0	355.6	
2	1253.623	H	55.3	32.1	-9.9	45.4	22.2	76.0	56.0	30.6	33.8	100.0	354.8	
3	1956.522	H	49.1	25.7	-4.2	44.9	21.5	76.0	56.0	31.1	34.5	100.0	49.4	
4	1963.768	V	53.2	30.1	-4.2	49.0	25.9	76.0	56.0	27.0	30.1	100.0	3.1	

◆ Calculation

Over Limit [dB] = (Read Level[dBuV] + Ant Factor[dB/m] + Cable Loss [dB] - Preamp Factor [dB]) - Limit Line[dBuV]

Over Limit : Margin Value, Read Level : Reading Value, Ant Factor : Ant Factor,
Cable Loss : Cable loss, Preamp Factor : Preamp Factor

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**Harmonic Current Emissions and Voltage Fluctuations and Flicker**

- D-SUB Mode

Average harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	89.499E-3	100.000		
2	1.604E-3	1.792		PASS
3	78.359E-3	87.553	2.30	PASS
4	2.353E-3	2.629		PASS
5	74.061E-3	82.751	1.14	PASS
6	1.872E-3	2.091		PASS
7	69.219E-3	77.341	770.00E-3	PASS
8	1.640E-3	1.833		PASS
9	61.610E-3	68.838	400.00E-3	PASS
10	1.686E-3	1.884		PASS
11	53.554E-3	59.838	330.00E-3	PASS
12	1.331E-3	1.487		PASS
13	46.330E-3	51.766	210.00E-3	PASS
14	1.431E-3	1.599		PASS
15	38.308E-3	42.803	150.00E-3	PASS
16	1.195E-3	1.335		PASS
17	29.415E-3	32.866	130.00E-3	PASS
18	837.274E-6	0.936		PASS
19	21.164E-3	23.647	120.00E-3	PASS
20	798.736E-6	0.892		PASS
21	14.131E-3	15.789	165.00E-3	PASS
22	749.485E-6	0.837		PASS
23	8.339E-3	9.317	150.00E-3	PASS
24	828.283E-6	0.925		PASS
25	4.743E-3	5.299		PASS
26	846.284E-6	0.946		PASS
27	4.264E-3	4.765		PASS
28	829.513E-6	0.927		PASS
29	5.249E-3	5.865	120.00E-3	PASS
30	764.884E-6	0.855		PASS
31	6.077E-3	6.790	105.00E-3	PASS
32	736.233E-6	0.823		PASS
33	6.268E-3	7.003	105.00E-3	PASS
34	718.582E-6	0.803		PASS
35	6.101E-3	6.817	90.00E-3	PASS
36	683.818E-6	0.764		PASS
37	5.361E-3	5.990	90.00E-3	PASS
38	682.841E-6	0.763		PASS
39	4.077E-3	4.556		PASS
40	579.611E-6	0.648		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	89.677E-3	100.000		
2	1.880E-3	2.096		PASS
3	78.512E-3	87.550	3.45	PASS
4	2.728E-3	3.041		PASS
5	74.174E-3	82.712	1.71	PASS
6	2.092E-3	2.333		PASS
7	69.331E-3	77.312	1.15	PASS
8	1.880E-3	2.097		PASS
9	61.813E-3	68.929	600.00E-3	PASS
10	1.945E-3	2.169		PASS
11	54.201E-3	60.441	495.00E-3	PASS
12	1.566E-3	1.746		PASS
13	46.508E-3	51.862	315.00E-3	PASS
14	1.746E-3	1.947		PASS
15	38.532E-3	42.968	225.00E-3	PASS
16	1.421E-3	1.585		PASS
17	29.619E-3	33.029	195.00E-3	PASS
18	984.669E-6	1.098		PASS
19	21.366E-3	23.825	180.00E-3	PASS
20	941.658E-6	1.050		PASS
21	14.333E-3	15.983	165.00E-3	PASS
22	852.838E-6	0.951		PASS
23	8.525E-3	9.506	150.00E-3	PASS
24	920.076E-6	1.026		PASS
25	4.890E-3	5.453		PASS
26	913.155E-6	1.018		PASS
27	4.381E-3	4.886		PASS
28	915.587E-6	1.021		PASS
29	5.377E-3	5.996	120.00E-3	PASS
30	860.992E-6	0.960		PASS
31	6.297E-3	7.021	105.00E-3	PASS
32	832.019E-6	0.928		PASS
33	6.382E-3	7.117	105.00E-3	PASS
34	802.057E-6	0.894		PASS
35	6.269E-3	6.991	90.00E-3	PASS
36	773.363E-6	0.862		PASS
37	5.455E-3	6.083	90.00E-3	PASS
38	786.550E-6	0.877		PASS
39	4.197E-3	4.680		PASS
40	665.068E-6	0.742		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.



- HDMI Mode

Average harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	89.694E-3	100.000		
2	1.093E-3	1.218		PASS
3	78.451E-3	87.465	2.30	PASS
4	2.258E-3	2.517		PASS
5	74.094E-3	82.607	1.14	PASS
6	1.466E-3	1.635		PASS
7	68.925E-3	76.845	770.00E-3	PASS
8	1.284E-3	1.431		PASS
9	61.147E-3	68.173	400.00E-3	PASS
10	1.641E-3	1.830		PASS
11	52.977E-3	59.064	330.00E-3	PASS
12	1.150E-3	1.282		PASS
13	45.165E-3	50.354	210.00E-3	PASS
14	1.592E-3	1.775		PASS
15	36.613E-3	40.820	150.00E-3	PASS
16	1.336E-3	1.489		PASS
17	27.797E-3	30.990	130.00E-3	PASS
18	777.107E-6	0.866		PASS
19	19.601E-3	21.853	120.00E-3	PASS
20	753.586E-6	0.840		PASS
21	12.471E-3	13.904	165.00E-3	PASS
22	758.788E-6	0.846		PASS
23	6.895E-3	7.687	150.00E-3	PASS
24	771.830E-6	0.861		PASS
25	3.958E-3	4.413		PASS
26	755.437E-6	0.842		PASS
27	4.408E-3	4.914		PASS
28	727.191E-6	0.811		PASS
29	5.768E-3	6.430	120.00E-3	PASS
30	655.777E-6	0.731		PASS
31	6.467E-3	7.210	105.00E-3	PASS
32	652.995E-6	0.728		PASS
33	6.343E-3	7.071	105.00E-3	PASS
34	630.760E-6	0.703		PASS
35	5.936E-3	6.618	90.00E-3	PASS
36	643.047E-6	0.717		PASS
37	4.965E-3	5.536		PASS
38	664.246E-6	0.741		PASS
39	3.498E-3	3.900		PASS
40	549.092E-6	0.612		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	89.842E-3	100.000		
2	1.409E-3	1.569		PASS
3	78.596E-3	87.482	3.45	PASS
4	2.574E-3	2.865		PASS
5	74.244E-3	82.638	1.71	PASS
6	1.684E-3	1.875		PASS
7	69.148E-3	76.966	1.15	PASS
8	1.574E-3	1.752		PASS
9	61.524E-3	68.481	600.00E-3	PASS
10	1.983E-3	2.207		PASS
11	53.756E-3	59.834	495.00E-3	PASS
12	1.340E-3	1.492		PASS
13	45.528E-3	50.676	315.00E-3	PASS
14	1.913E-3	2.129		PASS
15	37.246E-3	41.458	225.00E-3	PASS
16	1.582E-3	1.761		PASS
17	28.259E-3	31.454	195.00E-3	PASS
18	931.307E-6	1.037		PASS
19	19.965E-3	22.223	180.00E-3	PASS
20	877.629E-6	0.977		PASS
21	12.898E-3	14.357	165.00E-3	PASS
22	845.278E-6	0.941		PASS
23	7.265E-3	8.086	150.00E-3	PASS
24	890.869E-6	0.992		PASS
25	4.197E-3	4.671		PASS
26	848.606E-6	0.945		PASS
27	4.818E-3	5.363		PASS
28	840.978E-6	0.936		PASS
29	6.067E-3	6.753	120.00E-3	PASS
30	898.508E-6	1.000		PASS
31	6.908E-3	7.689	105.00E-3	PASS
32	895.888E-6	0.997		PASS
33	6.529E-3	7.268	105.00E-3	PASS
34	737.491E-6	0.821		PASS
35	6.061E-3	6.747	90.00E-3	PASS
36	730.647E-6	0.813		PASS
37	5.126E-3	5.706	90.00E-3	PASS
38	771.822E-6	0.859		PASS
39	3.715E-3	4.135		PASS
40	643.582E-6	0.716		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.



- BNC Mode

Average harmonic current results

Hn	I _{eff} [A]	% of Limit	Limit [A]	Result
1	88.857E-3	100.000		
2	1.528E-3	1.719		PASS
3	77.783E-3	87.538	2.30	PASS
4	2.213E-3	2.491		PASS
5	73.972E-3	83.249	1.14	PASS
6	1.684E-3	1.895		PASS
7	69.302E-3	77.992	770.00E-3	PASS
8	1.486E-3	1.672		PASS
9	62.527E-3	70.368	400.00E-3	PASS
10	1.658E-3	1.866		PASS
11	55.246E-3	62.174	330.00E-3	PASS
12	1.219E-3	1.371		PASS
13	48.014E-3	54.035	210.00E-3	PASS
14	1.505E-3	1.694		PASS
15	40.013E-3	45.031	150.00E-3	PASS
16	1.252E-3	1.409		PASS
17	31.717E-3	35.695	130.00E-3	PASS
18	902.483E-6	1.016		PASS
19	23.837E-3	26.827	120.00E-3	PASS
20	877.275E-6	0.987		PASS
21	16.644E-3	18.731	165.00E-3	PASS
22	807.180E-6	0.908		PASS
23	10.617E-3	11.948	150.00E-3	PASS
24	775.968E-6	0.873		PASS
25	6.192E-3	6.969	135.00E-3	PASS
26	761.839E-6	0.857		PASS
27	4.377E-3	4.926		PASS
28	814.076E-6	0.916		PASS
29	4.724E-3	5.317		PASS
30	743.176E-6	0.836		PASS
31	5.807E-3	6.535	105.00E-3	PASS
32	716.450E-6	0.806		PASS
33	6.304E-3	7.094	105.00E-3	PASS
34	695.941E-6	0.783		PASS
35	6.449E-3	7.258	90.00E-3	PASS
36	726.164E-6	0.817		PASS
37	5.934E-3	6.678	90.00E-3	PASS
38	754.544E-6	0.849		PASS
39	4.697E-3	5.286		PASS
40	627.318E-6	0.706		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	89.187E-3	100.000		
2	2.974E-3	3.334		PASS
3	77.954E-3	87.405	3.45	PASS
4	2.898E-3	3.249		PASS
5	74.462E-3	83.490	1.71	PASS
6	2.330E-3	2.613		PASS
7	69.512E-3	77.940	1.15	PASS
8	2.090E-3	2.343		PASS
9	63.658E-3	71.376	600.00E-3	PASS
10	2.168E-3	2.431		PASS
11	56.549E-3	63.405	495.00E-3	PASS
12	1.578E-3	1.769		PASS
13	48.259E-3	54.110	315.00E-3	PASS
14	2.095E-3	2.349		PASS
15	40.663E-3	45.593	225.00E-3	PASS
16	1.734E-3	1.944		PASS
17	31.996E-3	35.876	195.00E-3	PASS
18	1.236E-3	1.386		PASS
19	24.092E-3	27.013	180.00E-3	PASS
20	1.037E-3	1.163		PASS
21	17.179E-3	19.261	165.00E-3	PASS
22	986.558E-6	1.106		PASS
23	11.405E-3	12.788	150.00E-3	PASS
24	958.981E-6	1.075		PASS
25	6.420E-3	7.199	135.00E-3	PASS
26	960.094E-6	1.076		PASS
27	4.710E-3	5.281		PASS
28	952.230E-6	1.068		PASS
29	4.896E-3	5.489		PASS
30	971.767E-6	1.090		PASS
31	5.991E-3	6.718	105.00E-3	PASS
32	993.503E-6	1.114		PASS
33	6.470E-3	7.255	105.00E-3	PASS
34	878.786E-6	0.985		PASS
35	6.606E-3	7.407	90.00E-3	PASS
36	901.498E-6	1.011		PASS
37	6.052E-3	6.786	90.00E-3	PASS
38	952.728E-6	1.068		PASS
39	4.901E-3	5.495		PASS
40	692.987E-6	0.777		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 - Voltage Fluctuations

Maximum Flicker results

- D-SUB Mode

	EUT values	Limit	Result
Pst	0.028	1.00	PASS
Plt	0.028	0.65	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.068	4.00	PASS
Tmax [s]	0.000	0.50	PASS

- HDMI Mode

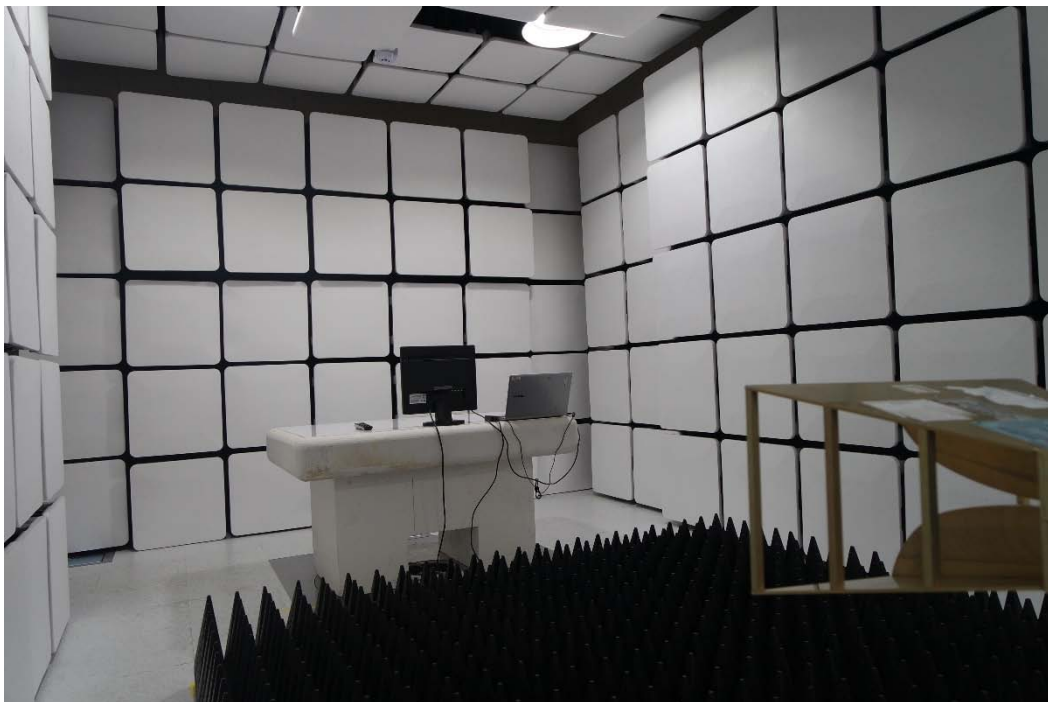
	EUT values	Limit	Result
Pst	0.028	1.00	PASS
Plt	0.028	0.65	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.035	4.00	PASS
Tmax [s]	0.000	0.50	PASS

- BNC Mode

	EUT values	Limit	Result
Pst	0.028	1.00	PASS
Plt	0.028	0.65	PASS
dc [%]	0.000	3.30	PASS
dmax [%]	0.035	4.00	PASS
Tmax [s]	0.000	0.50	PASS

Test Setup Photos and Configuration

Conducted Voltage Emissions



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Test report No.:
KES-E1-17T0426
Page (66) of (82)

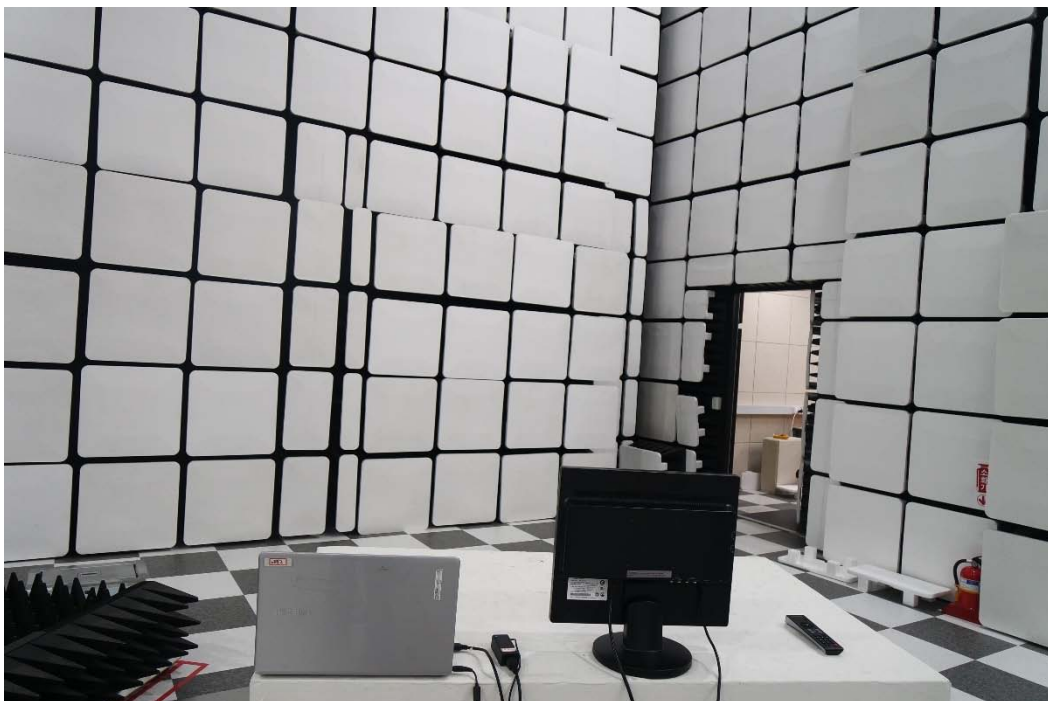
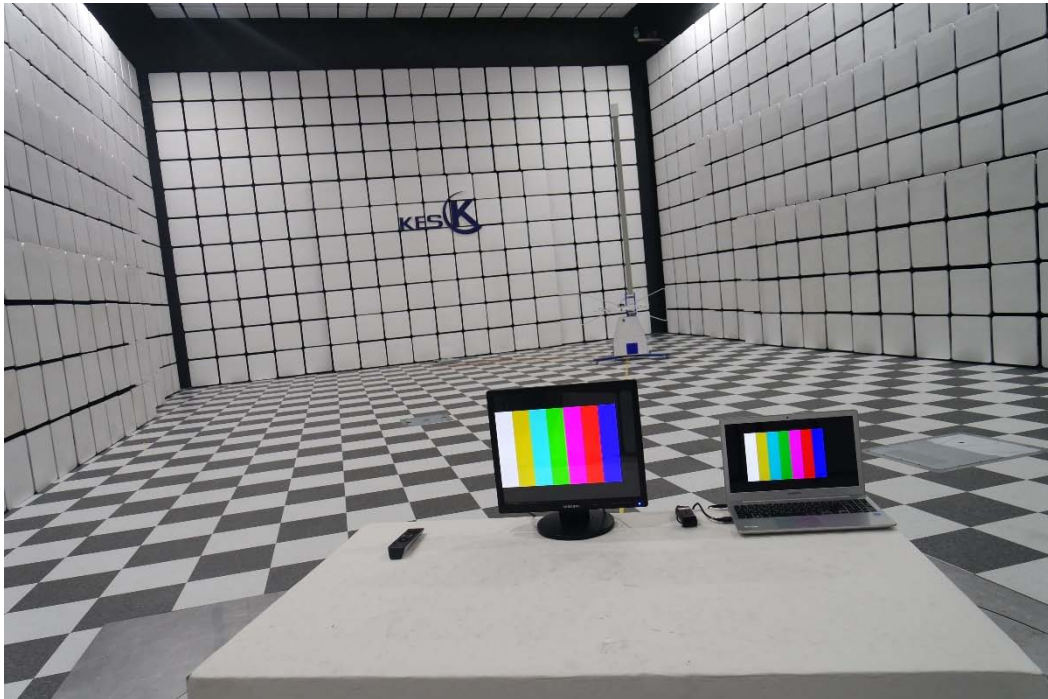
Conducted Telecommunication Emissions

N/A

N/A

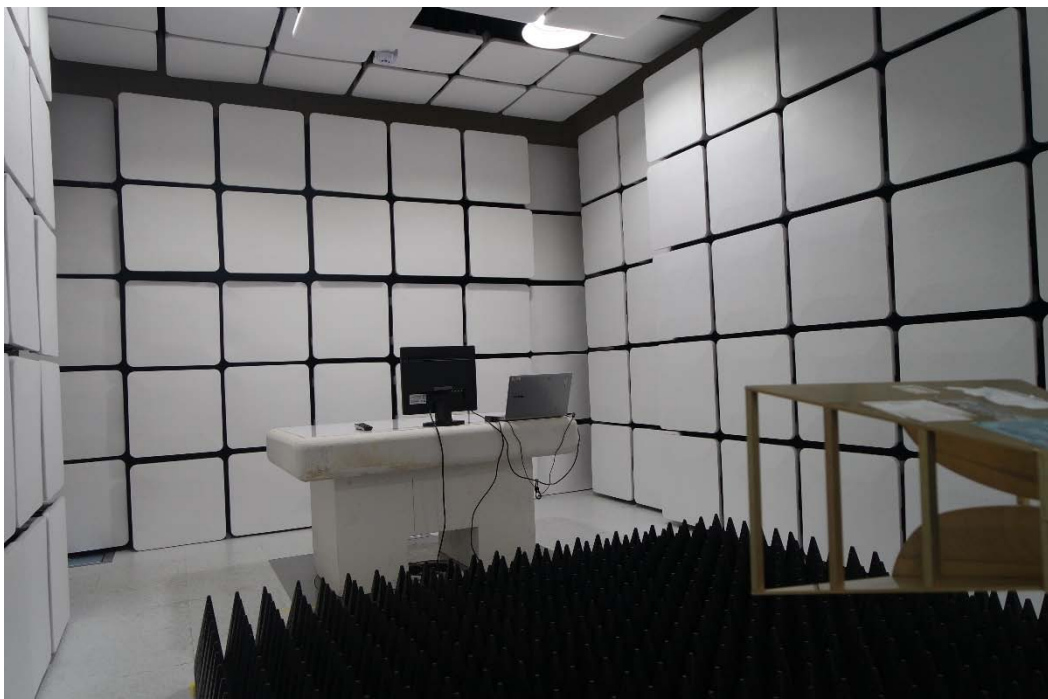
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Radiated Electric Field Emissions(Below 1 GHz)



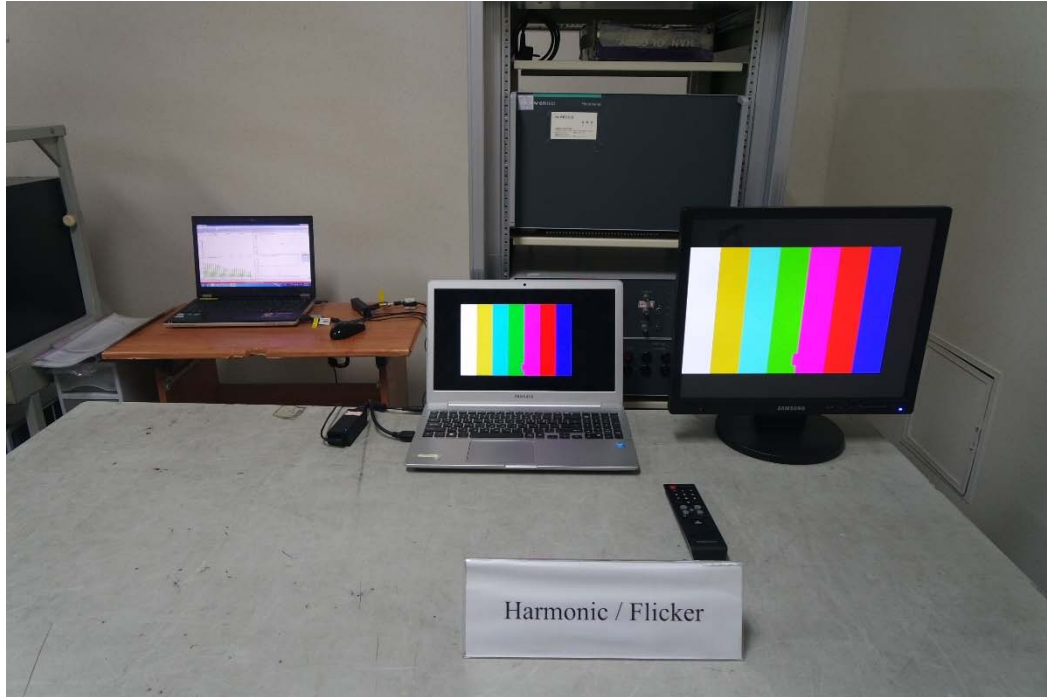
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Radiated Electric Field Emissions(Above 1 GHz)



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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



N/A

Surge Transients



Conducted Disturbance



N/A

Voltage Dips and Short Interruptions



EUT External Photographs

(Top)



(Bottom)



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EUT Internal Photographs

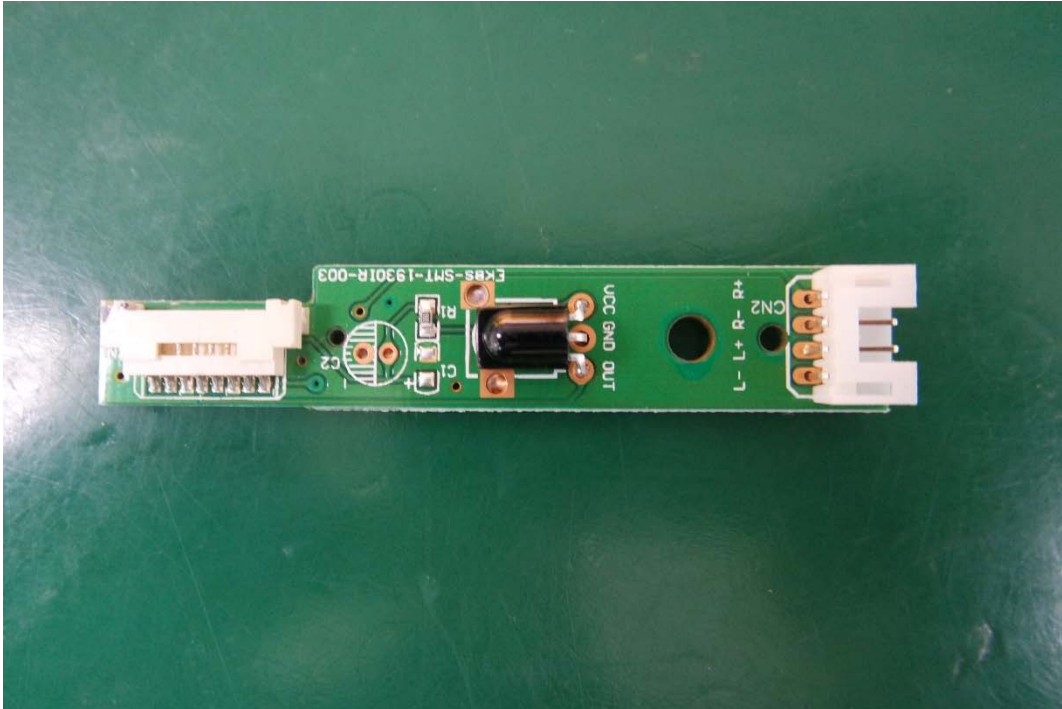
(Internal View)



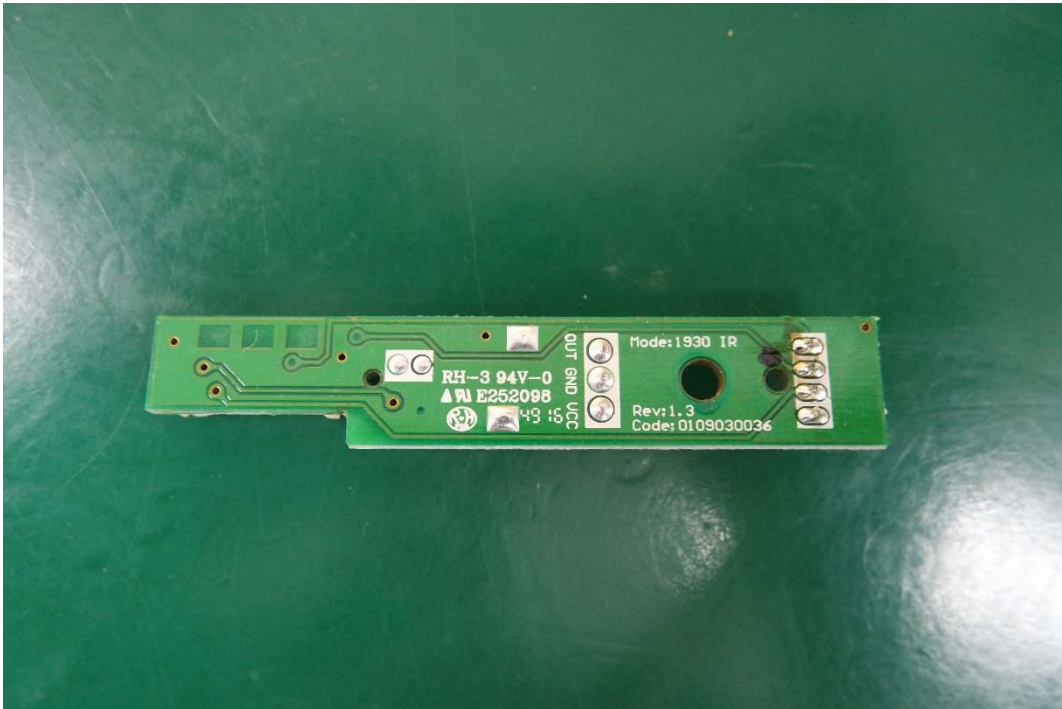
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EUT Internal View – Sub Board 1

(Top)



(Bottom)



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EUT Internal View – Sub Board 2

(Top)

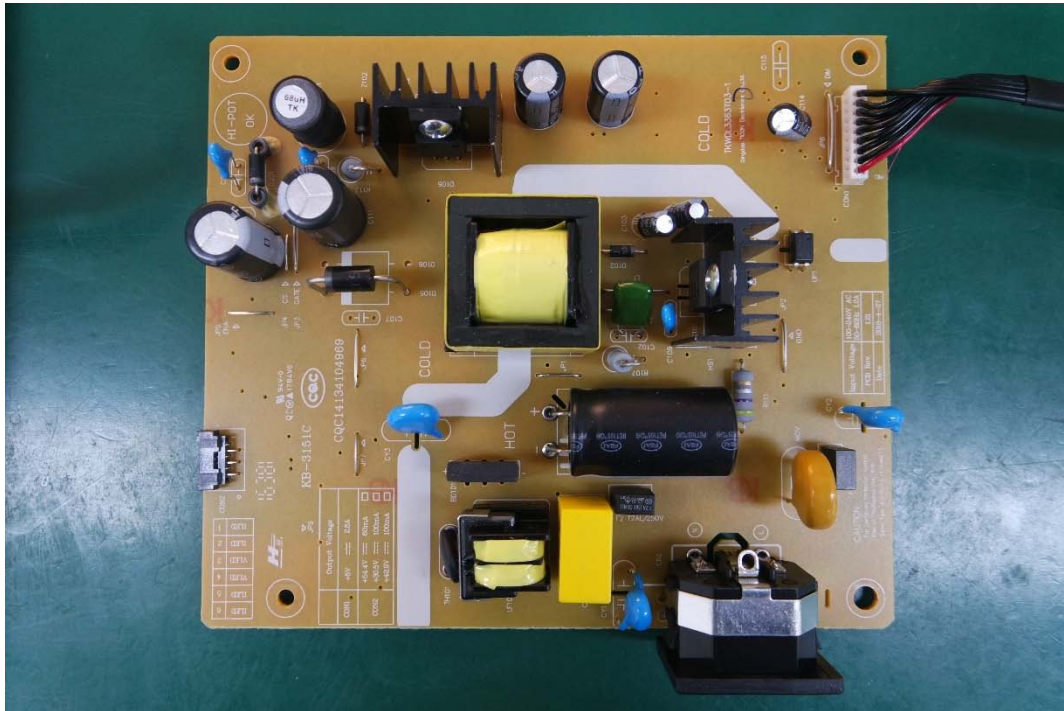


(Bottom)

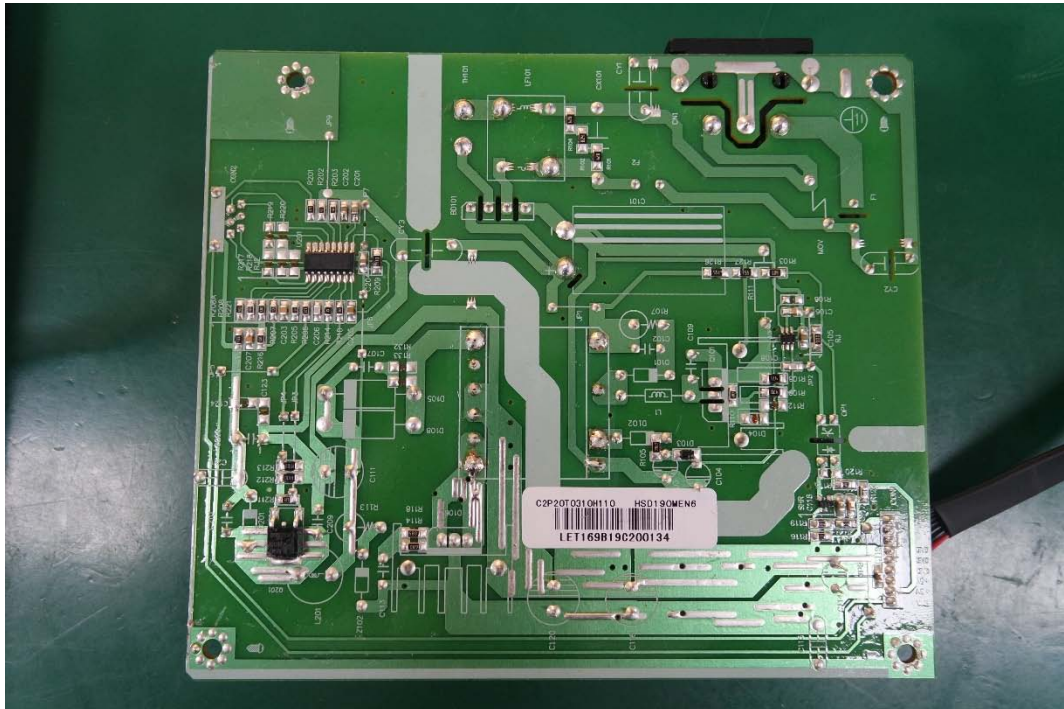
N/A

EUT Internal View – Power Board

(Top)



(Bottom)



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EUT Internal View – Panel Board

(Top)



(Bottom)



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EUT Internal View – Panel

(Top)



(Bottom)



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Label and Location



LED MONITOR

Model No : SMT-1935

Manufacturer : Weihai Daewoo Electronics Co.,Ltd.

Made in of China

