



EMC TEST REPORT

Test Report No. : KES-E1-17T0734-R1
Date of Issue : Nov. 02, 2021
Product name : Security LED Monitor
Model/Type No. : SMT-3233
Variant Mode : -
Applicant : Hanwha Techwin Co., Ltd.
Applicant Address : 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si,
Gyeonggi-do, Republic of 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)
Equipment authorization : **Supplier's Declaration of Conformity**
Date of Receipt : Oct. 30, 2017
Test date : Nov. 06, 2017 ~ Nov. 07, 2017
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by


Jin Bae, Lee
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.



REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Nov. 13, 2017	KES-E1-17T0734	Issued
Nov. 02, 2021	KES-E1-17T0734-R1	- Applicant Address/Manufacturer change at customer's request - IC Regulation ICES-003 Issue 7 Update ANSI C63.4-2014 or ANSI C63.4-2014 amended as per ANSI C63.4a-2017

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd. This document may be altered or revised by KES Co., Ltd. personnel only, and shall be noted in the revision section of the document. Any alteration of this document not carried out by KES Co., Ltd. will constitute fraud and shall nullify the document.



KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-EM-17T0734-R1

Page (3) of (38)

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	EUT Operating Mode(s)	8
1.8	Configuration.....	9
1.9	Remarks when standards applied	11
1.10	Calibration Details of Equipment Used for Measurement	11
1.11	Test Facility	11
1.12	Laboratory Accreditations and Listings	11
2.0	Test Regulations.....	12
2.1	Conducted Emissions at Mains Power Ports	14
2.2	Radiated Electric Field Emissions(Below 1 GHz)	15
2.3	Radiated Electric Field Emissions(Above 1 GHz)	16
APPENDIX A – TEST DATA.....		17
Conducted Emissions at Mains Power Ports.....		17
Radiated Electric Field Emissions(Below 1 GHz)		25
Radiated Electric Field Emissions(Above 1 GHz)		29
Test Setup Photos and Configuration		33
Conducted Voltage Emissions		33
Radiated Electric Field Emissions(Below 1 GHz)		34
Radiated Electric Field Emissions(Above 1 GHz)		35
EUT External Photographs		36
EUT Internal Photographs		37

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr



1.0 General Product Description

Main Specifications of EUT are:

Model Name		SMT-3233
Image		
<i>Display</i>		
Screen Size		31.5"
Max. Resolution		1,920 x 1,080
Brightness		350cd/m ²
Contrast Ratio		1200:1
Aspect Ratio		16:9
Viewing Angle (H/V)		178°/178°
Display Color		16.7 million
Response Time		8ms(G to G)
Video System		NTSC/PAL
Panel Life		30,000 hours
Filter Type		3D combfilter
<i>Interface</i>		
Video	Connector	VGA, DVI, HDMI, BNC
RGB/DVI	Connector	Analog D-sub(15 pin), DVI-D
	Input Signal	0.7Vp-p±5%
	Available Format	640 x 480@60Hz/66Hz/72Hz/75Hz (VGA), 720 x 400@70Hz, 800 x 600@56Hz/60Hz/72Hz/75Hz (SVGA), 832 x 624@75Hz, 1,024 x 768@60Hz/70Hz/75Hz (XGA), 1,152 x 864@75Hz, 1,280 x 720@60Hz, 1,280 x 800@60Hz, 1,280 x 1,024@60Hz/75Hz (SXGA), 1,360 x 768@60Hz, 1,440 x 900@60Hz, 1,600 x 900@60Hz, 1,680 x 1,050@60Hz, 1,920 x 1,080@60Hz
HDMI	Connector	HDMI
	Available Format	640 x 480p@60Hz, 720 x 480p@60Hz, 720 x 576p@50Hz, 1,280 x 720p@50Hz/60Hz, 1,920 x 1,080i@60Hz, 1,920 x 1,080p@60Hz
Audio	Connector	3.5mm Mini Phone Jack
	Output Signal	Loop-through line level(PC only), Speakers : 2x2W
Application Support		Remote Controller
<i>On Screen Display (OSD)</i>		
Functions		VESA™ DPM Compatible
Language		Chinese(Simplified), English, French, German, Spanish,Dutch,Russian,Arabic
<i>General</i>		
Electrical	Input Voltage	AC 100 ~ 240V(50/60Hz)
	Power Consumption	<50W
Environmental	Operating Temperature	0 ~ +40°C (+32°F ~ +104°F)
	Operating Humidity	10% ~ 80% (non-condensing)
Mechanical	Dimensions with Stand	TBD
	Dimensions without Stand	727.7 x 433.2 x 48.8mm
	Bezel Size	14.5/25mm(Top/Bottom)
	Weight	TBD
	Cabinet Color	Black
	Rack Mount	N/A
	VESA Mounts Interface	100 x 100mm
Accessory		STAND

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr



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
Security LED Monitor	SMT-3233	-	HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.	E.U.T

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Notebook	NT630Z5J	JK9091EF400142M	SAMSUNG	-
Notebook Adapter	A13-040N2A	CN60BA4400313AD 0N843KO200	Chicony Power Technology (suzhou)Co., Ltd.	-
MONITOR	SMT-2232	C95V67VF900038B	Weihai Daewoo Electronics Co., Ltd.	-
Camera	SCV-5083RP	-	Hanwha Techwin Co., Ltd.	-
Camera Adapter	2ACB022F	-	Channel Well Technology (Guangzhou) Co., Ltd.	-
Speaker	BR10000A CUVE	-	BEIJING EDIFIER HI-TECH GROUP.	-



1.6 External I/O Cabling

■ D-SUB Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
Security LED Monitor (E.U.T)	D-SUB	Notebook	D-SUB	1.4	S
	Audio in		Audio out	1.5	U
	Audio out	Speaker	Audio in	1.6	U
	BNC OUT	MONITOR	BNC IN	4.0	S
	BNC IN	Camera	BNC OUT	4.0	S

* Unshielded=U, Shielded=S

■ HDMI Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
Security LED Monitor (E.U.T)	HDMI	Notebook	HDMI	1.2	S
	Audio in		Audio out	1.5	U
	Audio out	Speaker	Audio in	1.6	U
	BNC OUT	MONITOR	BNC IN	4.0	S
	BNC IN	Camera	BNC OUT	4.0	S

* Unshielded=U, Shielded=S



■ DVI Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
Security LED Monitor (E.U.T)	DVI	Notebook	HDMI	1.3	S
	Audio in		Audio out	1.5	U
	Audio out	Speaker	Audio in	1.6	U
	BNC OUT	MONITOR	BNC IN	4.0	S
	BNC IN	Camera	BNC OUT	4.0	S

* Unshielded=U, Shielded=S

■ BNC Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
Security LED Monitor (E.U.T)	Audio in	Notebook Speaker	Audio out	1.5	U
	Audio out		Audio in	1.6	U
	BNC OUT	MONITOR	BNC IN	4.0	S
	BNC IN	Camera	BNC OUT	4.0	S

* Unshielded=U, Shielded=S



1.7 EUT Operating Mode(s)

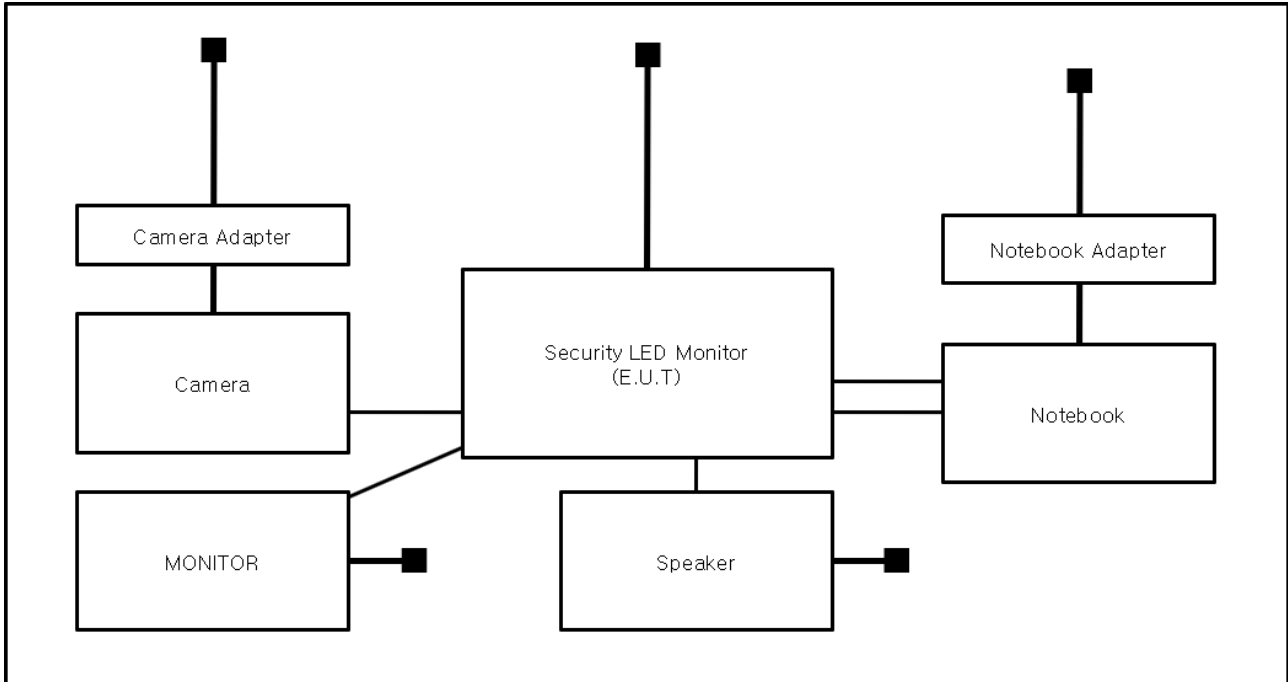
Test mode	operating
D-SUB	We performed COLOR BAR on the notebook to check whether the screen output status of the test equipment and the 1 kHz tone sound from the speaker were normally output. We confirmed that the camera image was output to the monitor through the test equipment.
HDMI	We performed COLOR BAR on the notebook to check whether the screen output status of the test equipment and the 1 kHz tone sound from the speaker were normally output. We confirmed that the camera image was output to the monitor through the test equipment.
DVI	We performed COLOR BAR on the notebook to check whether the screen output status of the test equipment and the 1 kHz tone sound from the speaker were normally output. We confirmed that the camera image was output to the monitor through the test equipment.
BNC	We connected each camera and monitor to the BNC IN and OUT ports of the test equipments, and it was confirmed that the image of the camera was outputted normally on the test equipments and the monitor. We confirmed that the 1 khz tone of the notebook was outputted normally from the speaker through the test equipments.

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

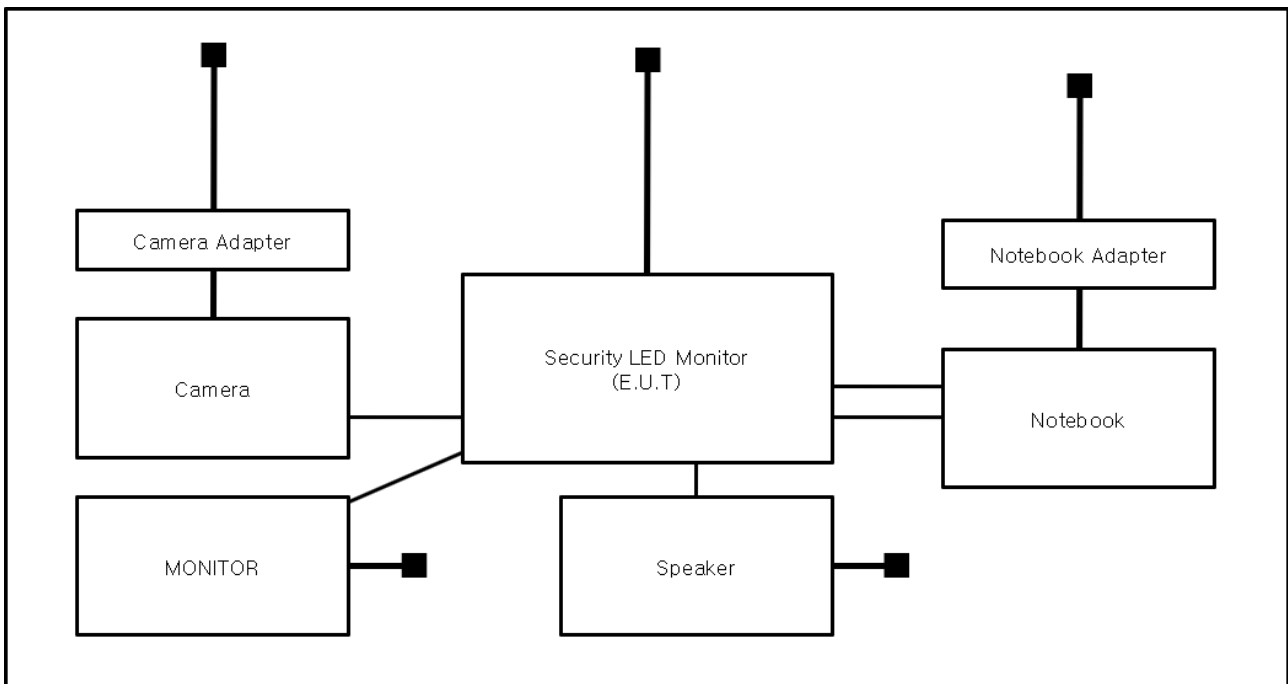
1.8 Configuration

■ AC Main
 □ DC Main

■ D-SUB Mode

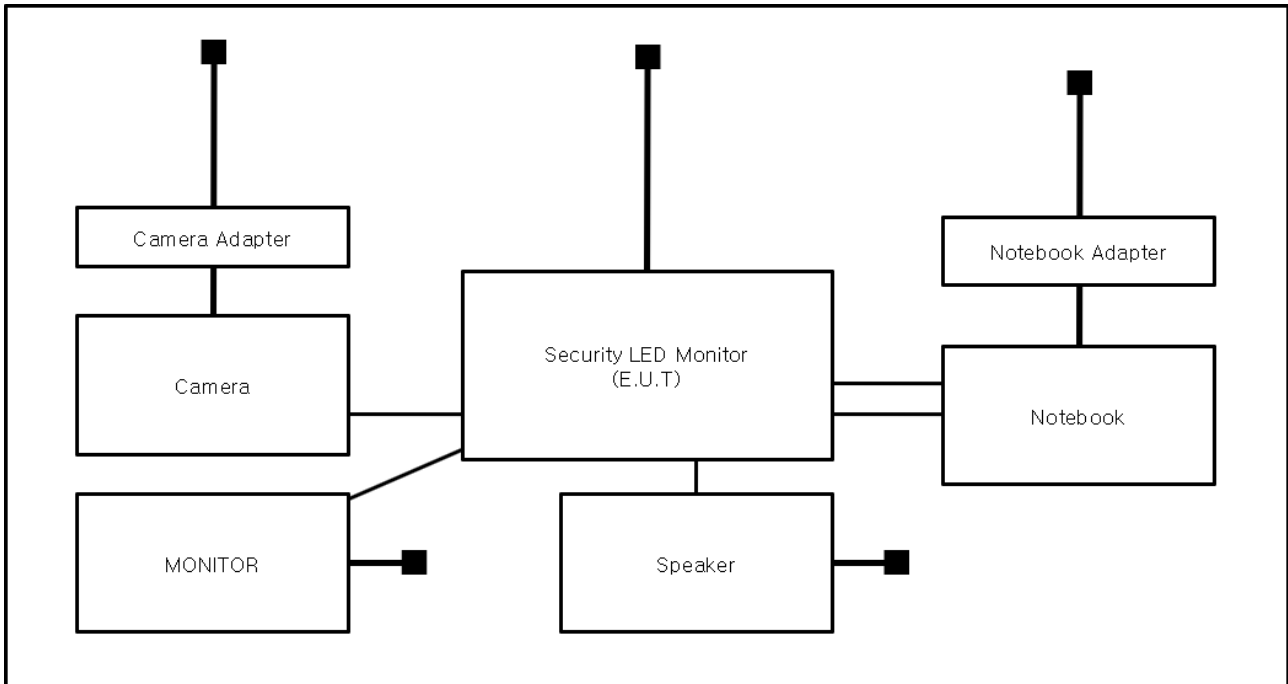


■ HDMI Mode

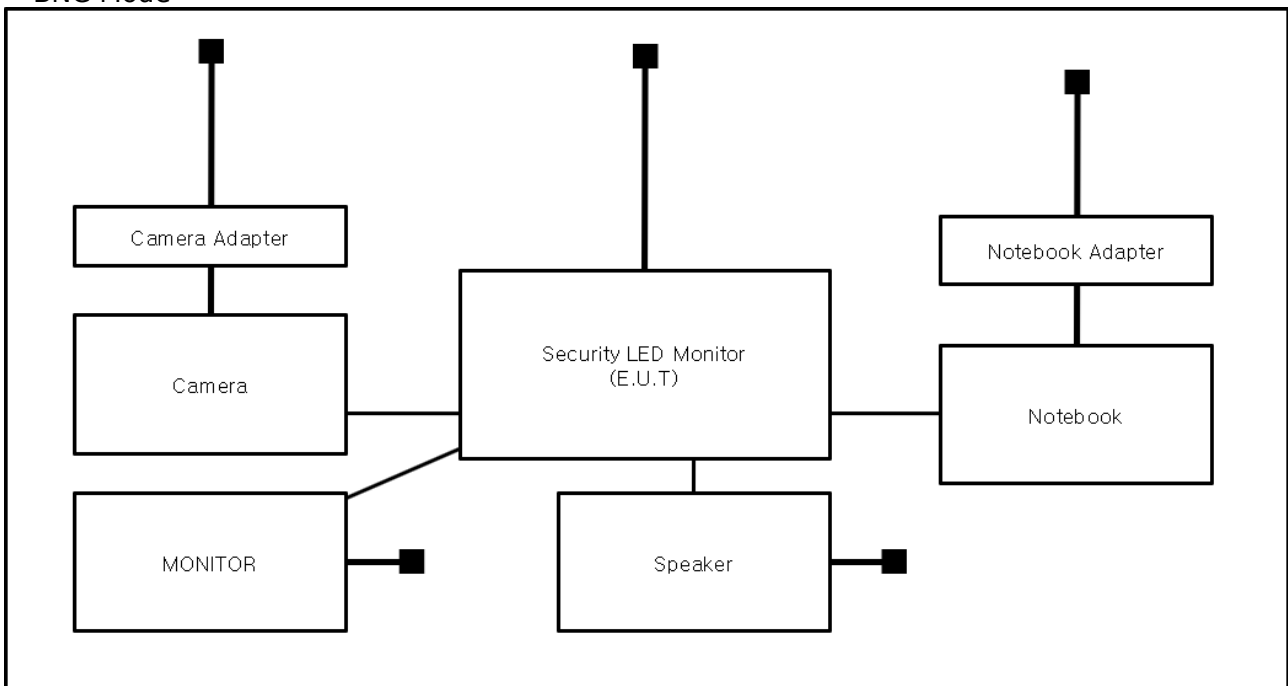


This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
 The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
 The authenticity of the test report, contact shchoi@kes.co.kr

■ DVI Mode



■ BNC Mode



1.9 Remarks when standards applied

N/A

1.10 Calibration Details of Equipment Used for Measurement

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

1.11 Test Facility

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

1.12 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 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



KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-EM-17T0734-R1

Page (13) of (38)

☐ **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 C63.4a-2017

☐ Class A

☐ Class B

☒ **IC Regulation ICES-003 Issue 7**

☒ CAN/CSA-CISPR 32:17

☒ Class A

☐ Class B

☐ ANSI C63.4a-2017

☐ Class A

☐ Class B

☐ **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

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr



2.1 Conducted Emissions at Mains Power Ports

Test Date

Nov. 06, 2017

Test Location

Electro wave Shieldroom #3

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EMC32	R & S	9.12.00	-
☒	EMI TEST RECEIVER	ESR3	R & S	101783	04, 27, 2018
☒	LISN	ENV216	R & S	101137	02, 03, 2018
☒	LISN	ENV216	R & S	101786	04, 27, 2018
☒	PULSE LIMITER	ESH3-Z2	R & S	101914	12, 13, 2017
☐	LISN	NNBM8124	SCHWARZBECK	8124-1002	08, 07, 2018
☐	LISN	NNBM8124	SCHWARZBECK	8124-1003	08, 07, 2018

Test Conditions

Temperature: 19,6 °C
Relative Humidity: 51,0 %

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.



2.2 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Nov. 06, 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: 19,7 °C
Relative Humidity: 43,2 %

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

Nov. 06, 2017

Test Location

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, 17, 2018
☒	PREAMPLIFIER	8449B	AGILENT	3008A01967	05, 31, 2017
☐	ATTENUATOR	8491A	HP	32173	03, 24, 2018
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	05, 02, 2019

Test Conditions

Temperature: 20,2 °C
Relative Humidity: 42,7 %

Frequency Range of Measurement

1 GHz to 5 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.

APPENDIX A – TEST DATA

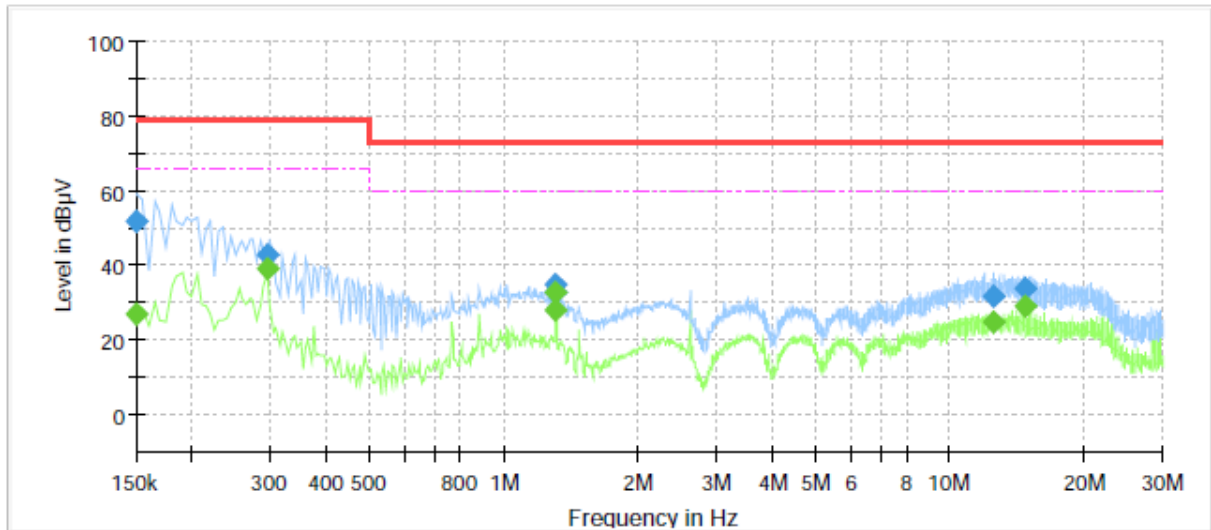
Conducted Emissions at Mains Power Ports

■ D-SUB Mode

HOT LINE

Common Information

Test Description:	Conducted Emission
Model No.:	SMT-3233
Mode	120 V / 60 Hz _ 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)
0.150000	---	27.23	66.00	38.77	1000.0	9.000	L1	19.4
0.150000	51.69	---	79.00	27.31	1000.0	9.000	L1	19.4
0.295000	---	39.00	66.00	27.00	1000.0	9.000	L1	19.5
0.295000	42.63	---	79.00	36.37	1000.0	9.000	L1	19.5
1.305000	---	28.22	60.00	31.78	1000.0	9.000	L1	19.9
1.305000	32.73	---	73.00	40.27	1000.0	9.000	L1	19.9
1.310000	---	32.71	60.00	27.29	1000.0	9.000	L1	19.9
1.310000	34.82	---	73.00	38.18	1000.0	9.000	L1	19.9
12.515000	---	24.73	60.00	35.27	1000.0	9.000	L1	19.8
12.515000	31.73	---	73.00	41.27	1000.0	9.000	L1	19.8
14.720000	---	29.25	60.00	30.75	1000.0	9.000	L1	19.9
14.720000	33.95	---	73.00	39.05	1000.0	9.000	L1	19.9

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
 The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
 The authenticity of the test report, contact shchoi@kes.co.kr



KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-EM-17T0734-R1

Page (18) of (38)

NEUTRAL LINE

Common Information

Test Description:

Model No.:

Mode

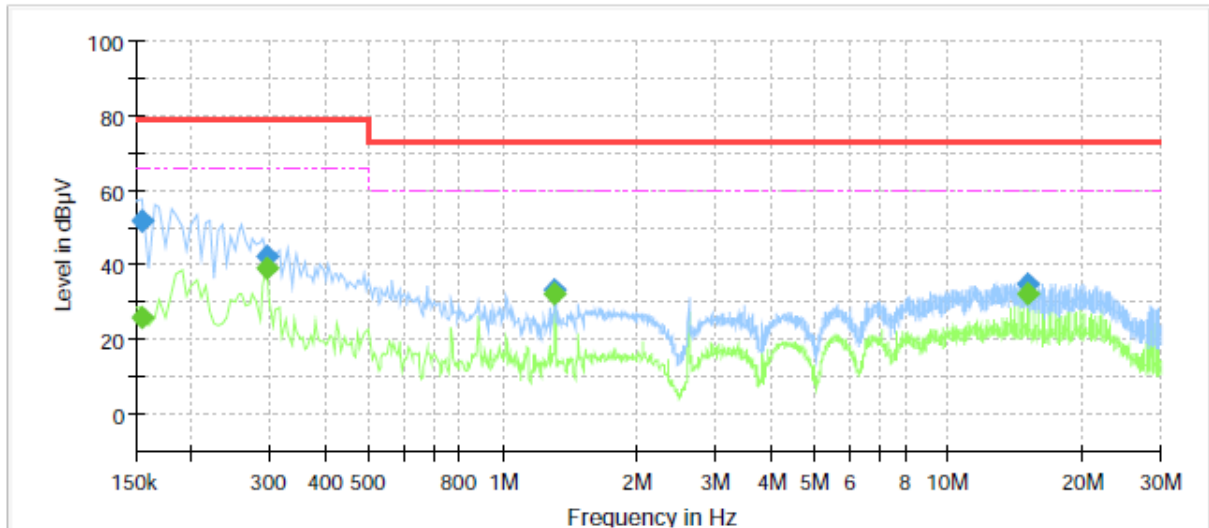
Operator Name:

Conducted Emission

SMT-3233

120 V / 60 Hz _ D-SUB _ N

KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	26.15	66.00	39.85	1000.0	9.000	N	19.4
0.155000	51.71	---	79.00	27.29	1000.0	9.000	N	19.4
0.295000	---	38.92	66.00	27.08	1000.0	9.000	N	19.5
0.295000	42.60	---	79.00	36.40	1000.0	9.000	N	19.5
1.310000	---	32.33	60.00	27.67	1000.0	9.000	N	19.9
1.310000	33.46	---	73.00	39.54	1000.0	9.000	N	19.9
15.015000	---	32.29	60.00	27.71	1000.0	9.000	N	20.0
15.015000	34.81	---	73.00	38.19	1000.0	9.000	N	20.0

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

The authenticity of the test report, contact shchoi@kes.co.kr



KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-EM-17T0734-R1

Page (19) of (38)

■ HDMI Mode

HOT LINE

Common Information

Test Description:

Model No.:

Mode

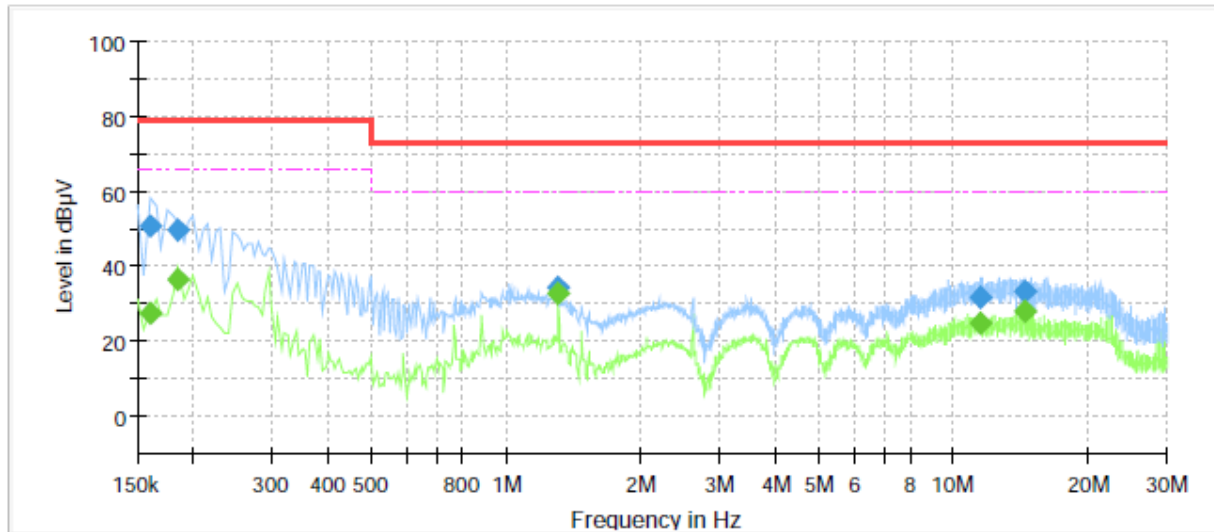
Operator Name:

Conducted Emission

SMT-3233

120 V / 60 Hz _ HDMI _ H

KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.160000	---	27.51	66.00	38.49	1000.0	9.000	L1	19.4
0.160000	50.91	---	79.00	28.09	1000.0	9.000	L1	19.4
0.185000	---	36.36	66.00	29.64	1000.0	9.000	L1	19.4
0.185000	50.02	---	79.00	28.98	1000.0	9.000	L1	19.4
1.310000	---	32.60	60.00	27.40	1000.0	9.000	L1	19.9
1.310000	34.65	---	73.00	38.35	1000.0	9.000	L1	19.9
11.445000	---	25.05	60.00	34.95	1000.0	9.000	L1	19.7
11.445000	31.80	---	73.00	41.20	1000.0	9.000	L1	19.7
14.425000	---	28.28	60.00	31.72	1000.0	9.000	L1	19.9
14.425000	33.43	---	73.00	39.57	1000.0	9.000	L1	19.9

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

The authenticity of the test report, contact shchoi@kes.co.kr



KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-EM-17T0734-R1

Page (20) of (38)

NEUTRAL LINE

Common Information

Test Description:

Model No.:

Mode

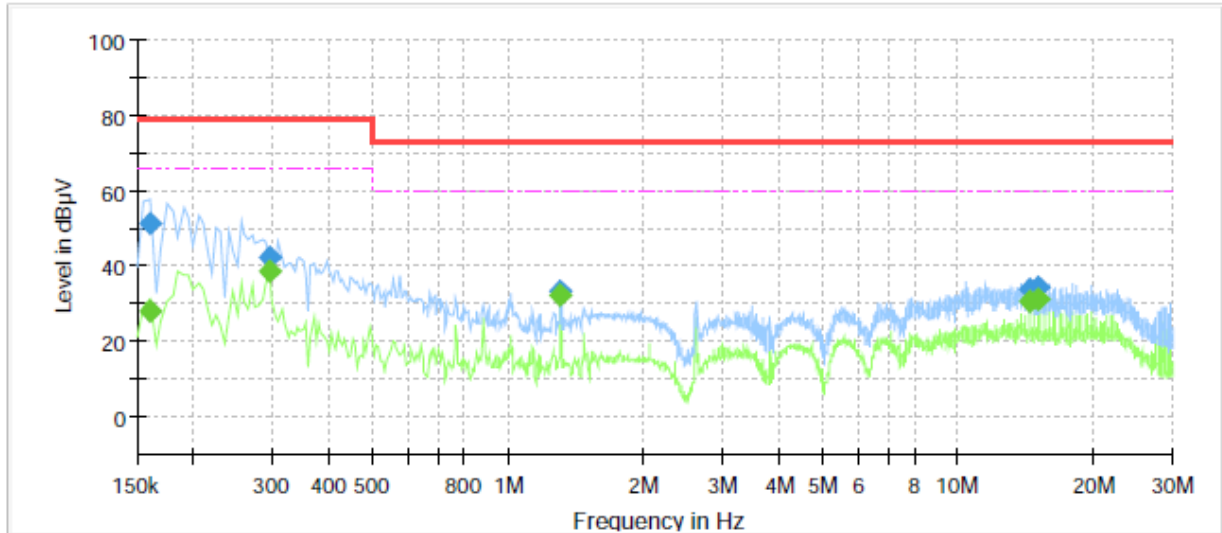
Operator Name:

Conducted Emission

SMT-3233

120 V / 60 Hz _ HDMI _ N

KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.160000	---	28.18	66.00	37.82	1000.0	9.000	N	19.4
0.160000	51.12	---	79.00	27.88	1000.0	9.000	N	19.4
0.295000	---	38.85	66.00	27.15	1000.0	9.000	N	19.5
0.295000	42.49	---	79.00	36.51	1000.0	9.000	N	19.5
1.310000	---	32.24	60.00	27.76	1000.0	9.000	N	19.9
1.310000	33.38	---	73.00	39.62	1000.0	9.000	N	19.9
14.425000	---	30.85	60.00	29.15	1000.0	9.000	N	19.9
14.425000	34.04	---	73.00	38.96	1000.0	9.000	N	19.9
15.015000	---	31.51	60.00	28.49	1000.0	9.000	N	20.0
15.015000	34.21	---	73.00	38.79	1000.0	9.000	N	20.0

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

The authenticity of the test report, contact shchoi@kes.co.kr



KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-EM-17T0734-R1

Page (21) of (38)

■ DVI Mode

HOT LINE

Common Information

Test Description:

Model No.:

Mode

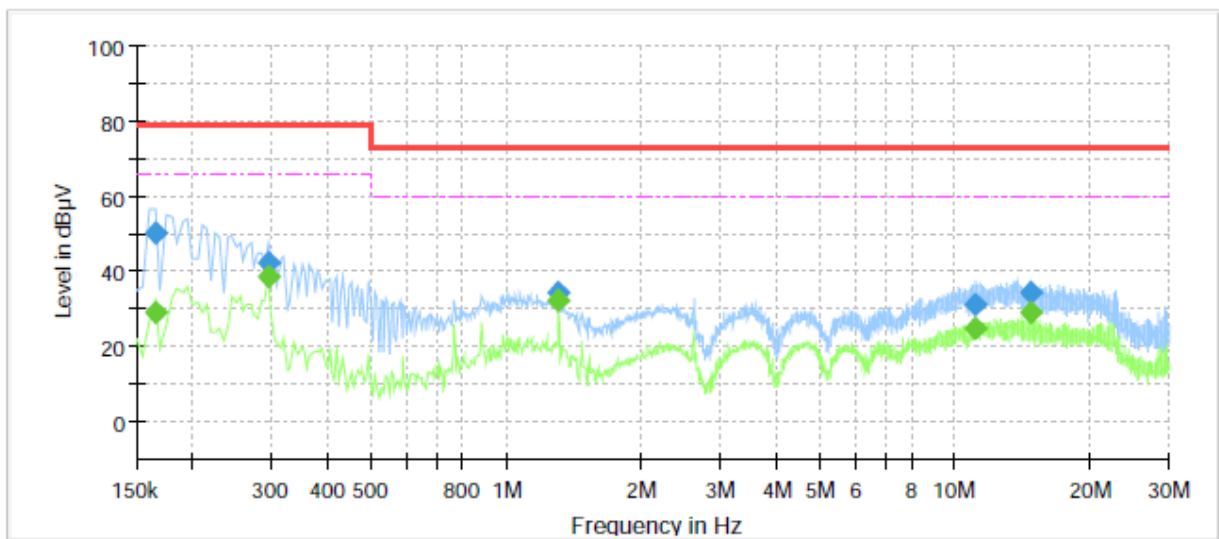
Operator Name:

Conducted Emission

SMT-3233

120 V / 60 Hz _ DVI _ H

KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.165000	---	29.11	66.00	36.89	1000.0	9.000	L1	19.4
0.165000	50.55	---	79.00	28.45	1000.0	9.000	L1	19.4
0.295000	---	38.75	66.00	27.25	1000.0	9.000	L1	19.5
0.295000	42.34	---	79.00	36.66	1000.0	9.000	L1	19.5
1.310000	---	32.47	60.00	27.53	1000.0	9.000	L1	19.9
1.310000	34.55	---	73.00	38.45	1000.0	9.000	L1	19.9
11.105000	---	25.12	60.00	34.88	1000.0	9.000	L1	19.7
11.105000	31.50	---	73.00	41.50	1000.0	9.000	L1	19.7
14.720000	---	28.98	60.00	31.02	1000.0	9.000	L1	19.9
14.720000	34.28	---	73.00	38.72	1000.0	9.000	L1	19.9

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

The authenticity of the test report, contact shchoi@kes.co.kr



KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-EM-17T0734-R1

Page (22) of (38)

NEUTRAL LINE

Common Information

Test Description:

Model No.:

Mode

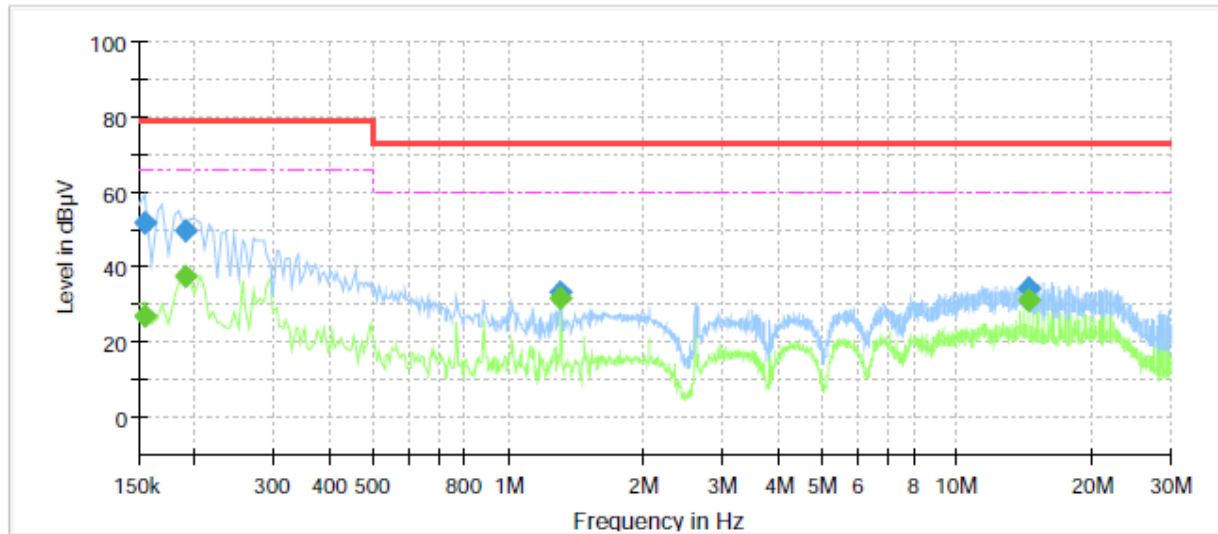
Operator Name:

Conducted Emission

SMT-3233

120 V / 60 Hz _ DVI _ N

KES



Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	26.81	66.00	39.19	1000.0	9.000	N	19.4
0.155000	51.77	---	79.00	27.23	1000.0	9.000	N	19.4
0.190000	---	37.57	66.00	28.43	1000.0	9.000	N	19.4
0.190000	49.52	---	79.00	29.48	1000.0	9.000	N	19.4
1.310000	---	31.99	60.00	28.01	1000.0	9.000	N	19.9
1.310000	33.25	---	73.00	39.75	1000.0	9.000	N	19.9
14.425000	---	31.12	60.00	28.88	1000.0	9.000	N	19.9
14.425000	34.41	---	73.00	38.59	1000.0	9.000	N	19.9

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

The authenticity of the test report, contact shchoi@kes.co.kr



KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-EM-17T0734-R1

Page (23) of (38)

■ BNC Mode

HOT LINE

Common Information

Test Description:

Model No.:

Mode

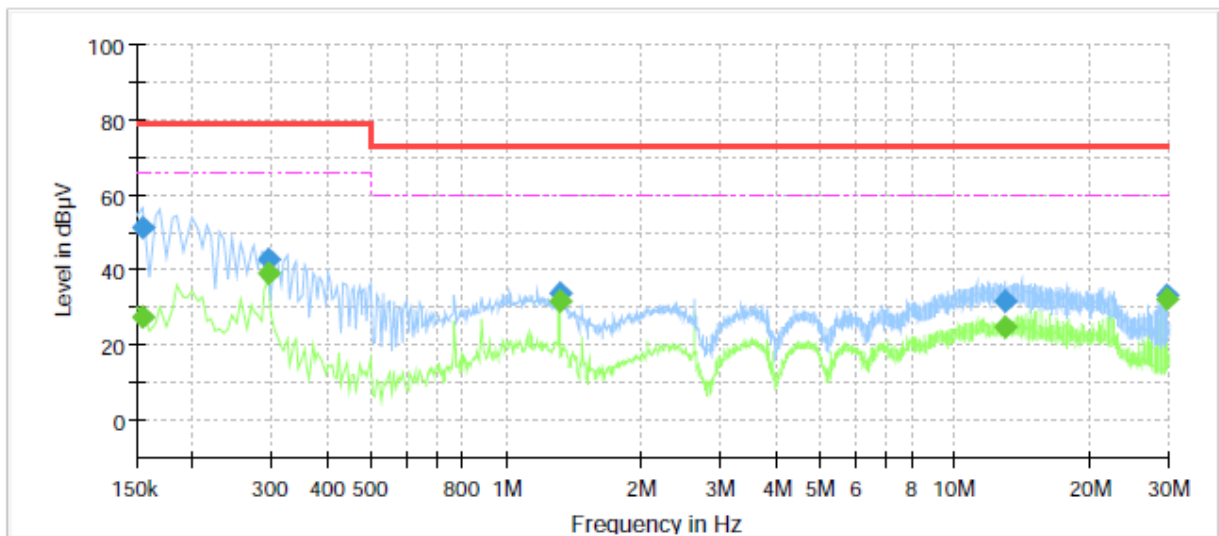
Operator Name:

Conducted Emission

SMT-3233

120 V / 60 Hz _ BNC _ H

KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	27.46	66.00	38.54	1000.0	9.000	L1	19.4
0.155000	51.45	---	79.00	27.55	1000.0	9.000	L1	19.4
0.295000	---	39.01	66.00	26.99	1000.0	9.000	L1	19.5
0.295000	42.70	---	79.00	36.30	1000.0	9.000	L1	19.5
1.315000	---	31.60	60.00	28.40	1000.0	9.000	L1	19.9
1.315000	33.94	---	73.00	39.06	1000.0	9.000	L1	19.9
12.970000	---	24.98	60.00	35.02	1000.0	9.000	L1	19.8
12.970000	31.88	---	73.00	41.12	1000.0	9.000	L1	19.8
29.735000	---	32.30	60.00	27.70	1000.0	9.000	L1	20.2
29.735000	33.40	---	73.00	39.60	1000.0	9.000	L1	20.2

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

The authenticity of the test report, contact shchoi@kes.co.kr



KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-EM-17T0734-R1

Page (24) of (38)

NEUTRAL LINE

Common Information

Test Description:

Conducted Emission

Model No.:

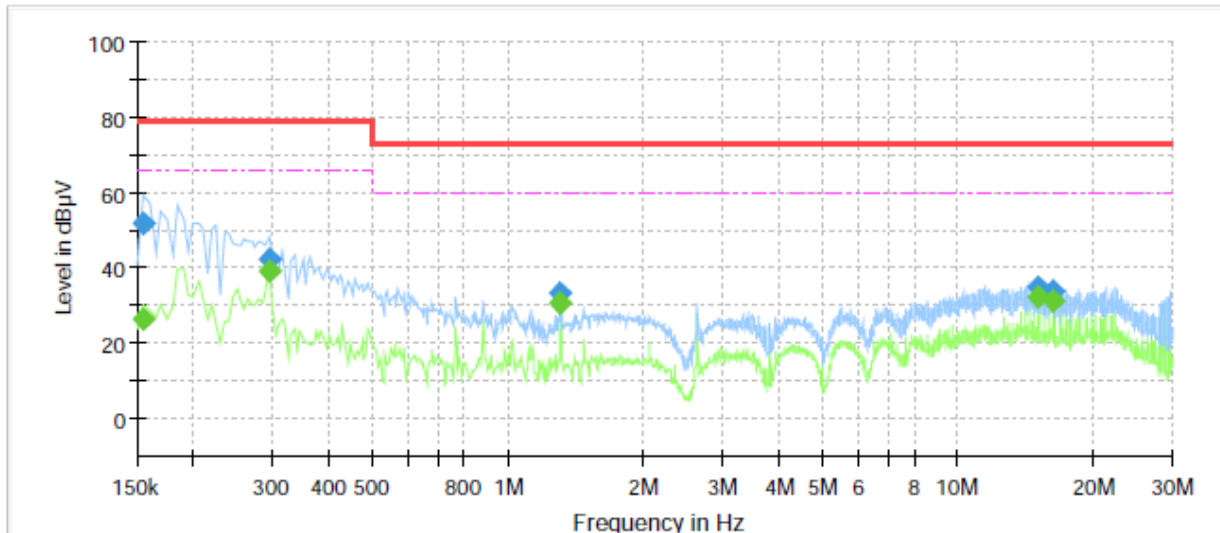
SMT-3233

Mode

120 V / 60 Hz _ 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)
0.155000	---	26.63	66.00	39.37	1000.0	9.000	N	19.4
0.155000	51.77	---	79.00	27.23	1000.0	9.000	N	19.4
0.295000	---	38.96	66.00	27.04	1000.0	9.000	N	19.5
0.295000	42.60	---	79.00	36.40	1000.0	9.000	N	19.5
1.310000	---	30.50	60.00	29.50	1000.0	9.000	N	19.9
1.310000	33.17	---	73.00	39.83	1000.0	9.000	N	19.9
15.015000	---	32.29	60.00	27.71	1000.0	9.000	N	20.0
15.015000	34.93	---	73.00	38.07	1000.0	9.000	N	20.0
16.190000	---	31.36	60.00	28.64	1000.0	9.000	N	20.0
16.190000	34.05	---	73.00	38.95	1000.0	9.000	N	20.0

◆ 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))

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

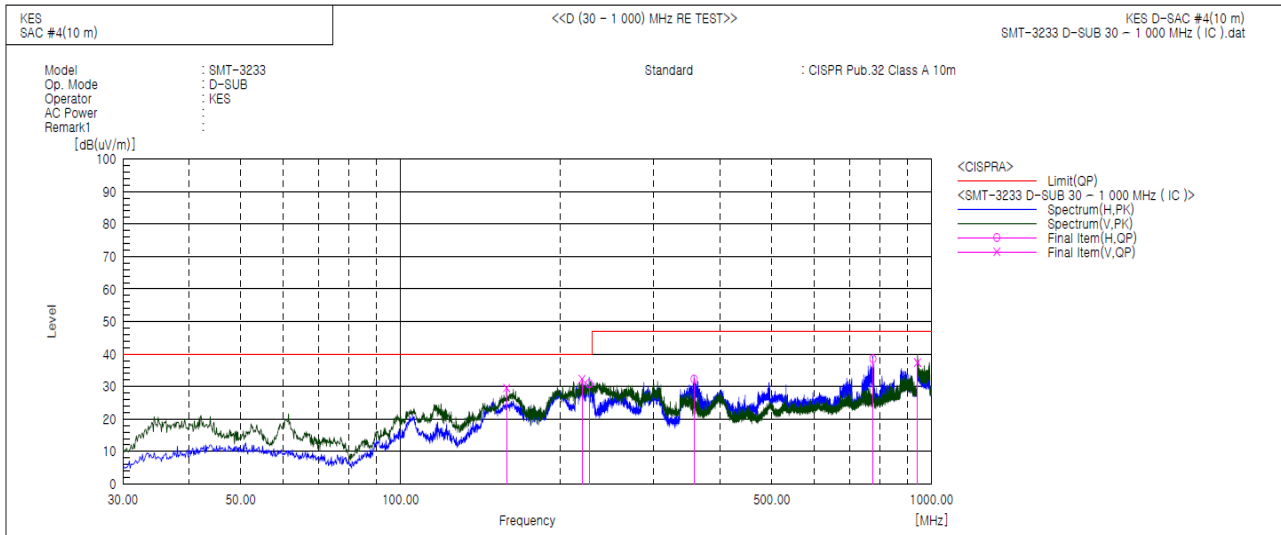
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

The authenticity of the test report, contact shchoi@kes.co.kr



Radiated Electric Field Emissions(Below 1 GHz)

■ D-SUB Mode



Final Result

No.	Frequency	(P)	Reading	c.f	Result	Limit	Margin	Height	Angle	Remark
	[MHz]		QP		QP	QP	QP			
			[dB(uV)]	[dB(1/m)]	[dB(uV/m)]	[dB(uV/m)]	[dB]	[cm]	[deg]	
1	158.404	V	60.3	-30.8	29.5	40.0	10.5	100.0	177.0	
2	219.635	V	58.6	-26.3	32.3	40.0	7.7	150.0	19.0	
3	226.546	H	57.0	-26.1	30.9	40.0	9.1	400.0	338.0	
4	357.133	H	54.0	-21.7	32.3	47.0	14.7	201.0	173.0	
5	775.324	H	51.2	-12.7	38.5	47.0	8.5	364.0	302.0	
6	940.830	V	46.5	-9.1	37.4	47.0	9.6	120.0	349.0	



KES Co., Ltd.

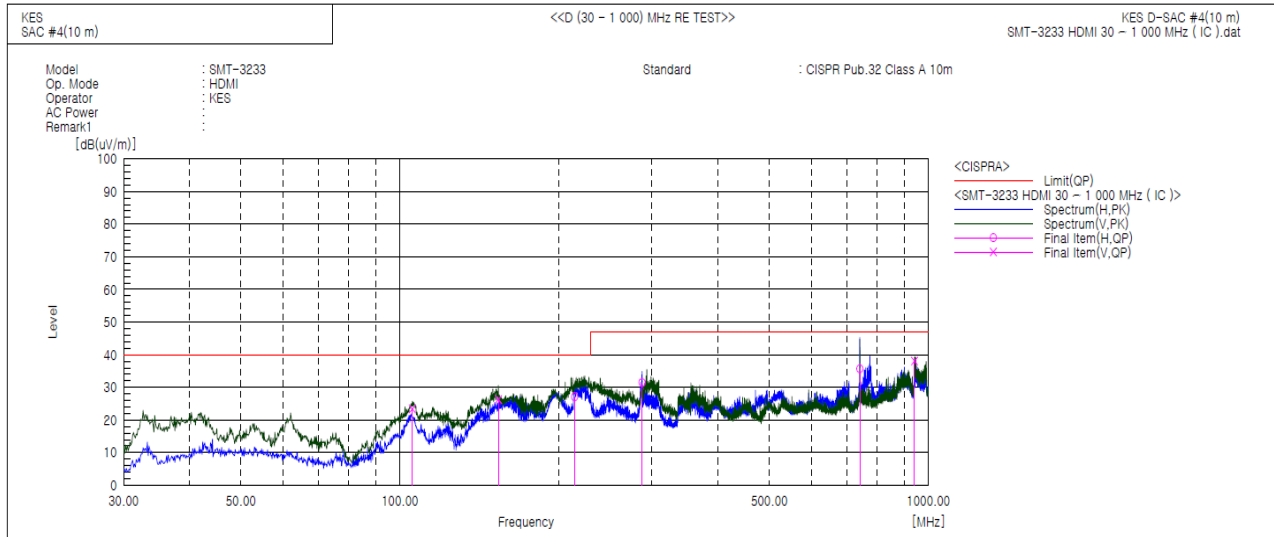
3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-EM-17T0734-R1

Page (26) of (38)

■ HDMI Mode



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	105.539	V	52.0	-28.6	23.4	40.0	16.6	100.0	17.0	
2	153.554	V	57.4	-31.1	26.3	40.0	13.7	125.0	170.0	
3	214.058	H	53.5	-26.4	27.1	40.0	12.9	377.0	345.0	
4	287.171	H	55.7	-24.2	31.5	47.0	15.5	400.0	169.0	
5	741.738	H	48.8	-13.1	35.7	47.0	11.3	380.0	167.0	
6	941.194	V	47.2	-9.1	38.1	47.0	8.9	100.0	333.0	

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr



KES Co., Ltd.

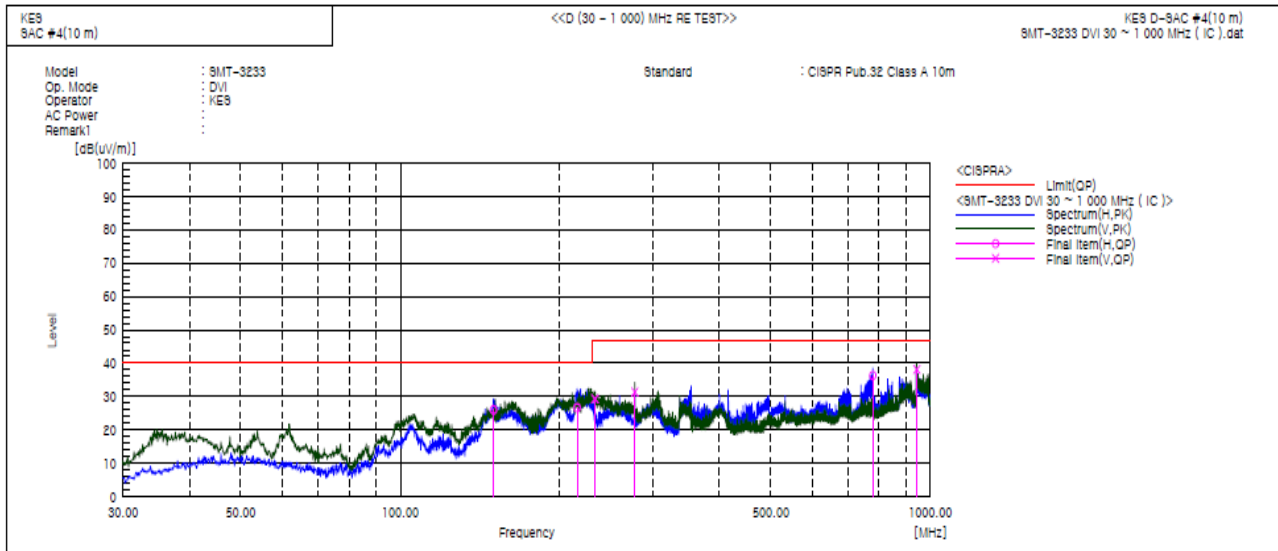
3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-EM-17T0734-R1

Page (27) of (38)

■ DVI Mode



Final Result

No.	Frequency (P)	Reading QP	c.f	Result QP	Limit QP	Margin QP	Height	Angle	Remark
	[MHz]	[dB(uV)]	[dB(1/m)]	[dB(uV/m)]	[dB(uV/m)]	[dB]	[cm]	[deg]	
1	149.916	H 57.3	-31.3	26.0	40.0	14.0	122.0	152.0	
2	215.513	H 53.0	-26.4	26.6	40.0	13.4	400.0	359.0	
3	232.973	V 55.2	-25.9	29.3	47.0	17.7	152.0	144.0	
4	276.865	V 55.9	-24.5	31.4	47.0	15.6	151.0	11.0	
5	778.598	H 48.9	-12.6	36.3	47.0	10.7	362.0	320.0	
6	942.528	V 47.2	-9.1	38.1	47.0	8.9	150.0	333.0	

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr



KES Co., Ltd.

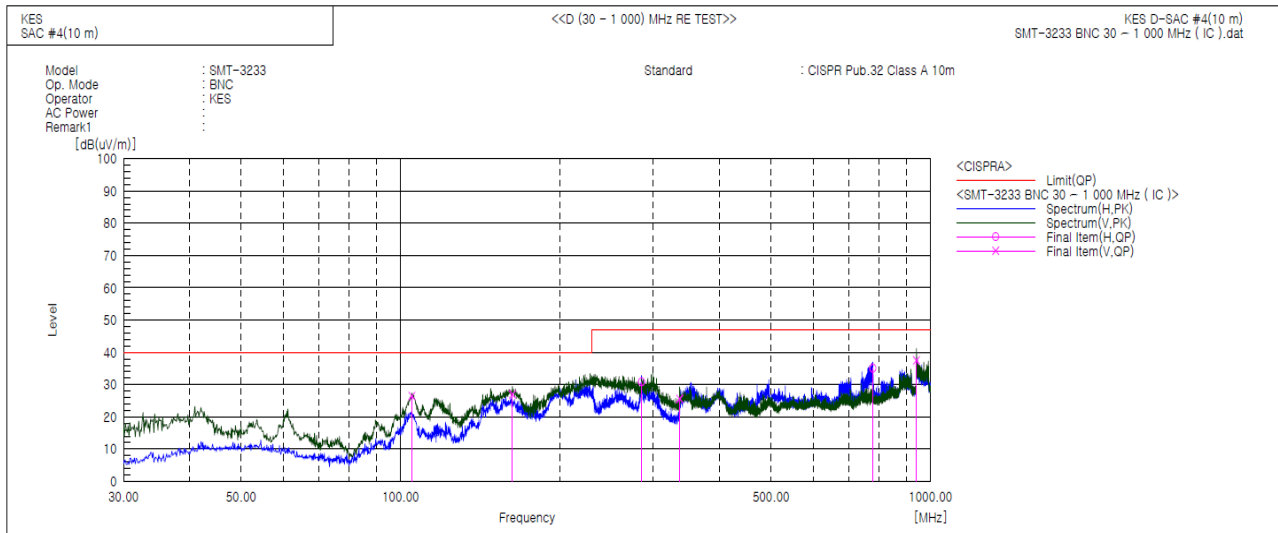
3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-EM-17T0734-R1

Page (28) of (38)

■ BNC Mode



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	105.054	V	55.0	-28.5	26.5	40.0	13.5	100.0	16.0	
2	162.526	V	57.7	-30.7	27.0	40.0	13.0	151.0	181.0	
3	284.868	H	55.2	-24.3	30.9	47.0	16.1	400.0	173.0	
4	336.278	V	48.1	-22.5	25.6	47.0	21.4	385.0	148.0	
5	778.355	H	47.7	-12.6	35.1	47.0	11.9	392.0	297.0	
6	940.709	V	46.6	-9.1	37.5	47.0	9.5	100.0	332.0	

◆ Calculation - SAC #4(10 m)

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

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

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.

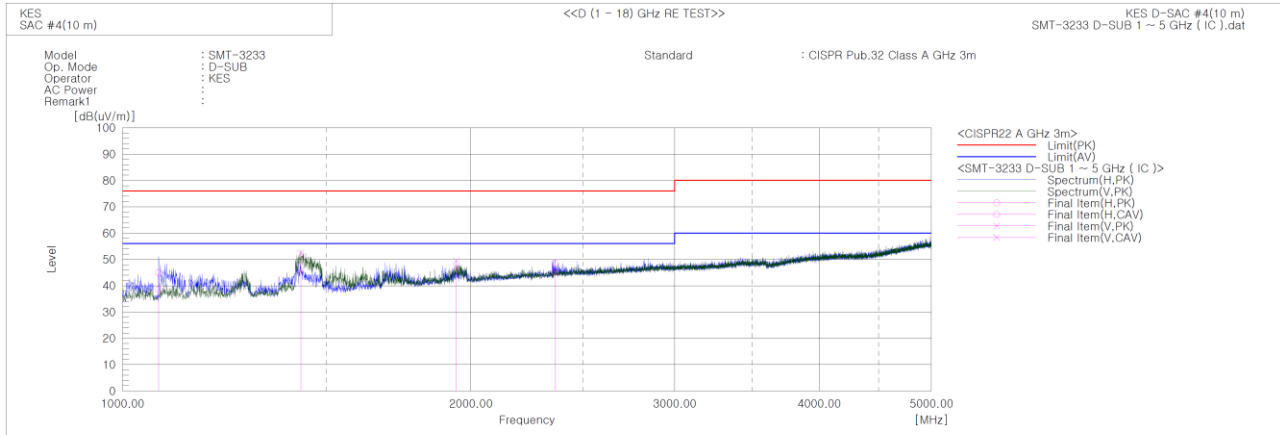
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

The authenticity of the test report, contact shchoi@kes.co.kr



Radiated Electric Field Emissions(Above 1 GHz)

■ D-SUB Mode

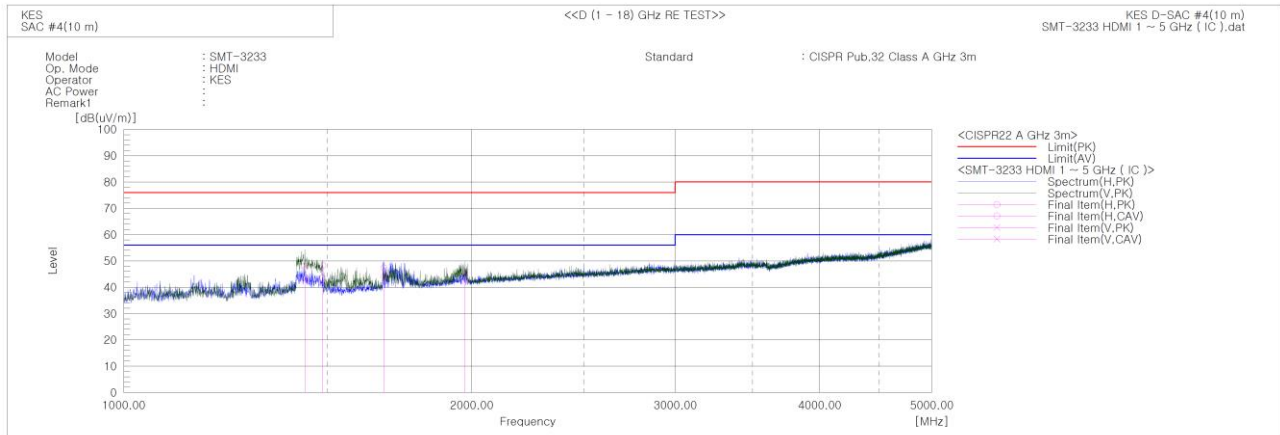


Final Result

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	1074.500	H	51.1	44.6	-6.1	45.0	38.5	76.0	56.0	31.0	17.5	374.0	17.0	
2	1426.000	V	55.3	48.7	-3.0	52.3	45.7	76.0	56.0	23.7	10.3	142.0	42.0	
3	1942.500	V	47.2	44.8	2.3	49.5	47.1	76.0	56.0	26.5	8.9	298.0	34.0	
4	2364.500	H	43.6	40.2	4.9	48.5	45.1	76.0	56.0	27.5	10.9	106.0	1.0	



■ 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	1434.500	V	51.2	45.6	-2.9	48.3	42.7	76.0	56.0	27.7	13.3	274.0	37.0	
2	1486.500	H	50.7	45.9	-2.4	48.3	43.5	76.0	56.0	27.7	12.5	100.0	345.0	
3	1680.000	H	47.6	44.4	-0.3	47.3	44.1	76.0	56.0	28.7	11.9	106.0	336.0	
4	1974.000	V	43.1	39.8	2.5	45.6	42.3	76.0	56.0	30.4	13.7	182.0	58.0	



KES Co., Ltd.

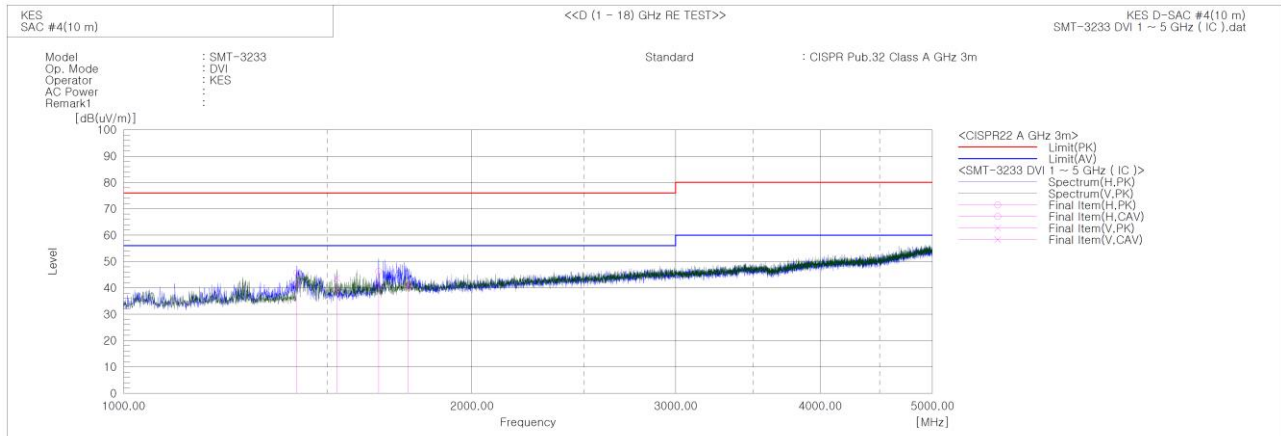
3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-EM-17T0734-R1

Page (31) of (38)

■ DVI 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	1411.500	H	48.7	44.5	-3.1	45.6	41.4	76.0	56.0	30.4	14.6	249.0	337.0	
2	1528.500	V	45.6	40.9	-1.9	43.7	39.0	76.0	56.0	32.3	17.0	275.0	345.0	
3	1661.500	H	46.7	41.3	-0.5	46.2	40.8	76.0	56.0	29.8	15.2	381.0	337.0	
4	1763.000	V	40.8	39.6	0.5	41.3	40.1	76.0	56.0	34.7	15.9	100.0	336.0	

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr



KES Co., Ltd.

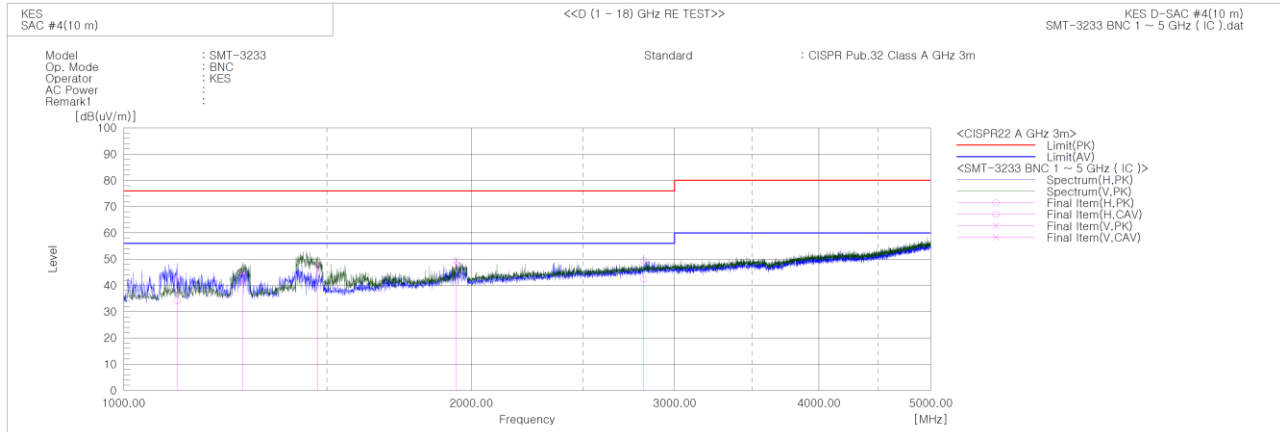
3701, 40, Simin-daero 365beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450
www.kes.co.kr

Report No.:

KES-EM-17T0734-R1

Page (32) of (38)

■ 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	1112.500	H	49.1	40.0	-5.8	43.3	34.2	76.0	56.0	32.7	21.8	100.0	15.0	
2	1268.000	V	49.1	45.6	-4.4	44.7	41.2	76.0	56.0	31.3	14.8	364.0	333.0	
3	1473.500	V	50.6	48.2	-2.5	48.1	45.7	76.0	56.0	27.9	10.3	122.0	73.0	
4	1941.500	V	47.2	45.3	2.3	49.5	47.6	76.0	56.0	26.5	8.4	253.0	55.0	
5	2821.500	H	42.2	35.2	7.2	49.4	42.4	76.0	56.0	26.6	13.6	182.0	36.0	

◆ 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

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

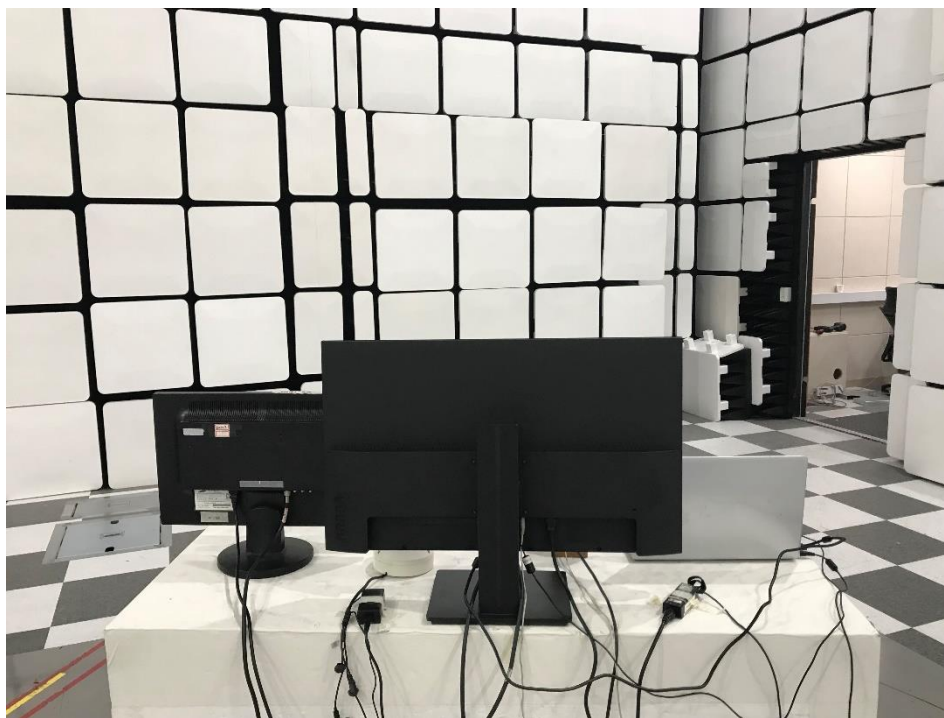
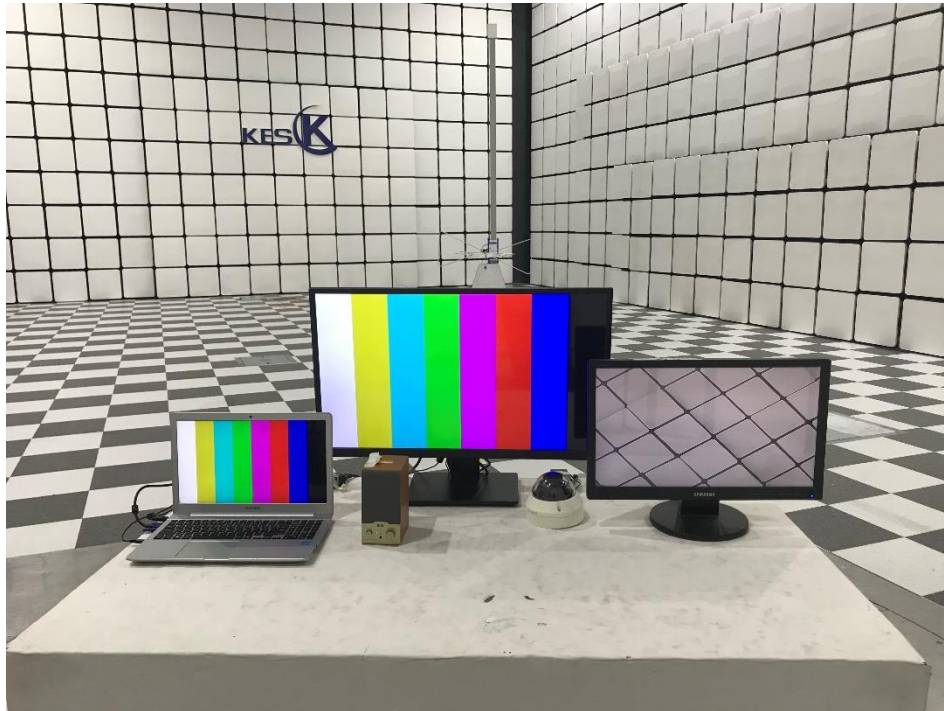
Test Setup Photos and Configuration

Conducted Voltage Emissions



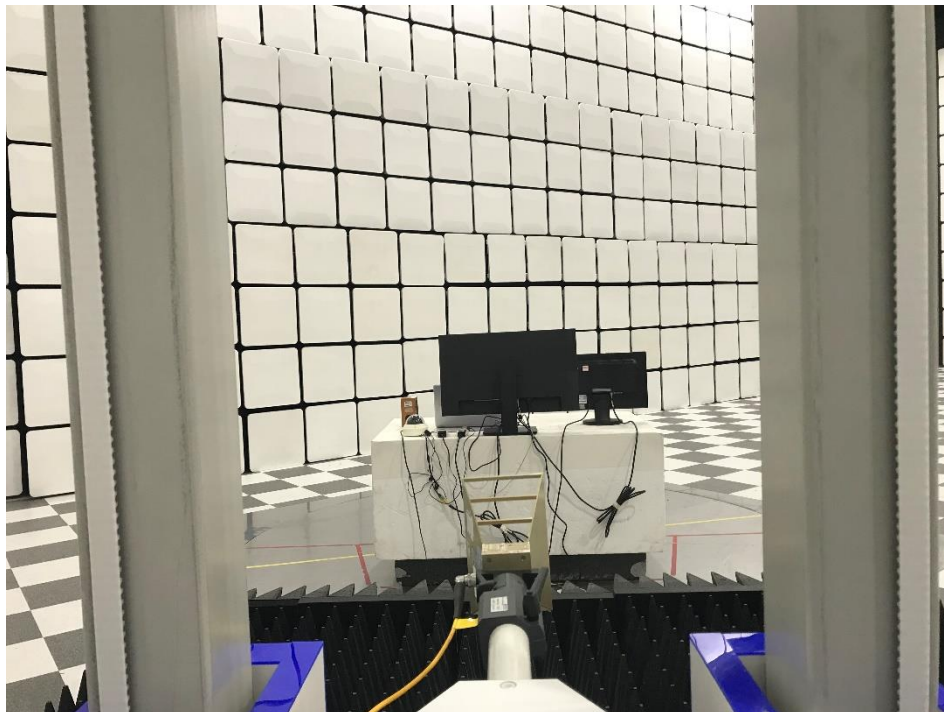
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

Radiated Electric Field Emissions(Below 1 GHz)



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

Radiated Electric Field Emissions(Above 1 GHz)



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT External Photographs

(Top)



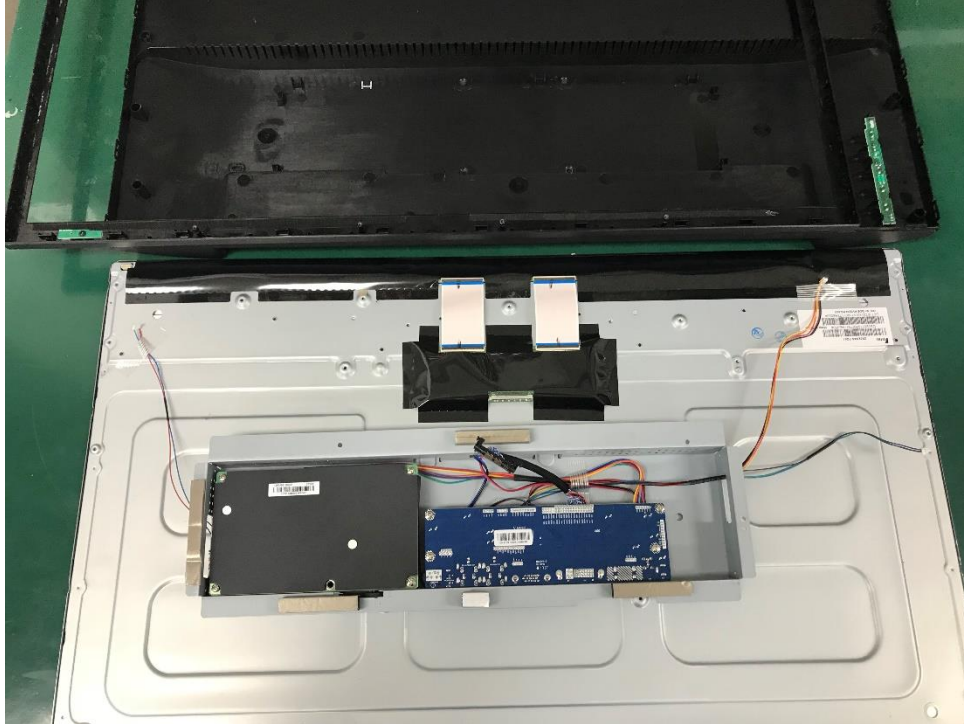
(Bottom)



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal Photographs

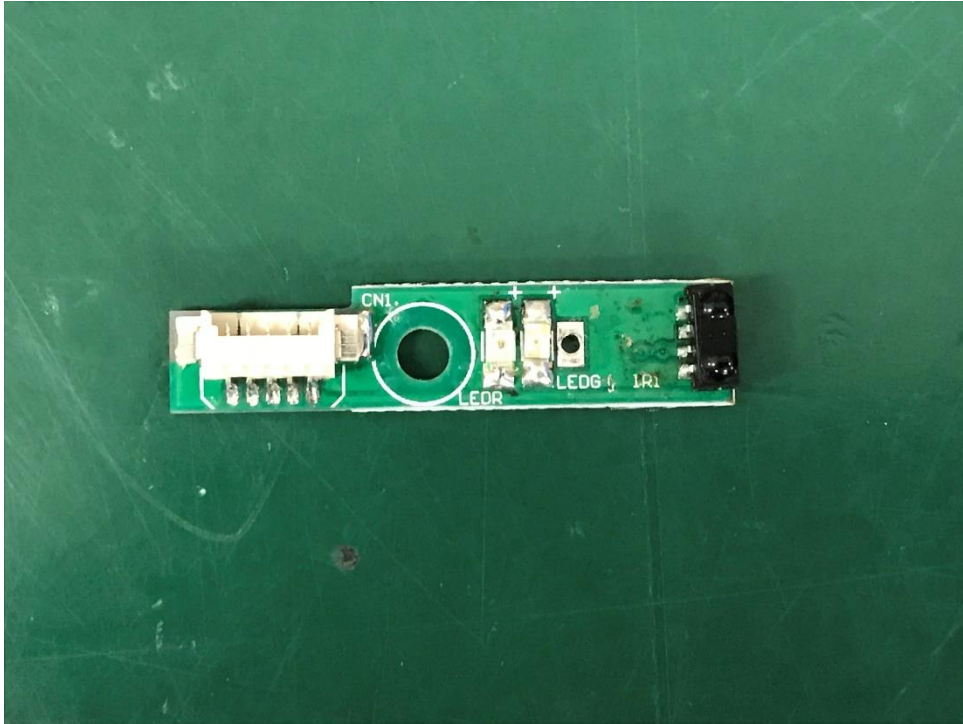
(Internal View)



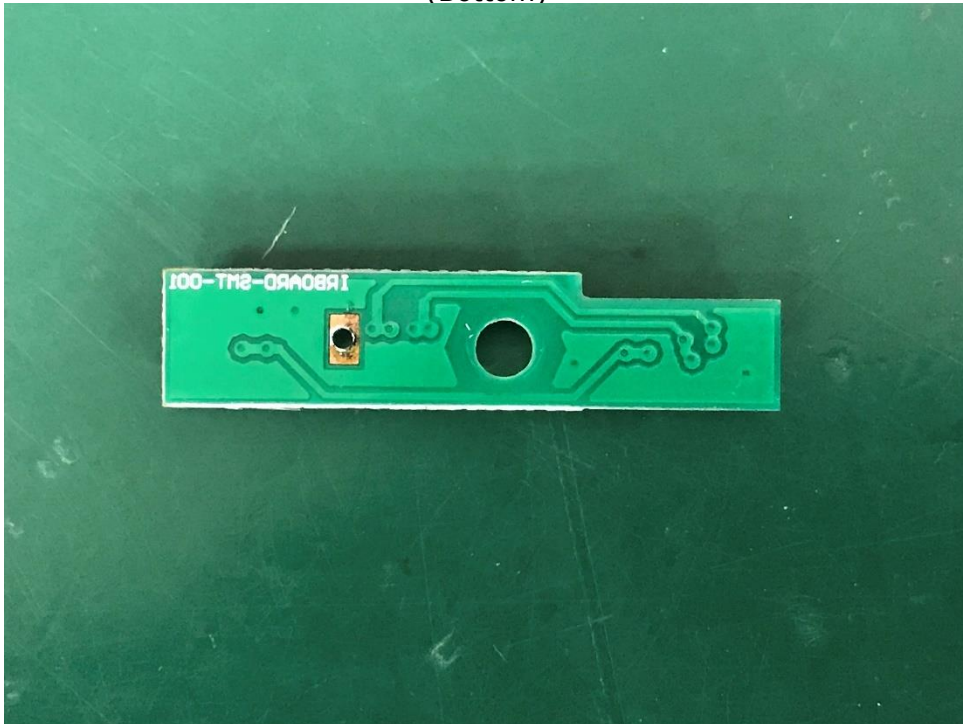
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – Board 1

(Top)



(Bottom)



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – Board 2

(Top)



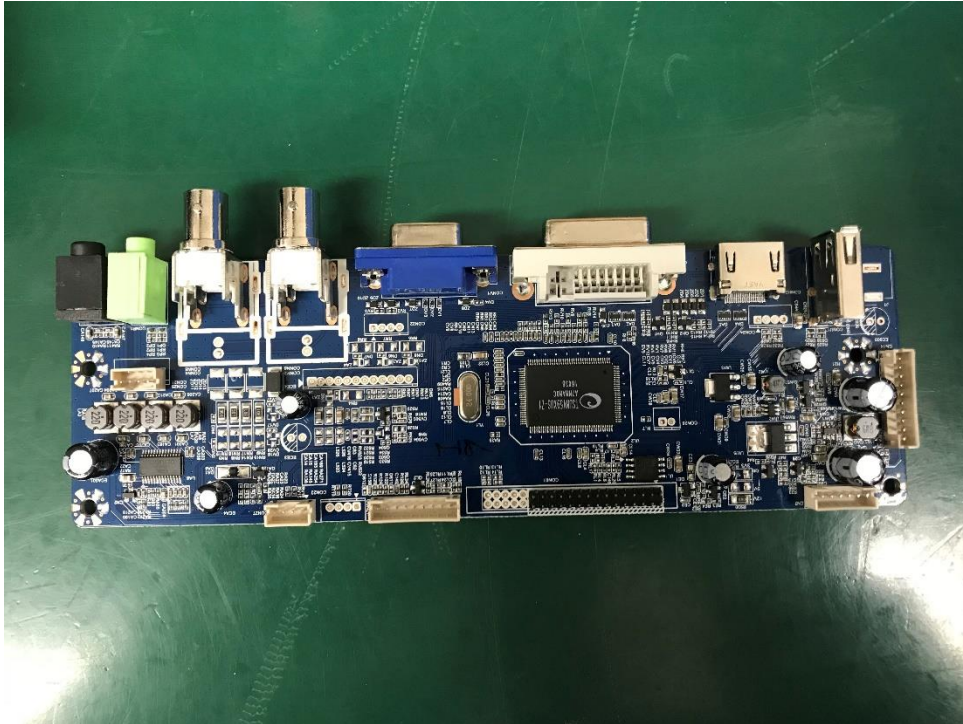
(Bottom)



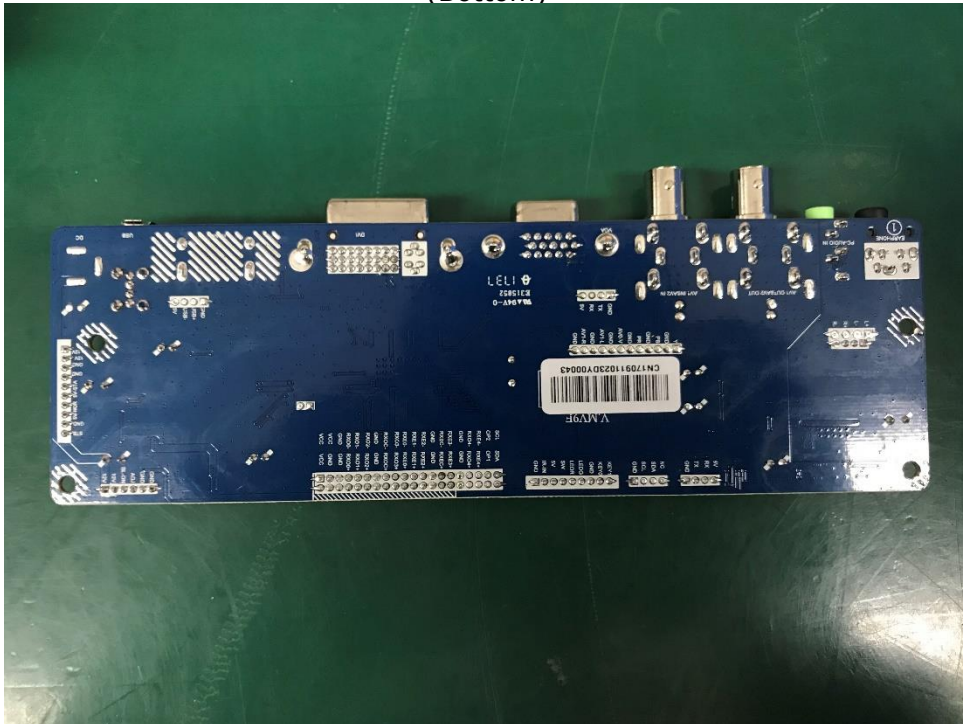
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
 The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
 The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – Board 3

(Top)



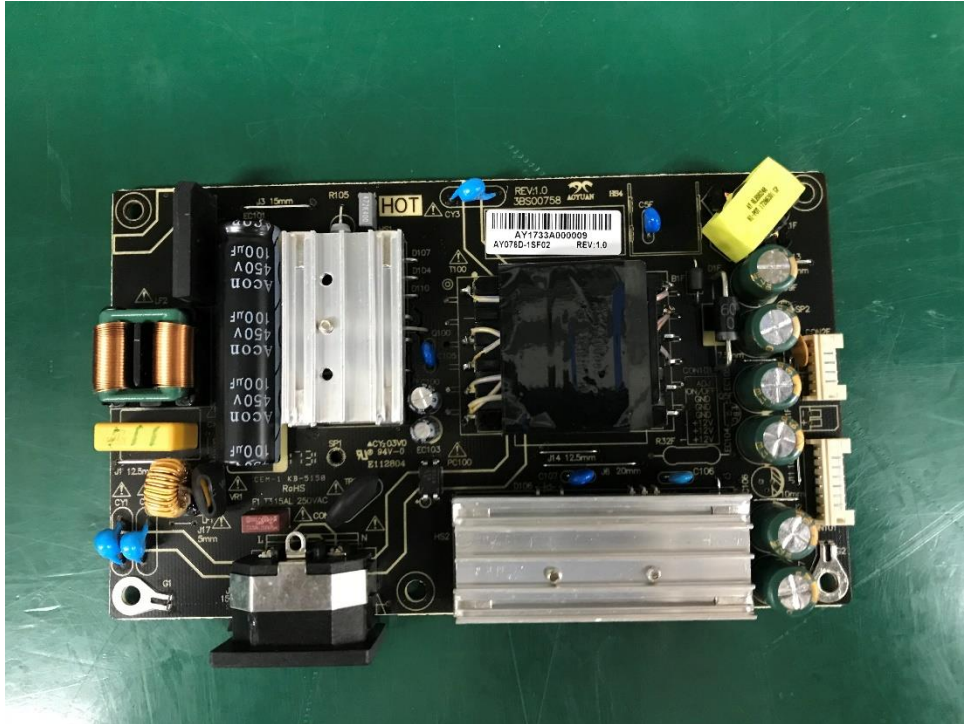
(Bottom)



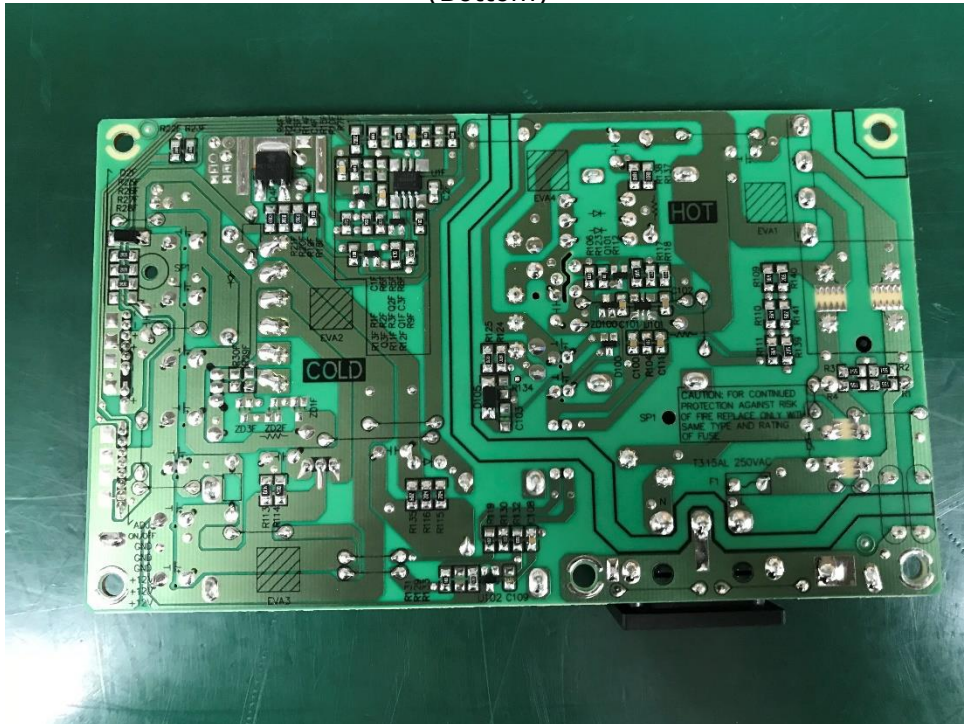
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – Board 4

(Top)



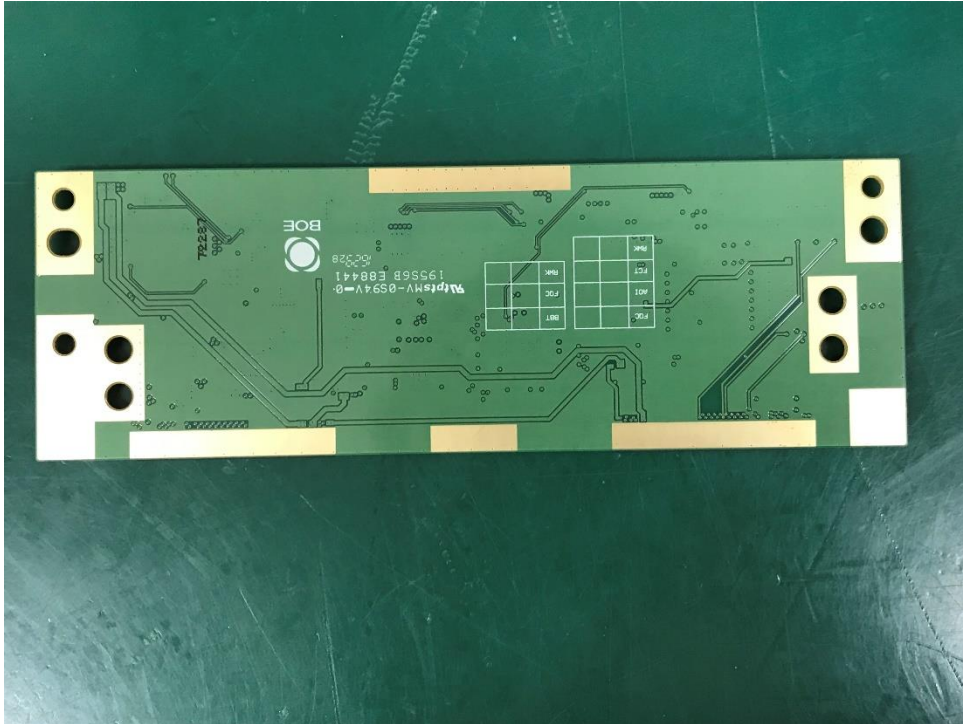
(Bottom)



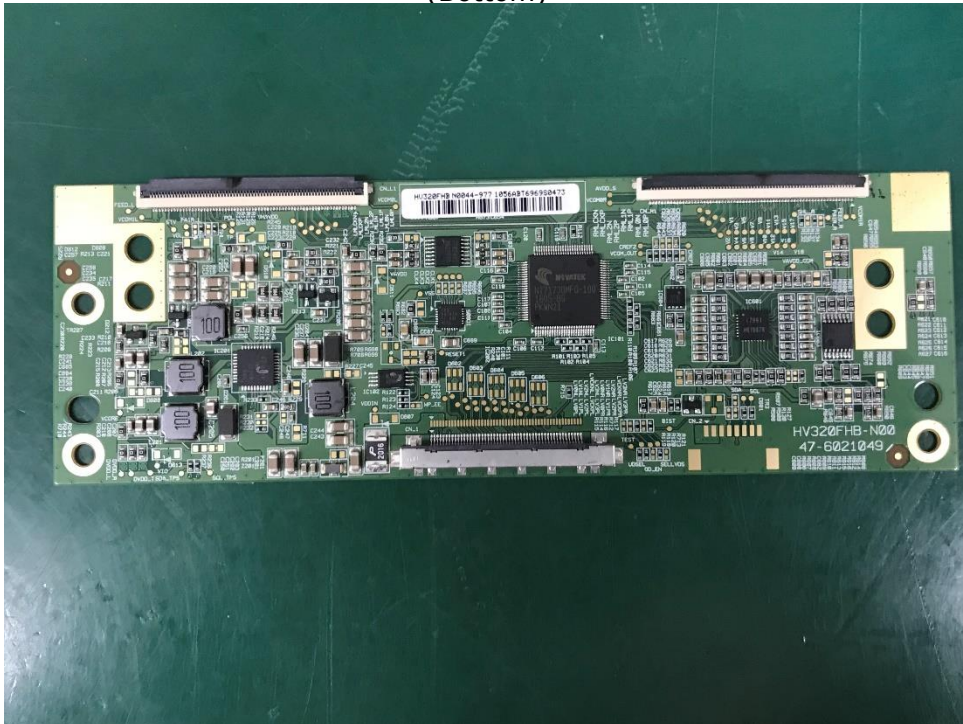
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
 The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
 The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – Board 5

(Top)



(Bottom)



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
 The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
 The authenticity of the test report, contact shchoi@kes.co.kr

EUT Internal View – Panel

(Top)



(Bottom)



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr

Label Photographs



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

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

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

(1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
The authenticity of the test report, contact shchoi@kes.co.kr