



KES Co., Ltd.

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Report No.:
KES-EM-23T0262
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EMC TEST REPORT For RCM

Test Report No. : KES-EM-23T0262
Date of Issue : Mar. 20, 2023
Product name : Security LED Monitor
Model/Type No. : SMT-2740
Variant Model : -
Applicant : Hanwha Vision Co., Ltd
Applicant Address : 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si,
Gyeonggi-do, Republic of 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 : Mar. 03, 2023
Test date : Mar. 09, 2023 ~ Mar. 14, 2023
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

김 세 현

Se Heon, Kim
EMC Test Engineer

Reviewed by

Seong Min, Choi

Seong Min, Choi
EMC Technical Manager

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

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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Mar. 20, 2023	KES-EM-23T0262	Issued

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1.0 General Product Description

Main Specifications of EUT are:

Model		UHD 27" SMT-2740	Remark
Display			
Screen Size		27"	
Max. Resolution		3840*2160 60Hz (UHD)	
Brightness		300 cd/m ² (Typ)	
Contrast Ratio		955:1 (Min) '1200:1 (Typ)	
Aspect Ratio		16:9	
Viewing Angle (H/V)		178°/178°	
Display Color		1.07B	
Response Time		14ms(Typ)	
Panel Life		30,000 hours	
Interface			
Video	Connector	HDMI 2.0(2), DP1.4(1)	
	Connector	N/A	
VGA	Available Format	N/A	
	Connector	HDMI	
HDMI	Available Format	640 x 480@60Hz, 800 x 600@56Hz/60Hz/72Hz/75Hz, 1024 x 768@60Hz/70Hz/75Hz, 1280 x 1024@60Hz/75Hz, 1440 x 900@60Hz, 1680 x 1050@60Hz, 1920 x 1080@50Hz/60Hz, 2560 x 1440@60Hz, 3840 x 2160@60Hz, 3840 x 2160P@30/50/60Hz, 720 x 480P60Hz, 1280 x 720P@50Hz, 720 x 576P@50Hz, 1920x1080P@50/60Hz, 1280 x 800@60Hz, 1280 x 960@60Hz, 1280 x 720@60Hz,	
	Connector	DP	
DP	Available Format	640 x 480@60Hz, 800 x 600@56Hz/60Hz/72Hz/75Hz, 1024 x 768@60Hz/70Hz/75Hz, 1280 x 1024@60Hz/75Hz, 1440 x 900@60Hz, 1680 x 1050@60Hz, 1920 x 1080@50Hz/60Hz, 2560 x 1440@60Hz, 3840 x 2160@60Hz, 3840 x 2160P@30/50/60Hz, 720 x 480P60Hz, 1280 x 720P@50Hz, 720 x 576P@50Hz, 1920x1080P@50/60Hz, 1280 x 800@60Hz, 1280 x 960@60Hz, 1280 x 720@60Hz,	
	Connector	Audio Out	
Audio	Output Signal	Loop-through line level(PC only), Speakers : 4Ω 2.5Wx 2	
	PIP/PBP	YES	
Remocon		N/A	
On Screen Display (OSD)			
Functions		VESA™ DPM Compatible	
Language		Korean, English, Русский, Deutsch, Français, Español, Italiano, Português, Chinese (Simplified), Chinese (Traditional), Japanese, Arabic	
General			
Electrical	Input Voltage	AC 100-240V, 50/60HZ, 1.0A	
	Power Consumption	<45W	
Environmental	Operating Temperature	0 ~ +40°C (+32°F ~ +104°F)	
	Operating Humidity	10% ~ 80% (non-condensing)	
Mechanical	Dimensions with Stand	614.7*452.5*224.1mm	
	Dimensions without Stand	614.7*336.4*50.8mm	
	Bezel Size	3 Frameless Top:2.2mm Bottom:21mm Side : 2.2mm	
	Cabinet Color	Black	
	VESA Mounts Interface	100*100mm	
Weight	Monitor with Stand	5.030kg	
	Monitor without Stand	4.620kg	
Stand		including	

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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.

☒ AC 240 V, 50 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-2740	-	Weihai Daewoo Electronics Co., Ltd.	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Desktop	-	-	-	-
Earphone	-	-	-	-
Keyboard	ST-600	-	CAN TECHNOLOGY CO., LTD.	-
Mouse	M-U0026	-	LOGITECH Inc.	-

1.6 External I/O Cabling

■ HDMI, DP

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
Security LED Monitor (EUT)	HDMI1	Desktop	HDMI1	1.0	S
	HDMI2		HDMI2	1.0	S
	DP		DP	1.5	S
	3.5 mm	Earphone	3.5 mm	1.7	U
Desktop	USB	Keyboard	USB	1.6	U
	USB	Mouse	USB	1.4	U

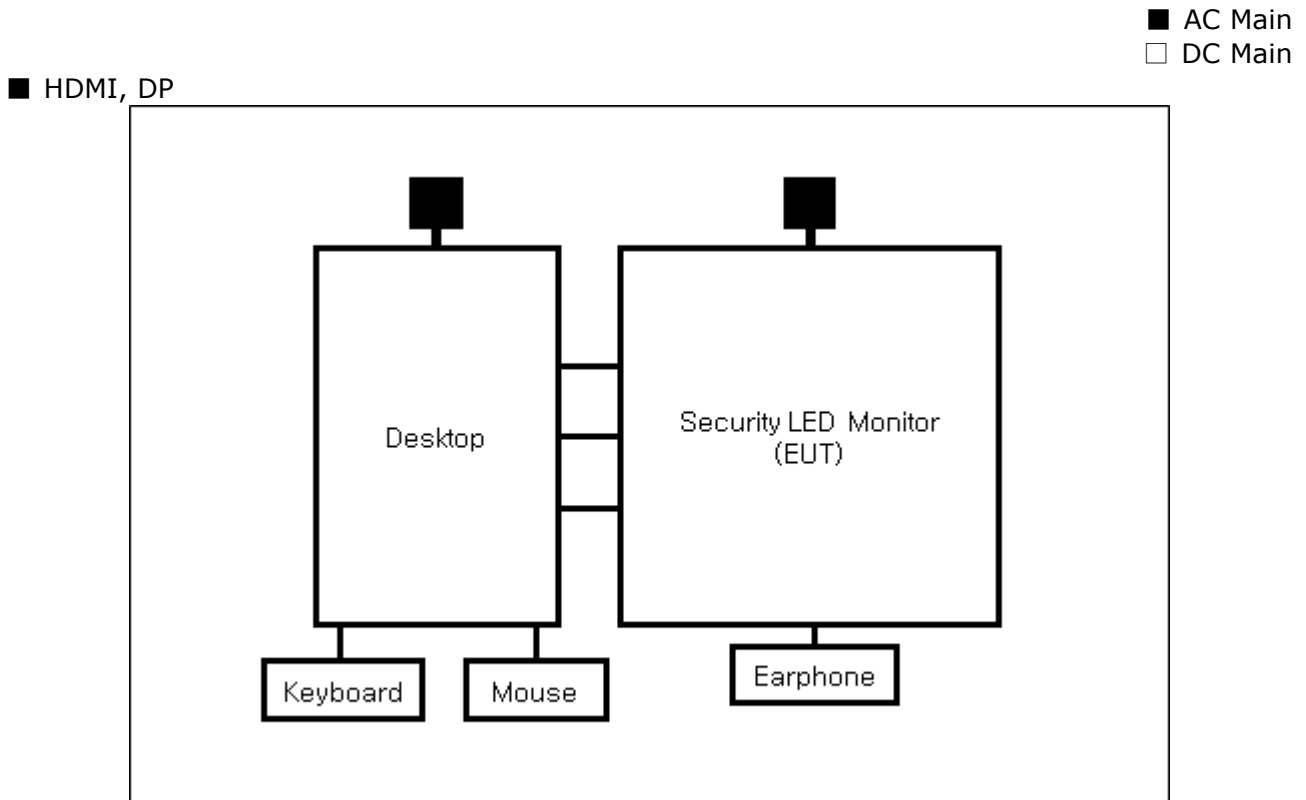
* Unshielded = U, Shielded = S

1.7 EUT Operating Mode(s)

Test mode	operating
HDMI, DP	Checked the screen and audio output of the EUT by running the 1kHz tone color bar.

EUT Test operating S/W		
Name	Version	Manufacture Company
-	-	-

1.8 Configuration



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, Republic of. The sites are constructed in conformance with the requirements of ANSI C63.4a-2017 and CISPR 16-1-4:2019

1.12 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
KOREA	RRA	EMI (3 m & 10 m Semi-Anechoic Chamber 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 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
JAPAN	VCCI	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site)	 C-20136, T-20137, R-20181, G-20176
Europe	TÜV SÜD	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 CARAT 001633 0004



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2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **AS/NZS CISPR 32:2015 AMD 1:2020**

☒ Class A

☐ Class B

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2.1 Conducted Emissions at Mains Power Ports

Test Date

Mar. 09, 2023

Test Location

Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EMC32	R & S	9.12.00	-
☒	EMI TEST RECEIVER	ESR3	R & S	101783	11, 11, 2023
☒	LISN	ENV216	R & S	101787	11, 10, 2023
☒	LISN	ESH2-Z5	R & S	100450	11, 10, 2023
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 10, 2023

Test Conditions

Temperature: (23,9 ± 0,1) °C

Relative Humidity: (43,7 ± 0,0) % R.H.

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.

2.2 Conducted Emissions at Telecommunication Ports

Test Date

N/A

Test Location

Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☐	EMI Test S/W	EMC32	R & S	9.12.00	-
☐	EMI TEST RECEIVER	ESR3	R & S	101783	11, 11, 2023
☐	LISN	ENV216	R & S	101787	11, 10, 2023
☐	LISN	ESH2-Z5	R & S	100450	11, 10, 2023
☐	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 10, 2023
☐	8-WIRE ISN CAT3,5	ENY81	R & S	100174	11, 22, 2023
☐	8-WIRE ISN CAT6	ENY81-CAT6	R & S	101665	11, 22, 2023
☐	CDN	CDNS502A	TESEQ	40431	11, 10, 2023

Test Conditions

Temperature: (±) °C

Relative Humidity: (±) % R.H.

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Results

The requirements are:

- ☐ PASS
☐ NOT PASS
☒ NOT APPLICABLE

Remarks

Does not apply because there is no signal line ports.

2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Mar. 09, 2023

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

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESU26	R & S	100551	03, 31, 2023
☒	AMPLIFIER	SCU 01	R & S	100603	11, 10, 2023
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	11, 17, 2024
☒	ATTENUATOR	8491A	HP	32173	03, 03, 2024

Test Conditions

Temperature: (24,1 ± 0,0) °C

Relative Humidity: (43,4 ± 0,1) % R.H.

Frequency Range of Measurement

30 MHz to 1 GHz

Instrument Settings

IF Band Width: 120 kHz

Test Results

The requirements are:

☒ PASS☐ NOT PASS☐ NOT APPLICABLE**Remarks**See Appendix A for test data.

2.4 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Mar. 14, 2023

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, 01, 2023
☒	PREAMPLIFIER	8449B	AGILENT	3008A01967	03, 06, 2024
☒	ATTENUATOR	8491A	HP	35496	03, 03, 2024
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 06, 2024

Test Conditions

Temperature: (24,2 ± 0,1) °C

Relative Humidity: (43,0 ± 0,1) % R.H.

Frequency Range of Measurement

1 GHz to 6 GHz

Instrument Settings

IF Band Width: 1 MHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.

APPENDIX A – TEST DATA

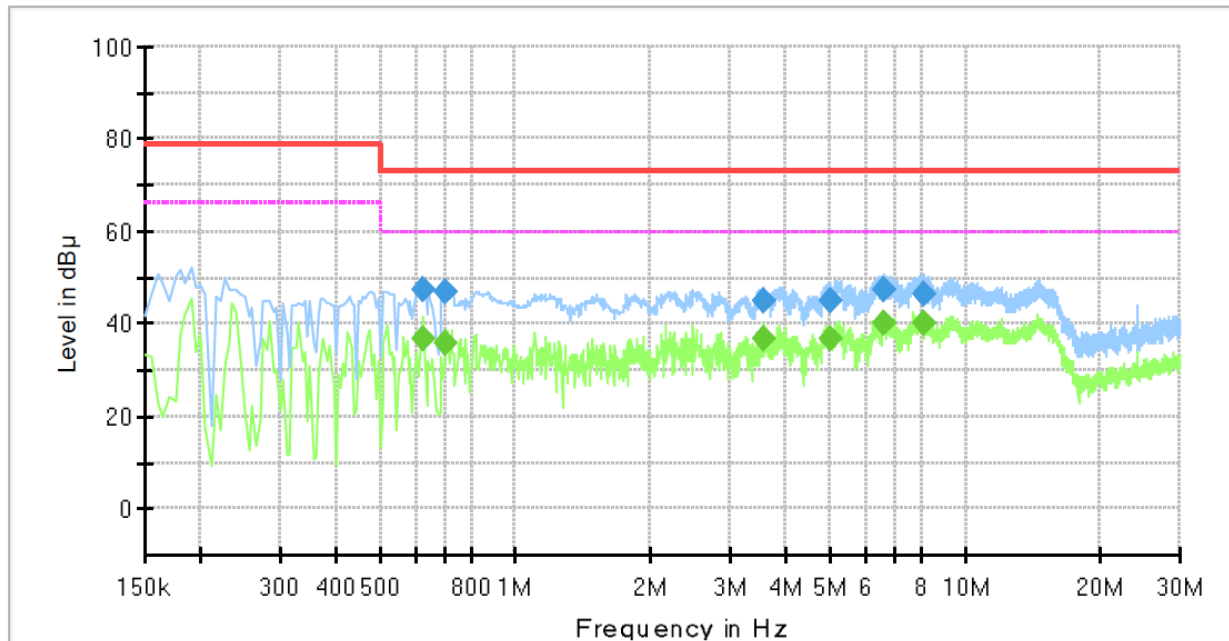
Conducted Emissions at Mains Power Ports

■ HDMI

HOT LINE

Common Information

Test Description:	Conducted Emission
Model No.:	SMT-2740
Phase:	L1
Mode:	HDMI
Operator Name:	KES



Final_Result

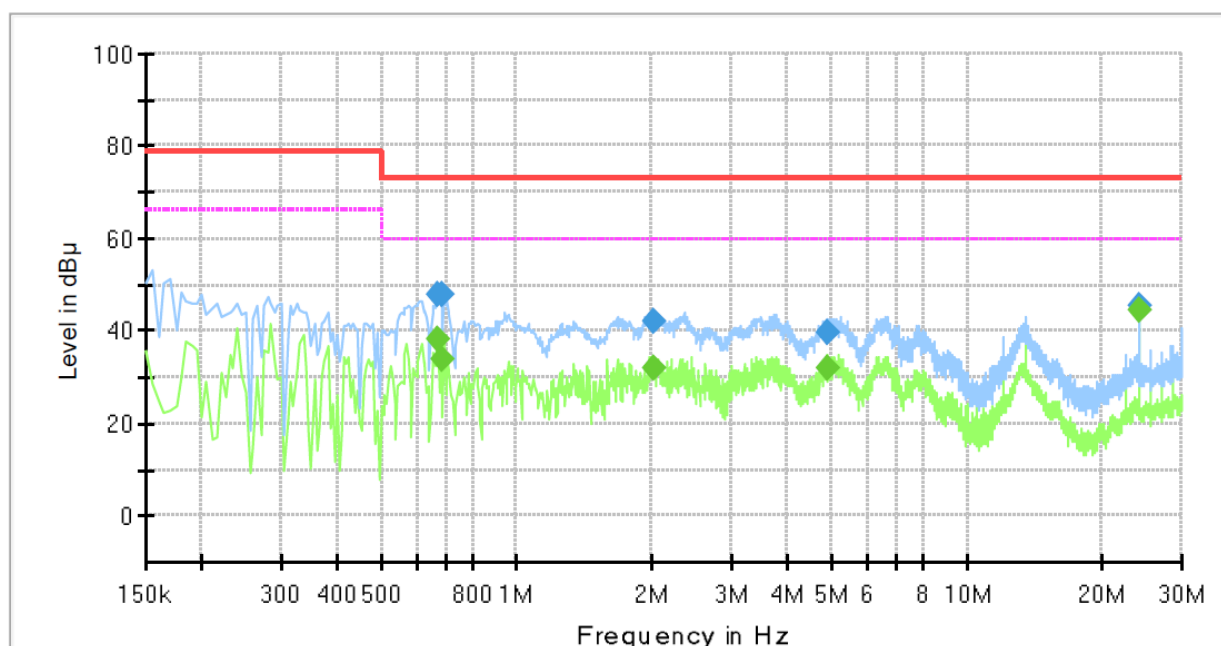
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.625000	---	36.90	60.00	23.10	1000.0	9.000	L1	19.8
0.625000	47.24	---	73.00	25.76	1000.0	9.000	L1	19.8
0.700000	---	35.89	60.00	24.11	1000.0	9.000	L1	19.9
0.700000	46.74	---	73.00	26.26	1000.0	9.000	L1	19.9
3.580000	---	36.69	60.00	23.31	1000.0	9.000	L1	20.0
3.580000	44.90	---	73.00	28.10	1000.0	9.000	L1	20.0
4.995000	---	36.94	60.00	23.06	1000.0	9.000	L1	19.7
4.995000	44.87	---	73.00	28.13	1000.0	9.000	L1	19.7
6.620000	---	40.34	60.00	19.66	1000.0	9.000	L1	19.6
6.620000	47.57	---	73.00	25.43	1000.0	9.000	L1	19.6
8.085000	---	40.02	60.00	19.98	1000.0	9.000	L1	19.7
8.085000	46.55	---	73.00	26.45	1000.0	9.000	L1	19.7

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NEUTRAL LINE

Common Information

Test Description:	Conducted Emission
Model No.:	SMT-2740
Phase:	N
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)
0.670000	---	38.35	60.00	21.65	1000.0	9.000	N	19.9
0.670000	48.06	---	73.00	24.94	1000.0	9.000	N	19.9
0.680000	---	33.88	60.00	26.12	1000.0	9.000	N	19.9
0.680000	47.85	---	73.00	25.15	1000.0	9.000	N	19.9
2.005000	---	32.20	60.00	27.80	1000.0	9.000	N	20.3
2.005000	41.91	---	73.00	31.09	1000.0	9.000	N	20.3
4.910000	---	32.19	60.00	27.81	1000.0	9.000	N	19.7
4.910000	39.86	---	73.00	33.14	1000.0	9.000	N	19.7
24.045000	---	44.74	60.00	15.26	1000.0	9.000	N	20.4
24.045000	45.36	---	73.00	27.64	1000.0	9.000	N	20.4

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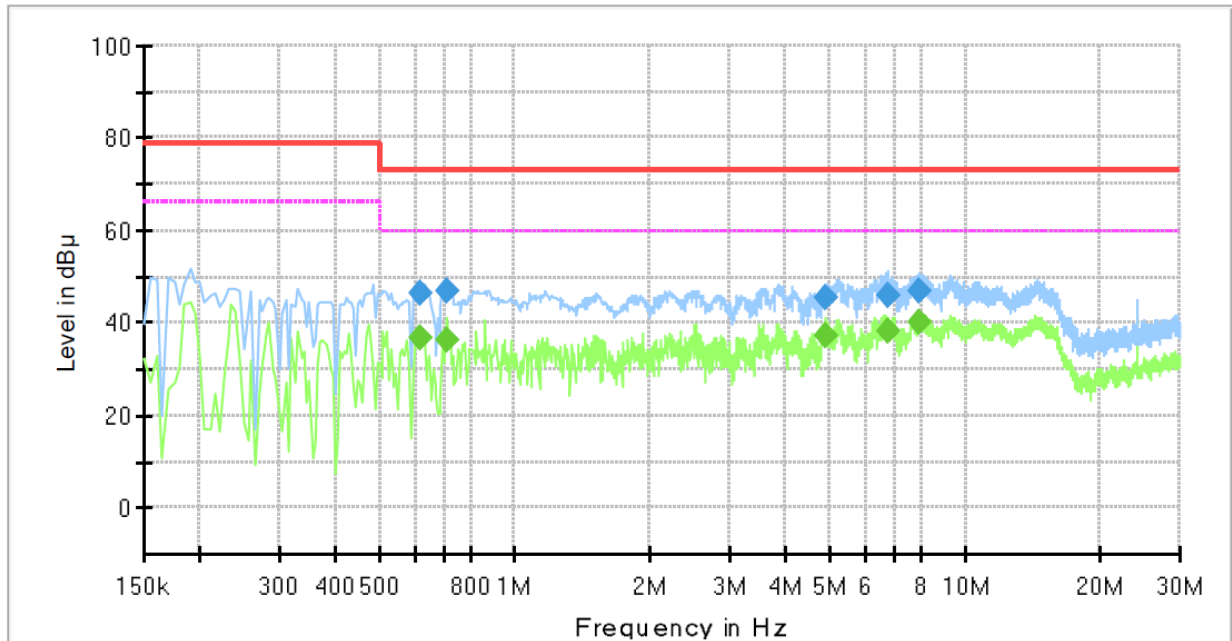
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■ DP

HOT LINE

Common Information

Test Description:	Conducted Emission
Model No.:	SMT-2740
Phase:	L1
Mode:	DP
Operator Name:	KES



Final_Result

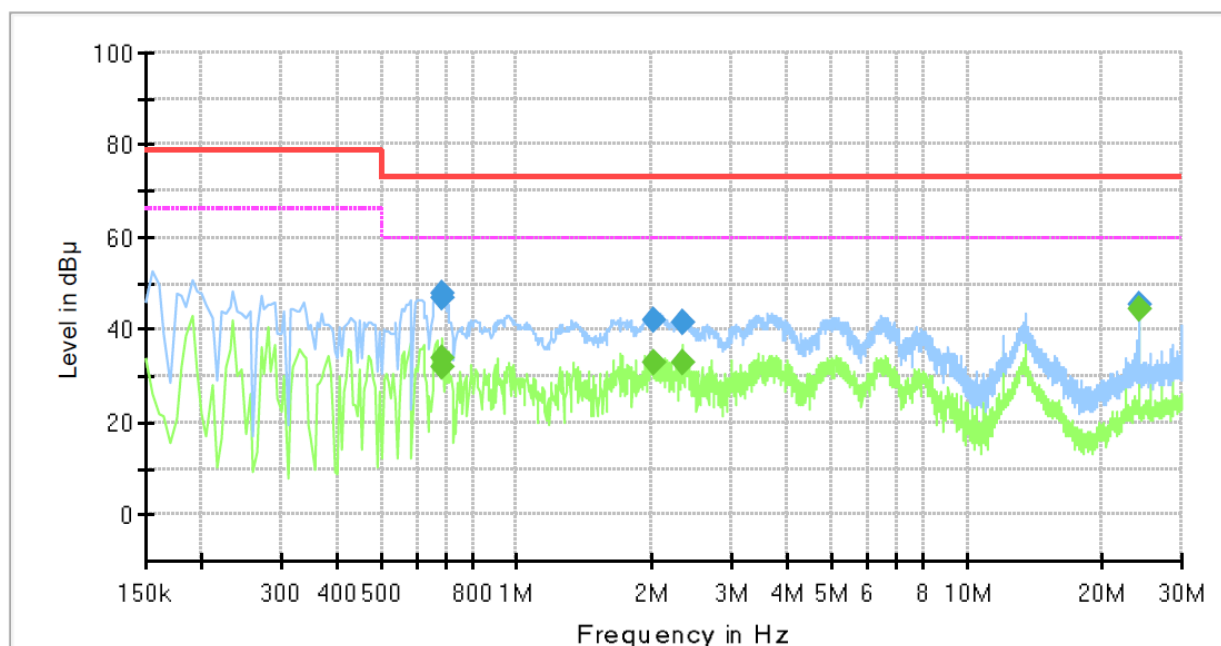
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.615000	---	37.00	60.00	23.00	1000.0	9.000	L1	19.8
0.615000	46.45	---	73.00	26.55	1000.0	9.000	L1	19.8
0.710000	---	36.48	60.00	23.52	1000.0	9.000	L1	19.9
0.710000	46.75	---	73.00	26.25	1000.0	9.000	L1	19.9
4.900000	---	37.49	60.00	22.51	1000.0	9.000	L1	19.7
4.900000	45.61	---	73.00	27.39	1000.0	9.000	L1	19.7
6.765000	---	38.37	60.00	21.63	1000.0	9.000	L1	19.6
6.765000	45.76	---	73.00	27.24	1000.0	9.000	L1	19.6
7.920000	---	40.18	60.00	19.82	1000.0	9.000	L1	19.6
7.920000	47.00	---	73.00	26.00	1000.0	9.000	L1	19.6

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NEUTRAL LINE

Common Information

Test Description:	Conducted Emission
Model No.:	SMT-2740
Phase:	N
Mode:	DP
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.680000	---	34.09	60.00	25.91	1000.0	9.000	N	19.9
0.680000	47.95	---	73.00	25.05	1000.0	9.000	N	19.9
0.685000	---	32.08	60.00	27.92	1000.0	9.000	N	19.9
0.685000	46.79	---	73.00	26.21	1000.0	9.000	N	19.9
2.010000	---	32.70	60.00	27.30	1000.0	9.000	N	20.3
2.010000	41.94	---	73.00	31.06	1000.0	9.000	N	20.3
2.340000	---	32.84	60.00	27.16	1000.0	9.000	N	20.3
2.340000	41.52	---	73.00	31.48	1000.0	9.000	N	20.3
24.045000	---	44.71	60.00	15.29	1000.0	9.000	N	20.4
24.045000	45.34	---	73.00	27.66	1000.0	9.000	N	20.4

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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



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**Conducted Emissions at Telecommunication Ports
[100 Mbps]**

N/A

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

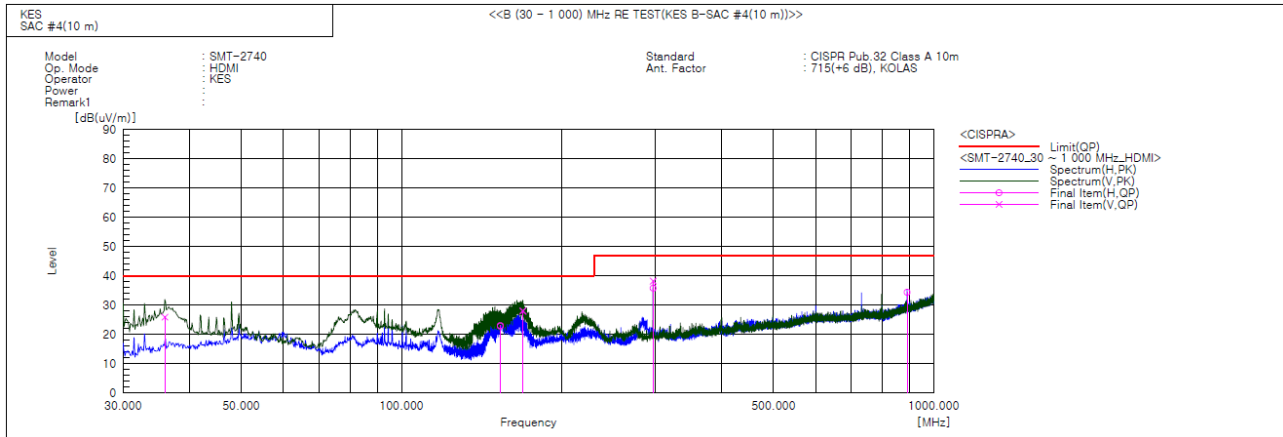
Reading Value : Not shown in the table.

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

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Radiated Electric Field Emissions(Below 1 GHz)

■ HDMI

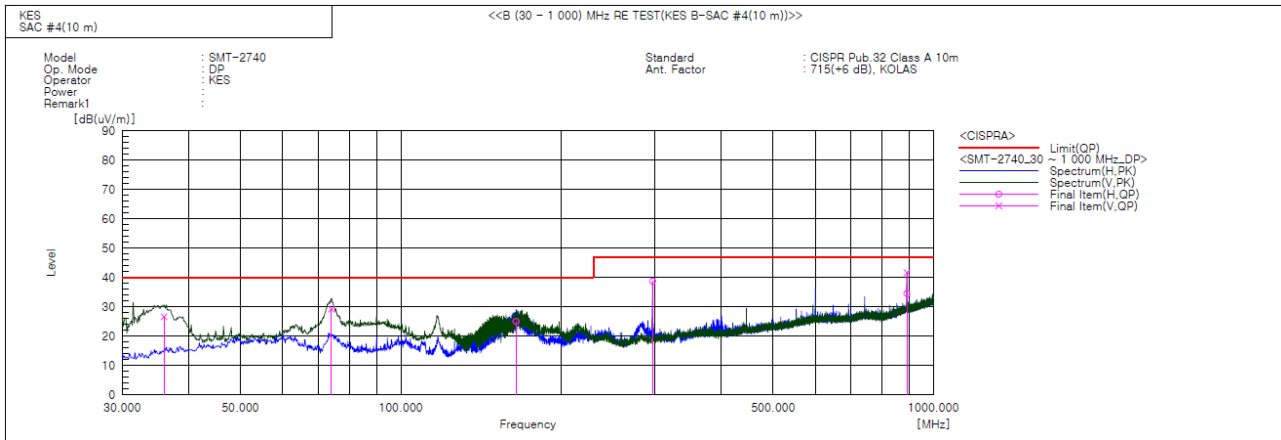


Final Result

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	35.941	V	49.9	-24.0	25.9	40.0	14.1	112.0	89.0	
2	153.311	H	48.1	-25.2	22.9	40.0	17.1	357.0	126.0	
3	169.074	V	52.5	-24.5	28.0	40.0	12.0	126.0	349.0	
4	296.993	V	56.3	-18.1	38.2	47.0	8.8	148.0	135.0	
5	296.993	H	53.9	-18.1	35.8	47.0	11.2	381.0	107.0	
6	891.118	H	39.1	-4.7	34.4	47.0	12.6	366.0	100.0	

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DP



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	35.941	V	50.6	-24.0	26.6	40.0	13.4	146.0	352.0	
2	74.135	V	55.5	-26.3	29.2	40.0	10.8	129.0	240.0	
3	164.588	H	49.8	-24.8	25.0	40.0	15.0	361.0	114.0	
4	296.993	H	56.8	-18.1	38.7	47.0	8.3	398.0	121.0	
5	890.996	V	46.3	-4.7	41.6	47.0	5.4	106.0	8.0	
6	890.996	H	39.2	-4.7	34.5	47.0	12.5	354.0	114.0	

Calculation

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

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

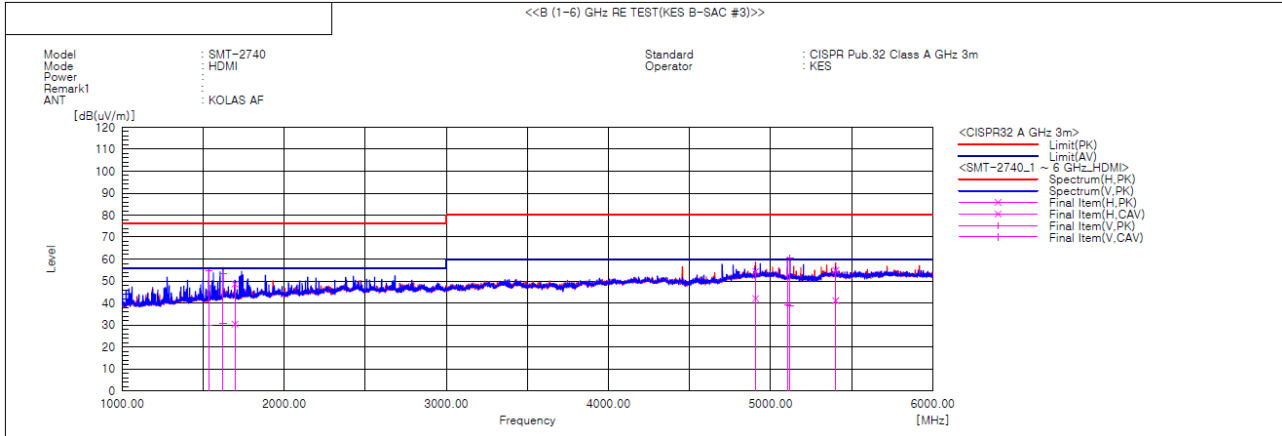
Reading(QP) : Reading value, Result(QP) : Reading value + Factor value

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



Radiated Electric Field Emissions(Above 1 GHz)

■ HDMI

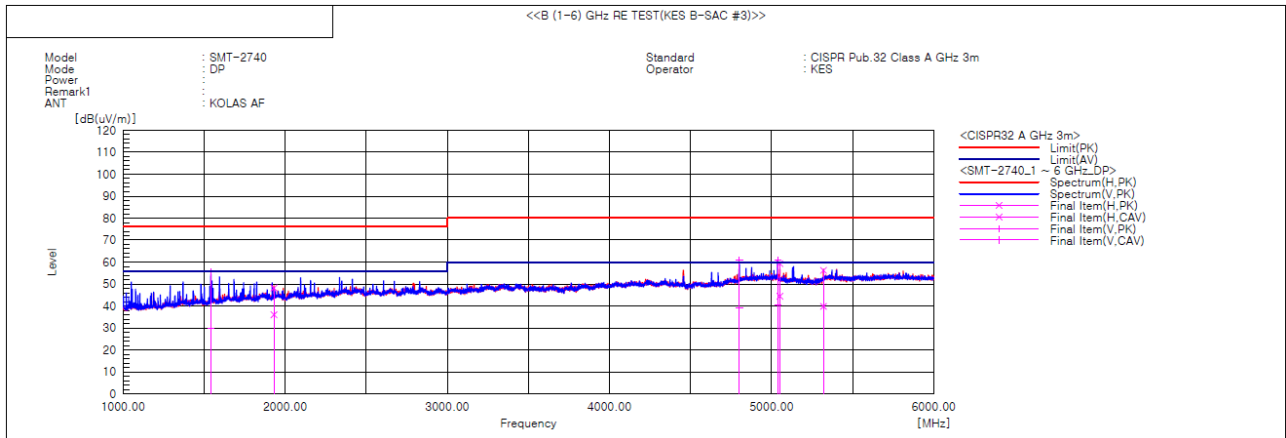


Final Result

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	1534.170	V	54.6	29.6	0.1	54.7	29.7	76.0	56.0	21.3	26.3	100.0	63.9	
2	1623.411	V	52.6	30.1	0.7	53.3	30.8	76.0	56.0	22.7	25.2	100.0	50.8	
3	1695.502	H	47.0	28.9	1.6	48.6	30.5	76.0	56.0	27.4	25.5	100.0	152.6	
4	4907.081	H	39.6	27.3	14.8	54.4	42.1	80.0	60.0	25.6	17.9	100.0	48.3	
5	5103.630	V	44.6	24.1	14.9	59.5	39.0	80.0	60.0	20.5	21.0	100.0	142.2	
6	5119.914	V	45.6	23.8	14.8	60.4	38.6	80.0	60.0	19.6	21.4	100.0	147.3	
7	5401.100	H	39.0	25.3	15.9	54.9	41.2	80.0	60.0	25.1	18.8	100.0	321.5	

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DP



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	1541.254	V	55.5	29.6	0.1	55.6	29.7	76.0	56.0	20.4	26.3	100.0	53.6	
2	1930.076	H	44.6	32.5	3.6	48.2	36.1	76.0	56.0	27.8	19.9	100.0	19.3	
3	4801.302	V	47.2	25.5	13.8	61.0	39.3	80.0	60.0	19.0	20.7	100.0	149.9	
4	5037.840	V	45.7	25.4	15.2	60.9	40.6	80.0	60.0	19.1	19.4	100.0	147.0	
5	5050.266	H	44.2	29.4	15.1	59.3	44.5	80.0	60.0	20.7	15.5	100.0	306.7	
6	5319.552	H	40.9	24.5	15.4	56.3	39.9	80.0	60.0	23.7	20.1	100.0	79.6	

Calculation

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

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

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

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

Test Setup Photos and Configuration

Conducted Emissions at Mains Power Ports



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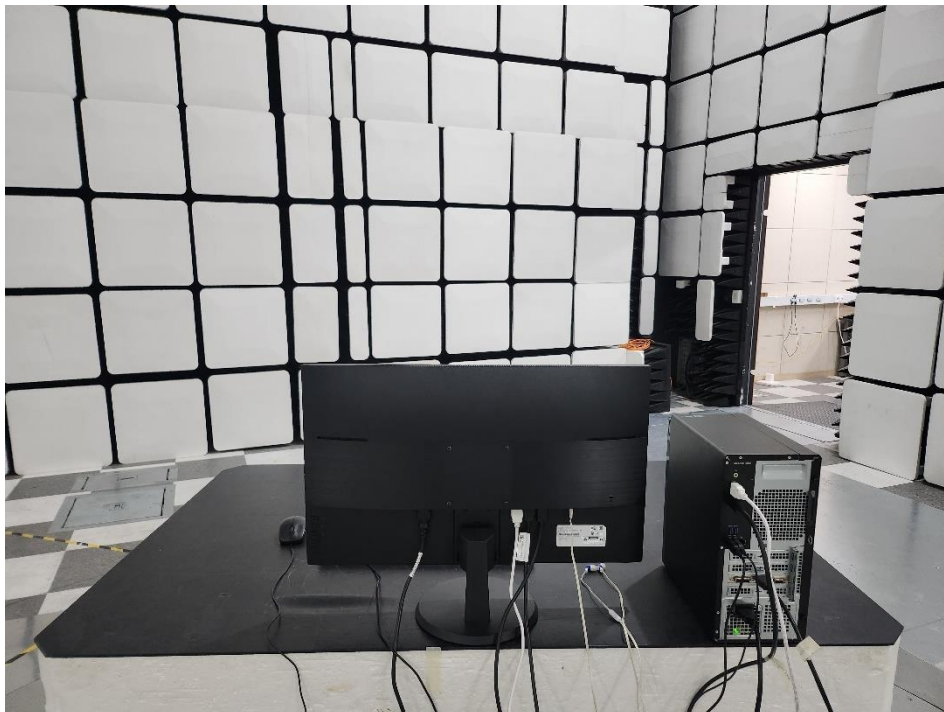
Report No.:
KES-EM-23T0262
Page (24) of (34)

Conducted Emissions at Telecommunication Ports

N/A

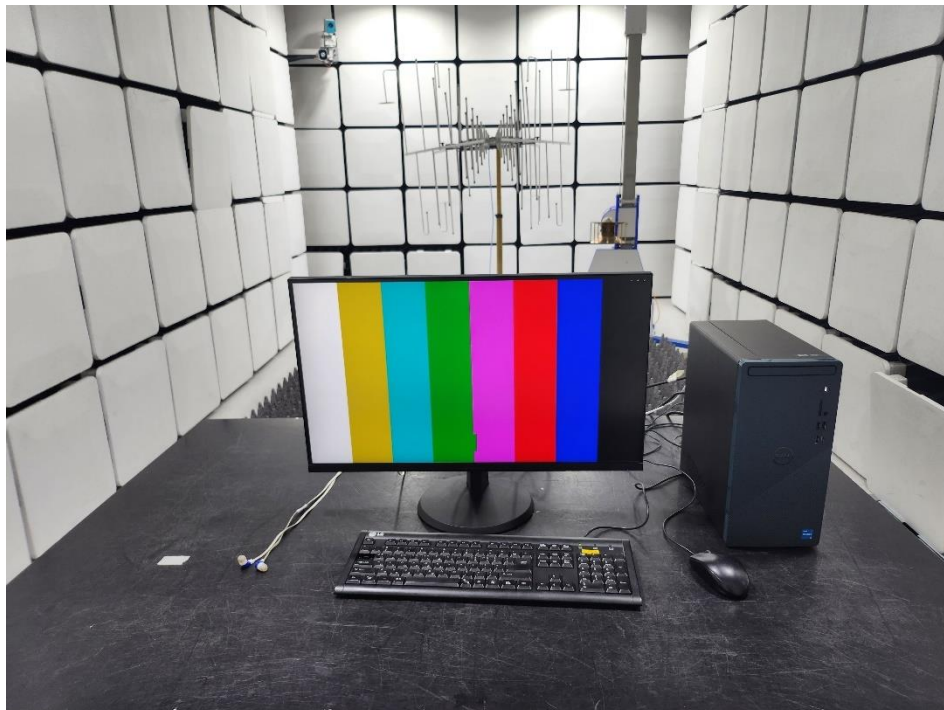
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Radiated Electric Field Emissions(Below 1 GHz)



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Radiated Electric Field Emissions(Above 1 GHz)



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EUT External Photographs

(Top)



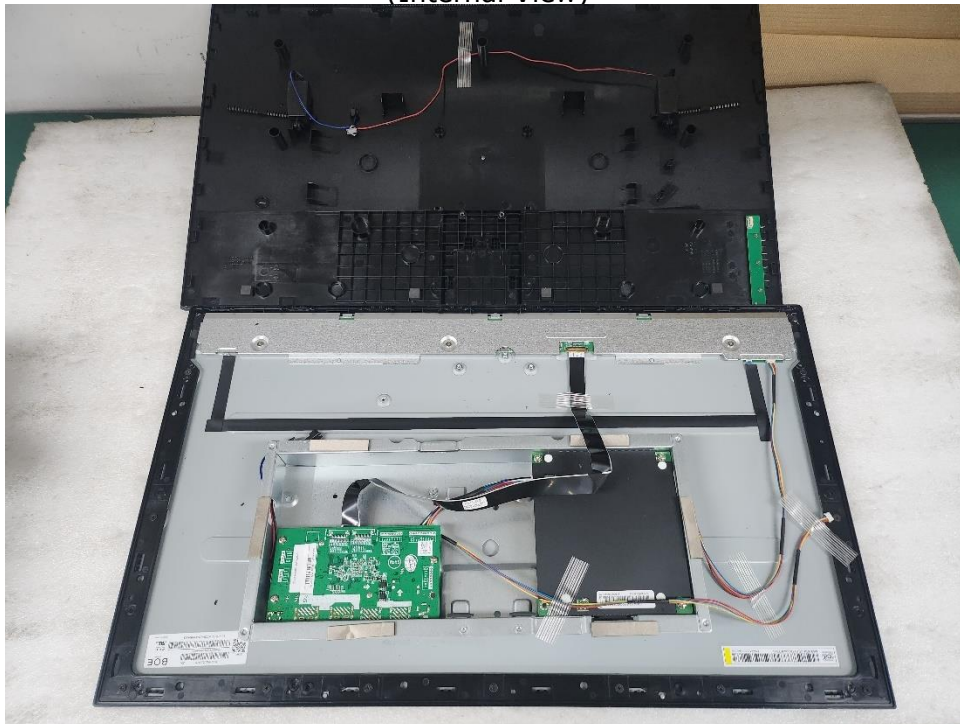
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EUT Internal Photographs

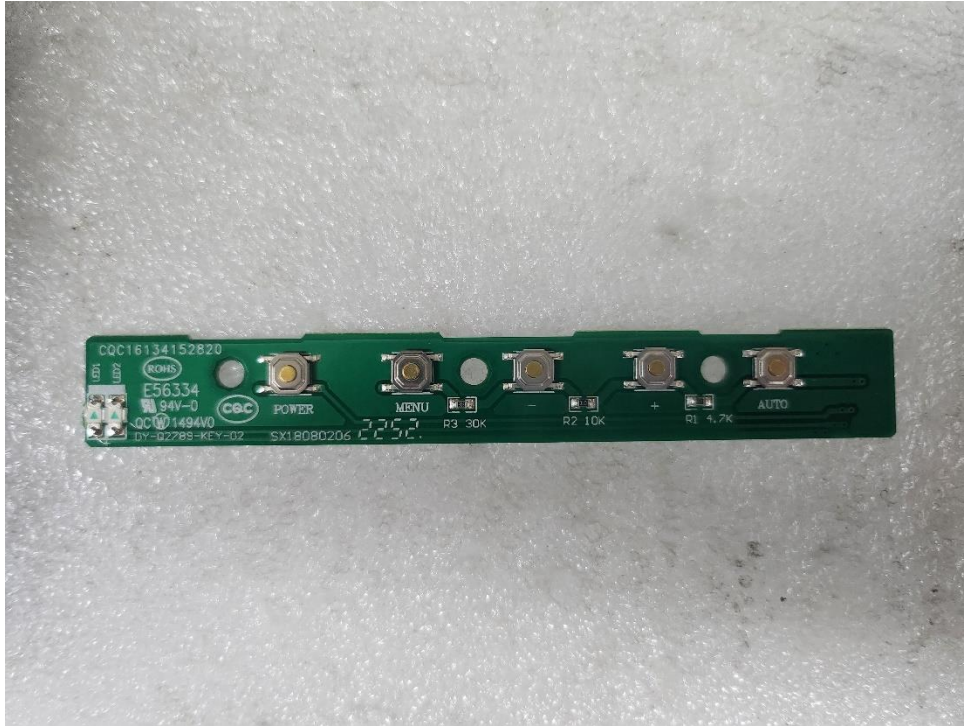
(Internal View)



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EUT Internal View – Board 1

(Top)



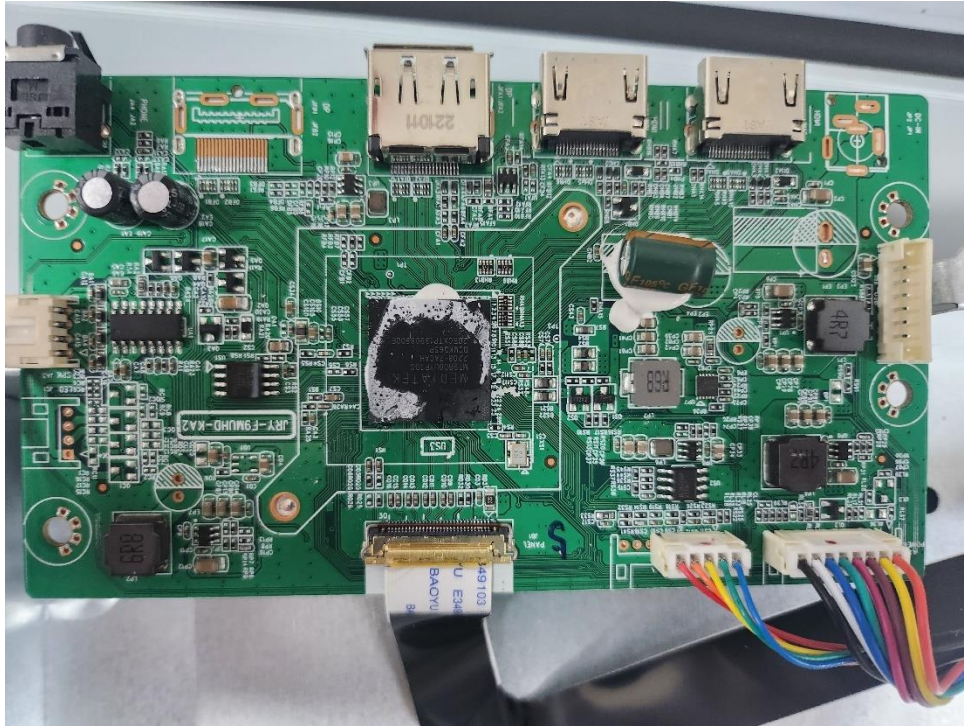
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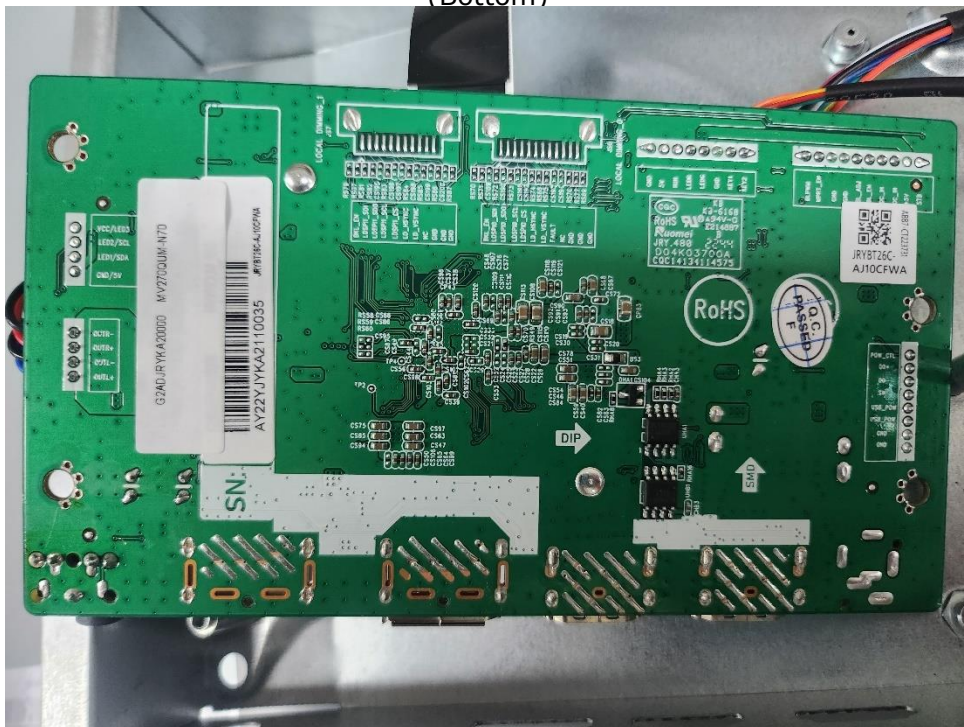
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EUT Internal View – Board 2

(Top)



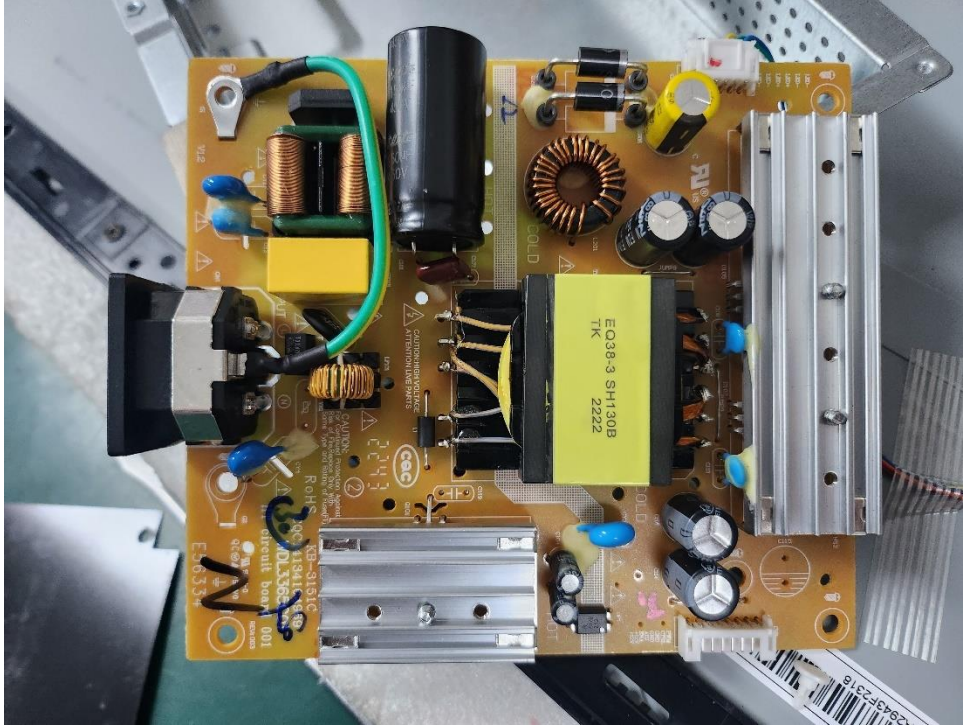
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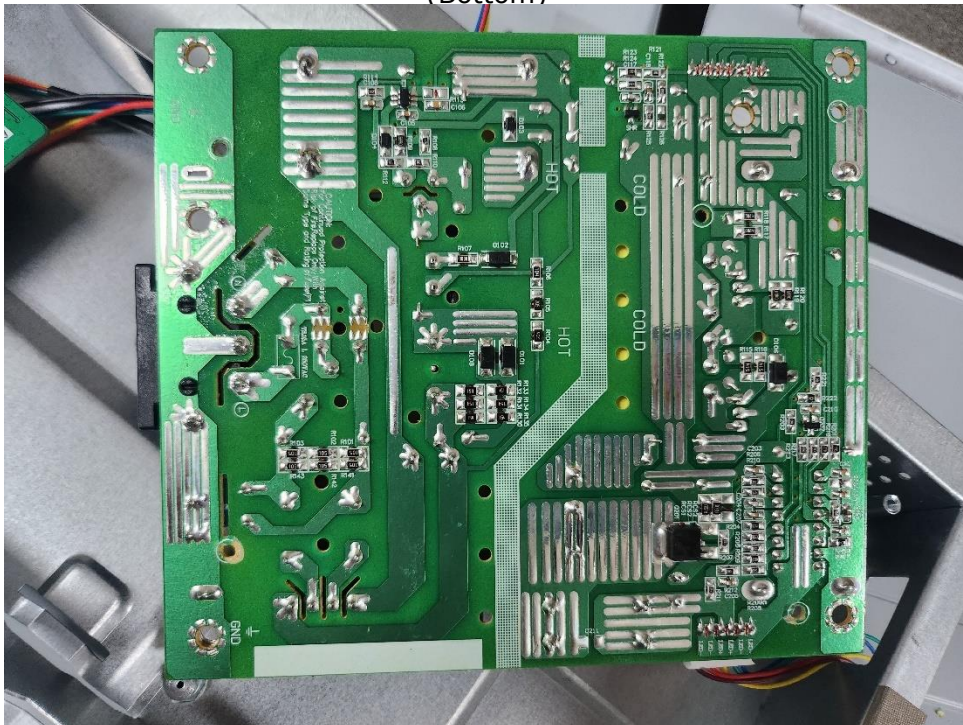
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EUT Internal View – Board 3

(Top)



(Bottom)



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EUT Internal View – Board 4

(Top)



(Bottom)



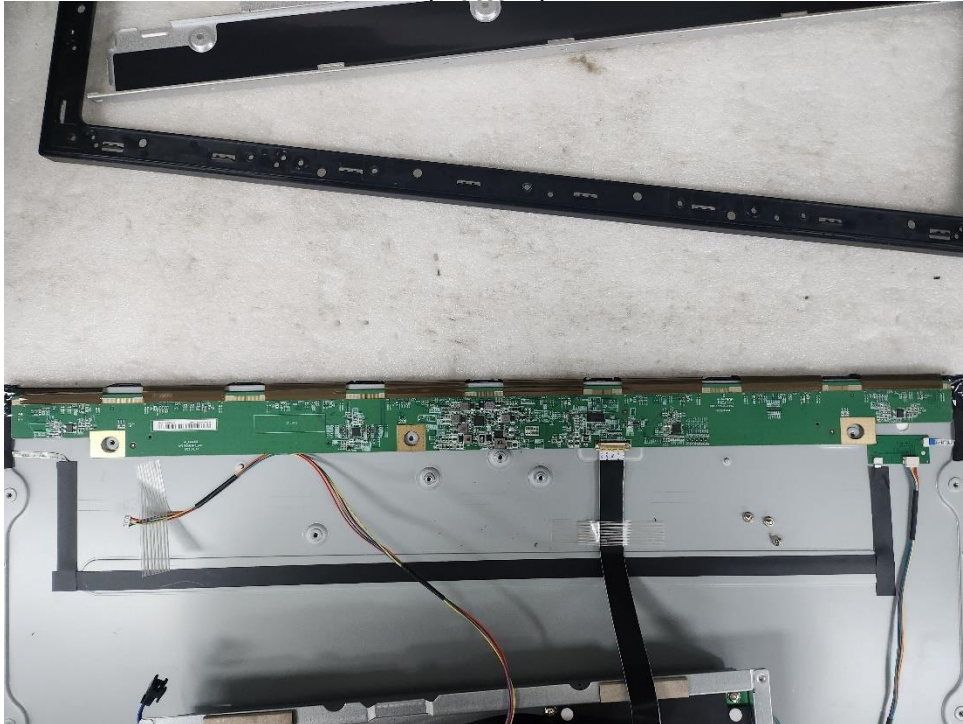
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EUT Internal View – Board 5

(Top)



(Bottom)



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EUT Internal View – Panel

(Top)



(Bottom)



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