



EMC TEST REPORT For RCM

Test Report No. : KES-E1-18T0437

Date of Issue : Aug. 01, 2018

Product name : 2M LENS Module

Model/Type No. : SLA-2M2800P

Variant Model : -

Applicant : Hanwha Techwin Co., Ltd.

Applicant Address : 6, Pangyo-ro 319 Beon-gil, Bundang-gu, Seongnam-si,
Gyeonggi-do, 13488, KOREA

Manufacturer : 1. Hanwha Techwin (Tianjin) Co.,Ltd.
2. HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.
3. D-TECH CO.,LTD.

Manufacturer Address : 1. No.11 Weiliu Rd, Micro-Electronic Industrial Park, TEDA, Tianjin,
300385, People's Republic of China
2. Lot O-2, Que Vo Industrial Zone extended area,
Nam Son commune, Bac Ninh city, Bac Ninh province, Vietnam
3. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi-do,
Korea (Suwon Industrial Complex)

Date of Receipt : Jul. 19, 2018

Test date : Jul. 19, 2018 ~ Jul. 20, 2018

Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Dae Jung, Choi
EMC Test Engineer

Reviewed by

Dong-Hun, Jang
EMC Technical Manager

This test report is not related to KOLAS.

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Test report No.:
KES-E1-18T0437
Page (2) of (28)

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Aug. 01, 2018	KES-E1-18T0437	Issued

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TABLE OF CONTENTS

1.0	General Product Description.....	4
1.1	Test Voltage & Frequency	5
1.2	Variant Model Differences.....	5
1.3	Device Modifications	5
1.4	Equipment Under Test.....	5
1.5	Support Equipments	5
1.6	External I/O Cabling	6
1.7	EUT Operating Mode(s)	6
1.8	Configuration.....	7
1.9	Remarks when standards applied	8
1.10	Calibration Details of Equipment Used for Measurement.....	8
1.11	Test Facility	8
1.12	Laboratory Accreditations and Listings	8
2.0	Test Regulations.....	9
2.1	Conducted Emissions at Mains Power Ports	11
2.2	Conducted Emissions at Telecommunication Ports.....	12
2.3	Radiated Electric Field Emissions(Below 1 GHz)	13
2.4	Radiated Electric Field Emissions(Above 1 GHz)	14
APPENDIX A – TEST DATA.....		15
Conducted Emissions at Mains Power Ports.....		15
Conducted Emissions at Telecommunication Ports		17
Radiated Electric Field Emissions(Below 1 GHz)		19
Radiated Electric Field Emissions(Above 1 GHz).....		20
Test Setup Photos and Configuration		21
Conducted Voltage Emissions		21
Conducted Telecommunication Emissions		22
Radiated Electric Field Emissions(Below 1 GHz)		23
Radiated Electric Field Emissions(Above 1 GHz).....		24
EUT External Photographs		25
EUT Internal Photographs		26



1.0 General Product Description

Main Specifications of EUT are:

	SLA-2M2800P
Video	
Imaging Device	1/2.8" 2M CMOS
Total Pixels	1945(H) x 1109(V) 2.16M
Effective Pixels	1945(H) x 1097(V) 2.13M
Scanning System	Progressive Scan
Min. Illumination	Color : 0.055Lux(F2.0, 1/30sec, 30IRE) B/W : 0.055Lux(F2.0, 1/30sec, 30IRE)
S / N Ratio	50dB
Wide Dynamic Range	150dB
Day & Night	Electrical
Lens	
Focal Length (Zoom Ratio)	2.8mm
Max. Aperture Ratio	F2.0
Angular Field of View	H:107.4°, V:62.2°, D:122.0°
Lens Type	Fixed focal
Mount Type	M12 Lens module with main unit
Pan/Tilt/Rotate	
Pan / Tilt / Rotate Range	-90°~+90° / +26~+80° / -180°~+180°
Mechanical	
Color / Material	Black / Plastic
Dimension (WxHxD)	Ø35.5 x 35.9 mm
Weight	30g (0.07 lb)



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 ☐ 240 Vac ☐ 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
2M LENS Module	SLA-2M2800P	-	Hanwha Techwin (Tianjin) Co., Ltd.	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
NETWORK CAMERA	PNM-9320VQP	-	Hanwha Techwin (Tianjin) Co., Ltd.	-
PoE Injector	PT-PSE109GBRO-AH	PT1824010157	Dongguan PROCET Network Technology Co.,Ltd	-
Notebook	NT730U3E	JJRE91CF200065 A	Samsung Electronics Co., Ltd.	-
AC/DC Adaptor	PA-1600-66	AD-6019P	LITEON	-
2M LENS Module	SLA-2M2400P	-	Hanwha Techwin (Tianjin) Co., Ltd.	1EA
2M LENS Module	SLA-2M3600P	-	Hanwha Techwin (Tianjin) Co., Ltd.	1EA
2M LENS Module	SLA-2M6000P	-	Hanwha Techwin (Tianjin) Co., Ltd.	1 EA



1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
2M LENS Module (EUT)	40 PIN	NETWORK CAMERA	40 PIN	-	-
NETWORK CAMERA	40 PIN	2M LENS Module	40 PIN	-	-
	40 PIN	2M LENS Module	40 PIN	-	-
	40 PIN	2M LENS Module	40 PIN	-	-
	RJ-45 (PoE)	PoE Injector	RJ-45 (PoE)	3.0	U
PoE Injector	RJ-45 (LAN)	Notebook	RJ-45 (LAN)	3.0	U

* Unshielded=U, Shielded=S

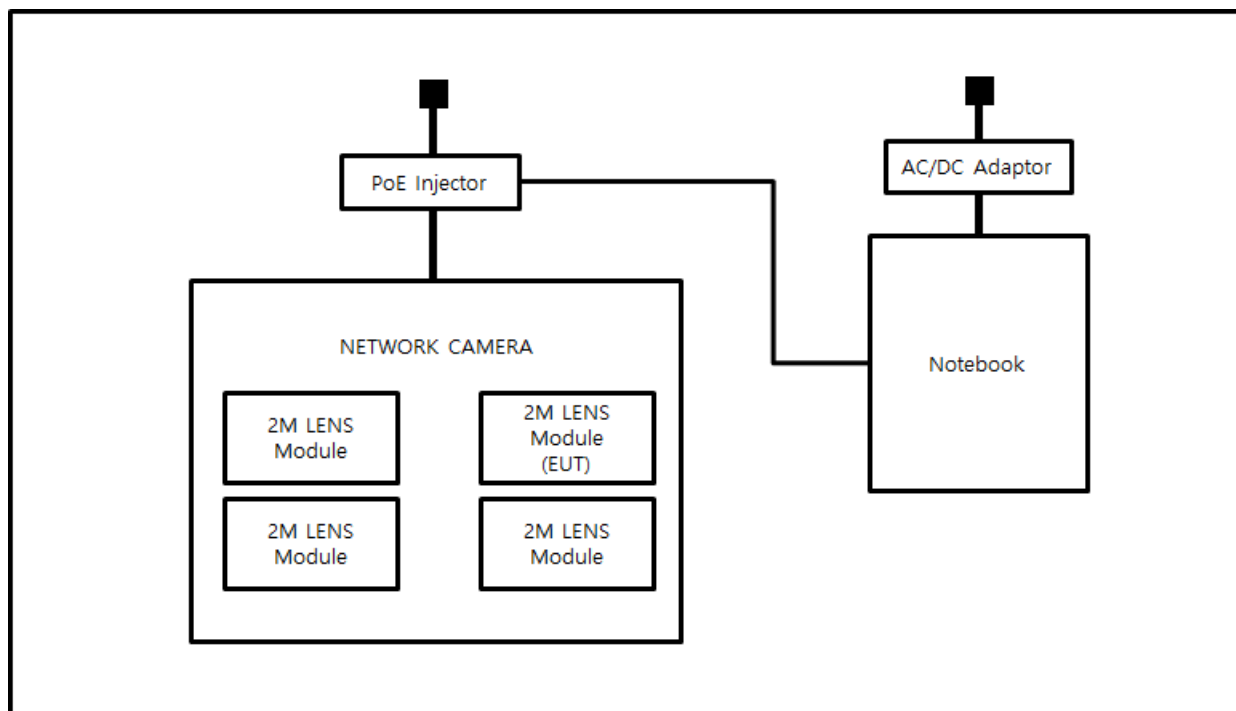
1.7 EUT Operating Mode(s)

Test mode	operating
PoE	E.U.T Monitoring, Ping Test

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

1.8 Configuration

■ AC Main
□ DC Main



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 C63.4:2014 and CISPR 16-1-4:2012

1.12 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
KOREA	RRA	EMI (3 m & 10 m Semi-Aechoic 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-Aechoic Chamber , and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KT489
USA	FCC	3 m & 10 m Semi-Aechoic Chamber, 10 m Open Area and Conducted test site to perform FCC Part 15/18 measurements.	 KR0100
Canada	ISED	3 m & 10 m Semi-Aechoic 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-4308, C-4798, T-2311, G-914
Europe	TÜV SÜD	EMI (3 m & 10 m Semi-Aechoic Chamber , 10 m Open Area and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 CARAT 17 07 01633 001

2.0 Test Regulations

The emissions tests were performed according to following regulations:

☐ **EMC – Directive 2014/30/EU**

☐ EN 61000-6-3:2011

☐ EN 61000-6-1:2007

☐ EN 61000-6-4:2007 +A1:2011

☐ EN 61000-6-2:2005

☐ EN 55011:2007 +A1:2010

☐ Group 1
☐ Class A

☐ Group 2
☐ Class B

☐ EN 55014-1:2006 +A2:2011

☐ EN 55014-2:1997 +A2:2008

☐ EN 55015:2013

☐ EN 55032:2015

☐ Class A

☐ Class B

☐ EN 55024:2010

☐ EN 50130-4:2011 +A1:2014

☐ EN 61000-3-2:2014

☐ EN 61000-3-3:2013

☐ EN 61326-1:2013



-
- | | | |
|---|---|----------------------------------|
| ☐ VCCI V-3 / 2015.04 | ☐ Class A | ☐ Class B |
| ☒ AS/NZS CISPR32:2013 | ☒ 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

Jul. 19, 2018

Test Location

Electro wave Shieldroom #6

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EMC32	R & S	9.12.00	-
☒	EMI TEST RECEIVER	ESR3	R & S	101781	04, 25, 2019
☒	LISN	ENV216	R & S	101787	01, 05, 2019
☒	LISN	ESH2-Z5	R & S	100450	04, 25, 2019
☒	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 27, 2018
☐	LISN	NNBM8124	SCHWARZBECK	8124-1002	08, 07, 2018
☐	LISN	NNBM8124	SCHWARZBECK	8124-1003	08, 07, 2018

Test Conditions

Temperature: 23,9 °C
Relative Humidity: 56,7 % 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	101781	04, 25, 2019
☐	LISN	ENV216	R & S	101787	01, 05, 2019
☐	LISN	ESH2-Z5	R & S	100450	04, 25, 2019
☐	PULSE LIMITER	ESH3-Z2	R & S	101915	11, 27, 2018
☐	8-WIRE ISN CAT3,5	ENY81	R & S	100174	01, 07, 2019
☐	8-WIRE ISN CAT6	ENY81-CAT6	R & S	101665	01, 07, 2019
☐	CDN	CDNS502A	TESEQ	40431	01, 05, 2019

Test ConditionsTemperature: °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

N/A

2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Jul. 20, 2018

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

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESU26	R & S	100551	04, 11, 2019
☒	AMPLIFIER	SCU 01	R & S	100603	11, 27, 2018
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	714	11, 28, 2018

Test ConditionsTemperature: 23,6 °C
Relative Humidity: 49,5 % 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

RemarksSee Appendix A for test data.

2.4 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Jul. 20, 2018

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, 07, 2018
☒	PREAMPLIFIER	8449B	AGILENT	3008A01967	05, 31, 2019
☐	ATTENUATOR	8491A	HP	35496	03, 21, 2019
☒	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	05, 02, 2019

Test Conditions

Temperature: 23,3 °C
Relative Humidity: 49,5 % R.H.

Frequency Range of Measurement

1 GHz to 6 GHz

Instrument Settings

IF Band Width: 1 MHz

Test Results

The requirements are:

- ☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks

See Appendix A for test data.



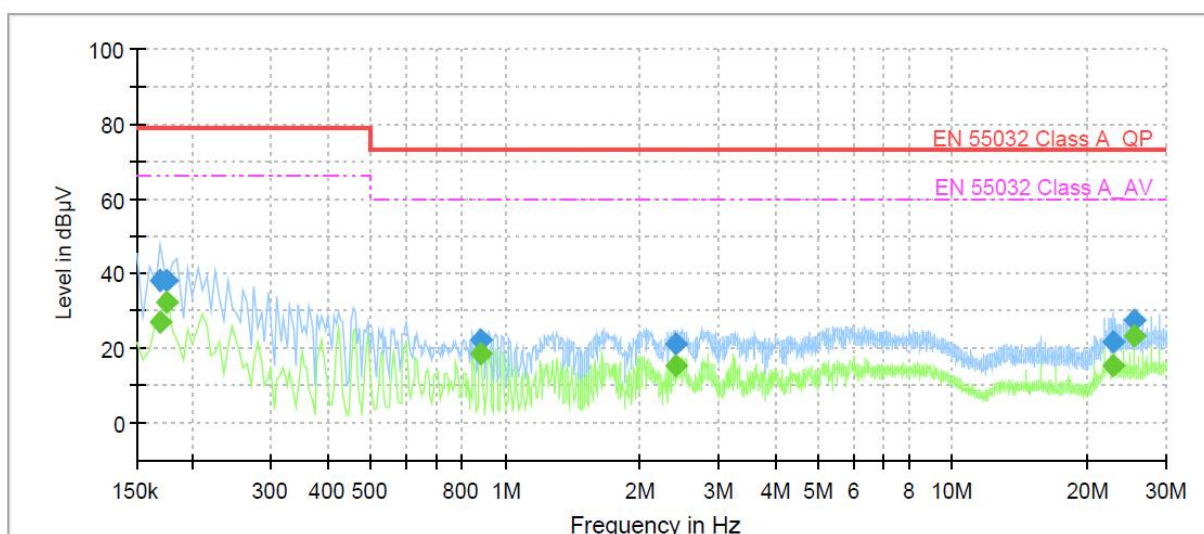
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

HOT LINE

Common Information

Test Description: Conducted Emission
Model No.: SLA-2M2800P
Mode: H
Operator Name: KES



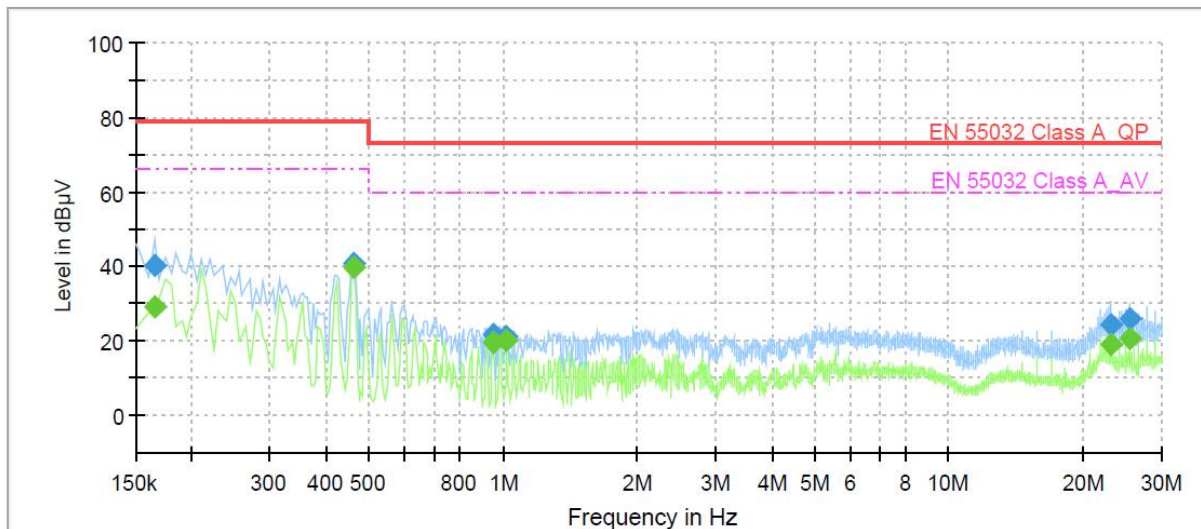
Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.170000	---	27.23	66.00	38.77	1000.0	9.000	L1	19.3
0.170000	37.91	---	79.00	41.09	1000.0	9.000	L1	19.3
0.175000	---	32.12	66.00	33.88	1000.0	9.000	L1	19.3
0.175000	38.06	---	79.00	40.94	1000.0	9.000	L1	19.3
0.885000	---	18.52	60.00	41.48	1000.0	9.000	L1	19.9
0.885000	22.15	---	73.00	50.85	1000.0	9.000	L1	19.9
2.405000	---	15.47	60.00	44.53	1000.0	9.000	L1	20.1
2.405000	21.36	---	73.00	51.64	1000.0	9.000	L1	20.1
22.790000	---	15.61	60.00	44.39	1000.0	9.000	L1	20.3
22.790000	21.50	---	73.00	51.50	1000.0	9.000	L1	20.3
25.430000	---	23.09	60.00	36.91	1000.0	9.000	L1	20.4
25.430000	27.38	---	73.00	45.62	1000.0	9.000	L1	20.4

NEUTRAL LINE

Common Information

Test Description:	Conducted Emission
Model No.:	SLA-2M2800P
Mode	N
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.165000	---	29.37	66.00	36.63	1000.0	9.000	N	19.3
0.165000	40.47	---	79.00	38.53	1000.0	9.000	N	19.3
0.460000	---	39.46	66.00	26.54	1000.0	9.000	N	19.6
0.460000	40.53	---	79.00	38.47	1000.0	9.000	N	19.6
0.950000	---	19.62	60.00	40.38	1000.0	9.000	N	19.9
0.950000	21.72	---	73.00	51.28	1000.0	9.000	N	19.9
1.020000	---	19.93	60.00	40.07	1000.0	9.000	N	20.0
1.020000	21.44	---	73.00	51.56	1000.0	9.000	N	20.0
23.000000	---	19.05	60.00	40.95	1000.0	9.000	N	20.4
23.000000	24.17	---	73.00	48.83	1000.0	9.000	N	20.4
25.430000	---	20.55	60.00	39.45	1000.0	9.000	N	20.4
25.430000	26.17	---	73.00	46.83	1000.0	9.000	N	20.4

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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



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Test report No.:
KES-E1-18T0437
Page (17) of (28)

Conducted Emissions at Telecommunication Ports

[10 Mbps]

N/A

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Test report No.:
KES-E1-18T0437
Page (18) of (28)

[1 000 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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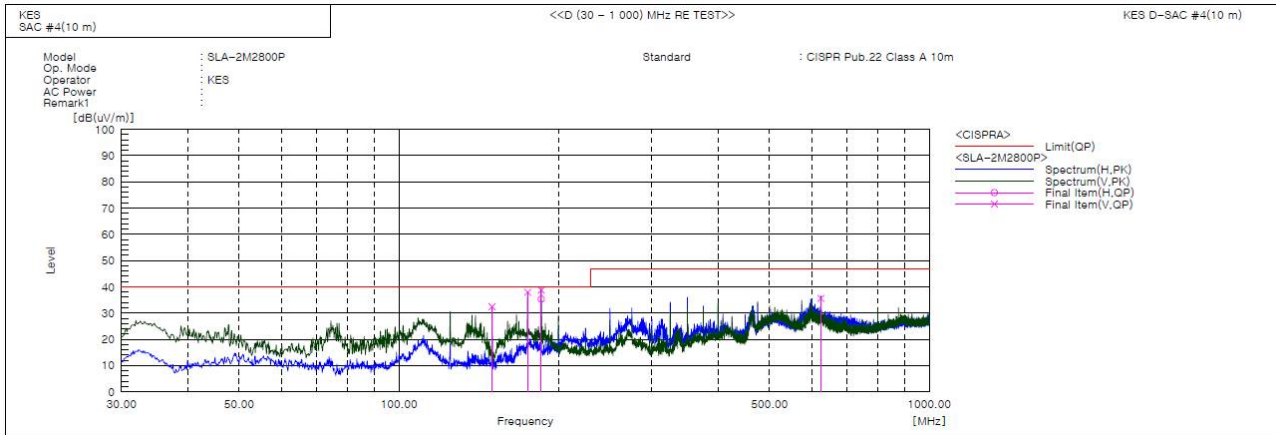


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Test report No.:
KES-E1-18T0437
Page (19) of (28)

Radiated Electric Field Emissions(Below 1 GHz)



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	149.918	V	64.5	-32.1	32.4	40.0	7.6	101.0	191.0	
2	175.014	V	68.8	-30.9	37.9	40.0	2.1	102.0	175.0	
3	185.569	V	68.1	-29.4	38.7	40.0	1.3	100.0	214.0	
4	185.636	H	64.7	-29.4	35.3	40.0	4.7	397.0	150.0	
5	624.979	V	51.3	-15.7	35.6	47.0	11.4	169.0	294.0	

◆ 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

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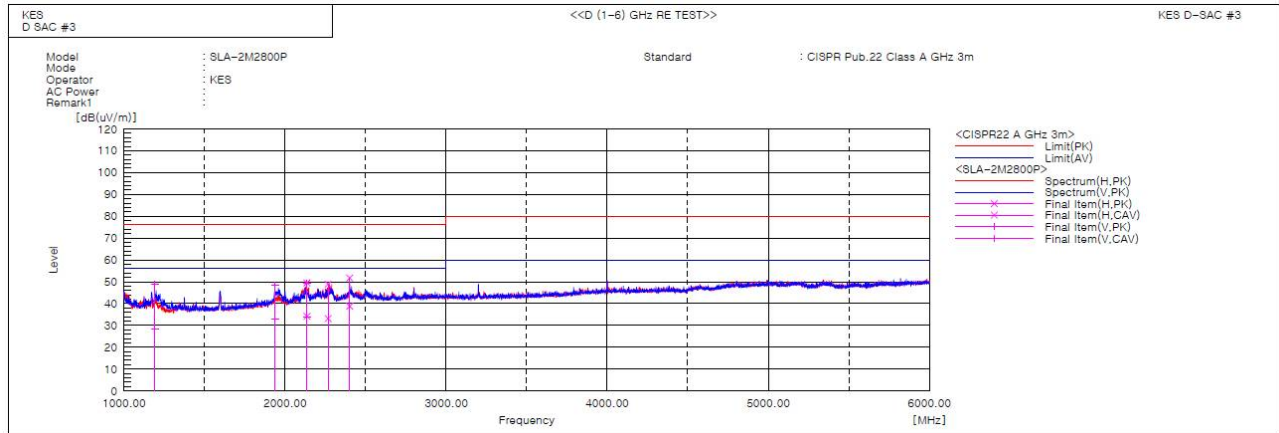


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Test report No.:
KES-E1-18T0437
Page (20) of (28)

Radiated Electric Field Emissions(Above 1 GHz)



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	1191.781	V	54.8	34.6	-6.1	48.7	28.5	76.0	56.0	27.3	27.5	100.0	2.5	
2	1938.004	V	49.5	34.0	-1.0	48.5	33.0	76.0	56.0	27.5	23.0	100.0	354.4	
3	2135.099	H	49.4	34.1	0.1	49.5	34.2	76.0	56.0	26.5	21.8	100.0	236.4	
4	2136.338	V	49.4	33.9	0.1	49.5	34.0	76.0	56.0	26.5	22.0	100.0	88.8	
5	2266.302	H	48.1	32.3	0.8	48.9	33.1	76.0	56.0	27.1	22.9	100.0	329.1	
6	2400.480	H	50.5	37.5	1.3	51.8	38.8	76.0	56.0	24.2	17.2	100.0	302.8	

◆ 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

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Test Setup Photos and Configuration

Conducted Voltage Emissions



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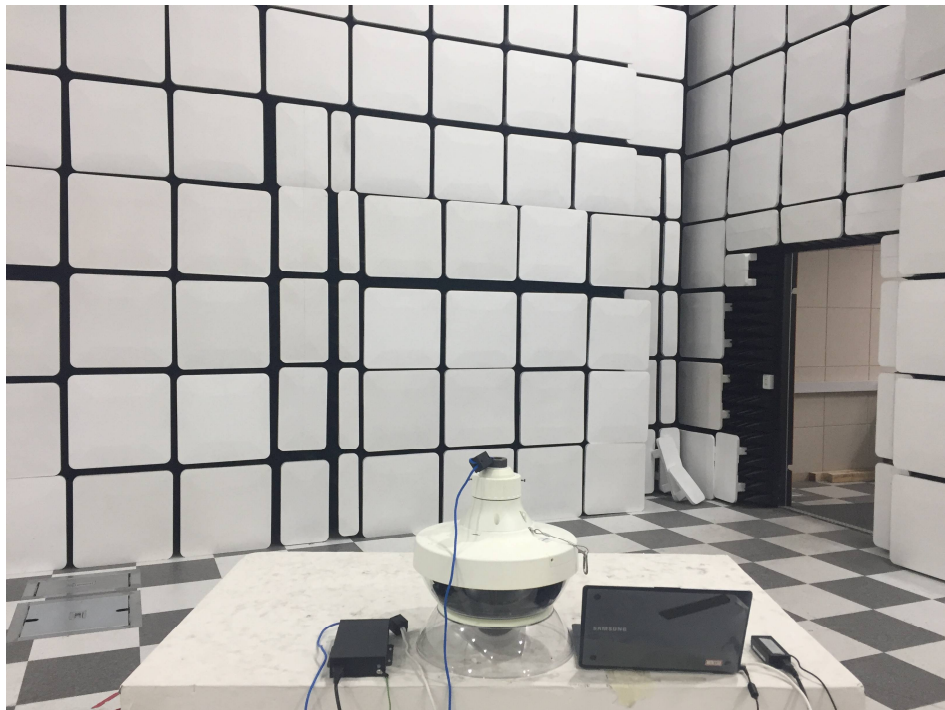
Test report No.:
KES-E1-18T0437
Page (22) of (28)

Conducted Telecommunication Emissions

N/A

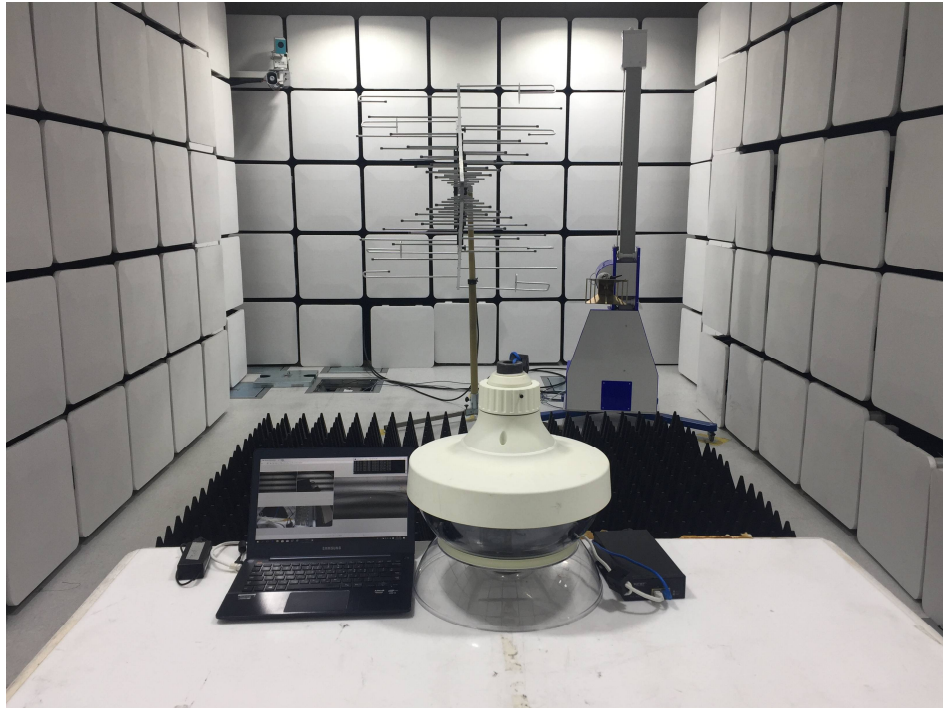
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Radiated Electric Field Emissions(Below 1 GHz)



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Radiated Electric Field Emissions(Above 1 GHz)



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EUT External Photographs

(Top)



(Bottom)



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EUT Internal Photographs

(Internal View)

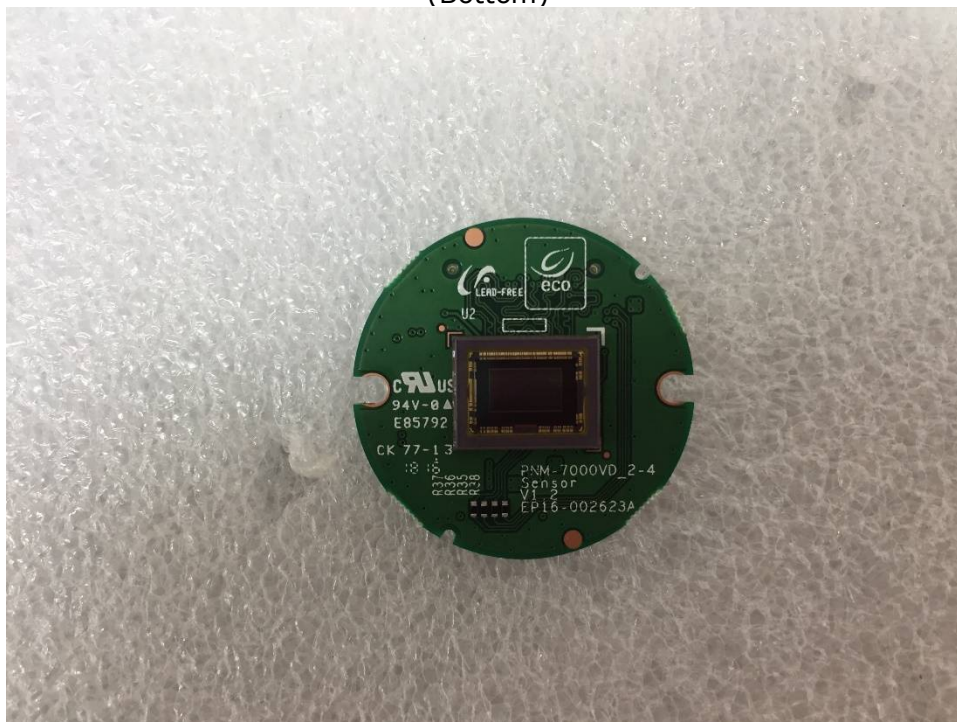


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(Top)



(Bottom)



EUT Internal View – LENS

(Top)



(Bottom)



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