EMC TEST REPORT For RCM

Test Report No.	:	KES-E1-18T0352-R1
Date of Issue	:	Jul. 27, 2020
Product name	:	2M LENS Module
Model/Type No.	:	SLA-2M2400Q
Variant Model	:	SLA-2M2402D
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	:	Jun. 12, 2018
Test date	:	Jun. 15, 2018
Test Results	:	☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Kang Hyeon, Kim
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.

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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Jun. 26, 2018	KES-E1-18T0352	Issued
Jul. 27, 2020	KES-E1-18T0352-R1	Reissue due to the addition of a derived model

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1.0 General Product Description

Main Specifications of EUT are:

SLA-2M2400Q
1/2.8" 2M CMOS
1945(H) x 1109(V) 2.16M
1945(H) x 1097(V) 2.13M
Progressive Scan
Color : 0.055Lux(F2.0, 1/30sec, 30IRE) B/W : 0.055Lux(F2.0, 1/30sec, 30IRE)
50dB
150dB
Electrical
2.4mm
F2.0
Fixed focal
M12 Lens module with main unit
Black / Plastic

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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 ☒ 240 Vac ☐ 100 Vac ☐ 24 Vac ☐ 12 Vdc ☐ PoE

Frequency ☒ 50 Hz ☐ 60 Hz ☐ Hz

1.2 Variant Model Differences

Added a simple variant model for the purpose of the vendor management and a country of origin for the dualization.

1.3 Device Modifications

Not applicable

1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
2M LENS Module	SLA-2M2400Q	-	Hanwha Techwin (Tianjin) Co.,Ltd	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Notebook	ProBook4430s	-	HP	-
Notebook Adaptor	SeriesPPP0009H	-	CHICONY POWER TECHNOLOGY (SUZHOU) CO.,LTD,	-
NETWORK CAMERA	PNM-9000VQ	-	Hanwha Techwin (Tianjin) Co.,Ltd	-
2M LENS Module	SLA-2M2800Q	-	Hanwha Techwin (Tianjin) Co.,Ltd	1EA
2M LENS Module	SLA-2M3600Q		Hanwha Techwin (Tianjin) Co.,Ltd	1EA
2M LENS Module	SLA-2M6000Q	-	Hanwha Techwin (Tianjin) Co.,Ltd	1EA
POE Adaptor	PT-PSE109GBRO-A	PT1817220025	PROCET	-

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1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	**I/O Port**	**Description**	**I/O Port**	**Length**	**Shield**
2M LENS Module (EUT)	-	NETWORK CAMERA	-	-	-
NETWORK CAMERA	-	2M LENS Module	-	-	-
	-	2M LENS Module	-	-	-
	-	2M LENS Module	-	-	-
	RJ-45	POE Adaptor	RJ-45	4.0	U
Notebook	RJ-45	POE Adaptor	RJ-45	4.0	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.

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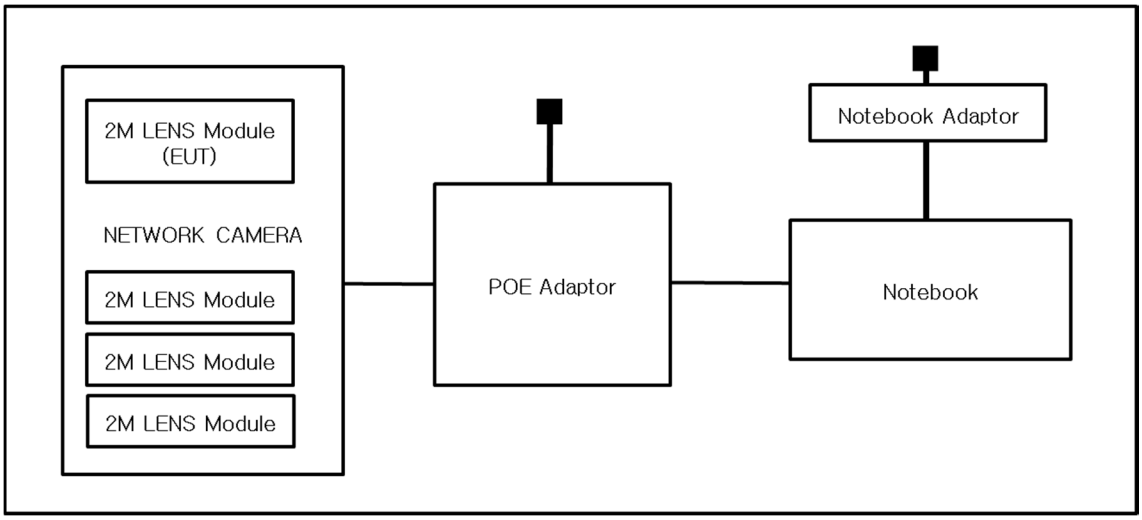
1.8 Configuration

■ 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, Yeoju-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-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 0003

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2.0 Test Regulations

The emissions tests were performed according to following regulations:

☐ **EMC – Directive 2014/30/EU**

☐ EN 61000-6-3:2011

☐ EN 61000-6-1:2007

☐ EN 61000-6-4:2007 +A1:2011

☐ EN 61000-6-2:2005

☐ EN 55011:2007 +A1:2010 ☐ Group 1 ☐ Group 2
☐ Class A ☐ 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

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☐ **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

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2.1 Conducted Emissions at Mains Power Ports

Test Date
Jun. 15, 2018

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, 25, 2019
☒	LISN	ENV216	R & S	101137	01, 31, 2019
☒	LISN	ENV216	R & S	101786	04, 25, 2019

Test Conditions
Temperature: 23,0 ℃
Relative Humidity: 48,6 % R.H.

Frequency Range of Measurement
150 ㎑ to 30 ㎒

Instrument Settings
IF Band Width: 9 ㎑

Test Results
The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks
See Appendix A for test data.

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2.2 Conducted Emissions at Telecommunication Ports

Test Date
N/A

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, 25, 2019
☐	LISN	ENV216	R & S	101137	01, 31, 2019
☐	LISN	ENV216	R & S	101786	04, 25, 2019
☐	8-WIRE ISN CAT3	CAT3 8158	SCHWARZBECK	8158-0019	03, 22, 2019
☐	8-WIRE ISN CAT5	CAT5 8158	SCHWARZBECK	8158-0030	03, 22, 2019
☐	8-WIRE ISN CAT6	NTFM 8158	SCHWARZBECK	8158-0029	08, 10, 2018

Test Conditions
Temperature: ℃
Relative Humidity: % R.H.

Frequency Range of Measurement
150 ㎑ to 30 ㎒

Instrument Settings
IF Band Width: 9 ㎑

Test Results
The requirements are:

☐ PASS
☐ NOT PASS
☒ NOT APPLICABLE

Remarks
N/A

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2.3 Radiated Electric Field Emissions(Below 1 ㎓)

Test Date
Jun. 15, 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 Conditions
Temperature: 22,0 ℃
Relative Humidity: 56,2 % R.H.

Frequency Range of Measurement
30 ㎒ to 1 ㎓

Instrument Settings
IF Band Width: 120 ㎑

Test Results
The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks
See Appendix A for test data.

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2.4 Radiated Electric Field Emissions(Above 1 ㎓)

Test Date
Jun. 15, 2018

Test Location
SEMI ANECHOIC CHAMBER #2

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
☒	EMI Test S/W	e3	AUDIX	8.083b	-
☒	EMI TEST RECEIVER	ESU26	R & S	100552	04, 18, 2019
☒	PREAMPLIFIER	8449B	AGILENT	8008A01640	01, 11, 2019
☐	ATTENUATOR	8491A	HP	32173	03, 21, 2019
☒	LOG-PERIODIC ANTENNA	STLP 9149	SCHWARZBECK	9149-255	05, 18, 2019

Test Conditions
Temperature: 23,0 ℃
Relative Humidity: 48,6 % R.H.

Frequency Range of Measurement
1 ㎓ to 6 ㎓

Instrument Settings
IF Band Width: 1 ㎒

Test Results
The requirements are:

☒ PASS
☐ NOT PASS
☐ NOT APPLICABLE

Remarks
See Appendix A for test data.

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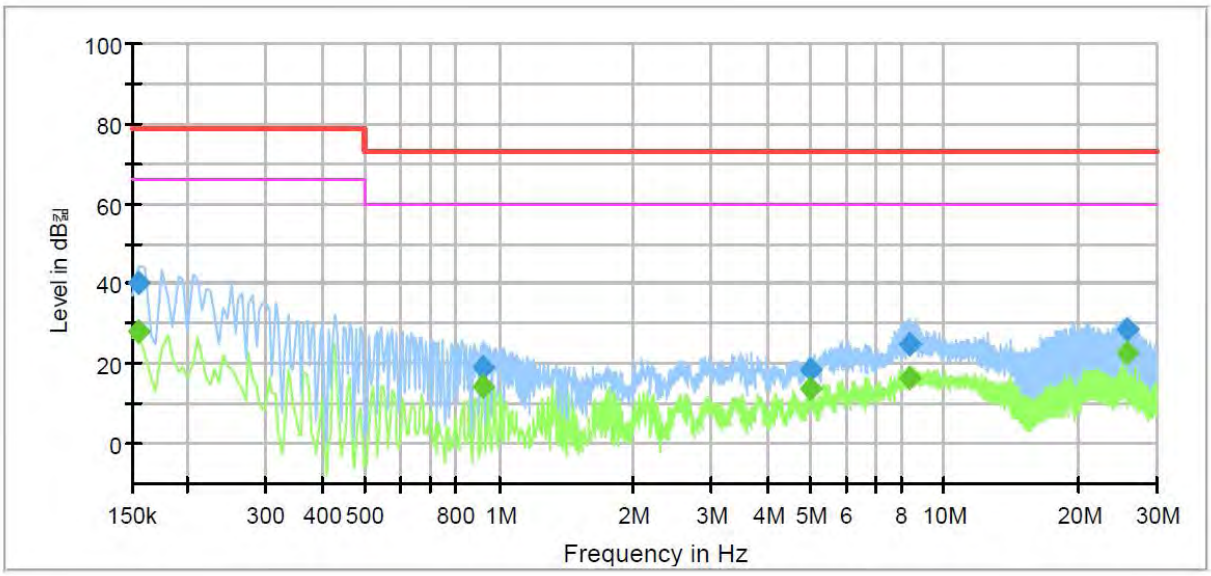
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

HOT LINE

Common Information

Test Description:	Conducted Emission
Model No.:	SLA-2M2400Q
Mode	RCM
Operator Name:	KES



Final_Result

Frequency (MHz)	QuasiPeak (dB㎶)	CAverage (dB㎶)	Limit (dB㎶)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	27.86	66.00	38.14	1000.0	9.000	L1	9.6
0.155000	40.40	---	79.00	38.60	1000.0	9.000	L1	9.6
0.920000	---	14.23	60.00	45.77	1000.0	9.000	L1	10.0
0.920000	18.83	---	73.00	54.17	1000.0	9.000	L1	10.0
4.990000	---	14.05	60.00	45.95	1000.0	9.000	L1	10.0
4.990000	18.52	---	73.00	54.48	1000.0	9.000	L1	10.0
8.320000	---	16.41	60.00	43.59	1000.0	9.000	L1	9.8
8.320000	25.15	---	73.00	47.85	1000.0	9.000	L1	9.8
25.755000	---	22.70	60.00	37.30	1000.0	9.000	L1	10.2
25.755000	28.35	---	73.00	44.65	1000.0	9.000	L1	10.2

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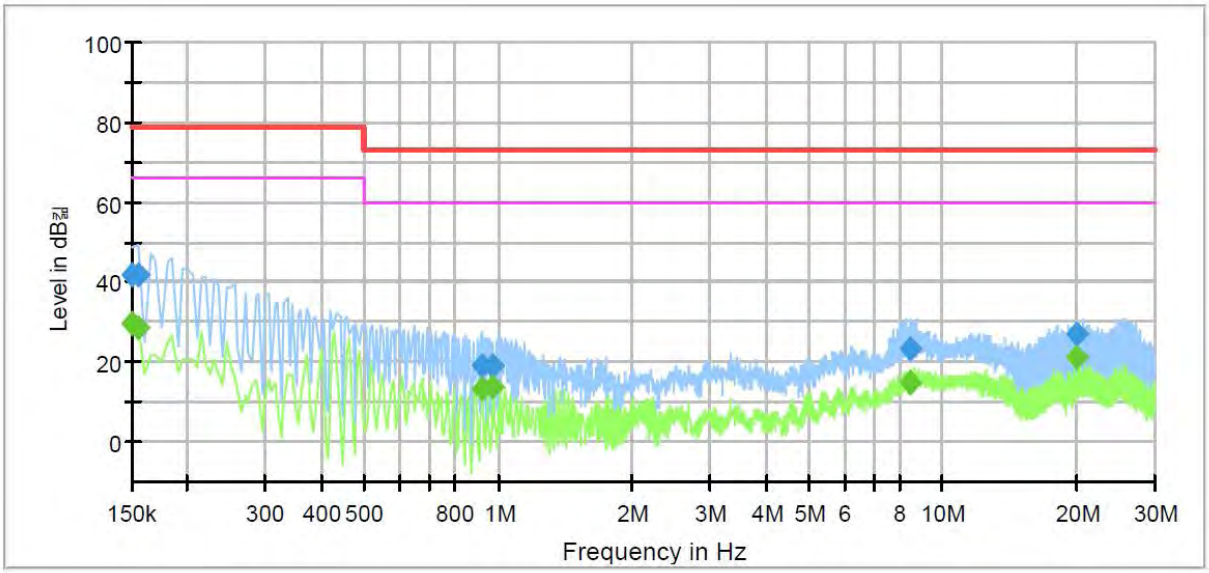
NEUTRAL LINE

Common Information

Test Description:	Conducted Emission
Model No.:	SLA-2M2400Q
Mode	REM
Operator Name:	KES



Final_Result

Frequency (MHz)	QuasiPeak (dB㎶)	CAverage (dB㎶)	Limit (dB㎶)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.150000	---	29.42	66.00	36.58	1000.0	9.000	N	9.6
0.150000	41.60	---	79.00	37.40	1000.0	9.000	N	9.6
0.155000	---	28.70	66.00	37.30	1000.0	9.000	N	9.6
0.155000	41.69	---	79.00	37.31	1000.0	9.000	N	9.6
0.915000	---	13.12	60.00	46.88	1000.0	9.000	N	10.0
0.915000	19.25	---	73.00	53.75	1000.0	9.000	N	10.0
0.975000	---	14.01	60.00	45.99	1000.0	9.000	N	10.0
0.975000	19.16	---	73.00	53.84	1000.0	9.000	N	10.0
8.410000	---	14.92	60.00	45.08	1000.0	9.000	N	9.8
8.410000	23.58	---	73.00	49.42	1000.0	9.000	N	9.8
19.955000	---	21.38	60.00	38.62	1000.0	9.000	N	10.2
19.955000	26.86	---	73.00	46.14	1000.0	9.000	N	10.2

♦ Calculation
QuasiPeak[㎶uV] / CAverage [㎶uV] = Reading Value[㎶uV] + Corr. [㎶]
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

[10 Mbps]

N/A

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[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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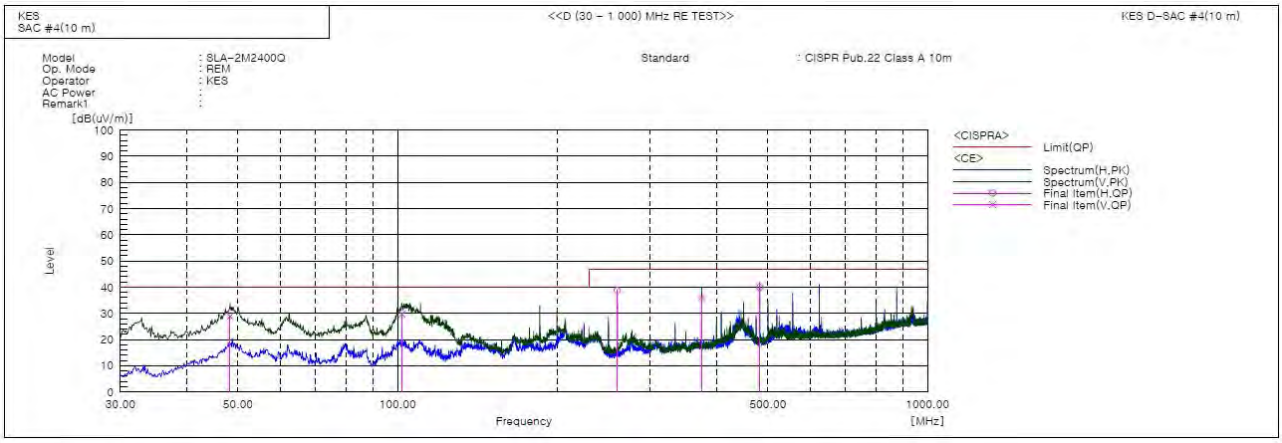
Radiated Electric Field Emissions(Below 1 ㎓)



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	48.309	V	57.3	-28.5	28.8	40.0	11.2	150.0	322.0	
2	101.901	V	58.7	-29.0	29.7	40.0	10.3	100.0	194.0	
3	259.890	H	64.9	-26.1	38.8	47.0	8.2	400.0	251.0	
4	374.956	V	58.4	-22.4	36.0	47.0	11.0	400.0	215.0	
5	482.626	H	59.3	-19.4	39.9	47.0	7.1	200.0	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

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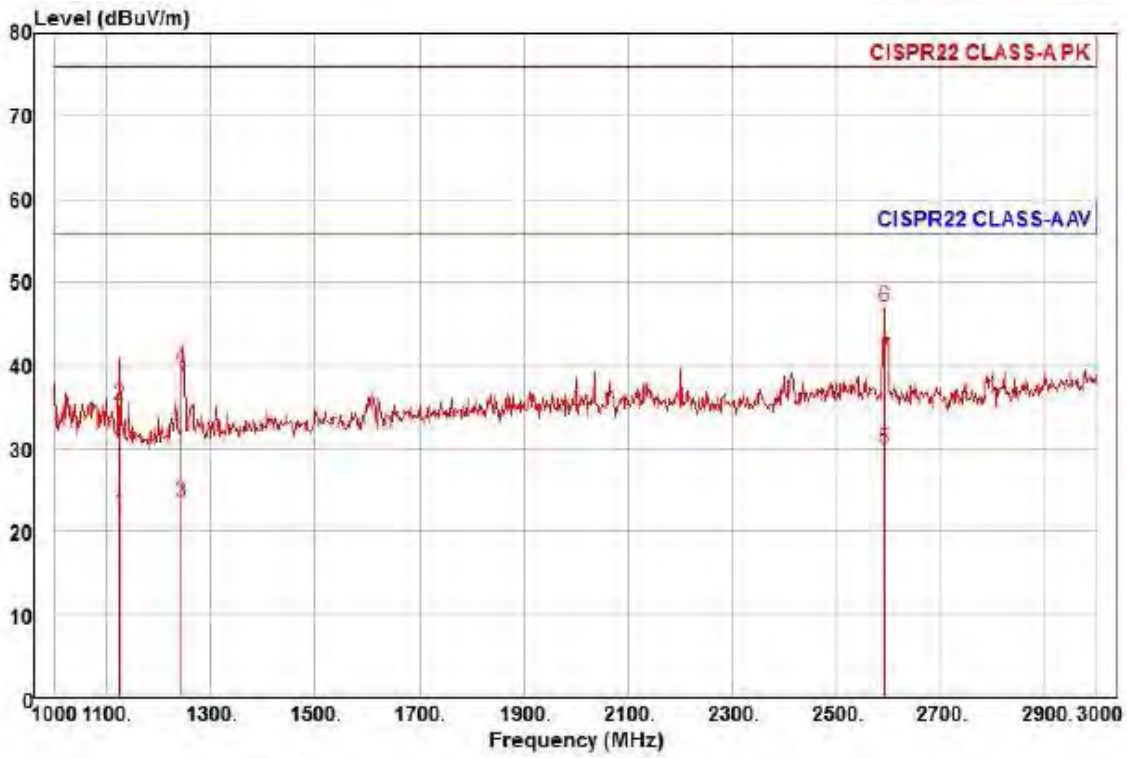
Radiated Electric Field Emissions(Above 1 GHz)



Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SLA-2M2400
Mode : REM
Memo : (1 ~ 3) GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1124.00	32.50	22.88	6.31	39.49	158	56.00	-33.80	horizontal	Average
2	1124.00	45.59	22.88	6.31	39.49	158	76.00	-40.71	horizontal	Peak
3	1244.00	32.68	23.24	6.65	39.03	237	56.00	-32.46	horizontal	Average
4	1244.00	48.97	23.24	6.65	39.03	237	76.00	-36.17	horizontal	Peak
5 pp	2594.00	30.22	27.95	9.85	38.07	222	56.00	-26.05	horizontal	Average
6 pk	2594.00	47.37	27.95	9.85	38.07	222	76.00	-28.90	horizontal	Peak

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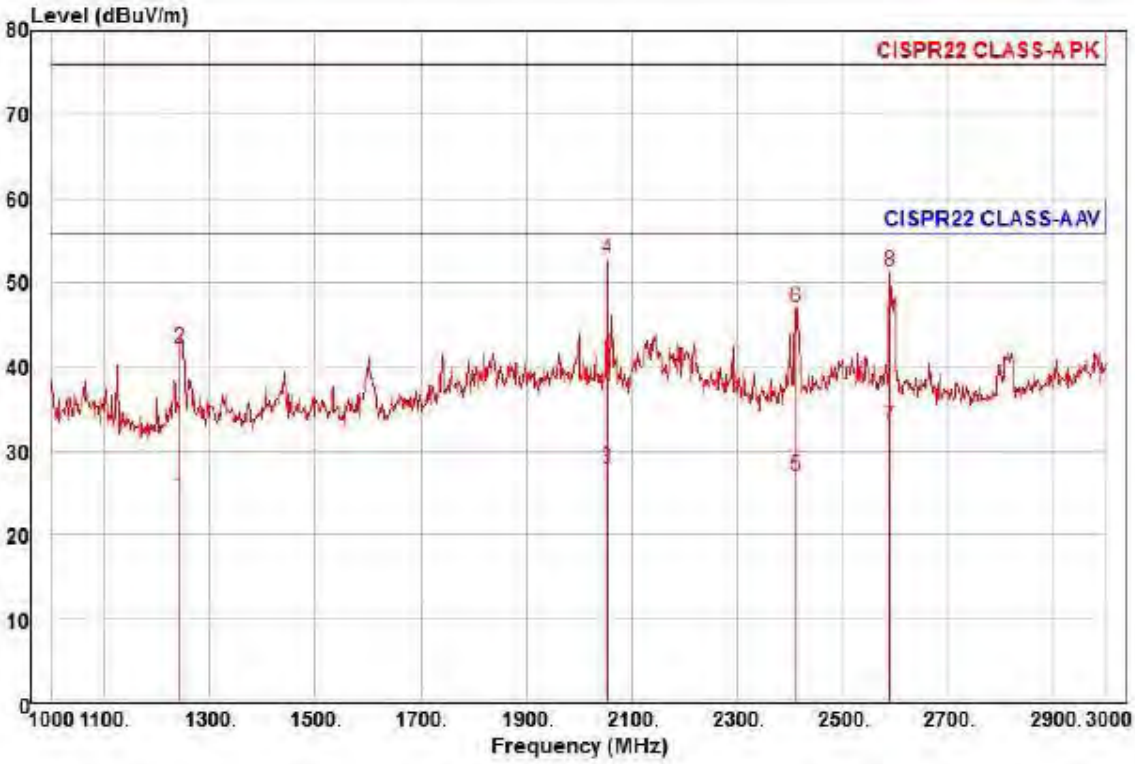

Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SLA-2M2400
Mode : REM
Memo : (1 ~ 3) GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1244.00	33.77	23.24	6.65	39.03	183	56.00	-31.37	vertical	Average
2	1244.00	51.28	23.24	6.65	39.03	183	76.00	-33.86	vertical	Peak
3	2054.00	31.40	26.17	8.60	38.33	119	56.00	-28.16	vertical	Average
4 pk	2054.00	56.30	26.17	8.60	38.33	119	76.00	-23.26	vertical	Peak
5	2412.00	28.35	27.26	9.43	38.10	168	56.00	-29.06	vertical	Average
6	2412.00	48.50	27.26	9.43	38.10	168	76.00	-28.91	vertical	Peak
7 pp	2590.00	33.17	27.93	9.84	38.07	236	56.00	-23.13	vertical	Average
8	2590.00	51.70	27.93	9.84	38.07	236	76.00	-24.60	vertical	Peak

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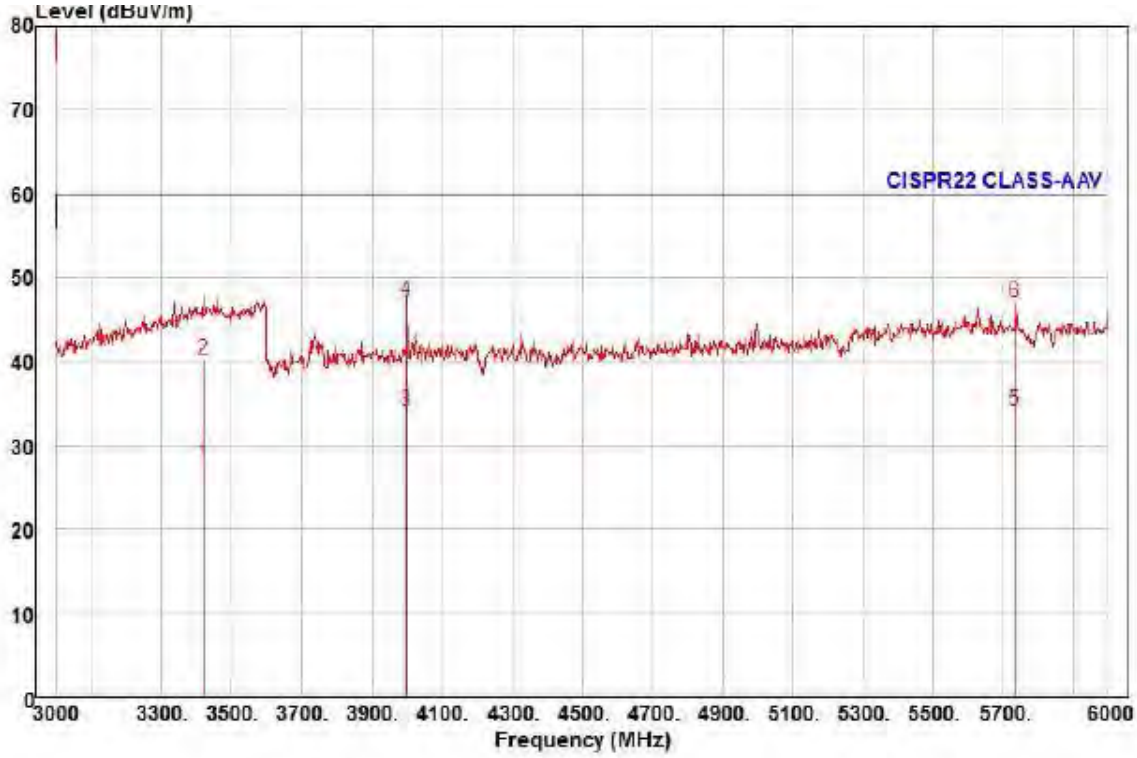

Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SLA-2M2400
Mode : REM
Memo : (3 ~ 6) GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3417.00	23.78	30.92	11.45	38.27	130	60.00	-32.12	horizontal	Average
2	3417.00	36.26	30.92	11.45	38.27	130	80.00	-39.64	horizontal	Peak
3	3999.00	27.31	32.50	12.19	37.84	338	60.00	-25.84	horizontal	Average
4 pk	3999.00	40.48	32.50	12.19	37.84	338	80.00	-32.67	horizontal	Peak
5 pp	5736.00	21.70	35.72	15.03	38.21	2	60.00	-25.76	horizontal	Average
6	5736.00	34.54	35.72	15.03	38.21	2	80.00	-32.92	horizontal	Peak

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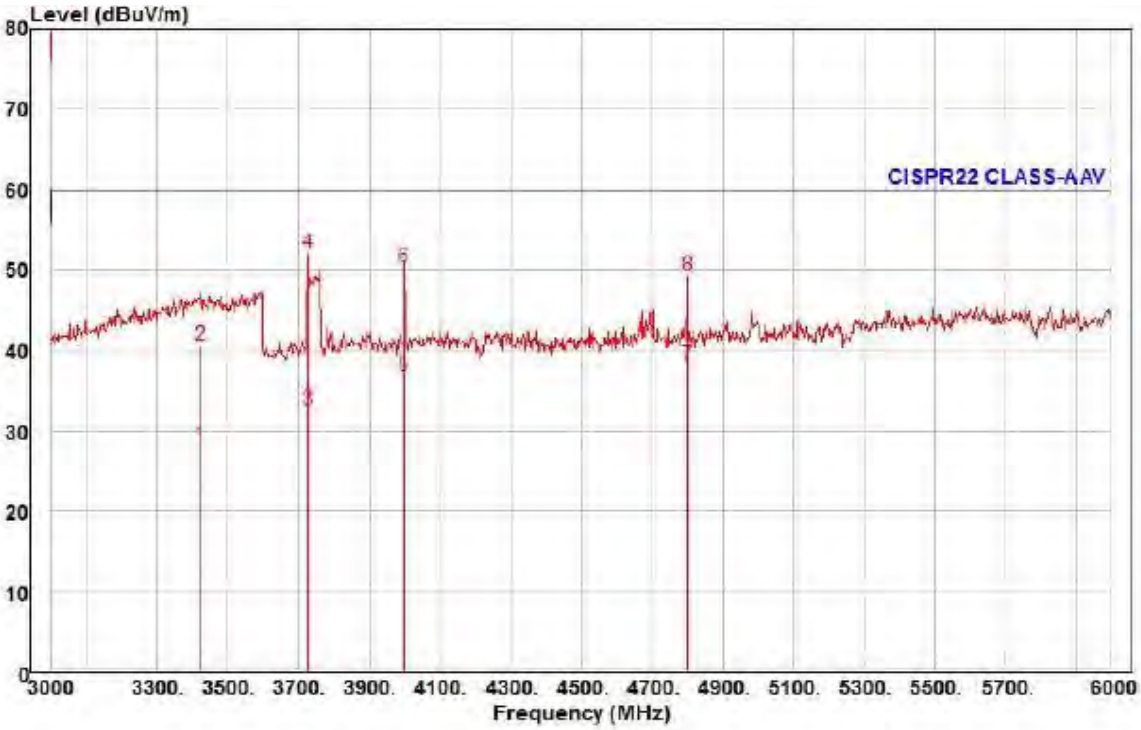

Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SLA-2M2400
Mode : REM
Memo : (3 ~ 6) GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3423.00	24.05	30.93	11.46	38.27	3	60.00	-31.83	vertical	Average
2	3423.00	36.46	30.93	11.46	38.27	3	80.00	-39.42	vertical	Peak
3	3726.00	27.24	31.76	11.75	38.08	18	60.00	-27.33	vertical	Average
4 pk	3726.00	46.75	31.76	11.75	38.08	18	80.00	-27.82	vertical	Peak
5	3999.00	29.97	32.50	12.19	37.84	353	60.00	-23.18	vertical	Average
6	3999.00	43.57	32.50	12.19	37.84	353	80.00	-29.58	vertical	Peak
7 pp	4800.00	29.92	32.99	13.39	38.12	0	60.00	-21.82	vertical	Average
8	4800.00	41.05	32.99	13.39	38.12	0	80.00	-30.69	vertical	Peak

♦ Calculation
Result(PK/CAV) [dB(㎶/m)] = (Reading(PK/CAV)[dB(㎶)] + c.f[dB(1/m)]
Margin(PK/CAV)[dB] = Limit[dB(㎶/m)] - Result(PK/CAV) [dB(㎶/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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Conducted Telecommunication Emissions

N/A

N/A

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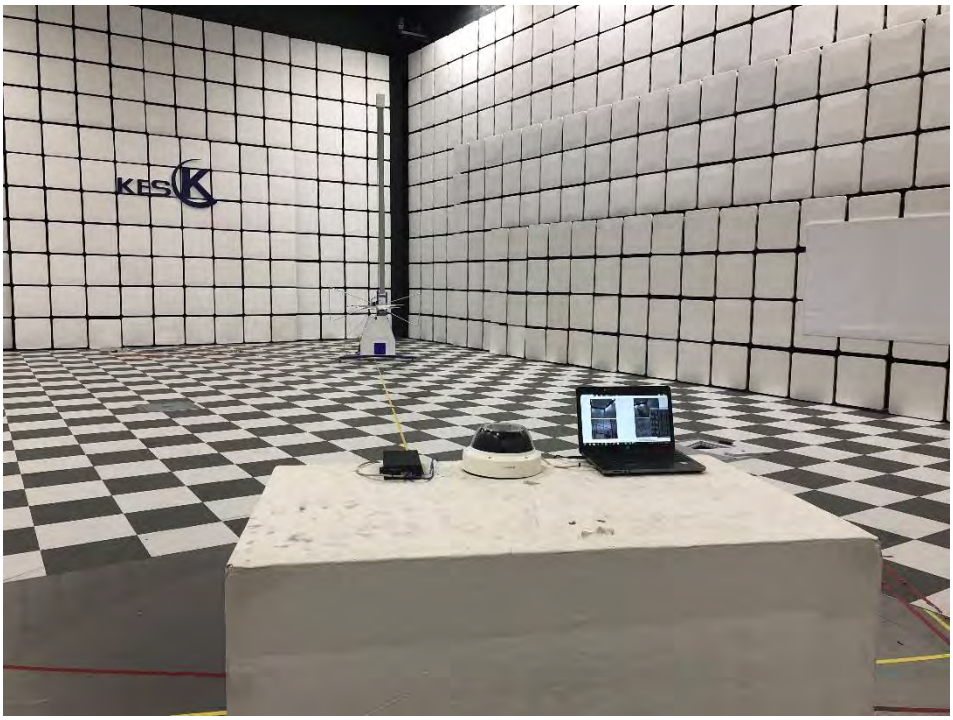
Radiated Electric Field Emissions(Below 1 ㎓)



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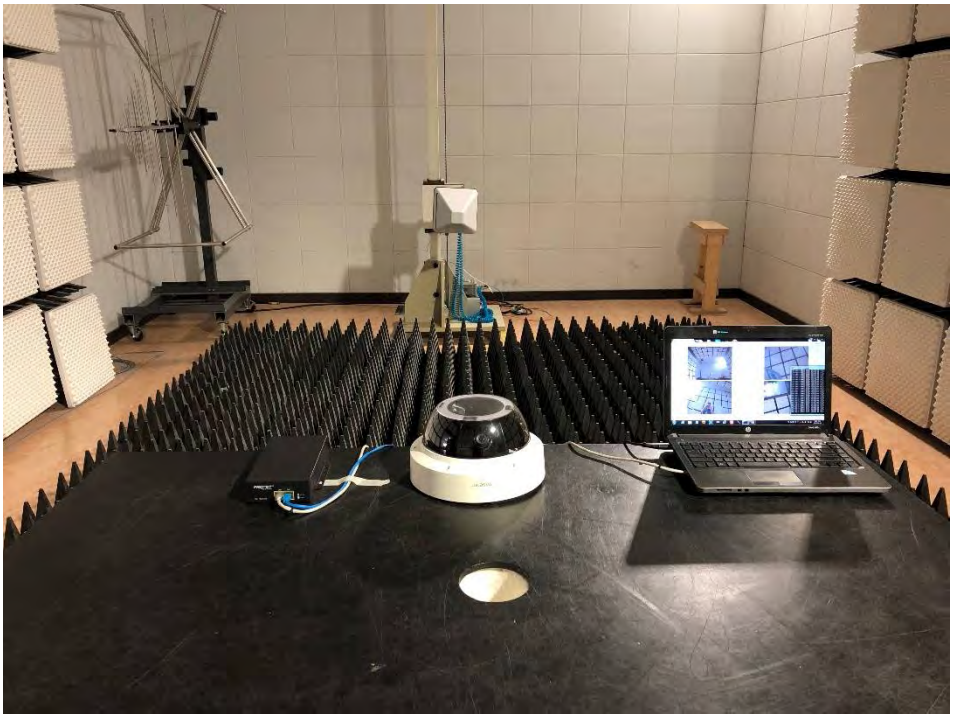
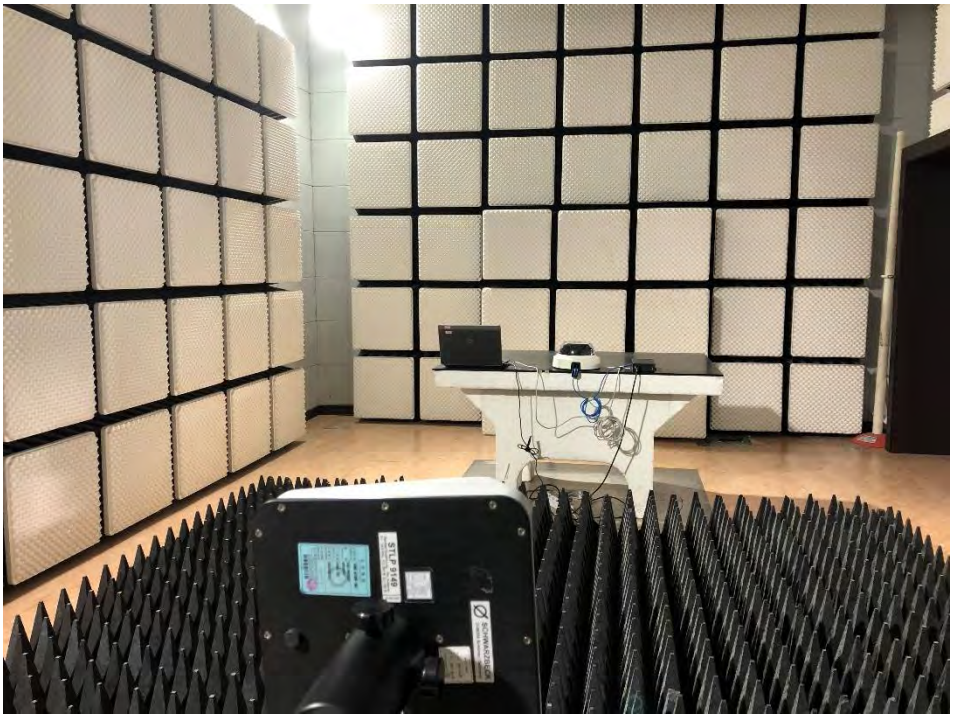
Radiated Electric Field Emissions(Above 1 ㎓)





EUT External Photographs

(Top)

(Bottom)

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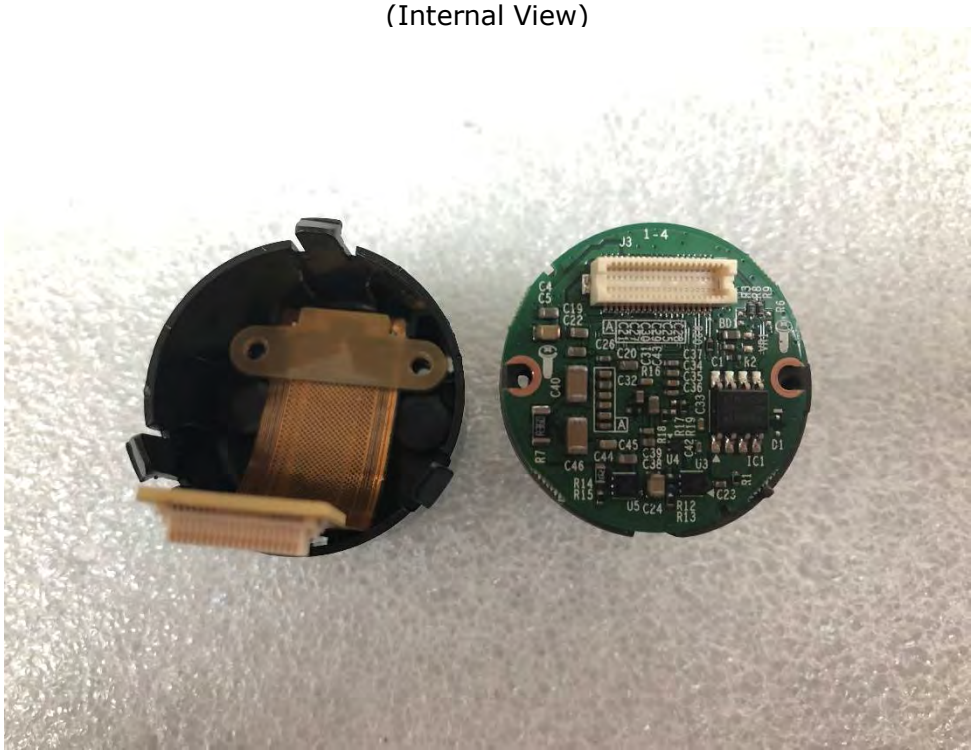
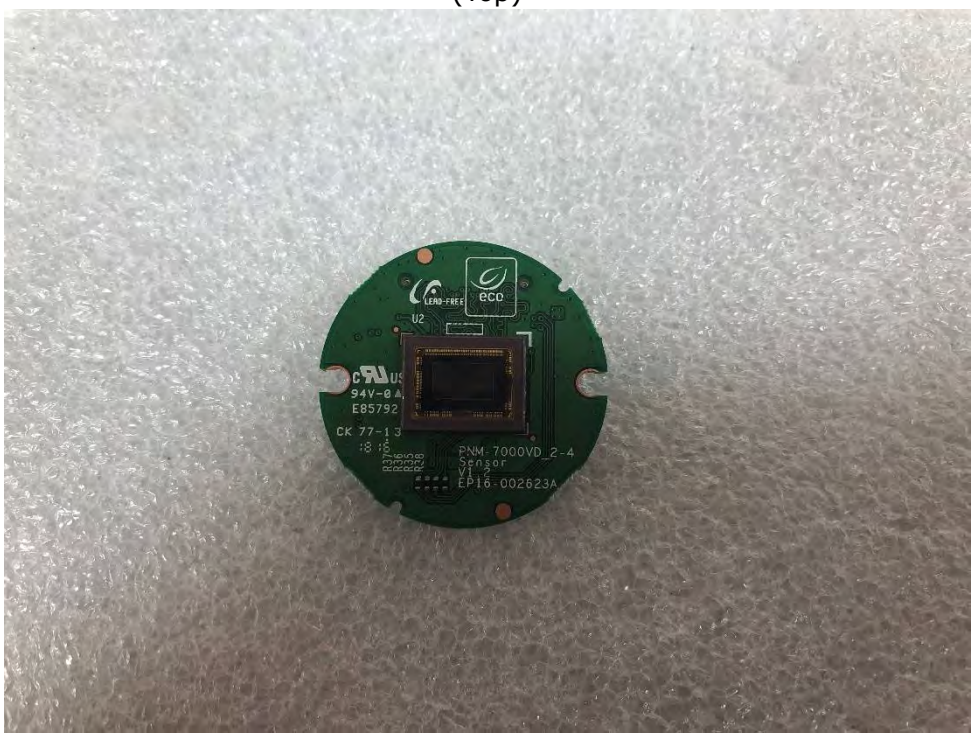
EUT Internal Photographs

(Internal View)



EUT Internal View – Board 1

(Top)



(Bottom)