



EMC TEST REPORT For VCCI

Test Report No. : KES-E1-18T0368

Date of Issue : Jun. 26, 2018

Product name : 5M LENS Module

Model/Type No. : SLA-5M3700Q

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)

Equipment authorization : ☐ Declaration of Conformity
☒ Verification
☐ Certification

Date of Receipt : Jun. 12, 2018

Test date : Jun. 12, 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 KOLAS.

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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Jun. 26, 2018	KES-E1-18T0368	Issued

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1.0 General Product Description

Main Specifications of EUT are:

SLA-5M3700Q
1/1.8" 5M CMOS
3096(H) x 2094(V)
2616(H) x 1976(V)
Progressive Scan
Color : 0.16Lux(F1.6, 1/30sec, 30IRE) B/W : 0.16Lux(F1.6, 1/30sec, 30IRE)
50dB
120dB
Electrical
3.7mm
F1.6
H:97.5°, V:71.9°, D:126.2°
-
-
Fixed focal
M12 Lens module with main unit
Black / Plastic



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 ☒ 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
5M LENS Module	SLA-5M3700Q	-	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	-
5M LENS Module	SLA-5M4600Q	-	Hanwha Techwin (Tianjin) Co.,Ltd	1EA
5M LENS Module	SLA-5M7000Q	-	Hanwha Techwin (Tianjin) Co.,Ltd	2EA
POE Adaptor	PT-PSE109GBRO-A	PT1817220025	PROCET	-



1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
5M LENS Module (EUT)	-	NETWORK CAMERA	-	-	-
NETWORK CAMERA	-	5M LENS Module	-	-	-
	-	5M LENS Module	-	-	-
	RJ-45	POE Adaptor	RJ-45	4.0	U
Notebook	RJ-45	POE Adaptor	RJ-45	4.0	U

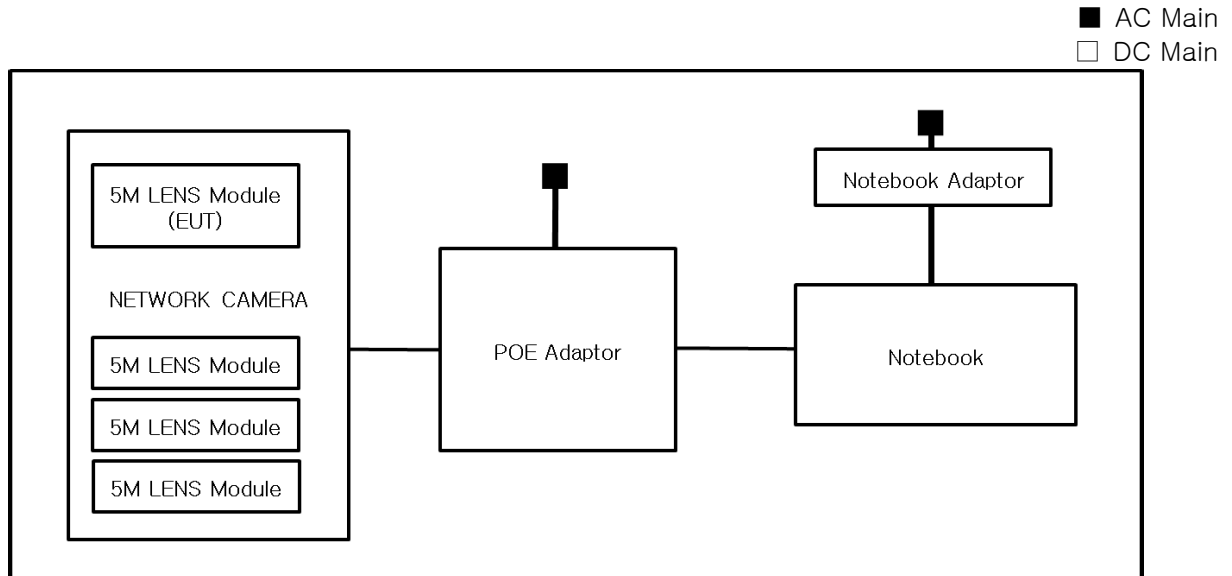
* Unshielded=U, Shielded=S

1.7 EUT Operating Mode(s)

Test mode	operating
PoE	EUT Monitoring, Ping Test

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

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. 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 61547 :2009

☐ EN 55032:2015

☐ Class A

☐ Class B

☐ EN 55024:2010 +A1:2015

☐ EN 50130-4:2011 +A1:2014

☐ EN 61000-3-2:2014

☐ EN 61000-3-3:2013

☐ EN 61326-1:2013



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

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2.1 Conducted Emissions Mains Power Ports

Test Date

Jun. 12, 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: 22,9 °C
Relative Humidity: 48,6 % 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 #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: °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

Jun. 12, 2018

Test Location

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

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 °C
Relative Humidity: 54,1 % 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

Jun. 12, 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: 22,9 °C
Relative Humidity: 48,6 % 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.



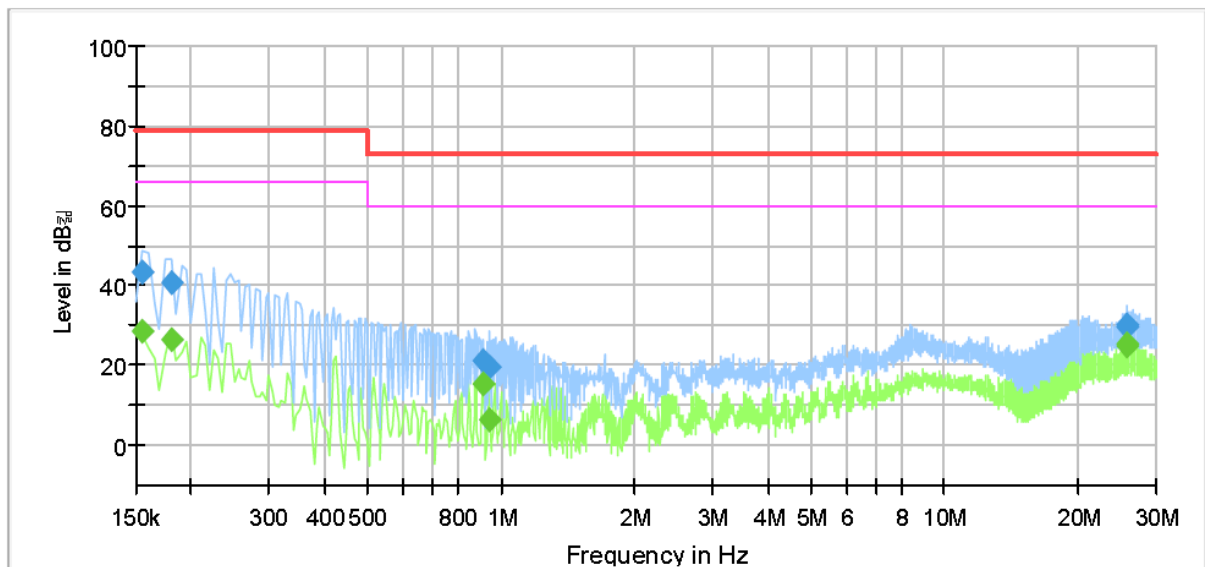
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

HOT LINE

Common Information

Test Description: Conducted Emission
Model No.: SLA-5M3700Q
Mode: VCCI
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	---	28.41	66.00	37.59	1000.0	9.000	L1	9.6
0.155000	43.25	---	79.00	35.75	1000.0	9.000	L1	9.6
0.180000	---	26.50	66.00	39.50	1000.0	9.000	L1	9.6
0.180000	40.67	---	79.00	38.33	1000.0	9.000	L1	9.6
0.905000	---	15.64	60.00	44.36	1000.0	9.000	L1	10.1
0.905000	21.07	---	73.00	51.93	1000.0	9.000	L1	10.1
0.945000	---	6.55	60.00	53.45	1000.0	9.000	L1	10.0
0.945000	19.82	---	73.00	53.18	1000.0	9.000	L1	10.0
25.660000	---	24.64	60.00	35.36	1000.0	9.000	L1	10.2
25.660000	29.77	---	73.00	43.23	1000.0	9.000	L1	10.2
25.665000	---	25.27	60.00	34.73	1000.0	9.000	L1	10.2
25.665000	30.23	---	73.00	42.77	1000.0	9.000	L1	10.2



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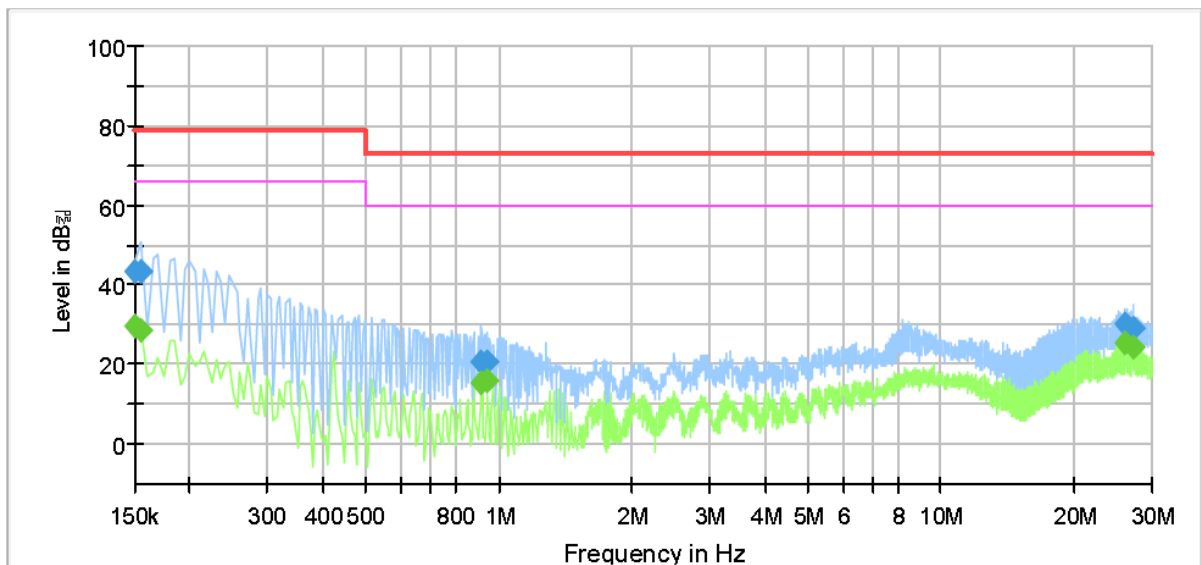
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NEUTRAL LINE

Common Information

Test Description: Conducted Emission
Model No.: SLA-5M3700Q
Mode: VCCI
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	---	29.77	66.00	36.23	1000.0	9.000	N	9.6
0.150000	43.34	---	79.00	35.66	1000.0	9.000	N	9.6
0.155000	---	28.49	66.00	37.51	1000.0	9.000	N	9.6
0.155000	43.59	---	79.00	35.41	1000.0	9.000	N	9.6
0.910000	---	15.31	60.00	44.69	1000.0	9.000	N	9.9
0.910000	20.67	---	73.00	52.33	1000.0	9.000	N	9.9
0.940000	---	16.05	60.00	43.95	1000.0	9.000	N	10.0
0.940000	20.78	---	73.00	52.22	1000.0	9.000	N	10.0
26.050000	---	25.49	60.00	34.51	1000.0	9.000	N	10.2
26.050000	30.44	---	73.00	42.56	1000.0	9.000	N	10.2
27.230000	---	24.30	60.00	35.70	1000.0	9.000	N	10.2
27.230000	29.35	---	73.00	43.65	1000.0	9.000	N	10.2

◆ 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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Conducted Emissions at Telecommunication Ports

[10 Mbps]

N/A

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[100 Mbps]

N/A

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

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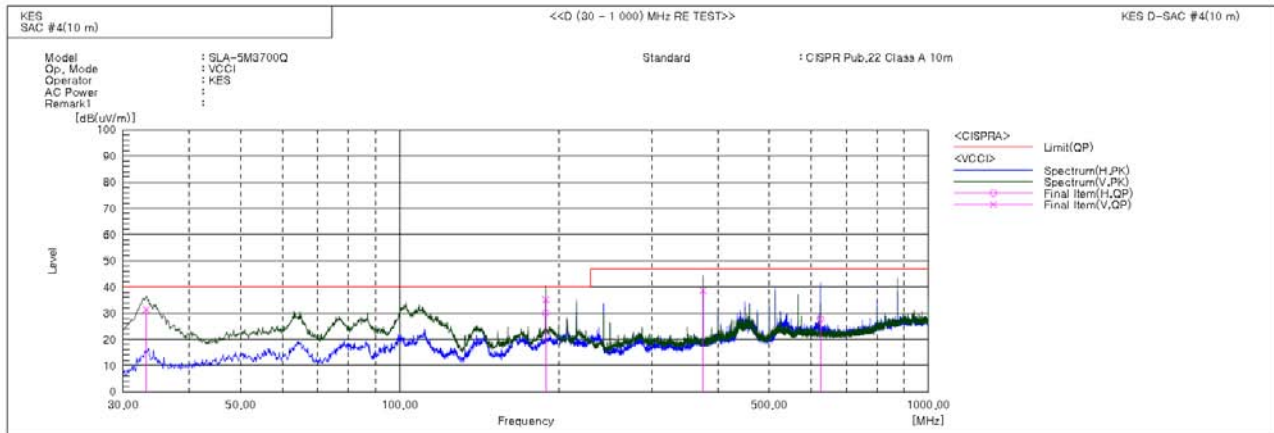


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Radiated Electric Field Emissions(Below 1 GHz)



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	33.153	V	64.0	-32.6	31.4	40.0	8.6	100.0	328.0	
2	188.959	H	58.8	-28.8	30.0	40.0	10.0	400.0	199.0	
3	188.959	V	63.9	-28.8	35.1	40.0	4.9	100.0	49.0	
4	374.956	V	61.0	-22.4	38.6	47.0	8.4	100.0	236.0	
5	625.095	H	43.5	-15.6	27.9	47.0	19.1	100.0	201.0	

◆ Calculation

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

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

Correction Factor : ANT FACTOR + Cable loss

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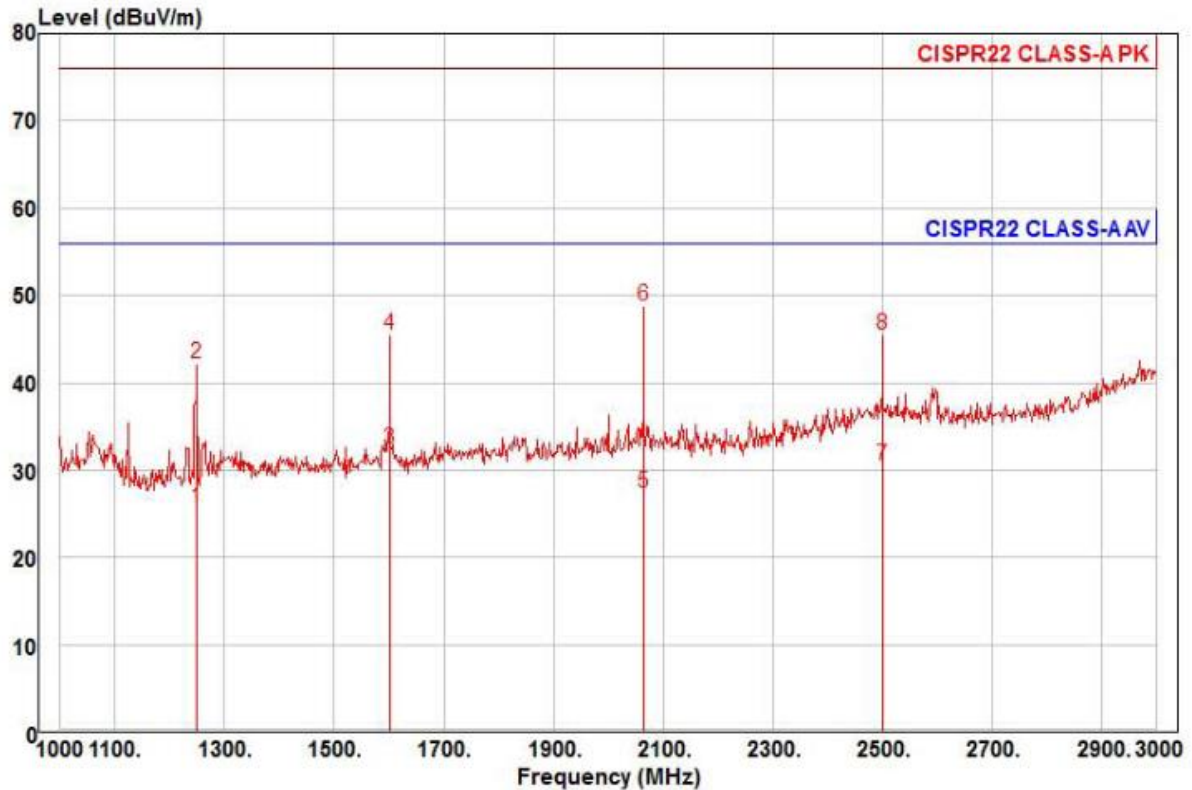


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Radiated Electric Field Emissions(Above 1 GHz)



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-5M3700
Mode : VCCI
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	1250.00	34.61	23.26	6.67	39.00	306	56.00	-30.46	horizontal	Average
2	1250.00	51.19	23.26	6.67	39.00	306	76.00	-33.88	horizontal	Peak
3 pp	1600.00	38.59	24.42	7.55	38.11	134	56.00	-23.55	horizontal	Average
4	1600.00	51.60	24.42	7.55	38.11	134	76.00	-30.54	horizontal	Peak
5	2064.00	30.96	26.20	8.62	38.32	13	56.00	-28.54	horizontal	Average
6 pk	2064.00	52.31	26.20	8.62	38.32	13	76.00	-27.19	horizontal	Peak
7	2500.00	31.38	27.53	9.63	38.04	22	56.00	-25.50	horizontal	Average
8	2500.00	46.33	27.53	9.63	38.04	22	76.00	-30.55	horizontal	Peak

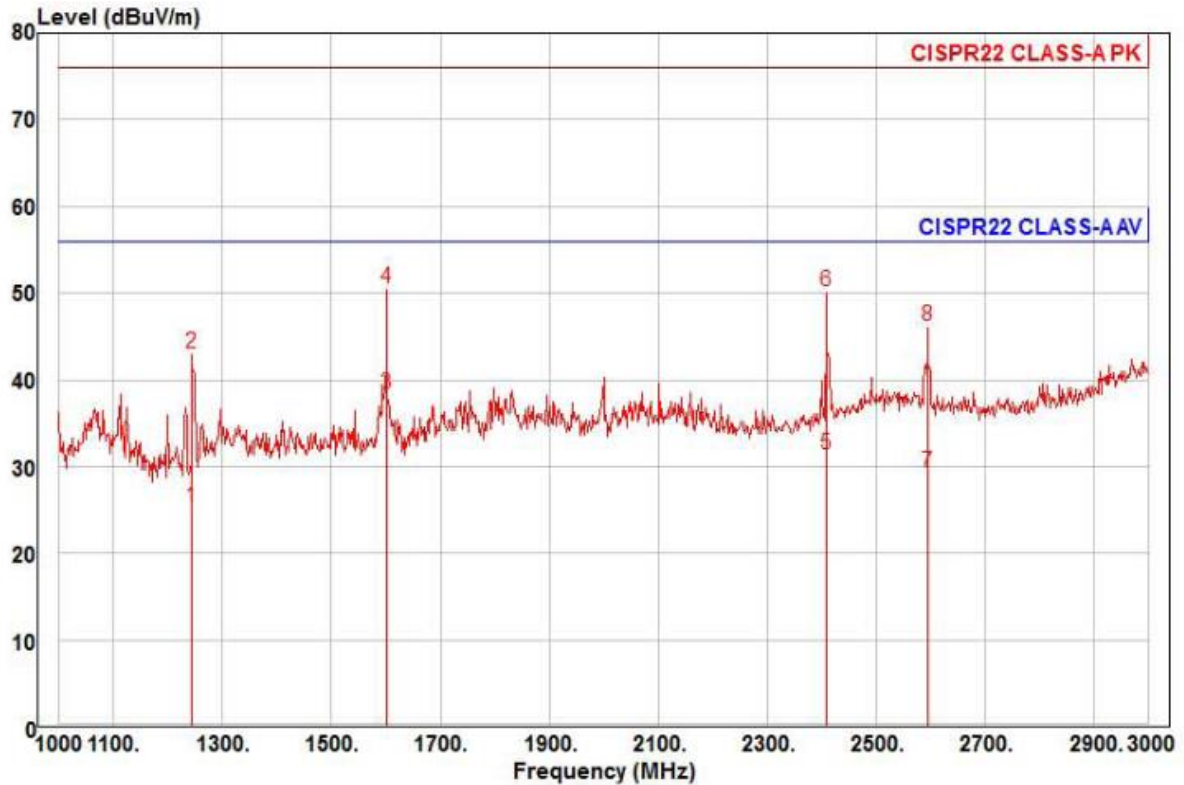
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Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SLA-5M3700
Mode : VCCI
Memo : (1 ~ 3) GHz

	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	34.33	23.24	6.65	39.03	188	56.00	-30.81	vertical	Average
2	1244.00	52.24	23.24	6.65	39.03	188	76.00	-32.90	vertical	Peak
3 pp	1600.00	44.51	24.42	7.55	38.11	341	56.00	-17.63	vertical	Average
4 pk	1600.00	56.73	24.42	7.55	38.11	341	76.00	-25.41	vertical	Peak
5	2410.00	32.71	27.26	9.42	38.10	355	56.00	-24.71	vertical	Average
6	2410.00	51.70	27.26	9.42	38.10	355	76.00	-25.72	vertical	Peak
7	2596.00	29.53	27.95	9.85	38.07	306	56.00	-26.74	vertical	Average
8	2596.00	46.53	27.95	9.85	38.07	306	76.00	-29.74	vertical	Peak

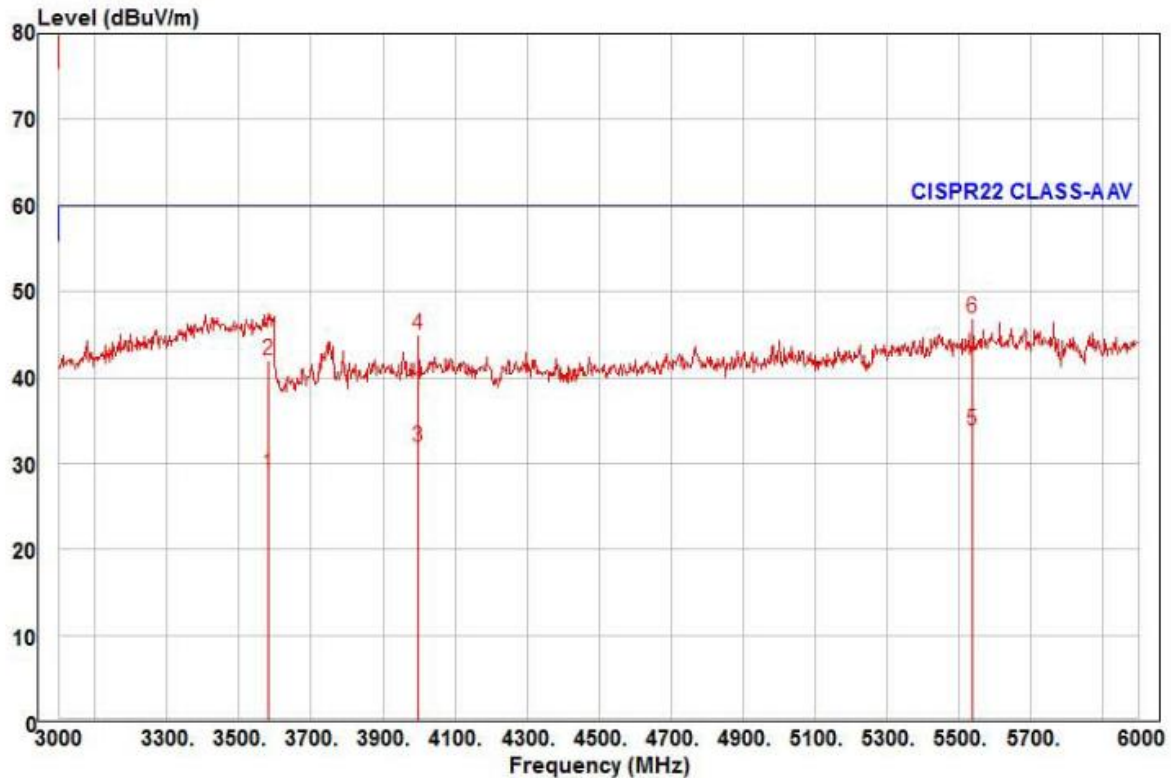
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Test report No.:
KES-E1-18T0368
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Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SLA-5M3700
Mode : VCCI
Memo : (3 ~ 6) GHz

		Read	Ant	Cable	Preamp	TPos	Limit	Over		
	Freq	Level	Factor	Loss	Factor		Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3582.00	23.99	31.37	11.60	38.21	89	60.00	-31.25	horizontal	Average
2	3582.00	37.30	31.37	11.60	38.21	89	80.00	-37.94	horizontal	Peak
3	3999.00	24.99	32.50	12.19	37.84	40	60.00	-28.16	horizontal	Average
4	3999.00	38.19	32.50	12.19	37.84	40	80.00	-34.96	horizontal	Peak
5 pp	5541.00	21.94	35.43	14.64	38.15	110	60.00	-26.14	horizontal	Average
6 pk	5541.00	35.01	35.43	14.64	38.15	110	80.00	-33.07	horizontal	Peak

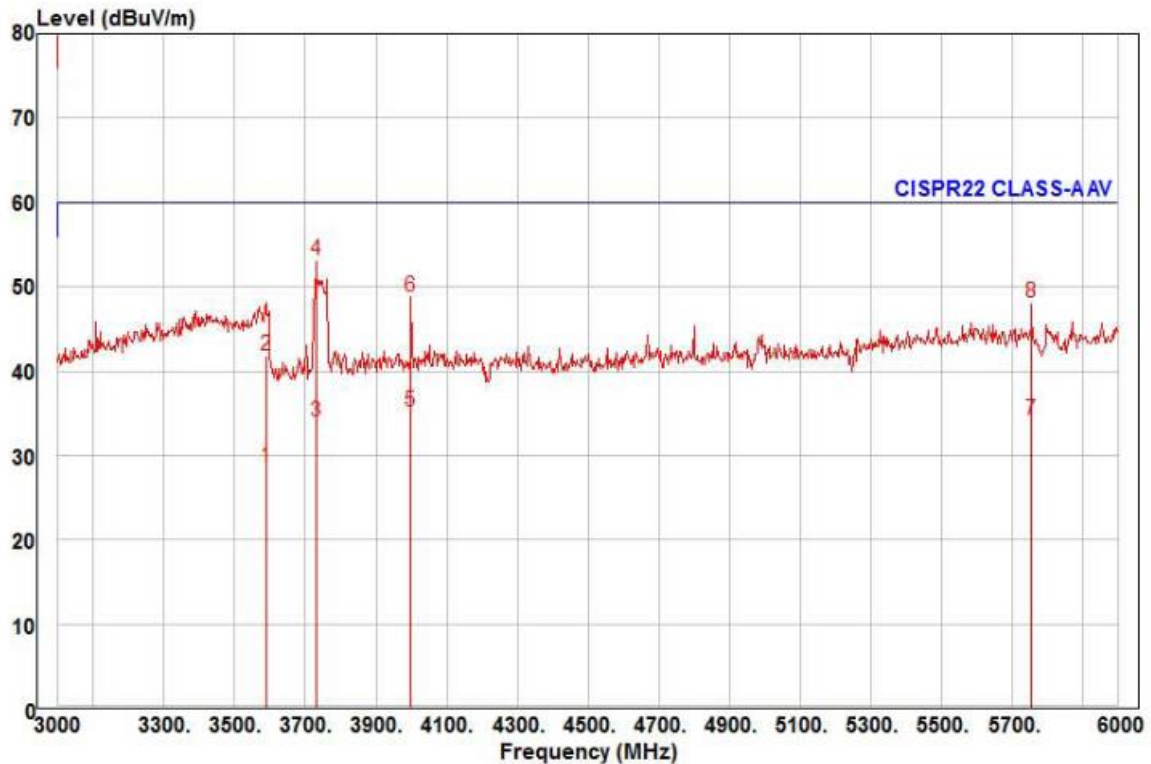
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Test report No.:
KES-E1-18T0368
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Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SLA-5M3700
Mode : VCCI
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	3588.00	23.83	31.39	11.61	38.20	249	60.00	-31.37	vertical	Average
2	3588.00	37.03	31.39	11.61	38.20	249	80.00	-38.17	vertical	Peak
3	3732.00	28.45	31.78	11.76	38.08	330	60.00	-26.09	vertical	Average
4 pk	3732.00	47.77	31.78	11.76	38.08	330	80.00	-26.77	vertical	Peak
5 pp	3999.00	28.37	32.50	12.19	37.84	355	60.00	-24.78	vertical	Average
6	3999.00	41.94	32.50	12.19	37.84	355	80.00	-31.21	vertical	Peak
7	5757.00	21.51	35.76	15.07	38.22	153	60.00	-25.88	vertical	Average
8	5757.00	35.59	35.76	15.07	38.22	153	80.00	-31.80	vertical	Peak

◆ 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

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Test Setup Photos and Configuration

Conducted Voltage Emissions



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Test report No.:
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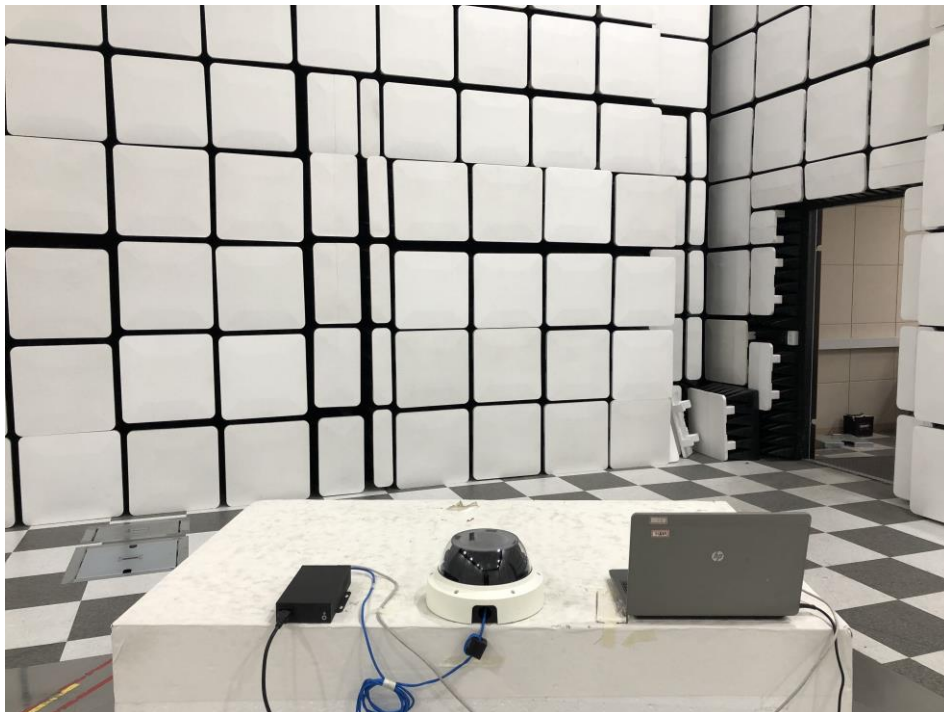
Conducted Telecommunication Emissions

N/A

N/A

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Radiated Electric Field Emissions(Below 1 GHz)



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Radiated Electric Field Emissions(Above 1 GHz)



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EUT External Photographs

(Top)



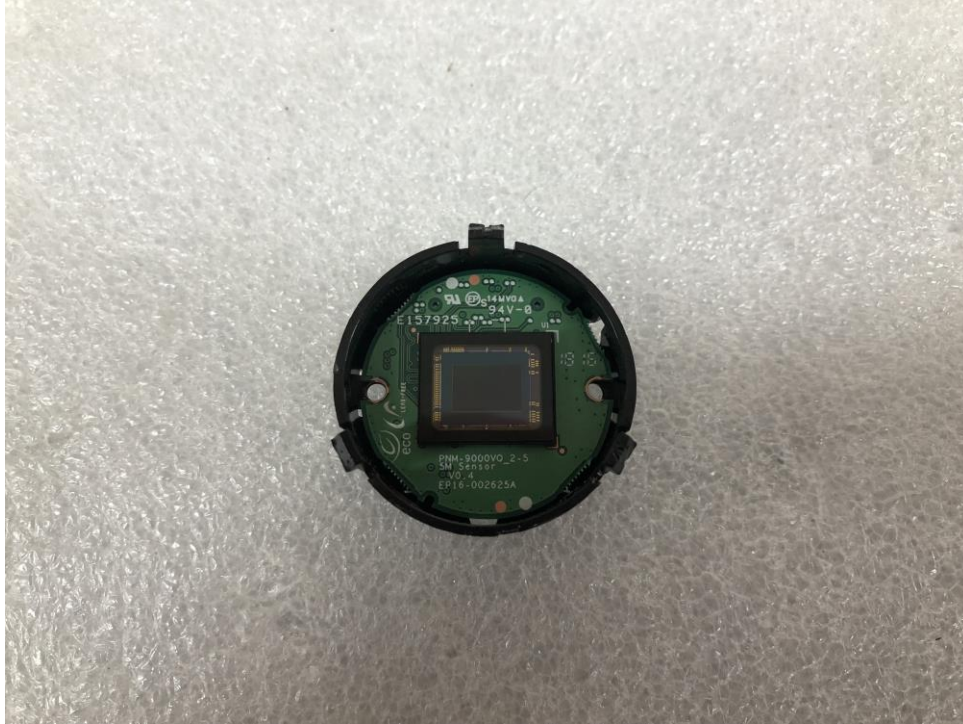
(Bottom)



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EUT Internal Photographs

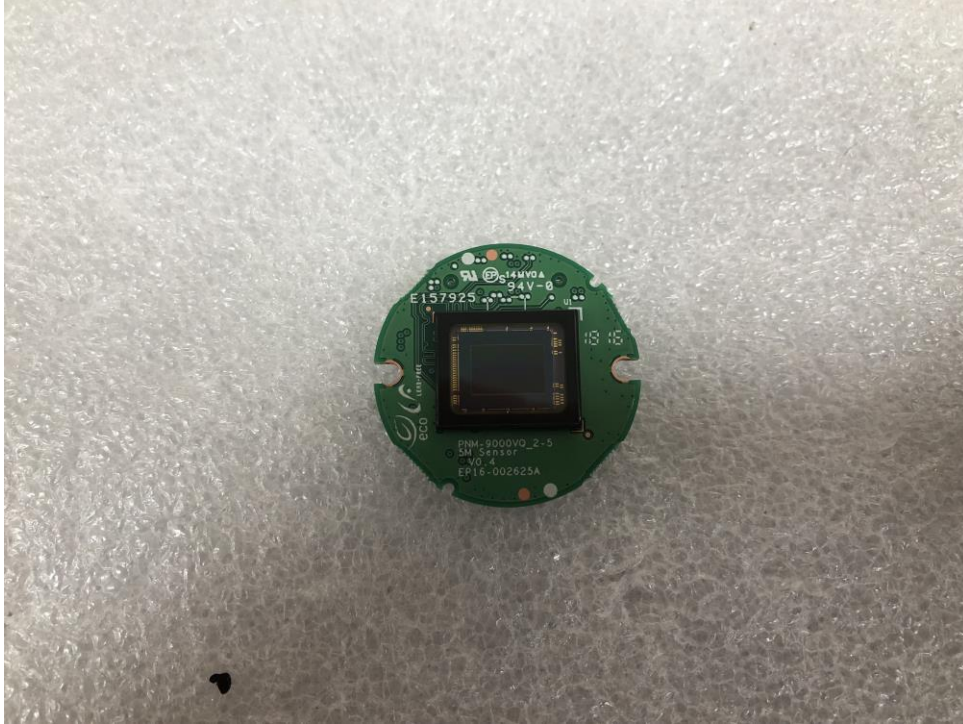
(Internal View)



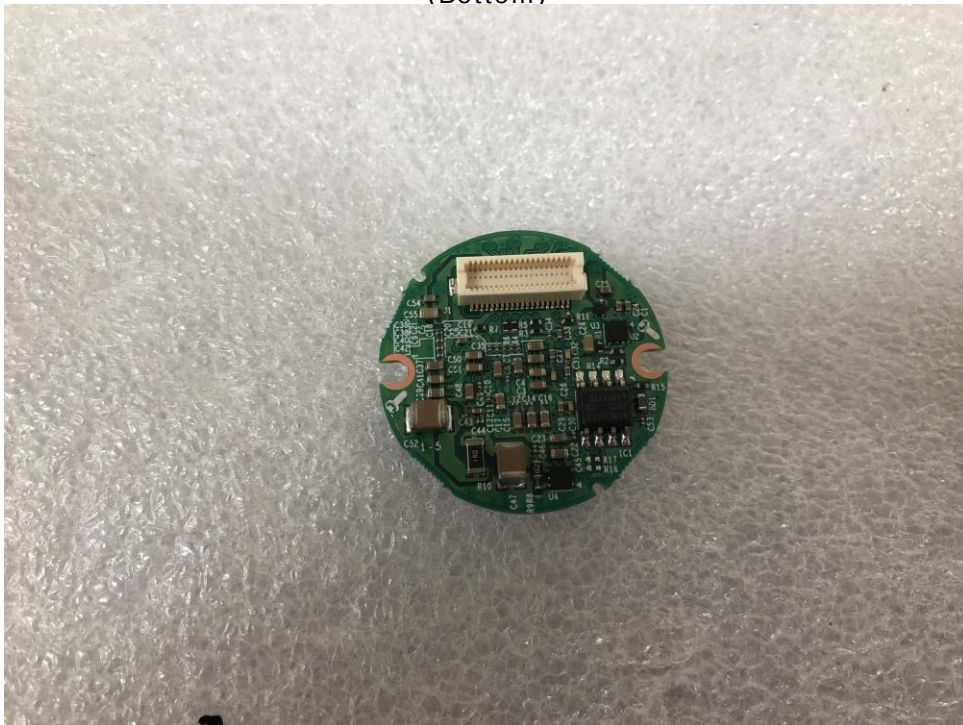
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EUT Internal View – Board 1

(Top)



(Bottom)



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