



EMC TEST REPORT For RCM

Test Report No. : KES-E1-18T0378

Date of Issue : Jun. 26, 2018

Product name : 5M LENS Module

Model/Type No. : SLA-5M7000Q

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 : Jun. 12, 2018

Test date : Jun. 14, 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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Test report No.:
KES-E1-18T0378
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REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Jun. 26, 2018	KES-E1-18T0378	Issued

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1.0 General Product Description

Main Specifications of EUT are:

SLA-5M7000Q
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
7mm
F1.6
H:50.7°, V:37.8°, D:63.8°
-
-
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 ☒ 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
5M LENS Module	SLA-5M7000Q	-	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-5M3700Q	-	Hanwha Techwin (Tianjin) Co.,Ltd	1EA
5M LENS Module	SLA-5M4600Q	-	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	-	-	-
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

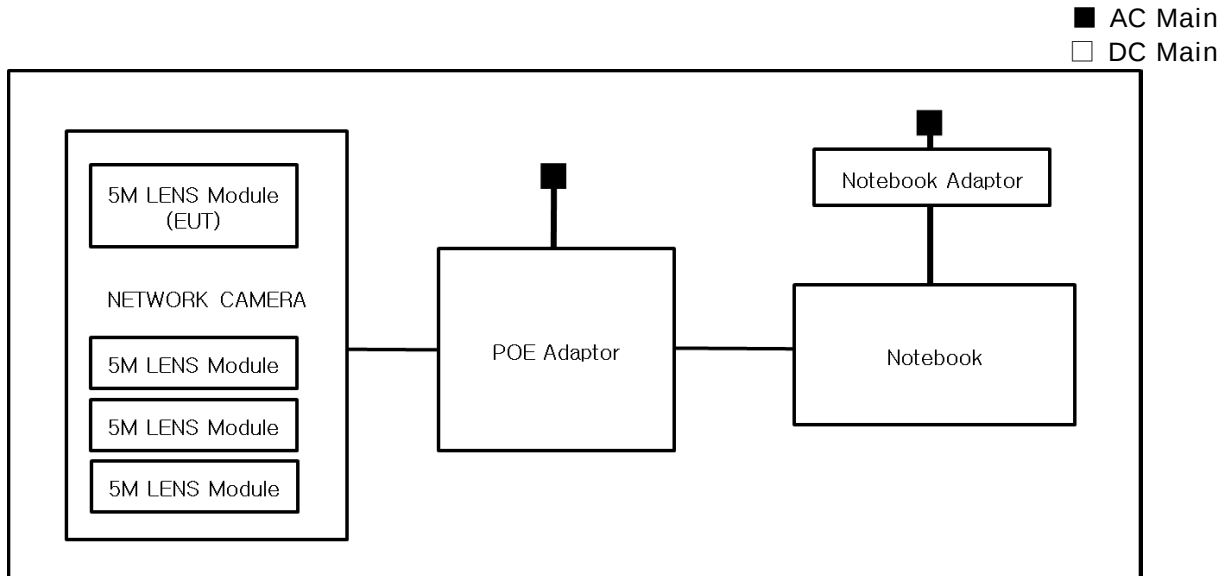
* Unshielded=U, Shielded=S

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 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

Jun. 14, 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: 23,1 °C
Relative Humidity: 48,7 % 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 #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. 14, 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: 21,5 °C
Relative Humidity: 57,4 % 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. 14, 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: 23,1 °C
Relative Humidity: 48,7 % 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.

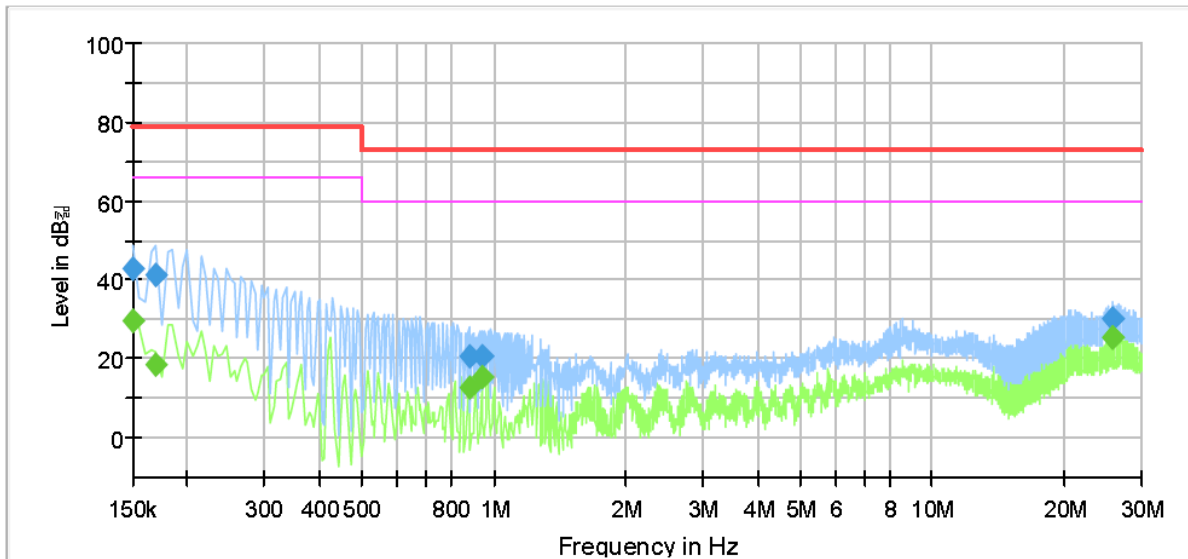
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

HOT LINE

Common Information

Test Description:	Conducted Emission
Model No.:	SLA-5M7000Q
Mode	REM
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	---	29.58	66.00	36.42	1000.0	9.000	L1	9.6
0.150000	42.91	---	79.00	36.09	1000.0	9.000	L1	9.6
0.170000	---	18.50	66.00	47.50	1000.0	9.000	L1	9.6
0.170000	41.46	---	79.00	37.54	1000.0	9.000	L1	9.6
0.880000	---	12.84	60.00	47.16	1000.0	9.000	L1	10.0
0.880000	20.71	---	73.00	52.29	1000.0	9.000	L1	10.0
0.940000	---	15.25	60.00	44.75	1000.0	9.000	L1	10.0
0.940000	20.81	---	73.00	52.19	1000.0	9.000	L1	10.0
25.665000	---	25.33	60.00	34.67	1000.0	9.000	L1	10.2
25.665000	30.45	---	73.00	42.55	1000.0	9.000	L1	10.2
25.860000	---	25.38	60.00	34.62	1000.0	9.000	L1	10.2
25.860000	30.35	---	73.00	42.65	1000.0	9.000	L1	10.2

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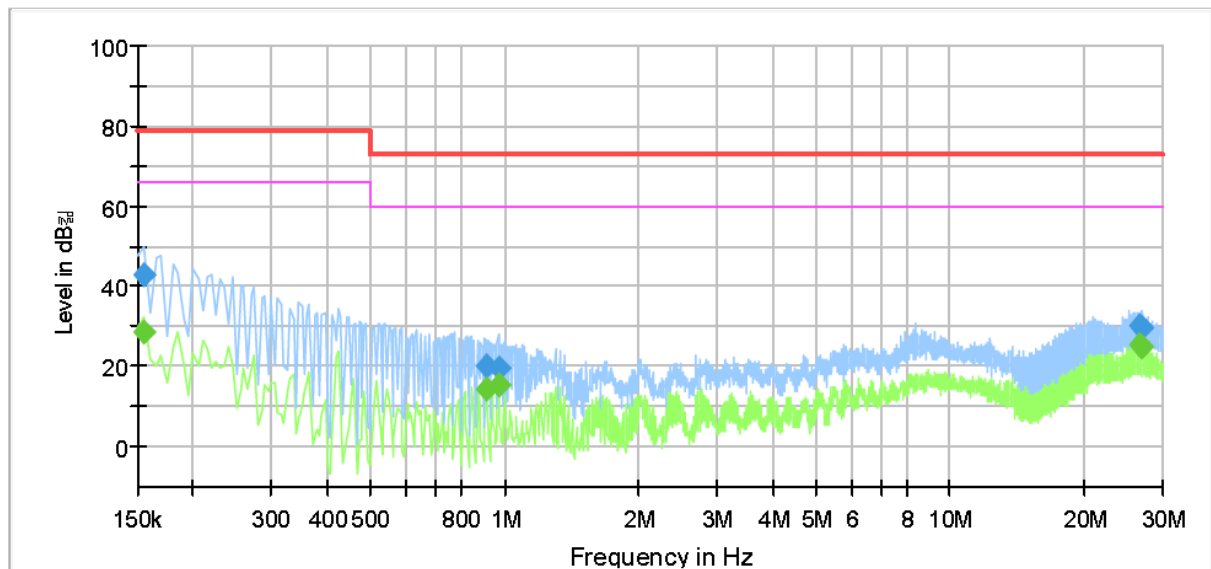
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NEUTRAL LINE

Common Information

Test Description: Conducted Emission
Model No.: SLA-5M7000Q
Mode: REM
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	---	28.56	66.00	37.44	1000.0	9.000	N	9.6
0.155000	42.65	---	79.00	36.35	1000.0	9.000	N	9.6
0.905000	---	14.33	60.00	45.67	1000.0	9.000	N	9.9
0.905000	20.15	---	73.00	52.85	1000.0	9.000	N	9.9
0.970000	---	15.15	60.00	44.85	1000.0	9.000	N	10.0
0.970000	19.71	---	73.00	53.29	1000.0	9.000	N	10.0
26.550000	---	25.52	60.00	34.48	1000.0	9.000	N	10.2
26.550000	30.34	---	73.00	42.66	1000.0	9.000	N	10.2
26.845000	---	24.70	60.00	35.30	1000.0	9.000	N	10.2
26.845000	29.76	---	73.00	43.24	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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[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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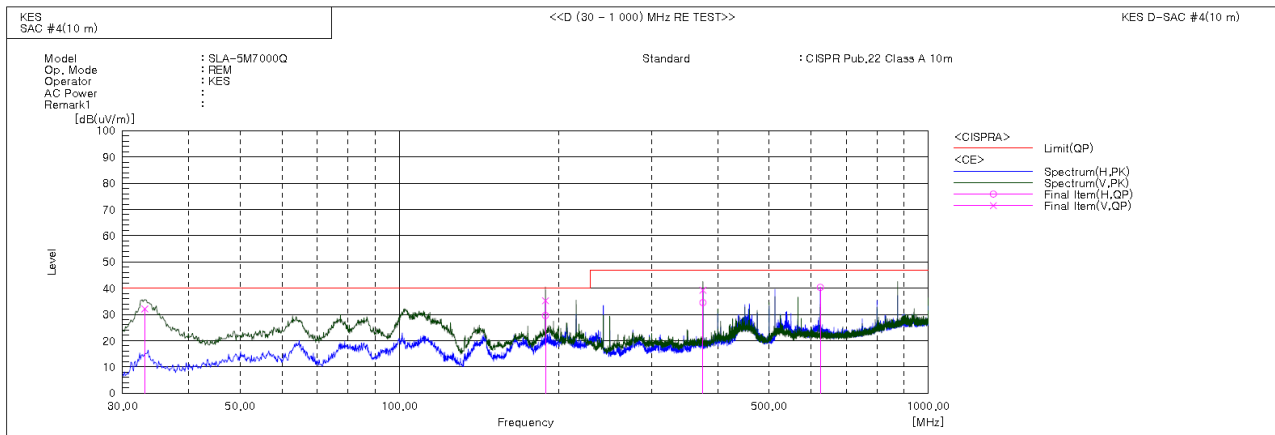


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Radiated Electric Field Emissions(Below 1 GHz)



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	32.910	V	64.5	-32.7	31.8	40.0	8.2	150.0	8.0	
2	188.959	H	58.1	-28.8	29.3	40.0	10.7	400.0	191.0	
3	188.959	V	63.2	-28.8	34.4	40.0	5.6	100.0	59.0	
4	374.956	H	57.8	-22.4	35.4	47.0	11.6	200.0	119.0	
5	374.956	V	50.2	-22.4	27.8	47.0	19.2	100.0	224.0	
6	625.095	H	57.4	-15.6	41.8	47.0	5.2	100.0	147.0	
7	875.113	V	37.7	-11.9	25.8	47.0	21.2	150.0	261.0	

◆ Calculation

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

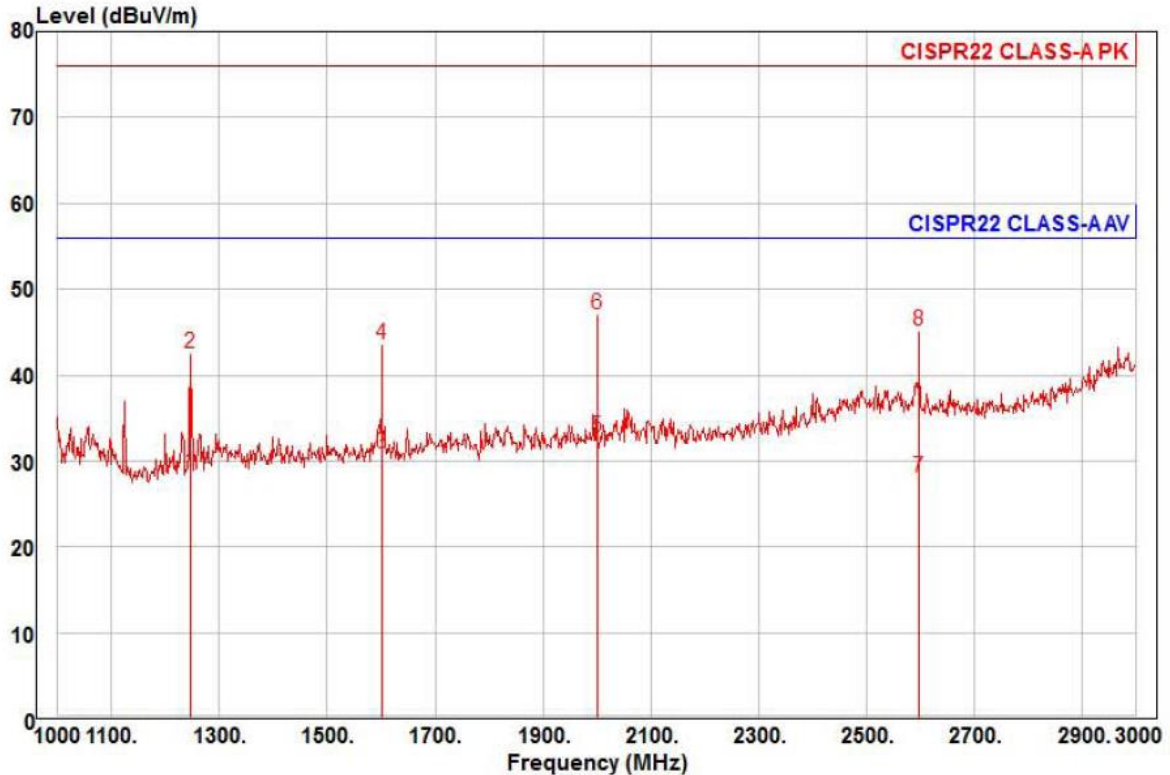
Margin(QP)[dB] = Limit[dB(μV/m)] - Result(QP) [dB(μV/m)]

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)



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-5M7000
Mode : REM
Memo : (1 ~ 3) GHz

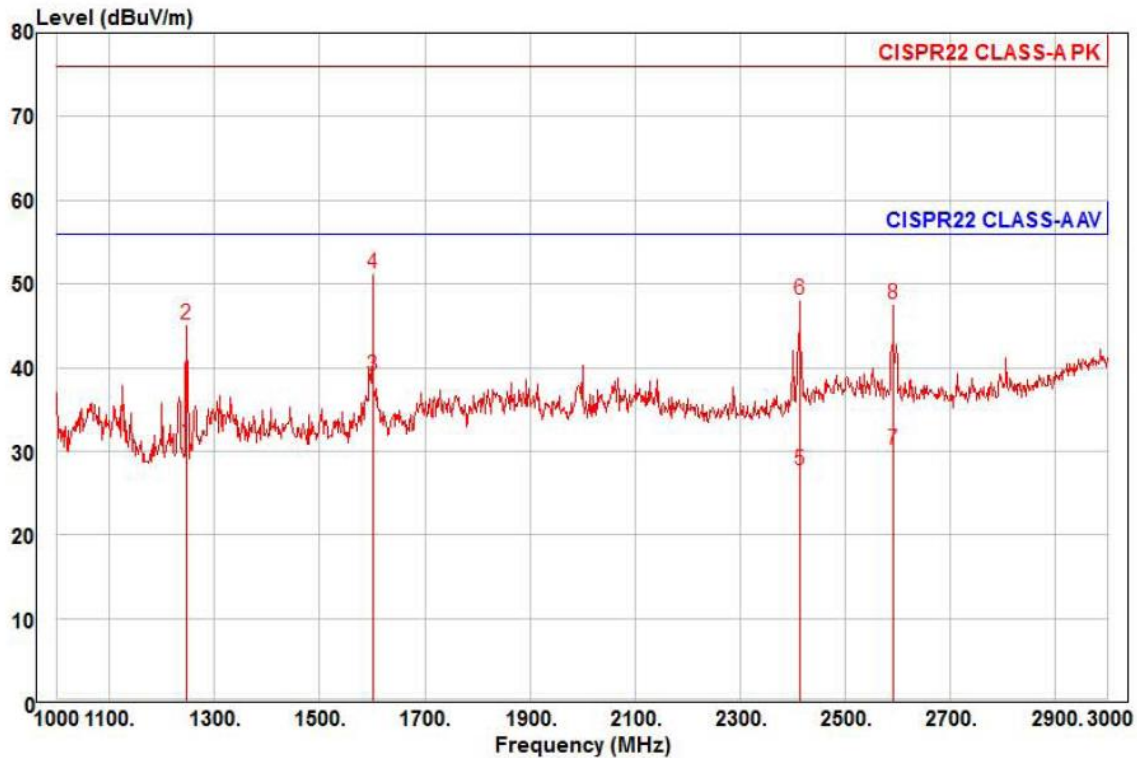
	Freq	Read Level	Ant Factor	Cable Loss	Preamplifier Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1246.00	37.69	23.25	6.66	39.02	312	56.00	-27.42	horizontal	Average
2	1246.00	51.70	23.25	6.66	39.02	312	76.00	-33.41	horizontal	Peak
3	1600.00	36.97	24.42	7.55	38.11	2	56.00	-25.17	horizontal	Average
4	1600.00	49.69	24.42	7.55	38.11	2	76.00	-32.45	horizontal	Peak
5 pp	2000.00	36.61	26.01	8.48	38.36	347	56.00	-23.26	horizontal	Average
6 pk	2000.00	50.90	26.01	8.48	38.36	347	76.00	-28.97	horizontal	Peak
7	2598.00	28.27	27.96	9.86	38.07	249	56.00	-27.98	horizontal	Average
8	2598.00	45.43	27.96	9.86	38.07	249	76.00	-30.82	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-5M7000
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	1246.00	40.12	23.25	6.66	39.02	197	56.00	-24.99	vertical	Average
2	1246.00	54.34	23.25	6.66	39.02	197	76.00	-30.77	vertical	Peak
3 pp	1600.00	45.18	24.42	7.55	38.11	347	56.00	-16.96	vertical	Average
4 pk	1600.00	57.34	24.42	7.55	38.11	347	76.00	-24.80	vertical	Peak
5	2414.00	29.04	27.27	9.43	38.10	314	56.00	-28.36	vertical	Average
6	2414.00	49.49	27.27	9.43	38.10	314	76.00	-27.91	vertical	Peak
7	2592.00	30.42	27.94	9.84	38.07	226	56.00	-25.87	vertical	Average
8	2592.00	47.93	27.94	9.84	38.07	226	76.00	-28.36	vertical	Peak

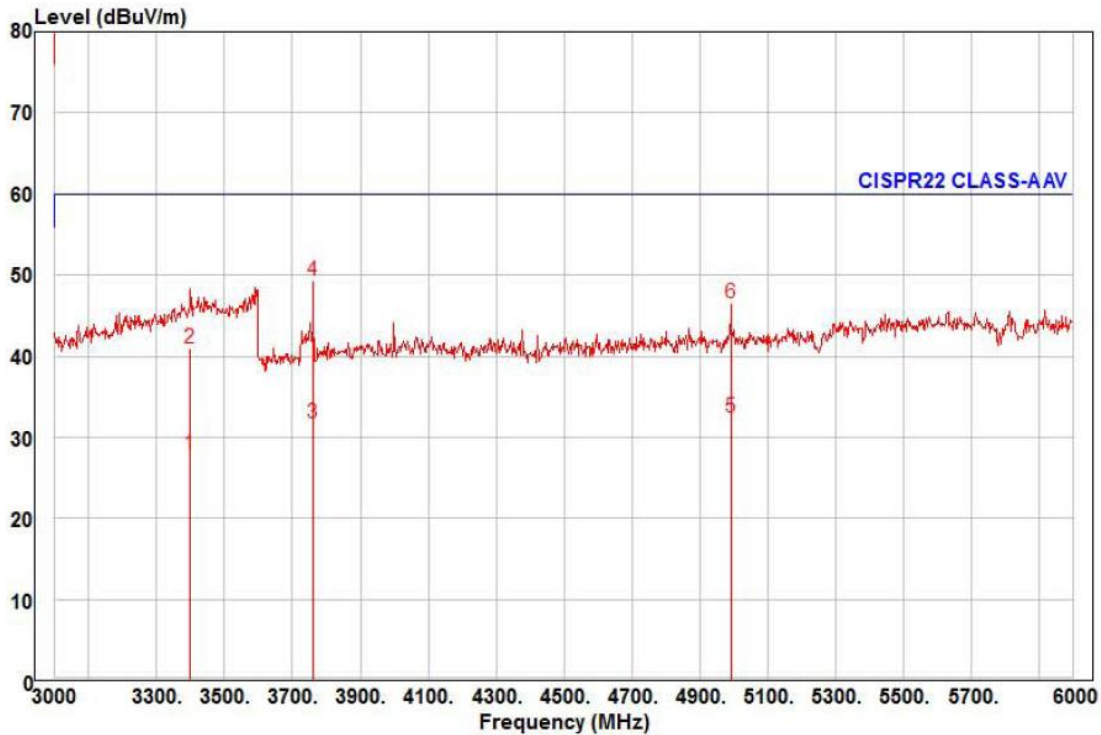
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Test report No.:
KES-E1-18T0378
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Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SLA-5M7000
Mode : REM
Memo : (3 ~ 6) GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamplifier Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3399.00	23.84	30.87	11.44	38.26	303	60.00	-32.11	horizontal	Average
2	3399.00	36.95	30.87	11.44	38.26	303	80.00	-39.00	horizontal	Peak
3	3762.00	26.12	31.86	11.79	38.05	29	60.00	-28.28	horizontal	Average
4 pk	3762.00	43.67	31.86	11.79	38.05	29	80.00	-30.73	horizontal	Peak
5 pp	4992.00	23.53	33.39	13.63	38.06	292	60.00	-27.51	horizontal	Average
6	4992.00	37.53	33.39	13.63	38.06	292	80.00	-33.51	horizontal	Peak

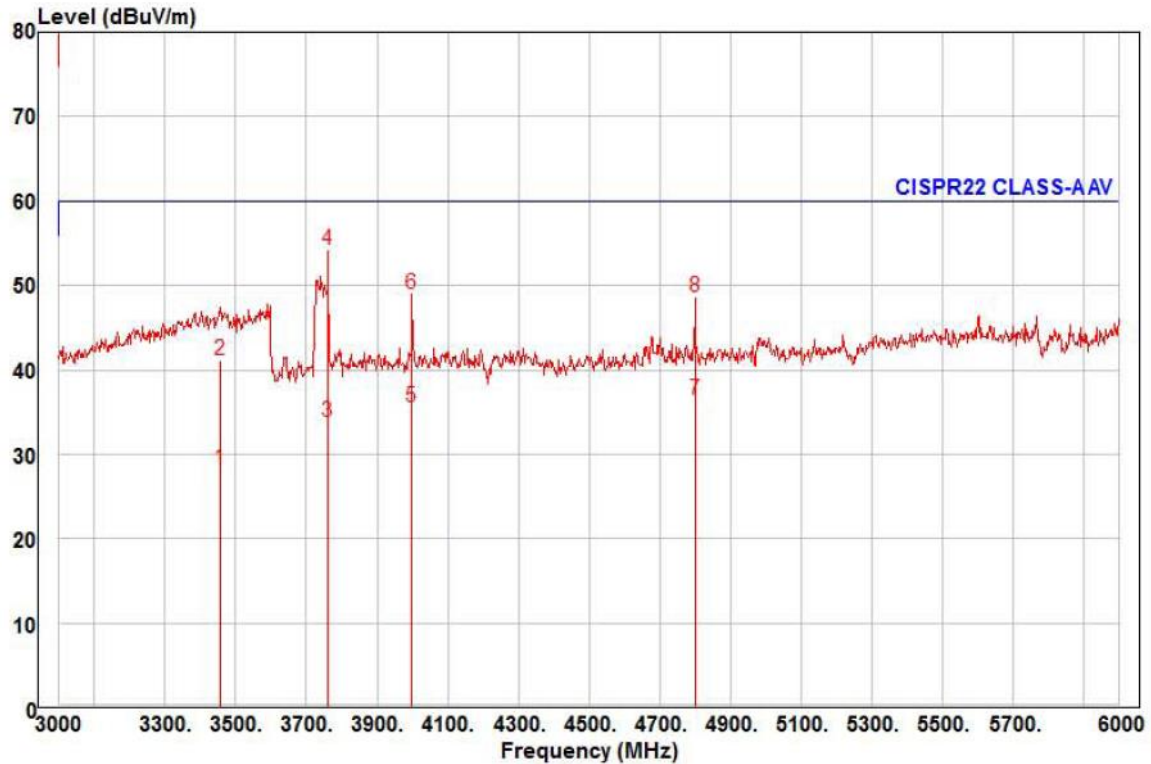
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Test report No.:
KES-E1-18T0378
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Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SLA-5M7000
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	3456.00	24.03	31.03	11.49	38.27	113	60.00	-31.72	vertical	Average
2	3456.00	36.90	31.03	11.49	38.27	113	80.00	-38.85	vertical	Peak
3	3762.00	28.21	31.86	11.79	38.05	340	60.00	-26.19	vertical	Average
4 pk	3762.00	48.54	31.86	11.79	38.05	340	80.00	-25.86	vertical	Peak
5	3999.00	28.69	32.50	12.19	37.84	8	60.00	-24.46	vertical	Average
6	3999.00	42.14	32.50	12.19	37.84	8	80.00	-31.01	vertical	Peak
7 pp	4800.00	28.16	32.99	13.39	38.12	229	60.00	-23.58	vertical	Average
8	4800.00	40.44	32.99	13.39	38.12	229	80.00	-31.30	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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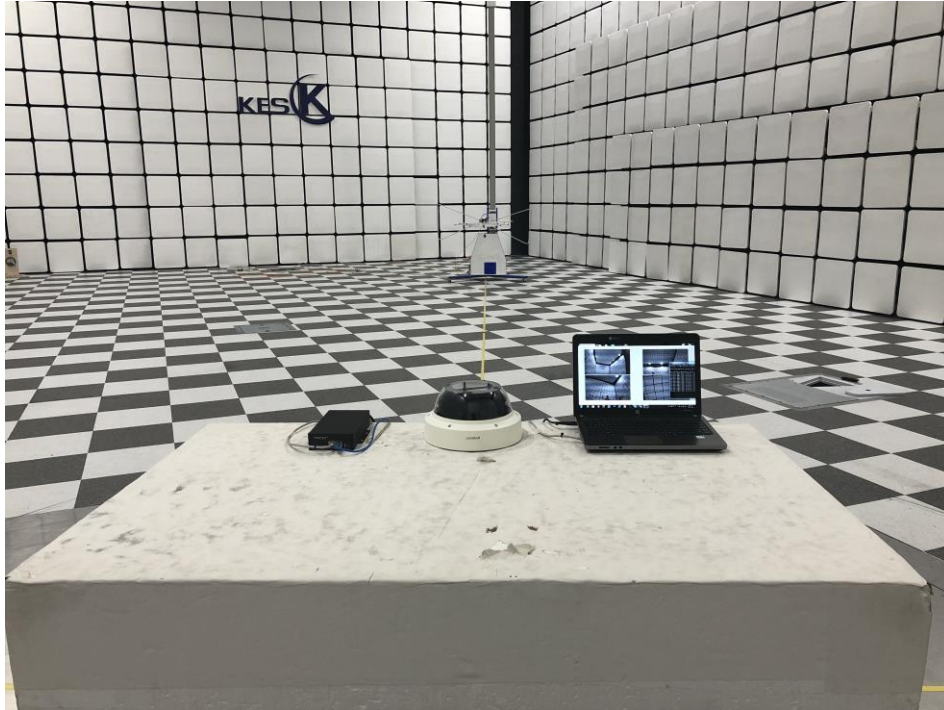
Conducted Telecommunication Emissions

N/A

N/A

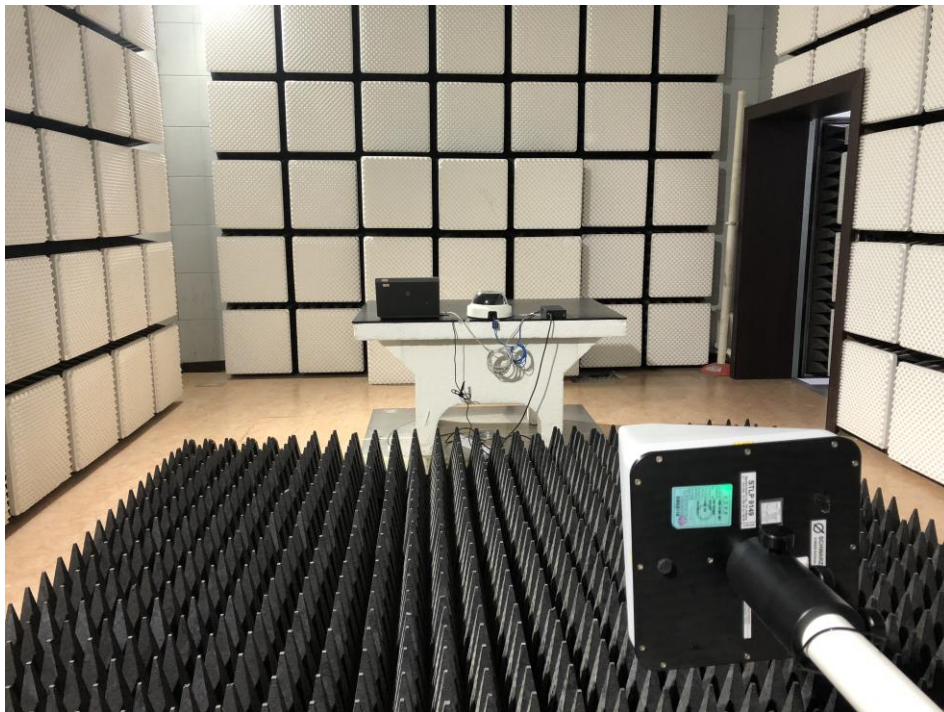
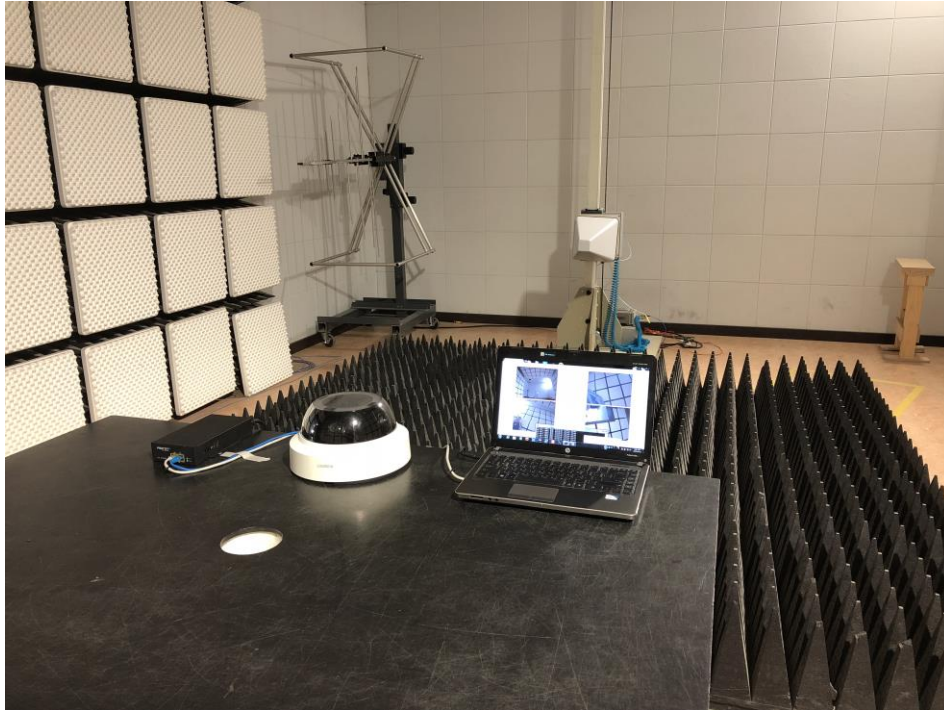
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Radiated Electric Field Emissions(Below 1 GHz)



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Radiated Electric Field Emissions(Above 1 GHz)



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EUT External Photographs

(Top)



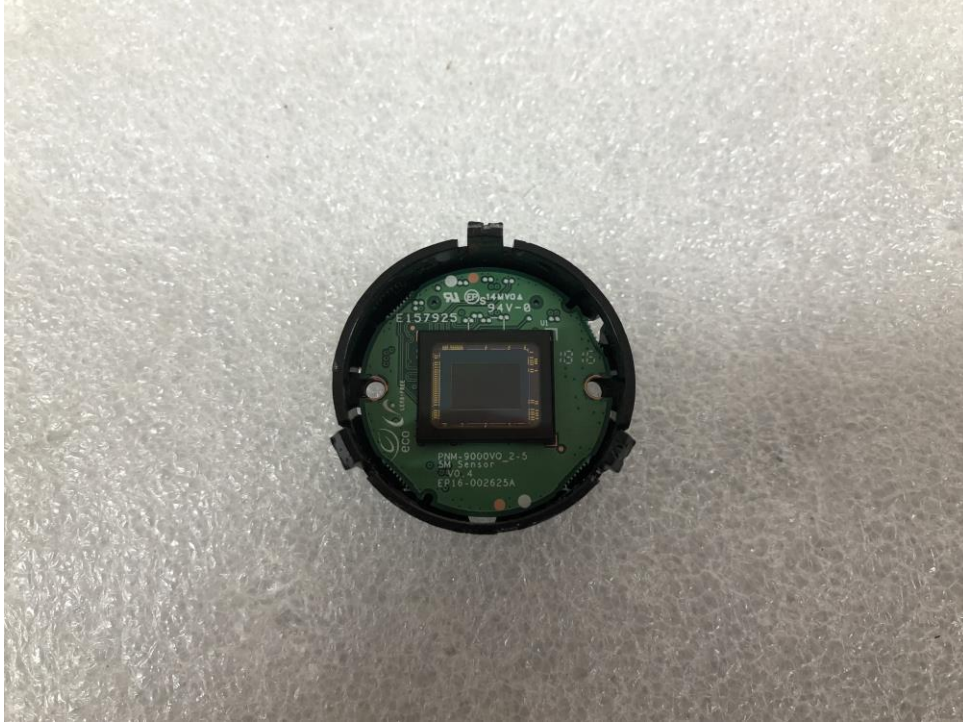
(Bottom)



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EUT Internal Photographs

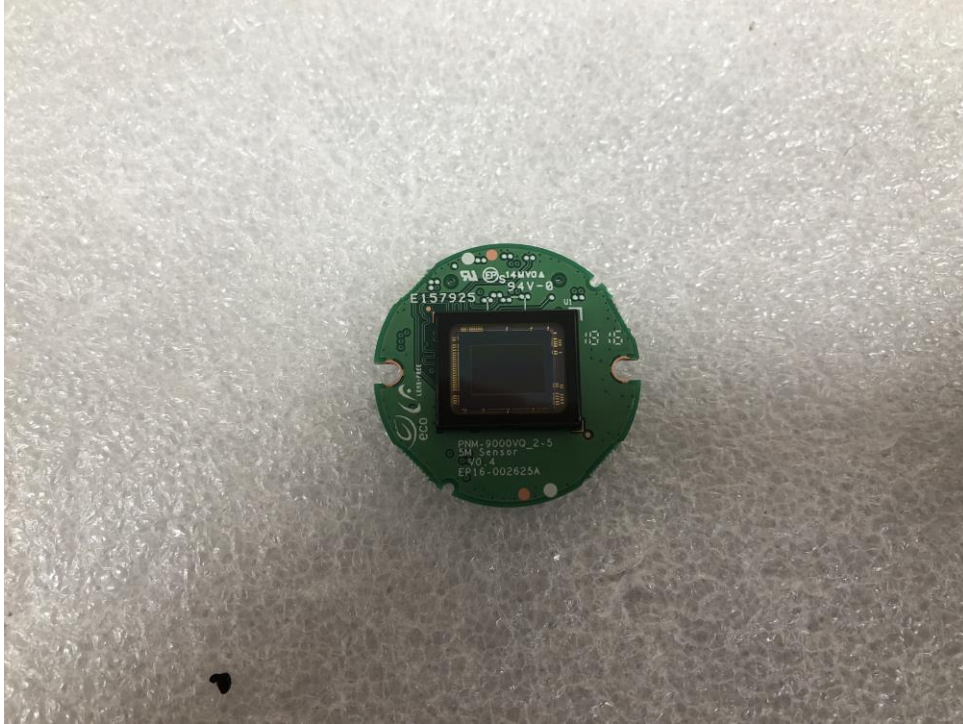
(Internal View)



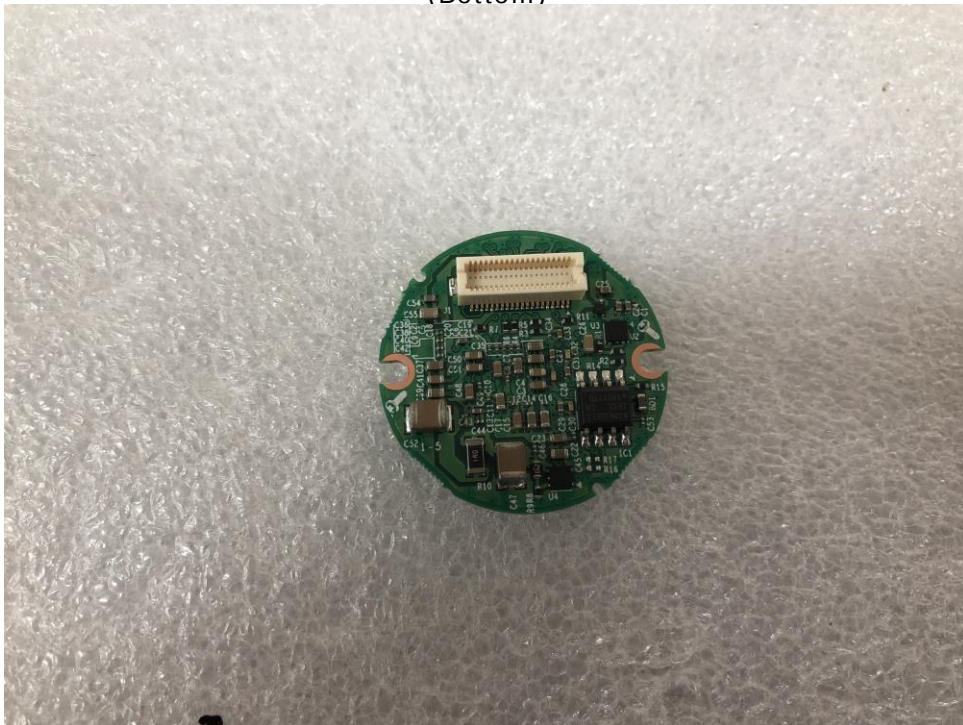
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EUT Internal View – Board

(Top)



(Bottom)



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