

**KES Co., Ltd.**

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Report No.:

KES-E1-18T0356-R2

Page (1) of (30)

EMC TEST REPORT For RCM

Test Report No. : KES-E1-18T0356-R2
Date of Issue : Feb. 24, 2023
Product name : 2M LENS Module
Model/Type No. : SLA-2M2800Q
Variant Model : SLA-2M2802D
Applicant : Hanwha Vision Co., Ltd
Applicant Address : 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si,
Gyeonggi-do, Republic of Korea
Manufacturer : 1. HANWHA VISION VIETNAM COMPANY LIMITED
2. D-TECH CO.,LTD.
Manufacturer Address : 1. Lot O-2, Que Vo Industrial Zone extended area,
Nam Son commune, Bac Ninh city, Bac Ninh province, Vietnam
2. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi- do,
Korea (Suwon Industrial Complex)
Date of Receipt : Jun. 12, 2018
Test date : Jun. 16, 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 No.:

KES-E1-18T0356-R2

Page (2) of (30)

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Jun. 26, 2018	KES-E1-18T0356	Issued
Jul. 27, 2020	KES-E1-18T0356-R1	Reissue due to the addition of a derived model
Feb. 24, 2023	KES-E1-18T0356-R2	Change the Applicant and manufacturer at the request of the customer, Factory deletion at the request of the customer

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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.....	8
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		24
Conducted Voltage Emissions		24
Conducted Telecommunication Emissions		25
Radiated Electric Field Emissions(Below 1 GHz)		26
Radiated Electric Field Emissions(Above 1 GHz).....		27
EUT External Photographs		28
EUT Internal Photographs		29
EUT Internal View – Board 1		30



1.0 General Product Description

Main Specifications of EUT are:

	SLA-2M2800Q
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
Lens Type	Fixed focal
Mount Type	M12 Lens module with main unit
Mechanical	
Color / Material	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

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-2M2800Q	-	HANWHA VISION VIETNAM COMPANY LIMITED	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 VISION VIETNAM COMPANY LIMITED	-
2M LENS Module	SLA-2M2400Q	-	HANWHA VISION VIETNAM COMPANY LIMITED	1EA
2M LENS Module	SLA-2M3600Q	-	HANWHA VISION VIETNAM COMPANY LIMITED	1EA
2M LENS Module	SLA-2M6000Q	-	HANWHA VISION VIETNAM COMPANY LIMITED	1EA
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
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

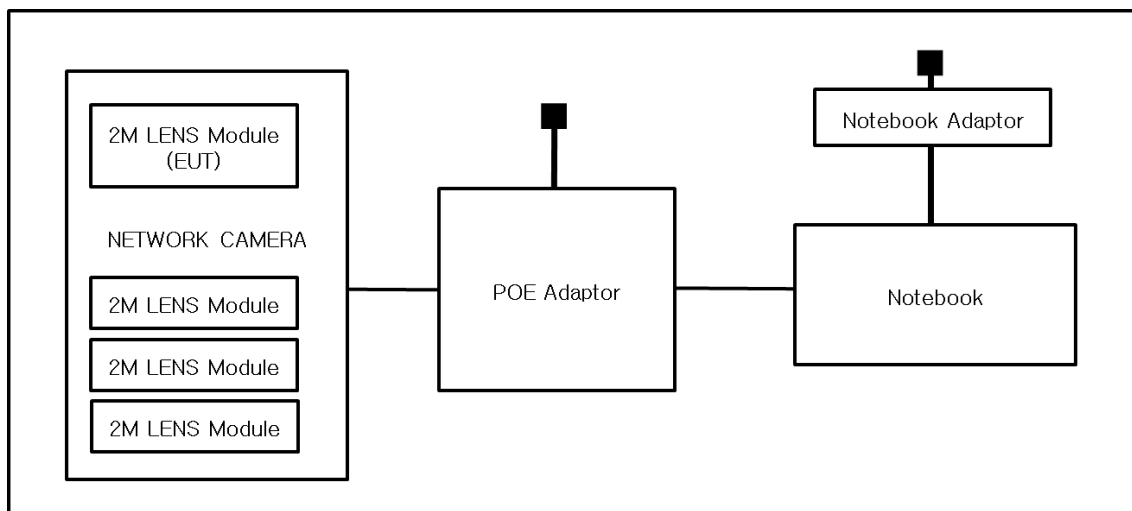
1.7 EUT Operating Mode(s)

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

EUT Test operating S/W		
Name	Version	Manufacture Company
WebViewer	-	Hanwha Vision 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, 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

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

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Report No.:

KES-E1-18T0356-R2

Page (10) of (30)

☐ **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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Report No.:

KES-E1-18T0356-R2

Page (11) of (30)

2.1 Conducted Emissions at Mains Power Ports

Test Date

Jun. 16, 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: 23,2 °C
Relative Humidity: 49,0 % 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

RemarksSee Appendix A for test data.

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Report No.:

KES-E1-18T0356-R2

Page (12) of (30)

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

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Report No.:

KES-E1-18T0356-R2

Page (13) of (30)

2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Jun. 16, 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: 23,0 °C
Relative Humidity: 55,7 % 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.

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2.4 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Jun. 16, 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 ConditionsTemperature: 23,2 °C
Relative Humidity: 49,0 % 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

RemarksSee Appendix A for test data.



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Report No.:

KES-E1-18T0356-R2

Page (15) of (30)

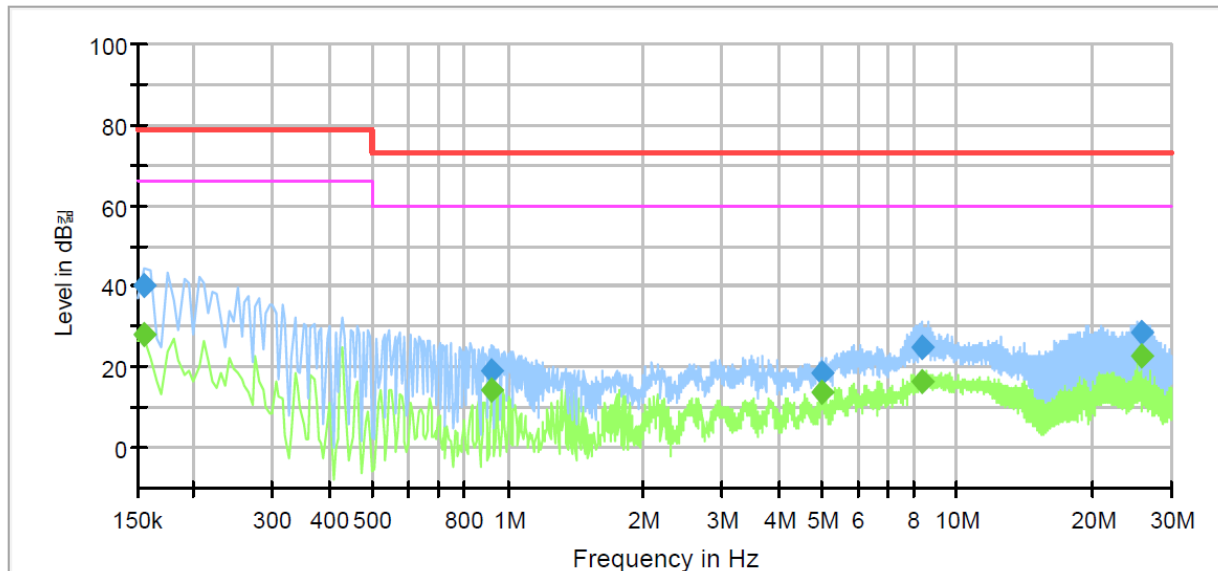
APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

HOT LINE

Common Information

Test Description: Conducted Emission
Model No.: SLA-2M2800Q
Mode: RCM
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	---	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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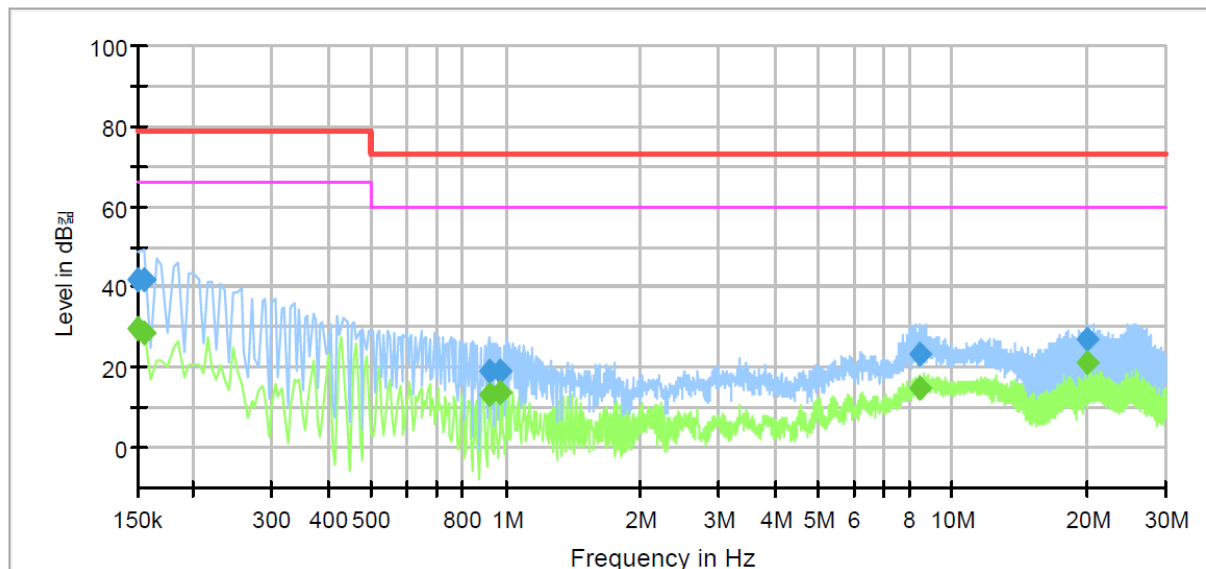
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NEUTRAL LINE

Common Information

Test Description:	Conducted Emission
Model No.:	SLA-2M2800Q
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	---	29.42	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 [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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Report No.:
KES-E1-18T0356-R2
Page (17) of (30)

Conducted Emissions at Telecommunication Ports

[10 Mbps]

N/A

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www.kes.co.kr

Report No.:

KES-E1-18T0356-R2

Page (18) of (30)

[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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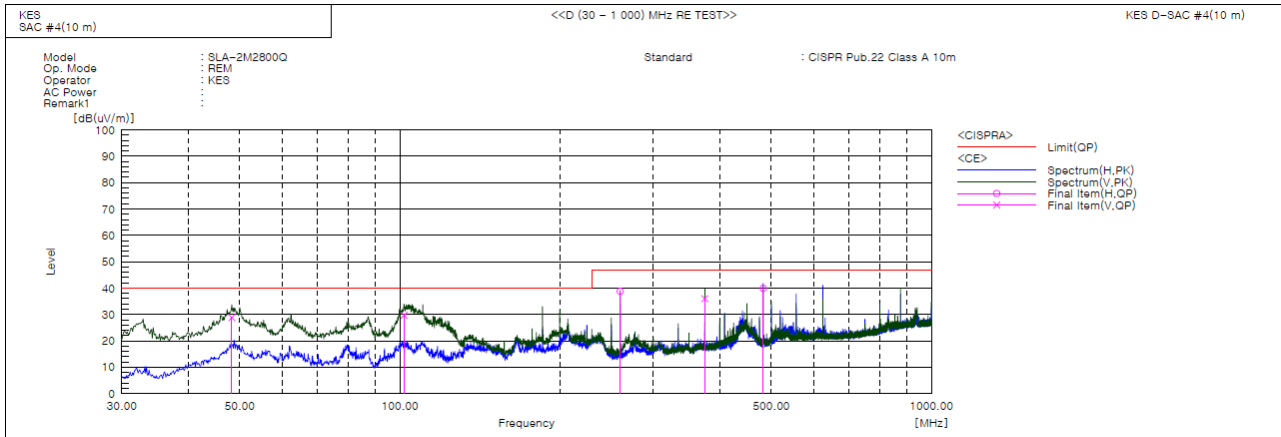
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Report No.:

KES-E1-18T0356-R2

Page (19) of (30)

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	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)])

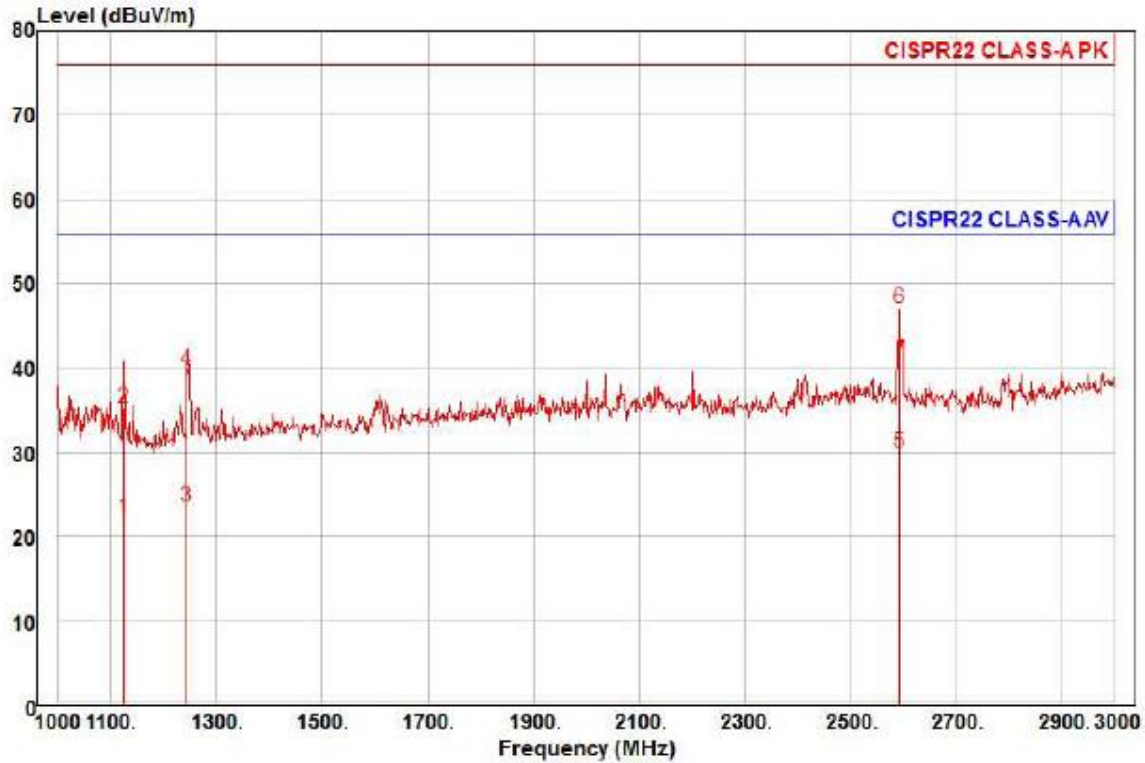
Margin(QP)[dB] = Limit[dB(μV/m)] - Result(QP) [dB(μV/m)]

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-2M2800
Mode : REM
Memo : (1 ~ 3) GHz

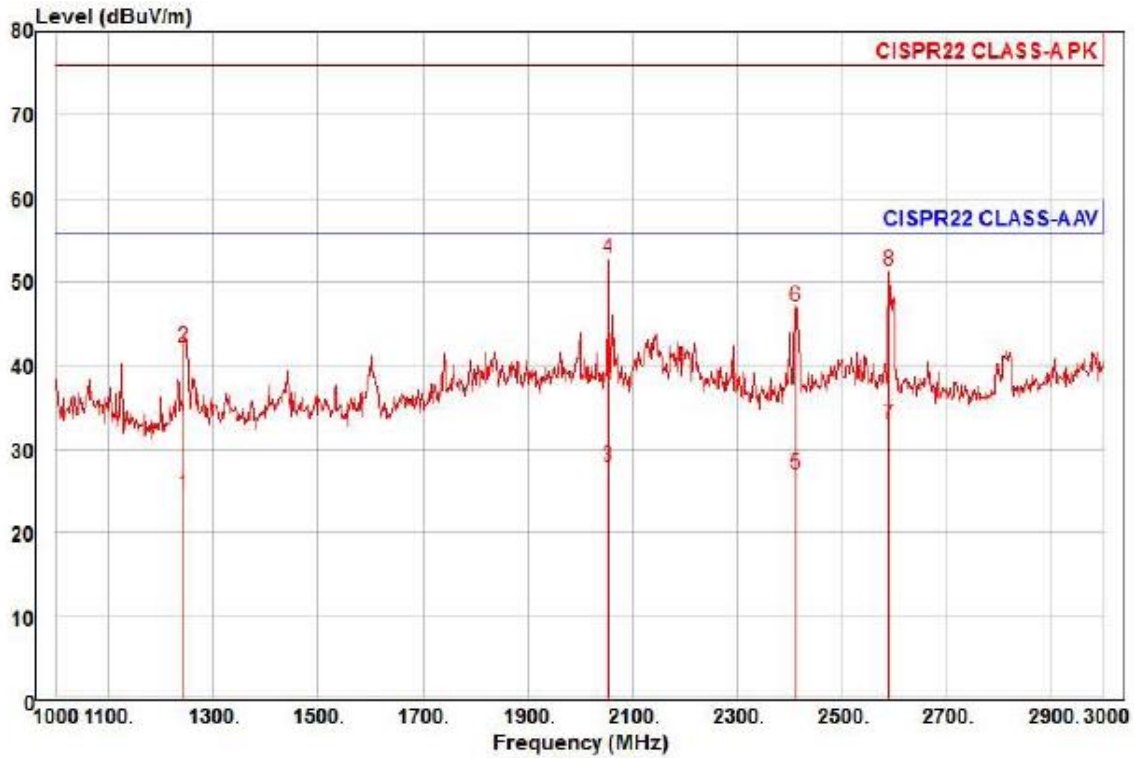
	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1124.00	32.50	22.88	6.31	39.49	158	56.00	-33.80	horizontal	Average
2	1124.00	45.59	22.88	6.31	39.49	158	76.00	-40.71	horizontal	Peak
3	1244.00	32.68	23.24	6.65	39.03	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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Report No.:
KES-E1-18T0356-R2
Page (21) of (30)



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-2M2800
Mode : REM
Memo : (1 ~ 3) GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamplifier	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

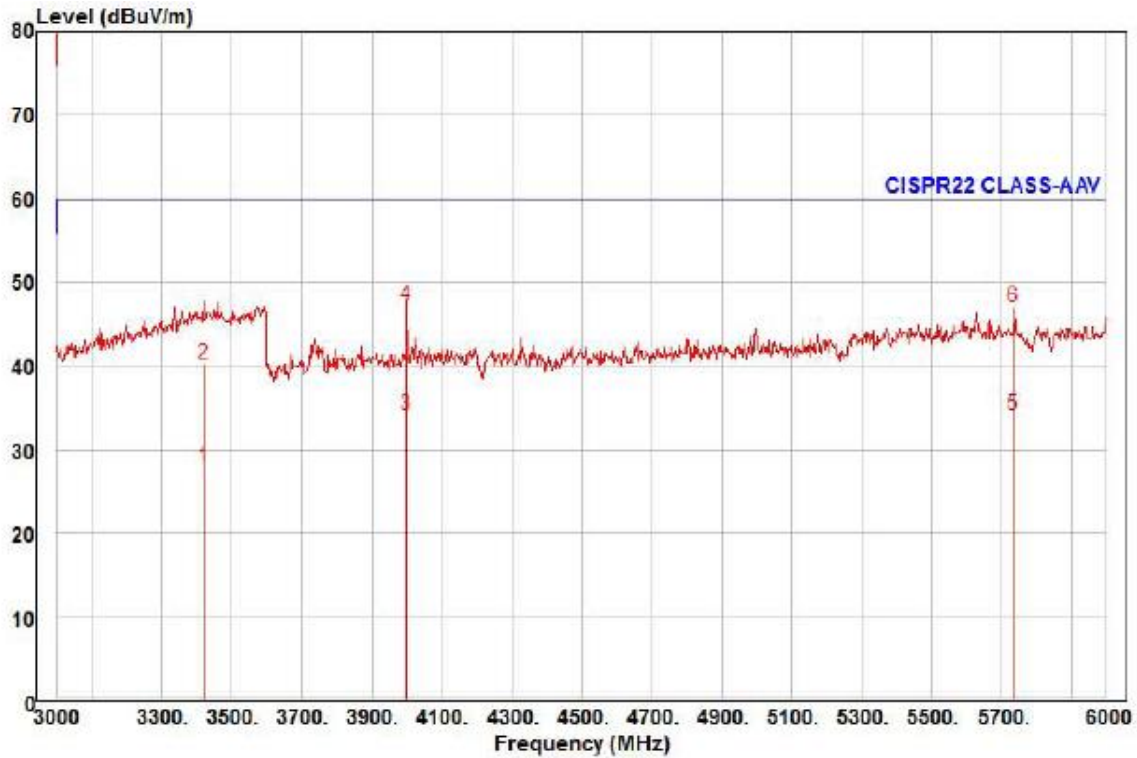
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Report No.:
KES-E1-18T0356-R2
Page (22) of (30)



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-2M2800
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

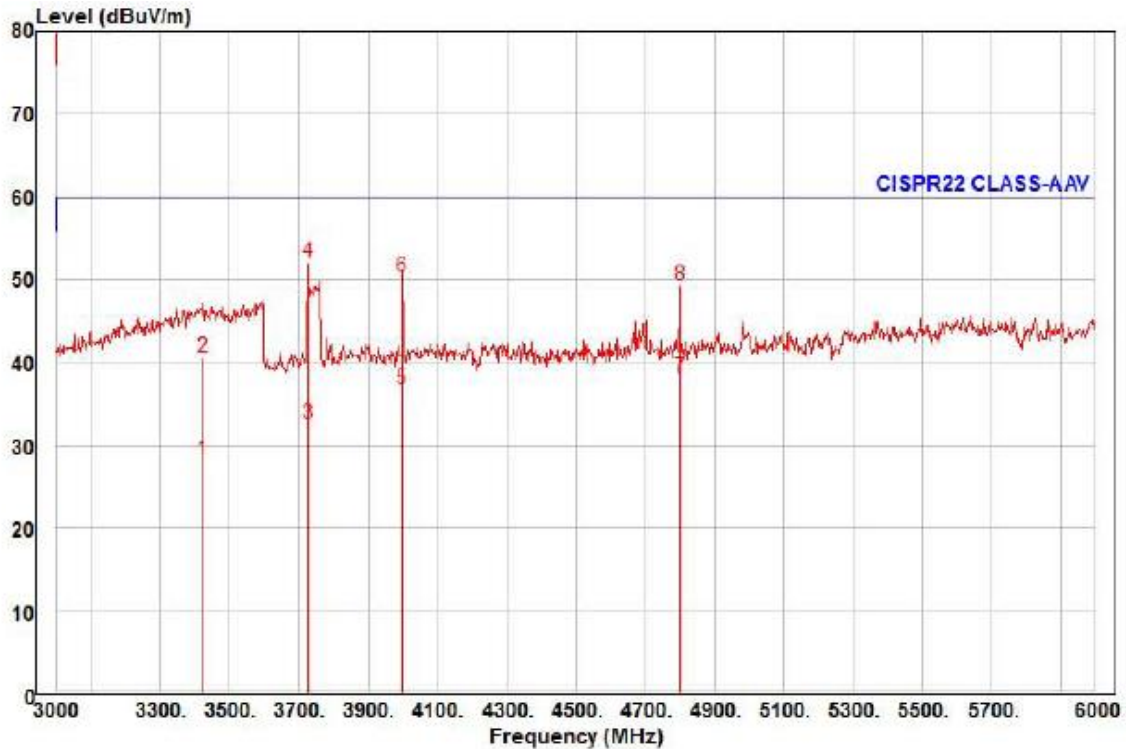
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Report No.:
KES-E1-18T0356-R2
Page (23) of (30)



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-2M2800
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(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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Page (25) of (30)

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)

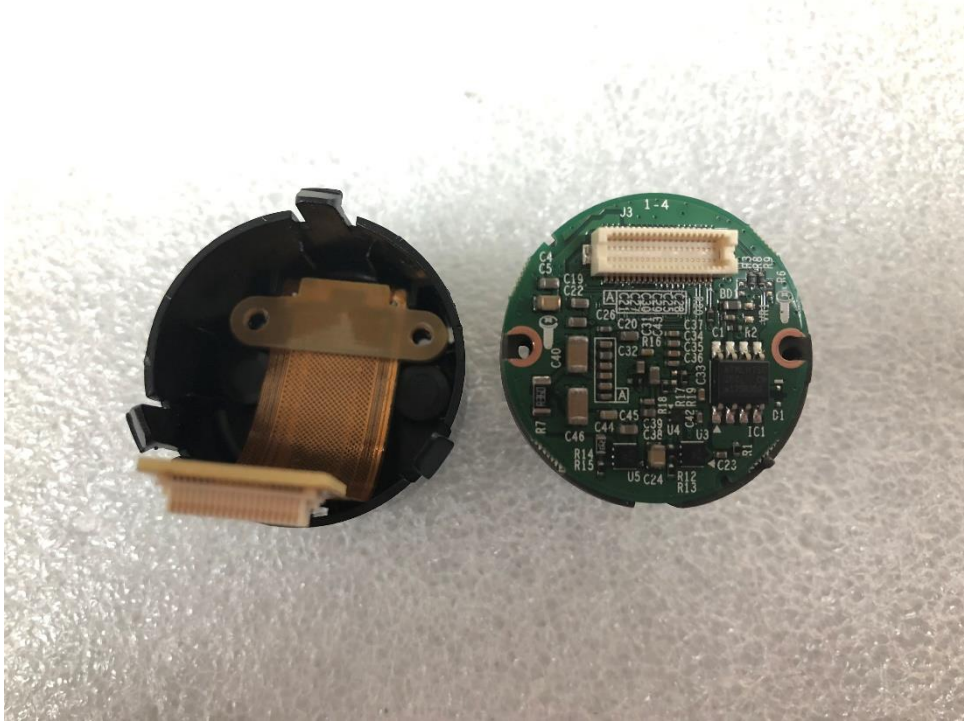


(Bottom)



EUT Internal Photographs

(Internal View)



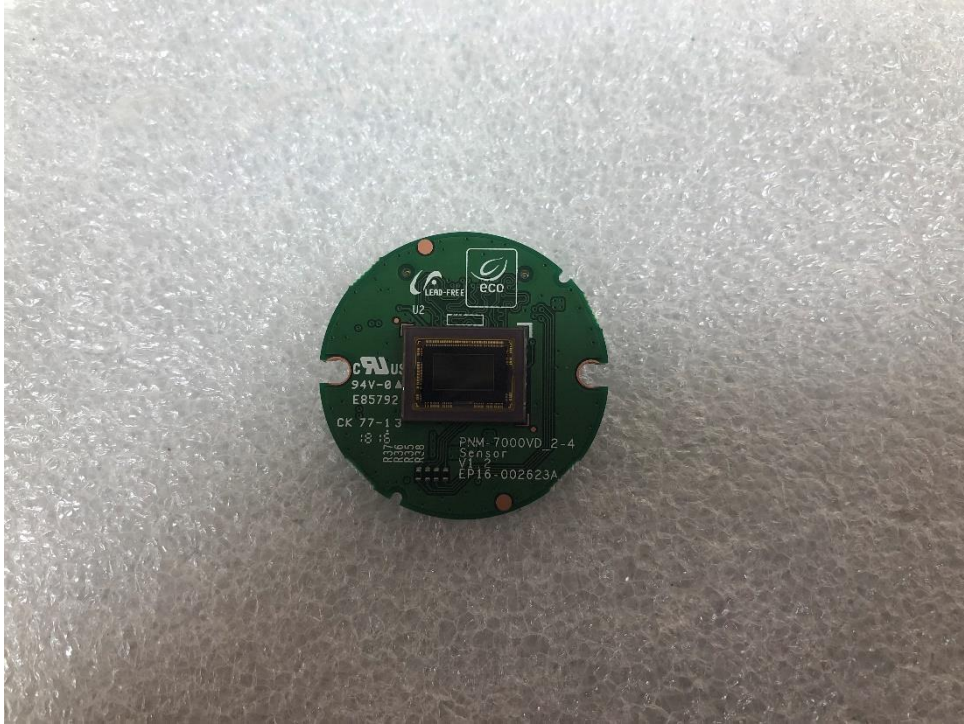
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EUT Internal View – Board 1

(Top)



(Bottom)



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