



## EMC TEST REPORT

Test Report No. : KES-E1-19T0185

Date of Issue : Apr. 08, 2019

Product name : 5M Lens Module

Model/Type No. : SLA-5M4600D

Variant Mode : -

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 : **Supply's Declaration of Conformity**

Date of Receipt : Mar. 25, 2019

Test date : Mar. 30, 2019

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

Tested by

Min Seong, 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 |
|---------------|-----------------|------------------|
| Apr. 08, 2019 | KES-E1-19T0185  | Issued           |
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## 1.0 General Product Description

Main Specifications of EUT are:

|                             |                                                                              |
|-----------------------------|------------------------------------------------------------------------------|
| <b>Video</b>                |                                                                              |
| Imaging Device              | 1/1.8" 5MP CMOS                                                              |
| Effective Pixels            | 2616(H)x1976(V)                                                              |
| Min. Illumination           | Color : 0.16Lux(F1.6, 1/30sec, 30IRE)<br>B/W : 0.16Lux(F1.6, 1/30sec, 30IRE) |
| <b>Lens</b>                 |                                                                              |
| Focal Length (Zoom Ratio)   | 4.6mm fixed focal                                                            |
| Max. Aperture Ratio         | F1.6                                                                         |
| Angular Field of View       | H: 77.9°, V: 57.9°, D: 98.7°                                                 |
| Lens Type                   | Fixed focal                                                                  |
| Mount Type                  | None                                                                         |
| <b>Pan / Tilt / Rotate</b>  |                                                                              |
| Pan / Tilt / Rotate Range   | -90°~+90° / +21~+85° / -180°~+180°                                           |
| <b>Operational</b>          |                                                                              |
| Wide Dynamic Range          | 120dB                                                                        |
| Day & Night                 | Auto(Electrical)                                                             |
| <b>Mechanical</b>           |                                                                              |
| Color / Material            | Black / Plastic                                                              |
| Product dimensions / weight | Ø35.5x35.9mm(1.40x1.41") / 35g(0.08 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 ☐ 230 Vac ☐ 120 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-5M4600D  | -             | Hanwha Techwin (Tianjin) Co.,Ltd. | EUT     |

## 1.5 Support Equipments

| Description      | Model Number | Serial Number   | Manufacturer                       | Remarks |
|------------------|--------------|-----------------|------------------------------------|---------|
| Network Camera   | PNM-9000VD   | -               | Hanwha Techwin (Tianjin) Co.,Ltd.  | -       |
| PoE Adapter      | GS728TPP     | -               | NETGEAR                            | -       |
| Notebook         | NT500R5M     | 0Q7491AJ800552B | Samsung Electronics Co., Ltd.      | -       |
| Notebook Adapter | A13-040N2A   | AD-4019C        | Chicony Power Technology Co., Ltd. | -       |
| Lens Module      | SLA-5M3700D  | -               | Hanwha Techwin (Tianjin) Co.,Ltd.  | -       |
| Micro SD Card    | -            | -               | SanDisk                            | 4 GB    |



## 1.6 External I / O Cabling

| Start                |              | END            |              | Cable Spec. |        |
|----------------------|--------------|----------------|--------------|-------------|--------|
| Description          | I / O Port   | Description    | I / O Port   | Length      | Shield |
| 5M Lens Module (EUT) | LENS Out     | Network Camera | LENS In      | -           | -      |
| Network Camera       | RJ-45 (PoE)  | PoE Adapter    | RJ-45 (PoE)  | 3.0         | U      |
|                      | LENS In      | Lens Module    | LENS Out     | -           | -      |
|                      | SLOT         | Micro SD Card  | SLOT         | -           | -      |
| PoE Adapter          | RJ-45 (DATA) | Notebook       | RJ-45 (DATA) | 4.0         | U      |

\* Unshielded=U, Shielded=S

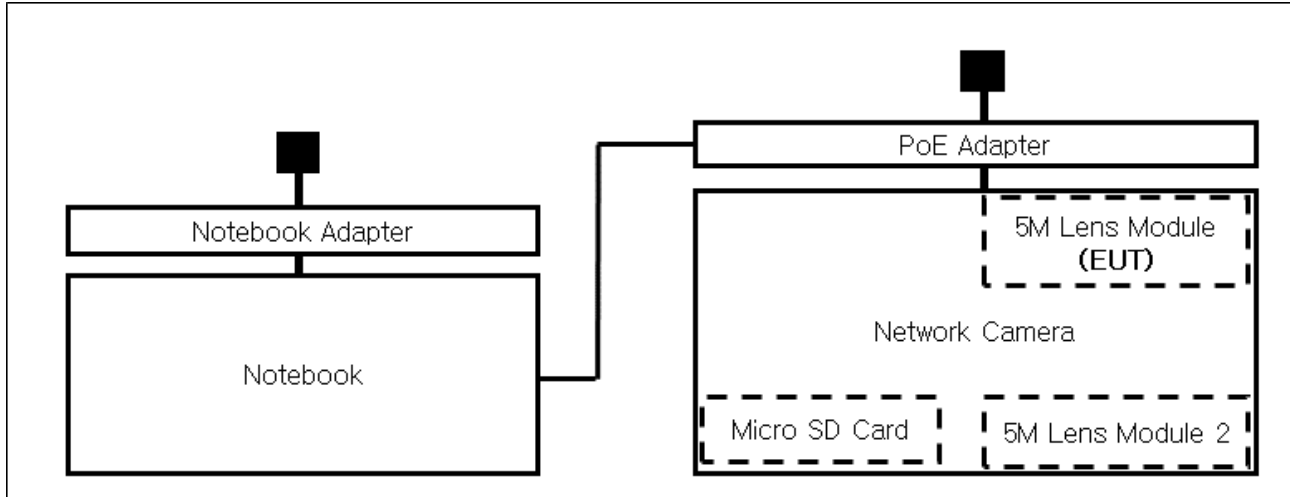
## 1.7 EUT Operating Mode(s)

| Test mode | operating                 |
|-----------|---------------------------|
| PoE       | EUT Monitoring, Ping Test |

| EUT Test operating S / W |         |                          |
|--------------------------|---------|--------------------------|
| Name                     | Version | Manufacture Company      |
| Web Viewer               | -       | 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-Anechoic Chamber ,<br>10 m Open Area and conducted test site)<br>EMS (ESD, RS, EFT/Burst, Surge, CS,<br>Magnetic, Dips and interruptions)                                 | <br>KR0100                             |
| International | KOLAS     | EMI (3 m & 10 m Semi-Anechoic Chamber , and conducted test site)<br>EMS (ESD, RS, EFT/Burst, Surge, CS,<br>Magnetic, Dips and interruptions)                                                   | <br>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.                                                                               | <br>KR0100                           |
| Canada        | ISED      | 3 m & 10 m Semi-Anechoic Chamber and Conducted test site                                                                                                                                       | <br>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 | <br>R-4308, C-4798,<br>T-2311, G-914 |
| Europe        | TÜ V SÜ D | EMI (3 m & 10 m Semi-Anechoic Chamber , 10 m Open Area and conducted test site)<br>EMS (ESD, RS, EFT/Burst, Surge, CS,<br>Magnetic, Dips and interruptions)                                    | <br>CARAT 17 07 01633<br>001         |

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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  
☐ 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



- 
- |                                                                          |                                             |                                  |
|--------------------------------------------------------------------------|---------------------------------------------|----------------------------------|
| <input type="checkbox"/> <b>VCCI-CISPR 32:2016</b>                       | <input type="checkbox"/> Class A            | <input type="checkbox"/> Class B |
| <input type="checkbox"/> <b>AS/NZS CISPR32:2015</b>                      | <input type="checkbox"/> Class A            | <input type="checkbox"/> Class B |
| <input checked="" type="checkbox"/> <b>47 CFR Part 15, Subpart B</b>     |                                             |                                  |
| <input type="checkbox"/> CISPR 22:2009 +A1:2010                          | <input type="checkbox"/> Class A            | <input type="checkbox"/> Class B |
| <input checked="" type="checkbox"/> ANSI C63.4-2014                      | <input checked="" type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input checked="" type="checkbox"/> <b>IC Regulation ICES-003 : 2016</b> |                                             |                                  |
| <input type="checkbox"/> CAN/CSA CISPR 22-10                             | <input type="checkbox"/> Class A            | <input type="checkbox"/> Class B |
| <input checked="" type="checkbox"/> ANSI C63.4-2014                      | <input checked="" type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> <b>RE- Directive 2014/53/EU</b>                 |                                             |                                  |
| <input type="checkbox"/> EN 301 489-1 V1.9.2                             |                                             |                                  |
| <input type="checkbox"/> Equipment for fixed use                         |                                             |                                  |
| <input type="checkbox"/> Equipment for vehicular use                     |                                             |                                  |
| <input type="checkbox"/> Equipment for portable use                      |                                             |                                  |
| <input type="checkbox"/> EN 301 489-3 V1.6.1                             |                                             |                                  |
| <input type="checkbox"/> EN 301 489-17 V2.2.1                            |                                             |                                  |
| <input type="checkbox"/> EN 60945:2002                                   |                                             |                                  |



## 2.1 Conducted Emissions at Mains Power Ports

### Test Date

N/A

### Test Location

Electro wave Shieldroom #6

### Test Equipment

| Used                     | Description       | Model Number | Manufacturer | Serial Number | Cal. Due     |
|--------------------------|-------------------|--------------|--------------|---------------|--------------|
| <input type="checkbox"/> | EMI Test S/W      | EMC32        | R & S        | 9.12.00       | -            |
| <input type="checkbox"/> | EMI TEST RECEIVER | ESR3         | R & S        | 101781        | 04, 25, 2019 |
| <input type="checkbox"/> | LISN              | ENV216       | R & S        | 101787        | 01, 04, 2020 |
| <input type="checkbox"/> | LISN              | ESH2-Z5      | R & S        | 100450        | 04, 25, 2019 |
| <input type="checkbox"/> | PULSE LIMITER     | ESH3-Z2      | R & S        | 101915        | 11, 26, 2019 |

### 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

It is not tested apply because it is powered by PoE.



## 2.2 Radiated Electric Field Emissions(Below 1 GHz)

### Test Date

Mar. 30, 2019

### Test Location

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

### Test Equipment

| Used                                | Description              | Model Number | Manufacturer     | Serial Number | Cal. Due     |
|-------------------------------------|--------------------------|--------------|------------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMI Test S/W             | EP5/RE       | TOYO Corporation | 6.0.0         | -            |
| <input checked="" type="checkbox"/> | EMI TEST RECEIVER        | ESU26        | R & S            | 100551        | 04, 11, 2019 |
| <input checked="" type="checkbox"/> | AMPLIFIER                | SCU 01       | R & S            | 100603        | 11, 26, 2019 |
| <input checked="" type="checkbox"/> | TRILOG-BROADBAND ANTENNA | VULB9163     | Schwarzbeck      | 715           | 11, 29, 2020 |
| <input checked="" type="checkbox"/> | ATTENUATOR               | 8491A        | HP               | 32173         | 03, 11, 2020 |

### Test Conditions

Temperature: 20,9 °C  
Relative Humidity: 39,1 % 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.



## 2.3 Radiated Electric Field Emissions(Above 1 GHz)

### Test Date

Mar. 30, 2019

### Test Location

SEMI ANECHOIC CHAMBER #4(10 m)

### Test Equipment

| Used                                | Description       | Model Number | Manufacturer     | Serial Number | Cal. Due     |
|-------------------------------------|-------------------|--------------|------------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMI Test S/W      | EP5/RE       | TOYO Corporation | 6.0.0         | -            |
| <input checked="" type="checkbox"/> | EMI TEST RECEIVER | ESU26        | R & S            | 100551        | 04, 11, 2019 |
| <input checked="" type="checkbox"/> | PREAMPLIFIER      | 8449B        | AGILENT          | 3008A01742    | 01, 08, 2020 |
| <input type="checkbox"/>            | ATTENUATOR        | 8491A        | HP               | 35496         | 03, 11, 2020 |
| <input checked="" type="checkbox"/> | HORN ANTENNA      | BBHA 9120D   | SCHWARZBECK      | 9120D-1802    | 03, 12, 2020 |

### Test Conditions

Temperature: 20,9 °C  
Relative Humidity: 39,1 % R.H.

### Frequency Range of Measurement

1 GHz to 5 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.



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## **APPENDIX A – TEST DATA**

### **Conducted Emissions at Mains Power Ports**

HOT LINE

N/A

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### NEUTRAL LINE

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 (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

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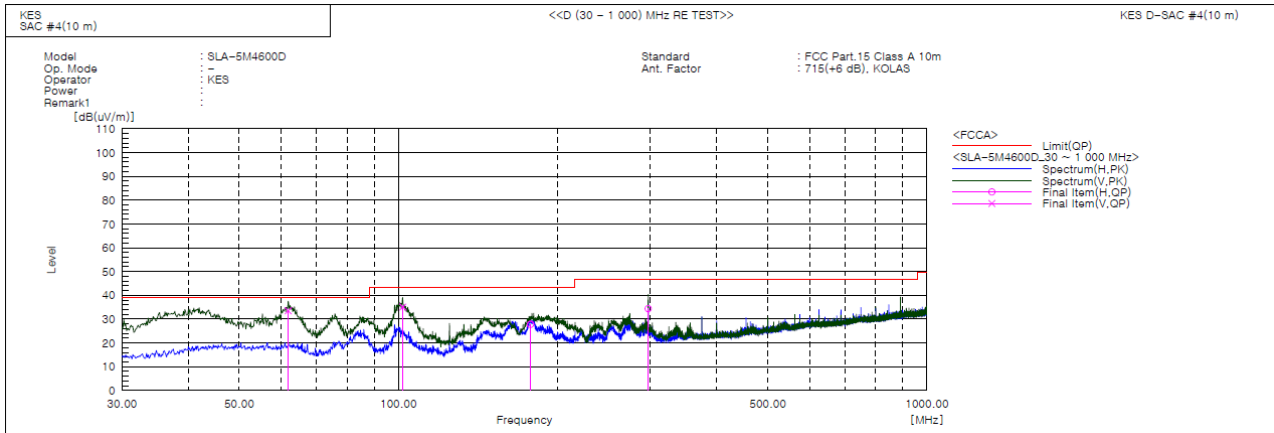


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### Radiated Electric Field Emissions(Below 1 GHz)



#### Final Result

| No. | Frequency<br>[MHz] | (P) | Reading<br>QP<br>[dB(uV)] | c.f<br>[dB(1/m)] | Result<br>QP<br>[dB(uV/m)] | Limit<br>QP<br>[dB(uV/m)] | Margin<br>QP<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark |
|-----|--------------------|-----|---------------------------|------------------|----------------------------|---------------------------|----------------------|----------------|----------------|--------|
| 1   | 61.889             | V   | 56.5                      | -23.0            | 33.5                       | 39.0                      | 5.5                  | 100.0          | 269.0          |        |
| 2   | 101.901            | V   | 57.7                      | -22.6            | 35.1                       | 43.5                      | 8.4                  | 151.0          | 169.0          |        |
| 3   | 177.804            | H   | 51.9                      | -24.1            | 27.8                       | 43.5                      | 15.7                 | 394.0          | 23.0           |        |
| 4   | 296.993            | H   | 53.2                      | -18.8            | 34.4                       | 46.5                      | 12.1                 | 369.0          | 317.0          |        |

#### ◆ Calculation – SAC #4(10 m)

Result(QP) [dB( $\mu$ V/m)] = (Reading(QP)[dB( $\mu$ V)] + c.f[dB(1/m)])

Margin(QP)[dB] = Limit[dB( $\mu$ V/m)] - Result(QP) [dB( $\mu$ V/m)]

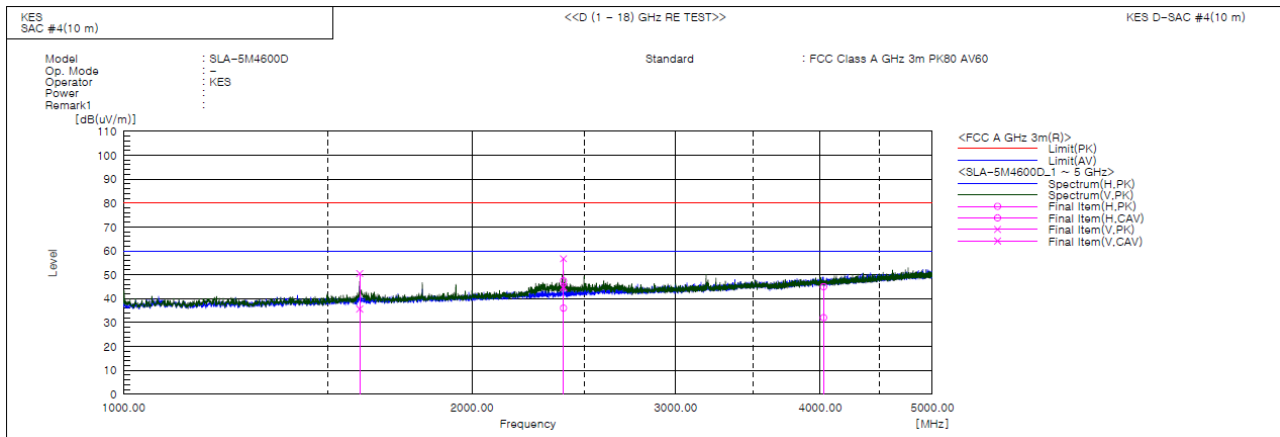
Reading(QP) : Reading value, Result(QP) : Reading value + Factor value

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)



### Final Result

| No. | Frequency [MHz] | (P) | Reading PK [dB(μV)] | Reading CAV [dB(μV)] | c.f [dB(1/m)] | Result PK [dB(μV/m)] | Result CAV [dB(μV/m)] | Limit PK [dB(μV/m)] | Limit AV [dB(μV/m)] | Margin PK [dB] | Margin CAV [dB] | Height [cm] | Angle [deg] | Remark |
|-----|-----------------|-----|---------------------|----------------------|---------------|----------------------|-----------------------|---------------------|---------------------|----------------|-----------------|-------------|-------------|--------|
| 1   | 1599.795        | V   | 52.7                | 37.9                 | -2.2          | 50.5                 | 35.7                  | 80.0                | 60.0                | 29.5           | 24.3            | 100.0       | 222.0       |        |
| 2   | 2399.725        | V   | 55.3                | 43.2                 | 1.5           | 56.8                 | 44.7                  | 80.0                | 60.0                | 23.2           | 15.3            | 100.0       | 251.0       |        |
| 3   | 2400.120        | H   | 46.0                | 34.6                 | 1.5           | 47.5                 | 36.1                  | 80.0                | 60.0                | 32.5           | 23.9            | 100.0       | 316.0       |        |
| 4   | 4027.650        | H   | 37.3                | 24.4                 | 7.7           | 45.0                 | 32.1                  | 80.0                | 60.0                | 35.0           | 27.9            | 100.0       | 214.0       |        |

### ◆ 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

N/A

N/A

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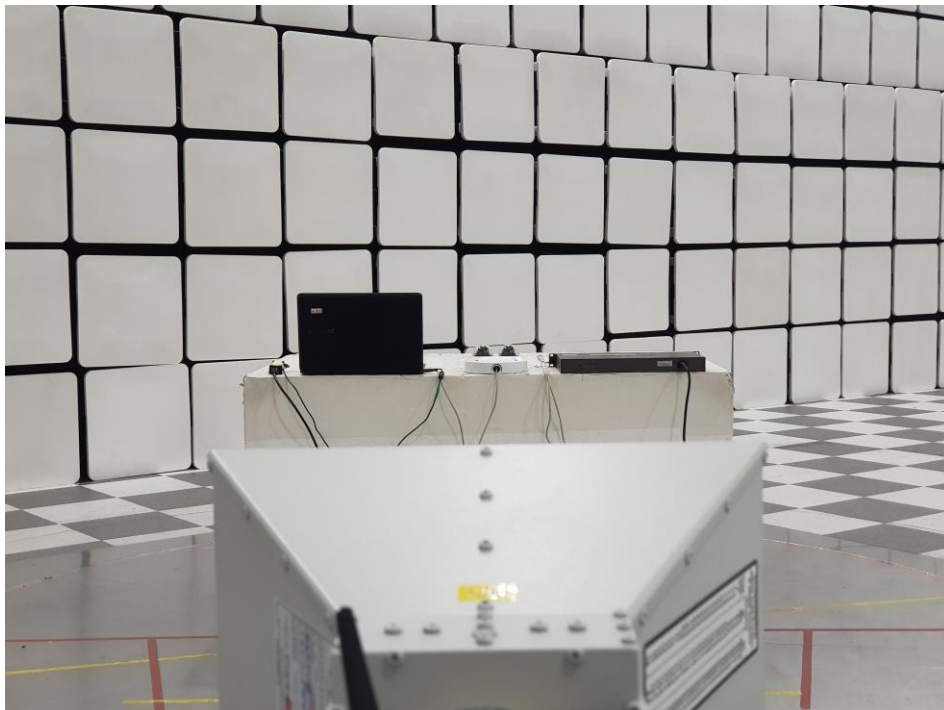
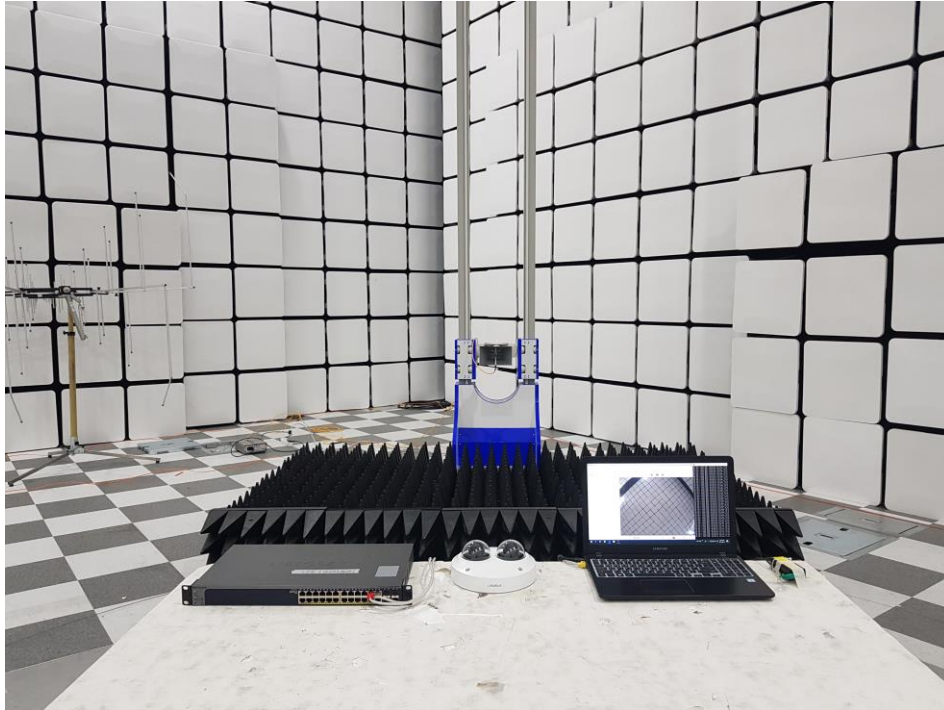
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## Radiated Electric Field Emissions(Below 1 GHz)



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## Radiated Electric Field Emissions(Above 1 GHz)



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## EUT External Photographs

(Top)



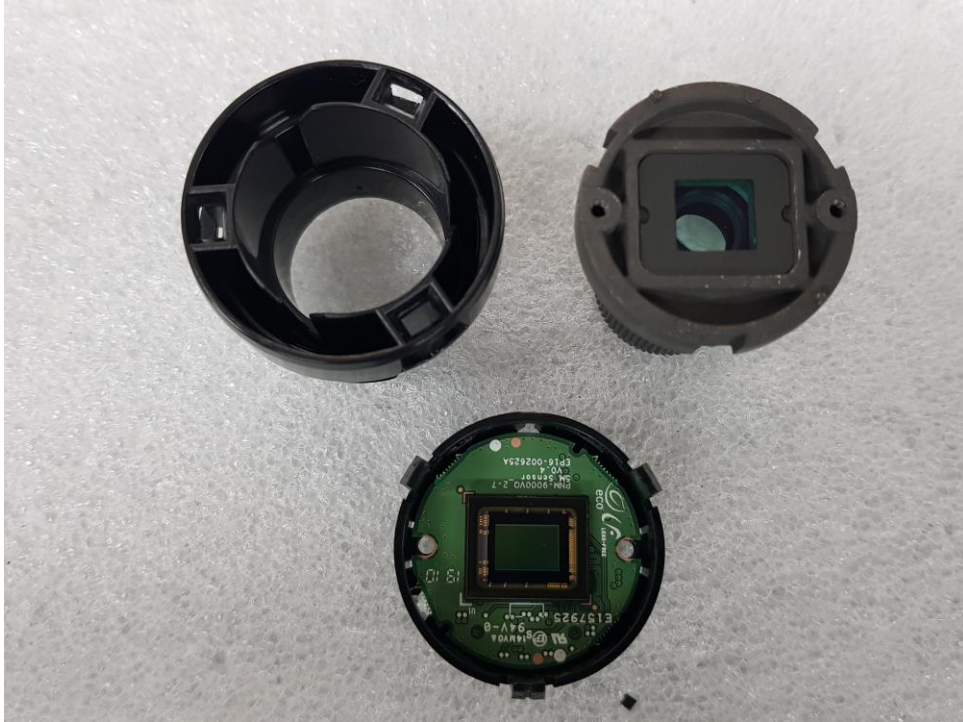
(Bottom)



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The authenticity of the test report, contact shchoi@kes.co.kr

## EUT Internal Photographs

(Internal View)



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## EUT Internal View – Lens

(Top)



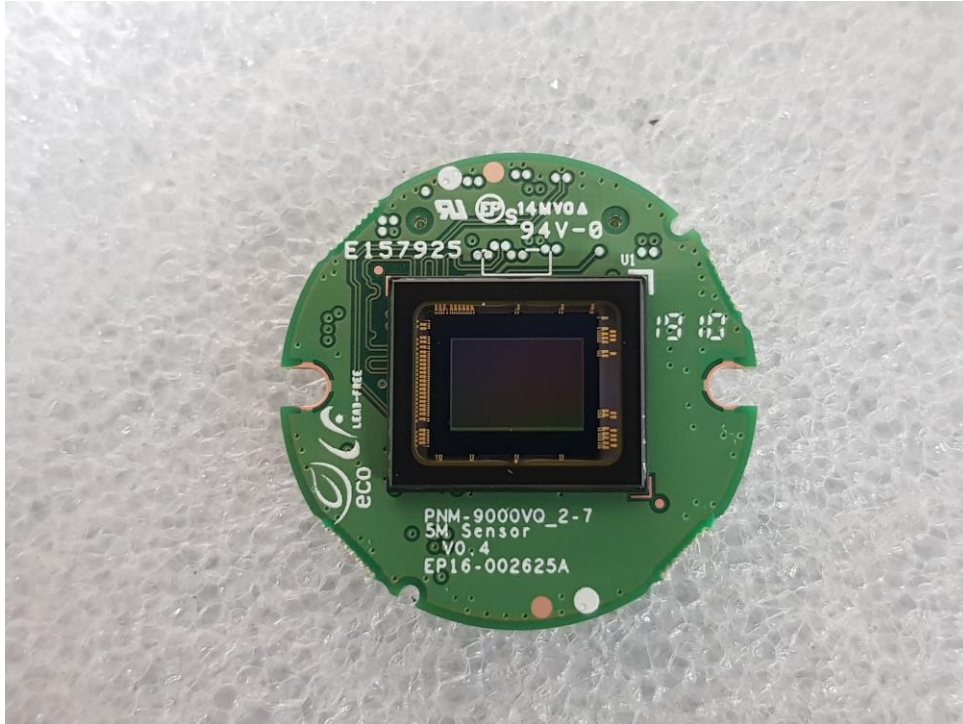
(Bottom)



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## EUT Internal View – Lens Board

(Top)

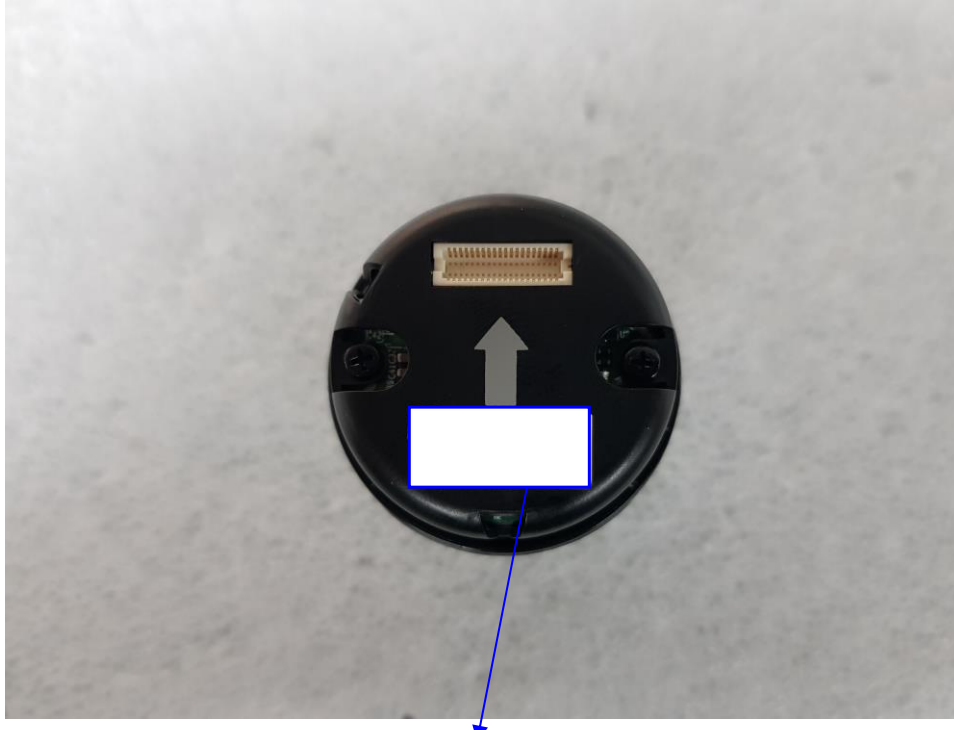


(Bottom)



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## Label Photographs



CAN ICES-3(A) / NMB-3(A)

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

(1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.