



## EMC TEST REPORT For VCCI

Test Report No. : KES-EM-22T0007-R1  
Date of Issue : Feb. 24, 2023  
Product name : LENS MODULE  
Model/Type No. : SLA-T4680A  
Variant Model : -  
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 : Dec. 09, 2021  
Test date : Dec. 17, 2021  
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                                                     |
|---------------|-------------------|----------------------------------------------------------------------|
| Jan. 03, 2022 | KES-EM-22T0007    | Issued                                                               |
| Feb. 24, 2023 | KES-EM-22T0007-R1 | Change the Applicant and manufacturer at the request of the customer |
|               |                   |                                                                      |
|               |                   |                                                                      |
|               |                   |                                                                      |
|               |                   |                                                                      |
|               |                   |                                                                      |
|               |                   |                                                                      |
|               |                   |                                                                      |
|               |                   |                                                                      |

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## 1.0 General Product Description

Main Specifications of EUT are:

### Video

|                      |                                |
|----------------------|--------------------------------|
| Imaging Device       | 1/2.8" 2MP CMOS                |
| Minimum Illumination | Color: 0.06Lux (F2.5, 1/30sec) |

### Lens

|                           |                               |
|---------------------------|-------------------------------|
| Focal Length (Zoom Ratio) | 4.6mm fixed focus             |
| Maximum Aperture Ratio    | F2.5                          |
| Angular Field of View     | H: 73 °, V: 39 °, D: 85 °     |
| Mount Type                | RJ12 connected with main unit |
| Focus Control             | Fixed                         |

### Mechanical

|                             |                  |
|-----------------------------|------------------|
| Color / Material            | Black / Plastic  |
| Product dimensions / weight | Ø24x49.8mm, 310g |



## 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.

☒ AC 100 V, 60 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 |
|-------------|--------------|---------------|---------------------------------------------|---------|
| LENS MODULE | SLA-T4680A   | -             | HANWHA VISION<br>VIETNAM COMPANY<br>LIMITED | EUT     |

## 1.5 Support Equipments

| Description     | Model Number | Serial Number | Manufacturer                                   | Remarks |
|-----------------|--------------|---------------|------------------------------------------------|---------|
| NETWORK CAMERA  | PNM-9000QB   | -             | HANWHA TECHWIN<br>SECURITY VIETNAM<br>CO.,LTD. | -       |
| LENS MODULE     | SLA-T2480A   | -             | HANWHA TECHWIN<br>SECURITY VIETNAM<br>CO.,LTD. | -       |
| LENS MODULE     | SLA-T4680VA  | -             | HANWHA TECHWIN<br>SECURITY VIETNAM<br>CO.,LTD. | -       |
| PoE Injector    | -            | -             | REPOTEC                                        | -       |
| Monitor         | 23MA53D      | 303KKMH9Z019  | LG                                             | -       |
| Monitor adapter | PSAB-L205A   | EAY62850201   | LG Innotek Yantai Co.<br>Ltd.                  | -       |



## 1.6 External I / O Cabling

| Start             |             | END             |             | Cable Spec. |        |
|-------------------|-------------|-----------------|-------------|-------------|--------|
| Description       | I / O Port  | Description     | I / O Port  | Length      | Shield |
| LENS MODULE (EUT) | RJ-12       | NETWORK CAMERA  | RJ-12       | 8.2         | S      |
| NETWORK CAMERA    | RJ-12       | LENS MODULE     | RJ-12       | 8.2         | S      |
|                   | RJ-12       | LENS MODULE     | RJ-12       | 8.2         | S      |
|                   | HDMI        | Monitor         | HDMI        | 1.5         | S      |
|                   | RJ-45 (PoE) | PoE             | RJ-45 (PoE) | 1.0         | S      |
| Monitor           | DC Jack     | Monitor adapter | DC Jack     | 1.4         | U      |

\* Unshielded=U, Shielded=S

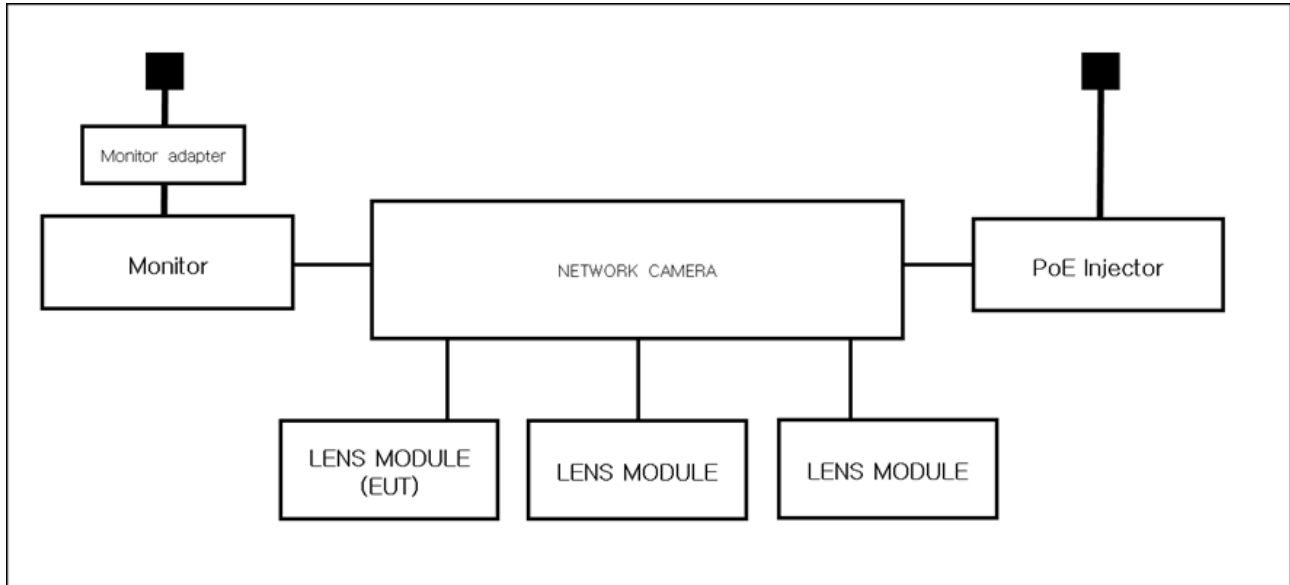
## 1.7 EUT Operating Mode(s)

| Test Mode      | operating      |
|----------------|----------------|
| Operation mode | Monitoring EUT |

| EUT Test operating S / W |         |                     |
|--------------------------|---------|---------------------|
| Name                     | Version | Manufacture Company |
| -                        | -       | -                   |

## 1.8 Configuration

■ AC Main  
□ DC Main





## **1.9 Remarks when standards applied**

- The power test-related conductive interference test (main power port) test is tested simultaneously because the PNM-9000QB was tested by connecting the SLA-T4680VA, SLA-T4680A and SLA-T2480A cameras together.

\* SLA-T4680VA, SLA-T4680A and SLA-T2480A products can be verified simultaneously.

## **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)<br>EMS (ESD, RS, EFT/Burst, Surge, CS, 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, Magnetic, Dips and interruptions) | <br>KT489                                   |
| USA           | FCC       | 3 m & 10 m Semi-Anechoic Chamber<br>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                                  |
| JAPAN         | VCCI      | EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site)                                                                          | <br>C-20136, T-20137,<br>R-20181, G-20176 |
| Europe        | TÜ V SÜ D | EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site)<br>EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions) | <br>CARAT 001633 0004                     |



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## 2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **VCCI-CISPR 32:2016**

☒ **Class A**

☐ **Class B**

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## 2.1 Conducted Emissions Mains Power Ports

**Test Date**

Dec. 17, 2021

**Test Location**

Electro wave Shieldroom #3

**Test Equipment**

| Used                                | Description       | Model Number | Manufacturer | Serial Number | Cal. Due     |
|-------------------------------------|-------------------|--------------|--------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMI Test S/W      | EMC32        | R & S        | 9.12.00       | -            |
| <input checked="" type="checkbox"/> | EMI TEST RECEIVER | ESU26        | R & S        | 100517        | 08, 05, 2022 |
| <input checked="" type="checkbox"/> | LISN              | ENV216       | R & S        | 101786        | 01, 19, 2022 |
| <input checked="" type="checkbox"/> | LISN              | ENV216       | R & S        | 101137        | 01, 19, 2022 |

**Test Conditions**

Temperature: (22,6 ± 0,3) °C

Relative Humidity: (43,9 ± 0,2) % 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.

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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     |
|--------------------------|-------------------|--------------|--------------|---------------|--------------|
| <input type="checkbox"/> | EMI Test S/W      | EMC32        | R & S        | 9.12.00       | -            |
| <input type="checkbox"/> | EMI TEST RECEIVER | ESU26        | R & S        | 100517        | 08, 05, 2022 |
| <input type="checkbox"/> | LISN              | ENV216       | R & S        | 101786        | 01, 19, 2022 |
| <input type="checkbox"/> | LISN              | ENV216       | R & S        | 101137        | 01, 19, 2022 |
| <input type="checkbox"/> | 8-WIRE ISN CAT3   | CAT3 8158    | SCHWARZBECK  | 8158-0019     | 03, 10, 2022 |
| <input type="checkbox"/> | 8-WIRE ISN CAT5   | CAT5 8158    | SCHWARZBECK  | 8158-0030     | 03, 10, 2022 |
| <input type="checkbox"/> | 8-WIRE ISN CAT6   | NTFM 8158    | SCHWARZBECK  | 8158-0029     | 03, 10, 2022 |
| <input type="checkbox"/> | CDN               | CDNS502A     | TESEQ        | 40431         | 12, 29, 2021 |

### 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

The RJ-12 port is not tested because it is a normal signal line, not an IP communication.

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

**Test Date**

Dec. 17, 2021

**Test Location**☐ OPEN AREA TEST SITE #2☒ SEMI ANECHOIC CHAMBER #4(10m)**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, 01, 2022 |
| <input checked="" type="checkbox"/> | AMPLIFIER                | SCU 01       | R & S            | 100603        | 11, 24, 2022 |
| <input checked="" type="checkbox"/> | TRILOG-BROADBAND ANTENNA | VULB9163     | Schwarzbeck      | 715           | 12, 08, 2022 |
| <input checked="" type="checkbox"/> | ATTENUATOR               | 8491A        | HP               | 32173         | 03, 10, 2022 |

**Test Conditions**

Temperature: (22,5 ± 0,4) °C

Relative Humidity: (43,7 ± 0,3) % 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.

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

**Test Date**

Dec. 17, 2021

**Test Location**

SEMI ANECHOIC CHAMBER #3

**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          | ESR7         | R & S            | 101190        | 08, 03, 2022 |
| <input checked="" type="checkbox"/> | PREAMPLIFIER               | 8449B        | AGILENT          | 3008A01967    | 04, 07, 2022 |
| <input type="checkbox"/>            | ATTENUATOR                 | 8491A        | HP               | 35496         | 03, 10, 2022 |
| <input checked="" type="checkbox"/> | DOUBLE RIDGED HORN ANTENNA | SAS-571      | A.H.SYSTEM,INC   | 781           | 03, 11, 2022 |

**Test Conditions**

Temperature: (22,4 ± 0,5) °C

Relative Humidity: (43,6 ± 0,4) % 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.

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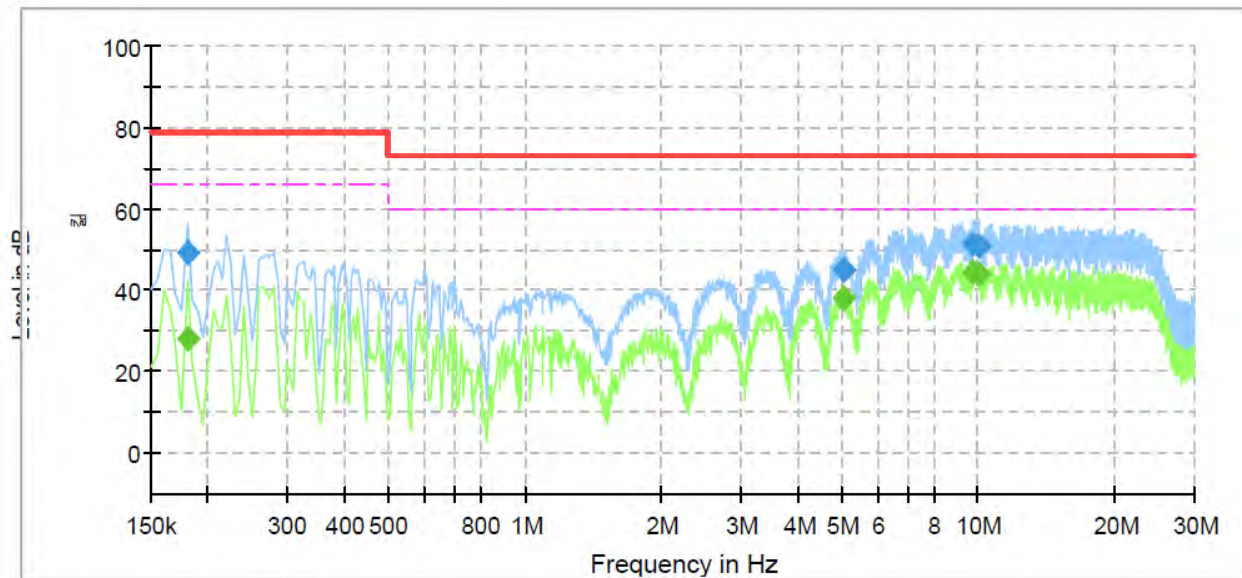
## APPENDIX A – TEST DATA

### Conducted Emissions at Mains Power Ports

HOT LINE

### Common Information

Test Description: Conducted Emission  
Model No.: SLA-T4680A  
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) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|------|------------|
| 0.180000        | ---              | 28.02           | 66.00        | 37.98       | 1000.0          | 9.000           | L1   | 9.6        |
| 0.180000        | 49.42            | ---             | 79.00        | 29.58       | 1000.0          | 9.000           | L1   | 9.6        |
| 5.050000        | ---              | 38.22           | 60.00        | 21.78       | 1000.0          | 9.000           | L1   | 9.9        |
| 5.050000        | 44.86            | ---             | 73.00        | 28.14       | 1000.0          | 9.000           | L1   | 9.9        |
| 5.065000        | ---              | 38.23           | 60.00        | 21.77       | 1000.0          | 9.000           | L1   | 9.9        |
| 5.065000        | 45.09            | ---             | 73.00        | 27.91       | 1000.0          | 9.000           | L1   | 9.9        |
| 9.695000        | ---              | 44.23           | 60.00        | 15.77       | 1000.0          | 9.000           | L1   | 9.6        |
| 9.695000        | 51.29            | ---             | 73.00        | 21.71       | 1000.0          | 9.000           | L1   | 9.6        |
| 10.035000       | ---              | 44.12           | 60.00        | 15.88       | 1000.0          | 9.000           | L1   | 9.7        |
| 10.035000       | 50.95            | ---             | 73.00        | 22.05       | 1000.0          | 9.000           | L1   | 9.7        |

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### NEUTRAL LINE

## Common Information

Test Description:

Model No.:

Mode

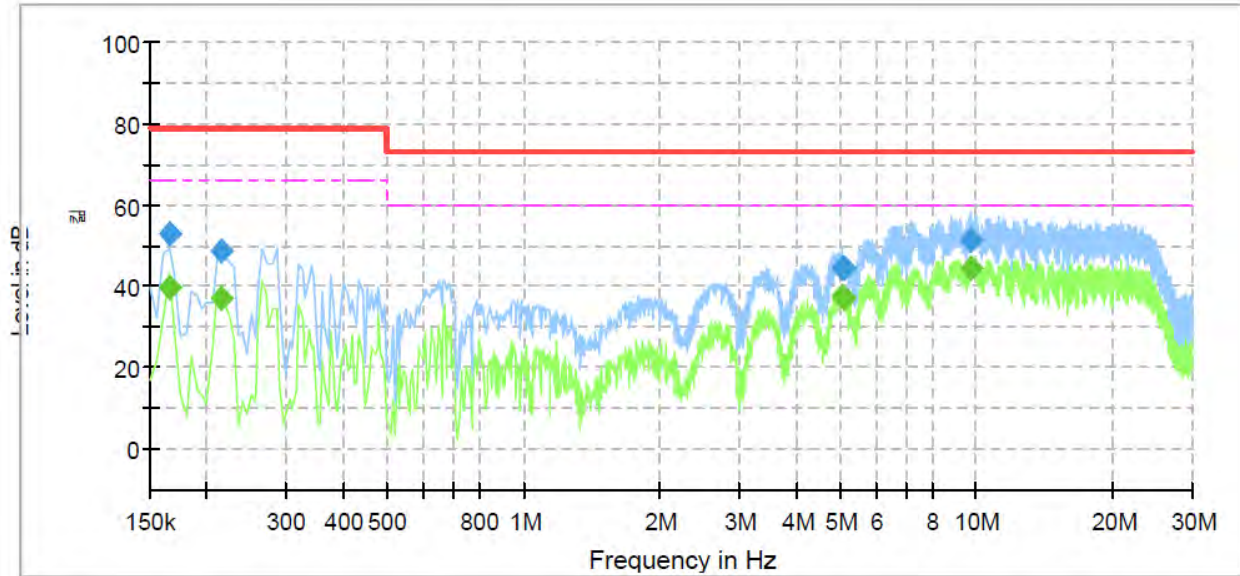
Operator Name:

Conducted Emission

SLA-T4680A

VCCI

KES



## Final Result

| Frequency (MHz) | QuasiPeak (dBμV) | CAverage (dBμV) | Limit (dBμV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|------|------------|
| 0.165000        | ---              | 39.73           | 66.00        | 26.27       | 1000.0          | 9.000           | N    | 9.5        |
| 0.165000        | 52.73            | ---             | 79.00        | 26.27       | 1000.0          | 9.000           | N    | 9.5        |
| 0.215000        | ---              | 37.00           | 66.00        | 29.00       | 1000.0          | 9.000           | N    | 9.5        |
| 0.215000        | 48.56            | ---             | 79.00        | 30.44       | 1000.0          | 9.000           | N    | 9.5        |
| 5.060000        | ---              | 37.40           | 60.00        | 22.60       | 1000.0          | 9.000           | N    | 9.9        |
| 5.060000        | 44.48            | ---             | 73.00        | 28.52       | 1000.0          | 9.000           | N    | 9.9        |
| 5.105000        | ---              | 37.13           | 60.00        | 22.87       | 1000.0          | 9.000           | N    | 9.9        |
| 5.105000        | 44.23            | ---             | 73.00        | 28.77       | 1000.0          | 9.000           | N    | 9.9        |
| 9.700000        | ---              | 44.34           | 60.00        | 15.66       | 1000.0          | 9.000           | N    | 9.6        |
| 9.700000        | 51.25            | ---             | 73.00        | 21.75       | 1000.0          | 9.000           | N    | 9.6        |

### ◆ 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**  
**[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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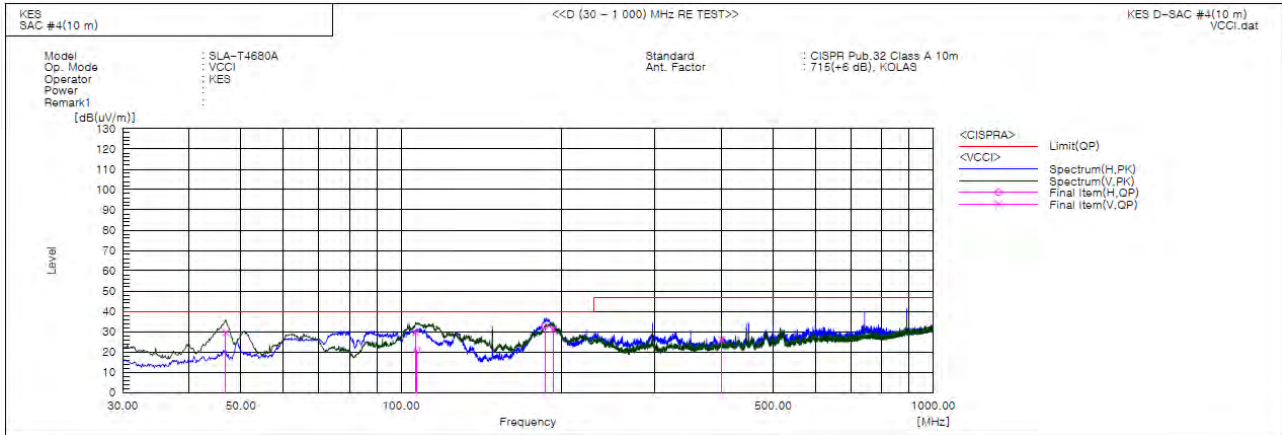
3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
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### Radiated Electric Field Emissions(Below 1 GHz)



#### 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   | 46.854             | V   | 50.5                      | -21.1            | 29.4                       | 40.0                      | 10.6                 | 103.0          | 127.0          |        |
| 2   | 106.509            | V   | 51.8                      | -22.3            | 29.5                       | 40.0                      | 10.5                 | 100.0          | 12.0           |        |
| 3   | 107.236            | H   | 43.0                      | -22.3            | 20.7                       | 40.0                      | 19.3                 | 365.0          | 7.0            |        |
| 4   | 186.291            | H   | 55.1                      | -22.6            | 32.5                       | 40.0                      | 7.5                  | 382.0          | 354.0          |        |
| 5   | 192.960            | V   | 52.5                      | -21.5            | 31.0                       | 40.0                      | 9.0                  | 100.0          | 193.0          |        |
| 6   | 399.934            | V   | 40.1                      | -14.1            | 26.0                       | 47.0                      | 21.0                 | 111.0          | 332.0          |        |

#### ◆ 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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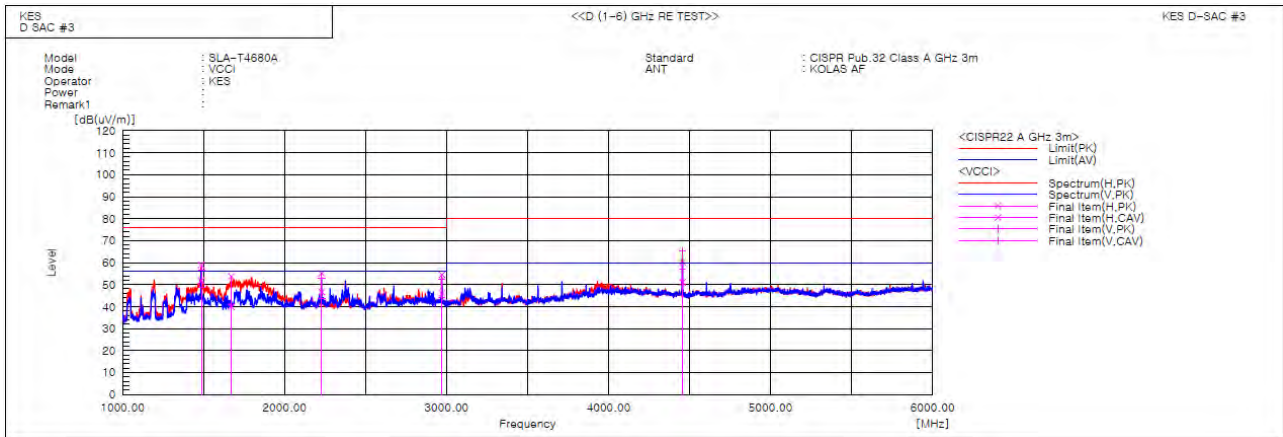
3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
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### Radiated Electric Field Emissions(Above 1 GHz)



#### Final Result

| No. | Frequency [MHz] | (P) | Reading PK [dB(uV)] | Reading CAV [dB(uV)] | c.f [dB(1/m)] | Result PK [dB(uV/m)] | Result CAV [dB(uV/m)] | Limit PK [dB(uV/m)] | Limit AV [dB(uV/m)] | Margin PK [dB] | Margin CAV [dB] | Height [cm] | Angle [deg] | Remark |
|-----|-----------------|-----|---------------------|----------------------|---------------|----------------------|-----------------------|---------------------|---------------------|----------------|-----------------|-------------|-------------|--------|
| 1   | 1485.920        | H   | 65.1                | 58.0                 | -6.2          | 58.9                 | 51.8                  | 76.0                | 56.0                | 17.1           | 4.2             | 100.0       | 21.8        |        |
| 2   | 1485.960        | V   | 62.6                | 55.1                 | -6.2          | 56.4                 | 48.9                  | 76.0                | 56.0                | 19.6           | 7.1             | 100.0       | 48.0        |        |
| 3   | 1671.100        | H   | 58.4                | 44.6                 | -4.6          | 53.8                 | 40.0                  | 76.0                | 56.0                | 22.2           | 16.0            | 100.0       | 283.1       |        |
| 4   | 2228.450        | V   | 53.4                | 44.3                 | -0.4          | 53.0                 | 43.9                  | 76.0                | 56.0                | 23.0           | 12.1            | 100.0       | 84.2        |        |
| 5   | 2228.540        | H   | 55.6                | 47.1                 | -0.4          | 55.2                 | 46.7                  | 76.0                | 56.0                | 20.8           | 9.3             | 100.0       | 40.0        |        |
| 6   | 2970.020        | V   | 50.7                | 42.4                 | 1.6           | 52.3                 | 44.0                  | 76.0                | 56.0                | 23.7           | 12.0            | 100.0       | 299.3       |        |
| 7   | 2970.700        | H   | 52.9                | 44.5                 | 1.6           | 54.5                 | 46.1                  | 76.0                | 56.0                | 21.5           | 9.9             | 100.0       | 286.0       |        |
| 8   | 4455.800        | V   | 58.6                | 50.1                 | 6.9           | 65.5                 | 57.0                  | 80.0                | 60.0                | 14.5           | 3.0             | 100.0       | 359.1       |        |
| 9   | 4456.020        | H   | 53.3                | 44.2                 | 6.9           | 60.2                 | 51.1                  | 80.0                | 60.0                | 19.8           | 8.9             | 100.0       | 132.9       |        |

#### ◆ 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

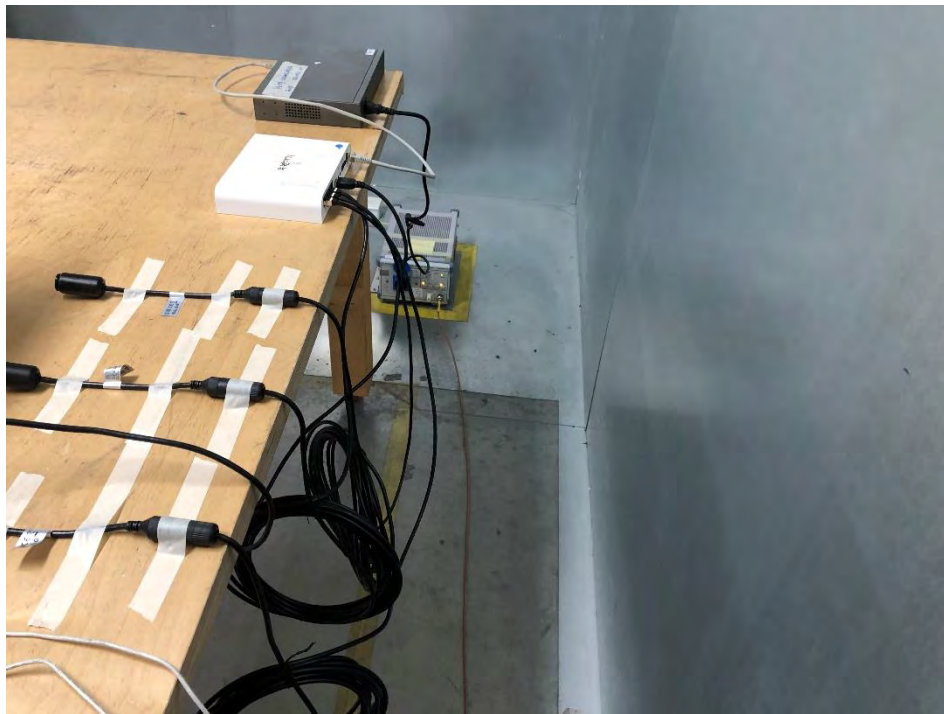
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## Test Setup Photos and Configuration

### Conducted Emissions at Mains Power Ports



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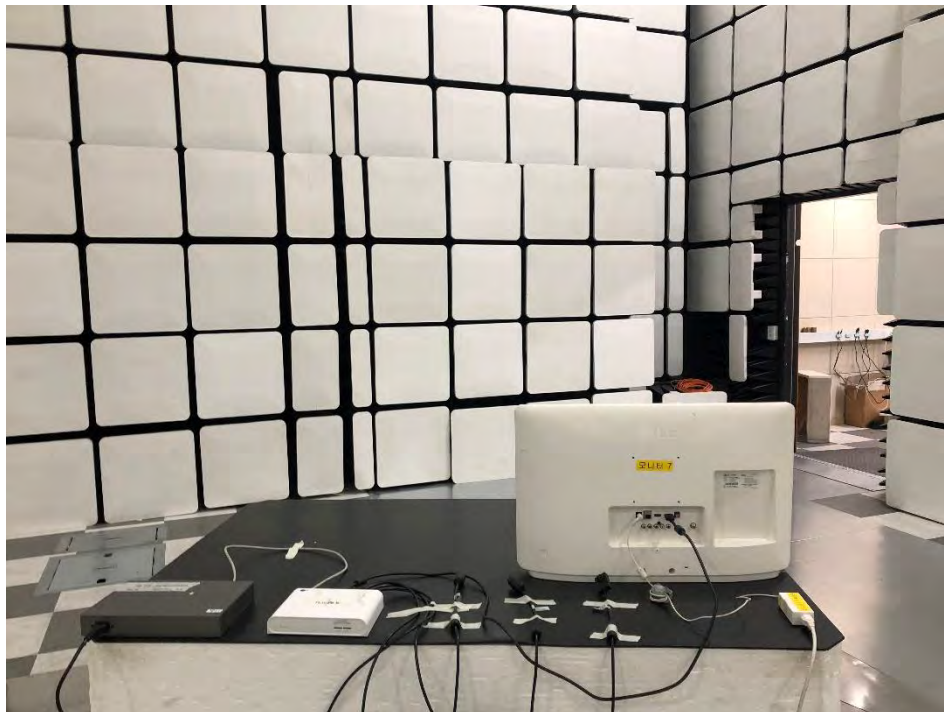
**Conducted Emissions at Telecommunication Ports**

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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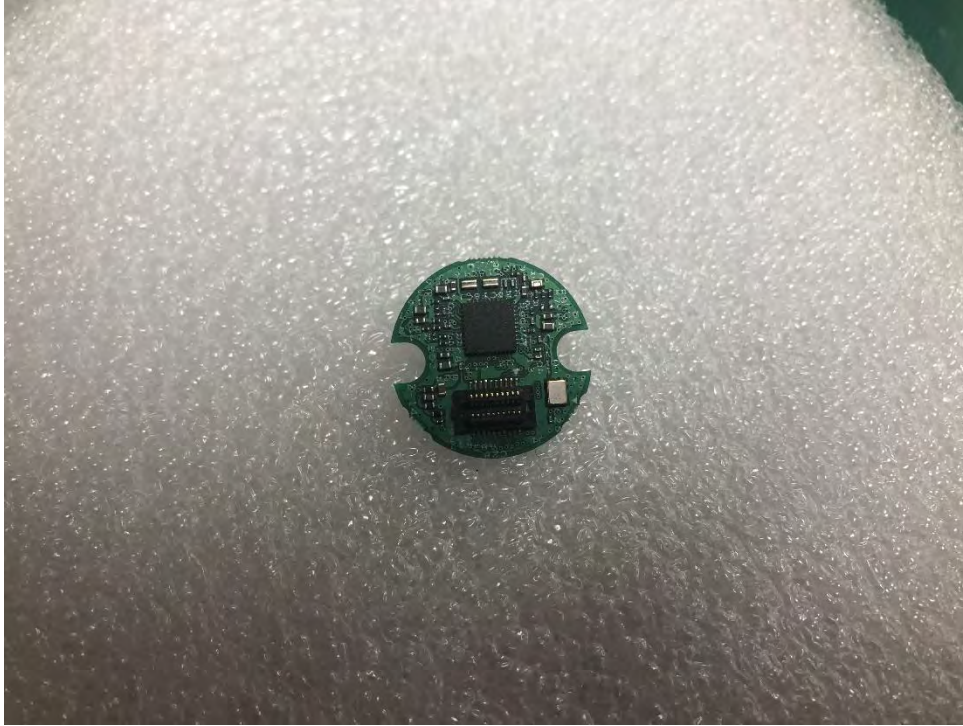
## EUT Internal Photographs

(Internal View)



## EUT Internal View – Board 1

(Top)



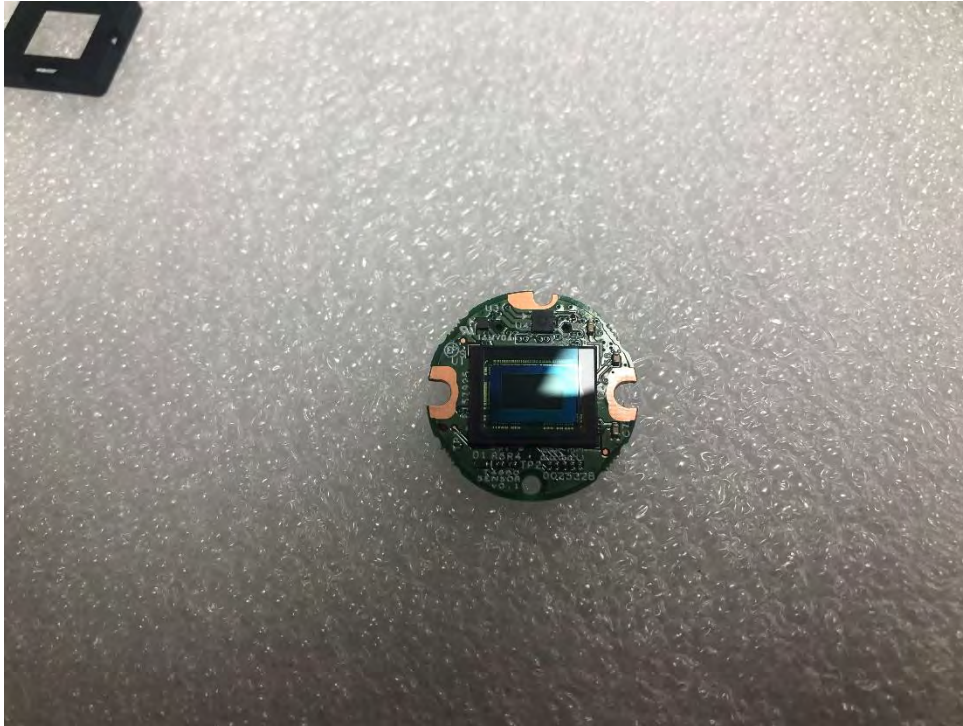
(Bottom)



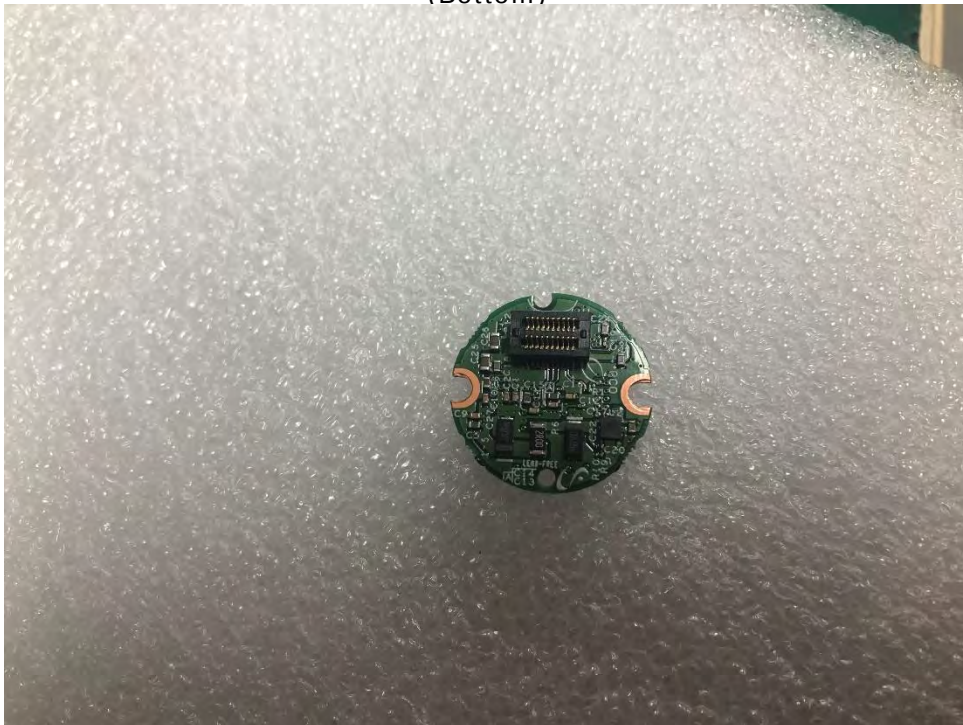
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## EUT Internal View – Board 2

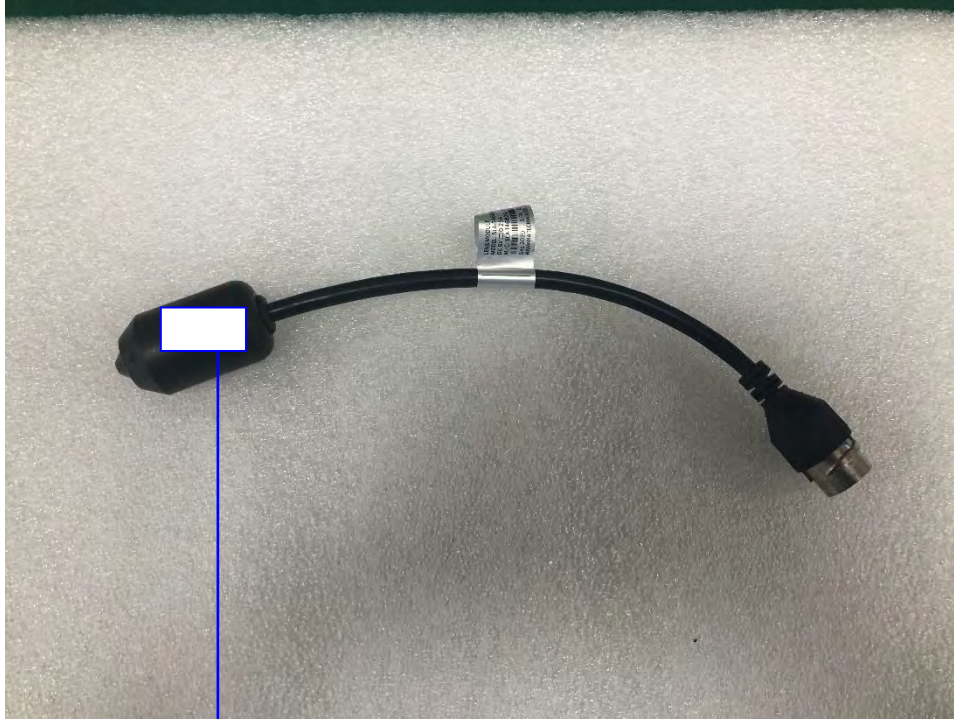
(Top)



(Bottom)



## Label Photographs



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VCCI-A