

# VERIFICATION OF FCC PART 15 COMPLIANCE

*KES hereby verify that the subject product complies with all the  
electromagnetic emission specified in the FCC Rule Part 15*

|                                   |                                                                                                            |
|-----------------------------------|------------------------------------------------------------------------------------------------------------|
| <b>Product Description:</b>       | NETWORK CAMERA                                                                                             |
| <b>Model/Brand Name:</b>          | TNB-6030N                                                                                                  |
| <b>Variant Model:</b>             | -                                                                                                          |
| <b>FCC Rule Part(s):</b>          | FCC 47CFR Part 15 Subpart B Class A<br>Part 15.107(b) & Part 15.109(b)                                     |
| <b>FCC Procedure:</b>             | Verification                                                                                               |
| <b>Applicant Name:</b>            | Hanwha Techwin Co., Ltd.                                                                                   |
| <b>Applicant Address:</b>         | 1204, Changwon-darero, Seongsan-gu<br>Changwon-si, Gyeongsangnam-do, Korea.                                |
| <b>Manufacturer Name:</b>         | Hanwha Techwin (Tianjin) Co.,Ltd.                                                                          |
| <b>Manufacturer Address:</b>      | No.11 Weiliu Rd, Micro-Electronic Industrial<br>Park, TEDA, Tianjin, 300385, People's Republic of<br>China |
| <b>Test Report Reference No.:</b> | KES-E1-17T0391                                                                                             |

NETWORK CAMERA, Model TNB-6030N has been tested in accordance with the measurement procedures specified in FCC 47CFR Part 15 Subpart B class A and has been shown to be complied with the electromagnetic emission limits specified in FCC Rule Part 15 Subpart B class A. A testing of the sample product has been valid for the sample tested based on the reference test report, KES-E1-17T0391

Date of Issue: 06. 16, 2017

Dong Hun, Jang  
Technical Manager  
Signature:



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## EMC TEST REPORT For FCC

Test Report No. : KES-E1-17T0391  
Date of Issue : Jun, 16, 2017  
Product name : NETWORK CAMERA  
Model/Type No. : TNB-6030N  
Variant Model : -  
Applicant : Hanwha Techwin Co., Ltd.  
Applicant Address : 1204, Changwon-daero, Seongsan-gu Changwon-si,  
Gyeongsangnam-do, Korea  
Manufacturer : Hanwha Techwin (Tianjin) Co., Ltd  
Manufacturer Address : No.11 Weiliu Rd, Micro-Electronic Industrial  
Park, TEDA, Tianjin, 300385, People's Republic of China.  
Equipment authorization : ☐ Declaration of Conformity  
☒ Verification  
☐ Certification  
Date of Receipt : Jun, 02, 2017  
Test date : Jun, 15, 2017  
Test Results : ☒ In Compliance ☐ Not in Compliance

Tested by

Young Suk, Song  
EMC Test Engineer

Reviewed by

Dong-Hun, Jang  
EMC Technical Manager



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Test report No.:  
KES-E1-17T0391  
Page (2) of (31)

### REPORT REVISION HISTORY

| Date          | Test Report No. | Revision History |
|---------------|-----------------|------------------|
| Jun. 16, 2017 | KES-E1-17T0391  | Issued           |
|               |                 |                  |
|               |                 |                  |
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## TABLE OF CONTENTS

|                                                      |                                                             |    |
|------------------------------------------------------|-------------------------------------------------------------|----|
| 1.0                                                  | General Product Description.....                            | 4  |
| 1.1                                                  | Test Voltage & Frequency .....                              | 8  |
| 1.2                                                  | Variant Model Differences.....                              | 8  |
| 1.3                                                  | Device Modifications .....                                  | 8  |
| 1.4                                                  | Equipment Under Test.....                                   | 8  |
| 1.5                                                  | Support Equipments .....                                    | 8  |
| 1.6                                                  | External I/O Cabling .....                                  | 9  |
| 1.7                                                  | EUT Operating Mode(s) .....                                 | 10 |
| 1.8                                                  | Configuration.....                                          | 11 |
| 1.9                                                  | Calibration Details of Equipment Used for Measurement ..... | 12 |
| 1.10                                                 | Test Facility .....                                         | 12 |
| 1.11                                                 | Laboratory Accreditations and Listings .....                | 12 |
| 2.0                                                  | Test Regulations.....                                       | 13 |
| 2.1                                                  | Conducted Emissions at Mains Power Ports .....              | 15 |
| 2.2                                                  | Radiated Electric Field Emissions(Below 1 GHz) .....        | 16 |
| 2.3                                                  | Radiated Electric Field Emissions(Above 1 GHz) .....        | 17 |
| APPENDIX A – TEST DATA.....                          |                                                             | 18 |
| Conducted Emissions at Mains Power Ports.....        |                                                             | 18 |
| Radiated Electric Field Emissions(Below 1 GHz) ..... |                                                             | 20 |
| Radiated Electric Field Emissions(Above 1 GHz) ..... |                                                             | 22 |
| Test Setup Photos and Configuration .....            |                                                             | 24 |
| Conducted Voltage Emissions .....                    |                                                             | 24 |
| Radiated Electric Field Emissions(Below 1 GHz) ..... |                                                             | 25 |
| Radiated Electric Field Emissions(Above 1 GHz) ..... |                                                             | 26 |
| EUT External Photographs .....                       |                                                             | 27 |
| EUT Internal Photographs .....                       |                                                             | 28 |



## 1.0 General Product Description

### Main Specifications of EUT are:

| 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 : 0.86lux(F2.5, 1/30sec)                                                                                                                                                               |
| S / N Ratio               | 50dB                                                                                                                                                                                         |
| Video Out                 | HDMI : Micro HDMI (1920 x 1080 30fps)                                                                                                                                                        |
| Lens                      |                                                                                                                                                                                              |
| Focal Length (Zoom Ratio) | 4.6mm                                                                                                                                                                                        |
| Max. Aperture Ratio       | F2.5                                                                                                                                                                                         |
| Angular Field of View     | H: 73°, V: 39°, D: 85°                                                                                                                                                                       |
| Min. Object Distance      | 0.3m(0.98ft)                                                                                                                                                                                 |
| Focus Control             | -                                                                                                                                                                                            |
| Lens Type                 | Pinhole                                                                                                                                                                                      |
| Mount Type                | Board-in type                                                                                                                                                                                |
| Pan / Tilt / Rotate       |                                                                                                                                                                                              |
| Pan / Tilt / Rotate range |                                                                                                                                                                                              |
| Operational               |                                                                                                                                                                                              |
| Camera Title              | Off / On (Displayed up to 85 characters)<br>- English/Numeric/Special Characters<br>- Multi-line (Max 5), Color (Grey/Green/Red/Blue/Black/White),<br>Transparency, Auto Scale by Resolution |
| Day & Night               | Auto (Electrical) / Color / B/W                                                                                                                                                              |
| Backlight Compensation    | Off / BLC / HLC(Masking/Dimming), WDR                                                                                                                                                        |
| Wide Dynamic Range        | 150dB                                                                                                                                                                                        |

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Test report No.:  
KES-E1-17T0391  
Page (5) of (31)

|                             |                                                                                                                                                                                           |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Contrast Enhancement        | SSDR (Off / On)                                                                                                                                                                           |
| Digital Noise Reduction     | SSNR5 (2D+3D Noise Filter) (Off / On)                                                                                                                                                     |
| Digital Image Stabilization | Off / On                                                                                                                                                                                  |
| Defog                       | Auto(input from fog detection) / Manual / Off                                                                                                                                             |
| Motion Detection            | Off/ On(8ea, 8point Polygonal zones), <a href="#">Handover</a>                                                                                                                            |
| Privacy Masking             | Off / On (32ea, polygonal zones)<br>- Color : Grey/Green/Red/Blue/Black/White<br>- Mosaic                                                                                                 |
| Gain Control                | Off / Low / Middle / High                                                                                                                                                                 |
| White Balance               | ATW / AWC / Manual / Indoor / Outdoor((included Mercury & Sodium))                                                                                                                        |
| Contrast                    | level adjustment                                                                                                                                                                          |
| LDC                         | On/Off (5 levels with Min/Max)                                                                                                                                                            |
| Electronic Shutter Speed    | Minimum / Maximum / Anti flicker (2 ~ 1/12,000sec)                                                                                                                                        |
| Digital PTZ                 | 24X, 'Digital PTZ(Preset, Group)                                                                                                                                                          |
| Flip / Mirror               | Flip : On/Off<br>Mirror : On/Off<br><br>Hallway view : 90°/270°                                                                                                                           |
| Video Analytics             | Tampering, Loitering, Directional Detection, Defocus Detection, Fog&Dust Detection, Virtual Line, Enter/Exit, Appear / Disappear, Face Detection, Motion Detection, Digital Auto Tracking |
| Alarm I/O                   | Input 1ea / Output 1ea                                                                                                                                                                    |
| Alarm Triggers              | Motion Detection, Video & Audio Analytics, Network Disconnect                                                                                                                             |
| Alarm events                | File upload via FTP, E-Mail<br>Notification via E-Mail<br>local storage(SD/SDHC/SDXC) or NAS recording at Event Triggers<br>External output<br>DPTZ preset                                |
| Audio In                    | Selectable (Mic IN/Line IN),<br>Supply voltage: 2.5VDC(4mA), Input impedance: approx. 2K Ohm                                                                                              |
| Audio out                   | Line out, Max output level: 1 Vrms                                                                                                                                                        |
| Pixel Counter               | Support                                                                                                                                                                                   |
| <b>Network</b>              |                                                                                                                                                                                           |

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|                          |                                                                                                                                                                                |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ethernet                 | RJ-45 (10/100BASE-T)                                                                                                                                                           |
| Video Compression Format | H.265/H.264 (MPEG-4 Part 10/AVC) : Main/Baseline/High , Motion JPEG                                                                                                            |
| Resolution               | 1920x1080, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360, 320x240                                                              |
| Max. Framerate           | H.265/H.264 : Max. 60fps at all resolutions<br>Motion JPEG : Max. 30fps                                                                                                        |
| Smart Codec              | Manual Mode (area-based : 5EA)                                                                                                                                                 |
| WiseStreamII             | Support                                                                                                                                                                        |
| Video Quality Adjustment | H.264/H.265 : Target Bitrate Level Control<br>MJPEG : Target Bitrate Level Control                                                                                             |
| Bitrate Control Method   | H.264/H.265 : CBR or VBR<br>MJPEG : VBR                                                                                                                                        |
| Streaming Capability     | Multiple Streaming (Up to 10 Profiles)                                                                                                                                         |
| Audio Compression Format | G.711 u-law /G.726 Selectable<br>G.726 (ADPCM) 8KHz, G.711 8KHz<br>G.726 : 16Kbps, 24Kbps, 32Kbps, 40Kbps<br>AAC-LC : 48Kbps at 8/16/32/48KHz                                  |
| Audio Communication      | Bi-dierctional (2-Way)                                                                                                                                                         |
| IP                       | IPv4, IPv6                                                                                                                                                                     |
| Protocol                 | TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP,RTSP, NTP, HTTP, HTTPS, SSL/TLS, DHCP, PPPoE, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, PIM-SM, UPnP, Bonjour |
| Security                 | HTTPS(SSL) Login Authentication<br>Digest Login Authentication<br>IP Address Filtering<br>User access Log<br>802.1X Authentication (EAP-TLS, EAP-LEAP)                         |
| Streaming Method         | Unicast / Multicast                                                                                                                                                            |
| Max. User Access         | 20 users at Unicast Mode                                                                                                                                                       |

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Test report No.:  
KES-E1-17T0391  
Page (7) of (31)

|                                   |                                                                                                                                                                                                                                                                                                                   |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Edge Storage                      | SD/SDHC/SDXC(256 GB)<br>- Motion Images recorded in the SD/SDHC/SDXC memory card can be downloaded.<br>NAS(Network Attached Storage)<br>Local PC for Instant Recording                                                                                                                                            |
| Application Programming Interface | ONVIF Profile S/G<br>SUNAPI(HTTP API)<br>Open Platform                                                                                                                                                                                                                                                            |
| Webpage Language                  | English                                                                                                                                                                                                                                                                                                           |
| Web Viewer                        | Supported OS: Windows 7, 8.1, 10, Mac OS X 10.10. 10.11 10.12<br><b>Non-plugin Webviewer</b><br>Supported Browser: Google Chrome , MS Edge , Mozilla Firefox (Window 64bit only) , Apple Safari 10 (Mac OS X only)<br><b>Plug-in Webviewer</b><br>Supported Browser : MS Explore 11, Apple Safari (Mac OS X only) |
| Central Management Software       | SmartViewer, SSM                                                                                                                                                                                                                                                                                                  |
| <b>Environmental</b>              |                                                                                                                                                                                                                                                                                                                   |
| Operating Temperature / Humidity  | -10°C ~ +50°C (-14°F ~ +122°F) / Less than 90% RH                                                                                                                                                                                                                                                                 |
| Storage Temperature / Humidity    | -30°C ~ +60°C (-22°F ~ +140°F) / Less than 90% RH                                                                                                                                                                                                                                                                 |
| Ingress Protection                | -                                                                                                                                                                                                                                                                                                                 |
| Vandal Resistance                 | -                                                                                                                                                                                                                                                                                                                 |
| <b>Electrical</b>                 |                                                                                                                                                                                                                                                                                                                   |
| Input Voltage / Current           | PoE(IEEE802.3af,Class3), 12VDC                                                                                                                                                                                                                                                                                    |
| Power Consumption                 | Max. 6W(12VDC), Max. 7W(PoE)                                                                                                                                                                                                                                                                                      |
| <b>Mechanical</b>                 |                                                                                                                                                                                                                                                                                                                   |
| Color / Material                  | Black / Plastic, Metal                                                                                                                                                                                                                                                                                            |
| Dimension (WxHxD)                 | 240 x 46 x 25mm                                                                                                                                                                                                                                                                                                   |
| Weight                            | TBD                                                                                                                                                                                                                                                                                                               |

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## 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 |
|----------------|--------------|---------------|-------------------------------------|---------|
| NETWORK CAMERA | TNB-6030N    | -             | Hanwha Techwin (Tianjin)<br>Co.,Ltd | E.U.T   |

## 1.5 Support Equipments

| Description      | Model Number  | Serial Number                 | Manufacturer                                     | Remarks |
|------------------|---------------|-------------------------------|--------------------------------------------------|---------|
| POE Adaptor      | PD-9501GR     | -                             | Microsemi                                        | -       |
| Notebook         | NT63025J      | JK9091EF400432X               | Samsung Electronics<br>Co., Ltd.                 | -       |
| Notebook Adaptor | A13-040N2A    | CN60BA4400313AD<br>0N843KO243 | Chicony Power<br>Technology (suzhou)Co.,<br>Ltd. | -       |
| MONITOR          | SMT-2232      | C95V67VF900015Y               | Weihai Daewoo<br>Electronics Co., Ltd.           |         |
| Speaker          | BR10000A CUVE | -                             | BEIJING EDIFIER HI-<br>TECH GROUP.               | -       |
| MIC              | CMK-303       | -                             | CAMAC                                            | -       |
| Alarm1           | -             | -                             | -                                                | -       |
| Alarm2           | SIP-1201DD D0 | -                             | SAMSUNG TECHWIN CO.,<br>LTD.                     | -       |



## 1.6 External I/O Cabling

- DC 12 V Mode

| Start                     |          | END         |          | Cable Spec. |        |
|---------------------------|----------|-------------|----------|-------------|--------|
| Description               | I/O Port | Description | I/O Port | Length      | Shield |
| NETWORK CAMERA<br>(시험기자재) | RJ-45    | Notebook    | RJ-45    | 3.0         | U      |
|                           | HDMI     | MONITOR     | HDMI     | 1.5         | S      |
|                           | 3.5 mm   | Speaker     | 3.5 mm   | 1.6         | U      |
|                           | 3.5 mm   | MIC         | 3.5 mm   | 1.7         | U      |
|                           | 2 Pin    | Alarm1      | 2 Pin    | 3.0         | U      |
|                           | 2 Pin    | Alarm2      | 2 Pin    | 1.5         | U      |

\* Unshielded = U, Shielded = S

- POE Mode

| Start                     |                 | END         |                 | Cable Spec. |        |
|---------------------------|-----------------|-------------|-----------------|-------------|--------|
| Description               | I/O Port        | Description | I/O Port        | Length      | Shield |
| NETWORK CAMERA<br>(시험기자재) | RJ-45<br>(POE)  | POE Adaptor | RJ-45<br>(POE)  | 3.0         | U      |
|                           | HDMI            | MONITOR     | HDMI            | 1.5         | S      |
|                           | 3.5 mm          | Speaker     | 3.5 mm          | 1.6         | U      |
|                           | 3.5 mm          | MIC         | 3.5 mm          | 1.7         | U      |
|                           | 2 Pin           | Alarm1      | 2 Pin           | 3.0         | U      |
|                           | 2 Pin           | Alarm2      | 2 Pin           | 1.5         | U      |
| Notebook                  | RJ-45<br>(DATA) | POE Adaptor | RJ-45<br>(DATA) | 3.0         | U      |

\* Unshielded = U, Shielded = S

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Test report No.:  
KES-E1-17T0391  
Page (10) of (31)

## 1.7 EUT Operating Mode(s)

| Test mode | operating                   |
|-----------|-----------------------------|
| DC 12 V   | E.U.T Monitoring, Ping Test |
| POE       | E.U.T Monitoring, Ping Test |

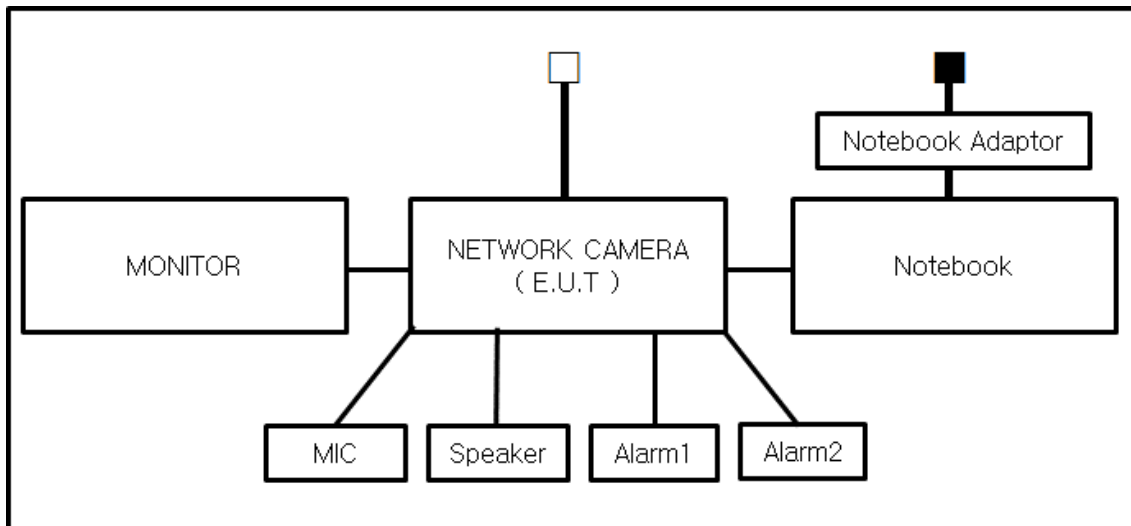
| E.U.T Test operating SW |         |                          |
|-------------------------|---------|--------------------------|
| Name                    | Version | Manufacture Company      |
| WebView                 | –       | Hanwha Techwin Co., Ltd. |

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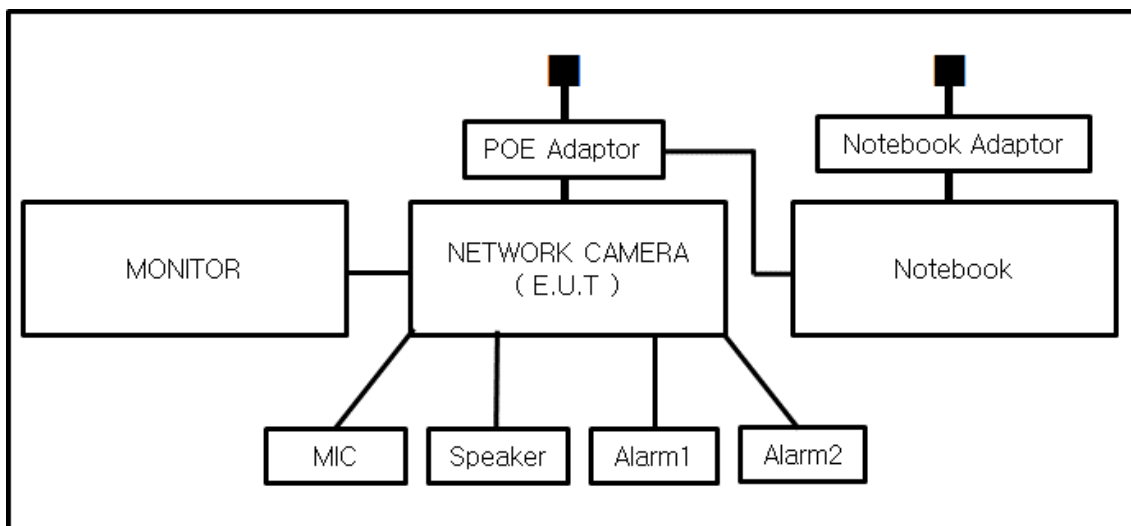
## 1.8 Configuration

■ AC Main  
□ DC Main

- DC 12 V Mode



- POE Mode



## 1.9 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.

## 1.10 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 and CISPR Publication 22.

## 1.11 Laboratory Accreditations and Listings

| Country       | Agency | Scope of Accreditation                                                                                                                                                                                 | Logo                                                                                                                     |
|---------------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| USA           | FCC    | 3 & 10 meter Open Area Test Sites and one conducted site to perform FCC Part 15/18 measurements.                                                                                                       |                                       |
| 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 |
| KOREA         | MSIP   | EMI (10 meter Open Area Test Site and two conducted sites)<br>Radio(3 & 10 meter Open Area Test Sites and one conducted site)<br>EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions) | <br>KR0100                          |
| Canada        | IC     | 3 & 10 meter Open Area Test Sites and one conducted site                                                                                                                                               | <br>4769B-1                         |
| Europe        | CE     | EMI (10 meter Open Area Test Site and two conducted sites)<br>Radio(3 & 10 meter Open Area Test Sites and one conducted site)<br>EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions) |                                     |
| International | KOLAS  | EMI (10 meter Open Area Test Site and two conducted sites)<br>Radio(3 & 10 meter Open Area Test Sites and one conducted site)<br>EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions) |                                     |

## 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 CISPR22:2009 +A1:2010**

☐ Class A

☐ Class B

☒ **47 CFR Part 15, Subpart B**

☐ CISPR 22:2009 +A1:2010

☐ Class A

☐ Class B

☒ ANSI C63.4-2014

☒ Class A

☐ Class B

☐ **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

N/A

### Test Location

Electro wave Shieldroom

### 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        | 101783        | 04, 27, 2018 |
| <input type="checkbox"/> | LISN              | ENV216       | R & S        | 101137        | 02, 03, 2018 |
| <input type="checkbox"/> | LISN              | ENV216       | R & S        | 101786        | 04, 27, 2018 |
| <input type="checkbox"/> | PULSE LIMITER     | ESH3-Z2      | R & S        | 101914        | 12, 13, 2017 |

### Test Conditions

Temperature: °C

Relative Humidity: %

### 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

-





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

### Test Date

Jun. 15, 2017

### Test Location

☐ OPEN AREA TEST SITE #2 ☒ SAC #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, 18, 2018 |
| <input checked="" type="checkbox"/> | AMPLIFIER                | SCU 01       | R & S            | 100603        | 12, 13, 2017 |
| <input checked="" type="checkbox"/> | TRILOG-BROADBAND ANTENNA | VULB9163     | Schwarzbeck      | 716           | 11, 28, 2018 |

### Test Conditions

Temperature: 25,3 °C

Relative Humidity: 48,7 %

### 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**

Jun. 15, 2017

**Test Location**

SAC #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, 17, 2018 |
| <input checked="" type="checkbox"/> | PREAMPLIFIER               | 8449B        | AGILENT          | 3008A01967    | 05, 31, 2018 |
| <input checked="" type="checkbox"/> | DOUBLE RIDGED HORN ANTENNA | SAS-571      | A.H.SYSTEM,INC   | 781           | 05, 02, 2019 |

**Test Conditions**Temperature: 25,3 °C  
Relative Humidity: 48,7 %**Frequency Range of Measurement**

1 GHz to 26.5 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.



## APPENDIX A – TEST DATA

### Conducted Emissions at Mains Power Ports

[HOT]

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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Test report No.:  
KES-E1-17T0391  
Page (19) of (31)

**[NEUTRAL]**

N/A

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

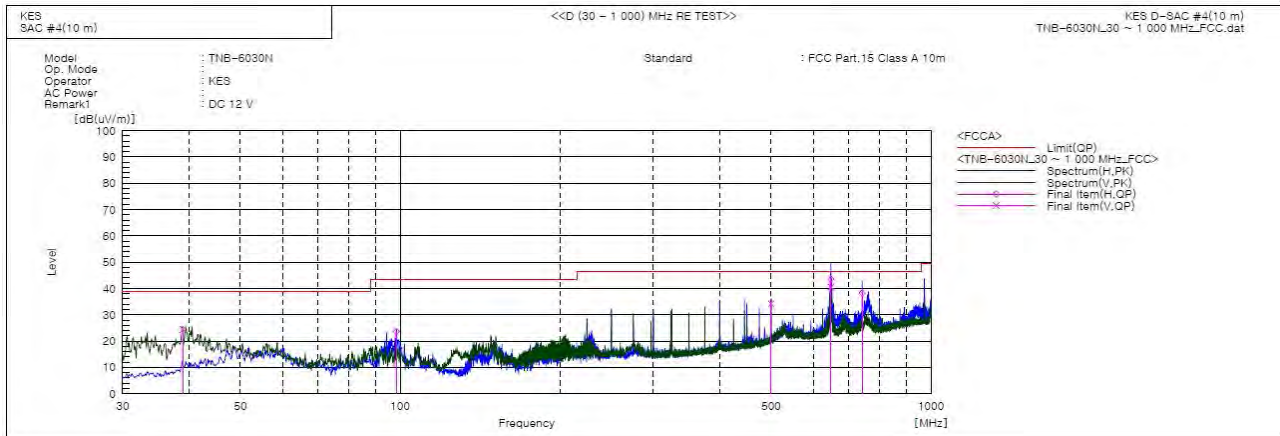
Reading Value : Not shown in the table.

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

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## Radiated Electric Field Emissions(Below 1 GHz)

- DC 12 V Mode



### 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   | 38.973             | V   | 54.7                      | -30.2            | 24.5                       | 39.0                      | 14.5                 | 100.0          | 284.0          |        |
| 2   | 98.385             | H   | 52.5                      | -28.9            | 23.6                       | 43.5                      | 19.9                 | 400.0          | 64.0           |        |
| 3   | 499.965            | V   | 52.9                      | -18.7            | 34.2                       | 46.5                      | 12.3                 | 100.0          | 156.0          |        |
| 4   | 647.987            | H   | 59.0                      | -15.4            | 43.6                       | 46.5                      | 2.9                  | 114.0          | 226.0          |        |
| 5   | 648.011            | V   | 56.0                      | -15.4            | 40.6                       | 46.5                      | 5.9                  | 150.0          | 191.0          |        |
| 6   | 742.586            | H   | 52.9                      | -14.6            | 38.3                       | 46.5                      | 8.2                  | 100.0          | 40.0           |        |

### ◆ Calculation

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

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

Correction Factor : ANT FACTOR + Cable loss

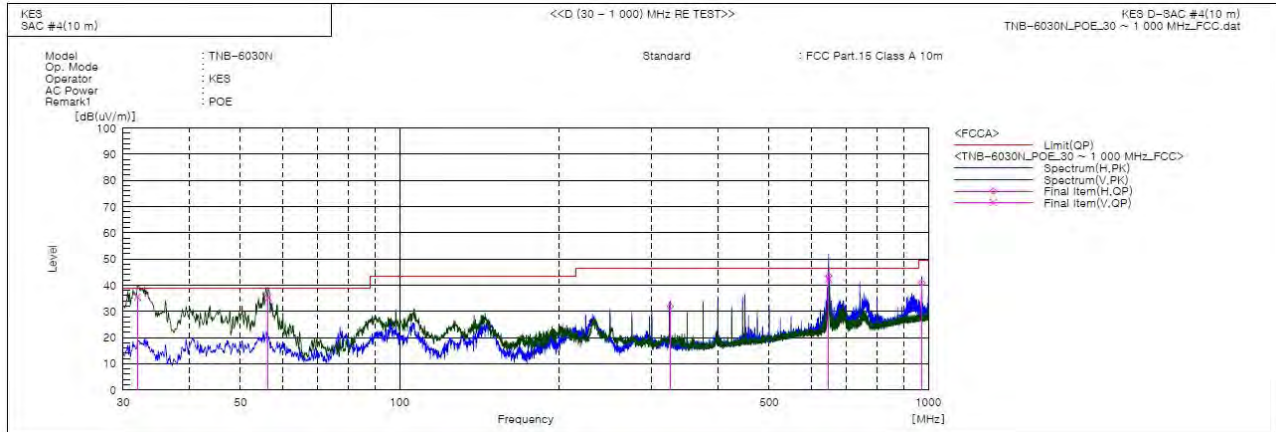


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KES-E1-17T0391  
Page (21) of (31)

### - POE Mode



### 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   | 31.940             | V   | 68.0                      | -32.5            | 35.5                       | 39.0                      | 3.5                  | 100.0          | 242.0          |        |
| 2   | 56.433             | V   | 63.8                      | -28.6            | 35.2                       | 39.0                      | 3.8                  | 100.0          | 130.0          |        |
| 3   | 325.001            | H   | 55.8                      | -23.9            | 31.9                       | 46.5                      | 14.6                 | 200.0          | 130.0          |        |
| 4   | 648.011            | V   | 57.8                      | -15.4            | 42.4                       | 46.5                      | 4.1                  | 400.0          | 219.0          |        |
| 5   | 648.037            | H   | 58.9                      | -15.4            | 43.5                       | 46.5                      | 3.0                  | 150.0          | 221.0          |        |
| 6   | 972.113            | H   | 51.4                      | -10.5            | 40.9                       | 49.5                      | 8.6                  | 100.0          | 144.0          |        |

### ◆ Calculation

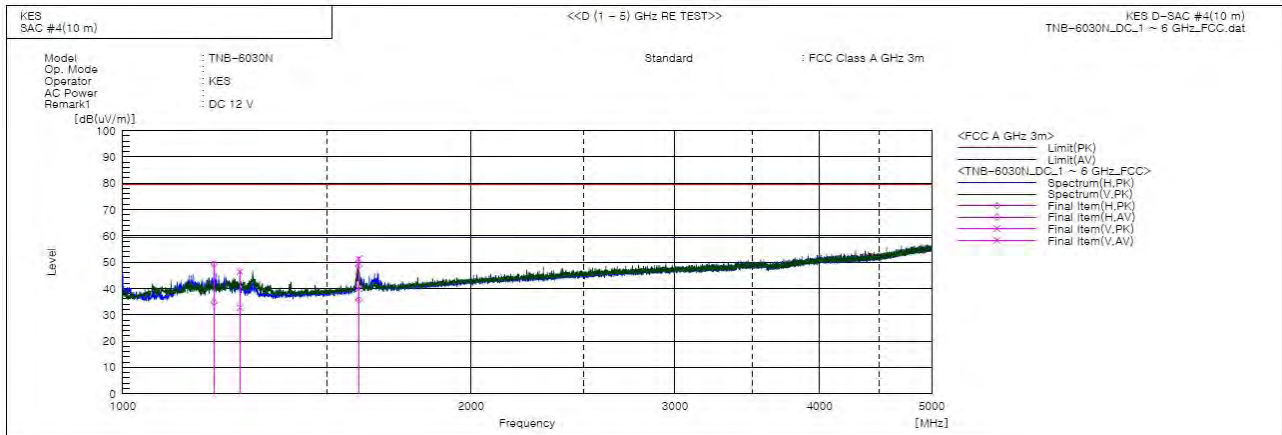
Corrected Amplitude [dBuV] = Amplitude[dBuV] + Correction Factor [dB]

Corrected Amplitude : The Final Value, Amplitude : Reading Value,  
Correction Factor : ANT FACTOR + Cable loss



## Radiated Electric Field Emissions(Above 1 GHz)

- DC 12 V Mode



### Final Result

| No. | Frequency [MHz] | (P) | Reading PK [dB(uV)] | Reading AV [dB(uV)] | c.f [dB(1/m)] | Result PK [dB(uV/m)] | Result AV [dB(uV/m)] | Limit PK [dB(uV/m)] | Limit AV [dB(uV/m)] | Margin PK [dB] | Margin AV [dB] | Height [cm] | Angle [deg] | Remark |
|-----|-----------------|-----|---------------------|---------------------|---------------|----------------------|----------------------|---------------------|---------------------|----------------|----------------|-------------|-------------|--------|
| 1   | 1199.500        | H   | 54.5                | 39.9                | -5.2          | 49.3                 | 34.7                 | 79.5                | 59.5                | 30.2           | 24.8           | 100.0       | 322.0       |        |
| 2   | 1262.500        | V   | 50.2                | 36.5                | -3.8          | 46.4                 | 32.7                 | 79.5                | 59.5                | 33.1           | 26.8           | 100.0       | 212.0       |        |
| 3   | 1599.500        | H   | 49.9                | 37.1                | -1.4          | 48.5                 | 35.7                 | 79.5                | 59.5                | 31.0           | 23.8           | 100.0       | 225.0       |        |
| 4   | 1599.500        | V   | 52.3                | 40.9                | -1.0          | 51.3                 | 39.9                 | 79.5                | 59.5                | 28.2           | 19.6           | 100.0       | 17.0        |        |

### ◆ Calculation

Correction Factor [dB] = Ant Factor[dB/m] + Cable Loss [dB] - Preamp Factor [dB]

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

Corrected Amplitude : The Final Value, Amplitude : Reading Value



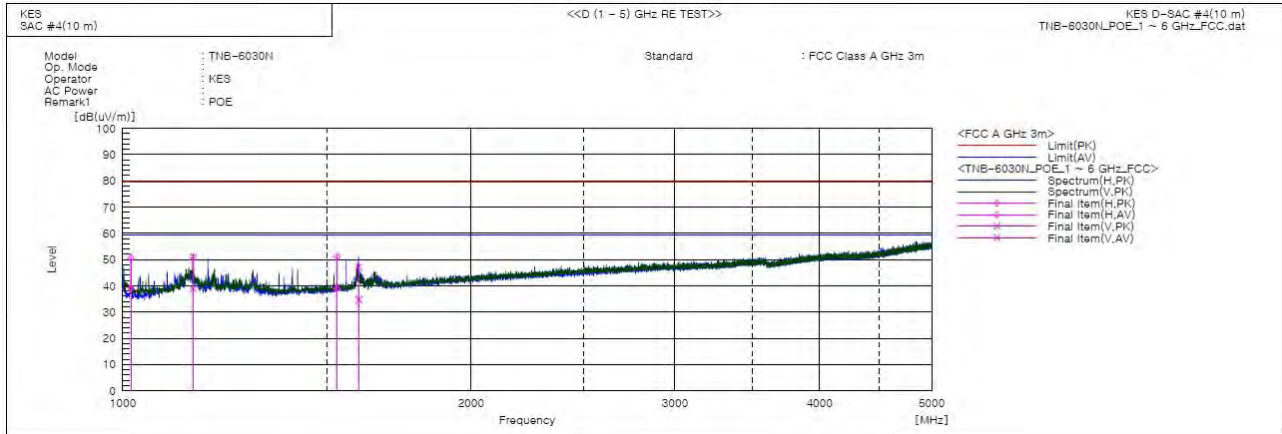


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### - POE mode



#### Final Result

| No. | Frequency [MHz] | (P) | Reading PK [dB(uV)] | Reading AV [dB(uV)] | c.f [dB(1/m)] | Result PK [dB(uV/m)] | Result AV [dB(uV/m)] | Limit PK [dB(uV/m)] | Limit AV [dB(uV/m)] | Margin PK [dB] | Margin AV [dB] | Height [cm] | Angle [deg] | Remark |
|-----|-----------------|-----|---------------------|---------------------|---------------|----------------------|----------------------|---------------------|---------------------|----------------|----------------|-------------|-------------|--------|
| 1   | 1016.500        | H   | 57.3                | 45.7                | -6.7          | 50.6                 | 39.0                 | 79.5                | 59.5                | 28.9           | 20.5           | 400.0       | 257.0       |        |
| 2   | 1150.500        | V   | 55.7                | 43.4                | -4.6          | 51.1                 | 38.8                 | 79.5                | 59.5                | 28.4           | 20.7           | 100.0       | 329.0       |        |
| 3   | 1532.000        | H   | 53.3                | 41.0                | -2.1          | 51.2                 | 38.9                 | 79.5                | 59.5                | 28.3           | 20.6           | 100.0       | 197.0       |        |
| 4   | 1599.500        | V   | 48.1                | 35.7                | -1.0          | 47.1                 | 34.7                 | 79.5                | 59.5                | 32.4           | 24.8           | 100.0       | 134.0       |        |

#### ◆ Calculation

Correction Factor [dB] = Ant Factor[dB/m] + Cable Loss [dB] - Preamp Factor [dB]

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

Corrected Amplitude : The Final Value, Amplitude : Reading Value





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KES-E1-17T0391  
Page (24) of (31)

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## **Test Setup Photos and Configuration**

### **Conducted Voltage Emissions**

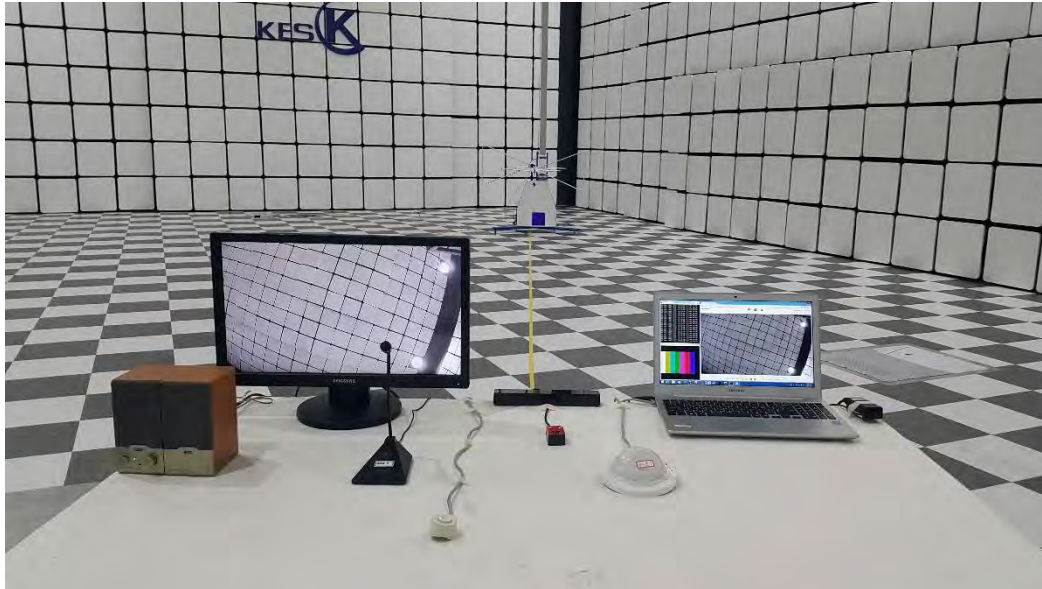
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N/A

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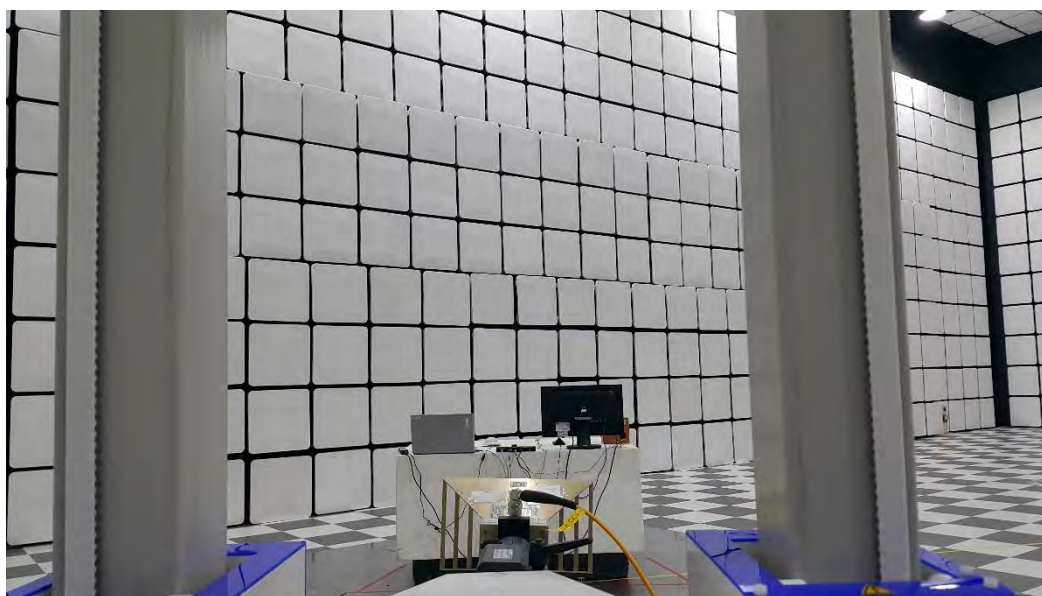
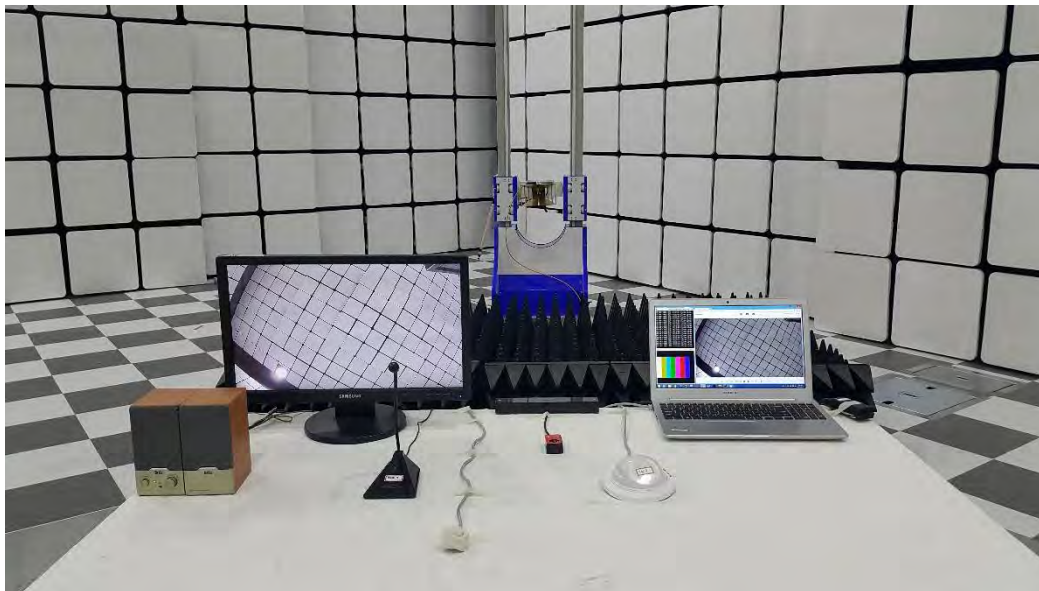
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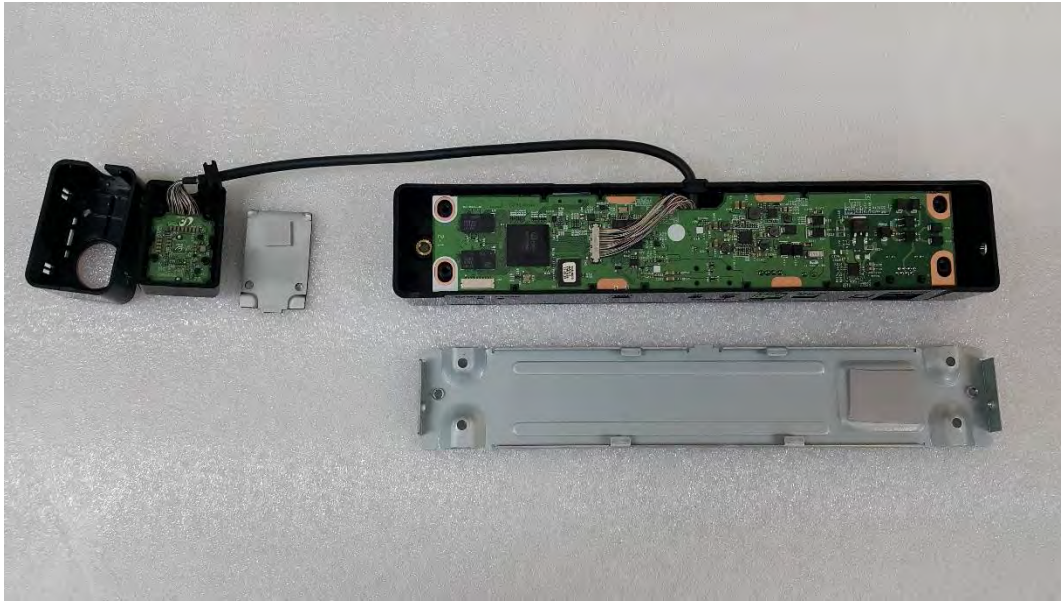
## EUT External Photographs



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## EUT Internal Photographs

(Internal View)



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## EUT Internal View – Lens Board

(Top)



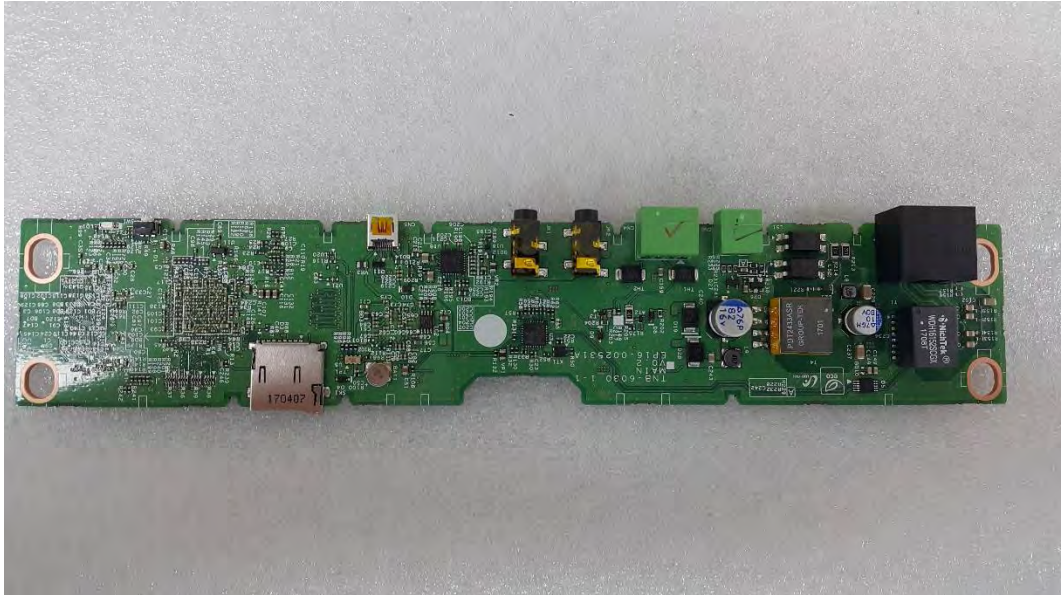
(Bottom)



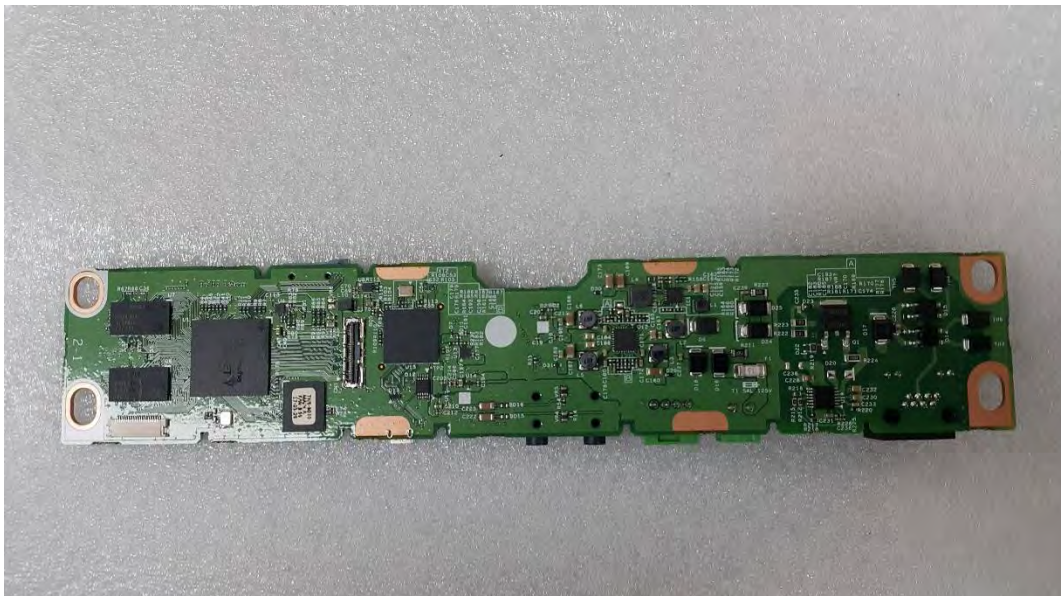
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## EUT Internal View – Board

(Top)



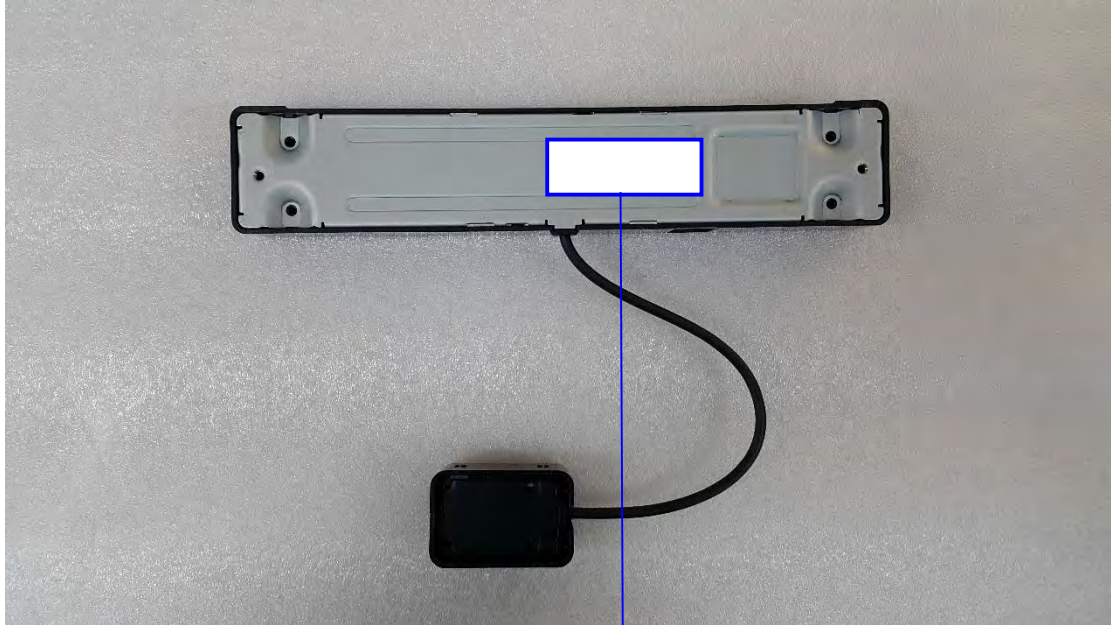
(Bottom)



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## Label Photographs



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