



## EMC TEST REPORT For CE

Test Report No. : KES-E1-17T0574-R1  
Date of Issue : Oct. 31, 2017  
Product name : NETWORK CAMERA  
Model/Type No. : TNB-6030P  
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.  
Date of Receipt : Jul. 26, 2017  
Test date : Aug. 09, 2017 ~ Aug. 13, 2017  
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Dae Jung, Choi  
EMC Test Engineer

Reviewed by

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EMC Technical Manager

This test report is not related to KOLAS.

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**REPORT REVISION HISTORY**

| Date          | Test Report No.   | Revision History  |
|---------------|-------------------|-------------------|
| Aug. 29, 2017 | KES-E1-17T0574    | Issued            |
| Oct. 31, 2017 | KES-E1-17T0574-R1 | Standard Revision |
|               |                   |                   |
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## 1.0 General Product Description

### Main Specifications of E.U.T 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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|                             |   |
|-----------------------------|---|
| 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)  |
| WiseStream II            | 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-directional (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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|                                   |   |
|-----------------------------------|---|
| 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 ☐ 230Vac ☐ 100 Vac ☐ 24 Vac ☒ 12 Vdc ☒ PoE  
Frequency ☐ 50 Hz ☐ 60 Hz ☐ Hz

## 1.2 Variant Model Differences

Not applicable

## 1.3 Device Modifications

Not applicable

## 1.4 Equipment Under Test

| Description    | Model Number | Serial Number | Manufacturer                      | Remarks |
|----------------|--------------|---------------|-----------------------------------|---------|
| NETWORK CAMERA | TNB-6030P    | -             | Hanwha Techwin (Tianjin) Co.,Ltd. | E.U.T   |

## 1.5 Support Equipments

| Description     | Model Number  | Serial Number    | Manufacturer                      | Remarks |
|-----------------|---------------|------------------|-----------------------------------|---------|
| Monitor         | LS23C340      | ZXPCHTMF A02346H | Samsung Electronics Co., Ltd.     | -       |
| AC/DC ADAPTER 1 | A2514_DPN     | -                | 11ssan Elecom(shen yang) Co., Ltd | -       |
| Notebook        | NT730U3E      | JJRE91CF200065A  | Samsung Electronics Co., Ltd.     | -       |
| AC/DC ADAPTER 2 | PA-1600-66    | AD-6019P         | LITE ON TECHNOLOGY CORPORATION    | -       |
| Speaker         | BR10000A CUVE | -                | BEIJING EDIFIER HI-TECH GROUP.    | -       |
| Mike            | CMK-303       | -                | CAMAC                             | -       |
| Alarm           | -             | -                | -                                 | -       |
| PoE ADAPTER     | ANY4805C-LT1  | -                | ANY ELECTRONICS CO., LTD.         | -       |
| Micro SD Card   | -             | -                | Samsung Electronics Co., Ltd.     | -       |



## 1.6 External I/O Cabling

### ■ 12 V (dc) Mode

| Start                  |            | END           |            | Cable Spec. |        |
|------------------------|------------|---------------|------------|-------------|--------|
| Description            | I/O Port   | Description   | I/O Port   | Length      | Shield |
| NETWORK CAMERA (E.U.T) | Micro HDMI | Monitor       | HDMI       | 1.2         | S      |
|                        | RJ-45(LAN) | Notebook      | RJ-45(LAN) | 4.0         | U      |
|                        | AUDIO      | Speaker       | AUDIO      | 1.3         | U      |
|                        | AUDIO      | Mike          | AUDIO      | 1.7         | U      |
|                        | 2 Pin      | Alarm         | 2 Pin      | 3.0         | U      |
|                        | Micro SD   | Micro SD Card | Micro SD   | -           | -      |

### ■ PoE Mode

| Start                  |            | END           |            | Cable Spec. |        |
|------------------------|------------|---------------|------------|-------------|--------|
| Description            | I/O Port   | Description   | I/O Port   | Length      | Shield |
| NETWORK CAMERA (E.U.T) | Micro HDMI | Monitor       | HDMI       | 1.2         | S      |
|                        | RJ-45(PoE) | PoE ADAPTER   | RJ-45(PoE) | 4.0         | U      |
|                        | AUDIO      | Speaker       | AUDIO      | 1.3         | U      |
|                        | AUDIO      | Mike          | AUDIO      | 1.7         | U      |
|                        | 2 Pin      | Alarm         | 2 Pin      | 3.0         | U      |
|                        | Micro SD   | Micro SD Card | Micro SD   | -           | -      |
| PoE ADAPTER            | RJ-45(LAN) | Notebook      | RJ-45(LAN) | 5.0         | U      |

\* Unshielded=U, Shielded=S



## 1.7 E.U.T Operating Mode(s)

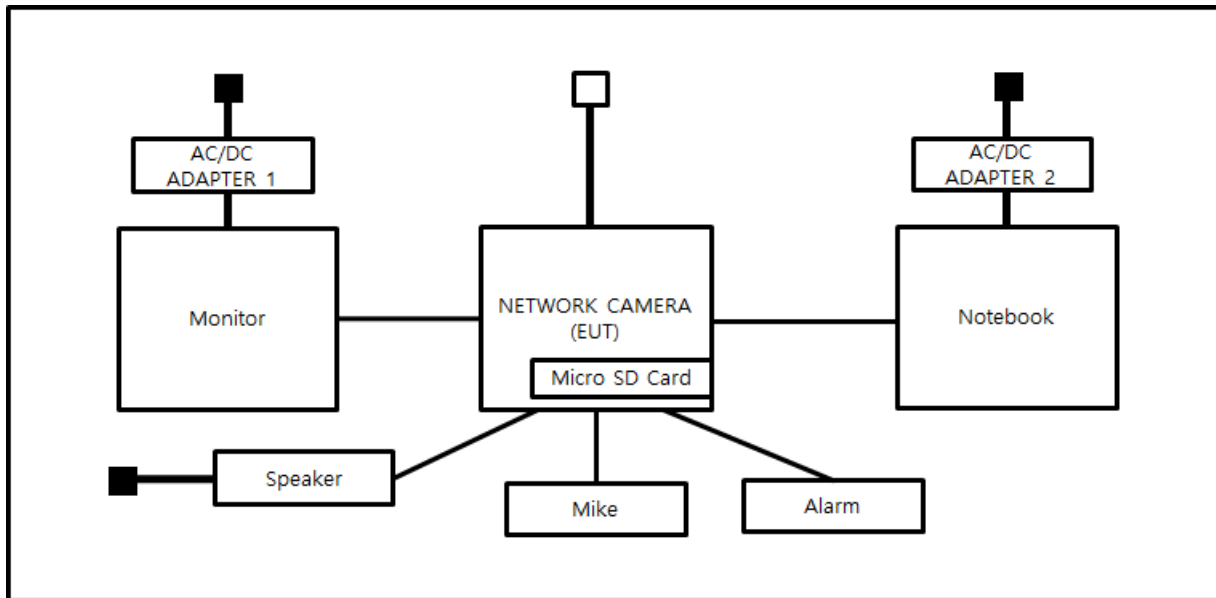
| Test mode | operating                   |
|-----------|-----------------------------|
| 12 V (dc) | E.U.T Monitoring, Ping test |
| PoE       | E.U.T Monitoring, Ping test |

| E.U.T Test operating S/W |         |                     |
|--------------------------|---------|---------------------|
| Name                     | Version | Manufacture Company |
| -                        | -       | -                   |

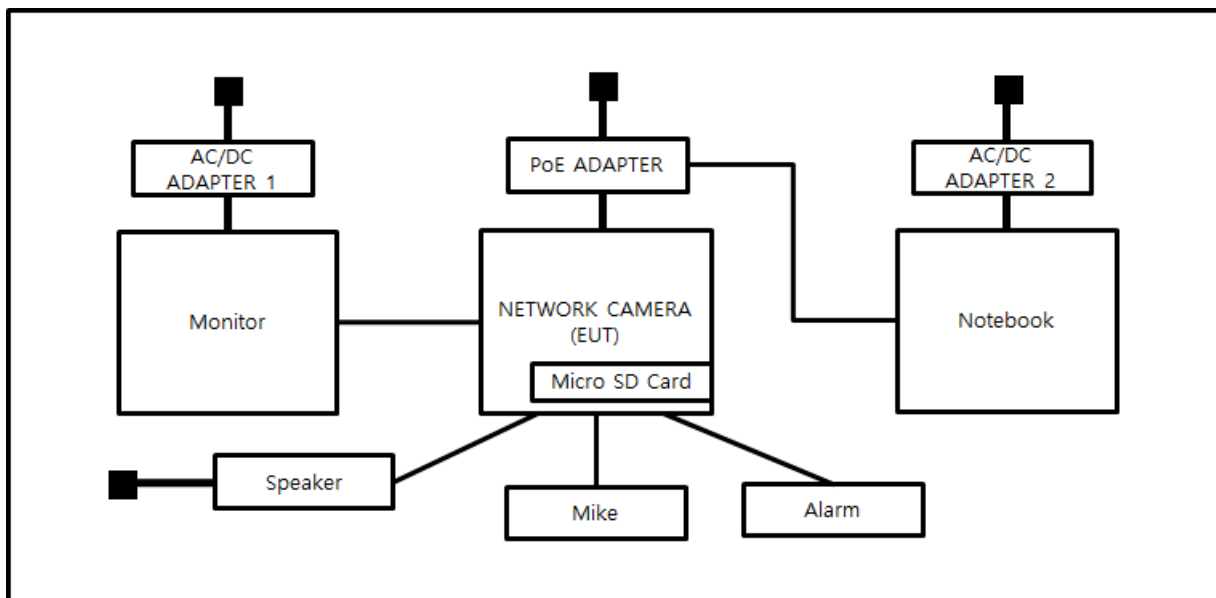
## 1.8 Configuration

■ AC Main  
 □ DC Main

### ■ 12 V (dc) Mode



### ■ PoE Mode



## 1.9 Remarks when standards applied

- N/A





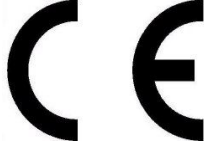

## 1.10 Calibration Details of Equipment Used for Measurement

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 and CISPR Publication 22.

## 1.12 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) |                                      |

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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 61547:2009

☒ EN 55032:2012

☒ Class A

☐ Class B

☐ EN 55024:2010 +A1:2015

☒ EN 50130-4:2011

☐ EN 61000-3-2:2014

☐ EN 61000-3-3:2013

☐ EN 61326-1:2013



- 
- |   |                                  |                                  |
|---|----------------------------------|----------------------------------|
| <input type="checkbox"/> <b>VCCI V-3 / 2015.04</b>            | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> <b>AS/NZS CISPR22:2009 +A1:2010</b>  | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input 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 type="checkbox"/> ANSI C63.4-2009                      |                                  |                                  |
| <input 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 type="checkbox"/> ANSI C63.4-2014                      |                                  |                                  |
| <br><input type="checkbox"/> <b>RE- Directive 2014/53/EU</b>  |                                  |                                  |
| <br><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           |                                  |                                  |
| <br><input type="checkbox"/> EN 301 489-3 V1.6.1              |                                  |                                  |
| <br><input type="checkbox"/> EN 301 489-17 V2.2.1             |                                  |                                  |
| <br><input type="checkbox"/> 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        | 101781        | 04, 27, 2018 |
| <input type="checkbox"/> | LISN              | ENV216       | R & S        | 101787        | 01, 11, 2018 |
| <input type="checkbox"/> | LISN              | ESH2-Z5      | R & S        | 100450        | 04, 27, 2018 |
| <input type="checkbox"/> | PULSE LIMITER     | ESH3-Z2      | R & S        | 101915        | 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

N/A



## 2.2 Conducted Emissions at Telecommunication Ports

### Test Date

Aug. 09, 2017

### Test Location

Electro wave Shieldroom #6

### 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 | ESR3         | R & S        | 101781        | 04, 27, 2018 |
| <input checked="" type="checkbox"/> | LISN              | ENV216       | R & S        | 101787        | 01, 11, 2018 |
| <input checked="" type="checkbox"/> | LISN              | ESH2-Z5      | R & S        | 100450        | 04, 27, 2018 |
| <input checked="" type="checkbox"/> | PULSE LIMITER     | ESH3-Z2      | R & S        | 101915        | 12, 13, 2017 |
| <input checked="" type="checkbox"/> | 8-WIRE ISN CAT3,5 | ENY81        | R & S        | 100174        | 01, 11, 2018 |
| <input type="checkbox"/>            | 8-WIRE ISN CAT6   | ENY81-CAT6   | R & S        | 101665        | 01, 11, 2018 |

### Test Conditions

Temperature: 24,2 °C  
Relative Humidity: 50,1 %

### Frequency Range of Measurement

150 kHz to 30 MHz

### Instrument Settings

IF Band Width: 9 kHz

### Test Results

The requirements are:

- ☒ PASS  
☐ NOT PASS  
☐ NOT APPLICABLE

### Remarks

See Appendix A for test data.





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

### Test Date

Aug. 09, 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: 24,9 °C  
Relative Humidity: 56,0 %

### Frequency Range of Measurement

30 MHz to 1 GHz

### Instrument Settings

IF Band Width: 120 kHz

### Test Results

The requirements are:

☒ PASS  
☐ NOT PASS  
☐ NOT APPLICABLE

### Remarks

See Appendix A for test data.

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

**Test Date**

Aug. 10, 2017

**Test Location**

SEMI ANECHOIC CHAMBER #2

**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, 07, 2018 |
| <input checked="" type="checkbox"/> | PREAMPLIFIER               | 8449B        | AGILENT          | 3008A01967    | 05, 31, 2018 |
| <input type="checkbox"/>            | ATTENUATOR                 | 8491A        | HP               | 32173         | 03, 24, 2018 |
| <input checked="" type="checkbox"/> | DOUBLE RIDGED HORN ANTENNA | SAS-571      | A.H.SYSTEM,INC   | 781           | 05, 02, 2019 |

**Test Conditions**Temperature: 26,7 °C  
Relative Humidity: 55,6 %**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.



## 2.5 Harmonic Current Emissions

### 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           | dpa.control  | EM TEST      | 5.4.11.0      | -            |
| <input type="checkbox"/> | DIGITAL POWER ANALYZER | DPA 500N     | EM TEST      | V1024106759   | 08, 09, 2018 |
| <input type="checkbox"/> | POWER SOURCE           | ACS 500N6    | EM TEST      | V1024106760   | -            |

### Test Conditions

Temperature: °C  
Relative Humidity: %

### Classification of Equipment for Harmonic Current Emissions

- ☐ Class A
- ☐ Class B
- ☐ Class C(Below 25 W)
- ☐ Class C(Above 25 W)
- ☐ Class D

### Test Results

The requirements are:

- ☐ PASS
- ☐ NOT PASS
- ☒ NOT APPLICABLE

### Remarks

-



## 2.6 Voltage Fluctuations and Flicker

### 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           | dpa.control  | EM TEST      | 5.4.11.0      | -            |
| <input type="checkbox"/> | DIGITAL POWER ANALYZER | DPA 500N     | EM TEST      | V1024106759   | 08, 08, 2018 |
| <input type="checkbox"/> | POWER SOURCE           | ACS 500N6    | EM TEST      | V1024106760   | -            |

### Test Conditions

Temperature: °C  
Relative Humidity: %

### Test Results

The requirements are:

- ☐ PASS  
☐ NOT PASS  
☒ NOT APPLICABLE

### Remarks

-

### 3.0 Criteria for compliance

Criteria for compliance was based on the following guidelines:

EN 50130-4:2011 +A1:2014 Alarm systems-Part 4: Electromagnetic compatibility Product family standard: Immunity requirements for components of fire, intruder and social alarm systems

The variety and the diversity of the apparatus within the scope of this document makes it difficult to define precise criteria for the evaluation of the immunity test results.

If as a result of the application of the tests defined in this standard, the apparatus becomes dangerous or unsafe then the apparatus shall be deemed to have failed the test.

A functional description and a definition of performance by the manufacture and noted in the test report, based on the following criteria:

#### Electrostatic discharge

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing that is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change.

#### Radiated electromagnetic fields

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing which could be interpreted by associated equipment as a change, and no such

Flickering of indicators occurs at a field strength of 3 V/m.

For components of CCTV systems, where the picture is allowed at 10 V/m, providing.

(a) there is no permanent damage or change to EUT

(e.g. no corruption of memory or changes to programmable setting etc.)

(b) at 3 V/m, any deterioration of the picture is so minor that the system could still be used; and

(c) there is no observable deterioration of the picture at 1 V/m.

---

**Fast transient burst / slow high energy voltage surge**

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing

That there is no residual is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change.

**Conducted RF immunity**

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing

That there is no residual is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change,  
and no such flickering of indicators oeuvres at  $U = 130 \text{ dB}\mu\text{V}$ .

For component of CCTV systems, where the status is monitored by observing the TV picture,  
then deterioration of the picture is allowed at  $U = 140 \text{ dB}\mu\text{V}$ , providing:

- (a) there is no permanent damage or change to the EUT  
(e.g. no corruption of memory or changes to programmable settings etc.)
- (b) at  $U = 130 \text{ dB}\mu\text{V}$ , any deterioration of the picture is so minor that the system could still be used; and
- (c) there in no observable deterioration of the picture at  $U = 120 \text{ dB}\mu\text{V}$ .

**Voltage dip/interruption / Voltage variation**

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change. The EUT shall meet the acceptance criteria for the functional test, after the conditioning.



### 3.1 Electrostatic Discharge

#### Reference Standard

EN 61000-4-2:2009

#### Test Date

Aug. 10, 2017

#### Test Location

EMS-ESD: Electro wave Shieldroom #3

#### Test Equipment

| Used                                | Description   | Model Number | Manufacturer | Serial Number | Cal. Due     |
|-------------------------------------|---------------|--------------|--------------|---------------|--------------|
| <input type="checkbox"/>            | EMS Test S/W  | -            | -            | -             | -            |
| <input checked="" type="checkbox"/> | ESD SIMULATOR | ESS-2000     | Noise Ken    | ESS05X4620    | 02, 24, 2018 |
| <input checked="" type="checkbox"/> | HCP           | -            | Noise Ken    | -             | -            |
| <input checked="" type="checkbox"/> | VCP           | -            | Noise Ken    | -             | -            |

#### Test Conditions

Temperature: 22,1 °C  
Relative Humidity: 43,0 %  
Atmospheric Pressure: 98,4 kPa



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### Test Specifications

Discharge Factor:  $\geq 1$  s

Discharge Impedance: 330 ohm / 150 pF

Kind of Discharge: Air, Contact (direct and indirect)

Polarity: Positive and Negative

Number of Discharge: 10 at all locations for Air discharge  
10 at all locations for Contact discharge

| Discharge Voltage: | Contact                                  | Air                                      | HCP                                      | VCP                                      |
|--------------------|--|--|--|--|
|                    | <input type="checkbox"/> 2 kV            | <input checked="" type="checkbox"/> 2 kV | <input type="checkbox"/> 2 kV            | <input type="checkbox"/> 2 kV            |
|                    | <input type="checkbox"/> 4 kV            | <input checked="" type="checkbox"/> 4 kV | <input type="checkbox"/> 4 kV            | <input type="checkbox"/> 4 kV            |
|                    | <input checked="" type="checkbox"/> 6 kV | <input type="checkbox"/> 6 kV            | <input checked="" type="checkbox"/> 6 kV | <input checked="" type="checkbox"/> 6 kV |
|                    | <input type="checkbox"/> 8 kV            | <input checked="" type="checkbox"/> 8 kV | <input type="checkbox"/> 8 kV            | <input type="checkbox"/> 8 kV            |
|                    | <input type="checkbox"/> 15 kV           | <input type="checkbox"/> 15 kV           | <input type="checkbox"/> 15 kV           | <input type="checkbox"/> 15 kV           |

Notes: HCP: Horizontal coupling plane

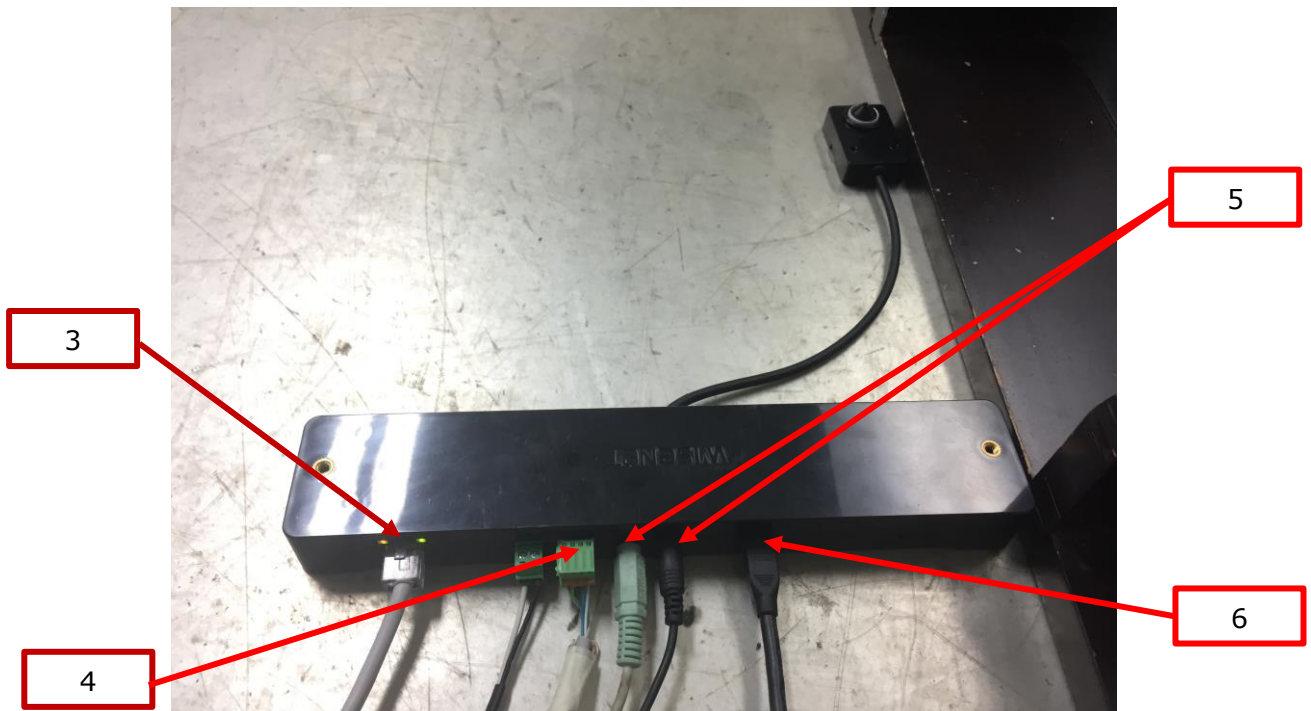
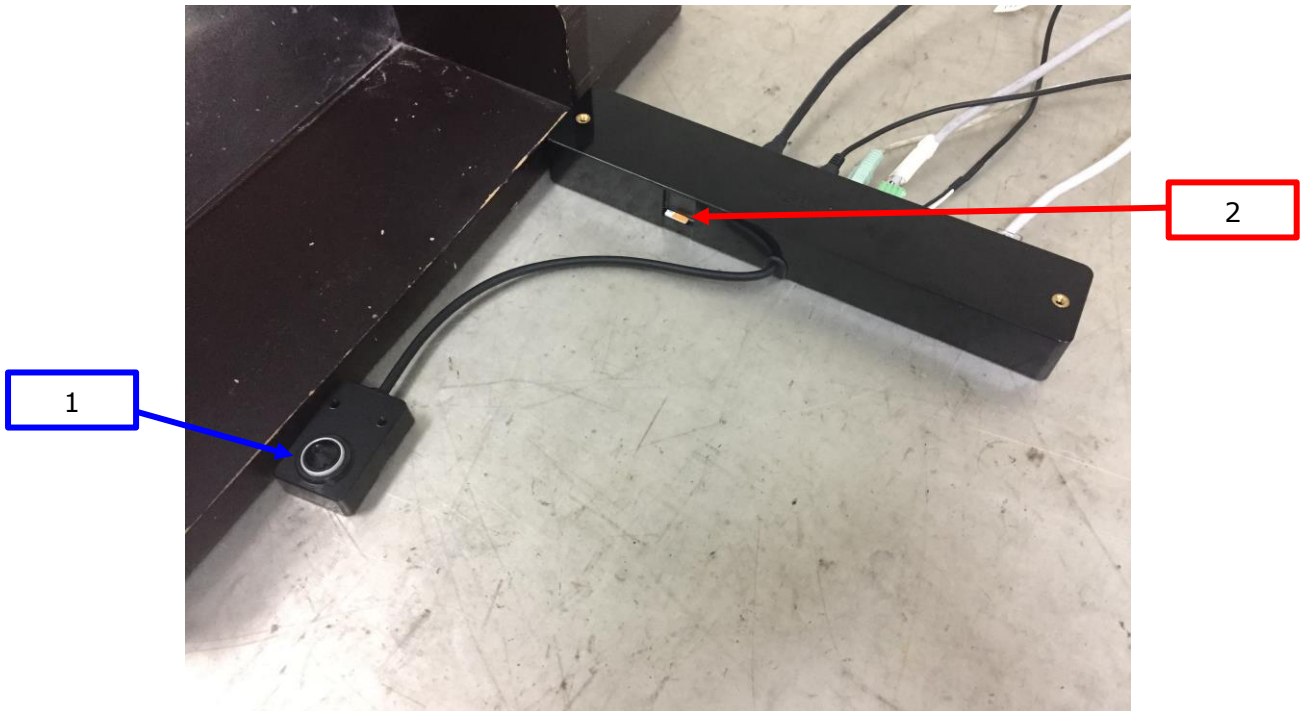
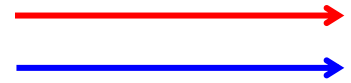
VCP: Vertical coupling plane

Required Performance Criteria: ☒ Complied



**Location of Discharge:**

|         |
|---------|
| Air     |
| Contact |



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**Test Data**

## ■ 12 V (dc) Mode

## Indirect Discharge

| No. | Test Point  | Discharge Method  | Observations | Remarks |
|-----|-------------|-------------------|--------------|---------|
| 1   | HCP Contact | Contact Discharge | Complied     | -       |
| 2   | VCP Contact | Contact Discharge | Complied     | -       |

## Direct Discharge

| No. | Test Point    | Discharge Method  | Observations | Remarks |
|-----|---------------|-------------------|--------------|---------|
| 1   | Camera border | Contact Discharge | Complied     | -       |
| 2   | Micro SD port | Air Discharge     | Complied     | -       |
| 3   | RJ-45 port    | Air Discharge     | Complied     | -       |
| 4   | Alarm port    | Air Discharge     | Complied     | -       |
| 5   | Audio port    | Air Discharge     | Complied     | -       |
| 6   | Micro HDMI    | Air Discharge     | Complied     | -       |

## ■ PoE Mode

## Indirect Discharge

| No. | Test Point  | Discharge Method  | Observations | Remarks |
|-----|-------------|-------------------|--------------|---------|
| 1   | HCP Contact | Contact Discharge | Complied     | -       |
| 2   | VCP Contact | Contact Discharge | Complied     | -       |

## Direct Discharge

| No. | Test Point    | Discharge Method  | Observations | Remarks |
|-----|---------------|-------------------|--------------|---------|
| 1   | Camera border | Contact Discharge | Complied     | -       |
| 2   | Micro SD port | Air Discharge     | Complied     | -       |
| 3   | RJ-45 port    | Air Discharge     | Complied     | -       |
| 4   | Alarm port    | Air Discharge     | Complied     | -       |
| 5   | Audio port    | Air Discharge     | Complied     | -       |
| 6   | Micro HDMI    | Air Discharge     | Complied     | -       |

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

**Test Results**

- ☒ PASS Required Performance Criteria  
☐ NOT PASS Required Performance Criteria

**Remarks**PASS Required Performance Criteria.

## 3.2 Radiated Electric Field Immunity

### Reference Standard

EN 61000-4-3:2006 +A2:2010

### Test Date

Aug. 11, 2017

### Test Location

EMS-RS: ☐ SEMI ANECHOIC CHAMBER #2 ☒ SEMI ANECHOIC CHAMBER #3

### Test Equipment

| Used                                | Description                     | Model Number    | Manufacturer    | Serial Number | Cal. Due     |
|-------------------------------------|---------------------------------|-----------------|-----------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMS Test S/W                    | EMC32           | R & S           | 10.10.02      | -            |
| <input checked="" type="checkbox"/> | SIGNAL GENERATOR                | SMB 100A        | R & S           | 177586        | 08, 07, 2018 |
| <input checked="" type="checkbox"/> | BROADBAND AMPLIFIER             | BBA100          | R & S           | 101239        | 08, 07, 2018 |
| <input checked="" type="checkbox"/> | BROADBAND AMPLIFIER             | 100S1G6M1       | AR              | 579931        | 08, 07, 2018 |
| <input checked="" type="checkbox"/> | POWER METER                     | NRP2            | R & S           | 103475        | 08, 07, 2018 |
| <input checked="" type="checkbox"/> | AVG POWER SENSOR                | NRP-Z91         | R & S           | 102526        | 08, 07, 2018 |
| <input checked="" type="checkbox"/> | AVG POWER SENSOR                | NRP-Z91         | R & S           | 102527        | 08, 07, 2018 |
| <input checked="" type="checkbox"/> | STACKED DOUBLE LOG-PER- ANTENNA | STPL9128 E      | Schwarzbeck     | 9128ES-121    | -            |
| <input checked="" type="checkbox"/> | DIRECTIONAL COUPLER             | KYDC-D1070-DX40 | KY TELECOM      | KY150001      | 08, 07, 2018 |
| <input checked="" type="checkbox"/> | DOUBLE RIDGED HORN ANTENNA      | SAS-571         | A.H.SYSTEM, INC | 781           | 05, 02, 2019 |

### Test Conditions

Temperature: 27,4 °C  
Relative Humidity: 58,2 %  
Atmospheric Pressure: 99,1 kPa



### Test Specifications

Antenna Polarization: Horizontal & vertical unless indicated otherwise

Antenna Distance: ☒ 3 m

Field Strength: ☐ 1 V/m ☐ 3 V/m  
☒ 10 V/m

Frequency Range: ☐ 80 MHz to 1 GHz ☐ 1,4 GHz to 2,7 GHz  
☒ 80 MHz to 2,7 GHz

Modulation: ☒ AM, 80 %, 1 kHz sine wave  
☒ PM, 1 Hz (0,5 s ON : 0,5 s OFF)

Frequency step: ☒ 1 % step

Dwell Time: ☒ 1 s ☐ 3 s

# of Sides Radiated: ☒ 4

Required Performance Criteria: ☒ Complied

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**Test Data****■ 12 V (dc) Mode**

| Side Exposed | Observations |          |
|--------------|--------------|----------|
|              | Horizontal   | Vertical |
| Front        | Complied     | Complied |
| Right        | Complied     | Complied |
| Back         | Complied     | Complied |
| Left         | Complied     | Complied |

**■ PoE Mode**

| Side Exposed | Observations |          |
|--------------|--------------|----------|
|              | Horizontal   | Vertical |
| Front        | Complied     | Complied |
| Right        | Complied     | Complied |
| Back         | Complied     | Complied |
| Left         | Complied     | Complied |

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

**Test Results**

- ☒ PASS Required Performance Criteria  
☐ NOT PASS Required Performance Criteria

**Remarks**

PASS Required Performance Criteria.

### 3.3 Electrical Fast Transients/Bursts

#### Reference Standard

EN 61000-4-4:2012

#### Test Date

Aug. 13, 2017

#### Test Location

EMS-EFT: Electro wave Shieldroom #3

#### Test Equipment

| Used                                | Description               | Model Number | Manufacturer | Serial Number | Cal. Due     |
|-------------------------------------|---------------------------|--------------|--------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMS Test S/W              | iec.control  | EM TEST      | 5.3.9         | -            |
| <input checked="" type="checkbox"/> | ULTRA COMPACT SIMULATOR   | UCS 500N5T   | EM TEST      | P1317117973   | 02, 08, 2018 |
| <input checked="" type="checkbox"/> | MOTOR VARIAC              | MV2616       | EM TEST      | V0936105123   | 02, 08, 2018 |
| <input checked="" type="checkbox"/> | CAPACITIVE COUPLING CLAMP | HFK          | EM TEST      | 070925        | 06, 26, 2018 |

#### Test Conditions

Temperature: 23,6 °C  
Relative Humidity: 42,8 %  
Atmospheric Pressure: 99,2 kPa

#### Test Specifications

Pulse Amplitude & Polarity:  
(AC Power Lines) ☐ ± 1.0 kV ☐ ± 2.0 kV  
☐ ± 4.0 kV

Pulse Amplitude & Polarity:  
(Other supply / Signal Lines) ☐ ± 0.5 kV ☒ ± 1.0 kV  
☐ ± 2.0 kV

Burst Period: ☒ 300 ms ☐ 2 s

Repetition Rate: ☐ 5 kHz ☒ 100 kHz

Duration of Test Voltage: ☒ ≥ 1 min

Required Performance Criteria: ☒ Complied



## Test Data

### ■ 12 V (dc) Mode

☐ Input a.c. power ports – Coupling/Decoupling Network used

| Mode of Application | Observations   |                |
|---------------------|----------------|----------------|
|                     | (+) Burst (kV) | (-) Burst (kV) |
| -                   | -              | -              |

☒ Input d.c. power ports – Coupling/Decoupling Network used

| Mode of Application | Observations   |                |
|---------------------|----------------|----------------|
|                     | (+) Burst (kV) | (-) Burst (kV) |
| L1 – L2             | Complied       | Complied       |

☒ Signal ports and telecommunication ports – Coupling Clamp used

| Mode of Application | Observations   |                |
|---------------------|----------------|----------------|
|                     | (+) Burst (kV) | (-) Burst (kV) |
| RJ-45               | Complied       | Complied       |
| Alarm               | Complied       | Complied       |

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**■ PoE Mode**

☐ Input a.c. power ports – Coupling/Decoupling Network used

| Mode of Application | Observations   |                |
|---------------------|----------------|----------------|
|                     | (+) Burst (kV) | (-) Burst (kV) |
| -                   | -              | -              |

☐ Input d.c. power ports – Coupling/Decoupling Network used

| Mode of Application | Observations   |                |
|---------------------|----------------|----------------|
|                     | (+) Burst (kV) | (-) Burst (kV) |
| -                   | -              | -              |

☒ Signal ports and telecommunication ports – Coupling Clamp used

| Mode of Application | Observations   |                |
|---------------------|----------------|----------------|
|                     | (+) Burst (kV) | (-) Burst (kV) |
| RJ-45               | Complied       | Complied       |
| Alarm               | Complied       | Complied       |

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

**Test Results**

- ☒ PASS Required Performance Criteria  
☐ NOT PASS Required Performance Criteria

**Remarks**

PASS Required Performance Criteria.





### 3.4 Surge Transients

#### Reference Standard

EN 61000-4-5:2014

#### Test Date

Aug. 13, 2017

#### Test Location

EMS-Surge: Electro wave Shieldroom #3

#### Test Equipment

| Used                                | Description             | Model Number | Manufacturer | Serial Number | Cal. Due     |
|-------------------------------------|-------------------------|--------------|--------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMS Test S/W            | iec.control  | EM TEST      | 5.3.9         | -            |
| <input checked="" type="checkbox"/> | ULTRA COMPACT SIMULATOR | UCS 500N5T   | EM TEST      | P1317117973   | 02, 08, 2018 |
| <input checked="" type="checkbox"/> | MOTOR VARIAC            | MV2616       | EM TEST      | V0936105123   | 02, 08, 2018 |
| <input checked="" type="checkbox"/> | CDN                     | CNV 508N1    | EM TEST      | P1551168979   | 04, 26, 2018 |
| <input type="checkbox"/>            | CDN                     | CNV 508T5    | EM TEST      | P1549168422   | 04, 26, 2018 |

#### Test Conditions

Temperature: 23,6 °C  
Relative Humidity: 42,8 %  
Atmospheric Pressure: 99,2 kPa



## Test Specifications

### AC Power Lines

Source Impedance: 12 ohm for common mode and 2 ohm for differential mode

Surge Amplitude :

Common Mode

☐ (0,5 / 1,0 / 2,0) kV

Differential Mode

☐ (0,5 / 1,0) kV

Number of Surges:

☐ 5 surges per angle

Angle:

☐ 0°, 90°, 180°, 270° (input a.c. power port)

Polarity:

☐ Positive & Negative

Repetition Rate:

☐ 1 surge per min    ☐ 1 surge per 30 sec.

Required Performance Criteria: ☐ Complied

### Other supply / Signal Lines

Source Impedance: 42 ohm for common mode

Surge Amplitude:

Common Mode

☒ (0,5 / 1,0) kV

Number of Surges:

☒ 5 Surges

Polarity:

☒ Positive & Negative

Repetition Rate:

☒ 1 surge per min    ☐ 1 surge per 30 sec.

Required Performance Criteria: ☒ Complied

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**Test Data****■ 12 V (dc) Mode**☐ Line to Line – Differential Mode

| Mode of Application | Observations   |                |
|---------------------|----------------|----------------|
|                     | (+) Surge (kV) | (-) Surge (kV) |
| -                   | -              | -              |

☐ Line to Earth – Common Mode

| Mode of Application | Observations   |                |
|---------------------|----------------|----------------|
|                     | (+) Surge (kV) | (-) Surge (kV) |
| -                   | -              | -              |

**Signal Lines**☒ Line to Earth – Common Mode

| Mode of Application | Observations   |                |
|---------------------|----------------|----------------|
|                     | (+) Surge (kV) | (-) Surge (kV) |
| RJ-45               | Complied       | Complied       |
| Alarm               | Complied       | Complied       |

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**■ PoE Mode**☐ Line to Line – Differential Mode

| Mode of Application | Observations   |                |
|---------------------|----------------|----------------|
|                     | (+) Surge (kV) | (-) Surge (kV) |
| -                   | -              | -              |

☐ Line to Earth – Common Mode

| Mode of Application | Observations   |                |
|---------------------|----------------|----------------|
|                     | (+) Surge (kV) | (-) Surge (kV) |
| -                   | -              | -              |

**Signal Lines**☒ Line to Earth – Common Mode

| Mode of Application | Observations   |                |
|---------------------|----------------|----------------|
|                     | (+) Surge (kV) | (-) Surge (kV) |
| RJ-45               | Complied       | Complied       |
| Alarm               | Complied       | Complied       |

Note: "Blank" = Not performed

Observations:

Complied – No degradation of function

**Test Results**

- ☒ PASS Required Performance Criteria  
☐ NOT PASS Required Performance Criteria

**Remarks**

PASS Required Performance Criteria.



## 3.5 Conducted Disturbance

### Reference Standard

EN 61000-4-6:2014

### Test Date

Aug. 10, 2017

### Test Location

EMS-CS: Electro wave Shieldroom #3

### Test Equipment

| Used                                | Description               | Model Number | Manufacturer | Serial Number | Cal. Due     |
|-------------------------------------|---------------------------|--------------|--------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMS Test S/W              | icd.control  | EM TEST      | 5.3.7         | -            |
| <input checked="" type="checkbox"/> | CONTINUOUS WAVE SIMULATOR | CWS 500N1    | EM TEST      | V0936105119   | 08, 07, 2018 |
| <input checked="" type="checkbox"/> | ATTENUATOR                | ATT6         | EM TEST      | 1208-34       | 08, 07, 2018 |
| <input checked="" type="checkbox"/> | CDN                       | CDN-M2/M3N   | EM TEST      | 0909-06       | 08, 07, 2018 |
| <input type="checkbox"/>            | CDN                       | CDN T8RJ45   | EM TEST      | 0909-09       | 08, 07, 2018 |
| <input checked="" type="checkbox"/> | EM INJECTION CLAMP        | EM 101       | Liithi       | 35943         | 02, 03, 2018 |

### Test Conditions

Temperature: 22,1 °C  
Relative Humidity: 43,0 %  
Atmospheric Pressure: 98,4 kPa



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**Test Specifications**

Frequency range: ☒ 150 kHz to 100 MHz ☐ 150 kHz to 80 MHz

Voltage Level: ☐ 1 Vrms ☐ 3 Vrms  
☒ 10 Vrms

Modulation: ☒ AM, 80 %, 1 kHz sine wave  
☒ PM, 1 Hz (0,5 s ON : 0,5 s OFF)

Frequency step: ☒ 1 % step

Dwell Time: ☒ 1 s ☐ 3 s

Required Performance Criteria: ☒ Complied

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## Test Data

### ■ 12 V (dc) Mode

#### ☐ Input a.c. power ports

| Coupling Location<br>(Line Stressed) | Coupling Method   | Observations |
|--------------------------------------|---|--------------|
| -                                    | CDN ( <input type="checkbox"/> M2, <input type="checkbox"/> M3) | -            |

#### ☒ Input d.c. power ports

| Coupling Location<br>(Line Stressed) | Coupling Method  | Observations |
|--------------------------------------|--|--------------|
| L1 – L2                              | CDN ( <input checked="" type="checkbox"/> M2, <input type="checkbox"/> M3) | Complied     |

#### ☒ Signal ports and telecommunication ports

| Coupling Location<br>(Line Stressed) | Coupling Method       | Observations |
|--------------------------------------|-----------------------|--------------|
| RJ-45                                | EM INJECTION<br>CLAMP | Complied     |
| Alarm                                | EM INJECTION<br>CLAMP | Complied     |

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**■ PoE Mode**☐ Input a.c. power ports

| Coupling Location<br>(Line Stressed) | Coupling Method   | Observations |
|--------------------------------------|---|--------------|
| -                                    | CDN ( <input type="checkbox"/> M2, <input type="checkbox"/> M3) | -            |

☐ Input d.c. power ports

| Coupling Location<br>(Line Stressed) | Coupling Method   | Observations |
|--------------------------------------|---|--------------|
| -                                    | CDN ( <input type="checkbox"/> M2, <input type="checkbox"/> M3) | Complied     |

☒ Signal ports and telecommunication ports

| Coupling Location<br>(Line Stressed) | Coupling Method       | Observations |
|--------------------------------------|-----------------------|--------------|
| RJ-45                                | EM INJECTION<br>CLAMP | Complied     |
| Alarm                                | EM INJECTION<br>CLAMP | Complied     |

Notes: CDN = Coupling Decoupling Network  
"blank" = Not performed

Observations:  
Complied – No degradation of function

**Test Results**

- ☒ PASS Required Performance Criteria  
☐ NOT PASS Required Performance Criteria

**Remarks**

PASS Required Performance Criteria.





### 3.6 Voltage Dips and Short Interruptions

#### Reference Standard

EN 61000-4-11:2004

#### Test Date

N/A

#### Test Location

EMS-Voltage dip: Electro wave Shieldroom #3

#### Test Equipment

| Used                     | Description             | Model Number | Manufacturer | Serial Number | Cal. Due     |
|--------------------------|-------------------------|--------------|--------------|---------------|--------------|
| <input type="checkbox"/> | EMS Test S/W            | iec.control  | EM TEST      | 5.3.9         | -            |
| <input type="checkbox"/> | ULTRA COMPACT SIMULATOR | UCS 500N5T   | EM TEST      | P1317117973   | 02, 08, 2018 |
| <input type="checkbox"/> | MOTOR VARIAC            | MV2616       | EM TEST      | V0936105123   | 02, 08, 2018 |

#### Test Conditions

Temperature: °C  
Relative Humidity: %  
Atmospheric Pressure: kPa



## Test Specifications & Observations/Remarks

(Test Voltage : 50 Hz)

| <u>Test Level</u>                  | <u>Duration [in period/ms (50 Hz)]</u> | <u>Results</u> |
|------------------------------------|--|----------------|
| <input type="checkbox"/> 20 % dip  | <input type="checkbox"/> 250 / 5 000   | <u>N/A</u>     |
| <input type="checkbox"/> 30 % dip  | <input type="checkbox"/> 25 / 500      | <u>N/A</u>     |
| <input type="checkbox"/> 60 % dip  | <input type="checkbox"/> 10 / 200      | <u>N/A</u>     |
| <input type="checkbox"/> 100 % dip | <input type="checkbox"/> 250 / 5 000   | <u>N/A</u>     |

- Voltage variations

|                                      |                                       |            |
|--------------------------------------|---------------------------------------|------------|
| <input type="checkbox"/> Unom + 10 % | <input type="checkbox"/> 253.0 V (ac) | <u>N/A</u> |
| <input type="checkbox"/> Unom - 15 % | <input type="checkbox"/> 195.5 V (ac) | <u>N/A</u> |

Observations:  
Complied – No degradation of function

### Test Results

- ☐ PASS Required Performance Criteria
- ☐ NOT PASS Required Performance Criteria
- ☒ NOT APPLICABLE

### Remarks

N/A



## 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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[ 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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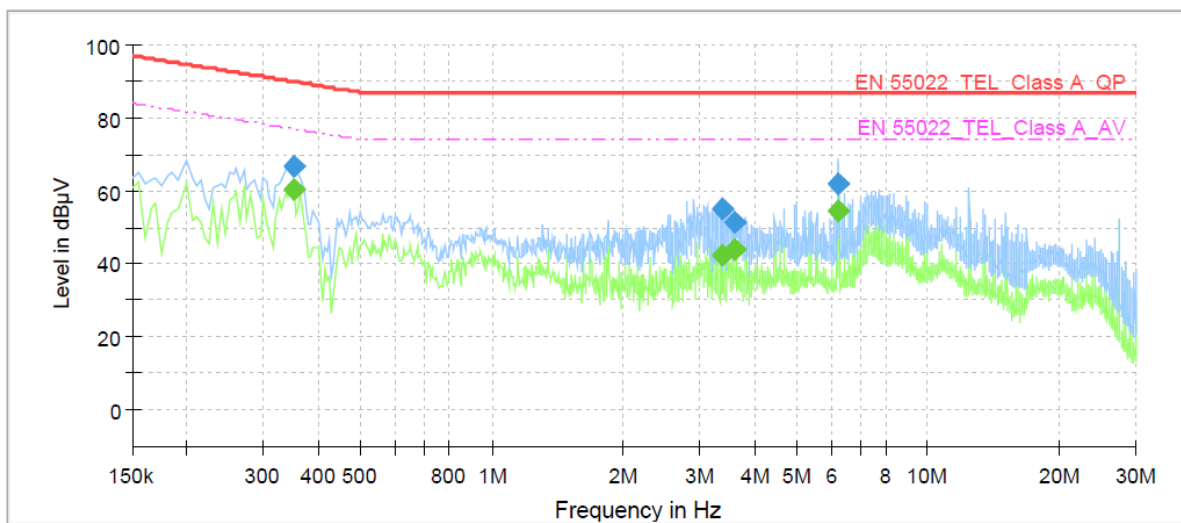
## Conducted Emissions at Telecommunication Ports

■ 12 V (dc) Mode

[10 Mbps]

### Common Information

Test Description: Telecommunication Emission  
Model No.: TNB-6030P  
Mode: 12 V (dc) , TEL 10 Mbps  
Operator Name: KES



### Final Result

| Frequency (MHz) | QuasiPeak (dBμV) | CAverage (dBμV) | Limit (dBμV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line        | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|-------------|------------|
| 0.350000        | ---              | 60.56           | 76.96        | 16.40       | 1000.0          | 9.000           | Single Line | 19.6       |
| 0.350000        | 66.75            | ---             | 89.96        | 23.21       | 1000.0          | 9.000           | Single Line | 19.6       |
| 3.365000        | ---              | 42.52           | 74.00        | 31.48       | 1000.0          | 9.000           | Single Line | 19.8       |
| 3.365000        | 55.02            | ---             | 87.00        | 31.98       | 1000.0          | 9.000           | Single Line | 19.8       |
| 3.585000        | ---              | 43.72           | 74.00        | 30.28       | 1000.0          | 9.000           | Single Line | 19.8       |
| 3.585000        | 51.23            | ---             | 87.00        | 35.77       | 1000.0          | 9.000           | Single Line | 19.8       |
| 6.250000        | ---              | 54.49           | 74.00        | 19.51       | 1000.0          | 9.000           | Single Line | 19.4       |
| 6.250000        | 61.87            | ---             | 87.00        | 25.13       | 1000.0          | 9.000           | Single Line | 19.4       |

#### ◆ Calculation

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

QuasiPeak / CAverage : The Final Value

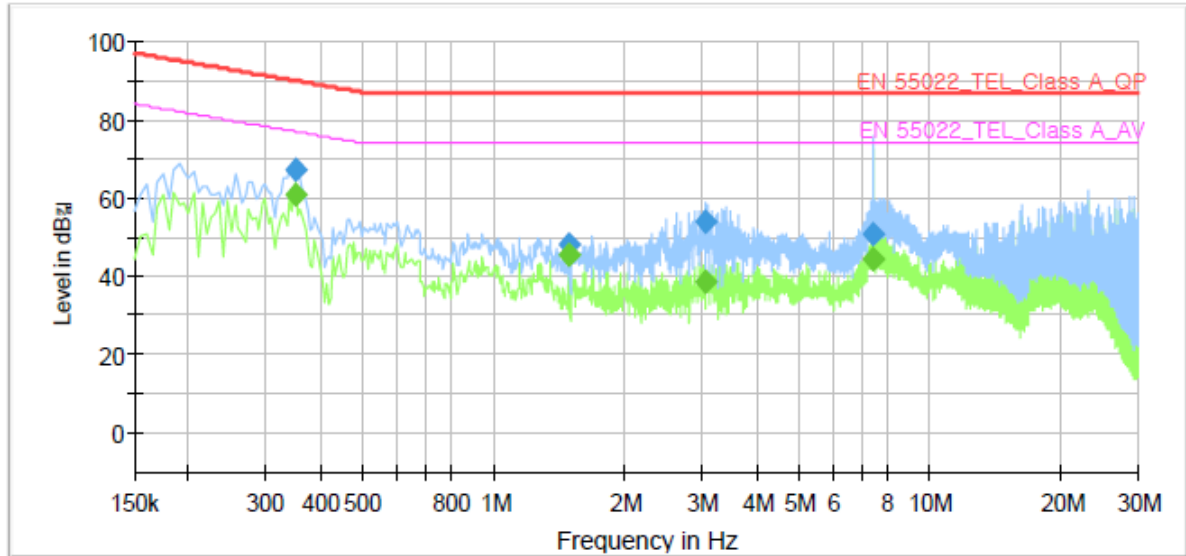
Reading Value : Not shown in the table.

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

## [100 Mbps]

### Common Information

|                   |                            |
|-------------------|----------------------------|
| Test Description: | Telecommunication Emission |
| Model No.:        | TNB-6030P                  |
| Mode              | 12 V (dc) , TEL 100 Mbps   |
| Operator Name:    | KES                        |



### Final Result

| Frequency (MHz) | QuasiPeak (dBμV) | CAverage (dBμV) | Limit (dBμV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line        | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|-------------|------------|
| 0.350000        | ---              | 60.96           | 76.96        | 16.00       | 1000.0          | 9.000           | Single Line | 19.9       |
| 0.350000        | 67.22            | ---             | 89.96        | 22.74       | 1000.0          | 9.000           | Single Line | 19.9       |
| 1.485000        | ---              | 45.73           | 74.00        | 28.27       | 1000.0          | 9.000           | Single Line | 20.3       |
| 1.485000        | 48.18            | ---             | 87.00        | 38.82       | 1000.0          | 9.000           | Single Line | 20.3       |
| 3.070000        | ---              | 38.63           | 74.00        | 35.37       | 1000.0          | 9.000           | Single Line | 20.2       |
| 3.070000        | 53.81            | ---             | 87.00        | 33.19       | 1000.0          | 9.000           | Single Line | 20.2       |
| 7.415000        | ---              | 44.30           | 74.00        | 29.70       | 1000.0          | 9.000           | Single Line | 19.7       |
| 7.415000        | 50.93            | ---             | 87.00        | 36.07       | 1000.0          | 9.000           | Single Line | 19.7       |

#### ◆ Calculation

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

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

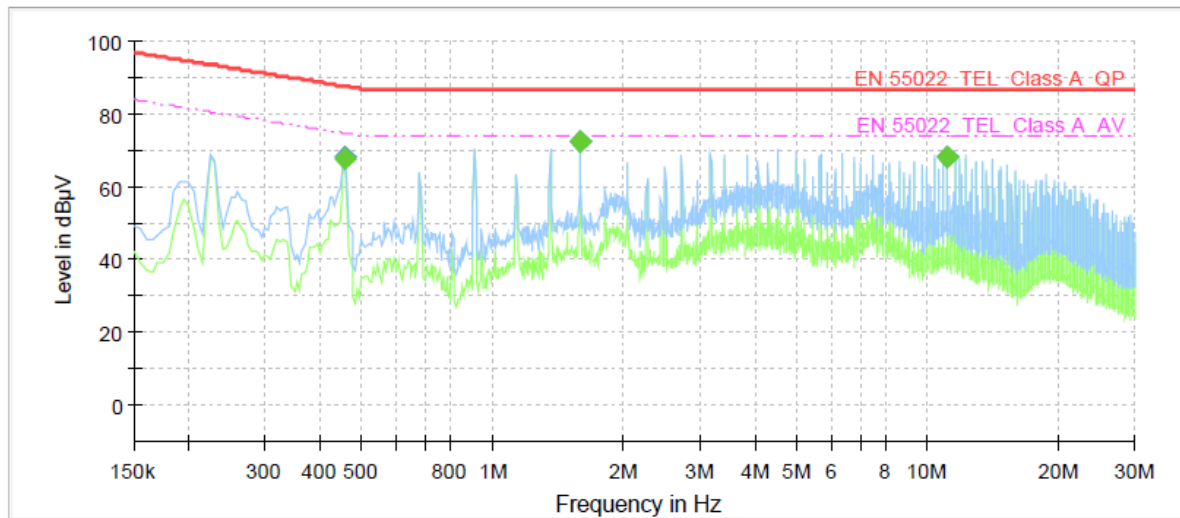
Corr. : Correction values (ISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

■ PoE Mode

**[10 Mbps]**

**Common Information**

|                   |                            |
|-------------------|----------------------------|
| Test Description: | Telecommunication Emission |
| Model No.:        | TNB-6030P                  |
| Mode              | PoE , TEL 10 Mbps          |
| Operator Name:    | KES                        |



**Final Result**

| Frequency (MHz) | QuasiPeak (dBμV) | CAverage (dBμV) | Limit (dBμV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line        | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|-------------|------------|
| 0.455000        | ---              | 67.70           | 74.78        | 7.08        | 1000.0          | 9.000           | Single Line | 19.7       |
| 0.455000        | 68.44            | ---             | 87.78        | 19.34       | 1000.0          | 9.000           | Single Line | 19.7       |
| 1.590000        | ---              | 72.26           | 74.00        | 1.74        | 1000.0          | 9.000           | Single Line | 20.0       |
| 1.590000        | 72.39            | ---             | 87.00        | 14.61       | 1000.0          | 9.000           | Single Line | 20.0       |
| 11.120000       | ---              | 68.18           | 74.00        | 5.82        | 1000.0          | 9.000           | Single Line | 19.9       |
| 11.120000       | 68.41            | ---             | 87.00        | 18.59       | 1000.0          | 9.000           | Single Line | 19.9       |

◆ Calculation

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

QuasiPeak / CAverage : The Final Value

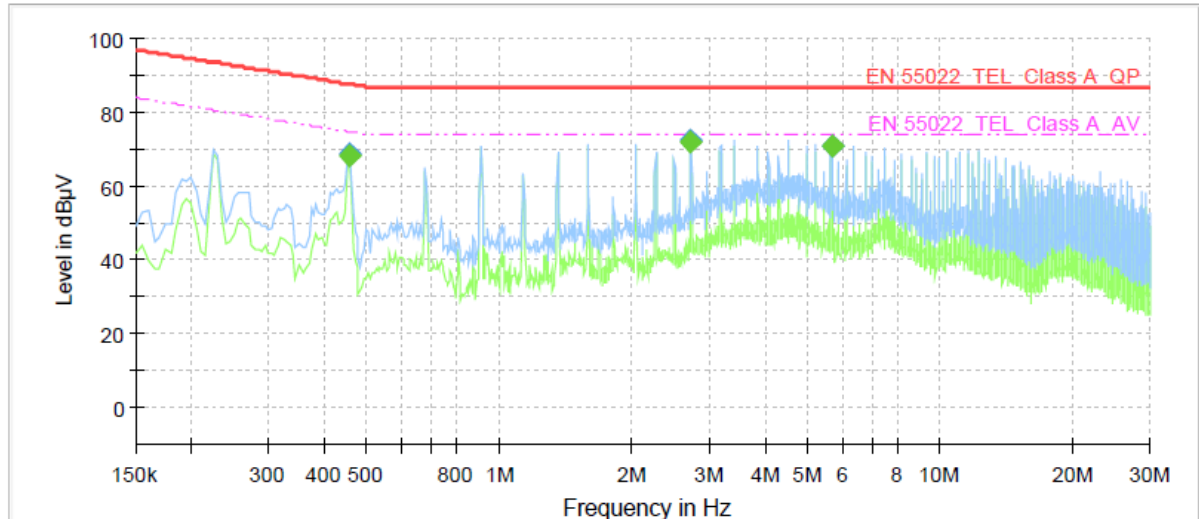
Reading Value : Not shown in the table.

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

## [100 Mbps]

### Common Information

|                   |                            |
|-------------------|----------------------------|
| Test Description: | Telecommunication Emission |
| Model No.:        | TNB-6030P                  |
| Mode              | PoE , TEL 100 Mbps         |
| Operator Name:    | KES                        |



### Final Result

| Frequency (MHz) | QuasiPeak (dBμV) | CAverage (dBμV) | Limit (dBμV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line        | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|-------------|------------|
| 0.455000        | ---              | 68.30           | 74.78        | 6.48        | 1000.0          | 9.000           | Single Line | 20.0       |
| 0.455000        | 69.04            | ---             | 87.78        | 18.74       | 1000.0          | 9.000           | Single Line | 20.0       |
| 2.725000        | ---              | 72.23           | 74.00        | 1.77        | 1000.0          | 9.000           | Single Line | 20.2       |
| 2.725000        | 72.41            | ---             | 87.00        | 14.59       | 1000.0          | 9.000           | Single Line | 20.2       |
| 5.675000        | ---              | 70.73           | 74.00        | 3.27        | 1000.0          | 9.000           | Single Line | 19.7       |
| 5.675000        | 71.11            | ---             | 87.00        | 15.89       | 1000.0          | 9.000           | Single Line | 19.7       |

#### ◆ 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))





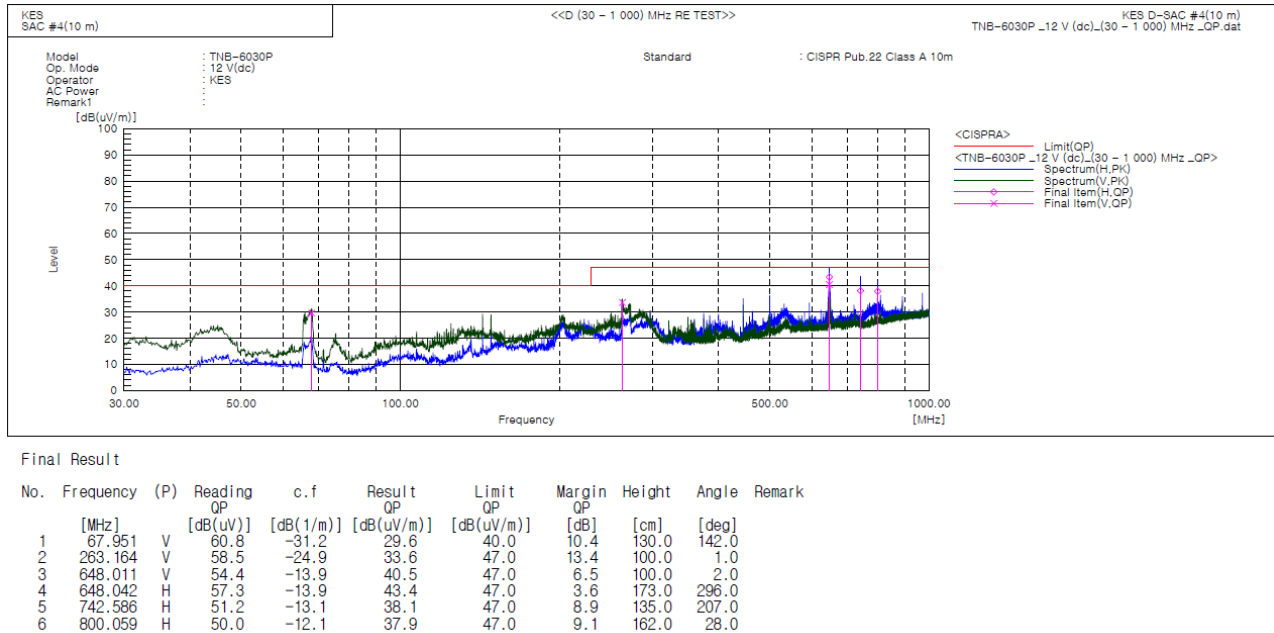
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## Radiated Electric Field Emissions(Below 1 GHz)

### ■ 12 V (dc) Mode



### ◆ Calculation

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

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

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

Limit(QP) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value

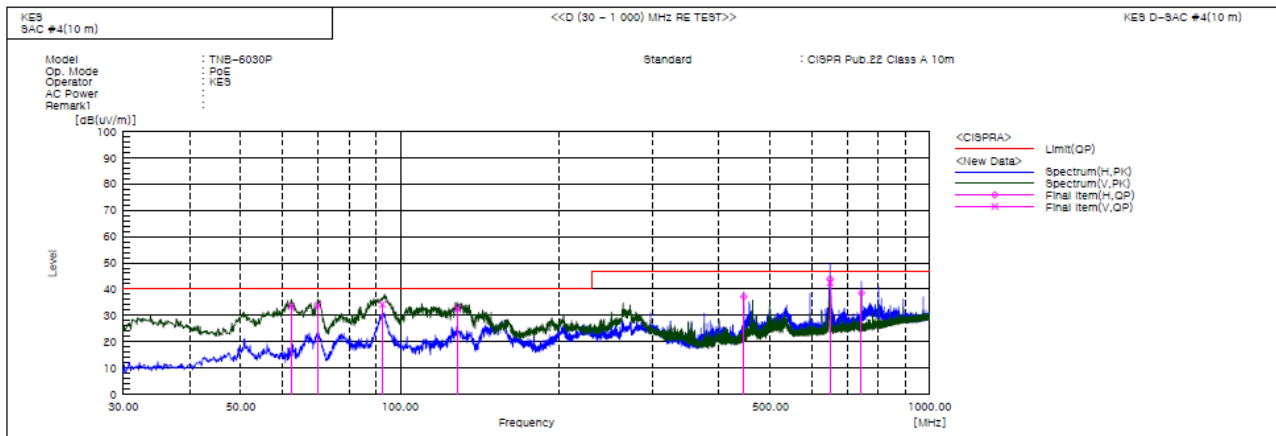


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### ■ PoE Mode



#### Final Result

| No. | Frequency [MHz] | (P) | Reading QP [dB(uV)] | c.f [dB(1/m)] | Result QP [dB(uV/m)] | Limit QP [dB(uV/m)] | Margin QP [dB] | Height [cm] | Angle [deg] | Remark |
|-----|-----------------|-----|---------------------|---------------|----------------------|---------------------|----------------|-------------|-------------|--------|
| 1   | 62.253          | V   | 63.0                | -29.5         | 33.5                 | 40.0                | 6.5            | 100.0       | 266.0       |        |
| 2   | 69.891          | V   | 65.7                | -31.8         | 33.9                 | 40.0                | 6.1            | 130.0       | 98.0        |        |
| 3   | 92.565          | V   | 63.9                | -29.6         | 34.3                 | 40.0                | 5.7            | 150.0       | 177.0       |        |
| 4   | 128.213         | V   | 64.4                | -31.7         | 32.7                 | 40.0                | 7.3            | 100.0       | 207.0       |        |
| 5   | 445.524         | H   | 56.3                | -19.1         | 37.2                 | 47.0                | 9.8            | 190.0       | 171.0       |        |
| 6   | 648.011         | H   | 57.8                | -13.9         | 43.9                 | 47.0                | 3.1            | 161.0       | 190.0       |        |
| 7   | 648.011         | V   | 56.4                | -13.9         | 42.5                 | 47.0                | 4.5            | 100.0       | 163.0       |        |
| 8   | 742.586         | H   | 51.6                | -13.1         | 38.5                 | 47.0                | 8.5            | 140.0       | 202.0       |        |

### ◆ Calculation

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

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

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

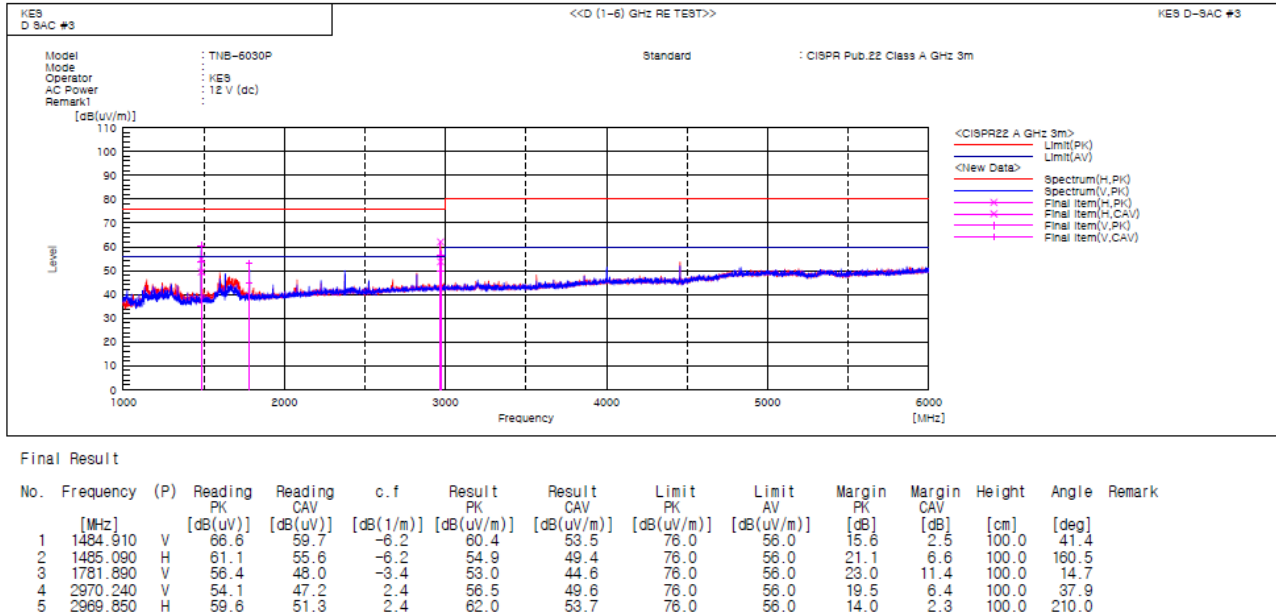
Limit(QP) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value

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## Radiated Electric Field Emissions(Above 1 GHz)

### ■ 12 V (dc) Mode



### ◆ 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

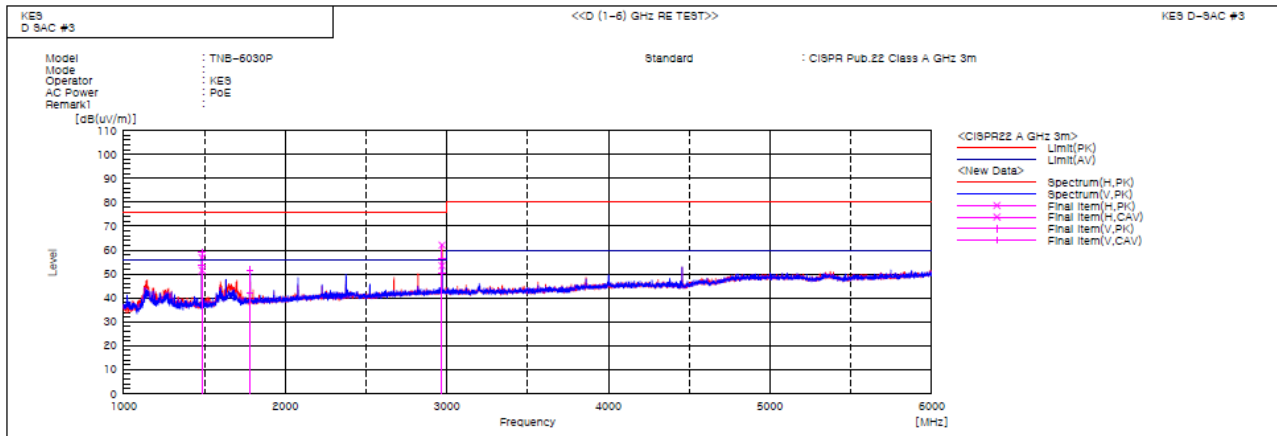


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### PoE Mode



#### 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   | 1485.080        | V   | 65.2                | 59.8                 | -6.2          | 59.0                 | 53.6                  | 76.0                | 56.0                | 17.0           | 2.4             | 100.0       | 35.1        |        |
| 2   | 1485.080        | H   | 63.0                | 57.7                 | -6.2          | 56.8                 | 51.5                  | 76.0                | 56.0                | 19.2           | 4.5             | 100.0       | 37.0        |        |
| 3   | 1761.590        | V   | 55.1                | 45.5                 | -3.4          | 51.7                 | 42.1                  | 76.0                | 56.0                | 24.3           | 13.9            | 100.0       | 15.4        |        |
| 4   | 2969.800        | H   | 59.7                | 51.1                 | 2.4           | 62.1                 | 53.5                  | 76.0                | 56.0                | 13.9           | 2.5             | 100.0       | 245.6       |        |
| 5   | 2969.900        | V   | 54.1                | 47.7                 | 2.4           | 56.5                 | 50.1                  | 76.0                | 56.0                | 19.5           | 5.9             | 100.0       | 33.5        |        |

### Calculation

Result(PK/CAV) [dB(uV/m)] = (Reading(PK/CAV)[dB(uV)] + c.f[dB(1/m)])

Margin(PK/CAV)[dB] = Limit[dB(uV/m)] - Result(PK/CAV) [dB(uV/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 Data - Voltage Fluctuations

**Maximum Flicker results**

|          | EUT values | Limit | Result |
|----------|------------|-------|--------|
| Pst      | N/A        |       |        |
| Plt      |            |       |        |
| dc [%]   |            |       |        |
| dmax [%] |            |       |        |
| Tmax [s] |            |       |        |



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# Test Setup Photos and Configuration

## Conducted Voltage Emissions

N/A

N/A

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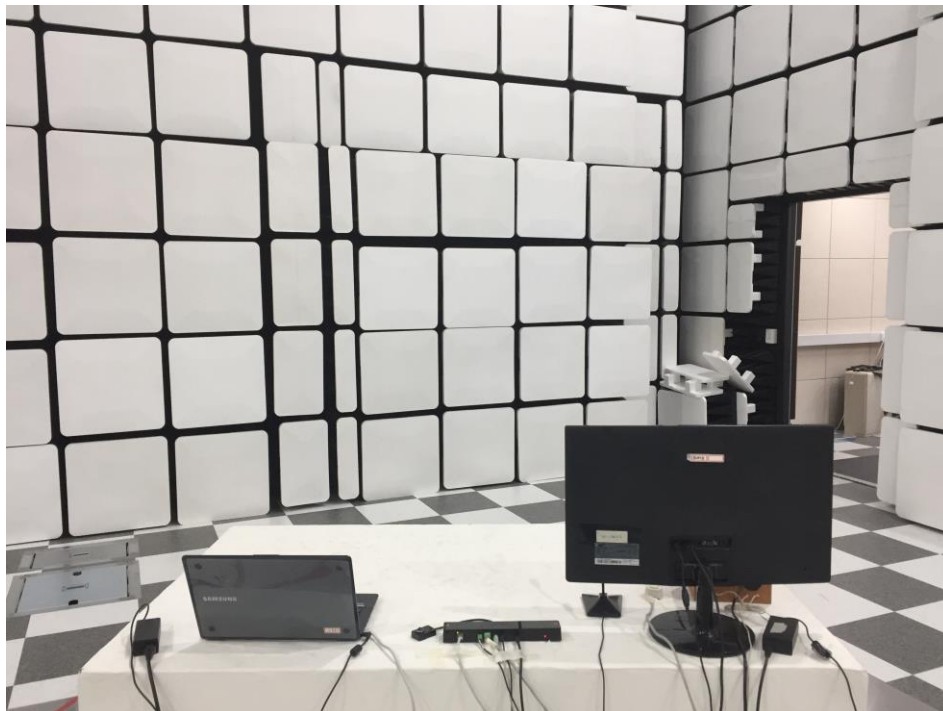
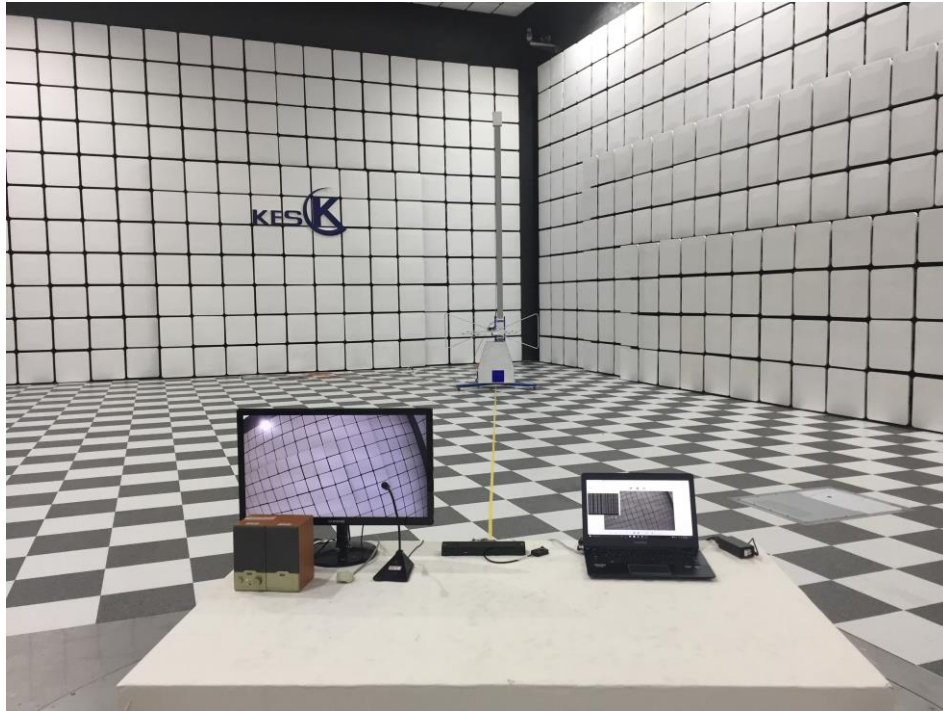


## Conducted Telecommunication Emissions



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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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## Harmonic Current Emissions and Voltage Fluctuations and Flicker

N/A

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## Electrostatic Discharge

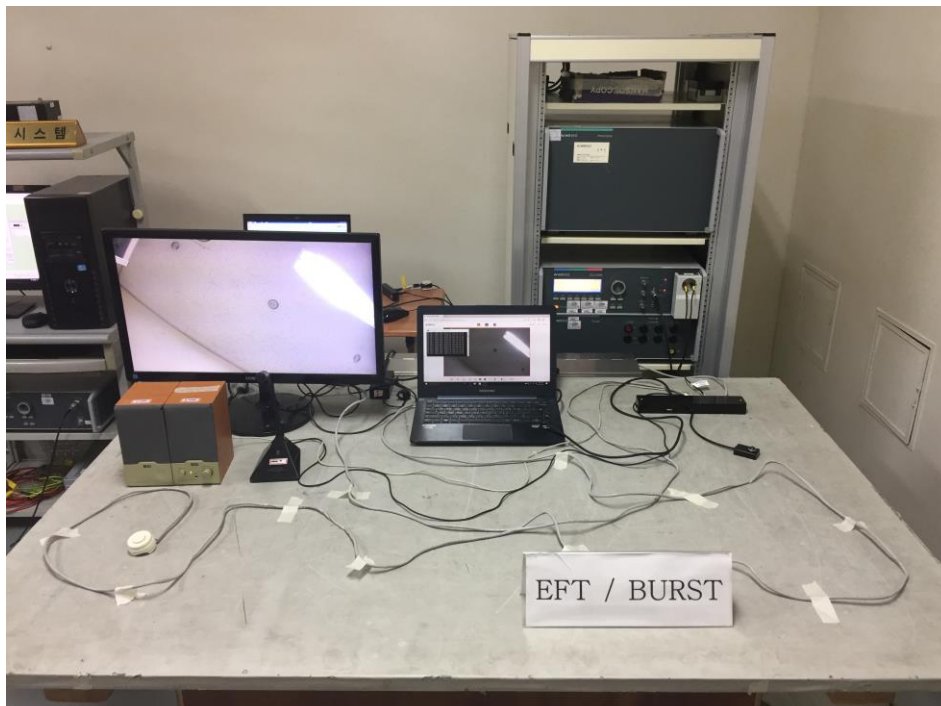
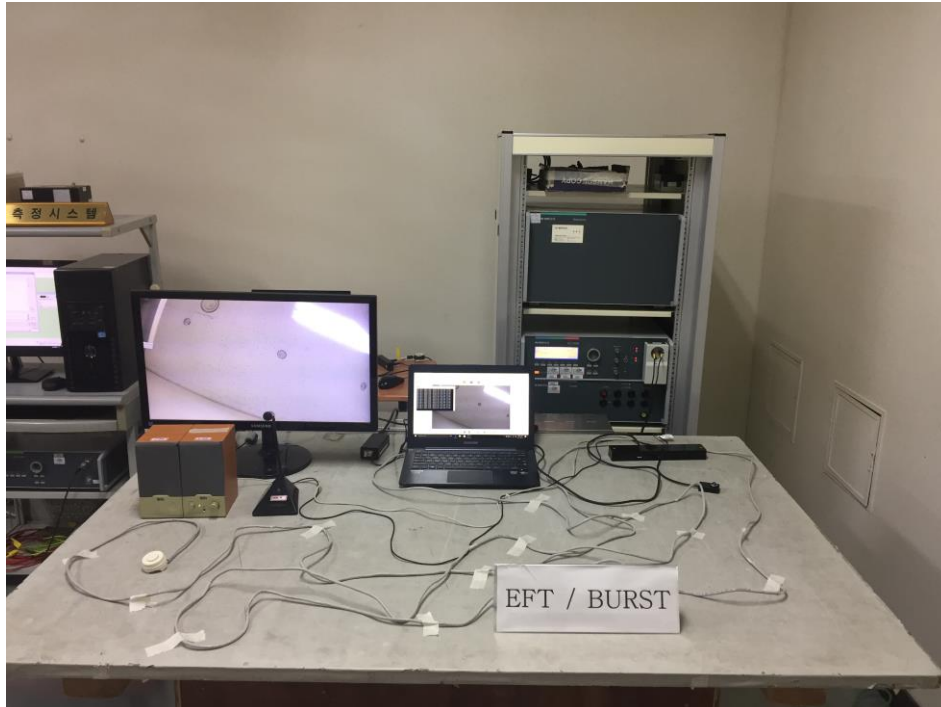


## Radiated Electric Field Immunity



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## Electrical Fast Transients/Bursts



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## Surge Transients



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## Conducted Disturbance



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### Voltage Dips and Short Interruptions

N/A

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## EUT External Photographs

(Top)



(Bottom)



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## EUT Internal Photographs

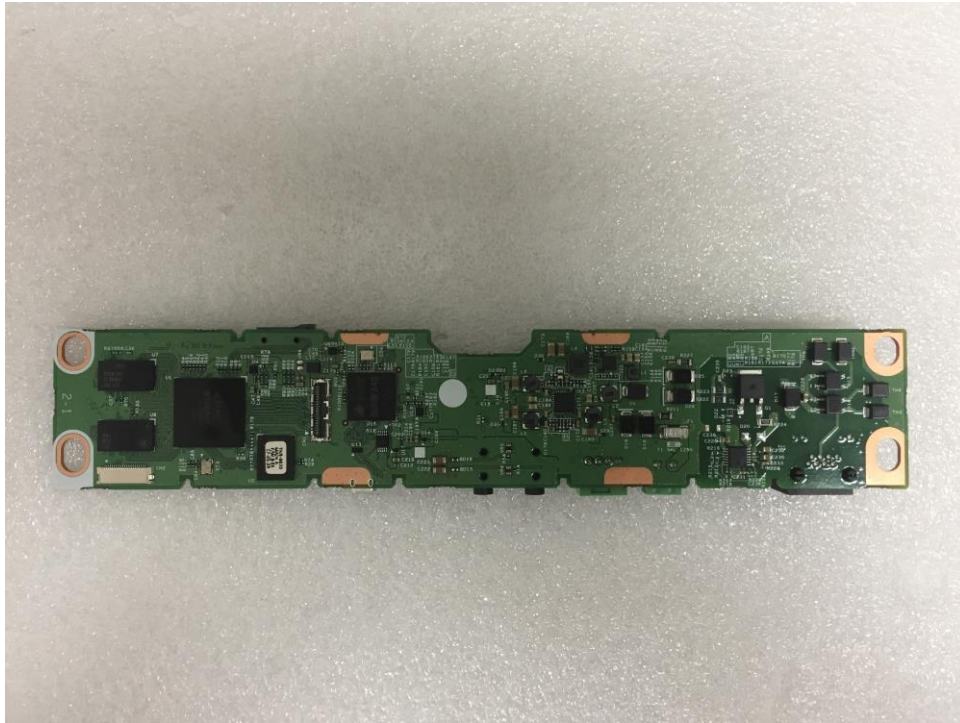
(Internal View)



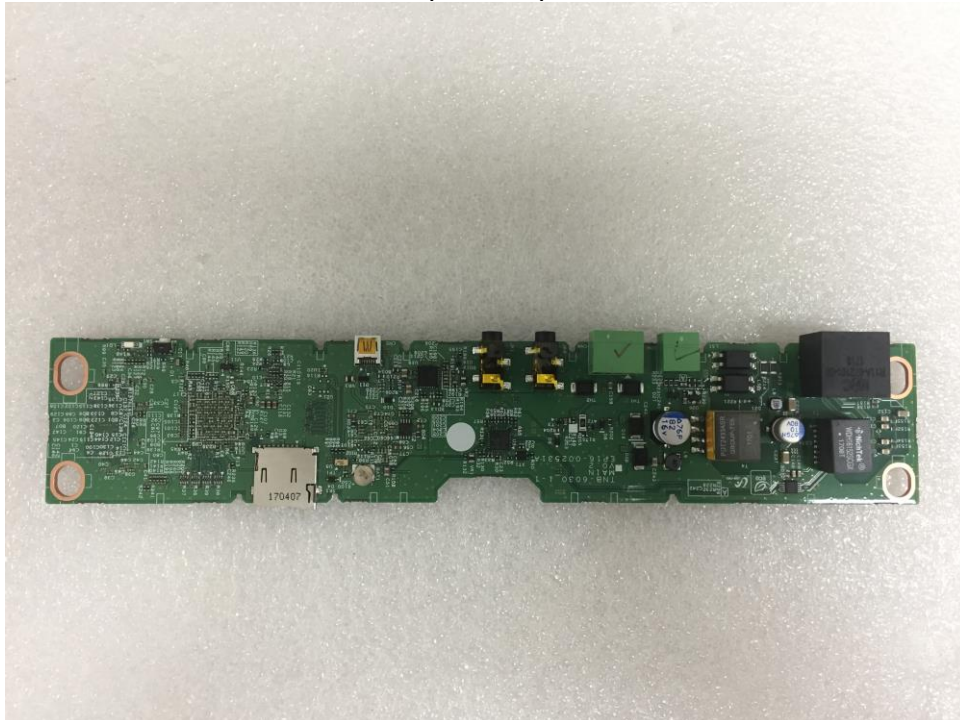
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The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

## EUT Internal View – Main board

(Top)



(Bottom)

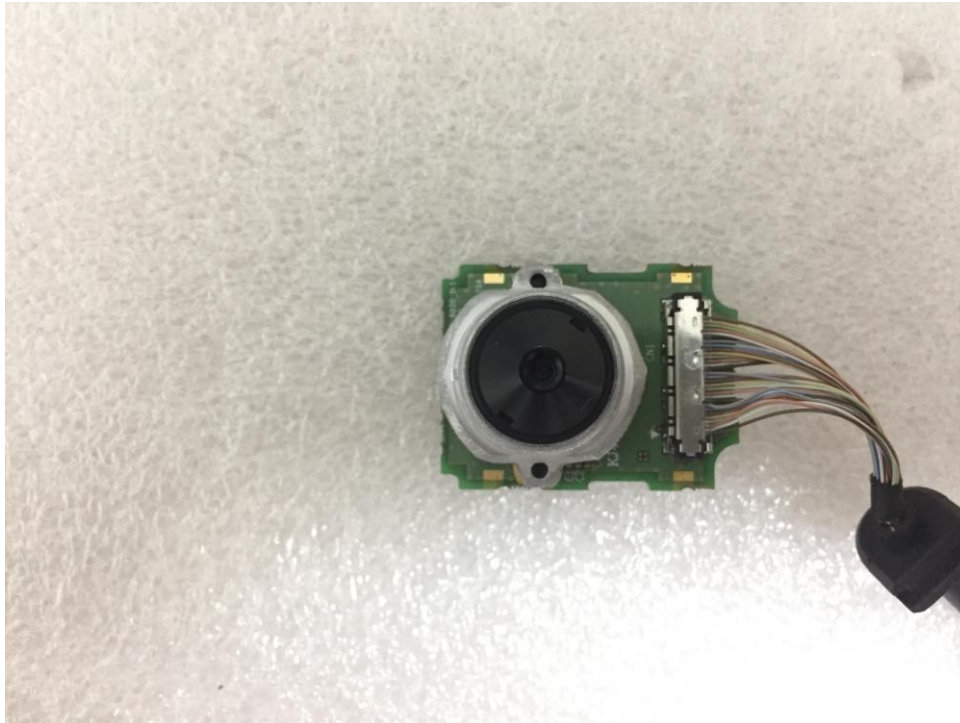


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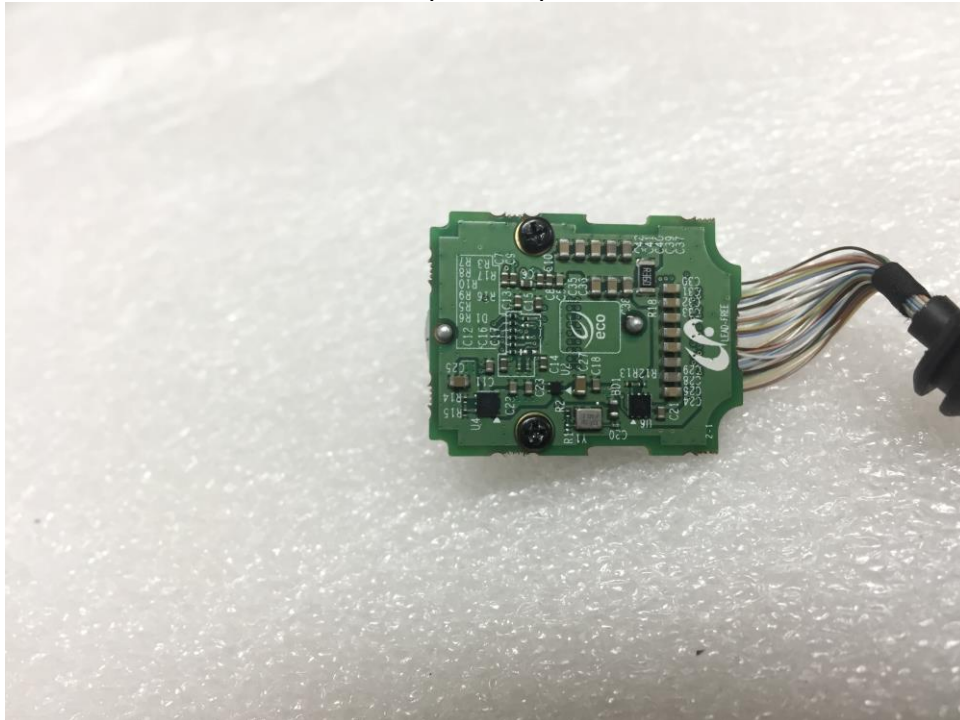


## EUT Internal View – Camera board

(Top)

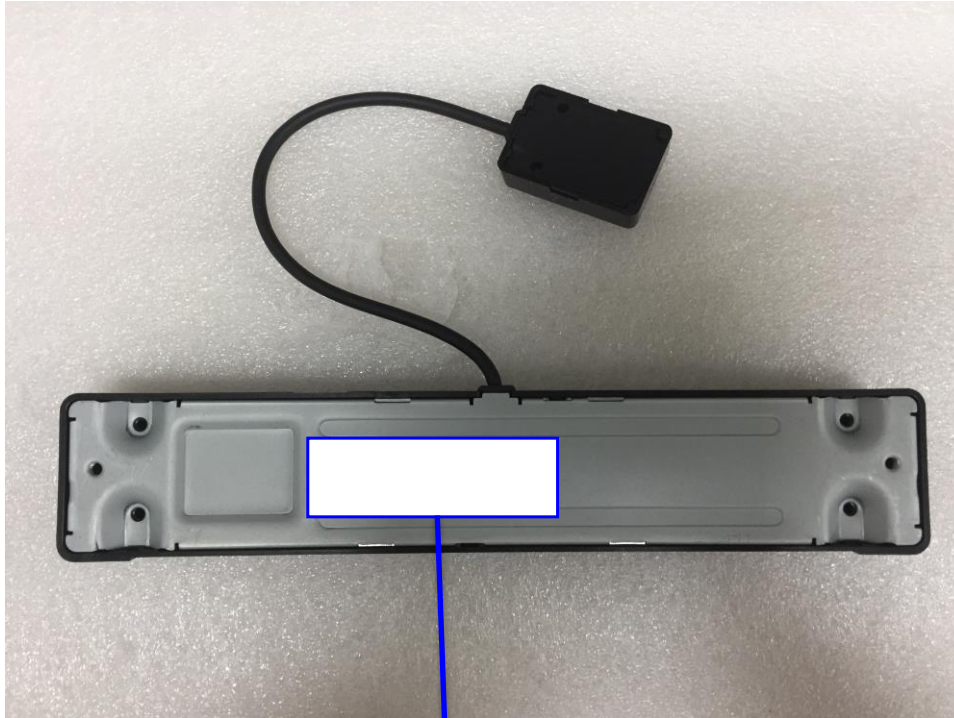


(Bottom)



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## Label and Location



### **NETWORK CAMERA**

Model No : TNB-6030P

Manufacturer : Hanwha Techwin (Tianjin) Co.,Ltd.

Made in of China

