

# TESTING CERTIFICATE

|                                                                                                                                                       |                                                            |                                                                                                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>EMC Compliance Ltd.</b><br>65, Sinwon-ro, Yeongtong-gu,<br>Suwon-si, Gyeonggi-do,<br>443-390, Korea<br>TEL: 82 31 336 9919<br>FAX: 82 505 299 8311 | Certificate No.: EMC-CE-4582<br><br>Page( 1 ) / (42) Pages |   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## 1. Applicant

Name: Samsung Techwin Co., Ltd.  
 Address: 84, Jeongdong-ro, Seongsan-gu, Changwon-si,  
 Gyeongsangnam-do, Korea  
 Date of Receipt: January 15, 2014

## 2. Manufacturer

Name#1: Samsung Techwin Co., Ltd.  
 Name#2: TIANJIN SAMSUNG TECHWIN  
 OPTO-ELECTRONIC CO., LTD

## 3. Use of Report:

Completed report

## 4. Test Sample:

Network Camera, SNB-7004P

## 5. Date of Test:

February 06, 2014

## 6. Test method used:

AS/NZS CISPR 22:2009+A1:2010, Class A

## 7. Testing Environment:

Temperature:  $(19.45 \pm 2.65) ^\circ\text{C}$ ,  
 Relative Humidity:  $(20.2 \pm 2.7) \% \text{ R.H.}$

## 8. Test Results:

Refer to page 15 ~ page 35  
 (Measurement uncertainty: Refer to page 6)

This result shown in this report refer only to the sample(s) tested unless otherwise stated.

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|             |                                                                                                                        |                                                                                                                                    |
|-------------|------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Affirmation | Tested by<br><br>Name: PARK, GUN-SU | Technical Manager<br><br>Name: YEOM, HAN-SEOK |
|-------------|------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|

The above test certificate is the accredited test results by Korea Laboratory Accreditation Scheme, which signed the ILAC-MRA.

2014.02.12  
**EMC Compliance Ltd.**

Accredited by KOLAS, Republic of KOREA

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## 1. Applicant information

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## 2. Laboratory information

### Address

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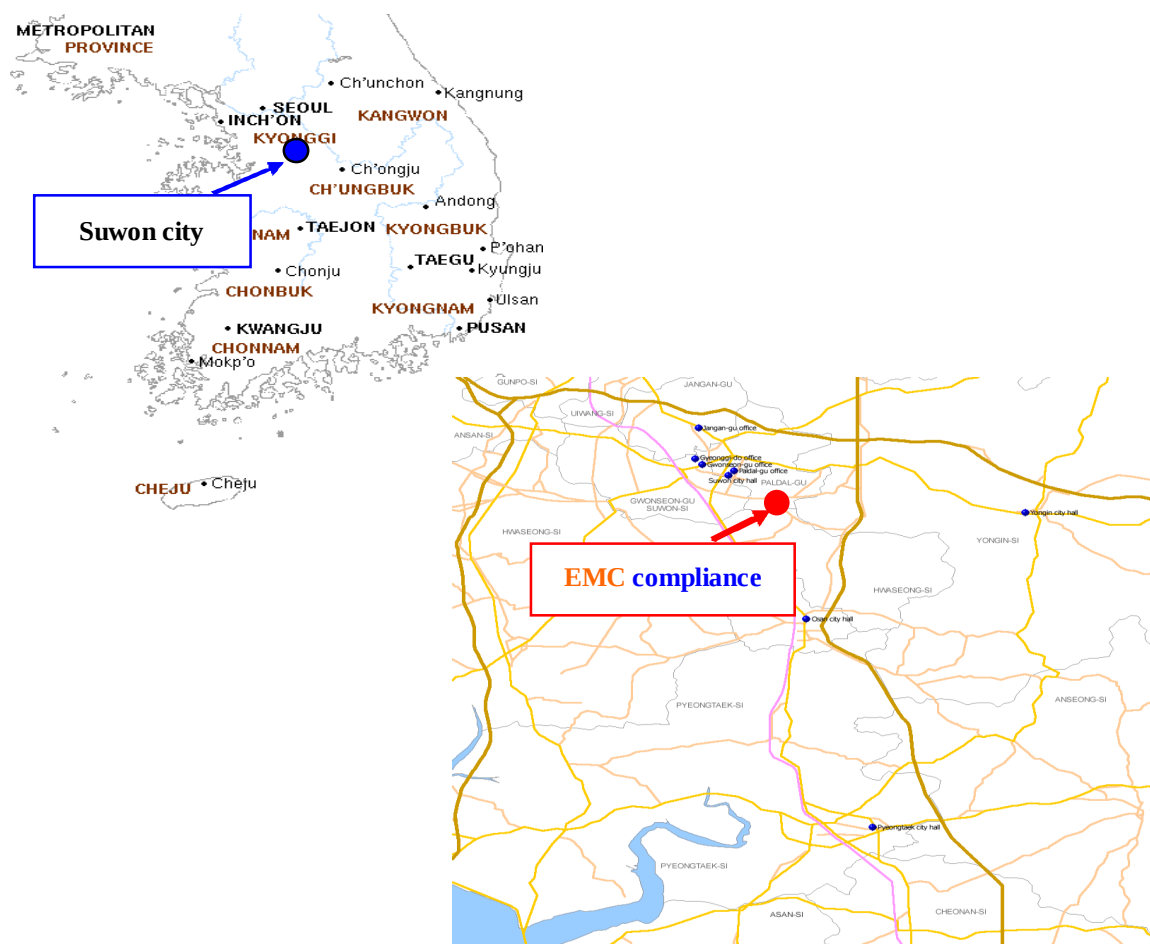
FCC CAB.: KR0040

VCCI Registration No. : R-3327, G-198, C-3706, T-1849

Industry Canada Registration No.: 8035A

KOLAS NO.: 231

### **SITE MAP**



### 3. Test system configuration

#### 3.1 Operation environment

|                   | Temperature | Humidity    | Pressure |
|-------------------|-------------|-------------|----------|
| Chamber(10 m)     | : 16.8 °C   | 22.9 % R.H. | -        |
| Shielded room(CE) | : 22.1 °C   | 17.5 % R.H. | -        |

#### Test site

These testing items were performed following locations;

| Test item          | Test site     |
|--------------------|---------------|
| Conducted Emission | Shielded Room |
| Radiated Emission  | 10 m Chamber  |

## 3.2 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC.

The factors contributing to uncertainties are test receiver, cable loss, antenna factor calibration, Antenna directivity, antenna factor variation with height, antenna phase center variation, antenna frequency interpolation, measurement distance variation, site imperfection, mismatch, and system repeatability. Based on CISPR 16-4-2, the measurement uncertainty level with a 95 % confidence level was applied.

| Conducted emission measurement (C.L: Approx 95 %, k = 2) |                                 |                                                         |
|----------------------------------------------------------|---------------------------------|---------------------------------------------------------|
| Shielded Room (CE#1)                                     | 9 kHz ~ 150 kHz: $\pm 3.82$ dB  |                                                         |
|                                                          | 150 kHz ~ 30 MHz: $\pm 3.43$ dB |                                                         |
| Shielded Room (CE#2)                                     | 9 kHz ~ 150 kHz: $\pm 3.82$ dB  |                                                         |
|                                                          | 150 kHz ~ 30 MHz: $\pm 3.43$ dB |                                                         |
| Shielded Room (CE#3)                                     | 9 kHz ~ 150 kHz: $\pm 4.00$ dB  |                                                         |
|                                                          | 150 kHz ~ 30 MHz: $\pm 3.63$ dB |                                                         |
| Radiated Emission measurement (C.L: Approx 95 %, k = 2)  |                                 |                                                         |
| 10 m Chamber (#F4)                                       | 30 MHz ~ 300 MHz                | 3 m: + 4.56 dB, - 4.58 dB<br>10 m: + 4.56 dB, - 4.56 dB |
|                                                          | 300 MHz ~ 1 000 MHz             | 3 m: + 4.84 dB, - 4.85 dB<br>10 m: + 4.71 dB, - 4.72 dB |
|                                                          | 1 GHz ~ 6 GHz                   | 3 m: + 6.19 dB, - 6.20 dB                               |
| 10 m Chamber (#F2)                                       | 30 MHz ~ 300 MHz                | 3 m: + 4.86 dB, - 4.88 dB<br>10 m: + 4.86 dB, - 4.86 dB |
|                                                          | 300 MHz ~ 1 000 MHz             | 3 m: + 4.98 dB, - 4.99 dB<br>10 m: + 4.85 dB, - 4.87 dB |
|                                                          | 1 GHz ~ 6 GHz                   | 3 m: + 6.19 dB, - 6.20 dB                               |

## 4. Description of E.U.T.

### 4.1 General information

| Video                       |                                                                                               |
|-----------------------------|-----------------------------------------------------------------------------------------------|
| Imaging Device              | 1/2.8" PS Exmor 3.20M CMOS (IMX124)                                                           |
| Total Pixels                | 2,065(H) X 1,565(V)                                                                           |
| Effective Pixels            | 2,065(H) X 1,553(V)                                                                           |
| Scanning System             | Progressive                                                                                   |
| Min. Illumination           | Color : 0.1 Lux (F1.2, 50IRE), 0.01Lux (Sens-up 60x, 50IRE)<br>B/W : 0 Lux (IR LED on)        |
| S / N Ratio                 | 50dB                                                                                          |
| Video Out                   | CVBS : 1.0 Vp-p / 75Ω composite, 720x480(N), 720x576(P), for installation<br>- connector type |
| Lens                        |                                                                                               |
| Focal Length (Zoom Ratio)   | 3 ~ 8.5mm (2.8x) Motorized Varifocal                                                          |
| Max. Aperture Ratio         | F1.2                                                                                          |
| Angular Field of View       | H : 100.12°(Wide) ~ 35.38°(Tele) / V : 73.76°(Wide) ~ 26.58°(Tele)                            |
| Min. Object Distance        | 0.5m(1.64ft)                                                                                  |
| Focus Control               | Simple Focus (Motorized V/F) / Manual<br>- Remote control via network (Manual, Simple Focus)  |
| Lens Type                   | DC Auto Iris                                                                                  |
| Mount Type                  | Board-in type                                                                                 |
| Pan / Tilt / Rotate         |                                                                                               |
| Pan Range                   | 0 ° ~ +355 °                                                                                  |
| Tilt Range                  | 0 ° ~ +67 °                                                                                   |
| Rotate Range                | 0 ° ~ +355 °                                                                                  |
| Operational                 |                                                                                               |
| IR LED                      | 12ea                                                                                          |
| Viewable Length             | 25m(82.02ft)                                                                                  |
| Camera Title                | Off / On (Displayed up to 45 characters)                                                      |
| Day & Night                 | Auto (ICR) / Color / B/W / External / Schedule                                                |
| Backlight Compensation      | Off / BLC                                                                                     |
| Wide Dynamic Range          | Max. 120dB                                                                                    |
| Contrast Enhancement        | SSDR (Samsung Super Dynamic Range) (Off / On)                                                 |
| Digital Noise Reduction     | SSNRIII (2D+3D Noise Filter) (Off / On)                                                       |
| Digital Image Stabilization | Off / On                                                                                      |
| Defog                       | Auto/Manual/Off                                                                               |
| Motion Detection            | Off / On (4 zones with 4 points Polygon)                                                      |
| Privacy Masking             | Off / On (32 zones with 4 points of polygon)                                                  |
| Sens-up (Frame Integration) | -                                                                                             |
| Gain Control                | Off / Low / Middle / High                                                                     |
| White Balance               | ATW / AWC / Manual / Indoor / Outdoor                                                         |
| Electronic Shutter Speed    | Minimum / Maximum / Anti flicker (1 ~ 1/12,000sec)                                            |

|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Digital PTZ                 | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Flip / Mirror               | Off / On                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Intelligent Video Analytics | Tampering, Virtual Line, Enter/Exit, Appear / Disappear, Audio Detection, Face Detection with Metadata                                                                                                                                                                                                                                                                                                                                                                                                               |
| Alarm I/O                   | Input 1ea / Output 1ea                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Alarm Triggers              | Motion detection, <b>Tampering Detection</b> , Audio Detection, Face Detecton, Video Loss, Video Analytics, Alarm Input                                                                                                                                                                                                                                                                                                                                                                                              |
| Alarm events                | File upload via FTP and E-Mail<br>Notification via E-Mail, TCP and HTTP<br>local storage(SD/SDHC/SDXC) recording at Network disconnected & Event (Alarm Triggers)<br>External output                                                                                                                                                                                                                                                                                                                                 |
| <b>Network</b>              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Ethernet                    | RJ-45 (10/100BASE-T)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Video Compression Format    | H.264 (MPEG-4 Part 10/AVC), Motion JPEG                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Resolution                  | 2048x1536 / 1920x1080 / 1600x1200 / 1280x1024 / 1280x960 / 1280x720 / 1024x768 / 800x600 / 800x450 / 640x480 / 640x360 / 320x240 / 320x180                                                                                                                                                                                                                                                                                                                                                                           |
| Max. Framerate              | H.264 : 3M Mode Max 30fps@2048x1536 / 1920x1080 / 1600x1200 / 1280x1024 / 1280x960 / 1280x720 / 1024x768 / 800x600 / 800x450 / 640x480 / 640x360 / 320x240 / 320x180<br>2M Mode <b>Max 60fps</b> @1920x1080 / 1600x1200 / 1280x1024 / 1280x960 / 1280x720 / 1024x768 / 800x600 / 800x450 / 640x480 / 640x360 / 320x240 / 320x180<br>MJPEG : Max 10fps@2048x 1536 / 1920x1080 / <b>1600x1200</b> / 1280x1024 / 1280x960 / 1280x720 / 1024x768<br>Max 30fps@ 800x600 / 800x450 / 640x480 / 640x360 / 320x240 / 320x180 |
| Smart Codec                 | Built-in<br>Area-Based : 5EA<br>Face detection Mode                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Video Quality Adjustment    | H.264 : Compression Level, Target Bitrate Level Control<br>MJPEG : Quality Level Control                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Bitrate Control Method      | H.264 : CBR or VBR,<br>MJPEG : VBR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Streaming Capability        | Multiple Streaming (Up to 10 Profiles)                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Audio I/O                   | Mic(Line)-in Selectable via UI, Line-out (Mono, 1Vrms)<br><b>2.5VDC(4mA)</b> powered 2K Ohm                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 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                                                                                                                                                                                                                                                                                                                                                                                                            |
| Audio Communication         | Bi-directional                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| IP                          | IPv4, IPv6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Protocol                    | TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP,RTSP, NTP, HTTP, HTTPS, SSL, 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                                                                                                                                                                                                                                                                                                                                                                                   |

|                                   |                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Streaming Method                  | Unicast / Multicast                                                                                                                                                                                                                                                                                                                                       |
| Max. User Access                  | 15 users at Unicast Mode                                                                                                                                                                                                                                                                                                                                  |
| Memory Slot                       | micro SD/SDHC/SDXC<br>- motion Images recorded in the SDX/SDHC/SD memory card can be downloaded.                                                                                                                                                                                                                                                          |
| Application Programming Interface | ONVIF Profile S<br>SUNAPI(HTTP API) v2.0<br>SVNP 1.2                                                                                                                                                                                                                                                                                                      |
| Webpage Language                  | English, French, German, Spanish, Italian, Chinese, Korean, Russian, Japanese, Swedish, Danish, Portuguese, Turkish, Polish, Czech, Rumanian, Serbian, Dutch, Croatian, Hungarian, Greek, Norwegian, Finnish                                                                                                                                              |
| Web Viewer                        | Supported OS : Windows XP / VISTA / 7 / 8, MAC OS X 10.7<br>Supported Browser : Microsoft Internet Explorer (Ver. 10, 9, 8, 7),<br>Mozilla Firefox (Ver. 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 9),<br>Google Chrome (Ver. 25, 24, 23, 22, 21, 20, 19, 18, 17, 16, 15),<br>Apple Safari (Ver. 6.0.2(Mac OS X 10.8, 10.7 only), 5.1.7) *<br>Mac OS X only |
| Central Management Software       | SmartViewer 4.x                                                                                                                                                                                                                                                                                                                                           |
| <b>Environmental</b>              |                                                                                                                                                                                                                                                                                                                                                           |
| Operating Temperature / Humidity  | AC24V : -40°C to +55°C / Less than 90% RH<br>DC12V, PoE (IEEE802.3af) : -10°C to +55°C / Less than 90% RH                                                                                                                                                                                                                                                 |
| Storage Temperature / Humidity    | -30°C ~ +60°C (-22°F ~ +140°F) / Less than 90% RH                                                                                                                                                                                                                                                                                                         |
| Ingress Protection                | IP66 Grade                                                                                                                                                                                                                                                                                                                                                |
| Vandal Resistance                 | IK10                                                                                                                                                                                                                                                                                                                                                      |
| <b>Electrical</b>                 |                                                                                                                                                                                                                                                                                                                                                           |
| Input Voltage / Current           | AC24V, DC12V, PoE(IEEE802.3af class 3)                                                                                                                                                                                                                                                                                                                    |
| Power Consumption                 | Max. 10.5W (DC 12V)<br>Max. 11.5W (PoE)<br>Max. 12.0W(AC24V, Heater Off), Max 15.0W(AC24V, Heater On)                                                                                                                                                                                                                                                     |
| <b>Mechanical</b>                 |                                                                                                                                                                                                                                                                                                                                                           |
| Color / Material                  | Ivory / Aluminum                                                                                                                                                                                                                                                                                                                                          |
| Dimension (WxHxD)                 | Ø160 x H118.5                                                                                                                                                                                                                                                                                                                                             |
| Weight                            | 960g                                                                                                                                                                                                                                                                                                                                                      |

## 4.2 Product description

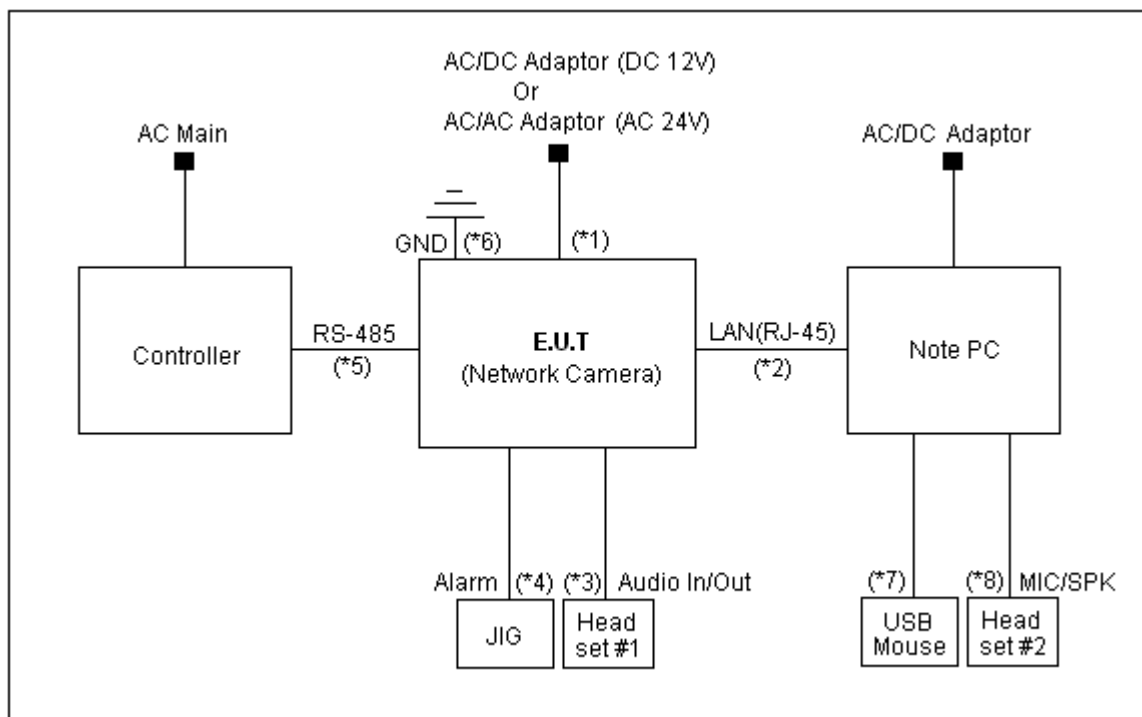
|                          |                                                                                                                                                                      |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type of product          | Network Camera                                                                                                                                                       |
| Model name (Basic)       | SNB-7004P                                                                                                                                                            |
| Model name (Variant)     | -                                                                                                                                                                    |
| Difference               | -                                                                                                                                                                    |
| Trade name               | -                                                                                                                                                                    |
| Serial no                | Engineering Sample                                                                                                                                                   |
| Testing voltage          | DC 12 V , AC 24 V , PoE                                                                                                                                              |
| Product rating           | DC 12 V , AC 24 V , PoE                                                                                                                                              |
| Internal clock frequency | Above 108 MHz                                                                                                                                                        |
| Note                     | * AC/DC adaptor was not provided by the manufacturer.<br>* AC/AC adaptor was not provided by the manufacturer.<br>* PoE Switch was not provided by the manufacturer. |

## 4.3 Auxiliary equipments

| Type                      | Model / Part # | Serial number | Manufacturer      |
|---------------------------|----------------|---------------|-------------------|
| Note PC                   | C1321          | 472680432038  | FUJITSU           |
| USB Mouse                 | 1088           | 8165906051248 | Microsoft         |
| Headset #1                | SHS-250V       | -             | SAMSUNG           |
| Headset #2                | SHS-250V       | -             | SAMSUNG           |
| Controller                | SCC-1000       | EW089028913   | SAMSUNG           |
| JIG                       | -              | -             | -                 |
| AC/DC Adaptor<br>(DC 12V) | ADS-30S1-12-2  | -             | -                 |
| AC/AC Adaptor<br>(AC 24V) | SA0613-4003A   | -             | Dream Electronics |
| PoE Switch                | FS108P         | 1DL20C3N00544 | NETGEAR           |

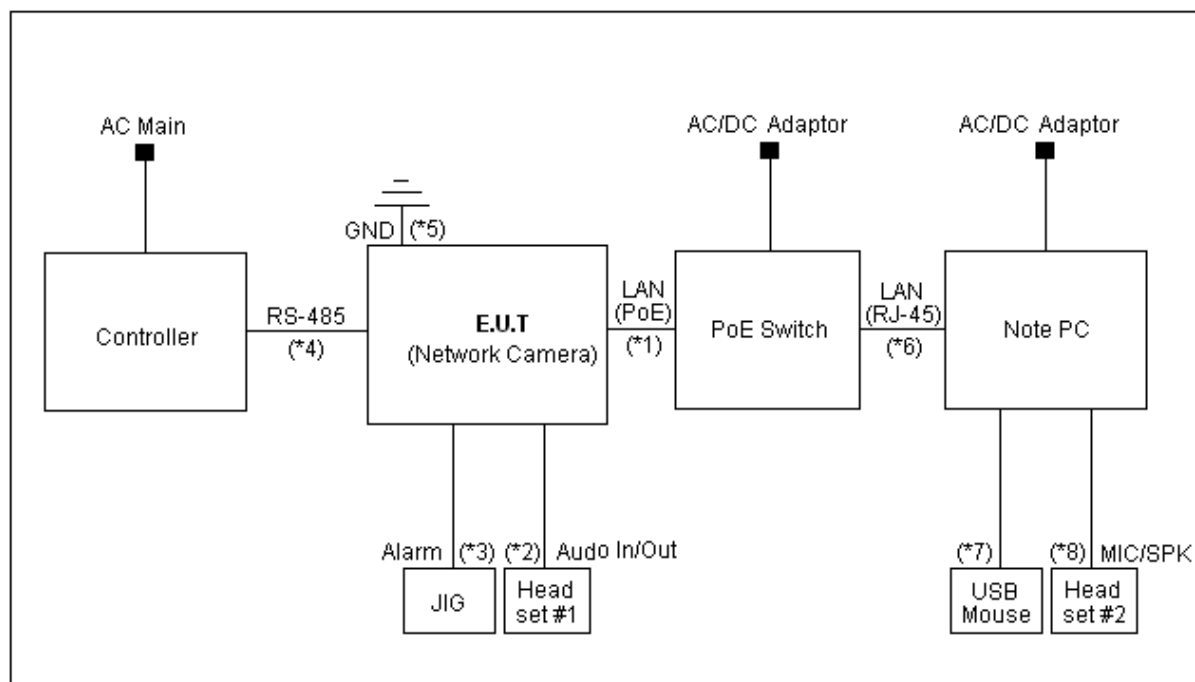
## 4.4 Test configuration

#1- DC 12V, #2- AC 24V



| Note<br>* | Start                   |              | End                                  |              | Cable      |            |
|-----------|-------------------------|--------------|--------------------------------------|--------------|------------|------------|
|           | Name                    | I/O port     | Name                                 | I/O port     | Length (m) | Spec.      |
| 1         | EUT<br>(Network Camera) | Power        | AC/DC Adaptor<br>Or<br>AC/AC Adaptor | Power        | 1.2        | Non-Shield |
| 2         |                         | LAN(RJ-45)   | Note PC                              | LAN(RJ-45)   | 3.0        | Non-Shield |
| 3         |                         | Audio In/Out | Headset #1                           | Audio In/Out | 3.0        | Non-Shield |
| 4         |                         | Alarm        | JIG                                  | Alarm        | 3.0        | Non-Shield |
| 5         |                         | RS-485       | Controller                           | RS-485       | 3.0        | Non-Shield |
| 6         |                         | GND          | GND                                  | GND          | 1.4        | Non-Shield |
| 7         | Note PC                 | USB          | USB Mouse                            | USB          | 1.5        | Shield     |
| 8         |                         | MIC/SPK      | Headset #2                           | MIC/SPK      | 2.0        | Non-Shield |

### #3- PoE



\* Power supplied from PoE Switch

| Note<br>* | Start                          |              | End        |              | Cable      |            |
|-----------|--------------------------------|--------------|------------|--------------|------------|------------|
|           | Name                           | I/O port     | Name       | I/O port     | Length (m) | Spec.      |
| 1         | <b>EUT</b><br>(Network Camera) | LAN(PoE)     | PoE Switch | LAN(PoE)     | 3.0        | Non-Shield |
| 2         |                                | Audio In/Out | Headset #1 | Audio In/Out | 3.0        | Non-Shield |
| 3         |                                | Alarm        | JIG        | Alarm        | 3.0        | Non-Shield |
| 4         |                                | RS-485       | Controller | RS-485       | 3.0        | Non-Shield |
| 5         |                                | GND          | GND        | GND          | 1.4        | Non-Shield |
| 6         | Note PC                        | LAN(RJ-45)   | PoE Switch | LAN(RJ-45)   | 3.0        | Non-Shield |
| 7         |                                | USB          | USB Mouse  | USB          | 1.8        | Shield     |
| 8         |                                | MIC/SPK      | Headset #2 | MIC/SPK      | 2.0        | Non-Shield |

## 4.5 Operating conditions

The EUT was configured as normal intended use.

| Test mode | Normal operating            |
|-----------|-----------------------------|
| 1         | Alarm test.                 |
|           | Audio In/Out test.          |
|           | Web viewer monitoring test. |
|           | Ping test.                  |
|           | Controller test.            |

\* Note: 3 types of powers are available for the product, that are DC 12 V, AC 24 V, PoE.

Therefore, tests were performed for 3 different types of powers.

## 5. Summary of test results

### 5.1 Summary of EMI emission test results

| Applied                             | Test items         | Test method                   | Result            |
|-------------------------------------|--------------------|-------------------------------|-------------------|
| <input checked="" type="checkbox"/> | Conducted Emission | AS/NZS CISPR 22:2009, Class A | 15 Page ~ 23 Page |
| <input checked="" type="checkbox"/> | Radiated Emission  | AS/NZS CISPR 22:2009, Class A | 24 Page ~ 35 Page |

## 6. Test results

### 6.1 Conducted Emission

|                    |                               |                   |             |
|--------------------|-------------------------------|-------------------|-------------|
| Test specification | AS/NZS CISPR 22:2009, Class A |                   |             |
| Testing voltage    | DC 12 V, AC 24 V, PoE         |                   |             |
| Test facility      | Shielded room (CE#2)          |                   |             |
| Date               | 2014. 02. 06                  |                   |             |
| Temperature (°C)   | 22.1 °C                       | Humidity (% R.H.) | 17.5 % R.H. |
| Remarks            | Complied                      |                   |             |

#### 6.1.1 Limits of conducted emission measurement

☐ AC main

| Frequency<br>MHz | Class A $\text{dB}\mu\text{V}$ |         | Class B $\text{dB}\mu\text{V}$ |          |
|------------------|--------------------------------|---------|--------------------------------|----------|
|                  | Quasi-peak                     | Average | Quasi-peak                     | Average  |
| 0.15 ~ 0.5       | 79                             | 66      | 66 ~ 56 *                      | 56 ~ 46* |
| 0.5 ~ 5          | 73                             | 60      | 56                             | 46       |
| 5 ~ 30           | 73                             | 60      | 60                             | 50       |

\*The limit decreases linearly with the logarithm of frequency.

☒ Telecommunication

| Frequency<br>MHz | Class A Voltage Limits $\text{dB}\mu\text{V}$ |          | Current Limits $\text{dB}\mu\text{A}$ |          |
|------------------|-----------------------------------------------|----------|---------------------------------------|----------|
|                  | Quasi-Peak                                    | Average  | Quasi-Peak                            | Average  |
| 0.15 ~ 0.5       | 97 to 87                                      | 84 to 74 | 53 to 43                              | 40 to 30 |
| 0.5 ~ 30         | 87                                            | 74       | 43                                    | 30       |
| Frequency<br>MHz | Class B Limits $\text{dB}\mu\text{V}$         |          | Current Limits $\text{dB}\mu\text{A}$ |          |
|                  | Quasi-Peak                                    | Average  | Quasi-Peak                            | Average  |
| 0.15 ~ 0.5       | 84 to 74                                      | 74 to 64 | 40 to 30                              | 30 to 20 |
| 0.5 ~ 30         | 74                                            | 64       | 30                                    | 20       |

\* The limits decrease linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz

\* The current and voltage disturbance limits are derived for use with an impedance stabilization Network (ISN) which presents a common mode (asymmetric mode) impedance of 150  $\Omega$  to the telecommunication port under test (conversion factor is  $20 \log_{10} 150/I = 44 \text{ dB}$ ).

### 6.1.2 Measurement procedure

The measurements were performed in a shielded room. EUT was setup as shown in photograph and placed on a non-metallic table height of 0.8 m above the reference ground plane. The rear of table was located 0.4 m to the vertical conducted plane. EUT was power through the LISN, which was bonded to the ground plane. The LISN power was filtered. Each EUT power lead, except ground (safety) lead was individually connected through a LISN to input power source. EUT signal cables that hung closer than 0.4 m to the Horizontal metal ground 0.3 m ~ 0.4 m long. The power cord was bundles in the center. All peripheral equipment was powered from a sub LISN. The LISN and ISN were positioned 0.8 m from the EUT. Peak and Average detection were used in preliminary testing and Quasi-peak and Average detections were used at final measurement. Both lines of power cord, hot and neutral, were measured.

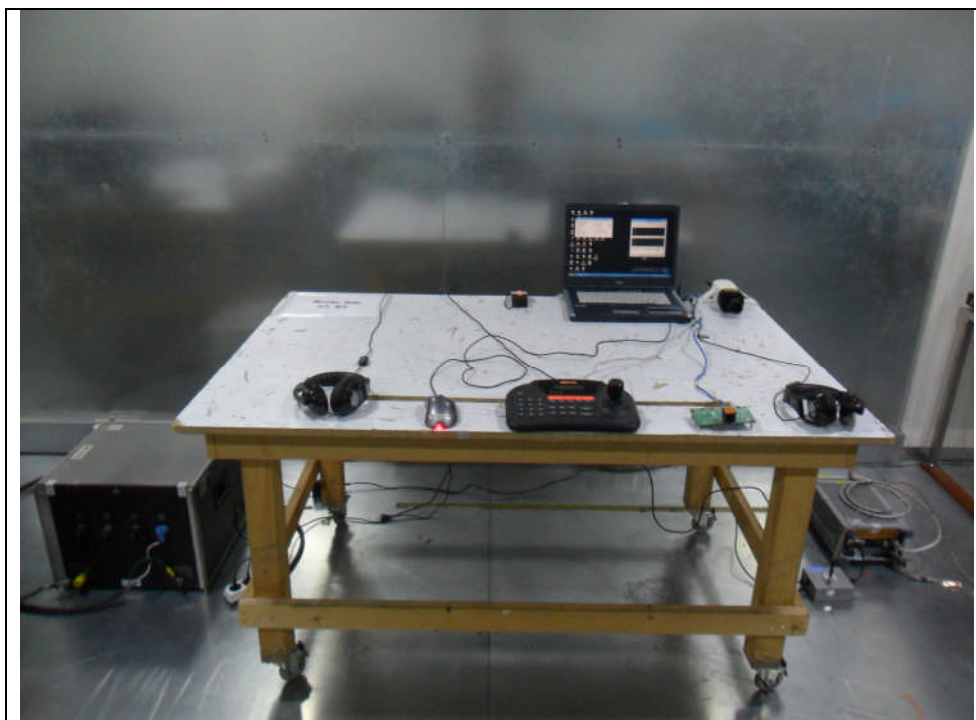
### 6.1.3 Used equipments

| Equipment     | Model          | Serial No.     | Makers      | Next Cal. Date | Used                                |
|---------------|----------------|----------------|-------------|----------------|-------------------------------------|
| Test Receiver | ESCI7          | 100732         | R&S         | 2015.01.27     | <input type="checkbox"/>            |
| Test Receiver | ESCI           | 100001         | R&S         | 2014.07.25     | <input checked="" type="checkbox"/> |
| Test Receiver | ESCI           | 100710         | R&S         | 2014.10.28     | <input type="checkbox"/>            |
| LISN          | ENV216         | 101352         | R&S         | 2015.01.02     | <input type="checkbox"/>            |
| LISN          | NNLK8121       | 8121-472       | SCHWARZBECK | 2014.07.08     | <input checked="" type="checkbox"/> |
| 8-WIRE ISN    | NTFM 8158 CAT5 | CAT5-8158-0071 | SCHWARZBECK | 2014.04.02     | <input checked="" type="checkbox"/> |
| 8-WIRE ISN    | NTFM 8158 CAT3 | CAT3-8158-0020 | SCHWARZBECK | 2014.04.13     | <input type="checkbox"/>            |
| ISN           | ST08           | 24342          | TESEQ       | 2014.06.21     | <input type="checkbox"/>            |
| ISN           | ENY81          | 101545         | R&S         | 2014.08.29     | <input type="checkbox"/>            |

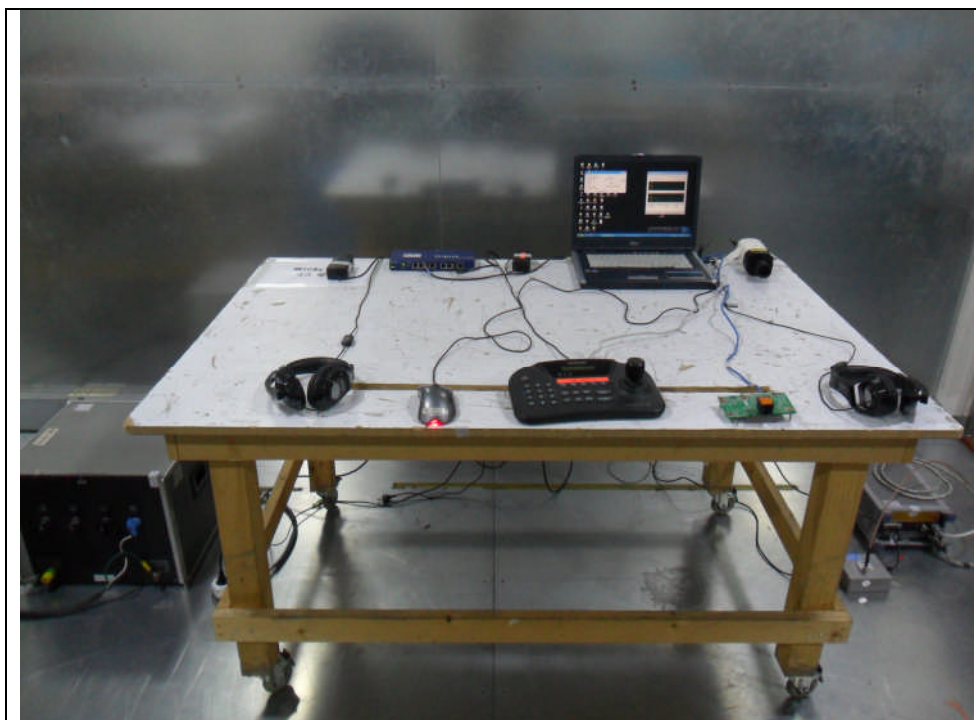
#### 6.1.4 Photographs of test setup

\* Telecommunication

#1- DC 12V, #2- AC 24V



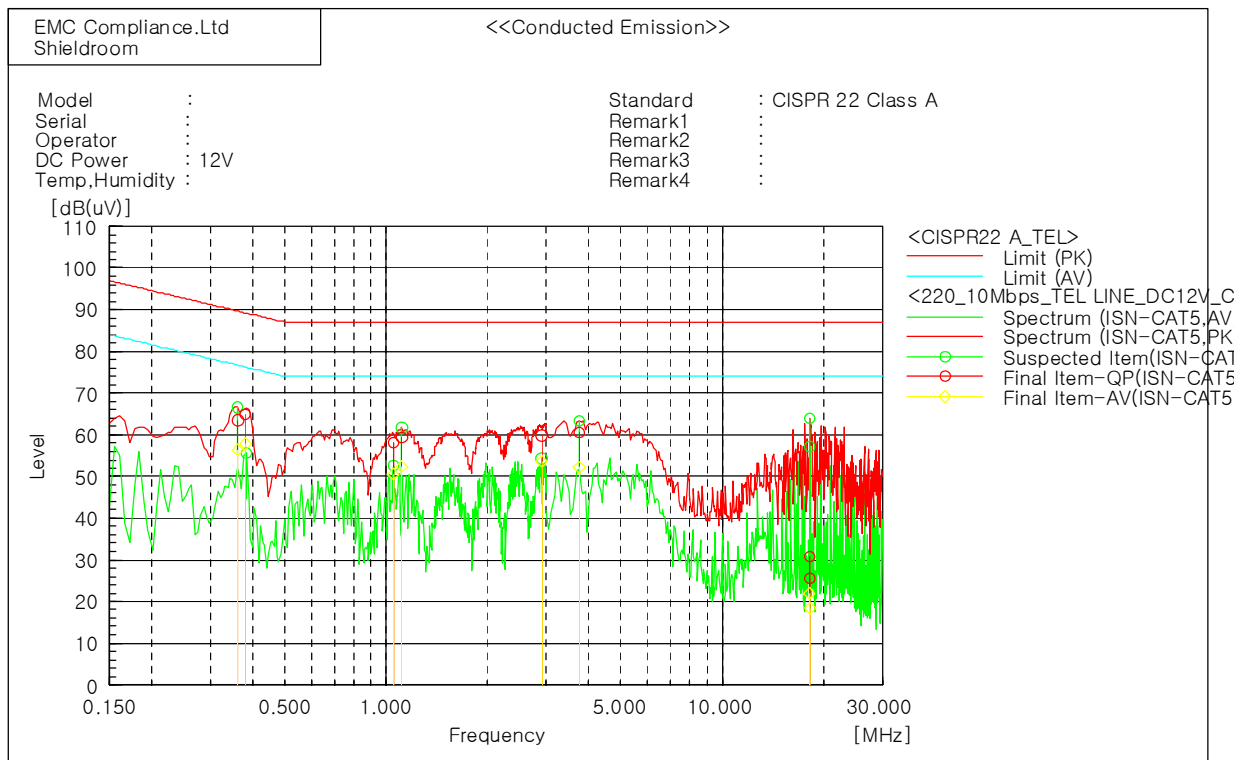
#3-PoE



## 6.1.5 Conducted emission measurement result

\* Telecommunication port (SNB-7004P)

#1- DC 12V \_ LAN Port (LCL 65 dB)\_10 Mbps

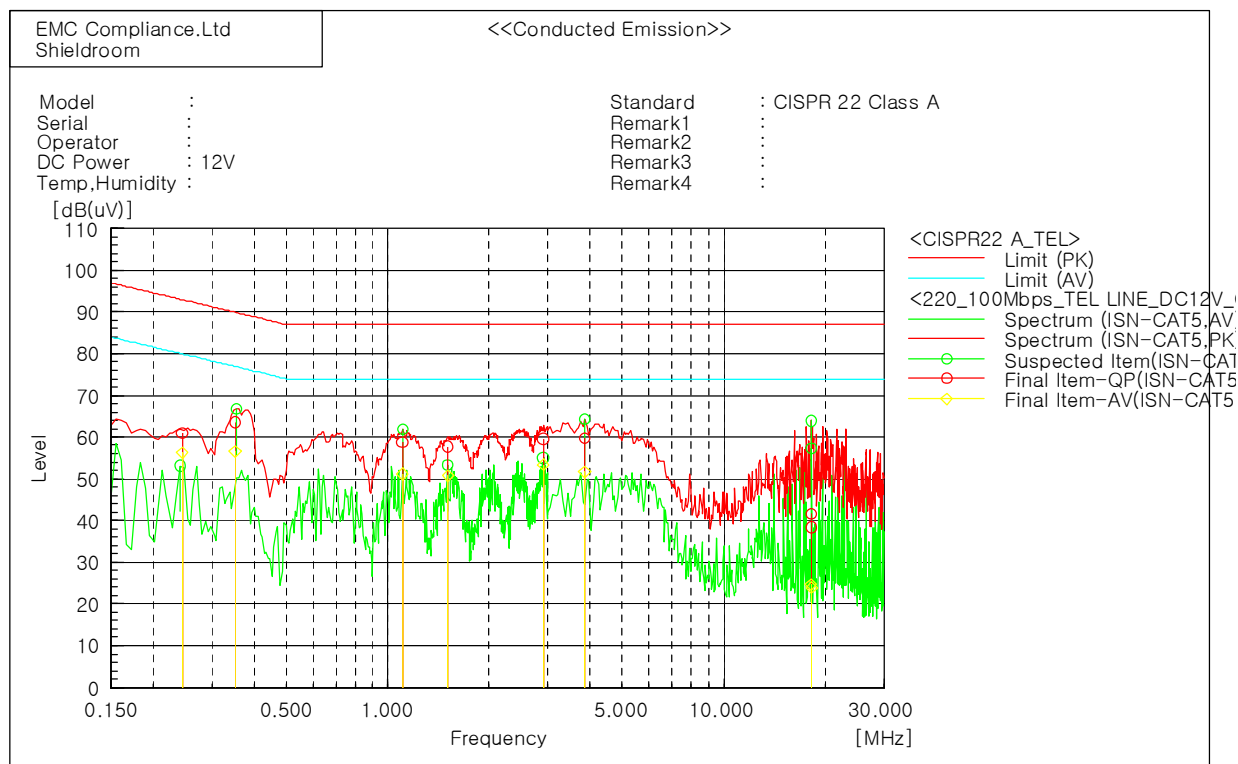


### Final Result

--- ISN-CAT5 Phase ---

| No. | Frequency<br>[MHz] | Reading<br>QP<br>[dB(μV)] | Reading<br>CAV<br>[dB(μV)] | c.f<br>[dB] | Result<br>QP<br>[dB(μV)] | Result<br>CAV<br>[dB(μV)] | Limit<br>QP<br>[dB(μV)] | Limit<br>AV<br>[dB(μV)] | Margin<br>QP<br>[dB] | Margin<br>CAV<br>[dB] |
|-----|--------------------|---------------------------|----------------------------|-------------|--------------------------|---------------------------|-------------------------|-------------------------|----------------------|-----------------------|
| 1   | 0.36206            | 53.8                      | 46.8                       | 9.6         | 63.4                     | 56.4                      | 89.7                    | 76.7                    | 26.3                 | 20.3                  |
| 2   | 0.38102            | 55.3                      | 48.2                       | 9.6         | 64.9                     | 57.8                      | 89.3                    | 76.3                    | 24.4                 | 18.5                  |
| 3   | 1.05256            | 48.7                      | 41.0                       | 9.5         | 58.2                     | 50.5                      | 87.0                    | 74.0                    | 28.8                 | 23.5                  |
| 4   | 1.11238            | 49.9                      | 42.8                       | 9.5         | 59.4                     | 52.3                      | 87.0                    | 74.0                    | 27.6                 | 21.7                  |
| 5   | 2.90532            | 50.4                      | 44.2                       | 9.4         | 59.8                     | 53.6                      | 87.0                    | 74.0                    | 27.2                 | 20.4                  |
| 6   | 3.75594            | 51.1                      | 42.8                       | 9.4         | 60.5                     | 52.2                      | 87.0                    | 74.0                    | 26.5                 | 21.8                  |
| 7   | 18.23156           | 21.2                      | 12.5                       | 9.5         | 30.7                     | 22.0                      | 87.0                    | 74.0                    | 56.3                 | 52.0                  |
| 8   | 18.28544           | 16.0                      | 8.8                        | 9.5         | 25.5                     | 18.3                      | 87.0                    | 74.0                    | 61.5                 | 55.7                  |

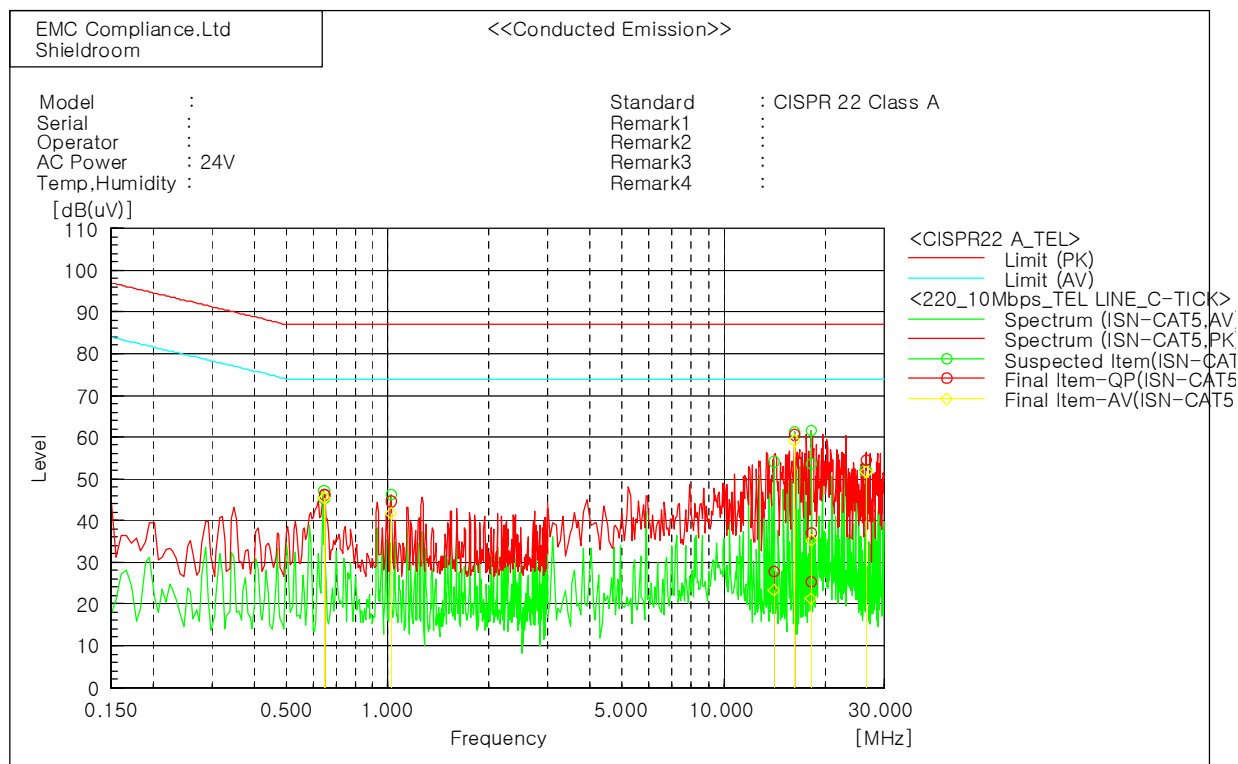
#1- DC 12V \_ LAN Port (LCL 65 dB)\_100 Mbps



Final Result

| --- ISN-CAT5 Phase --- |           |               |                |      |              |               |             |             |              |               |  |
|------------------------|-----------|---------------|----------------|------|--------------|---------------|-------------|-------------|--------------|---------------|--|
| No.                    | Frequency | Reading<br>QP | Reading<br>CAV | c.f  | Result<br>QP | Result<br>CAV | Limit<br>QP | Limit<br>AV | Margin<br>QP | Margin<br>CAV |  |
|                        | [MHz]     | [dB(uV)]      | [dB(uV)]       | [dB] | [dB(uV)]     | [dB(uV)]      | [dB(uV)]    | [dB(uV)]    | [dB]         | [dB]          |  |
| 1                      | 0.24476   | 51.2          | 46.6           | 9.7  | 60.9         | 56.3          | 92.9        | 79.9        | 32.0         | 23.6          |  |
| 2                      | 0.35166   | 54.0          | 46.9           | 9.6  | 63.6         | 56.5          | 89.9        | 76.9        | 26.3         | 20.4          |  |
| 3                      | 1.10418   | 49.3          | 41.6           | 9.5  | 58.8         | 51.1          | 87.0        | 74.0        | 28.2         | 22.9          |  |
| 4                      | 1.5112    | 48.2          | 41.3           | 9.5  | 57.7         | 50.8          | 87.0        | 74.0        | 29.3         | 23.2          |  |
| 5                      | 2.89838   | 50.2          | 43.9           | 9.4  | 59.6         | 53.3          | 87.0        | 74.0        | 27.4         | 20.7          |  |
| 6                      | 3.85906   | 50.3          | 42.2           | 9.4  | 59.7         | 51.6          | 87.0        | 74.0        | 27.3         | 22.4          |  |
| 7                      | 18.2243   | 32.0          | 15.2           | 9.5  | 41.5         | 24.7          | 87.0        | 74.0        | 45.5         | 49.3          |  |
| 8                      | 18.2834   | 28.8          | 14.3           | 9.5  | 38.3         | 23.8          | 87.0        | 74.0        | 48.7         | 50.2          |  |

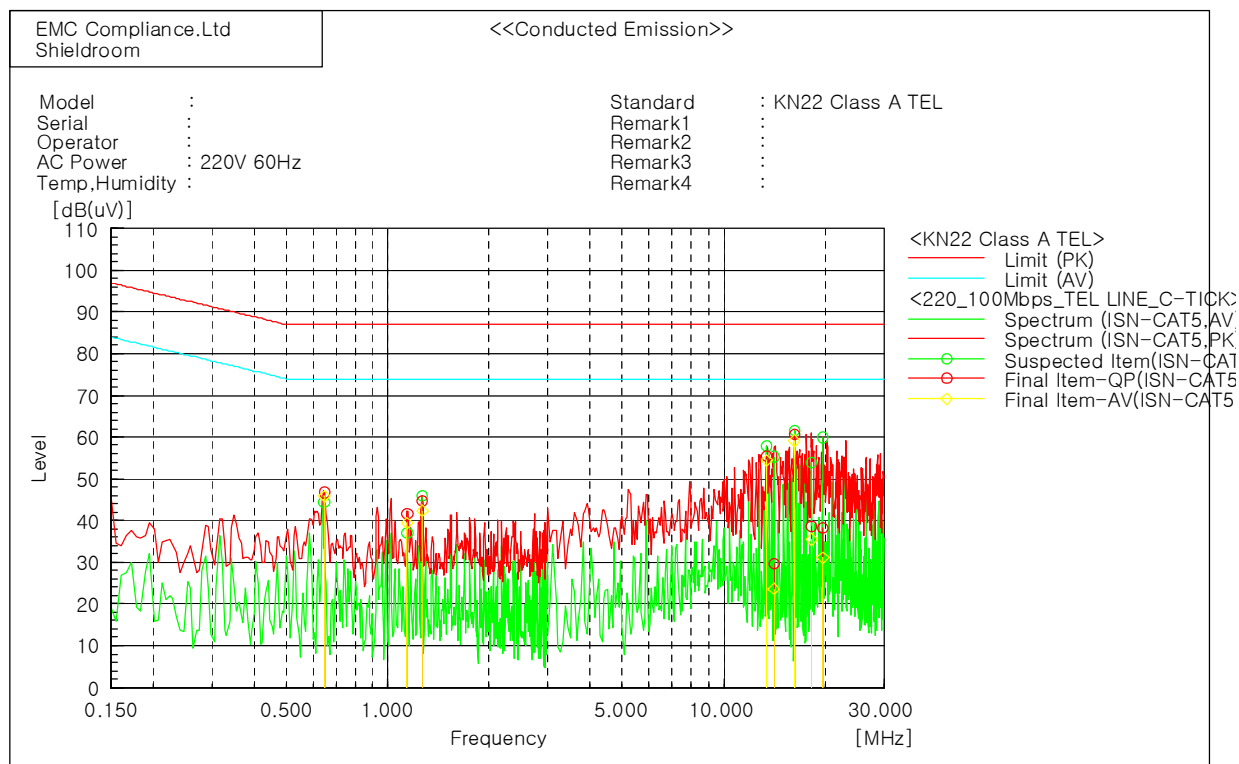
#2- AC 24V \_ LAN Port (LCL 65 dB)\_10 Mbps



Final Result

| --- ISN-CAT5 Phase --- |           |               |                |      |              |               |             |             |              |               |
|------------------------|-----------|---------------|----------------|------|--------------|---------------|-------------|-------------|--------------|---------------|
| No.                    | Frequency | Reading<br>QP | Reading<br>CAV | c.f  | Result<br>QP | Result<br>CAV | Limit<br>QP | Limit<br>AV | Margin<br>QP | Margin<br>CAV |
|                        | [MHz]     | [dB(uV)]      | [dB(uV)]       | [dB] | [dB(uV)]     | [dB(uV)]      | [dB(uV)]    | [dB(uV)]    | [dB]         | [dB]          |
| 1                      | 0.64772   | 36.7          | 35.9           | 9.5  | 46.2         | 45.4          | 87.0        | 74.0        | 40.8         | 28.6          |
| 2                      | 0.64816   | 36.6          | 35.9           | 9.5  | 46.1         | 45.4          | 87.0        | 74.0        | 40.9         | 28.6          |
| 3                      | 1.0232    | 35.1          | 32.1           | 9.5  | 44.6         | 41.6          | 87.0        | 74.0        | 42.4         | 32.4          |
| 4                      | 14.12352  | 18.2          | 13.8           | 9.5  | 27.7         | 23.3          | 87.0        | 74.0        | 59.3         | 50.7          |
| 5                      | 16.22894  | 51.0          | 49.6           | 9.5  | 60.5         | 59.1          | 87.0        | 74.0        | 26.5         | 14.9          |
| 6                      | 18.2321   | 15.8          | 11.8           | 9.5  | 25.3         | 21.3          | 87.0        | 74.0        | 61.7         | 52.7          |
| 7                      | 18.27734  | 27.5          | 25.7           | 9.5  | 37.0         | 35.2          | 87.0        | 74.0        | 50.0         | 38.8          |
| 8                      | 26.54834  | 44.9          | 41.9           | 9.7  | 54.6         | 51.6          | 87.0        | 74.0        | 32.4         | 22.4          |

#2- AC 24V \_ LAN Port (LCL 65 dB)\_100 Mbps

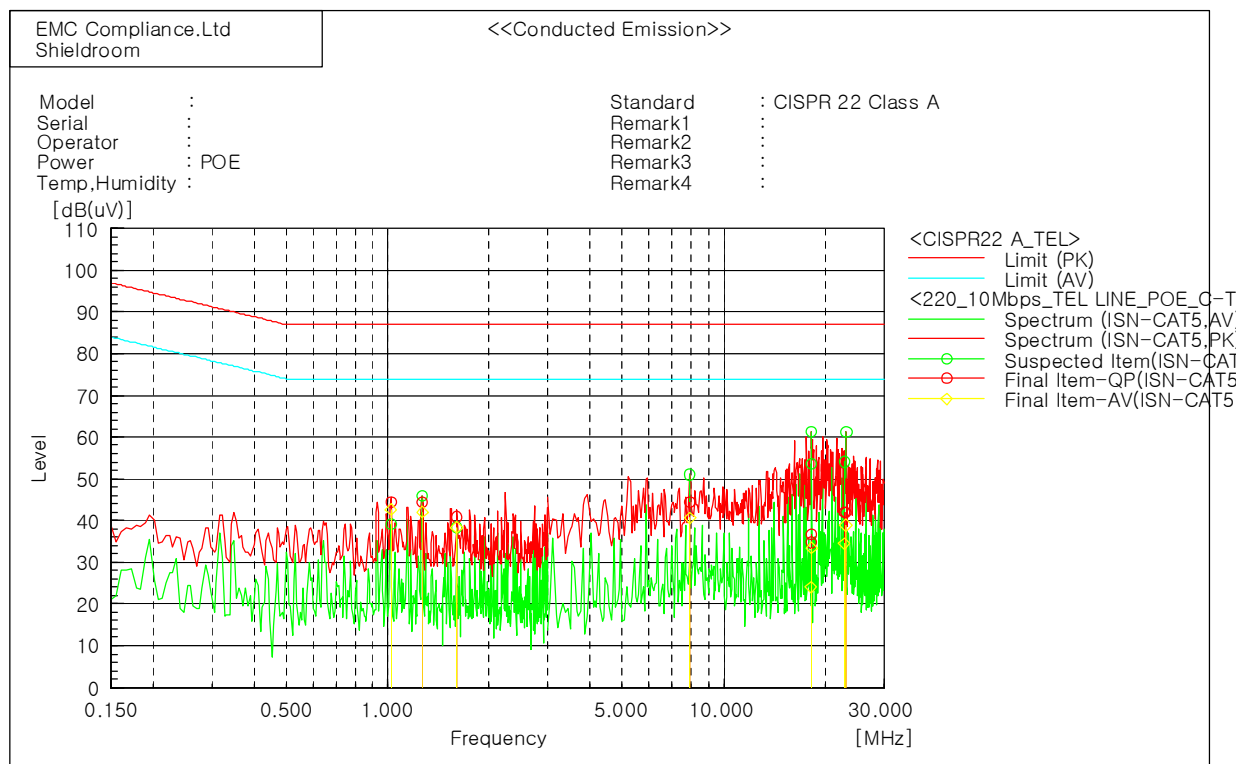


Final Result

--- ISN-CAT5 Phase ---

| No. | Frequency<br>[MHz] | Reading<br>QP<br>[dB(uV)] | Reading<br>CAV<br>[dB(uV)] | c.f<br>[dB] | Result<br>QP<br>[dB(uV)] | Result<br>CAV<br>[dB(uV)] | Limit<br>QP<br>[dB(uV)] | Limit<br>AV<br>[dB(uV)] | Margin<br>QP<br>[dB] | Margin<br>CAV<br>[dB] |
|-----|--------------------|---------------------------|----------------------------|-------------|--------------------------|---------------------------|-------------------------|-------------------------|----------------------|-----------------------|
| 1   | 0.64808            | 37.2                      | 36.4                       | 9.5         | 46.7                     | 45.9                      | 87.0                    | 74.0                    | 40.3                 | 28.1                  |
| 2   | 1.14488            | 32.2                      | 29.8                       | 9.5         | 41.7                     | 39.3                      | 87.0                    | 74.0                    | 45.3                 | 34.7                  |
| 3   | 1.26742            | 35.2                      | 32.8                       | 9.5         | 44.7                     | 42.3                      | 87.0                    | 74.0                    | 42.3                 | 31.7                  |
| 4   | 13.41924           | 45.9                      | 44.9                       | 9.5         | 55.4                     | 54.4                      | 87.0                    | 74.0                    | 31.6                 | 19.6                  |
| 5   | 14.12372           | 20.2                      | 14.1                       | 9.5         | 29.7                     | 23.6                      | 87.0                    | 74.0                    | 57.3                 | 50.4                  |
| 6   | 16.22862           | 51.1                      | 49.6                       | 9.5         | 60.6                     | 59.1                      | 87.0                    | 74.0                    | 26.4                 | 14.9                  |
| 7   | 18.27738           | 29.1                      | 25.9                       | 9.5         | 38.6                     | 35.4                      | 87.0                    | 74.0                    | 48.4                 | 38.6                  |
| 8   | 19.74072           | 28.7                      | 21.6                       | 9.5         | 38.2                     | 31.1                      | 87.0                    | 74.0                    | 48.8                 | 42.9                  |

#3- PoE \_ LAN Port (LCL 65 dB)\_10 Mbps

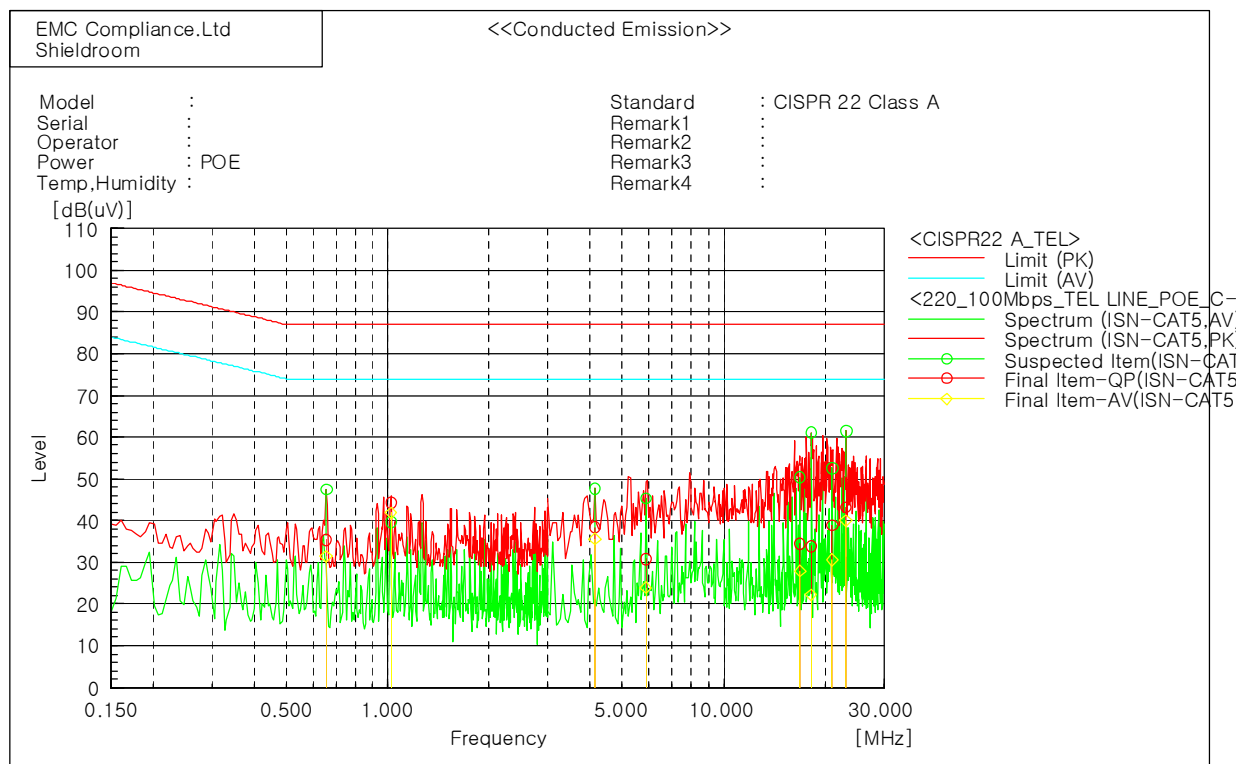


Final Result

--- ISN-CAT5 Phase ---

| No. | Frequency<br>[MHz] | Reading<br>QP<br>[dB(uV)] | Reading<br>CAV<br>[dB(uV)] | c.f<br>[dB] | Result<br>QP<br>[dB(uV)] | Result<br>CAV<br>[dB(uV)] | Limit<br>QP<br>[dB(uV)] | Limit<br>AV<br>[dB(uV)] | Margin<br>QP<br>[dB] | Margin<br>CAV<br>[dB] |
|-----|--------------------|---------------------------|----------------------------|-------------|--------------------------|---------------------------|-------------------------|-------------------------|----------------------|-----------------------|
| 1   | 1.02296            | 34.9                      | 33.0                       | 9.5         | 44.4                     | 42.5                      | 87.0                    | 74.0                    | 42.6                 | 31.5                  |
| 2   | 1.26716            | 34.9                      | 32.5                       | 9.5         | 44.4                     | 42.0                      | 87.0                    | 74.0                    | 42.6                 | 32.0                  |
| 3   | 1.60234            | 31.3                      | 28.9                       | 9.5         | 40.8                     | 38.4                      | 87.0                    | 74.0                    | 46.2                 | 35.6                  |
| 4   | 7.91872            | 34.9                      | 31.1                       | 9.5         | 44.4                     | 40.6                      | 87.0                    | 74.0                    | 42.6                 | 33.4                  |
| 5   | 18.23234           | 25.2                      | 14.5                       | 9.5         | 34.7                     | 24.0                      | 87.0                    | 74.0                    | 52.3                 | 50.0                  |
| 6   | 18.2779            | 27.1                      | 24.0                       | 9.5         | 36.6                     | 33.5                      | 87.0                    | 74.0                    | 50.4                 | 40.5                  |
| 7   | 22.87682           | 32.5                      | 25.1                       | 9.5         | 42.0                     | 34.6                      | 87.0                    | 74.0                    | 45.0                 | 39.4                  |
| 8   | 23.13732           | 32.4                      | 29.4                       | 9.5         | 41.9                     | 38.9                      | 87.0                    | 74.0                    | 45.1                 | 35.1                  |

#3- PoE \_ LAN Port (LCL 65 dB)\_100 Mbps



Final Result

--- ISN-CAT5 Phase ---

| No. | Frequency<br>[MHz] | Reading<br>QP<br>[dB(uV)] | Reading<br>CAV<br>[dB(uV)] | c.f<br>[dB] | Result<br>QP<br>[dB(uV)] | Result<br>CAV<br>[dB(uV)] | Limit<br>QP<br>[dB(uV)] | Limit<br>AV<br>[dB(uV)] | Margin<br>QP<br>[dB] | Margin<br>CAV<br>[dB] |
|-----|--------------------|---------------------------|----------------------------|-------------|--------------------------|---------------------------|-------------------------|-------------------------|----------------------|-----------------------|
| 1   | 0.65604            | 25.9                      | 21.9                       | 9.5         | 35.4                     | 31.4                      | 87.0                    | 74.0                    | 51.6                 | 42.6                  |
| 2   | 1.02298            | 34.7                      | 32.4                       | 9.5         | 44.2                     | 41.9                      | 87.0                    | 74.0                    | 42.8                 | 32.1                  |
| 3   | 4.1373             | 29.0                      | 26.2                       | 9.4         | 38.4                     | 35.6                      | 87.0                    | 74.0                    | 48.6                 | 38.4                  |
| 4   | 5.8664             | 21.4                      | 14.5                       | 9.4         | 30.8                     | 23.9                      | 87.0                    | 74.0                    | 56.2                 | 50.1                  |
| 5   | 16.873             | 25.0                      | 18.4                       | 9.4         | 34.4                     | 27.8                      | 87.0                    | 74.0                    | 52.6                 | 46.2                  |
| 6   | 18.2318            | 24.3                      | 12.8                       | 9.5         | 33.8                     | 22.3                      | 87.0                    | 74.0                    | 53.2                 | 51.7                  |
| 7   | 21.03158           | 29.4                      | 21.1                       | 9.5         | 38.9                     | 30.6                      | 87.0                    | 74.0                    | 48.1                 | 43.4                  |
| 8   | 23.13706           | 33.7                      | 30.5                       | 9.5         | 43.2                     | 40.0                      | 87.0                    | 74.0                    | 43.8                 | 34.0                  |

## 6.2 Radiated Emission

|                    |                               |                   |             |
|--------------------|-------------------------------|-------------------|-------------|
| Test specification | AS/NZS CISPR 22:2009, Class A |                   |             |
| Testing voltage    | DC 12 V, AC 24 V, PoE         |                   |             |
| Test facility      | 10 m Chamber (#F2)            |                   |             |
| Test distance      | 10 m, 3 m                     |                   |             |
| Date               | 2014. 02. 06                  |                   |             |
| Temperature (°C)   | 16.8 °C                       | Humidity (% R.H.) | 22.9 % R.H. |
| Remarks            | Complied                      |                   |             |

### 6.2.1 Limits of radiated emission measurement

☒ Limits below 1 GHz

| Frequency<br>MHz | Class A dB $\mu$ V/m @ 10 m | Class B dB $\mu$ V/m @ 10 m |
|------------------|-----------------------------|-----------------------------|
| 30 ~ 230         | 40                          | 30                          |
| 230 ~ 1 000      | 47                          | 37                          |

☒ Limits above 1 GHz

| Frequency<br>MHz | Class A @ 3 m                 |                            | Class B @ 3 m                 |                            |
|------------------|-------------------------------|----------------------------|-------------------------------|----------------------------|
|                  | Average limit<br>dB $\mu$ V/m | Peak limit<br>dB $\mu$ V/m | Average limit<br>dB $\mu$ V/m | Peak limit<br>dB $\mu$ V/m |
| 1 ~ 3            | 56                            | 76                         | 50                            | 70                         |
| 3 ~ 6            | 60                            | 80                         | 54                            | 74                         |

Note - The lower limit applies at the transition frequency.

### 6.2.2 Measurement procedure

The test was done at a 10 m chamber with a quasi-peak detector. EUT was placed on a non-metallic table height of 0.8 m above the reference ground plane. Cables were folded back and forth forming a bundle 0.3 m to 0.4 m long and were hanged at a 0.4 m height to the ground plane. Cables connected to EUT were fixed to cause maximum emission. Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

### 6.2.3 Used equipments

| Equipment         | Model no.  | Serial no. | Makers            | Next Cal. Date | Used                                |
|-------------------|------------|------------|-------------------|----------------|-------------------------------------|
| Test Receiver     | ESCI7      | 100732     | R&S               | 2015.01.27     | <input checked="" type="checkbox"/> |
| Test Receiver     | ESCI       | 100001     | R&S               | 2014.07.25     | <input type="checkbox"/>            |
| Test Receiver     | ESCI       | 100710     | R&S               | 2014.10.28     | <input type="checkbox"/>            |
| Test Receiver     | ESR        | 101078     | R&S               | 2014.10.17     | <input type="checkbox"/>            |
| Bi-Log Antenna    | VULB 9168  | 440        | SCHWARZBECK       | 2015.10.16     | <input checked="" type="checkbox"/> |
| Amplifier         | 310N       | 293004     | SONOMA INSTRUMENT | 2014.10.31     | <input checked="" type="checkbox"/> |
| 3 dB Attenuator   | 8491B      | 22981      | HP                | 2014.03.19     | <input checked="" type="checkbox"/> |
| Antenna Mast      | MA4000-EP  | 303        | Innco Systems     | -              | <input checked="" type="checkbox"/> |
| Turn Table        | DT2000S-1t | 079        | Innco Systems     | -              | <input checked="" type="checkbox"/> |
| Amplifier         | 8449B      | 3008A02343 | AGILENT           | 2014.10.31     | <input checked="" type="checkbox"/> |
| Horn ANT          | 3115       | 00086706   | ETS               | 2014.09.05     | <input checked="" type="checkbox"/> |
| Spectrum Analyzer | FSP7       | 100289     | R&S               | 2014.11.25     | <input type="checkbox"/>            |

### 6.2.4 Sample calculation

The field strength is calculated adding the antenna Factor, cable loss and, Antenna pad adding, subtracting the amplifier gain from the measured reading.

The sample calculation is as follow:

$$\text{Result} = \text{M.R} + \text{C.F}(\text{A.F} + \text{C.L} + 3 \text{ dB Att} - \text{A.G})$$

M.R = Meter Reading

C.F = Correction Factor

A.F = Antenna Factor

C.L = Cable Loss

A.G= Amplifier Gain

3 dB Att = 3 dB Attenuator

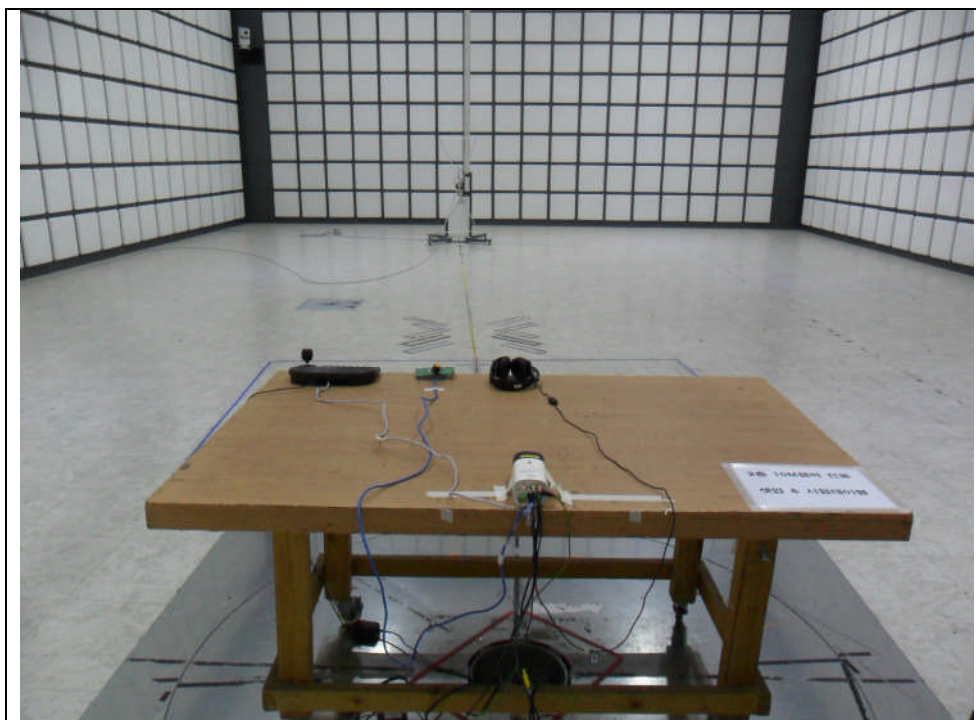
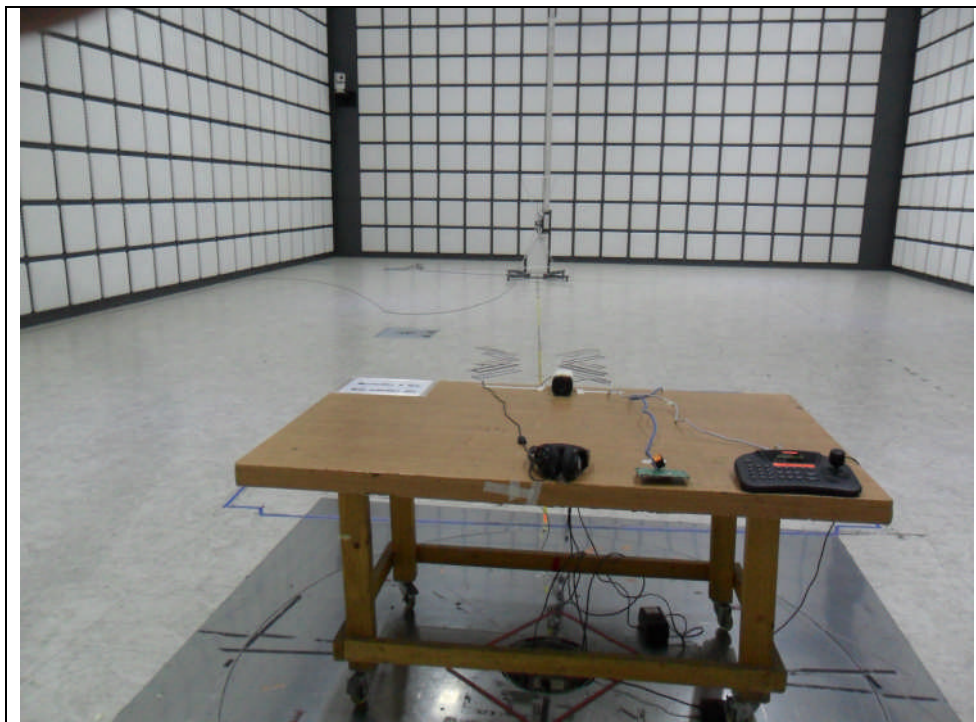
If M.R is 30 dB, A.F 12 dB, C.L 5 dB, 3 dB, A.G 35 dB

The result is

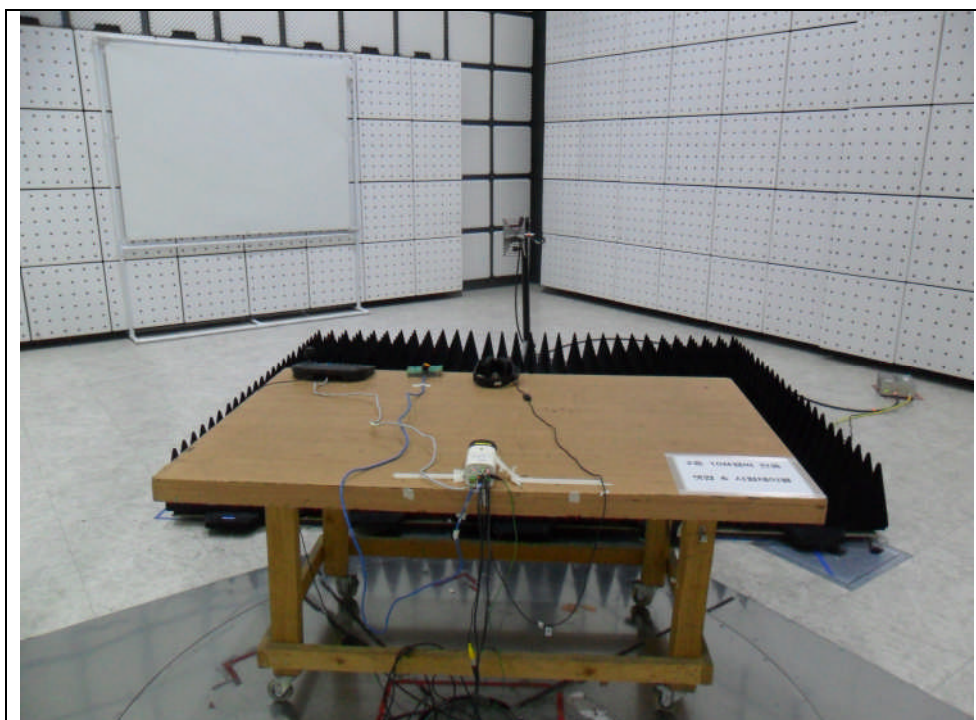
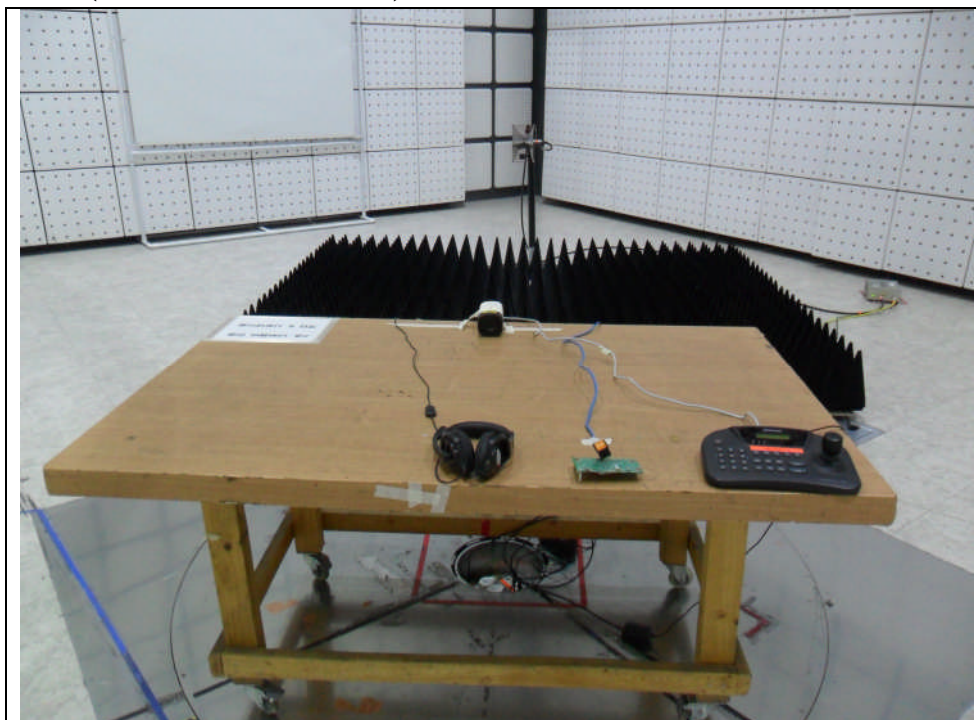
$$30 + 12 + 5 + 3 - 35 = 15 \text{ dB}\mu\text{V/m}$$

### 6.2.5 Photographs of test setup

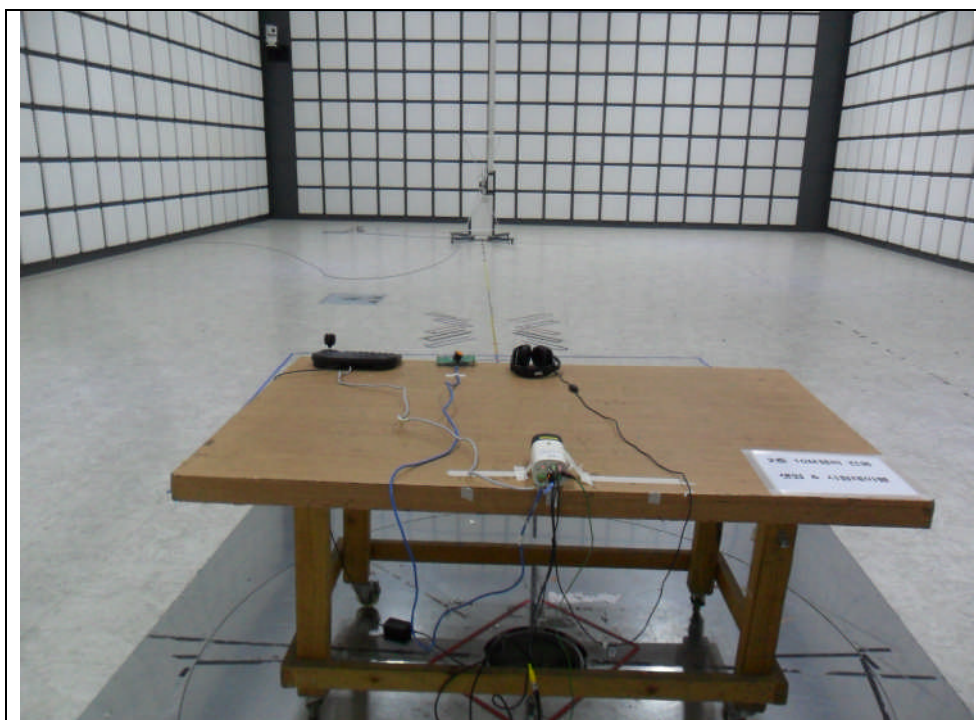
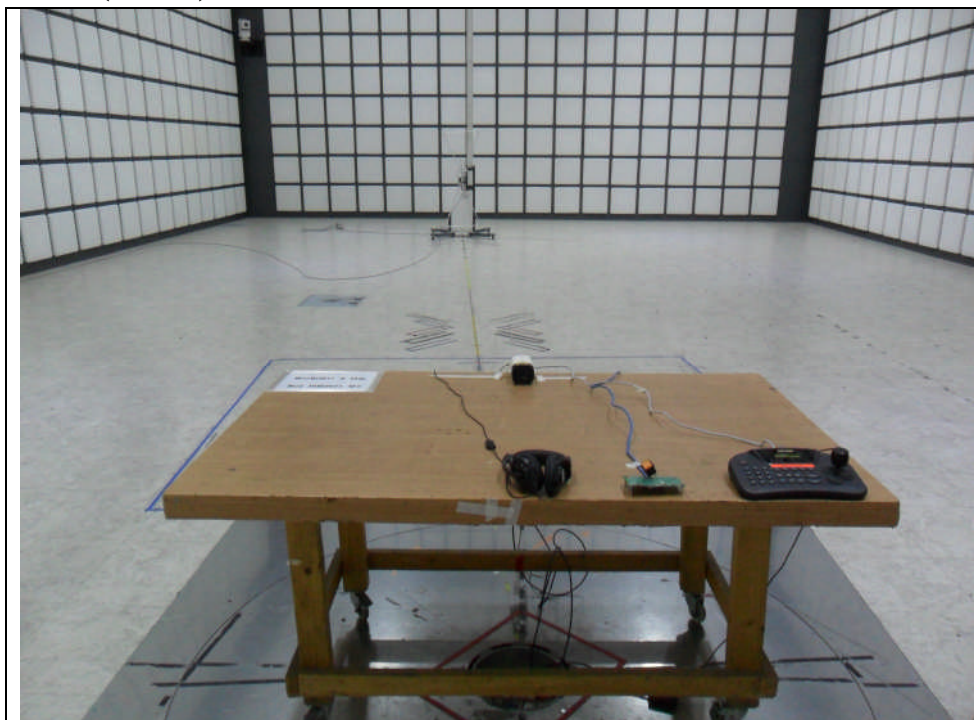
\* 30 MHz ~ 1 GHz (#1- DC 12V, #2- AC 24V)



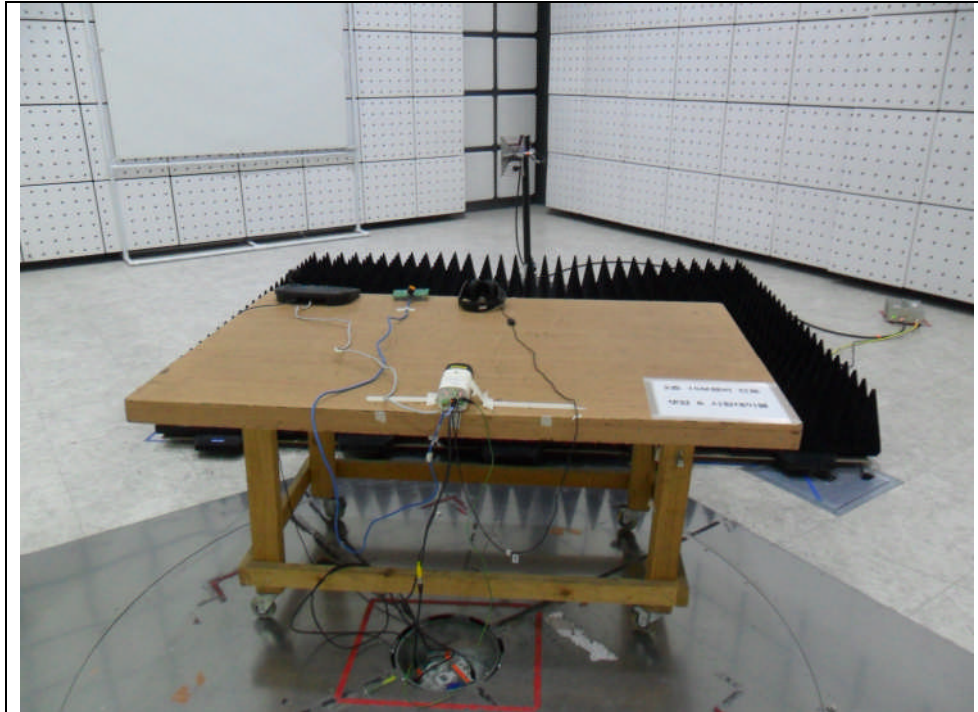
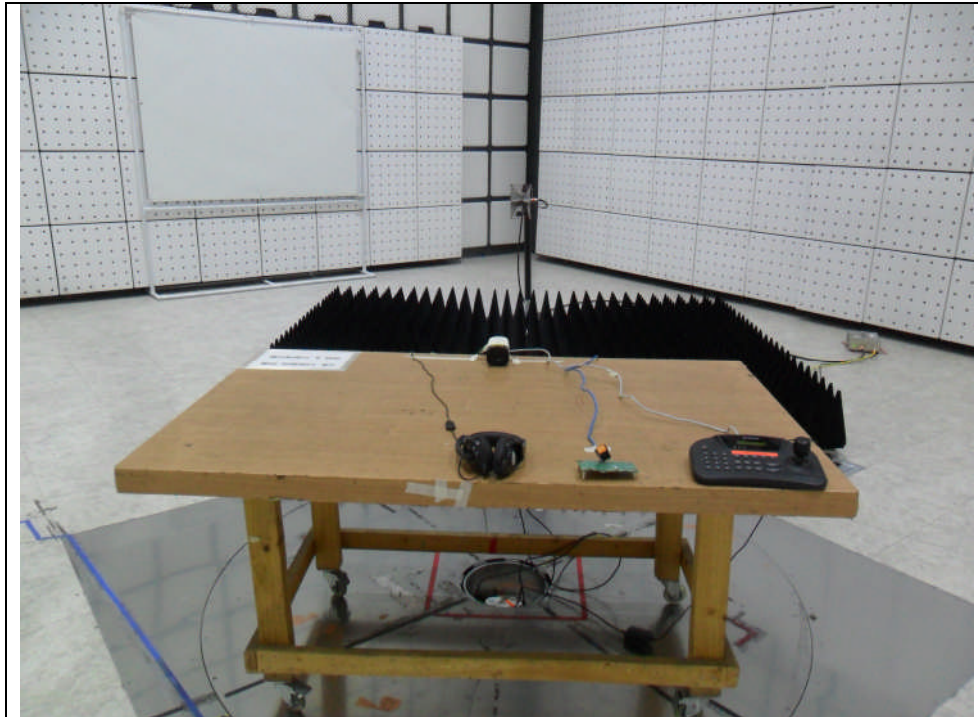
\* 1 GHz ~ 6 GHz (#1- DC 12V, #2- AC 24V)



\* 30 MHz ~ 1 GHz (#3-PoE)



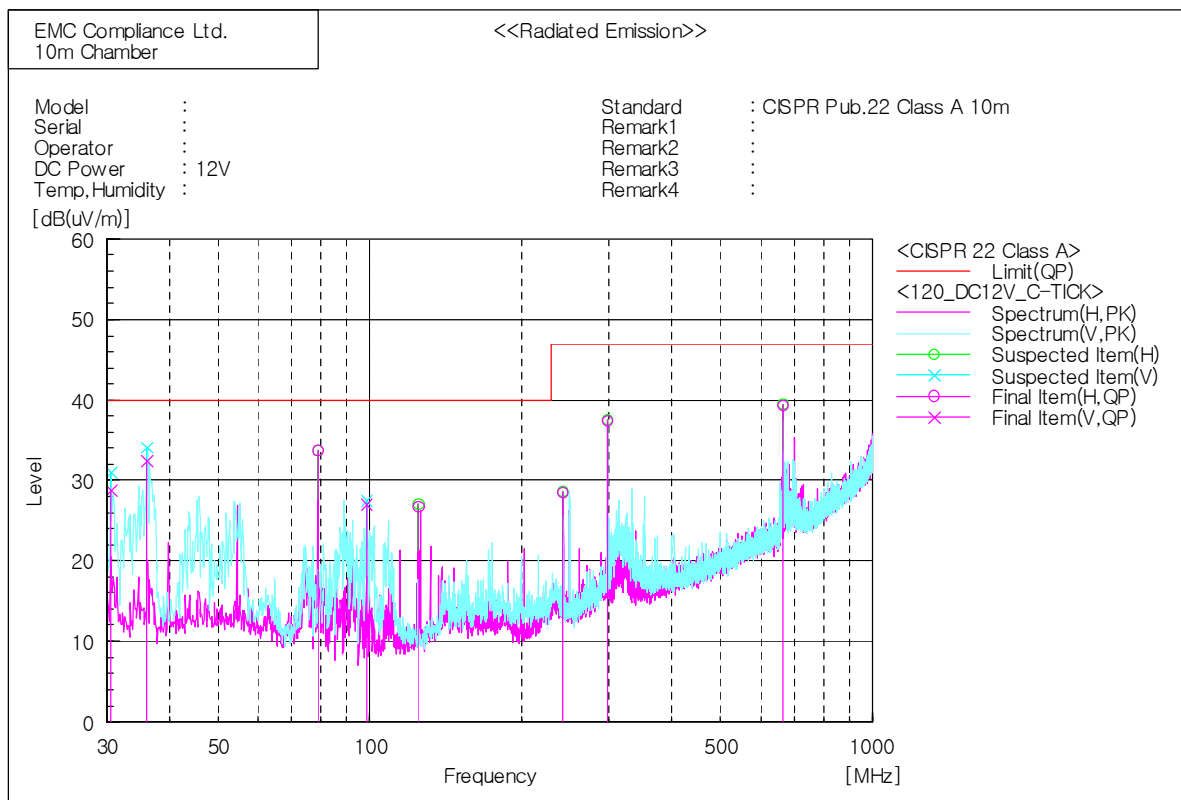
\* 1 GHz ~ 6 GHz (#3-PoE)



## 6.2.6 Radiated emission measurement result

### \* Graph and Data

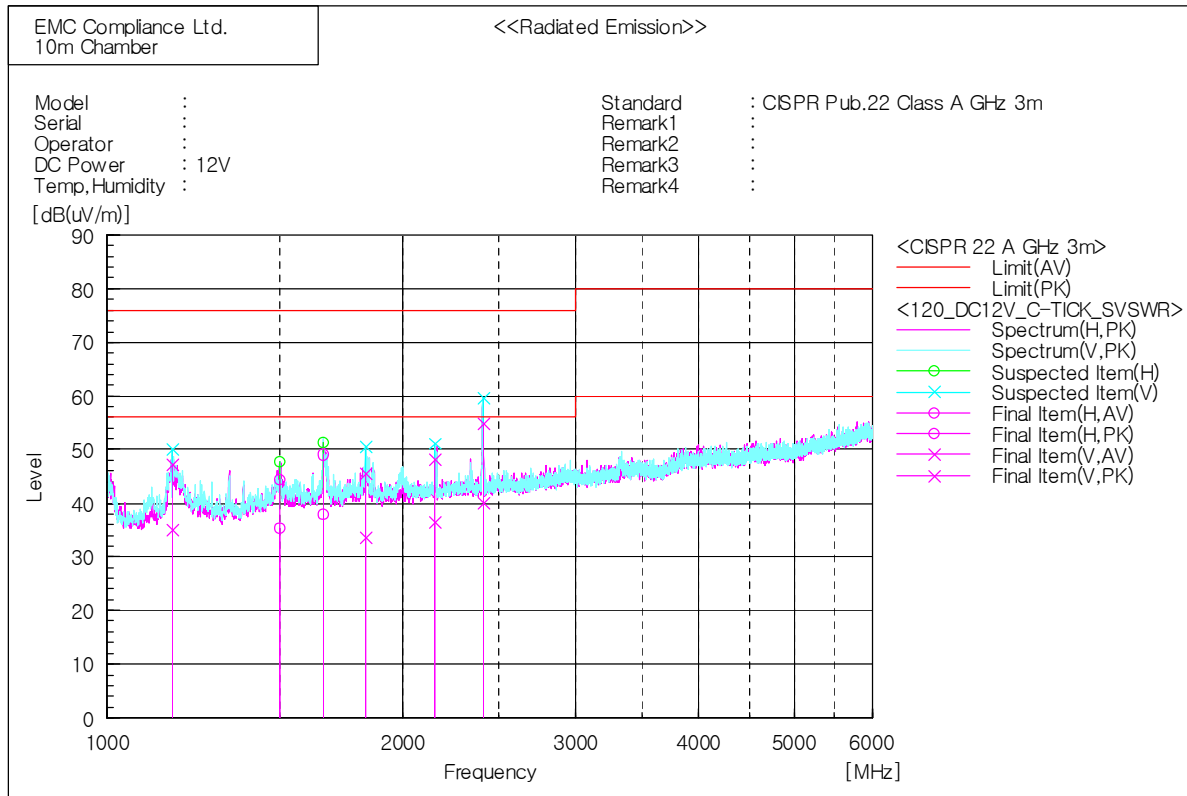
\* 30 MHz ~ 1 GHz (SNB-7004P)\_#1- DC 12V



### Final Result

| No. | Frequency [MHz] | (P) | Reading QP [dB(μV)] | c.f [dB(1/m)] | Result QP [dB(μV/m)] | Limit QP [dB(μV/m)] | Margin QP [dB] | Height [cm] | Angle [deg] |
|-----|-----------------|-----|---------------------|---------------|----------------------|---------------------|----------------|-------------|-------------|
| 1   | 30.606          | V   | 43.9                | -15.1         | 28.8                 | 40.0                | 11.2           | 100.0       | 128.4       |
| 2   | 36.063          | V   | 47.0                | -14.5         | 32.5                 | 40.0                | 7.5            | 100.0       | 329.3       |
| 3   | 78.621          | H   | 50.8                | -17.1         | 33.7                 | 40.0                | 6.3            | 400.0       | 328.9       |
| 4   | 98.385          | V   | 44.7                | -17.6         | 27.1                 | 40.0                | 12.9           | 100.0       | 329.3       |
| 5   | 124.939         | H   | 41.7                | -14.9         | 26.8                 | 40.0                | 13.2           | 400.0       | 196.4       |
| 6   | 243.036         | H   | 41.1                | -12.6         | 28.5                 | 47.0                | 18.5           | 400.0       | 81.7        |
| 7   | 296.993         | H   | 47.8                | -10.4         | 37.4                 | 47.0                | 9.6            | 400.0       | 241.6       |
| 8   | 666.078         | H   | 40.2                | -0.9          | 39.3                 | 47.0                | 7.7            | 100.0       | 82.4        |

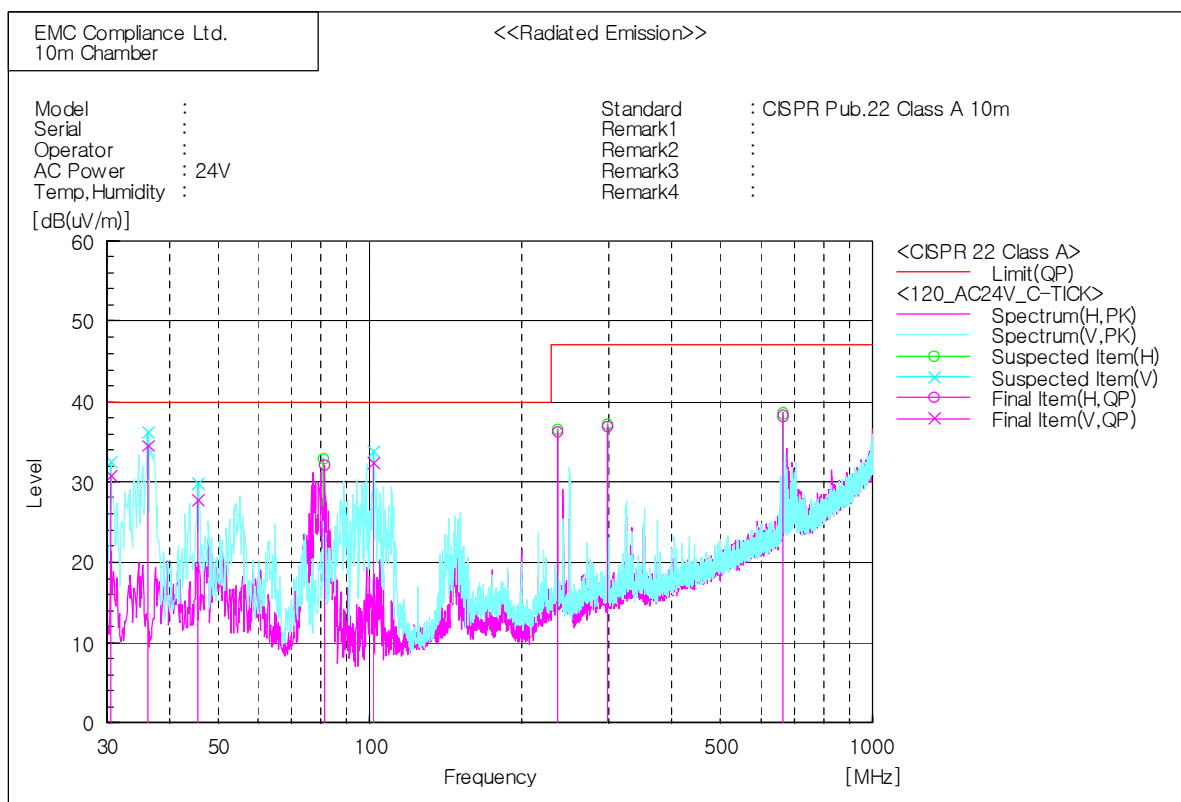
\* 1 GHz ~ 6 GHz (SNB-7004P)\_#1- DC 12V



Final Result

| No. | Frequency [MHz] | (P) | Reading AV [dB(μV)] | Reading PK [dB(μV)] | c.f [dB(1/m)] | Result AV [dB(μV/m)] | Result PK [dB(μV/m)] | Limit AV [dB(μV/m)] | Limit PK [dB(μV/m)] | Margin AV [dB] | Margin PK [dB] | Height [cm] | Angle [deg] |
|-----|-----------------|-----|---------------------|---------------------|---------------|----------------------|----------------------|---------------------|---------------------|----------------|----------------|-------------|-------------|
| 1   | 1165.625        | V   | 40.2                | 52.4                | -5.1          | 35.1                 | 47.3                 | 56.0                | 76.0                | 20.9           | 28.7           | 100.0       | 227.0       |
| 2   | 1496.250        | H   | 37.5                | 46.5                | -2.1          | 35.4                 | 44.4                 | 56.0                | 76.0                | 20.6           | 31.6           | 100.0       | 92.2        |
| 3   | 1658.125        | H   | 38.6                | 49.7                | -0.7          | 37.9                 | 49.0                 | 56.0                | 76.0                | 18.1           | 27.0           | 100.0       | 111.7       |
| 4   | 1831.250        | V   | 33.2                | 45.1                | 0.5           | 33.7                 | 45.6                 | 56.0                | 76.0                | 22.3           | 30.4           | 100.0       | 242.0       |
| 5   | 2156.875        | V   | 34.7                | 46.4                | 1.8           | 36.5                 | 48.2                 | 56.0                | 76.0                | 19.5           | 27.8           | 100.0       | 21.7        |
| 6   | 2410.625        | V   | 37.4                | 52.3                | 2.6           | 40.0                 | 54.9                 | 56.0                | 76.0                | 16.0           | 21.1           | 100.0       | 20.0        |

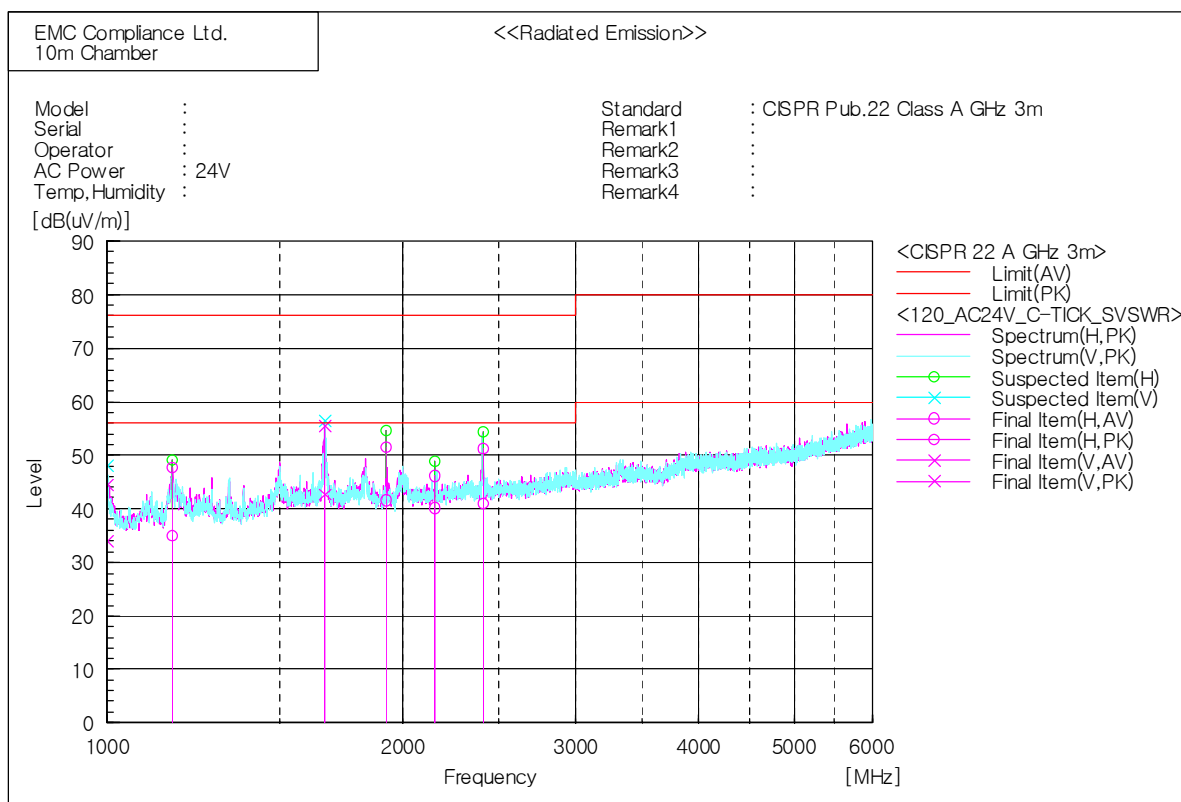
\* 30 MHz ~ 1 GHz (SNB-7004P)\_#2- AC 24V



Final Result

| No. | Frequency [MHz] | (P) | Reading QP [dB(μV)] | c.f [dB(1/m)] | Result QP [dB(μV/m)] | Limit QP [dB(μV/m)] | Margin QP [dB] | Height [cm] | Angle [deg] |
|-----|-----------------|-----|---------------------|---------------|----------------------|---------------------|----------------|-------------|-------------|
| 1   | 30.606          | V   | 46.0                | -15.1         | 30.9                 | 40.0                | 9.1            | 400.0       | 65.2        |
| 2   | 36.184          | V   | 49.0                | -14.5         | 34.5                 | 40.0                | 5.5            | 400.0       | 182.9       |
| 3   | 45.641          | V   | 41.1                | -13.3         | 27.8                 | 40.0                | 12.2           | 100.0       | 45.7        |
| 4   | 81.168          | H   | 49.7                | -17.5         | 32.2                 | 40.0                | 7.8            | 100.0       | 141.9       |
| 5   | 101.780         | V   | 49.6                | -17.2         | 32.4                 | 40.0                | 7.6            | 100.0       | 341.1       |
| 6   | 237.216         | H   | 49.2                | -12.9         | 36.3                 | 47.0                | 10.7           | 100.0       | 96.7        |
| 7   | 296.993         | H   | 47.3                | -10.4         | 36.9                 | 47.0                | 10.1           | 400.0       | 248.5       |
| 8   | 666.078         | H   | 39.1                | -0.9          | 38.2                 | 47.0                | 8.8            | 100.0       | 155.4       |

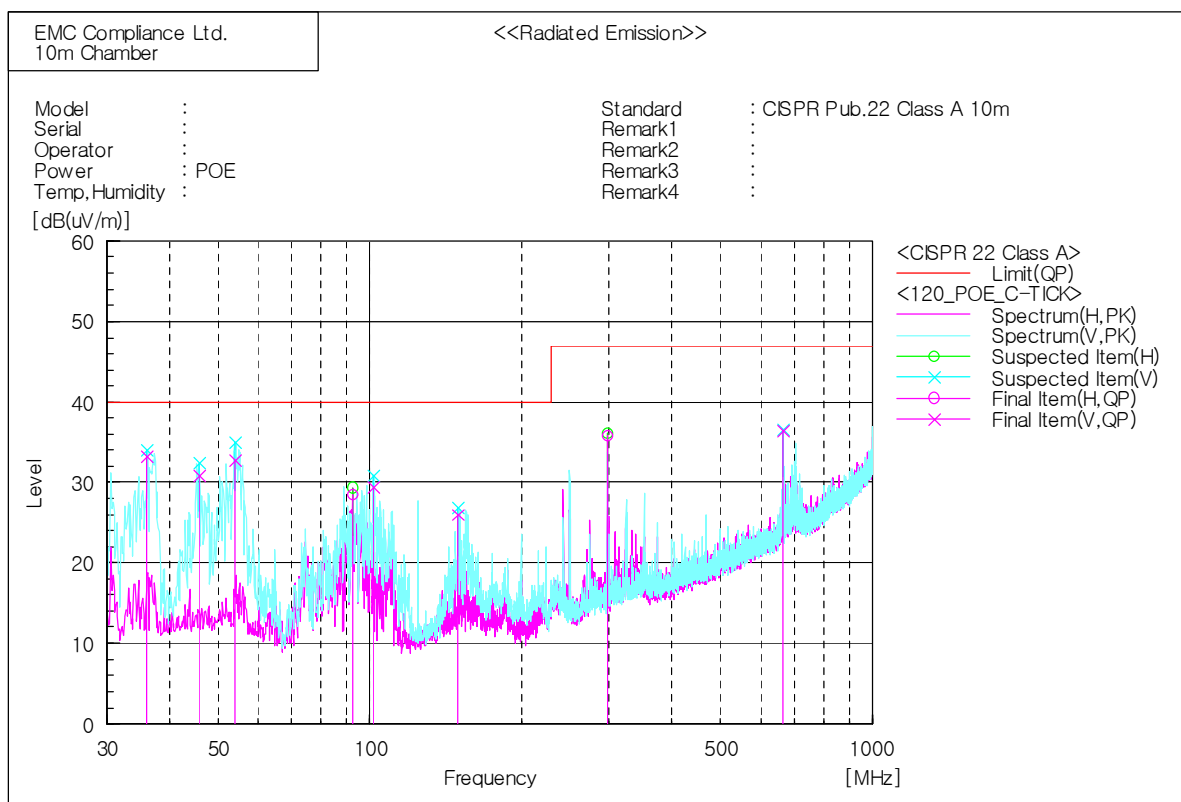
\* 1 GHz ~ 6 GHz (SNB-7004P)\_#2- AC 24V



Final Result

| No. | Frequency [MHz] | (P) | Reading AV [dB(μV)] | Reading PK [dB(μV)] | c.f [dB(1/m)] | Result AV [dB(μV/m)] | Result PK [dB(μV/m)] | Limit AV [dB(μV/m)] | Limit PK [dB(μV/m)] | Margin AV [dB] | Margin PK [dB] | Height [cm] | Angle [deg] |
|-----|-----------------|-----|---------------------|---------------------|---------------|----------------------|----------------------|---------------------|---------------------|----------------|----------------|-------------|-------------|
| 1   | 1000.000        | V   | 40.9                | 51.4                | -6.9          | 34.0                 | 44.5                 | 56.0                | 76.0                | 22.0           | 31.5           | 100.0       | 311.7       |
| 2   | 1165.000        | H   | 40.1                | 52.8                | -5.1          | 35.0                 | 47.7                 | 56.0                | 76.0                | 21.0           | 28.3           | 100.0       | 358.0       |
| 3   | 1665.000        | V   | 43.5                | 56.2                | -0.7          | 42.8                 | 55.5                 | 56.0                | 76.0                | 13.2           | 20.5           | 100.0       | 258.9       |
| 4   | 1924.375        | H   | 40.8                | 50.7                | 0.8           | 41.6                 | 51.5                 | 56.0                | 76.0                | 14.4           | 24.5           | 100.0       | 314.3       |
| 5   | 2156.250        | H   | 38.3                | 44.3                | 1.8           | 40.1                 | 46.1                 | 56.0                | 76.0                | 15.9           | 29.9           | 100.0       | 30.7        |
| 6   | 2410.625        | H   | 38.4                | 48.5                | 2.6           | 41.0                 | 51.1                 | 56.0                | 76.0                | 15.0           | 24.9           | 100.0       | 300.7       |

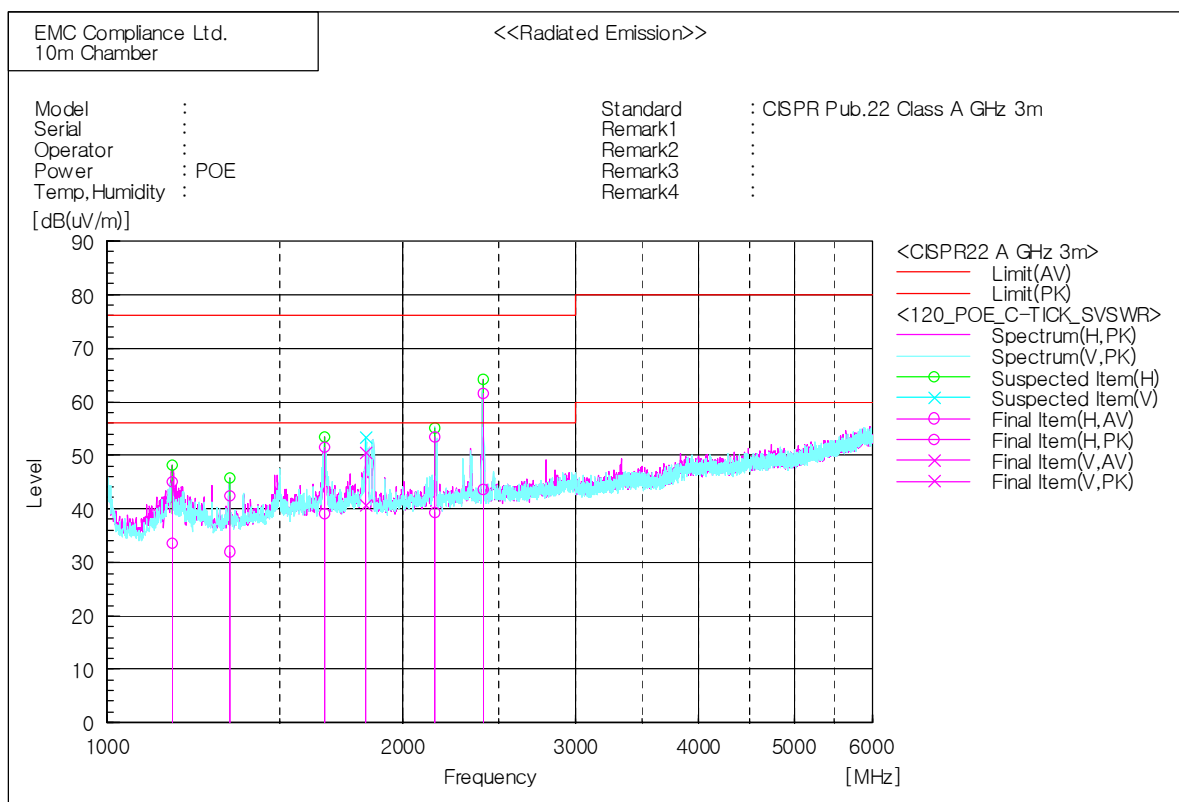
\* 30 MHz ~ 1 GHz (SNB-7004P)\_#3- PoE



Final Result

| No. | Frequency [MHz] | (P) | Reading QP [dB(μV)] | c.f [dB(1/m)] | Result QP [dB(μV/m)] | Limit QP [dB(μV/m)] | Margin QP [dB] | Height [cm] | Angle [deg] |
|-----|-----------------|-----|---------------------|---------------|----------------------|---------------------|----------------|-------------|-------------|
| 1   | 36.063          | V   | 47.7                | -14.5         | 33.2                 | 40.0                | 6.8            | 400.0       | 178.1       |
| 2   | 45.763          | V   | 44.2                | -13.3         | 30.9                 | 40.0                | 9.1            | 100.0       | 261.9       |
| 3   | 53.886          | V   | 46.1                | -13.3         | 32.8                 | 40.0                | 7.2            | 100.0       | 301.1       |
| 4   | 92.444          | H   | 46.8                | -18.3         | 28.5                 | 40.0                | 11.5           | 400.0       | 271.1       |
| 5   | 101.780         | V   | 46.6                | -17.2         | 29.4                 | 40.0                | 10.6           | 100.0       | 322.3       |
| 6   | 149.916         | V   | 39.0                | -13.0         | 26.0                 | 40.0                | 14.0           | 100.0       | 150.3       |
| 7   | 296.993         | H   | 46.3                | -10.4         | 35.9                 | 47.0                | 11.1           | 400.0       | 244.0       |
| 8   | 666.078         | V   | 37.3                | -0.9          | 36.4                 | 47.0                | 10.6           | 100.0       | 4.1         |

\* 1 GHz ~ 6 GHz (SNB-7004P)\_#3- PoE



Final Result

| No. | Frequency [MHz] | (P) | Reading AV [dB(μV)] | Reading PK [dB(μV)] | c.f [dB(1/m)] | Result AV [dB(μV/m)] | Result PK [dB(μV/m)] | Limit AV [dB(μV/m)] | Limit PK [dB(μV/m)] | Margin AV [dB] | Margin PK [dB] | Height [cm] | Angle [deg] |
|-----|-----------------|-----|---------------------|---------------------|---------------|----------------------|----------------------|---------------------|---------------------|----------------|----------------|-------------|-------------|
| 1   | 1164.375        | H   | 38.8                | 50.1                | -5.1          | 33.7                 | 45.0                 | 56.0                | 76.0                | 22.3           | 31.0           | 100.0       | 51.5        |
| 2   | 1331.875        | H   | 35.6                | 46.0                | -3.6          | 32.0                 | 42.4                 | 56.0                | 76.0                | 24.0           | 33.6           | 100.0       | 102.9       |
| 3   | 1664.375        | H   | 39.8                | 52.2                | -0.7          | 39.1                 | 51.5                 | 56.0                | 76.0                | 16.9           | 24.5           | 100.0       | 239.8       |
| 4   | 1832.500        | V   | 40.1                | 50.1                | 0.5           | 40.6                 | 50.6                 | 56.0                | 76.0                | 15.4           | 25.4           | 100.0       | 211.4       |
| 5   | 2156.250        | H   | 37.5                | 51.7                | 1.8           | 39.3                 | 53.5                 | 56.0                | 76.0                | 16.7           | 22.5           | 100.0       | 122.4       |
| 6   | 2410.000        | H   | 40.9                | 58.9                | 2.6           | 43.5                 | 61.5                 | 56.0                | 76.0                | 12.5           | 14.5           | 100.0       | 328.5       |

## 7. E.U.T. photographs

### Front View



### Rear View



Left View



Right View



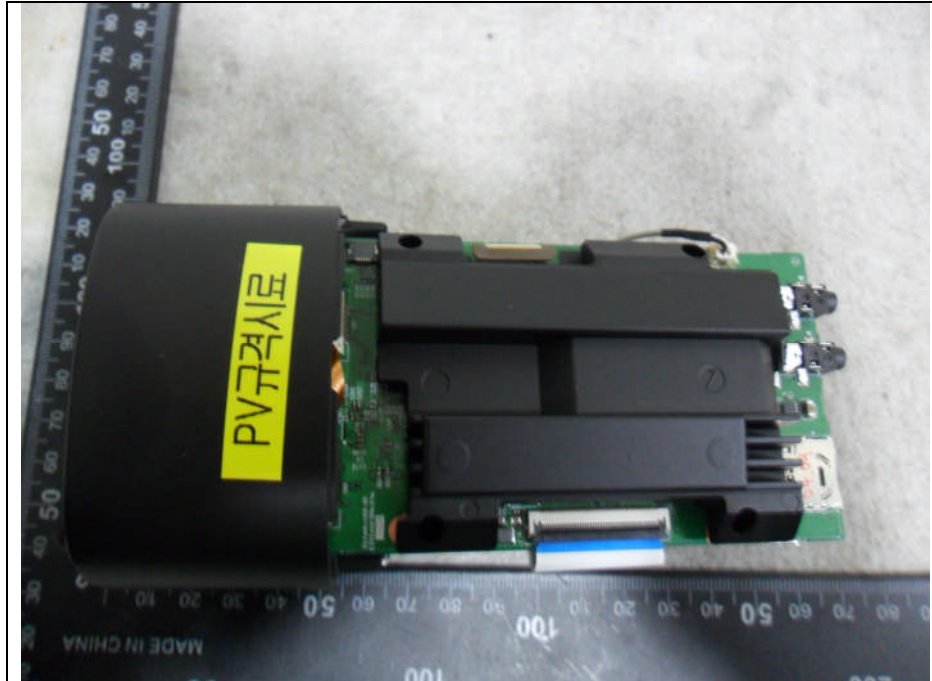
Top View



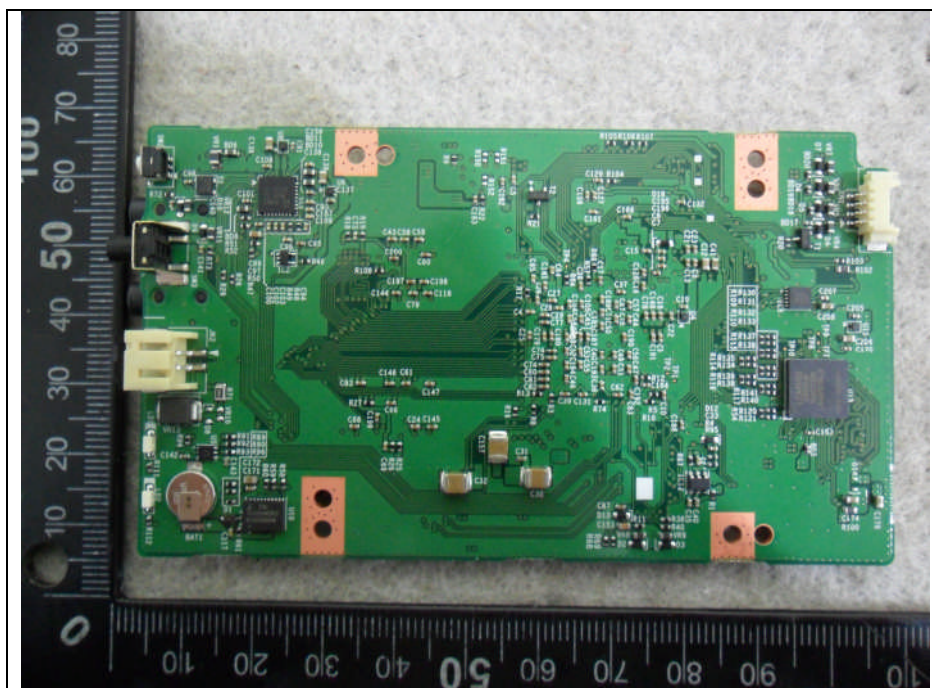
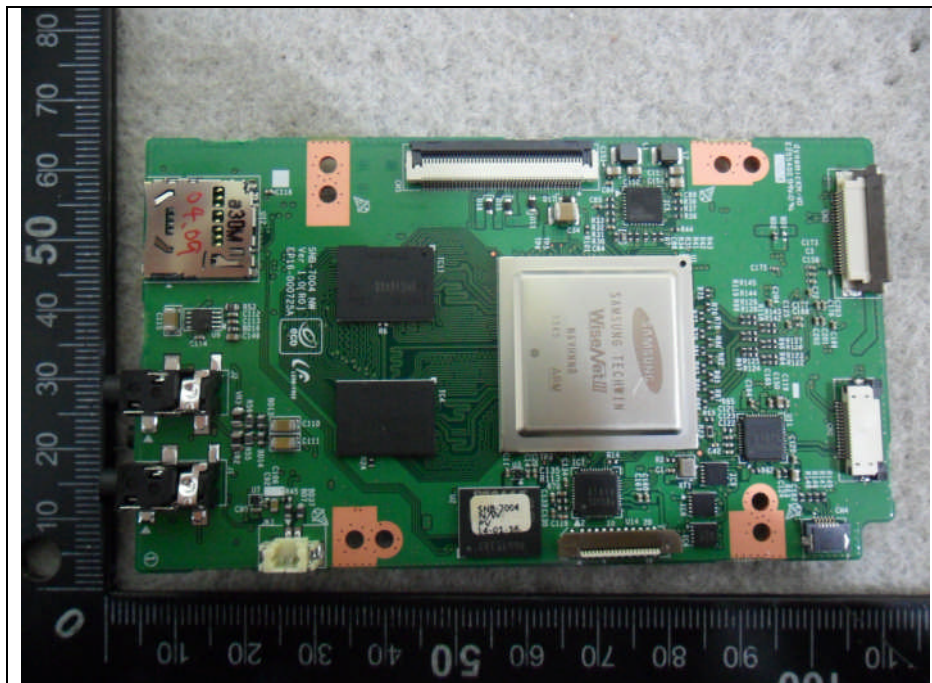
Bottom View



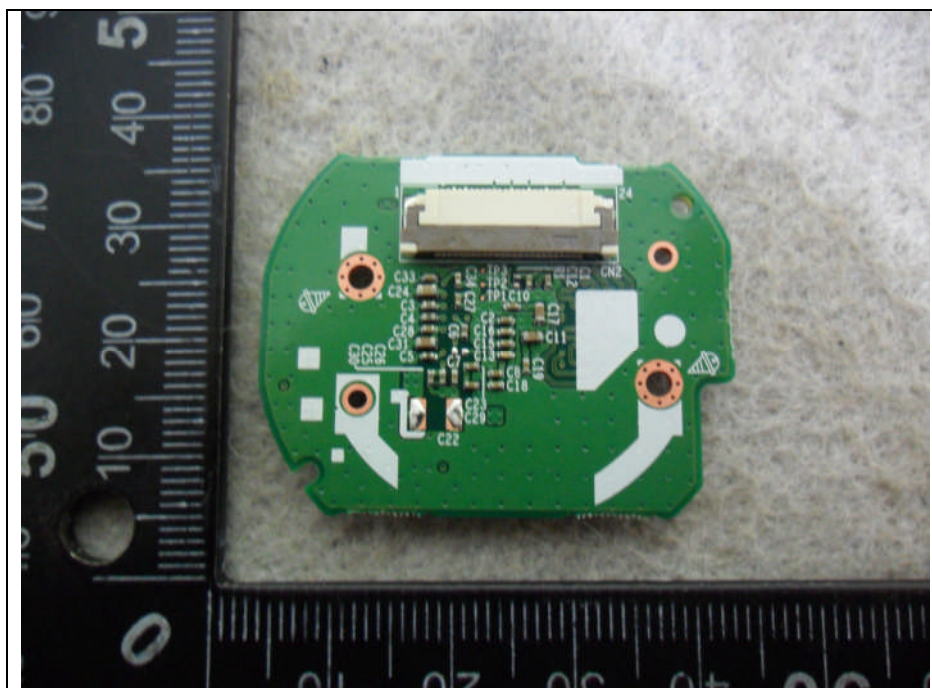
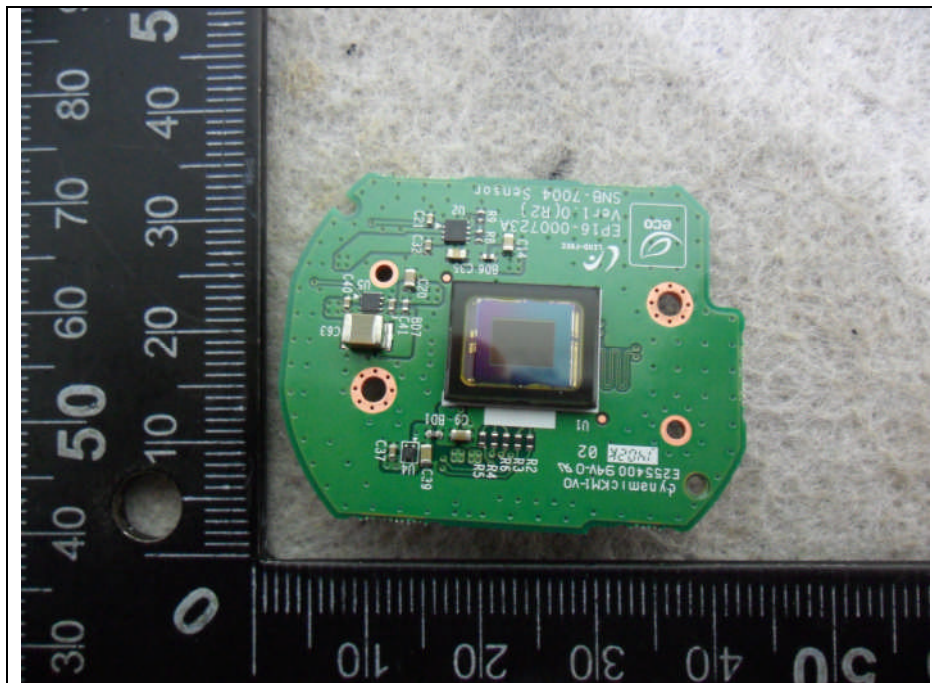
Inside



Main Board



CCD Board



Power Board

