

# CERTIFICATE of EMC Compliance

**Report No** : EMC-FCC-1730  
**Type of equipment** : Network Camera  
**Model Name** : SND-7082N  
**Variant Model Name** : SND-7082VN  
**Applicant** : Samsung Techwin Co., Ltd.  
#42 Seongju-Dong, Changwon-Shi,  
Kyungsangnam-Do, Korea  
**Manufacturer#1** : Samsung Techwin Co., Ltd.  
#42 Seongju-Dong, Changwon-Shi,  
Kyungsangnam-Do, Korea  
**Manufacturer#2** : TIANJIN SAMSUNG TECHWIN  
OPTO-ELECTRONIC CO., LTD  
No.11 Weiliu Road. Micro-Electronic Industrial  
Park Jingang Road Tianjin 300385, China  
**Test standards** : FCC part 15 subpart B, Class A  
**Classification** : Verification

The above equipment was tested by EMC compliance Testing Laboratory for with the requirements of FCC Rules and Regulations. The results of testing in this report apply to the product / system which was tested only.

These results are deemed satisfactory evidence of compliance with ICES-003 of the Canadian Interference-Causing Equipment Regulations.

## Laboratory

EMC compliance Ltd.  
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Yeom, Han-Seok/ Manager

## EMI TEST REPORT

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**Test standards** : FCC part 15 subpart B, Class A  
**Classification** : Verification  
**Test Procedure and Items**  
- Radiated Emissions Measurement : ANSI C63.4-2009  
**Testing Laboratory** : EMC Compliance Ltd.  
**Test result** : Complied

The above equipment was tested by EMC compliance Testing Laboratory for compliance with the requirements of FCC Rules and Regulations. The results of testing in this report apply to the product/system which was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

These results are deemed satisfactory evidence of compliance with ICES-003 of the Canadian Interference-Causing Equipment Regulations.

Date of receipt: 2012. 11. 05

Date of testing: 2012. 11. 12 ~ 11. 13

Issued date: 2012. 11. 20

Tested by:

BEAK, JEONG-SOO

Approved by:

YEOM, HAN-SEOK

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## 1. Applicant information

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**Contact name:** **Kang Jei Soon**

**Manufacturer#2:** TIANJIN SAMSUNG TECHWIN OPTO-ELECTRONIC CO., LTD  
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## 2. Laboratory information

### Address

#### **EMC compliance Ltd.**

480-5 Sin-dong, Yeongtong-gu, Suwon-city, Gyeonggi-do, 443-390, Korea

Telephone Number: 82 31 336 9919

Facsimile Number: 82 505 299 8311

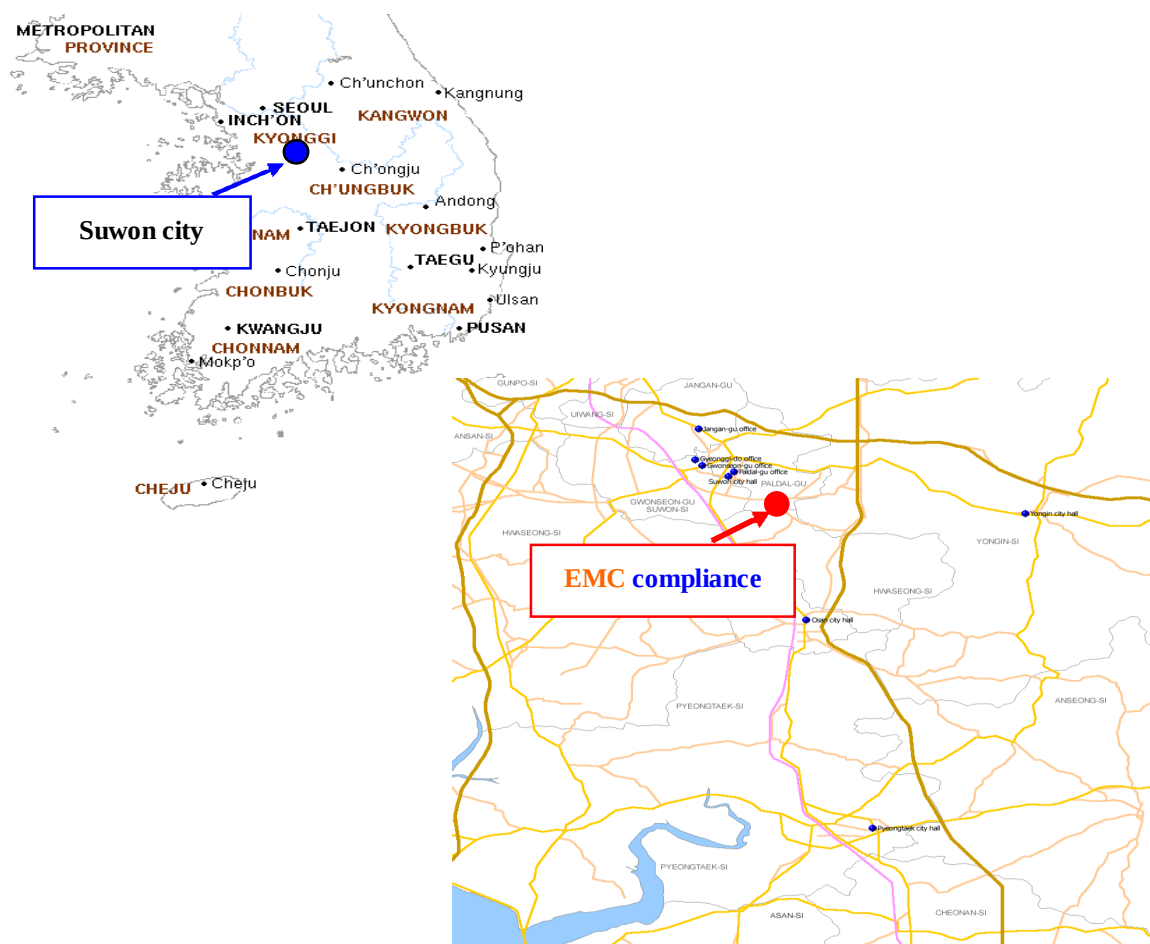
FCC CAB.: KR0040

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) | : 24 ~ 25 °C | 36 ~ 38 % 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<br>150 kHz ~ 30 MHz: $\pm 3.43$ dB |                                                         |
| Shielded Room (CE#2)                                     | 9 kHz ~ 150 kHz: $\pm 3.82$ dB<br>150 kHz ~ 30 MHz: $\pm 3.43$ dB |                                                         |
| Shielded Room (CE#3)                                     | 9 kHz ~ 150 kHz: $\pm 4.00$ dB<br>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                               |
|                                                          | 6 GHz ~ 18 GHz                                                    | 3 m: + 6.41 dB, - 6.53 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                               |
|                                                          | 6 GHz ~ 18 GHz                                                    | 3 m: + 6.41 dB, - 6.53 dB                               |

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

### 4.1 General information

| Items               |                           | Description                                                                                                     |                                                                           |          |
|---------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|----------|
|                     |                           | SNB-7002                                                                                                        | SND-7082(F)                                                               | SNV-7082 |
| Video               | Imaging Device            | 1/3" 3.1M PS CMOS                                                                                               |                                                                           |          |
|                     | Total Pixels              | 2,064(H) X 1,578(V)                                                                                             |                                                                           |          |
|                     | Effective Pixels          | 2,052(H) X 1,536(V)                                                                                             |                                                                           |          |
|                     | Scanning System           | Progressive                                                                                                     |                                                                           |          |
|                     | Min. Illumination         | Color : 0.7 Lux (F1.2, 50IRE), 0.011 Lux (Sens up 60X)<br>B/W : 0.07 Lux (F1.2, 50IRE), 0.001 Lux (Sens up 60X) |                                                                           |          |
|                     | S / N Ratio               | 50dB                                                                                                            |                                                                           |          |
|                     | Video Out                 | CVBS : 1.0 Vp-p / 75Ω composite (DIP Connector type), 704x480(N), 704x576(P), for installation                  | CVBS : 1.0 Vp-p / 75Ω composite, 704x480(N), 704x576(P), for installation |          |
| Lens                | Focal Length (Zoom Ratio) | -                                                                                                               | 3~8.5mm (2.8X) Motorized Vari-focal                                       |          |
|                     | Max. Aperture Ratio       | -                                                                                                               | F1.2                                                                      |          |
|                     | Angular Field of View     | -                                                                                                               | H : 87.3°(Wide)~ 31.2°(Tele),<br>V : 64.5°(Wide)~ 23.4°(Tele)             |          |
|                     | Min. Object Distance      | -                                                                                                               | 0.5 m                                                                     |          |
|                     | Focus Control             | Manual, Simple focus, Day&Night                                                                                 |                                                                           |          |
|                     | Zoom Movement Speed       | -                                                                                                               |                                                                           |          |
|                     | Lens Type                 | Manual / DC Auto Iris                                                                                           | DC Auto Iris                                                              |          |
|                     | Mount Type                | C/CS                                                                                                            | Board-in type                                                             |          |
|                     | Pan Range                 | -                                                                                                               | 0°~355°                                                                   |          |
| Pan / Tilt / Rotate | Pan Speed                 | -                                                                                                               |                                                                           |          |
|                     | Tilt Range                | -                                                                                                               | 0°~90°                                                                    |          |
|                     | Tilt Speed                | -                                                                                                               |                                                                           |          |
|                     | Rotate Range              | -                                                                                                               | 0°~355°                                                                   |          |



| Items       | Description                    |                                                                                                                                                                                             |          |
|-------------|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
|             | SNB-7002                       | SND-7082(F)                                                                                                                                                                                 | SNV-7082 |
| Operational | Camera Title                   | Off / On (Displayed up to 15 characters)                                                                                                                                                    |          |
|             | Day & Night                    | Auto (ICR) / Color / B/W / External                                                                                                                                                         |          |
|             | Backlight Compensation         | Off / BLC / HLC                                                                                                                                                                             |          |
|             | Wide Dynamic Range             | Off / On (96dB)<br>3M Mode : 20fps, 2M Mode : 30fps                                                                                                                                         |          |
|             | Contrast Enhancement           | SSDR (Samsung Super Dynamic Range) (Off / On)                                                                                                                                               |          |
|             | Digital Noise Reduction        | SSNRIII (2D+3D Noise Filter) (Off / On)                                                                                                                                                     |          |
|             | Digital Image Stabilization    | -                                                                                                                                                                                           |          |
|             | Motion Detection               | Off / On (4 Rectangular zones)                                                                                                                                                              |          |
|             | Privacy Masking                | Off / On (1ea 4 Point Polygonal + 16ea Rectangular zones)                                                                                                                                   |          |
| Operational | Sens-up<br>(Frame Integration) | Off / Auto (2X ~ 60X)                                                                                                                                                                       |          |
|             | AGC (Auto Gain Control)        | Off / Low / Middle / High                                                                                                                                                                   |          |
|             | White Balance                  | ATW / AWC / Manual / Indoor / Outdoor                                                                                                                                                       |          |
|             | Electronic Shutter Speed       | Auto / A.FLK / Manual (1/30 ~ 12,000sec)                                                                                                                                                    |          |
|             | Digital Zoom                   | -                                                                                                                                                                                           |          |
|             | Flip / Mirror                  | Off / On                                                                                                                                                                                    |          |
|             | Intelligent Video Analytics    | Audio Detection, Face Detection, Tampering, Virtual Line, Enter / Exit, Appear / Disappear                                                                                                  |          |
|             | Alarm I/O                      | Digital Input 1ea / Digital Output 1ea                                                                                                                                                      |          |
|             | Remote Control Interface       | -                                                                                                                                                                                           |          |
|             | RS-485 Protocol                | -                                                                                                                                                                                           |          |
|             | Alarm Triggers                 | Motion detection, Video Analytics, Sensor Input, Network Disconnect                                                                                                                         |          |
|             | Alarm events                   | <ul style="list-style-type: none"> <li>• File upload via FTP, E-Mail</li> <li>• Notification via E-Mail, TCP</li> <li>• local storage(SD/SDHC) recording at Network disconnected</li> </ul> |          |

| Items   | Description              |                                                                                                                                                                                                                                                                                            |                                  |
|---------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
|         | SNB-7002                 | SND-7082(F)                                                                                                                                                                                                                                                                                | SNV-7082                         |
| Network | Ethernet                 | RJ-45 (10/100BASE-T)                                                                                                                                                                                                                                                                       |                                  |
|         | Video Compression Format | H.264(MPEG-4 Part 10/AVC), Motion JPEG                                                                                                                                                                                                                                                     |                                  |
|         | Resolution               | <3M Mode><br>2048x1536 / 1920x1080 / 1600x1200 / 1280x1024 / 1280x960 / 1280x720 / 1024x768 / 800x600 / 800x450 / 640x480 / 640x360 / 320x240 / 320x180<br><2M Mode><br>1920x1080 / 1280x1024 / 1280x960 / 1280x720 / 1024x768 / 800x600 / 800x450 / 640x480 / 640x360 / 320x240 / 320x180 |                                  |
|         | Max. Framerate           | <3M Mode><br>* H.264 : Max 20 fps at all resolutions<br>* MJPEG : 800x600 ~ 320x180 - 20 fps,<br>1024x768 ~ 1920x1080 - 15 fps,<br>2048x1536 - 10 fps<br><2M Mode><br>* H.264 : Max 30 fps at all resolutions<br>* MJPEG : 800x600 ~ 320x180 - 30 fps,<br>1024x768 ~ 1920x1080 : 15 fps    |                                  |
|         | Smart Codec              | Yes (Area Based Method)                                                                                                                                                                                                                                                                    |                                  |
|         | 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 6 Profiles)                                                                                                                                                                                                                                                      |                                  |
|         | Audio I/O                | External Mic./Line in ,<br>Line out, Built-in Mic.                                                                                                                                                                                                                                         | External Mic./Line in , Line out |
|         | Audio Compression Format | G.711 $\mu$ -law, G.726 (16Kbps, 24Kbps, 32Kbps, 40Kbps)                                                                                                                                                                                                                                   |                                  |
|         | Audio Communication      | Bi-directional                                                                                                                                                                                                                                                                             |                                  |
|         | IP                       | IPv4, IPv6                                                                                                                                                                                                                                                                                 |                                  |
|         | Protocol                 | TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTSP, NTP, HTTP, HTTPS, SSL, DHCP, PPPoE, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, UPnP, RTCP                                                                                                                                 |                                  |
|         | Security                 | HTTPS(SSL) Login Authentication<br>Digest Login Authentication<br>IP Address Filtering<br>User access Log<br>802.1x Authentication                                                                                                                                                         |                                  |

| Items         |                                  | Description                                                                                                                                                                                     |                                                                                     |                                                                                                                                                                                            |
|---------------|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|               |                                  | SNB-7002                                                                                                                                                                                        | SND-7082(F)                                                                         | SNV-7082                                                                                                                                                                                   |
| Network       | Streaming Method                 | Unicast / Multicast                                                                                                                                                                             |                                                                                     |                                                                                                                                                                                            |
|               | Max. User Access                 | 10 users at Unicast Mode                                                                                                                                                                        |                                                                                     |                                                                                                                                                                                            |
|               | Memory Slot                      | SD/SDHC Memory Slot                                                                                                                                                                             |                                                                                     |                                                                                                                                                                                            |
|               | ONVIF Conformance                | Yes                                                                                                                                                                                             |                                                                                     |                                                                                                                                                                                            |
|               | Web Viewer                       | Supported OS : Windows XP / VISTA / 7, MAC OS X 10.7 or Higher<br>Supported Browser : Internet Explorer 7.0 or Higher,<br>Firefox 9.0 or higher, Chrome 15.0 or higher,<br>Safari 5.1 or higher |                                                                                     |                                                                                                                                                                                            |
|               | Central Management Software      | NET-i viewer                                                                                                                                                                                    |                                                                                     |                                                                                                                                                                                            |
| Environmental | Operating Temperature / Humidity | -10°C ~ +55°C (+14°F ~ +131°F) / 20% ~ 80% RH                                                                                                                                                   |                                                                                     | PoE : -35°C ~ +55°C (-40°F ~ +131°F) / ~ 90% RH<br>DC12V : -10°C ~ +55°C (+14°F ~ +131°F) / 20% ~ 80% RH<br>* Heater works at PoE power input.<br>* After Start up, working at -40° by PoE |
|               | Ingress Protection               | -                                                                                                                                                                                               |                                                                                     | IP66 Grade                                                                                                                                                                                 |
|               | Vandal Resistance                | -                                                                                                                                                                                               |                                                                                     | IK10                                                                                                                                                                                       |
| Electrical    | Input Voltage                    | DC 12V, PoE(IEEE802.3af)                                                                                                                                                                        |                                                                                     |                                                                                                                                                                                            |
|               | Power Consumption                | Max. 9.0W (DC 12V, PoE(class3))                                                                                                                                                                 |                                                                                     | Max. 9.0W (DC 12V, PoE(class3) - Heater Off)<br>Max. 12.95W (PoE(class3) - Heater On)                                                                                                      |
| Mechanical    | Color / Material                 | Body : Dark Gray / Aluminum                                                                                                                                                                     | Body : Ivory / Plastic                                                              | Body : Ivory / Aluminum                                                                                                                                                                    |
|               | Dimension                        | W72.0 (2.83") x H60.0 (2.36") x D150.5 (5.93") excluding projections                                                                                                                            | SND-7082 : Ø133.0 x H129.4mm<br>SND-7082F : Ø159.9 x H125.0mm (Flush Mounting Type) | Ø160.0 x H134.5mm                                                                                                                                                                          |
|               | Weight                           | 468g                                                                                                                                                                                            | SND-7082 : 635g<br>SND-7082F : 700g                                                 | 1,420g                                                                                                                                                                                     |

## 4.2 Product description

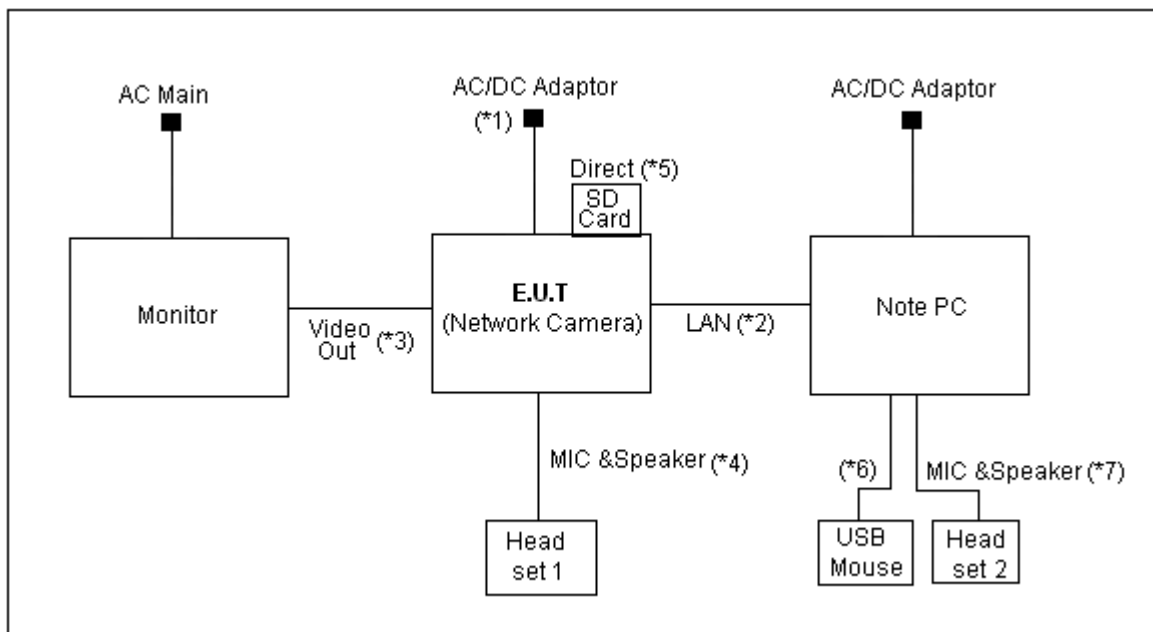
|                          |                                                                                                             |
|--------------------------|-------------------------------------------------------------------------------------------------------------|
| Type of product          | Network Camera                                                                                              |
| Model name (Basic)       | SND-7082N                                                                                                   |
| Model name (Variant)     | SND-7082VN                                                                                                  |
| Difference               | Buyer model name                                                                                            |
| Trade name               | -                                                                                                           |
| Serial no                | Engineering Sample                                                                                          |
| Testing voltage          | DC 12 V , PoE                                                                                               |
| Product rating           | DC 12 V , PoE                                                                                               |
| Internal clock frequency | -                                                                                                           |
| Note                     | * AC/DC 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                   | C1410          | 463680121002    | FUJITSU      |
| Monitor                   | PM24KO         | YER8HVDBA00057E | SAMSUNG      |
| USB Mouse                 | 1088           | 8165900112700   | Microsoft    |
| Headset 1                 | SHS-250V       | -               | SAMSUNG      |
| Headset 2                 | SHS-250V       | -               | SAMSUNG      |
| SD Card(2GB)              | -              | -               | SANDISK      |
| AC/DC Adaptor<br>(DC 12V) | ADS-30S1-12-2  | -               | SAMSUNG      |
| PoE Switch                | -              | -               | SAMSUNG      |

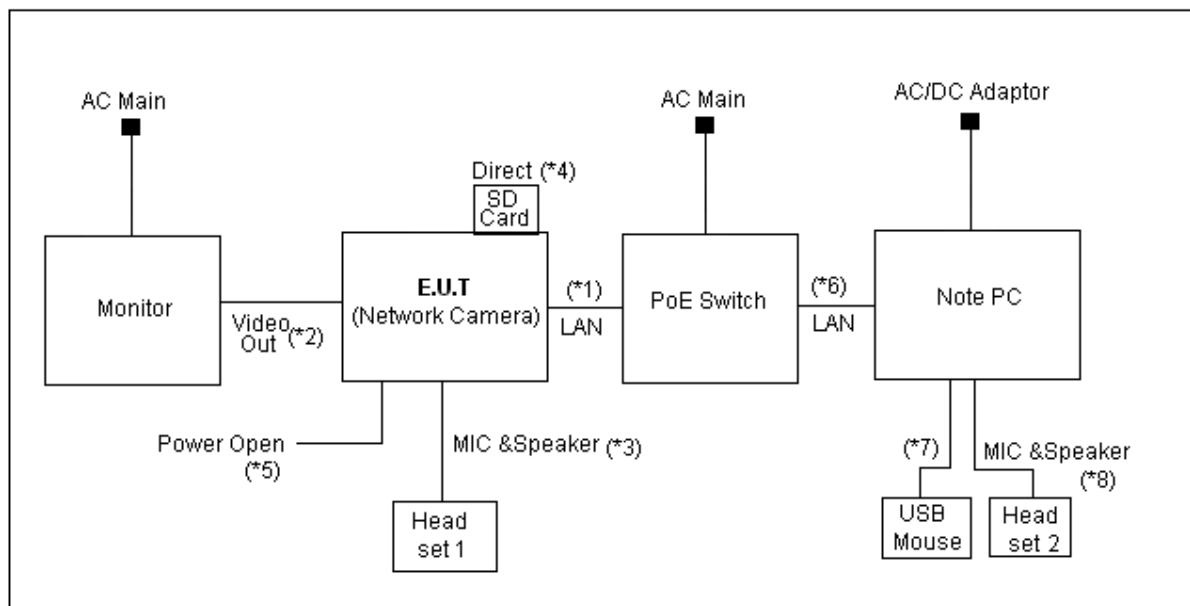
## 4.4 Test configuration

\* DC 12 V



| Note<br>* | Start                          |               | End           |               | Cable      |            |
|-----------|--------------------------------|---------------|---------------|---------------|------------|------------|
|           | Name                           | I/O port      | Name          | I/O port      | Length (m) | Spec.      |
| 1         | <b>EUT</b><br>(Network Camera) | Power         | AC/DC Adaptor | Power         | 2.5        | Non-Shield |
| 2         |                                | LAN           | Note PC       | LAN           | 3.0        | Non-Shield |
| 3         |                                | Video Out     | Monitor       | Video In      | 3.0        | Non-Shield |
| 4         |                                | MIC & Speaker | Headset 1     | MIC & Speaker | 2.0        | Non-Shield |
| 5         |                                | SD Card       | SD Card       | SD Card       | Direct     | -          |
| 6         | Note PC                        | USB           | USB Mouse     | USB           | 1.8        | Shield     |
| 7         |                                | MIC & Speaker | Headset 2     | MIC & Speaker | 2.0        | Non-Shield |

\* 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 Switch | LAN           | 3.0        | Non-Shield |
| 2         |                                | Video Out     | Monitor    | Video In      | 3.0        | Non-Shield |
| 3         |                                | MIC & Speaker | Headset 1  | MIC & Speaker | 2.0        | Non-Shield |
| 4         |                                | SD Card       | SD Card    | SD Card       | Direct     | -          |
| 5         |                                | Power         | Open       | -             | 0.6        | Non-Shield |
| 6         | Note PC                        | LAN           | PoE Switch | LAN           | 1.0        | Non-Shield |
| 7         |                                | USB           | USB Mouse  | USB           | 1.8        | Shield     |
| 8         |                                | MIC & Speaker | Headset 2  | MIC & Speaker | 2.0        | Non-Shield |



## 4.5 Operating conditions

The EUT was configured as normal intended use.

This test was done at worst case.

| Test mode | Normal operating                          |
|-----------|-------------------------------------------|
| 1         | Camera Operating mode.(Program: Web View) |

\* Note: 2 types of powers are available for the product, that are AC/DC adaptor (DC 12 V), PoE switch.

Therefore, tests were performed for 2 different types of powers.

## 5. Summary of test results

**In the above configuration tested, The EUT complied with the requirement of the specification**

### 5.1 Summary of EMI emission test results

FCC Part 15 Subpart B (Class A)

ANSI C63.4 – 2009

| Applied                             | Test items         | Test method       | Result   |
|-------------------------------------|--------------------|-------------------|----------|
| <input type="checkbox"/>            | Conducted Emission | ANSI C63.4 – 2009 | N/A      |
| <input checked="" type="checkbox"/> | Radiated Emission  | ANSI C63.4 – 2009 | Complied |

## 6. Test results

### 6.1 Radiated Emission

|                    |                                         |                   |                |
|--------------------|-----------------------------------------|-------------------|----------------|
| Test specification | FCC Part 15, Section 15.109(g), Class A |                   |                |
| Testing voltage    | DC 12 V, PoE                            |                   |                |
| Test facility      | 10 m Chamber (#F2, #4)                  |                   |                |
| Test distance      | 10 m, 3 m                               |                   |                |
| Date               | 2012. 11. 12 ~ 13                       |                   |                |
| Temperature (°C)   | 24 ~ 25 °C                              | Humidity (% R.H.) | 36 ~ 38 % R.H. |
| Remarks            | Complied                                |                   |                |

#### 6.1.1 Limits of radiated emission measurement

| Frequency<br>[MHz] | Class A (dB( $\mu$ V/m)) @ 10 m | Class B (dB( $\mu$ V/m)) @ 3 m |
|--------------------|---------------------------------|--------------------------------|
| 30-88              | 39                              | 40                             |
| 88-216             | 43.5                            | 43.5                           |
| 216-960            | 46.4                            | 46                             |
| Above 960          | 49.5                            | 54                             |

\* Note- Alternative standard: CISPR, Pub. 22 \*

#### 6.1.2 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.

### 6.1.3 Used equipments

\* 30 MHz ~ 1 GHz

| Equipment       | Model no.  | Serial no. | Makers            | Next Cal. Date | Used                                |
|-----------------|------------|------------|-------------------|----------------|-------------------------------------|
| Test Receiver   | ESCI       | 100710     | R&S               | 2013.11.06     | <input checked="" type="checkbox"/> |
| Bi-Log Antenna  | VULB 9168  | 9168-440   | SCHWARZBECK       | 2013.10.04     | <input checked="" type="checkbox"/> |
| Amplifier       | 310N       | 293004     | SONOMA INSTRUMENT | 2013.11.06     | <input checked="" type="checkbox"/> |
| 3 dB Attenuator | 8491A      | 27444      | HP                | 2013.11.06     | <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"/> |

\* 1 GHz ~ 6 GHz

| Equipment         | Model no.   | Serial no.  | Makers  | Next Cal. Date | Used                                |
|-------------------|-------------|-------------|---------|----------------|-------------------------------------|
| Antenna Mast      | AM4.0       | 079/3440509 | MATURO  | -              | <input checked="" type="checkbox"/> |
| Turn Table        | CO2000-SOFT | -           | MATURO  | -              | <input checked="" type="checkbox"/> |
| Horn ANT          | 3115        | 00086706    | ETS     | 2013.11.21     | <input checked="" type="checkbox"/> |
| Amplifier         | 8449B       | 3008A01802  | AGILENT | 2013.05.04     | <input checked="" type="checkbox"/> |
| Spectrum Analyzer | FSP7        | 100289      | R&S     | 2012.12.19     | <input checked="" type="checkbox"/> |

### 6.1.4 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

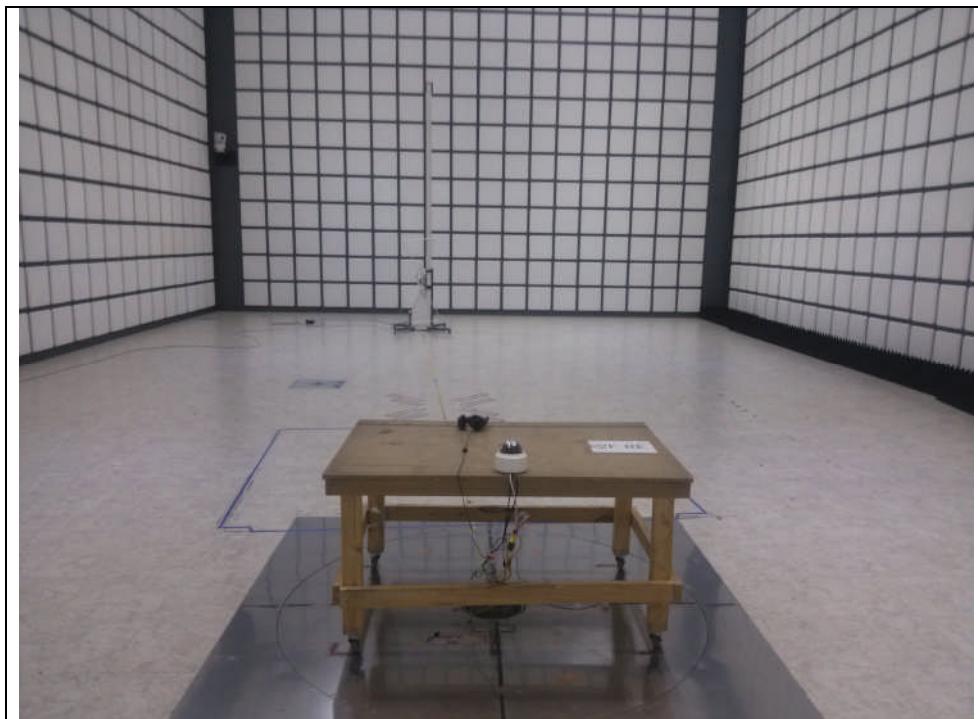
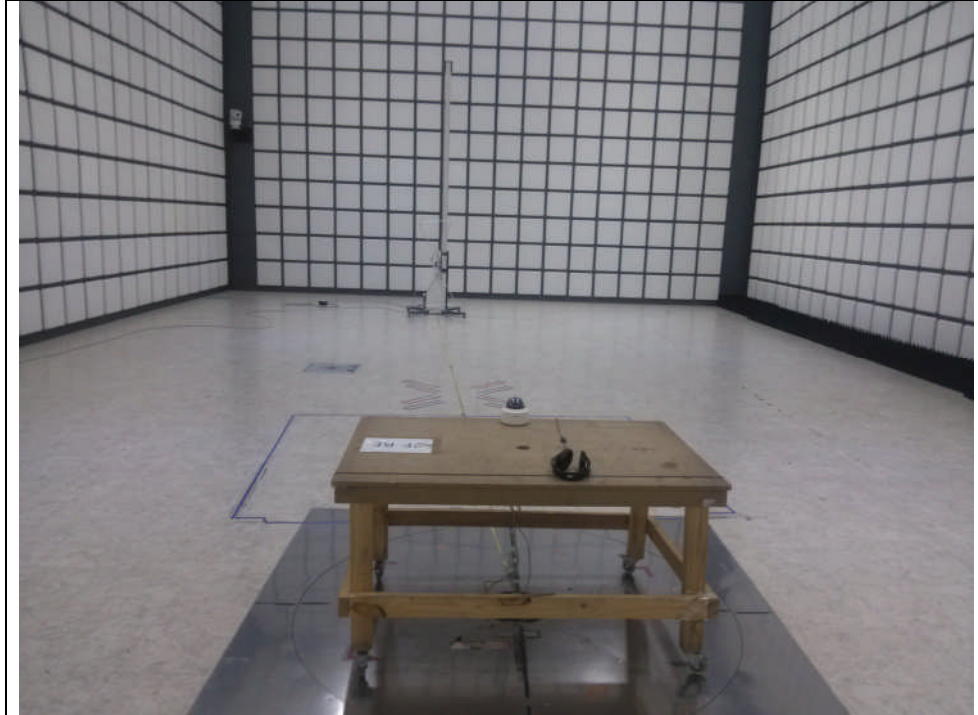
The result is

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

### 6.1.5 Photographs of test setup

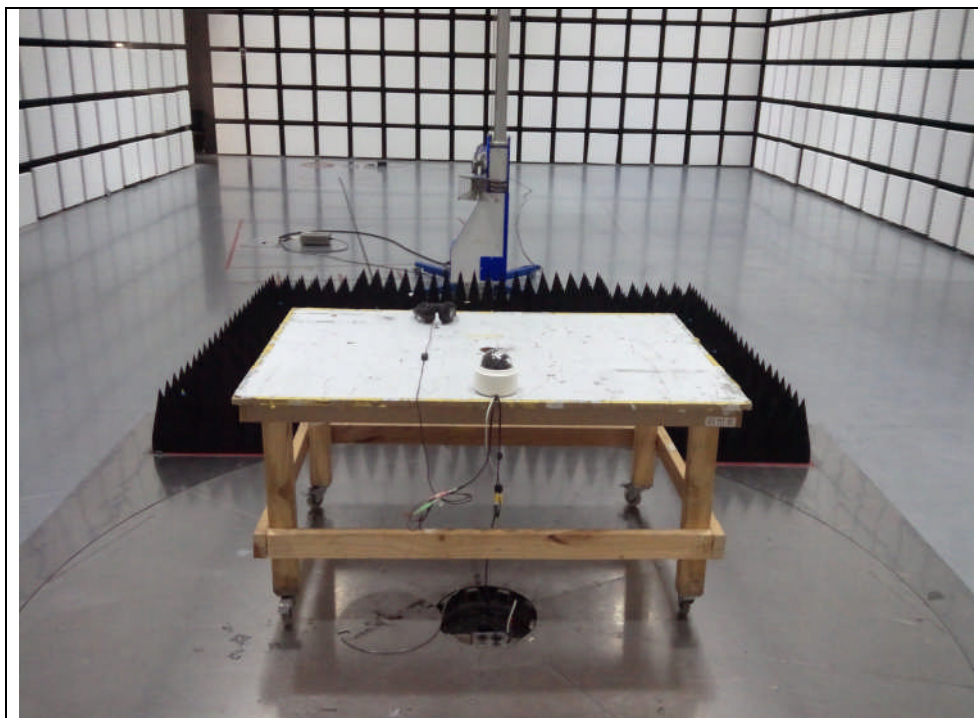
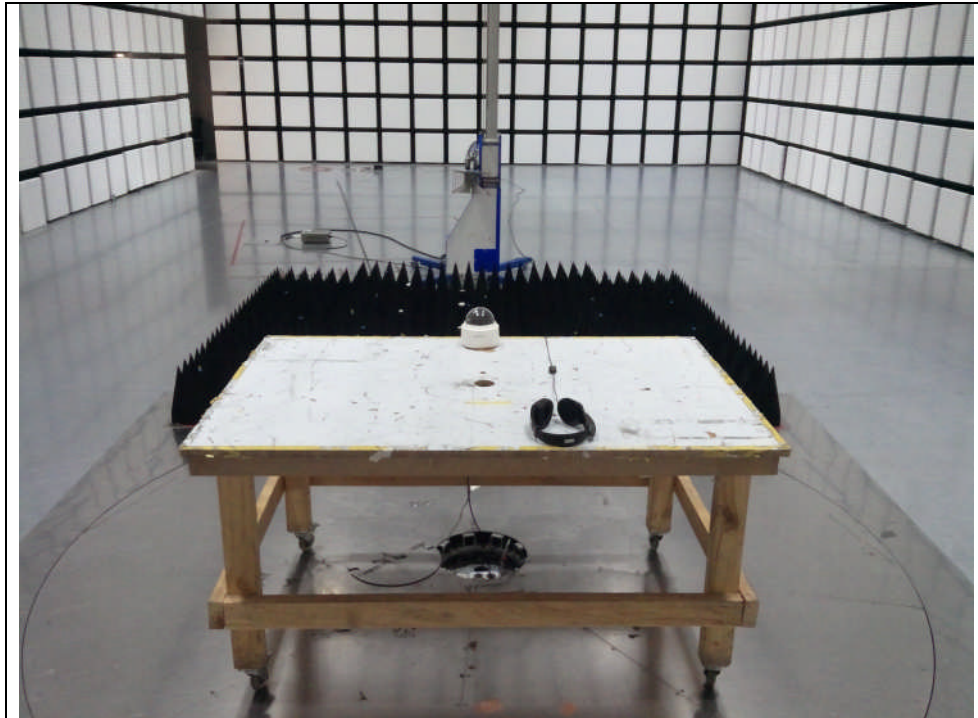
\* 30 MHz ~ 1 GHz

\* DC 12 V, PoE



\* 1 GHz ~ 6 GHz

\* DC 12 V, PoE

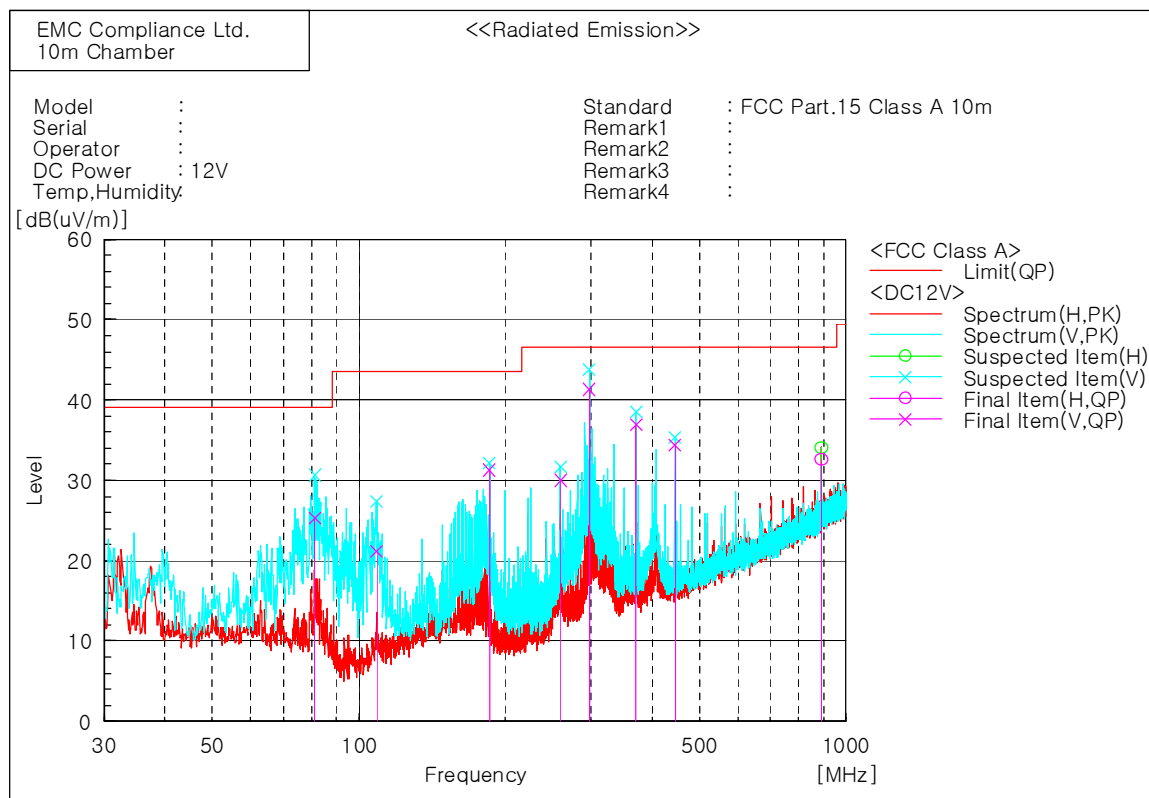




## 6.1.6 Radiated emission measurement result

### \* Graph and Data

\* 30 MHz ~ 1 GHz (SND-7082N\_DC 12V)

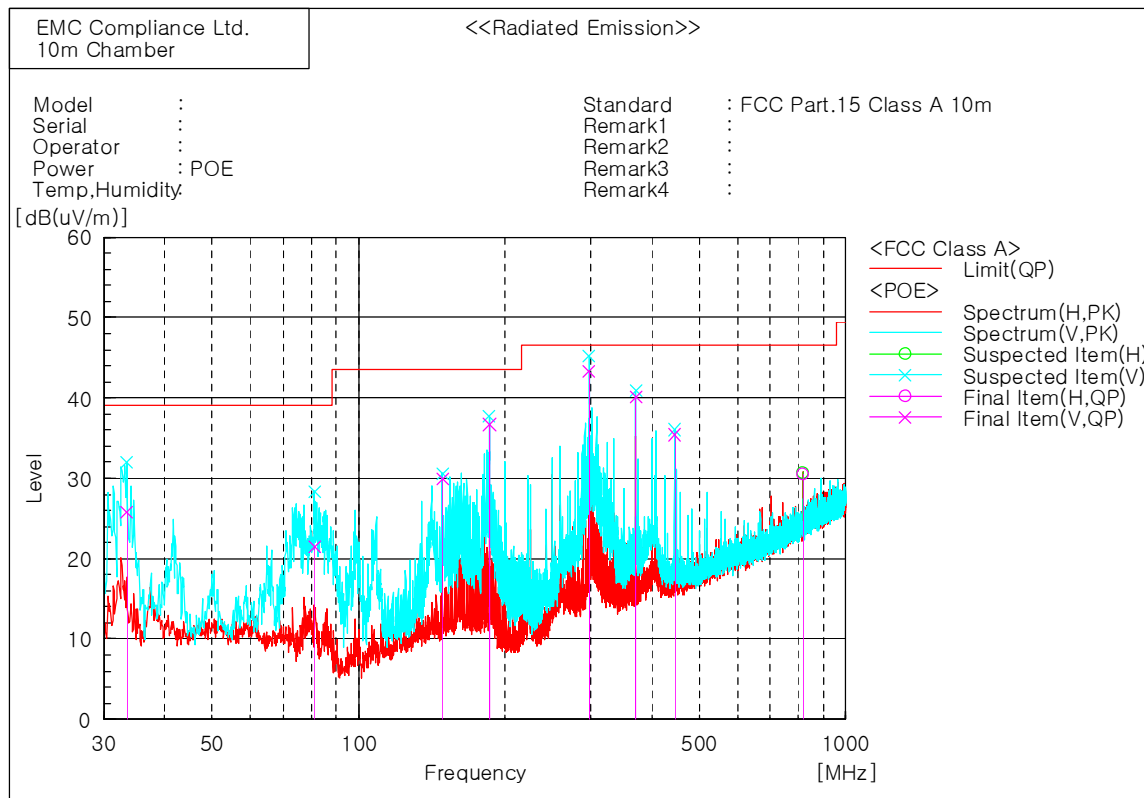


### Final Result

| No. | Frequency<br>[MHz] | (P) | Reading<br>QP<br>[dB(uV)] | c.f<br>[dB(1/m)] | Result<br>QP<br>[dB(uV/m)] | Limit<br>QP<br>[dB(uV/m)] | Margin<br>QP<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark |
|-----|--------------------|-----|---------------------------|------------------|----------------------------|---------------------------|----------------------|----------------|----------------|--------|
| 1   | 81.168             | V   | 43.2                      | -17.9            | 25.3                       | 39.0                      | 13.7                 | 100.0          | 205.3          |        |
| 2   | 108.813            | V   | 38.3                      | -17.1            | 21.2                       | 43.5                      | 22.3                 | 100.0          | 39.4           |        |
| 3   | 185.564            | V   | 46.4                      | -15.1            | 31.3                       | 43.5                      | 12.2                 | 100.0          | 64.8           |        |
| 4   | 259.890            | V   | 43.4                      | -13.4            | 30.0                       | 46.5                      | 16.5                 | 100.0          | 330.8          |        |
| 5   | 297.001            | V   | 53.2                      | -11.9            | 41.3                       | 46.5                      | 5.2                  | 100.0          | 330.8          |        |
| 6   | 371.319            | V   | 46.8                      | -9.9             | 36.9                       | 46.5                      | 9.6                  | 100.0          | 289.0          |        |
| 7   | 445.524            | V   | 42.3                      | -7.9             | 34.4                       | 46.5                      | 12.1                 | 100.0          | 88.7           |        |
| 8   | 891.117            | H   | 31.4                      | 1.2              | 32.6                       | 46.5                      | 13.9                 | 400.0          | 257.7          |        |



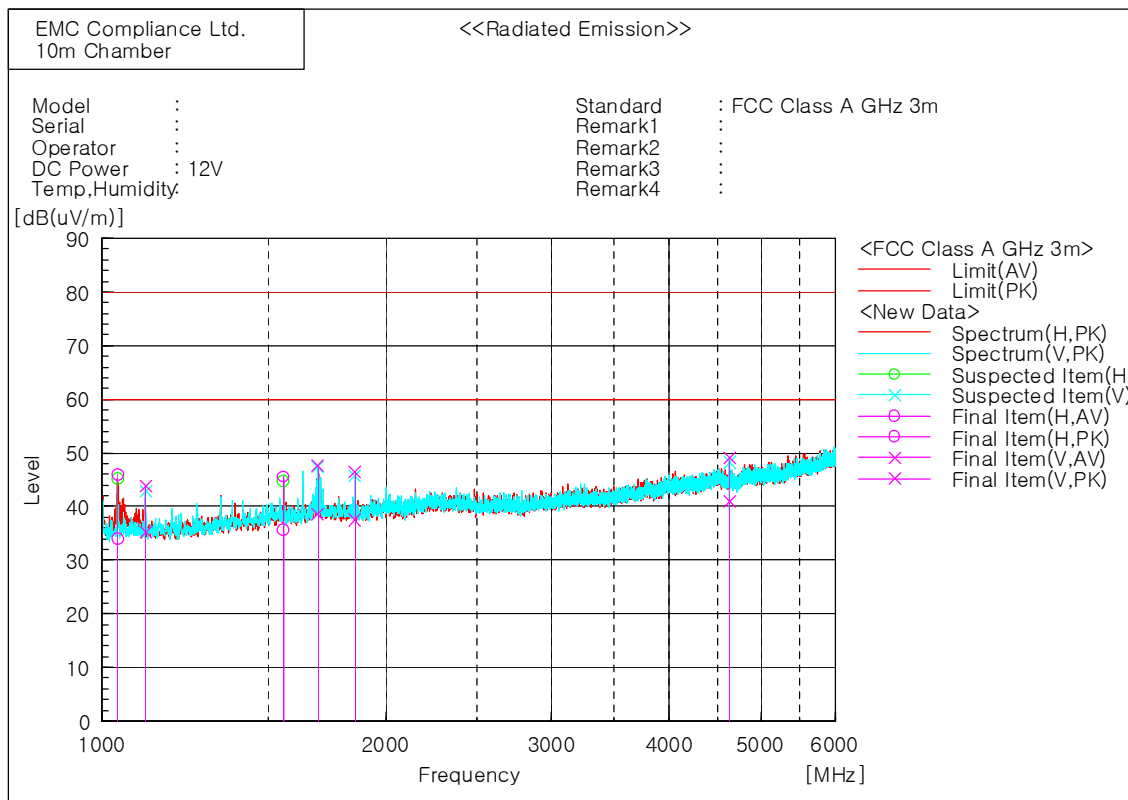
\* 30 MHz ~ 1 GHz (SND-7082N\_PoE)



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   | 33.412          | V   | 41.2                | -15.4         | 25.8                 | 39.0                | 13.2           | 100.0       | 242.0       |        |
| 2   | 81.184          | V   | 39.4                | -17.9         | 21.5                 | 39.0                | 17.5           | 100.0       | 134.0       |        |
| 3   | 148.432         | V   | 43.4                | -13.5         | 29.9                 | 43.5                | 13.6           | 100.0       | 316.6       |        |
| 4   | 185.580         | V   | 51.8                | -15.1         | 36.7                 | 43.5                | 6.8            | 100.0       | 327.0       |        |
| 5   | 297.003         | V   | 55.2                | -11.9         | 43.3                 | 46.5                | 3.2            | 100.0       | 217.0       |        |
| 6   | 371.198         | V   | 50.0                | -9.9          | 40.1                 | 46.5                | 6.4            | 100.0       | 125.0       |        |
| 7   | 445.524         | V   | 43.3                | -7.9          | 35.4                 | 46.5                | 11.1           | 100.0       | 164.0       |        |
| 8   | 816.791         | H   | 30.6                | -0.1          | 30.5                 | 46.5                | 16.0           | 400.0       | 116.0       |        |

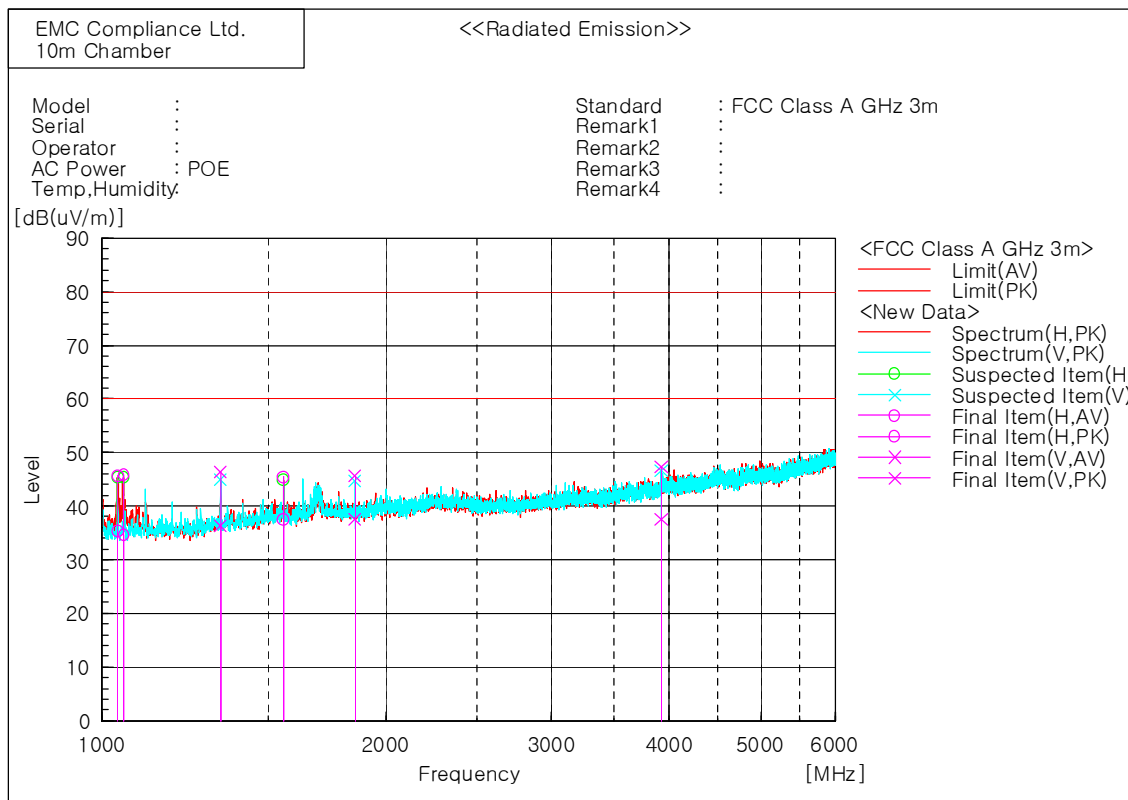
\* 1 GHz ~ 6 GHz (SND-7082N\_DC 12V)



Final Result

| No. | Frequency [MHz] | (P) | Reading AV [dB(uV)] | Reading PK [dB(uV)] | c.f [dB(1/m)] | Result AV [dB(uV/m)] | Result PK [dB(uV/m)] | Limit AV [dB(uV/m)] | Limit PK [dB(uV/m)] | Margin AV [dB] | Margin PK [dB] | Height [cm] | Angle [deg] | Remark |
|-----|-----------------|-----|---------------------|---------------------|---------------|----------------------|----------------------|---------------------|---------------------|----------------|----------------|-------------|-------------|--------|
| 1   | 1039.375        | H   | 43.2                | 55.2                | -9.2          | 34.0                 | 46.0                 | 60.0                | 80.0                | 26.0           | 34.0           | 100.0       | 123.9       |        |
| 2   | 1113.750        | V   | 43.7                | 52.3                | -6.4          | 35.3                 | 43.9                 | 60.0                | 80.0                | 24.7           | 36.1           | 100.0       | 205.4       |        |
| 3   | 1556.750        | H   | 40.4                | 50.4                | -4.8          | 35.6                 | 45.6                 | 60.0                | 80.0                | 24.4           | 34.4           | 100.0       | 7.3         |        |
| 4   | 1696.625        | V   | 42.1                | 51.2                | -3.6          | 38.5                 | 47.6                 | 60.0                | 80.0                | 21.5           | 32.4           | 100.0       | 141.3       |        |
| 5   | 1855.625        | V   | 40.5                | 49.4                | -3.0          | 37.5                 | 46.4                 | 60.0                | 80.0                | 22.5           | 33.6           | 100.0       | 55.1        |        |
| 6   | 4639.375        | V   | 35.6                | 43.7                | 5.4           | 41.0                 | 49.1                 | 60.0                | 80.0                | 19.0           | 30.9           | 100.0       | 354.1       |        |

\* 1 GHz ~ 6 GHz (SND-7082N\_PoE)



Final Result

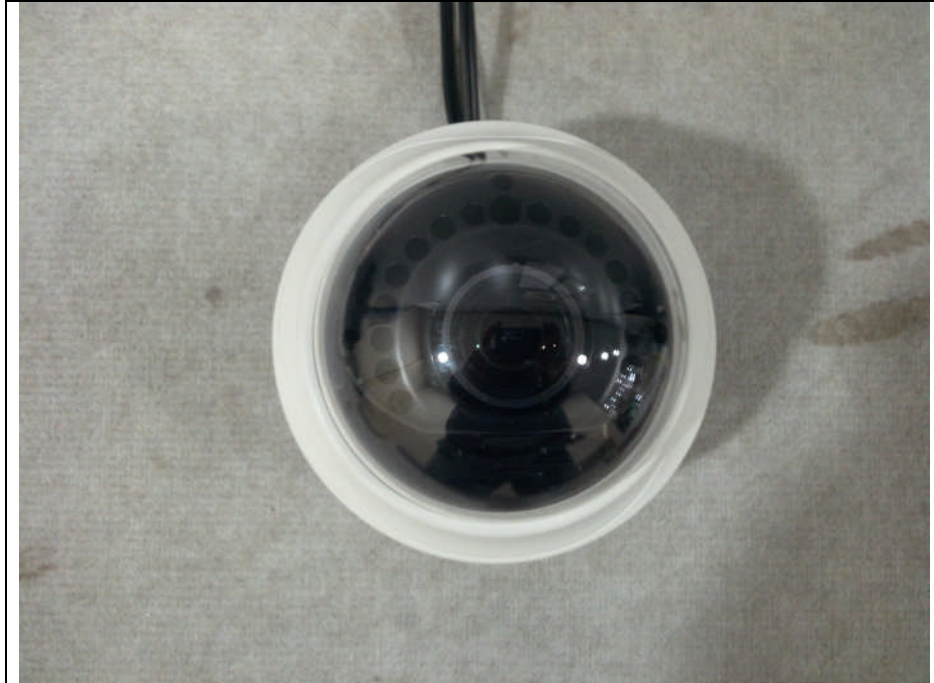
| No. | Frequency [MHz] | (P) | Reading AV [dB(uV)] | Reading PK [dB(uV)] | c.f [dB(1/m)] | Result AV [dB(uV/m)] | Result PK [dB(uV/m)] | Limit AV [dB(uV/m)] | Limit PK [dB(uV/m)] | Margin AV [dB] | Margin PK [dB] | Height [cm] | Angle [deg] | Remark |
|-----|-----------------|-----|---------------------|---------------------|---------------|----------------------|----------------------|---------------------|---------------------|----------------|----------------|-------------|-------------|--------|
| 1   | 1039.375        | H   | 44.5                | 54.9                | -9.2          | 35.3                 | 45.7                 | 60.0                | 80.0                | 24.7           | 34.3           | 100.0       | 81.9        |        |
| 2   | 1055.000        | H   | 43.7                | 54.9                | -9.1          | 34.6                 | 45.8                 | 60.0                | 80.0                | 25.4           | 34.2           | 100.0       | 92.4        |        |
| 3   | 1336.250        | V   | 42.6                | 52.7                | -6.3          | 36.3                 | 46.4                 | 60.0                | 80.0                | 23.7           | 33.6           | 100.0       | 183.9       |        |
| 4   | 1558.750        | H   | 42.3                | 50.2                | -4.8          | 37.5                 | 45.4                 | 60.0                | 80.0                | 22.5           | 34.6           | 100.0       | 6.9         |        |
| 5   | 1856.250        | V   | 40.5                | 48.6                | -3.0          | 37.5                 | 45.6                 | 60.0                | 80.0                | 22.5           | 34.4           | 100.0       | 34.5        |        |
| 6   | 3923.125        | V   | 34.2                | 44.1                | 3.3           | 37.5                 | 47.4                 | 60.0                | 80.0                | 22.5           | 32.6           | 100.0       | 77.2        |        |

## 7. E.U.T. photographs

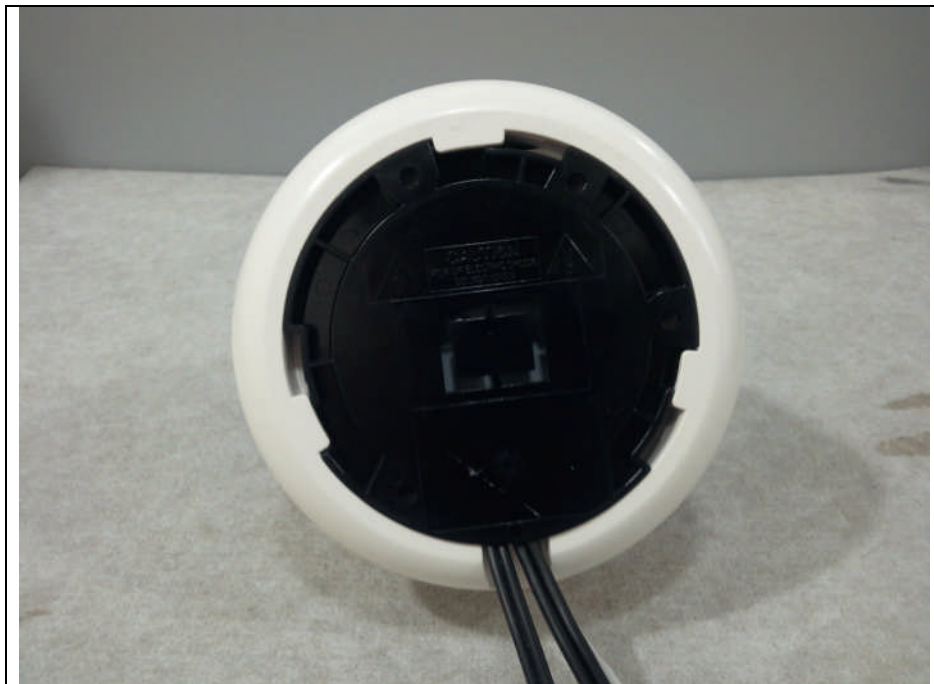
### Whole



Front View



Rear View



Left View



Right View





Top View

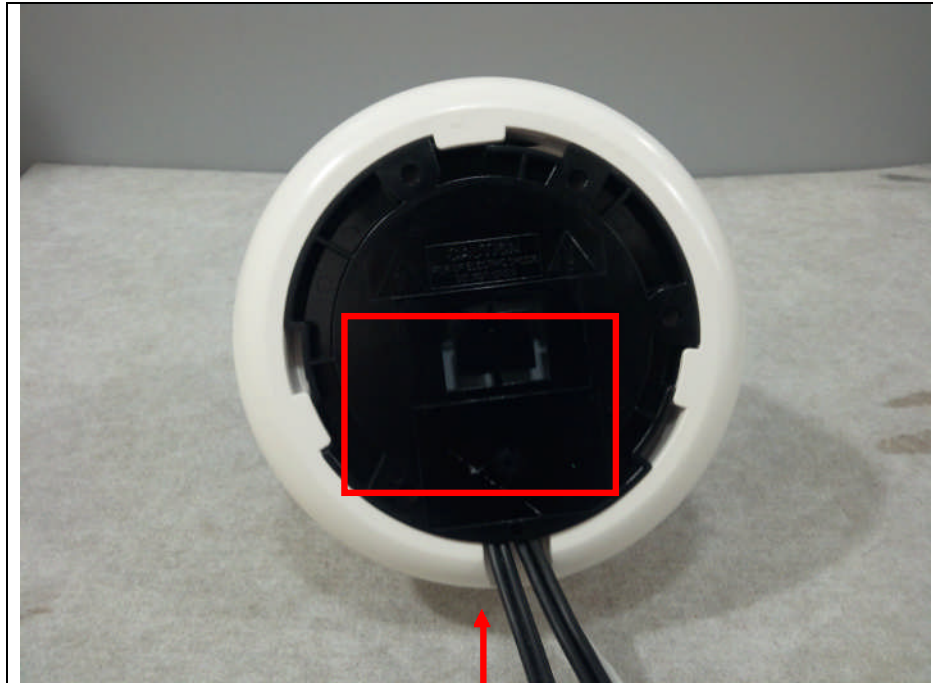


Bottom View





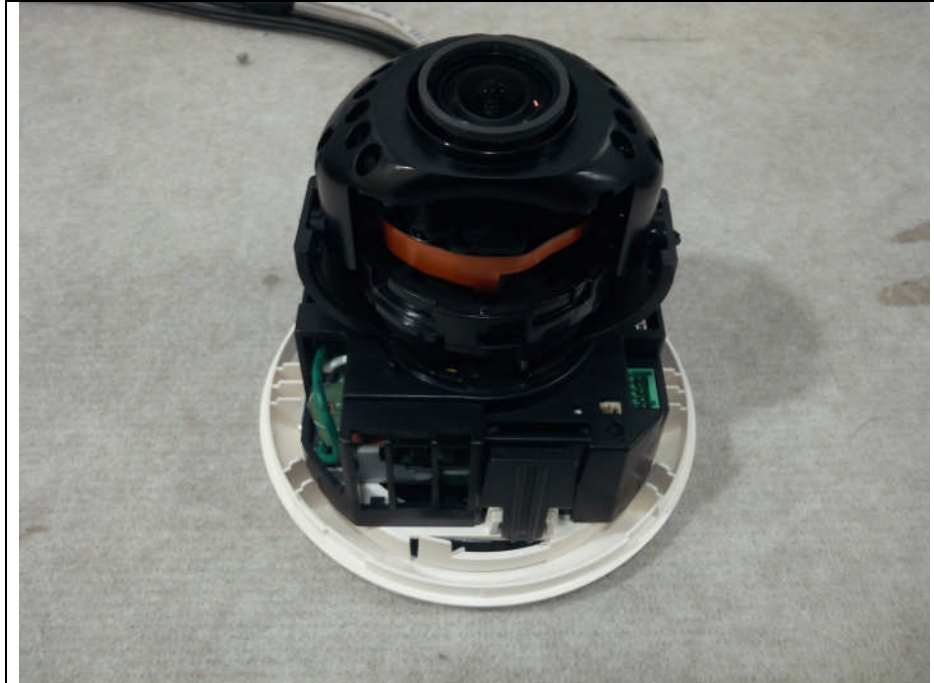
Label



**FCC Label Location**

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

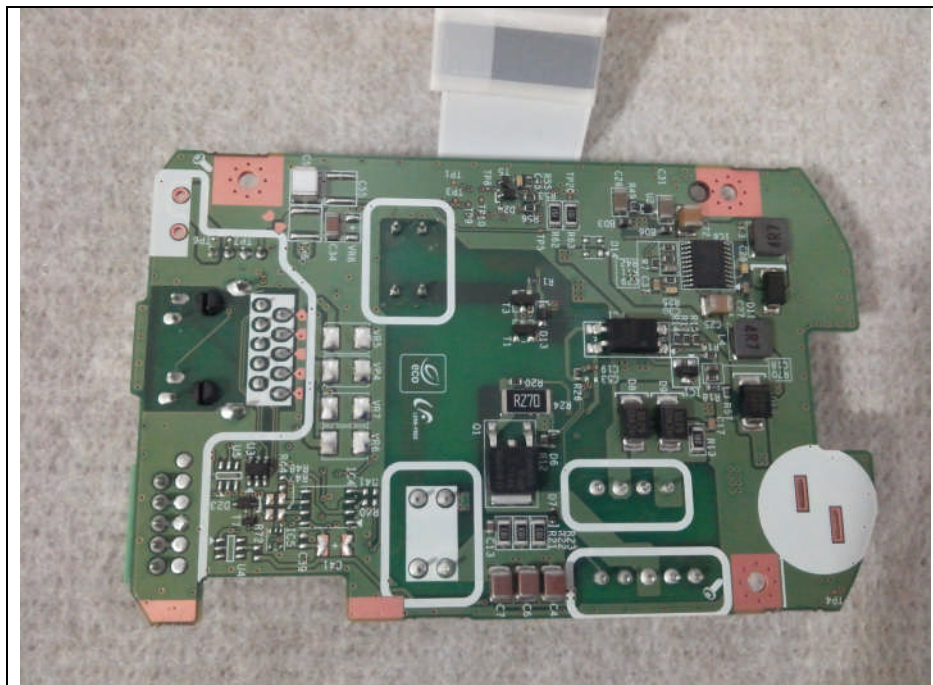
Inside



Main Board





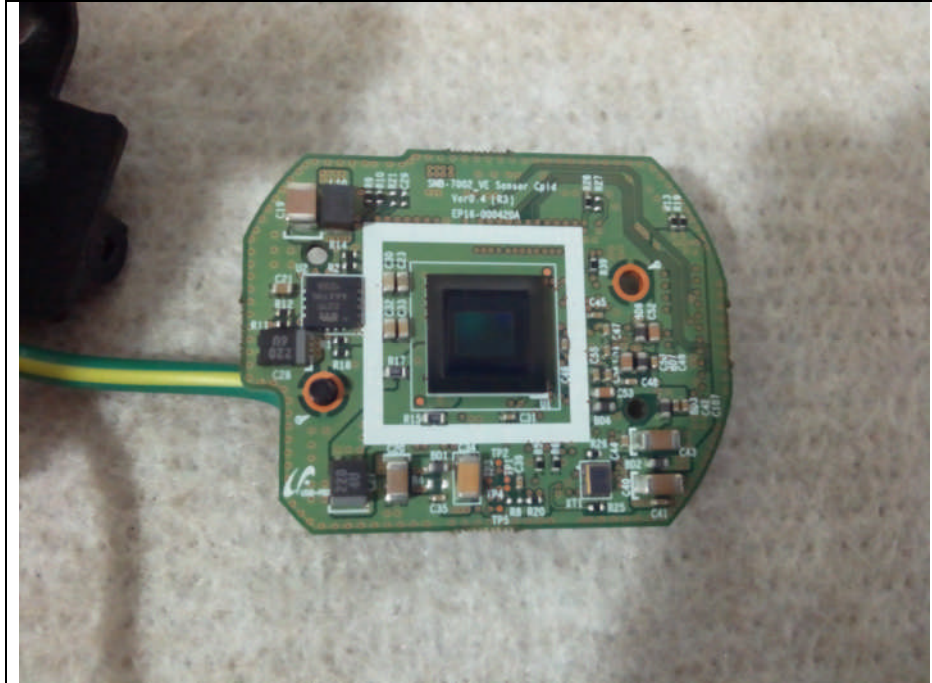


Lens



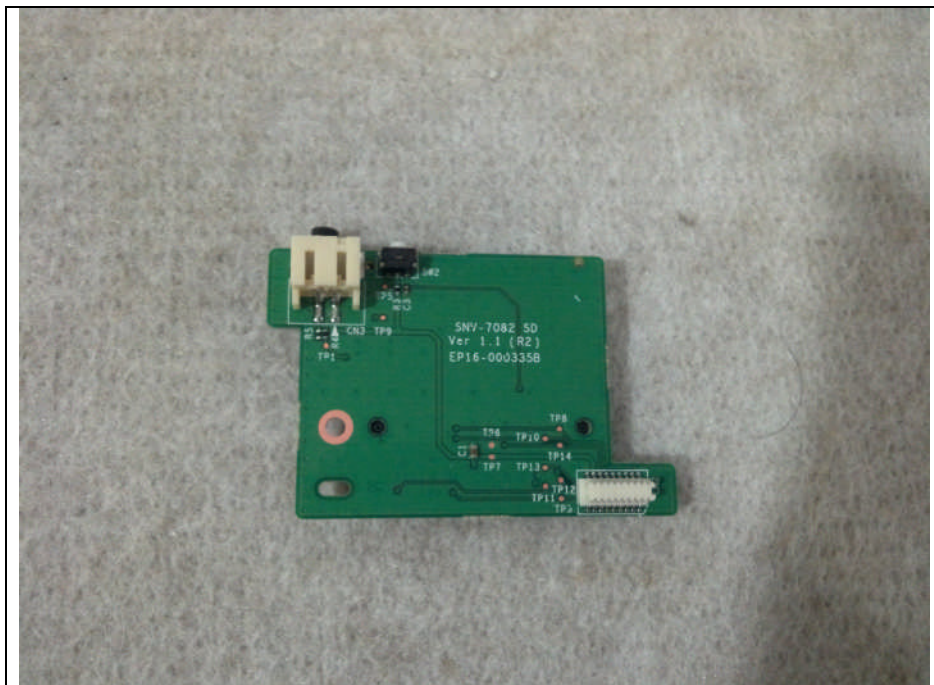
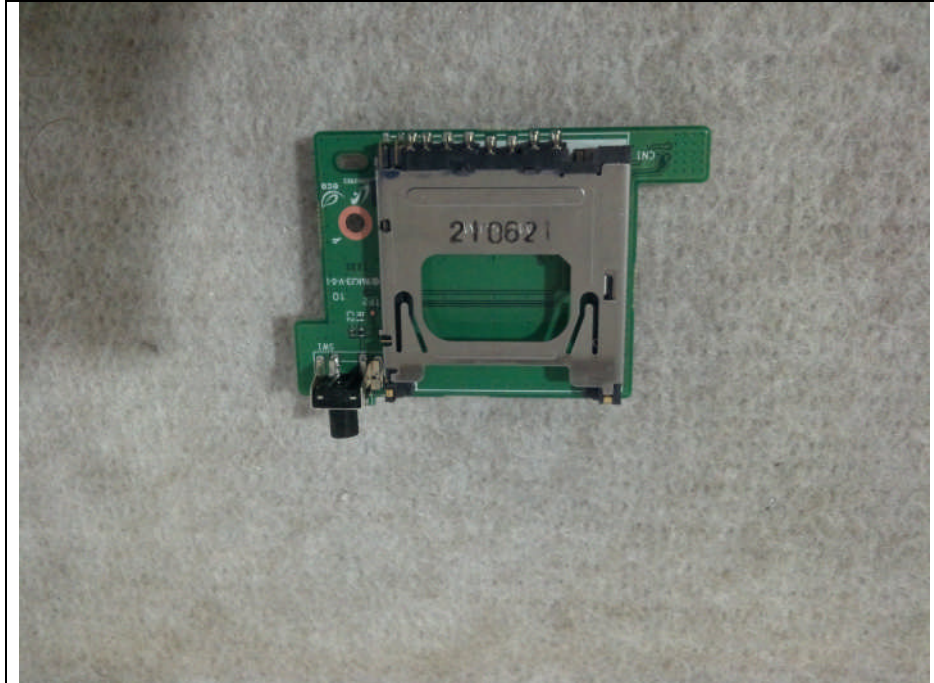


Lens Board





SD Card Board



Cable

