CERTIFICATE of EMC Compliance

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Report No:	**EMC-FCC-1341**
Type of equipment:	**NETWORK CAMERA**
Model Name:	**SND-1011N**
Applicant:	**Samsung Techwin Co., Ltd.**
Address:	**#42 Seongju-Dong, Changwon-Shi, Kyungsangnam-Do, Korea**
Manufacturer#1 :	**Samsung Techwin Co., Ltd.**
Address:	**#42 Seongju-Dong, Changwon-Shi, Kyungsangnam-Do, Korea**
Manufacturer#2 :	**TIANJIN SAMSUNG TECHWIN OPTO-ELECTRONIC CO., LTD**
Address:	**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.



Yeom, Han-Seok/ Manager

Laboratory

EMC compliance Ltd.
480-5 Sin-dong, Yeongtong-gu,
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EMI TEST REPORT

Test report No.:	**EMC-FCC-1341**
Type of Equipment:	**NETWORK CAMERA**
Model Name:	**SND-1011N**
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**
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: 2011. 08. 03

Date of testing: 2011. 08. 08 Issued date: 2011. 08. 10

Tested by: CHO, MOON-SUP

Approved by: YEOM, HAN-SEOK

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1. Applicant information

Applicant: Samsung Techwin Co., Ltd.
Address: #42 Seongju-Dong, Changwon-Shi,
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Fax: +82-31-277-2784
E-mail: js2002.kang@samsung.com
Contact name: **Kang Jei Soon**

Manufacturer#1: Samsung Techwin Co., Ltd.
Address: #42 Seongju-Dong, Changwon-Shi,
Kyungsangnam-Do, Korea
Telephone: +82-70-7147-8361
Fax: +82-31-277-2784
E-mail: js2002.kang@samsung.com
Contact name: **Kang Jei Soon**

Manufacturer#2: TIANJIN SAMSUNG TECHWIN OPTO-ELECTRONIC CO., LTD
Address: No.11 Weiliu Road. Micro-Electronic Industrial Park
Jingang Road Tianjin 300385, China

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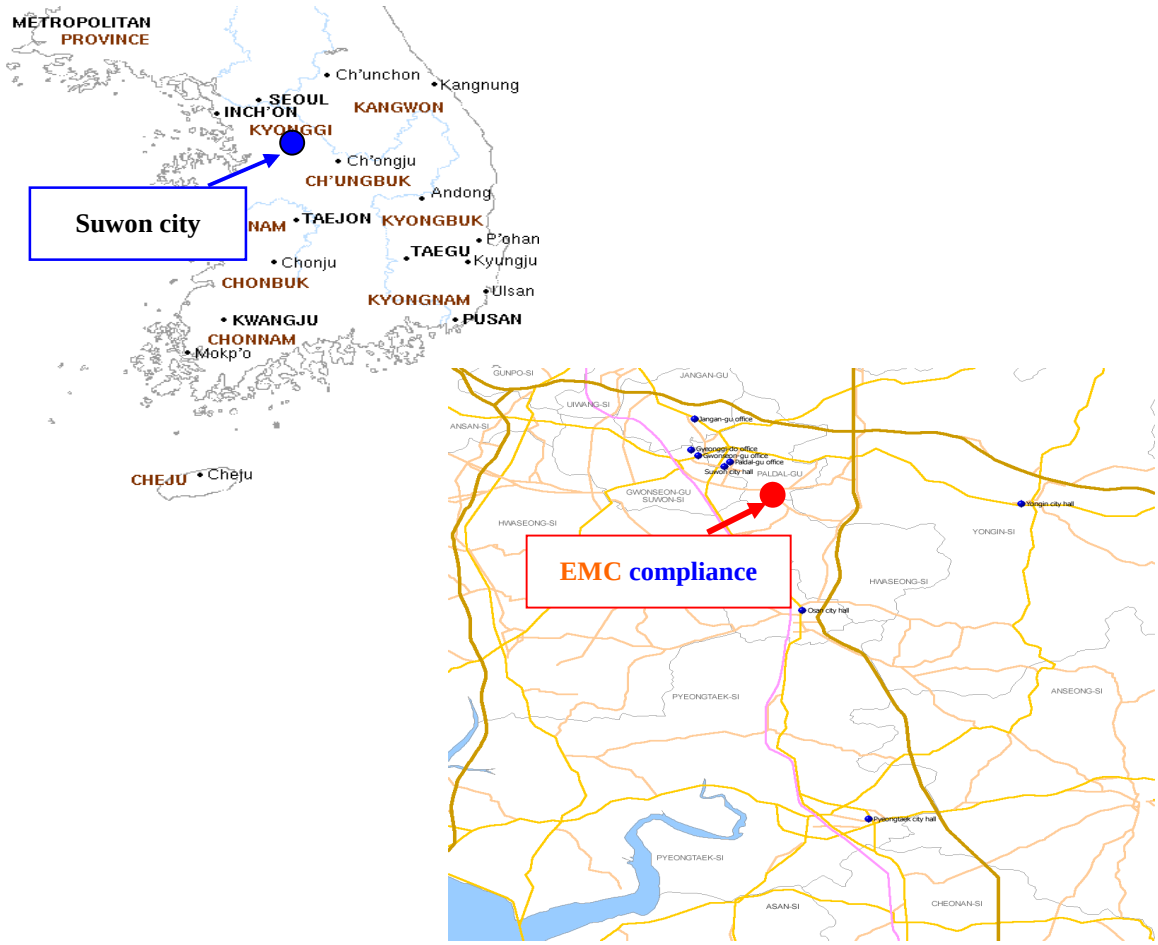
2. Laboratory information

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 31 336 4767

FCC CAB.: KR0040
VCCI Registration No. : R-3327, G-198, C-3706, T-1849
Industry Canada Registration No. : 8035A
KOLAS NO.: 231

SITE MAP



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3. Test system configuration

3.1 Operation environment

		Temperature	Humidity	Pressure
Chamber(10 m)	:	25 °C	48 % R.H.	-

Test site

These testing items were performed following locations;

Chamber (10 m) : Radiated Emission (Test distance: 10 m, 3m)

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.

Radiated Emission measurement :(k = 2, 95 %)

30 ㎒ ~ 300 ㎒: 3 m: ± 4.3 [dB]

10 m: ± 4.3 [dB]

300 ㎒ ~ 1 000 ㎒: 3 m: ± 4.4 [dB]

10 m: ± 4.3 [dB]

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4. Description of E.U.T.

4.1 General information

	SND-1011N
Video	
Imaging Device	1/4" PS CMOS
Total Pixels	680(H) x 512(V)
Effective Pixels	640(H) x 480(V)
Scanning System	Progressive
Min. Illumination	0.7lux(F1.2)
S / N Ratio	50dB
Video Out	DIP Connector, for installation
Lens	
Focal Length (Zoom Ratio)	3mm Fixed
Max. Aperture Ratio	F2.0
Angular Field of View	TBD
Min. Object Distance	40cm (0.4m)
Focus Cotrol	-
Zoom Movement Speed	-
Lens Type	-
Mount Type	Board type
Pan / Tilt / Rotate	
Pan Range	0°~355°
Pan Speed	-
Tilt Range	17°~90°
Tilt Speed	-
Rotate Range	0°~355°
Preset	
Preset Accuracy	
Auto Tracking	
Operational	
Camera Title	Off / On (Displayed up to 15 characters)
Day & Night	Auto (S/W) / Color / B/W
Backlight Compensation	Off / BLC
Wide Dynamic Range	-
Contrast Enhancement	SSDR (Samsung Super Dynamic Range) (Off / On)
Digital Noise Reduction	SSNRIII (2D+3D Noise Filter) (Off / On)
Digital Image Stabilization	기능 지원 하지 않음
Motion Detection	Off / On (4 programmable zones)
Privacy Masking	Off / On (32ea 4 Points Polygonal)
Sens-up (Frame Integration)	Off / Auto (x2~x60)
Gain Control	Off / Low / Medium / High
White Balance	ATW / AWC / Manual / Indoor / Outdoor
Electronic Shutter Speed	Auto / A.FLK / Manual (x60~1/12000sec)
Digital Zoom	-
Flip / Mirror	Off / On
Intelligent Video Analytics	Face Detection
Alarm I/O	Input 1ea
Remote Control Interface	-
RS-485 Protocol	-

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Network	
Ethernet	RJ-45 (10/100BASE-T)
Video Compression Format	H.264, MJPEG
Resolution	<H.264> 4:3 Mode : 640x480 / 320x240 / 160x120 <MJPEG> 4:3 Mode : 640x480 / 320x240 / 160x120
Max. Framerate	Max. 30fps at all resolutions
Video Quality Adjustment	H.264 : Compression Level, Target Bitrate Level Control MJPEG : Quality Level Control
Bitrate Control Method	H.264 : CBR or VBR MJPEG : VBR
Streaming Capability	Multiple Streaming (Up to 10 Profiles)
Audio I/O	Mic/Line in , Line out
Audio Compression Format	G.711 u-law
Audio Communication	2-Way
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
Security	HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access Log 802.1X Authentication
Streaming Method	Unicast / Multicast
Max. User Access	10 users at Unicast Mode
Memory Slot	Micro SD/SDHC Memory Slot
ONVIF Conformance	Yes
Webpage Language	English, French, German, Spanish, Italian, Chinese, Korean, Russian, Japanese, Swedish, Denish, Portuguese, Turkish, Polish, Czech, Rumanian, Serbian, Dutch, Croatia, Hungary, Greek
Web Viewer	Supported OS : Windows XP / VISTA / 7, MAC OS Supported Browser : Internet Explorer 7.0 or Higher, Firefox Google Chrome, Apple Safari
Central Management Software	NET-i viewer
Environmental	
Operating Temperature / Humidity	-10°C ~ +50°C (+14°F ~ +122°F) / 20% ~%80 RH
Ingress Protection	-
Electrical	
Input Voltage / Current	12V DC, PoE(IEEE802.3af)
Power Consumption	TBD
Mechanical	
Color / Material	Ivory, Plastic
Dimension (WxHxD)	H83.7 x Ø107.6mm
Weight	280g

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4.2 Product description

Type of product	NETWORK CAMERA
Model name (Basic)	SND-1011N
Model name (Variant)	N/A
Difference	-
Trade name	-
Serial no	Engineering Sample
Testing voltage	DC 12 Ⅴ / PoE
Product rating	DC 12 Ⅴ / PoE
Internal clock ferquence	108 ㎒
Note	* AC/DC adaptor was not provided by the manufacturer. * PoE Switch was not provided by the manufacturer.

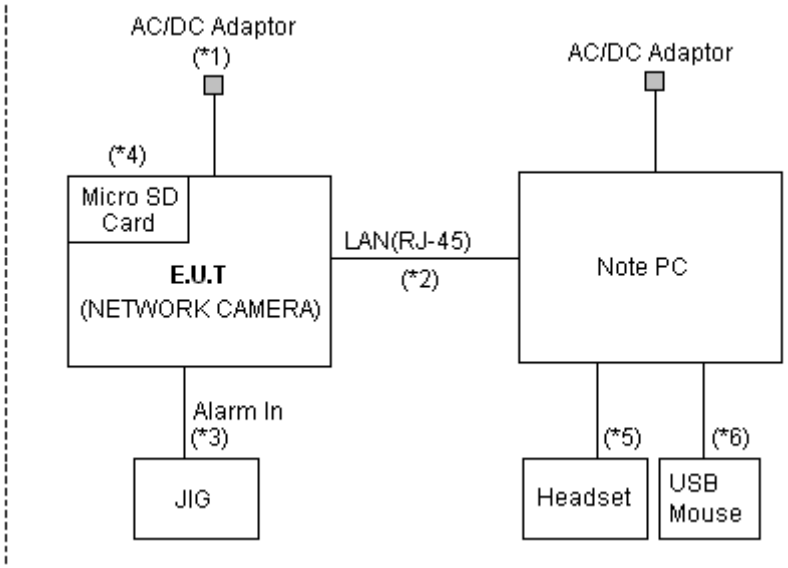
4.3 Auxiliary equipments

Type	Model / Part #	Serial number	Manufacturer
Note PC	C1321	472680432036	FUJITSU
USB Mouse	1088	8165900106545	Microsoft
JIG	-	-	-
Headset	SHS-250V	-	SAMSUNG
Micro SD Card(2GB)	-	-	SANDISK
PoE Switch	FS108P	1DL2093R00C1C	NETGEAR
AC/DC Adaptor(DC12V)	DAD12050DKA	-	Dreem Electronic

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4.4 Test configuration

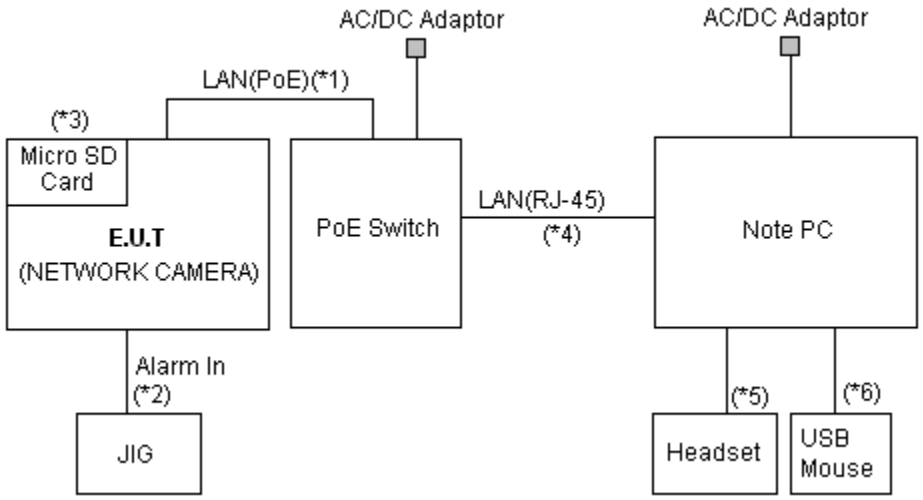
* AC/DC Adaptor (DC 12V)



Note	Start		End		Cable		
*	Name	I/O port	Name	I/O port	Length (m)	Spec.	Cable
1	**EUT** (NETWORK CAMERA)	Power	AC/DC Adaptor	Power	1.6	Non-Shield	-
2		LAN(RJ-45)	Note PC	LAN(RJ-45)	3.0	Non-Shield	-
3		Alarm In	JIG	Alarm Out	3.0	Non-Shield	Out-door
4		Micro SD Slot	Micro SD Card	Micro SD Slot	Direct	-	-
5	Note PC	Headset	Headset	Headset	2.0	Non-Shield	-
6		USB	USB Mouse	USB	1.7	Shield	-

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* PoE



* Power supplied from PoE Switch*

Note *	Start		End		Cable		
	Name	I/O port	Name	I/O port	Length (m)	Spec.	Cable
1	**EUT** (NETWORK CAMERA)	LAN(PoE)	PoE Switch	LAN(PoE)	3.0	Non-Shield	-
2		Alarm In	JIG	Alarm Out	3.0	Non-Shield	Out-door
3		Micro SD Slot	Micro SD Card	Micro SD Slot	Direct	-	-
4	Note PC	LAN(RJ-45)	PoE Switch	LAN(RJ-45)	3.0	Non-Shield	-
5		Headset	Headset	Headset	2.0	Non-Shield	-
6		USB	USB Mouse	USB	1.7	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	Web viewer test mode.

* Note: 2 types of powers are available for the product, that are AC/AC adaptor (AC 24 Ⅴ),
AC/DC adaptor (DC 12 Ⅴ). Therefore, tests were performed for 2 different types of powers.

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5. Summary of test results

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

5.1 Modification to the E.U.T.

None

5.2 Summary of EMI emission test results

FCC Part 15 Subpart B (Class A)

ANSI C63.4 – 2009

Application	Test method	Test result
Conducted emission	ANSI C63.4 – 2009	N/A
Radiated emission - DC 12 Ⅴ, PoE	ANSI C63.4 – 2009	Complied

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6. Test results

6.1 Radiated Emission

Test specification	FCC Part 15, Section 15.109(g), Class A		
Test mode	Web viewer test mode.		
Date	2011. 08.08		
Testing voltage	DC 12 V / PoE		
Test facility	10 m Chamber (Test distance: 10m, 3m)		
Temperature (°C)	25 °C	Humidity (% R.H.)	48 % R.H.
Remarks	Complied 30 MHz ~ 1 GHz Minimum limit margin is 3.1 dB at 87.466 MHz. (DC 12 V) 1 GHz ~ 2 GHz Minimum limit margin is 23.8 dB at 1500.002 MHz. (DC 12 V_Average)		

6.1.1 Limits of radiated emission measurement

Frequency [MHz]	Class A (dB(μV/m)) @ 10 m	Class B (dB(μV/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.

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6.1.3 Used equipments

Equipment	Model no.	Serial no.	Makers	Next cal. date	Used
Test Receiver	ESCI	100710	R&S	11.12.01	☒
Bi-Log Antenna	VULB 9168	9168-440	SCHWARZBECK	13.07.08	☒
Amplifier	310N	293004	SONOMA INSTRUMENT	11.12.01	☒
3 dB Attenuator	8491A	27444	HP	11.11.30	☒
Antenna Mast	MA4000-EP	303	Innco Systems	-	☒
Turn Table	DT2000S-1t	079	Innco Systems	-	☒
Amplifier	8449B	3008A01802	AGILENT	12.05.11	☒
Horn ANT	3115	00086706	ETS	11.12.22	☒
Spectrum Analyzer	FSP7	100289	R&S	11.12.17	☒

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:

Result = M.R + C.F(A.F + C.L +3 dB Att – 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

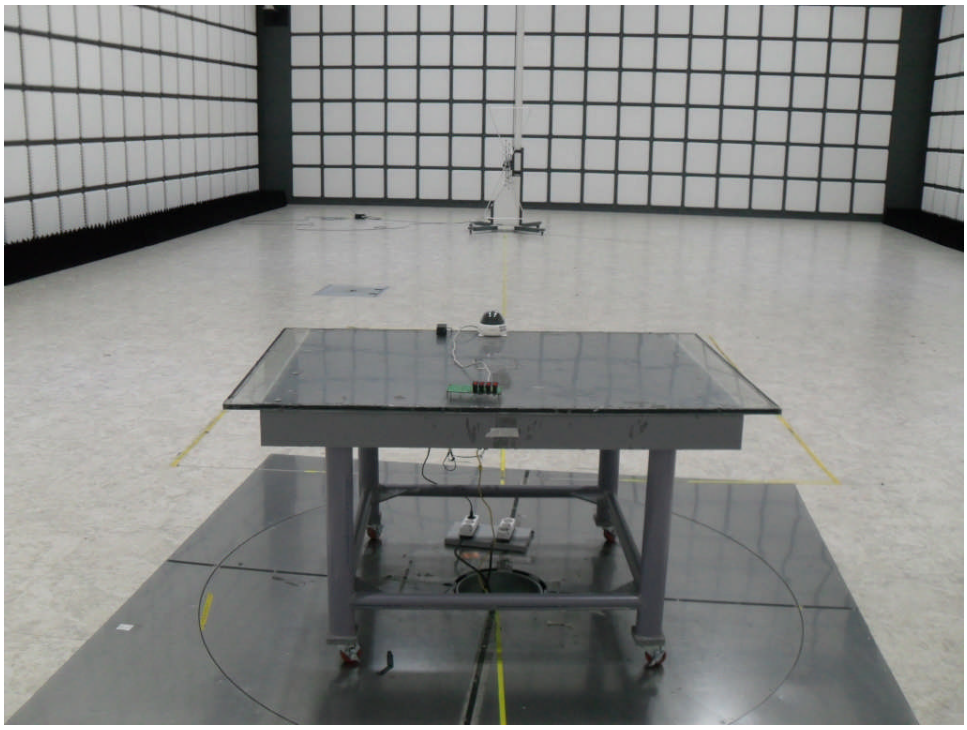
The result is 30 + 12 + 5 + 3 – 35 = 15 dB(μV/m)

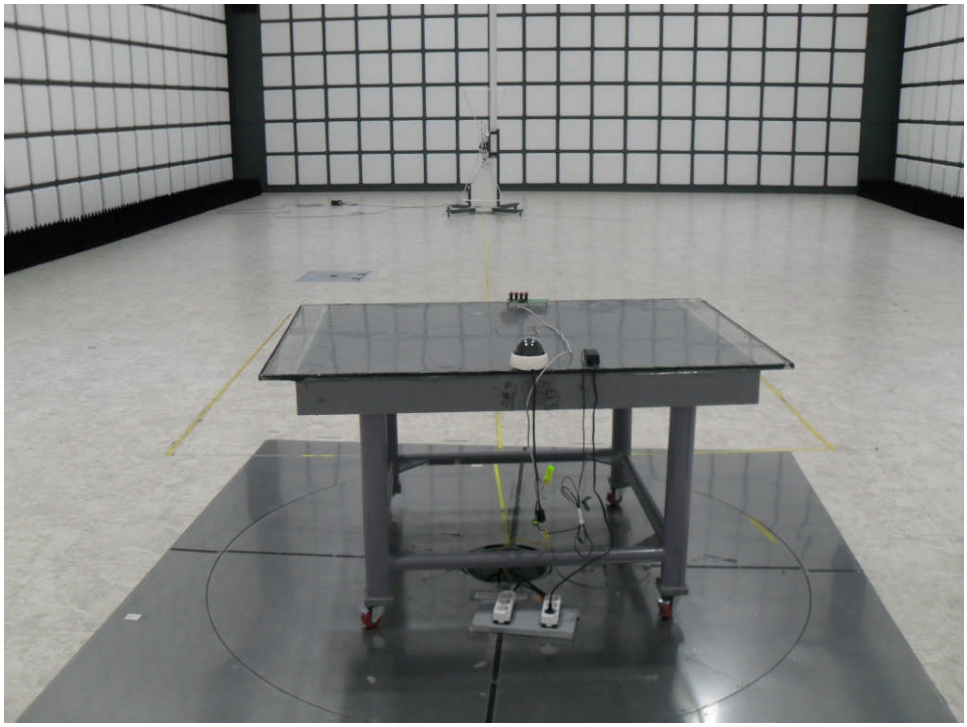
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6.1.5 Photographs of test setup

* 30 ㎒ ~ 1 ㎓

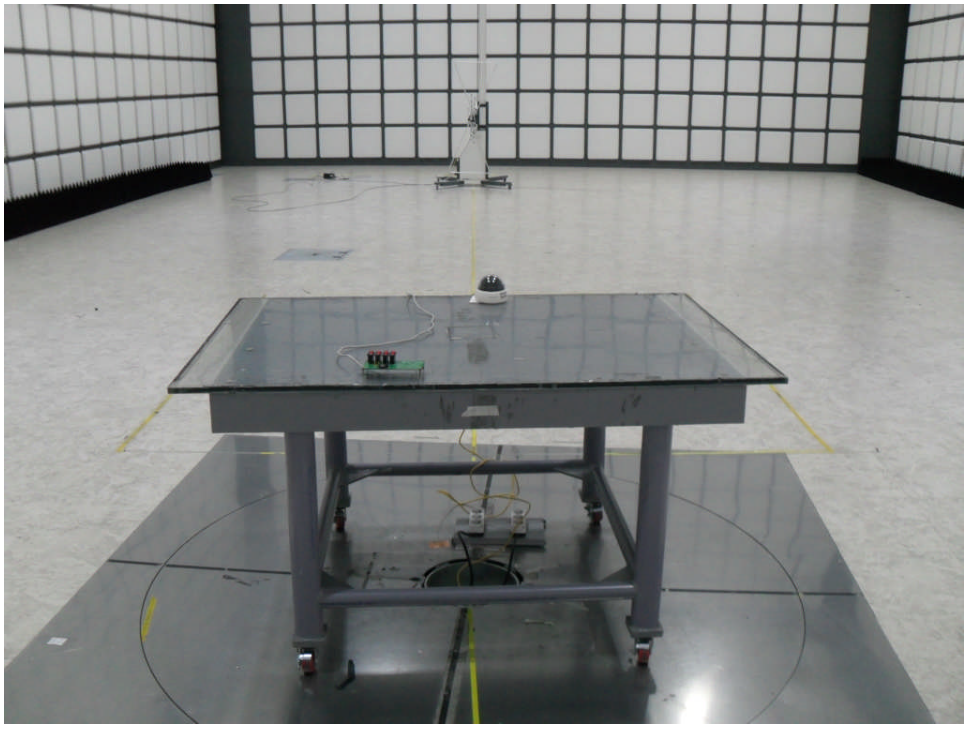
* DC 12 V

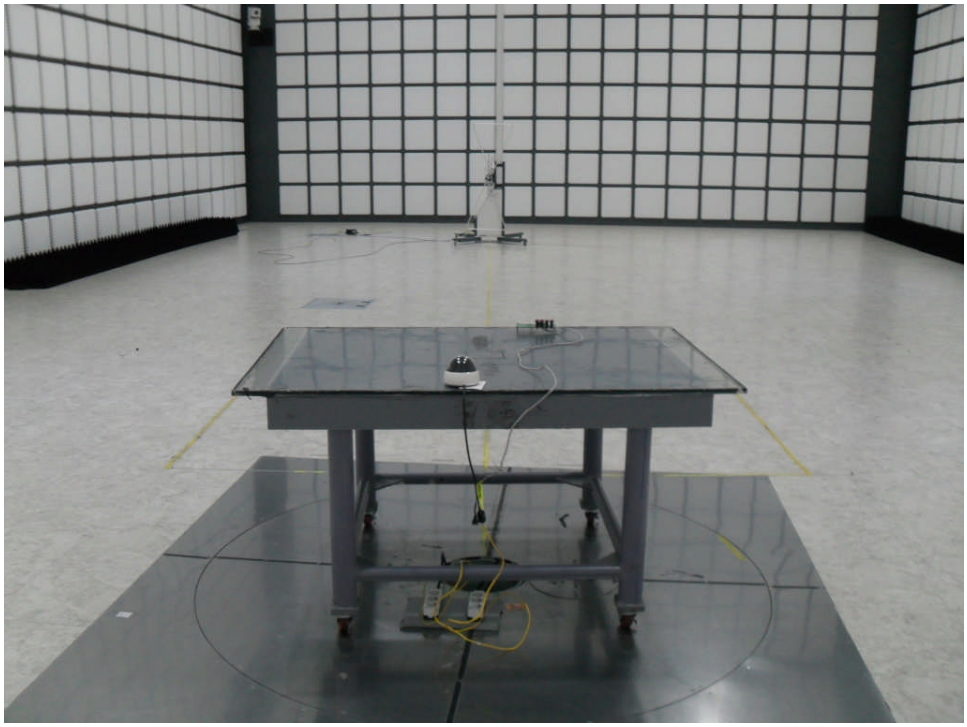




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* PoE

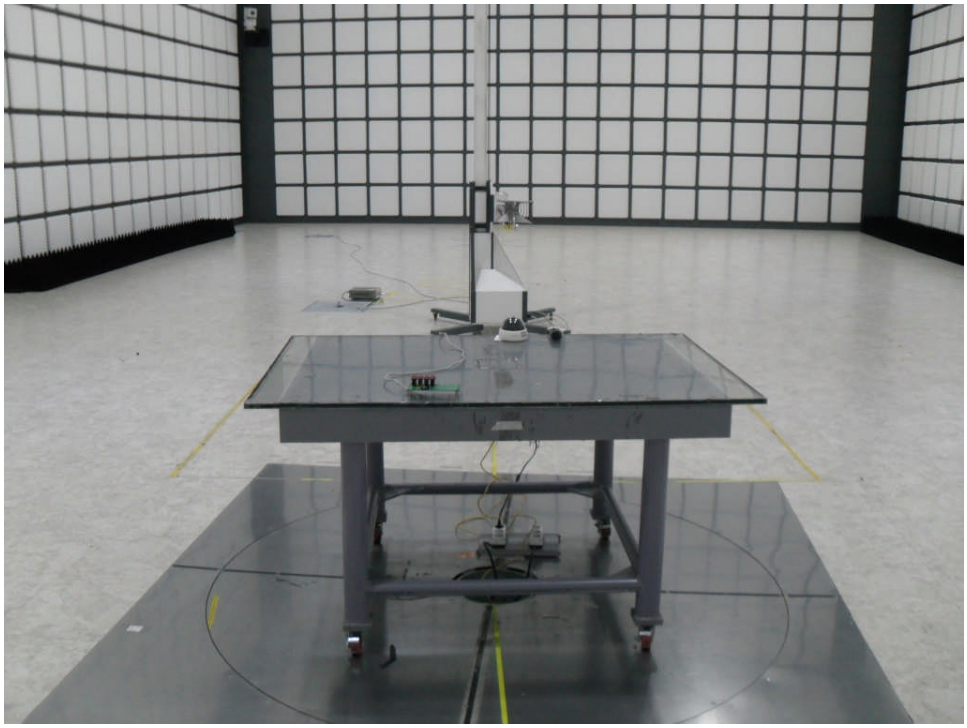


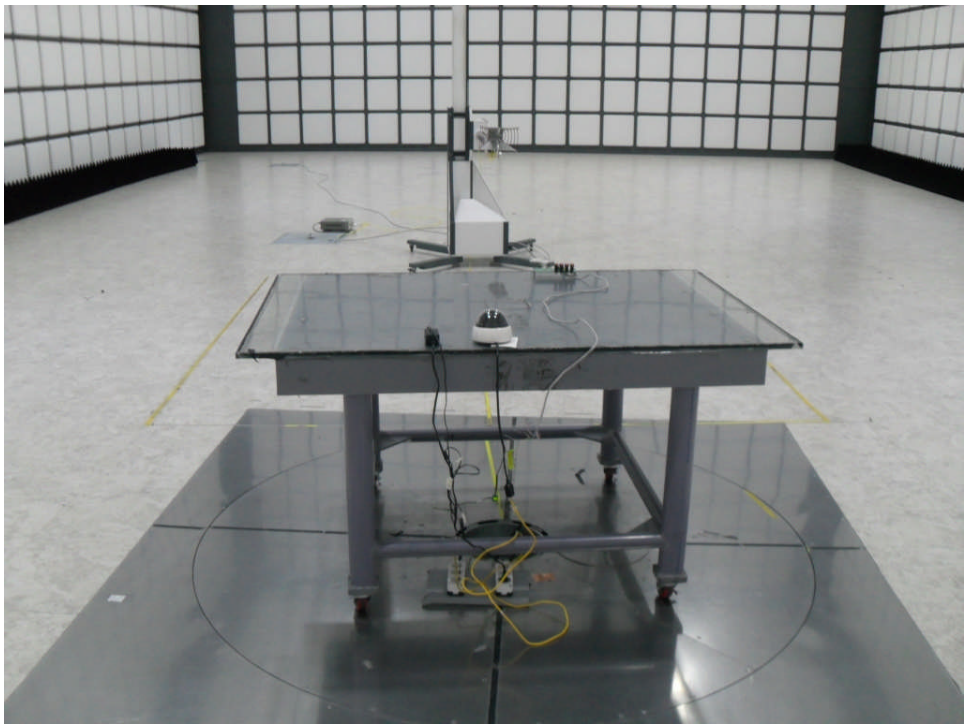


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* 1 ㎓ ~ 2 ㎓

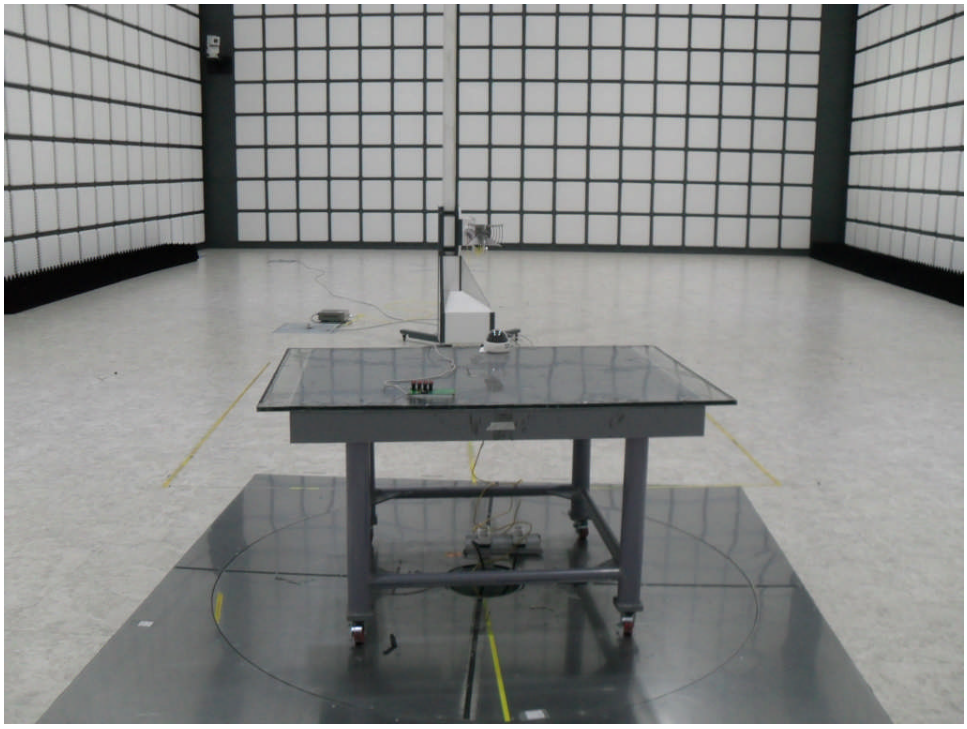
* DC 12 V

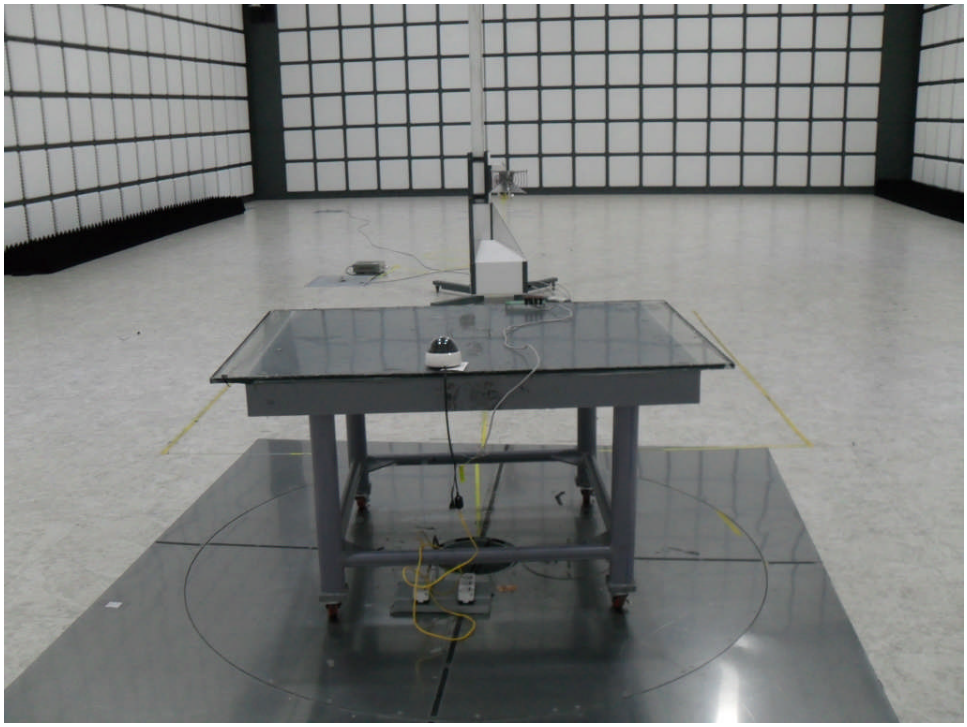




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* PoE





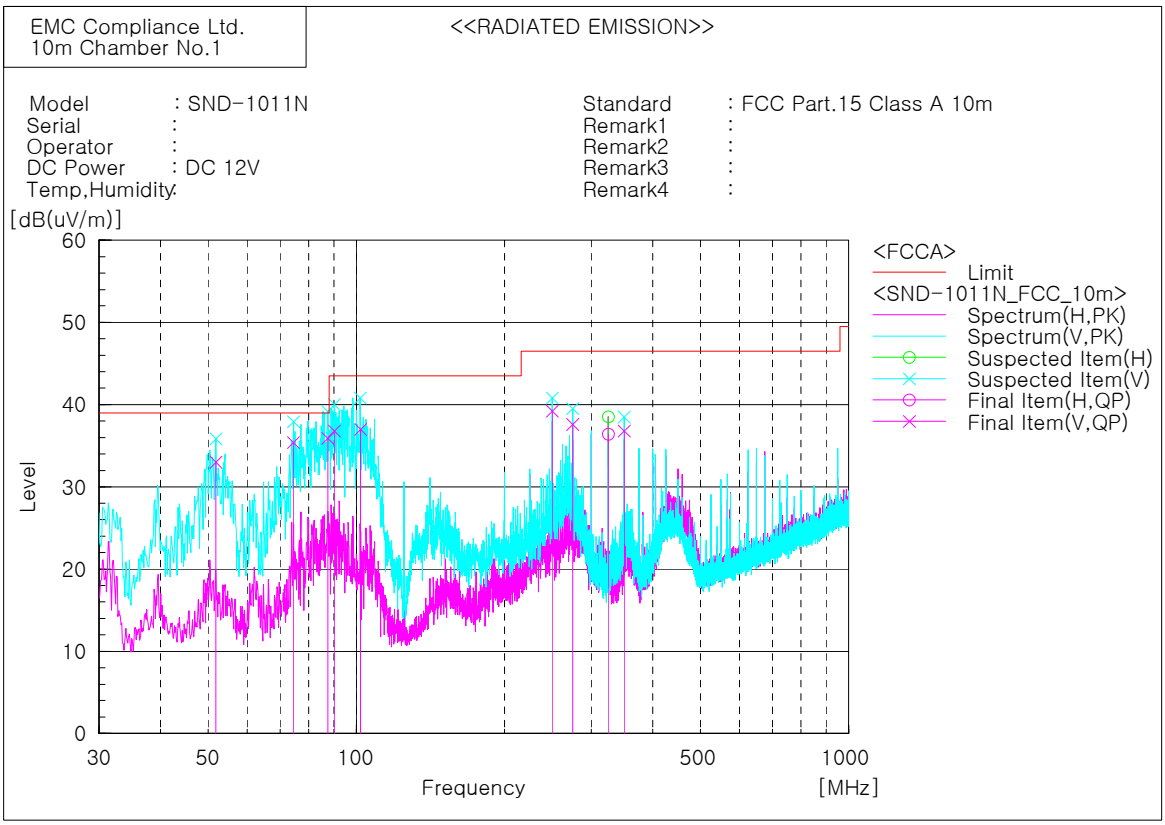
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6.1.6 Radiated emission measurement result

*** Graph and Data**

* 30 ㎒ ~ 1 ㎓

* DC 12 V

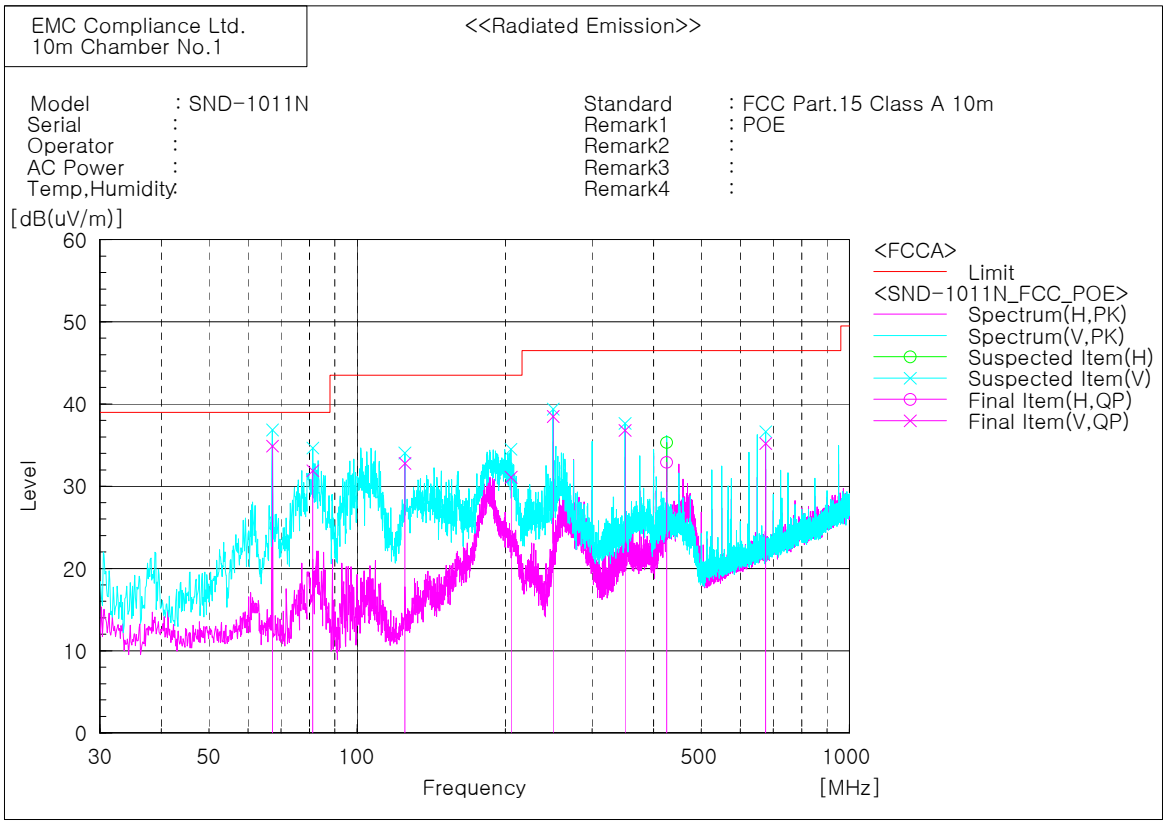


Final Result

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]
1	51.846	V	47.5	-14.5	33.0	39.0	6.0	199.0	84.2
2	74.485	V	53.1	-17.7	35.4	39.0	3.6	199.0	213.9
3	87.466	V	53.9	-18.0	35.9	39.0	3.1	199.0	276.1
4	90.250	V	54.7	-17.9	36.8	43.5	6.7	199.0	269.6
5	101.952	V	53.9	-16.9	37.0	43.5	6.5	199.0	300.7
6	250.019	V	52.8	-13.6	39.2	46.5	7.3	100.0	182.5
7	275.049	V	50.3	-12.7	37.6	46.5	8.9	199.0	194.5
8	325.049	H	47.4	-11.0	36.4	46.5	10.1	302.0	39.3
9	349.978	V	47.1	-10.3	36.8	46.5	9.7	100.0	230.5

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* PoE



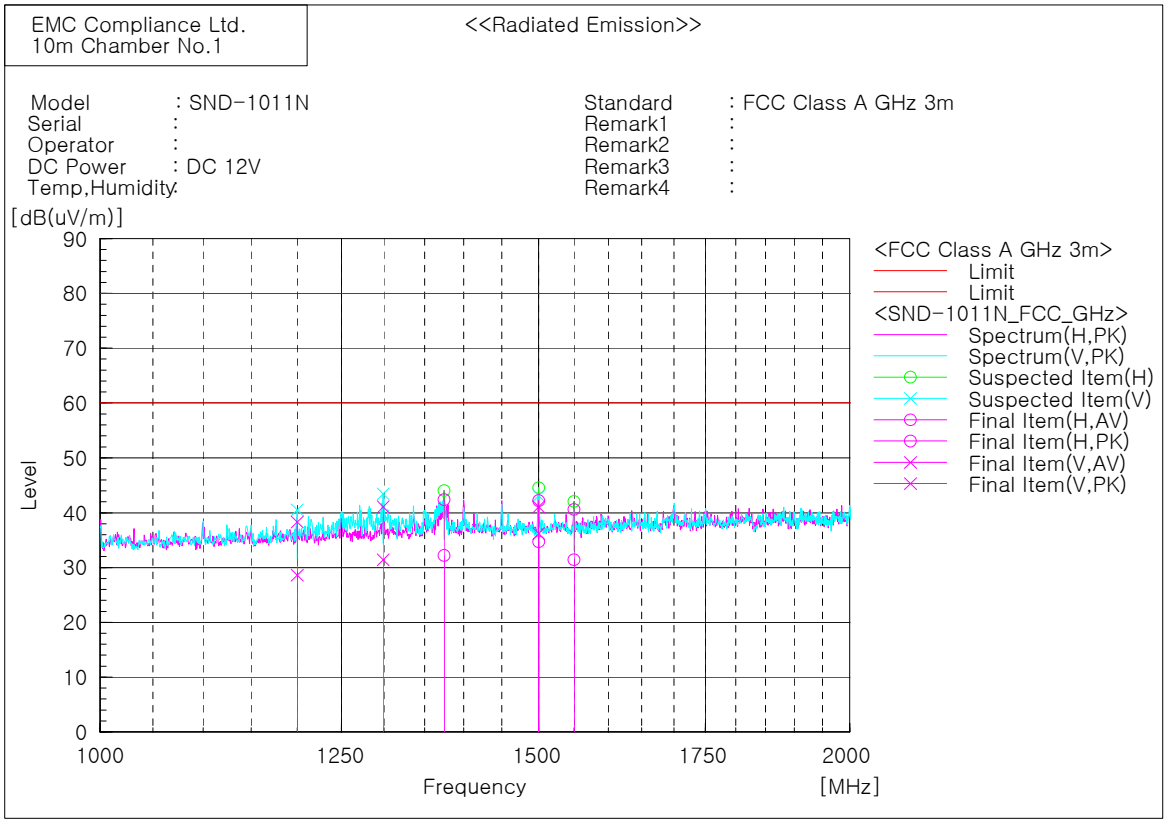
Final Result

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]
1	67.249	V	51.2	-16.3	34.9	39.0	4.1	100.0	24.5
2	81.158	V	50.1	-18.2	31.9	39.0	7.1	100.0	174.4
3	124.987	V	47.1	-14.3	32.8	43.5	10.7	100.0	236.7
4	205.249	V	47.1	-16.0	31.1	43.5	12.4	100.0	130.3
5	250.050	V	52.1	-13.6	38.5	46.5	8.0	100.0	162.8
6	349.987	V	47.1	-10.3	36.8	46.5	9.7	100.0	200.4
7	425.049	H	41.1	-8.2	32.9	46.5	13.6	301.0	88.1
8	675.049	V	37.8	-2.6	35.2	46.5	11.3	198.0	219.3

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* 1 ㎓ ~ 2 ㎓

* DC 12 V



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]
1	1200.001	V	39.9	49.6	-11.3	28.6	38.3	60.0	80.0	31.4	41.7	100.0	126.4
2	1299.155	V	41.9	51.6	-10.5	31.4	41.1	60.0	80.0	28.6	38.9	100.0	55.9
3	1374.575	H	42.1	52.3	-9.9	32.2	42.4	60.0	80.0	27.8	37.6	100.0	100.3
4	1500.002	V	45.1	50.0	-8.9	36.2	41.1	60.0	80.0	23.8	38.9	100.0	282.3
5	1500.002	H	43.6	51.1	-8.9	34.7	42.2	60.0	80.0	25.3	37.8	100.0	346.7
6	1550.049	H	40.0	49.2	-8.6	31.4	40.6	60.0	80.0	28.6	39.4	100.0	346.7

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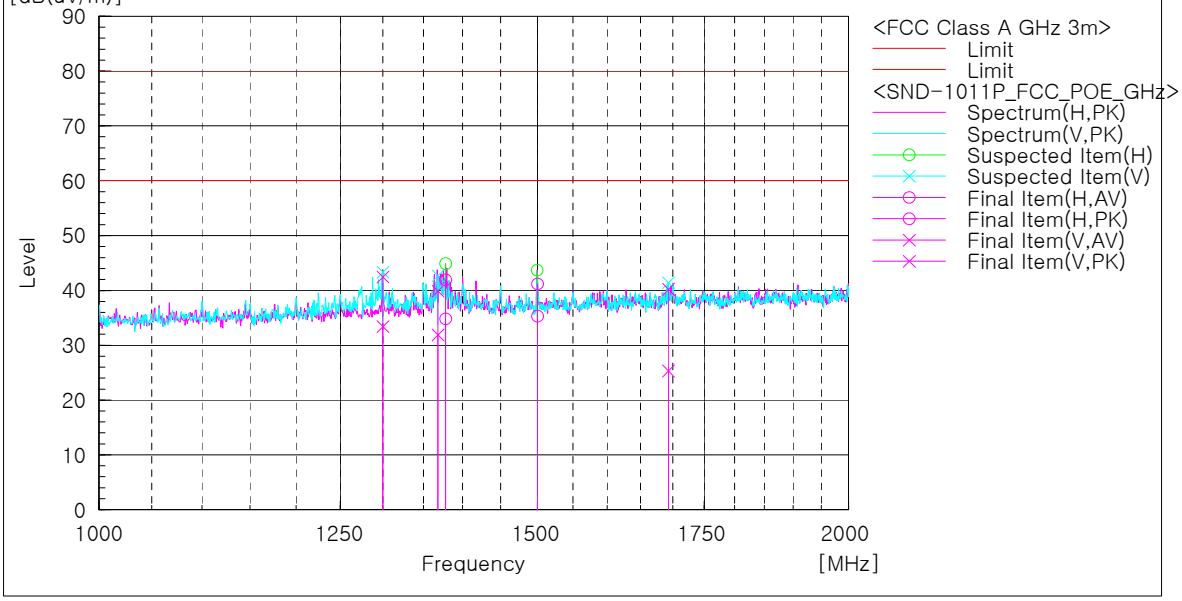
* PoE

EMC Compliance Ltd.
10m Chamber No.1

<<Radiated Emission>>

Model : SND-1011N
Serial :
Operator :
AC Power : POE
Temp,Humidity:

Standard : FCC Class A GHz 3m
Remark1 :
Remark2 :
Remark3 :
Remark4 :



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]
1	1300.023	V	43.9	53.0	-10.5	33.4	42.5	60.0	80.0	26.6	37.5	100.0	54.4
2	1368.125	V	41.8	49.8	-9.9	31.9	39.9	60.0	80.0	28.1	40.1	100.0	2.9
3	1378.190	H	44.7	51.8	-9.9	34.8	41.9	60.0	80.0	25.2	38.1	100.0	119.9
4	1500.015	H	44.2	50.1	-8.9	35.3	41.2	60.0	80.0	24.7	38.8	100.0	347.2
5	1693.149	V	32.9	47.8	-7.6	25.3	40.2	60.0	80.0	34.7	39.8	100.0	280.9

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7. E.U.T. photographs

Front View



Rear View



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Left View

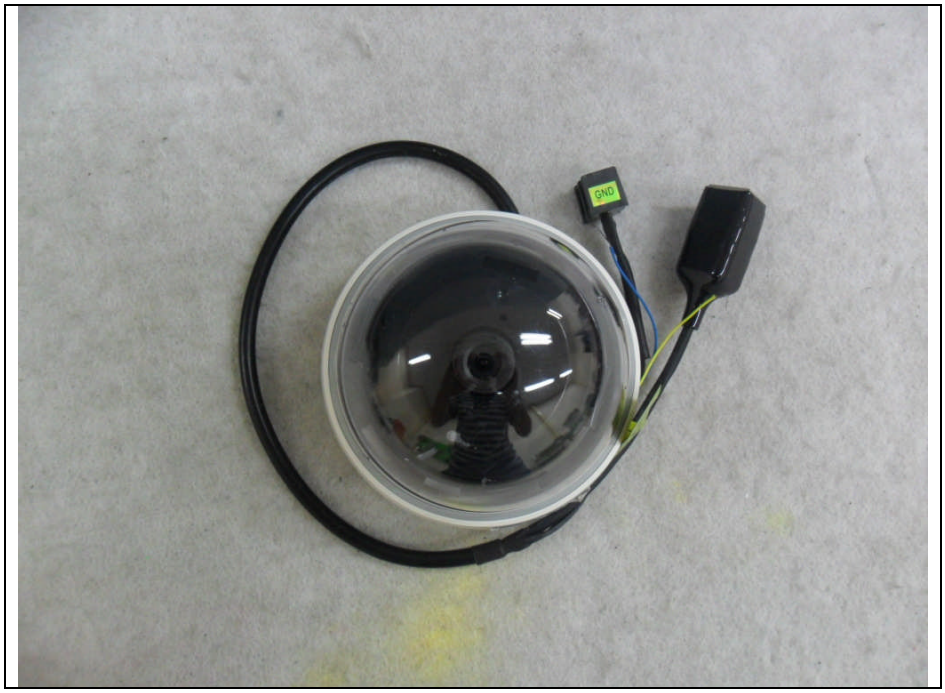


Right View

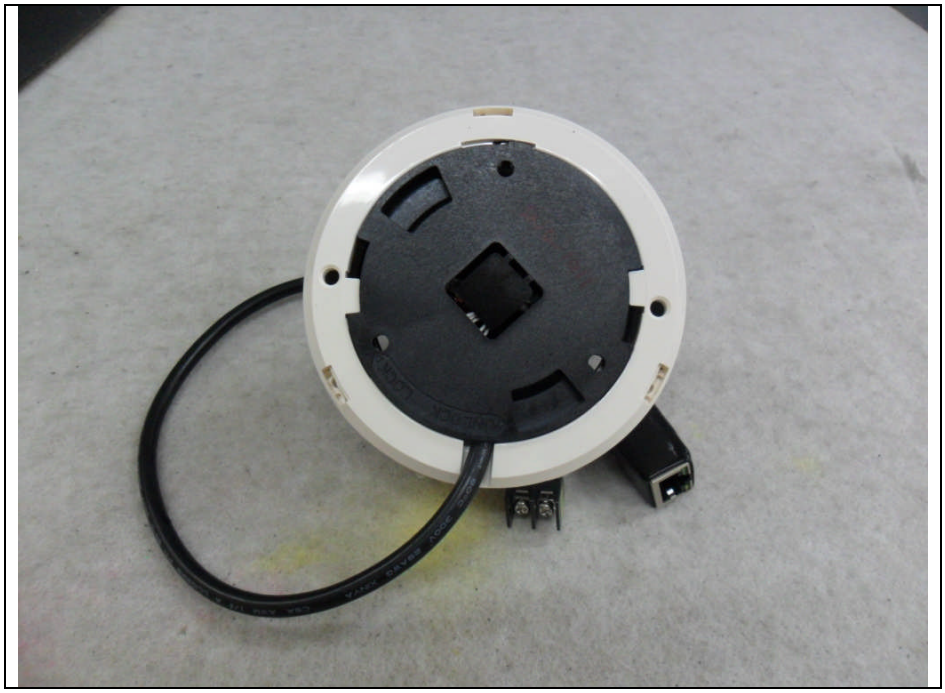


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Top View

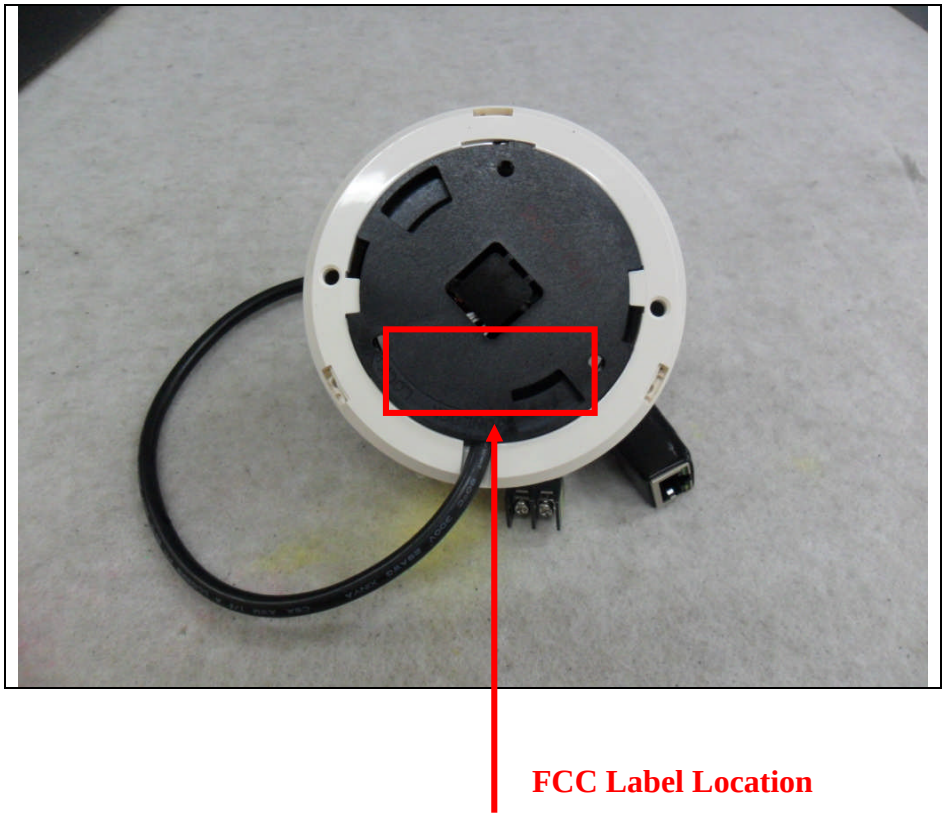


Bottom View



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Label



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.

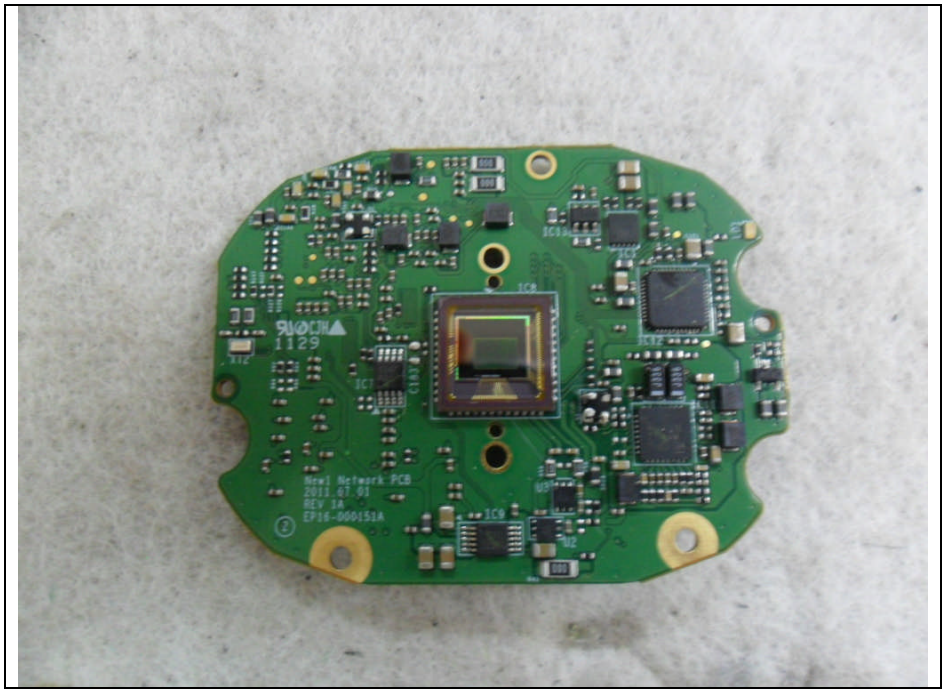
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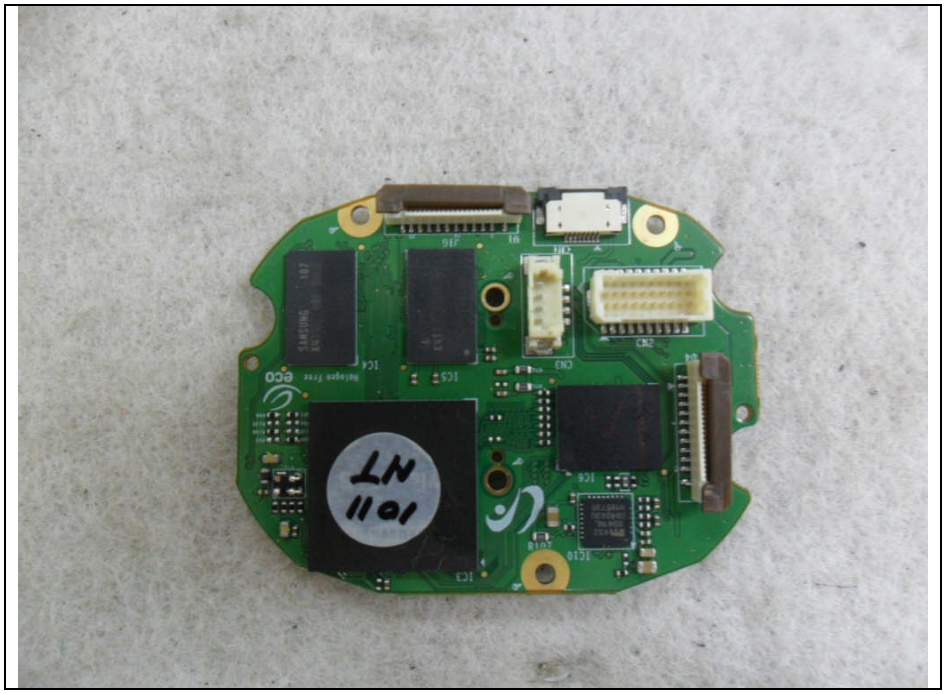
Inside



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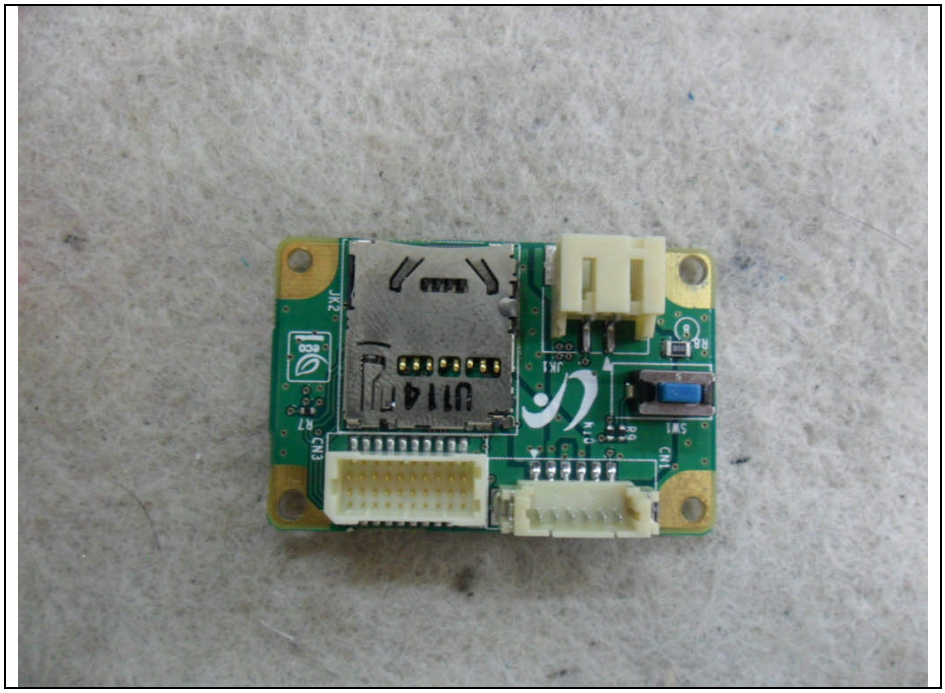
CCD Board

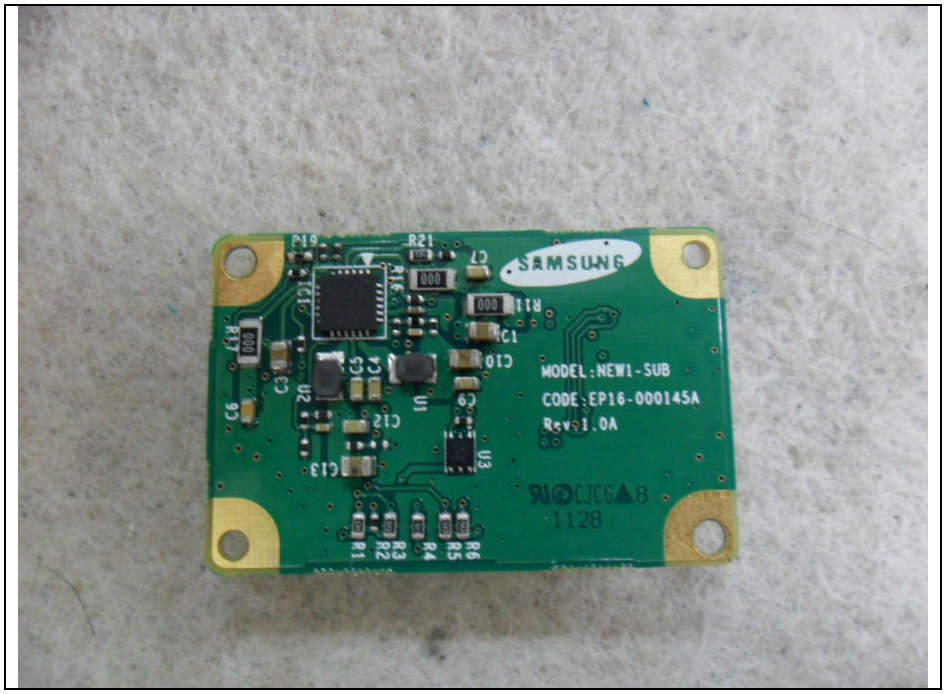




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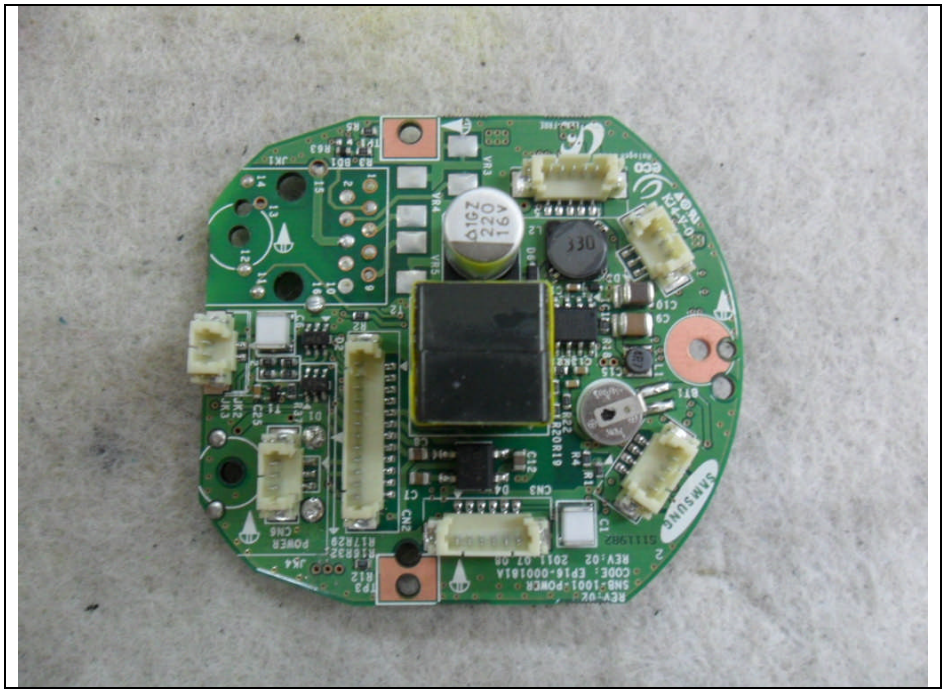
NEW1-Sub Board

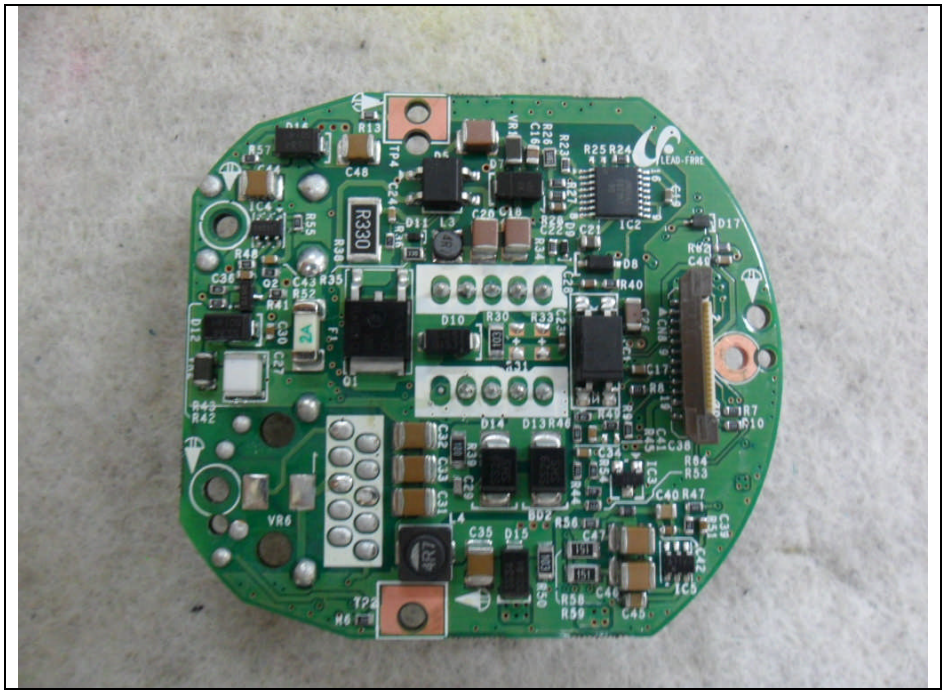




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Power Board





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