CERTIFICATE of EMC Compliance

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Report No	:	**EMC-FCC-1827**
Type of equipment	:	**Network Camera**
Model Name	:	**SND-6084N**
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.

Yeom, Han-Seok/ Manager

Laboratory

EMC compliance Ltd.
480-5 Sin-dong, Yeongtong-gu,
Suwon-city, Gyeonggi-do, 443-390, Korea

Tel: 82 31 336 9919
Fax: 82 505 299 8311

EMI TEST REPORT

Test report No	:	**EMC-FCC-1827**
Type of Equipment	:	**Network Camera**
Model Name	:	**SND-6084N**
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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**
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: 2013. 02. 05

Date of testing: 2013. 02. 14 ~ 02. 15

Issued date: 2013. 02. 20

Tested by: PARK, GUN-SU

Approved by: YEOM, HAN-SEOK

Contents

1. Applicant information

Applicant: 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#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

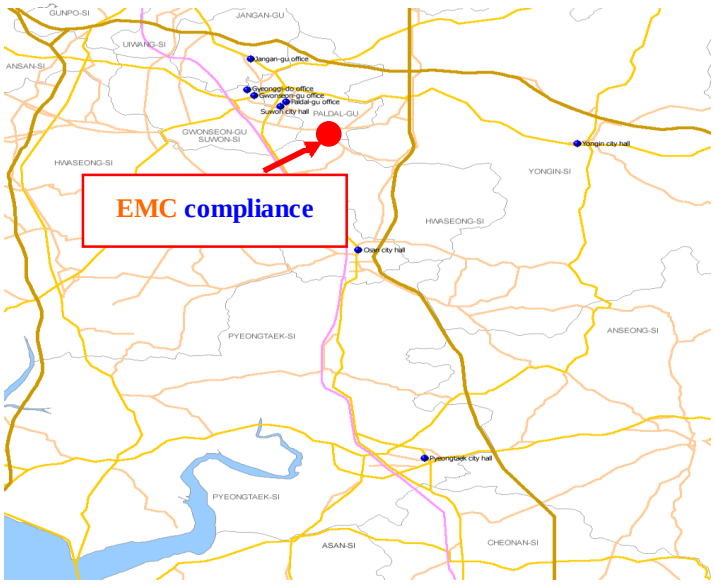
2. Laboratory information

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)	:	22 ~ 23 °C	29 ~ 30 % 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 ㎑ ~ 150 ㎑: ± 3.82 dB 150 ㎑ ~ 30 ㎒: ± 3.43 dB	
Shielded Room (CE#2)	9 ㎑ ~ 150 ㎑: ± 3.82 dB 150 ㎑ ~ 30 ㎒: ± 3.43 dB	
Shielded Room (CE#3)	9 ㎑ ~ 150 ㎑: ± 4.00 dB 150 ㎑ ~ 30 ㎒: ± 3.63 dB	
Radiated Emission measurement (C.L: Approx 95 %, k = 2)		
10 m Chamber (#F4)	30 ㎒ ~ 300 ㎒	3 m: + 4.56 dB, - 4.58 dB 10 m: + 4.56 dB, - 4.56 dB
	300 ㎒ ~ 1 000 ㎒	3 m: + 4.84 dB, - 4.85 dB 10 m: + 4.71 dB, - 4.72 dB
	1 ㎓ ~ 6 ㎓	3 m: + 6.19 dB, - 6.20 dB
	6 ㎓ ~ 18 ㎓	3 m: + 6.41 dB, - 6.53 dB
10 m Chamber (#F2)	30 ㎒ ~ 300 ㎒	3 m: + 4.86 dB, - 4.88 dB 10 m: + 4.86 dB, - 4.86 dB
	300 ㎒ ~ 1 000 ㎒	3 m: + 4.98 dB, - 4.99 dB 10 m: + 4.85 dB, - 4.87 dB
	1 ㎓ ~ 6 ㎓	3 m: + 6.19 dB, - 6.20 dB
	6 ㎓ ~ 18 ㎓	3 m: + 6.41 dB, - 6.53 dB

4. Description of E.U.T.

4.1 General information

Video	
Imaging Device	1/2.8" PS Exmor 2.38M CMOS (IMX136)
Total Pixels	1952(H) x 1116(V)
Effective Pixels	1944(H) x 1104(V)
Scanning System	Progressive
Min. Illumination	Color : 0.1 Lux (F1.2, 50IRE), 0.0017Lux (30fps 2sec, 50IRE) B/W : 0.01 Lux (F1.2, 50IRE)
S / N Ratio	50dB
Video Out	CVBS : 1.0 Vp-p / 75Ω composite, 720x480(N), 720x576(P), for installation - DIP connector type
Lens	
Focal Length (Zoom Ratio)	3~ 8.5mm (2.8X) Motorized Varifocal
Max. Aperture Ratio	F1.2
Angular Field of View	H: 105.5°(Wide)~37.1°(Tele), V: 57.5°(Wide)~21.0°(Tele)
Min. Object Distance	0.5m
Focus Control	Simple Focus (Motorized V/F) / Manual - Remote control via network, Button control (Manual, Simple Focus)
Lens Type	DC Auto Iris
Mount Type	Board-in type
Pan / Tilt / Rotate	
Pan Range	0 ° ~ +354 °
Tilt Range	0 ° ~ +67 °
Rotate Range	0 ° ~ +355 °
Operational	
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	100dB↑
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 (4ea 4 Points Polygonal zones)
Privacy Masking	Off / On (32 Zones with 4 Points of Polygonal)
Gain Control	Off / Low / Middle / High
White Balance	ATW / AWC / Manual / Indoor / Outdoor
Electronic Shutter Speed	Minimum / Maximum / Anti flicker (2 ~ 1/12,000sec)
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, Audio Detection, Face Detecton, Video Analytics, Alarm Input
Alarm events	File upload via FTP and E-Mail Notification via E-Mail, TCP and HTTP local storage(SD/SDHC/SDXC) recording at Network disconnected & Event (Alarm Triggers) External output

Network	
Ethernet	RJ-45 (10/100BASE-T)
Video Compression Format	H.264 (MPEG-4 Part 10/AVC), Motion JPEG
Resolution	1920x1080 / 1280x1024 /1280x960 / 1280x720 / 1024x768 / 800x600 / 800x450 / 640x480 / 640x360 / 320x240 / 320x180
Max. Framerate	H.264 : Max 60fps at all resolutions Motion JPEG : 1920x1080 / 1280x1024 /1280x960 / 1280x720 / 1024x768 : Max. 15 fps 800x600 / 800x450 / 640x480 / 640x360 / 320x240 / 320x180 : Max. 30fps
Video Quality Adjustment	H.264 : Compression Level, Target Bitrate Level Control MJPEG : Quality Level Control
Bitrate Control Method	H.264 : CBR or VBR, Motion JPEG : VBR
Streaming Capability	Multiple Streaming (Up to 10 Profiles)
Audio I/O	Mic(Line)-in Selectable via UI, Line-out (Mono, 1Vrms) 2.5VDC(4mA) powered 2K Ohm
Audio Compression Format	G.711 u-law /G.726 Selectable G.726 (ADPCM) 8KHz, G.711 8KHz 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 Digest Login Authentication IP Address Filtering User access Log 802.1x Authentication
Streaming Method	Unicast / Multicast
Max. User Access	15 users at Unicast Mode
Memory Slot	micro SD/SDHC/SDXC - motion Images recorded in the SDX/SDHC/SD memory card can be downloaded.
Application Programming Inter	ONVIF Profile S HTTP API v2.0 SVNP 1.2
Webpage Language	English, French, German, Spanish, Italian, Chinese, Korean, Russian, Japanese, Swedish, Denish, Portuguese, Turkish, Polish, Czech, Rumanian, Serbian, Dutch, Croatia, Hungary, Greek, Finnish, Norwegian
Web Viewer	Supported OS : Windows XP / VISTA / 7, MAC OS X 10.7 or Higher Supported Browser : Internet Explorer 7.0 or Higher, Firefox 9.0 or Higher, Chrome 15.0 or Higher, Safari 5.1 or Higher
Central Management Software	SmartViewer 4.0
Environmental	
Operating Temperature / Hum	-10°C ~ +55°C(+14°F ~ +131°F) / Less than 90% RH
Storage Temperature / Humidity	-30°C ~ +60°C (-22°F ~ +140°F) / Less than 90% RH
Electrical	
Input Voltage / Current	DC 12V, PoE (IEEE802.3af)
Power Consumption	PoE :11 MAX DC12V :9 MAX
Mechanical	
Color / Material	IVORY
Dimension (WxHxD)	D132.1 ,H107.6
Weight	505g

4.2 Product description

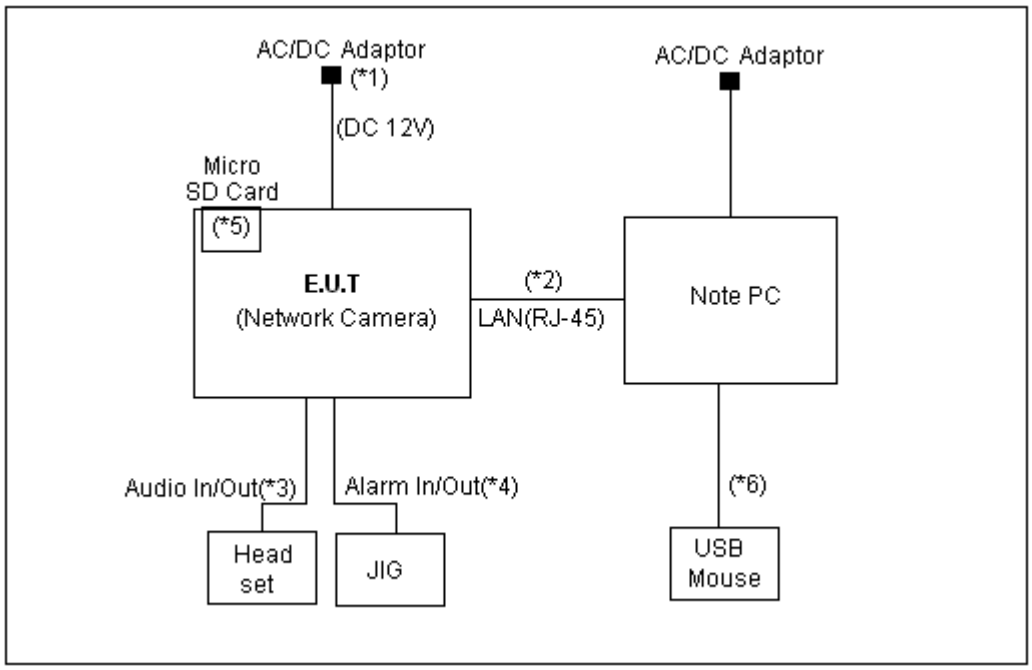
Type of product	Network Camera
Model name (Basic)	SND-6084N
Model name (Variant)	-
Difference	-
Trade name	-
Serial no	Engineering Sample
Testing voltage	DC 12 Ⅴ, PoE
Product rating	DC 12 Ⅴ, PoE
Internal clock frequency	Above 108 ㎒
Note	* AC/DC adaptor was not provided by the manufacturer. * PoE Switch was not provided by the manufacturer.

4.3 Auxiliary equipments

Type	Model / Part #	Serial number	Manufacturer
Note PC	PSLQ0K-02N005	3A045920Q	TOSHIBA
USB Mouse	1088	8165906051273	Microsoft
Headset	SHS-250V	-	SAMSUNG
JIG	-	-	-
Micro SD Card(2 GB)	-	-	Sandisk
AC/DC Adaptor (DC 12V)	SW12-1200100	-	Power-Tek
PoE Switch	FS108P	1DL20C3K00541	NETGEAR

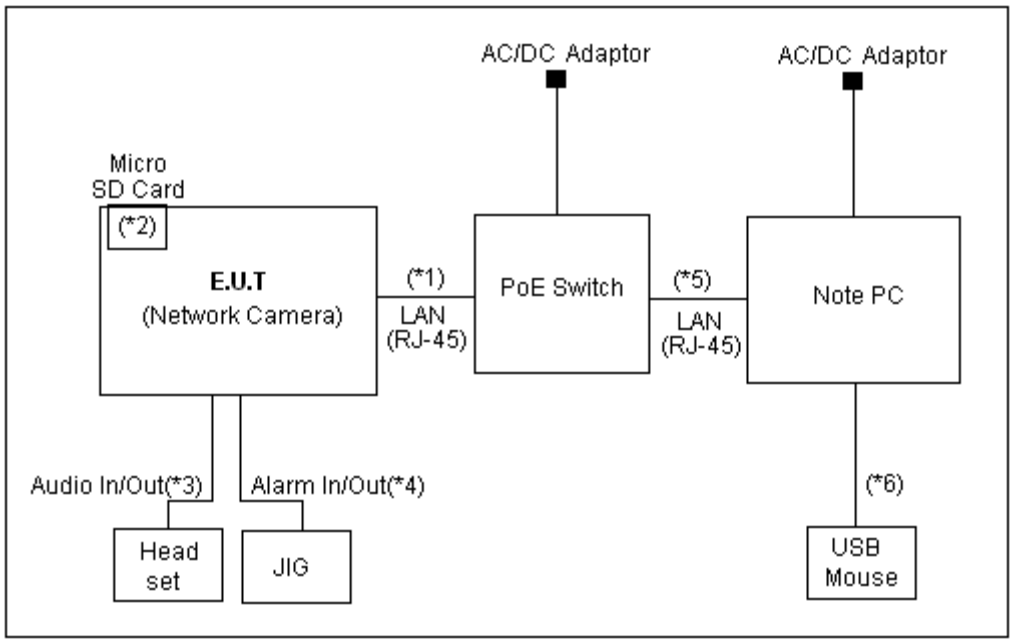
4.4 Test configuration

* DC 12 V



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

* PoE



*Power supplied from PoE Switch

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

4.5 Operating conditions

The EUT was configured as normal intended use.

Test mode	Normal operating
1	Camera Operating mode.(Web Viewer)

* 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
☐	Conducted Emission	ANSI C63.4 – 2009	N/A
☒	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 (#F4, #F2)		
Test distance	10 m, 3 m		
Date	2013. 02. 14 ~ 02. 15		
Temperature (°C)	22 ~ 23 °C	Humidity (% R.H.)	29 ~ 30 % R.H.
Remarks	Complied		

6.1.1 Limits of radiated emission measurement

Frequency [㎒]	Class A (dB(㎶/m)) @ 10 m	Class B (dB(㎶/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 ㎒ ~ 1 ㎓

Equipment	Model no.	Serial no.	Makers	Next Cal. Date	Used
Test Receiver	ESCI	100001	R&S	2013.07.10	☒
Bi-Log Antenna	VULB 9168	375	SCHWARZBECK	2013.09.21	☒
Amplifier	310N	186280	SONOMA INSTRUMENT	2013.02.24	☒
3 ㏈ Attenuator	8491A	16861	HP	2013.07.10	☒
Antenna Mast	AM4.0	079/3440509	MATURO	-	☒
Turn Table	CO2000-SOFT	-	MATURO	-	☒

* 1 ㎓ ~ 6 ㎓

Equipment	Model no.	Serial no.	Makers	Next Cal. Date	Used
Antenna Mast	MA4000-EP	303	Innco Systems	-	☒
Turn Table	DT2000S-1t	079	Innco Systems	-	☒
Horn ANT	3115	00086706	ETS	2013.11.21	☒
Amplifier	8449B	3008A02343	AGILENT	2013.11.06	☒
Spectrum Analyzer	FSP7	100289	R&S	2013.12.14	☒

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 ㏈ Att – A.G)

M.R = Meter Reading

C.F = Correction Factor

A.F = Antenna Factor

C.L = Cable Loss

A.G= Amplifier Gain

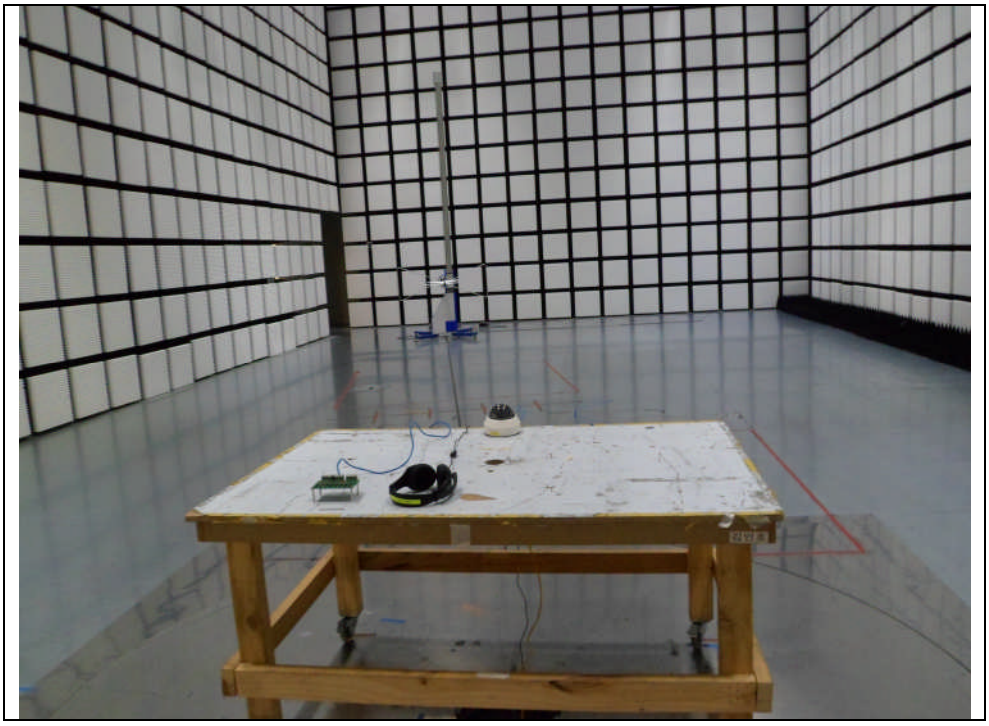
3 ㏈ Att = 3 ㏈ Attenuator

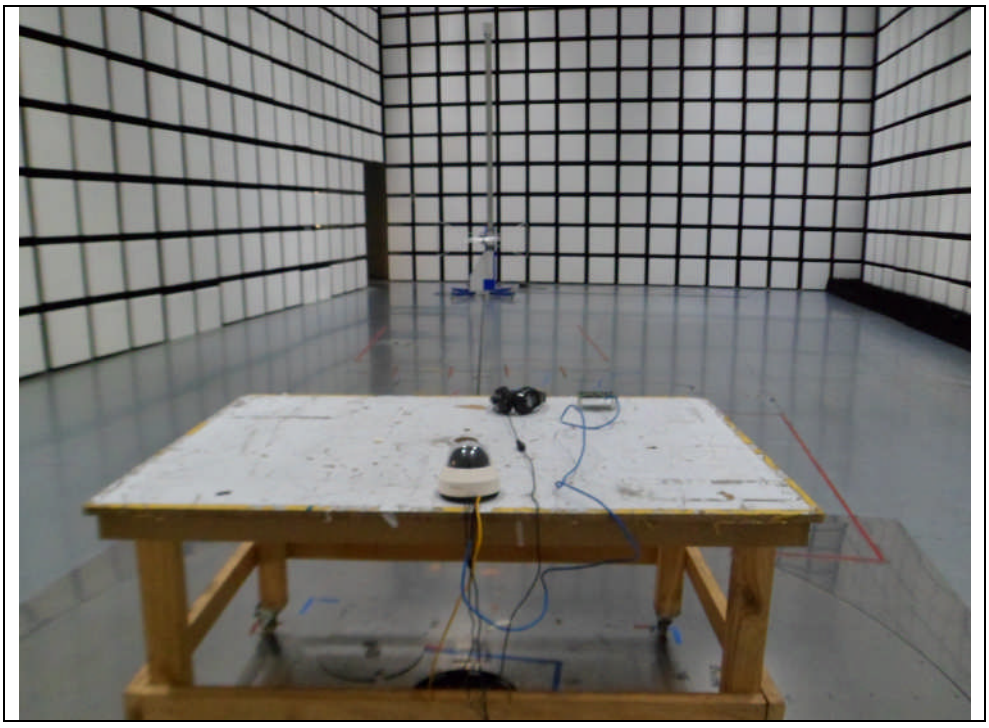
If M.R is 30 ㏈, A.F 12 ㏈, C.L 5 ㏈, 3 ㏈, A.G 35 ㏈

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

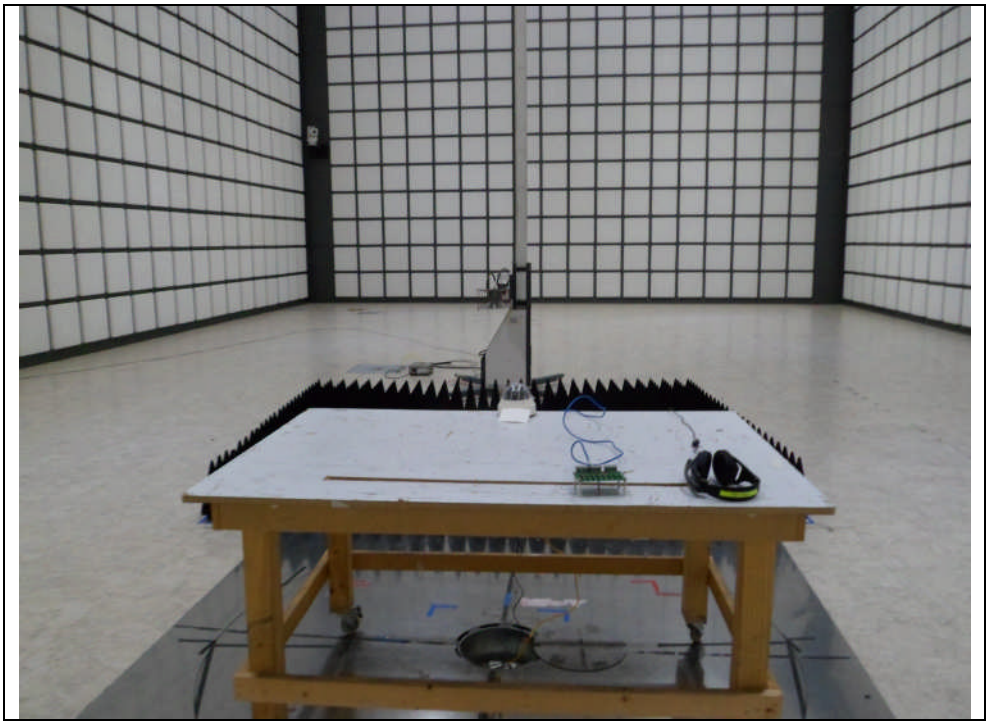
6.1.5 Photographs of test setup

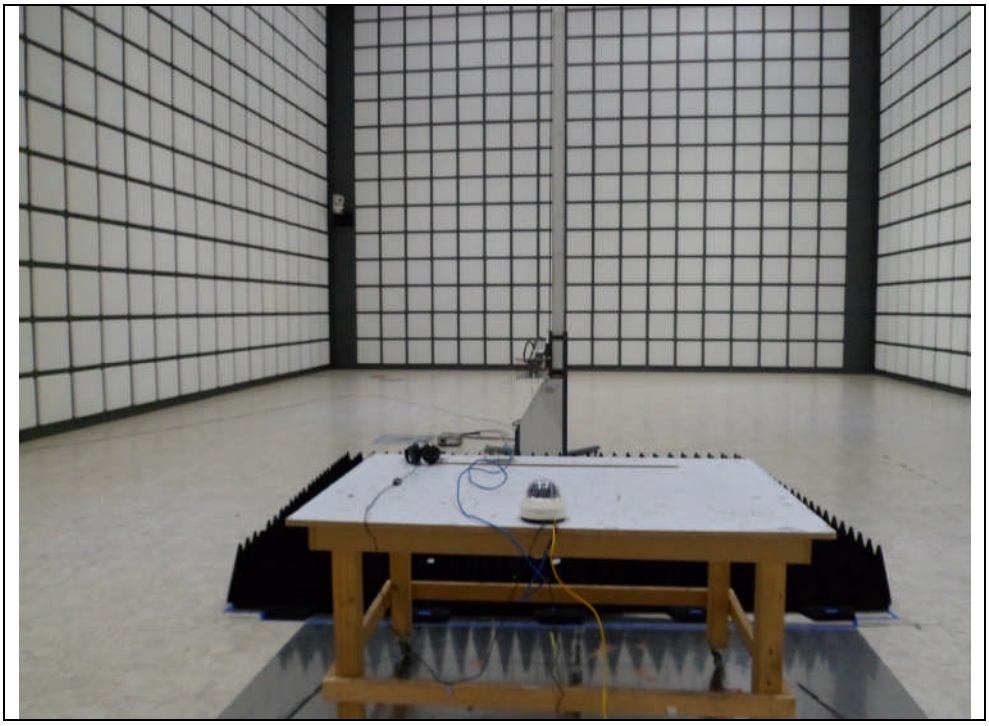
* 30 ㎒ ~ 1 ㎓ (DC 12 Ⅴ)



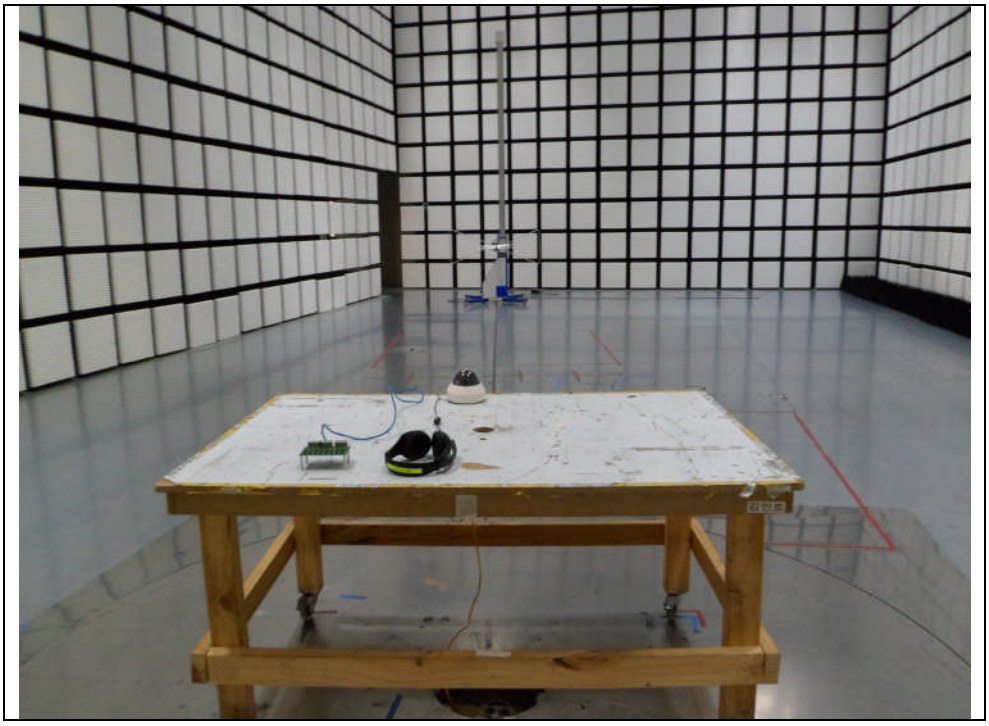


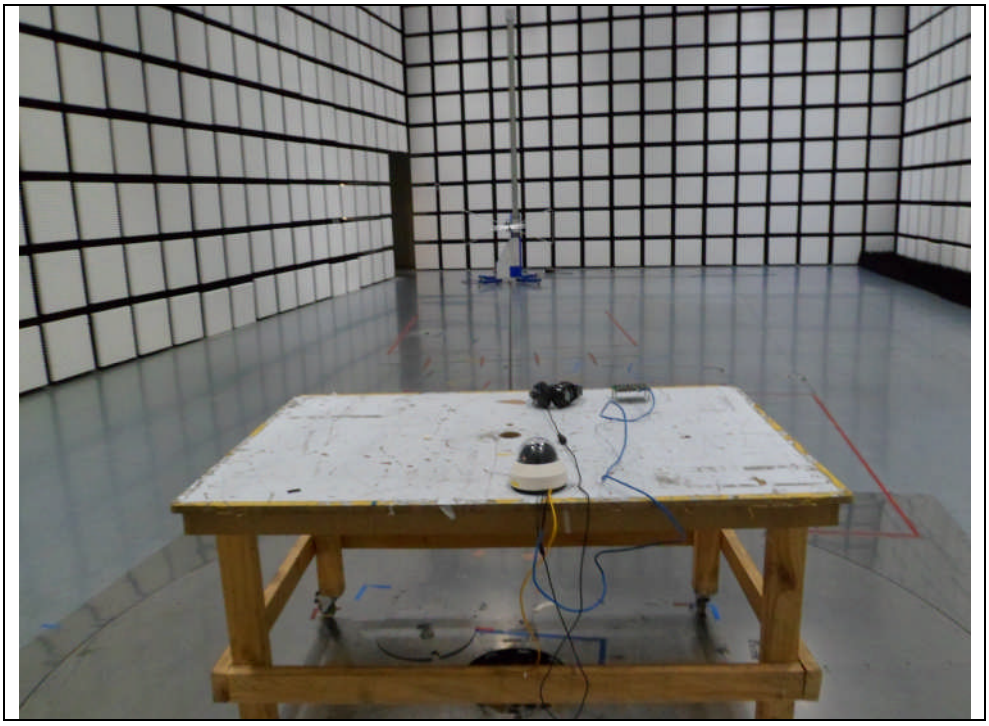
* 1 ㎓ ~ 6 ㎓ (DC 12 Ⅴ)





* 30 ㎒ ~ 1 ㎓ (PoE)





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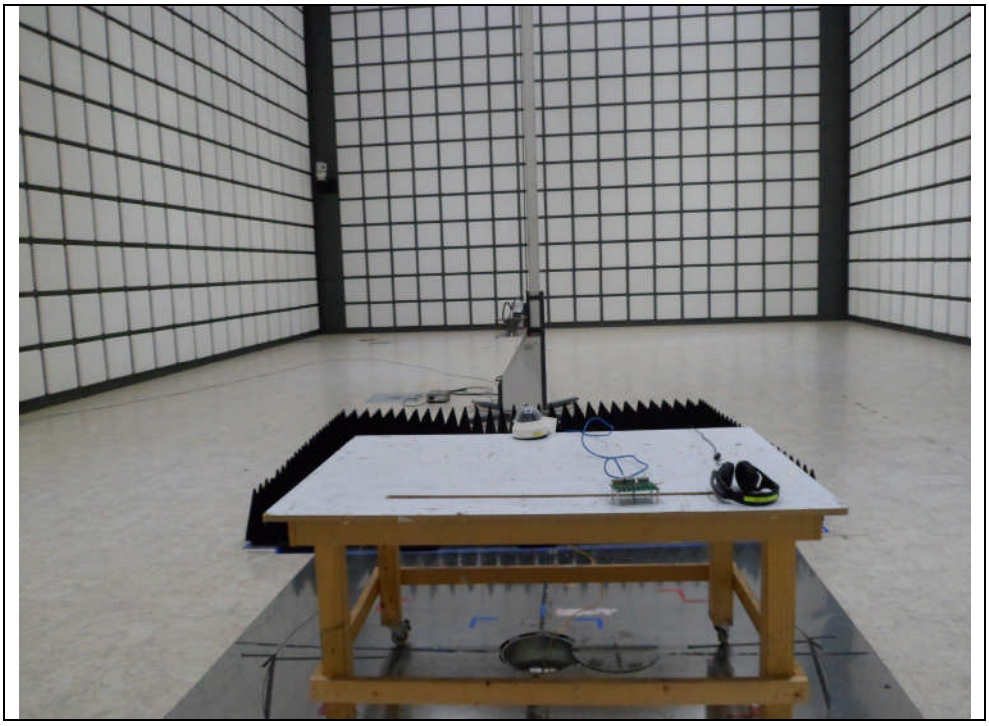
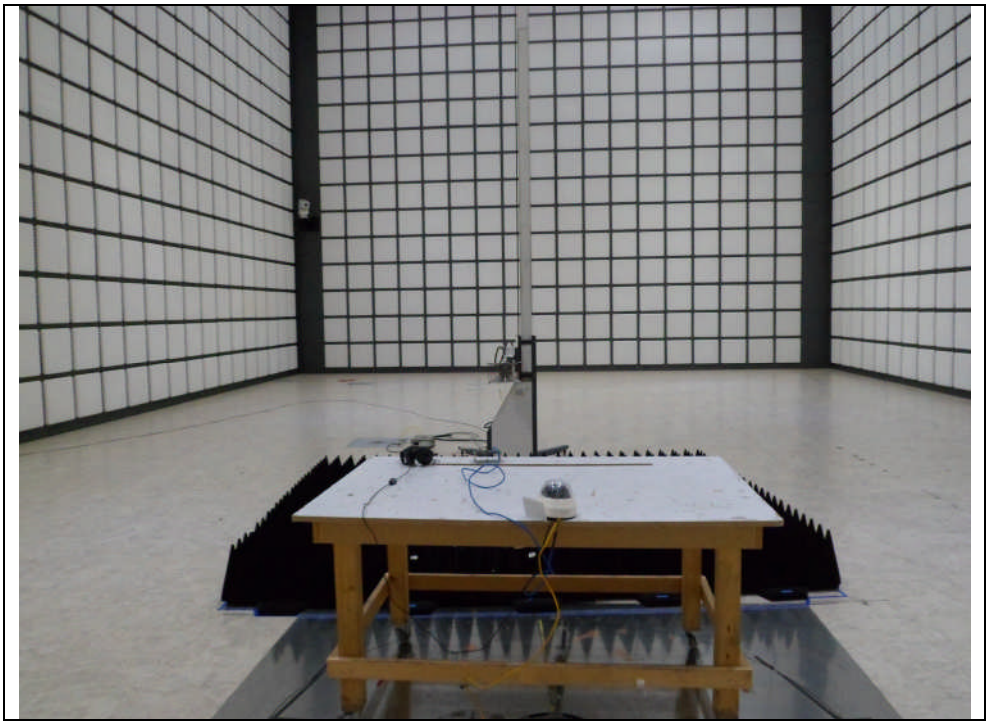
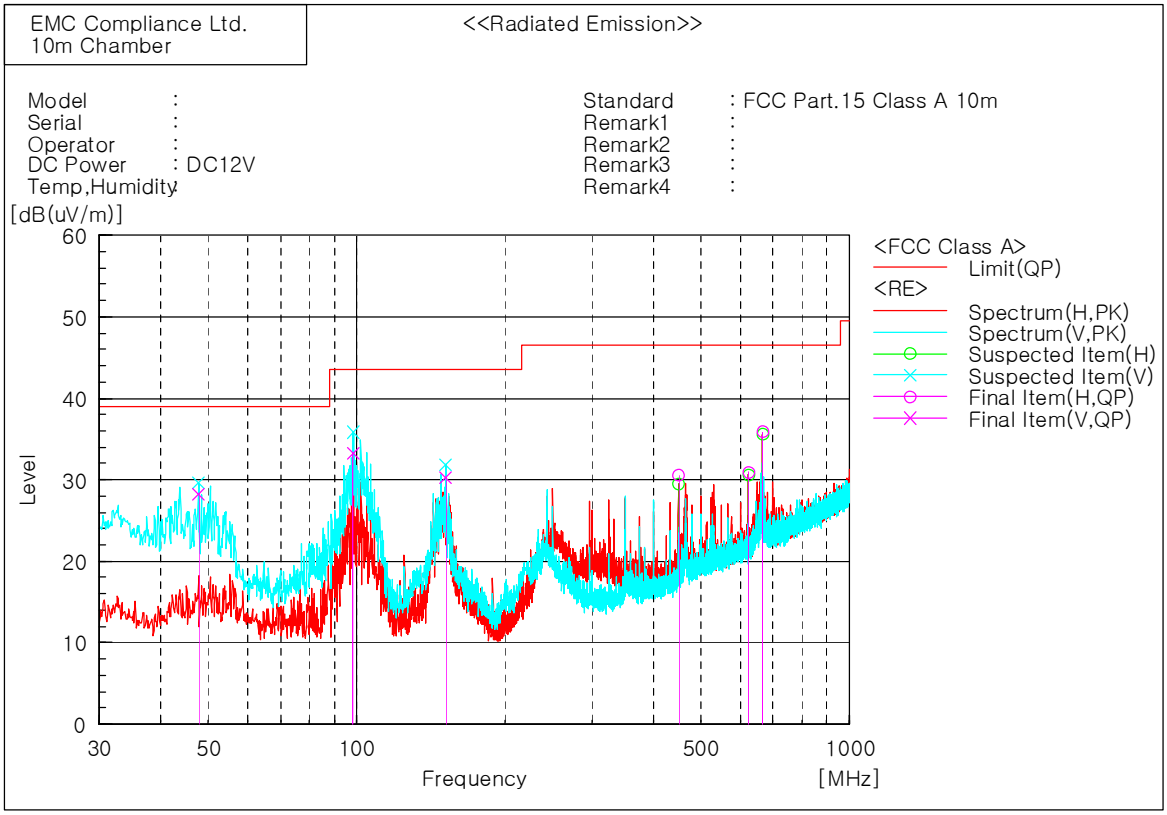




6.1.6 Radiated emission measurement result

*** Graph and Data**

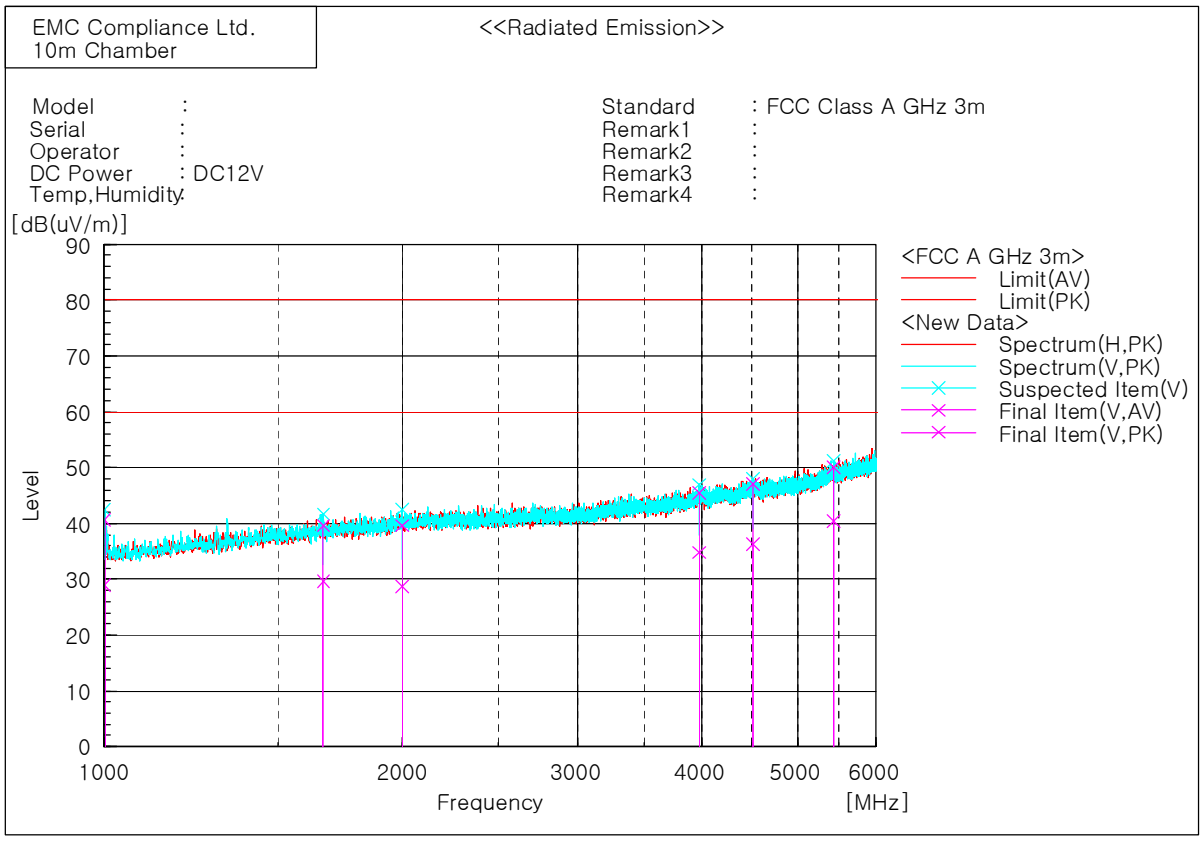
* 30 ㎒ ~ 1 ㎓ (SND-6084N)_DC 12V



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	47.703	V	42.2	-14.0	28.2	39.0	10.8	299.0	272.8
2	98.385	V	51.8	-18.5	33.3	43.5	10.2	199.0	318.6
3	151.493	V	43.7	-13.4	30.3	43.5	13.2	199.0	25.7
4	450.010	H	38.2	-7.7	30.5	46.5	16.0	301.0	205.2
5	624.974	H	34.6	-3.7	30.9	46.5	15.6	100.0	139.4
6	666.078	H	39.0	-3.1	35.9	46.5	10.6	201.0	139.2

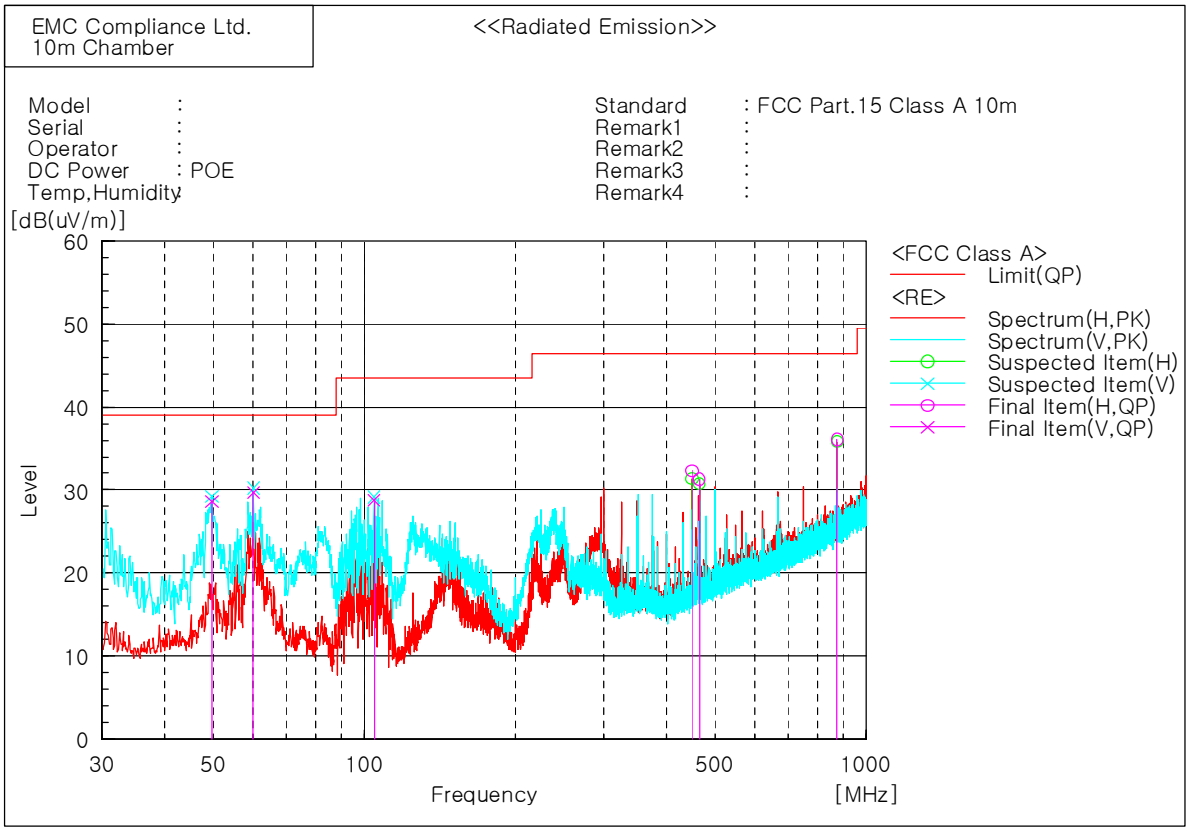
* 1 ㎓ ~ 6 ㎓ (SND-6084N)_DC 12V



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]
1	1002.500	V	38.5	50.1	-9.5	29.0	40.6	60.0	80.0	31.0	39.4	100.0	19.4
2	1665.000	V	33.5	43.5	-3.9	29.6	39.6	60.0	80.0	30.4	40.4	100.0	359.9
3	3978.125	V	30.8	41.5	4.0	34.8	45.5	60.0	80.0	25.2	34.5	100.0	268.5
4	4513.750	V	30.9	41.7	5.4	36.3	47.1	60.0	80.0	23.7	32.9	100.0	237.0
5	5437.500	V	31.8	41.5	8.6	40.4	50.1	60.0	80.0	19.6	29.9	100.0	129.0
6	1998.125	V	30.9	41.8	-2.2	28.7	39.6	60.0	80.0	31.3	40.4	100.0	311.9

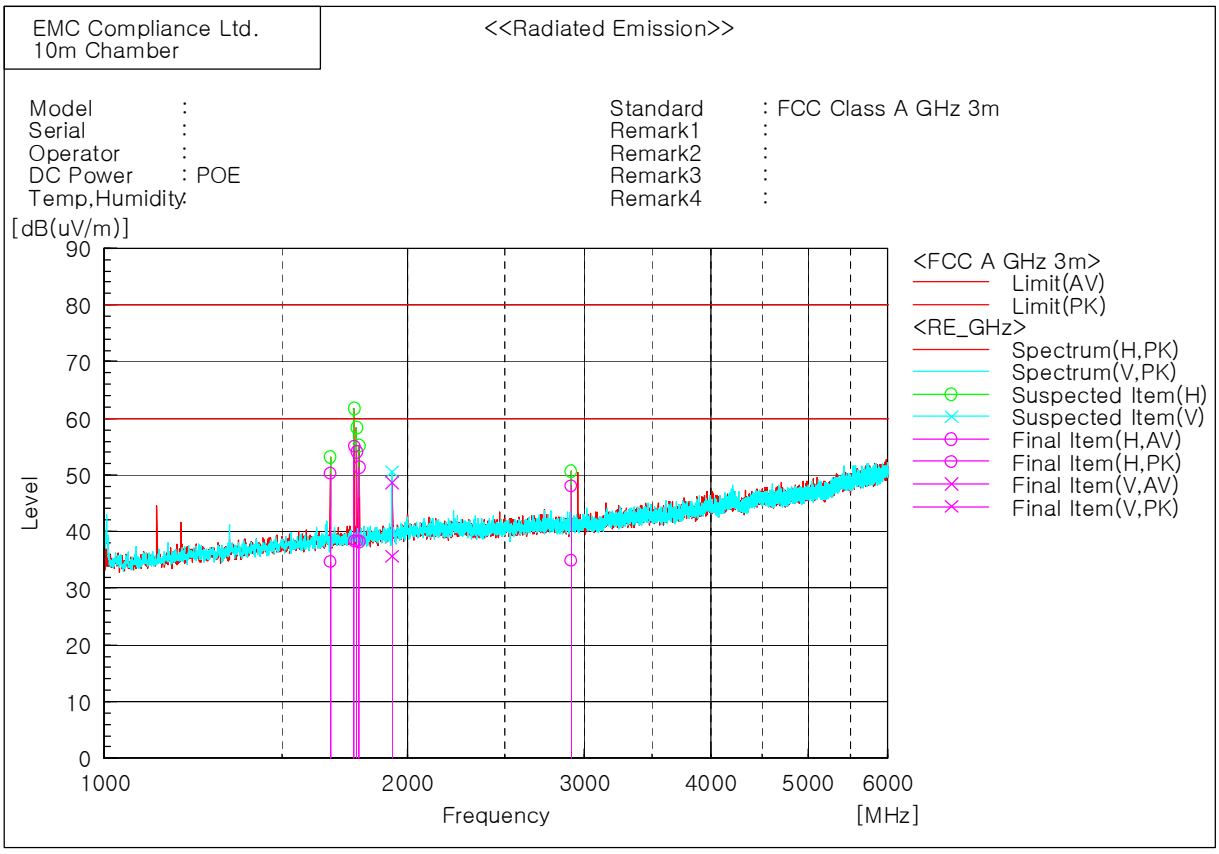
* 30 ㎒ ~ 1 ㎓ (SND-6084N)_PoE



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	49.764	V	42.5	-13.9	28.6	39.0	10.4	100.0	137.2
2	60.191	V	44.0	-14.3	29.7	39.0	9.3	100.0	334.0
3	104.690	V	46.5	-17.7	28.8	43.5	14.7	100.0	287.4
4	450.010	H	40.0	-7.7	32.3	46.5	14.2	301.0	336.7
5	465.166	H	38.6	-7.3	31.3	46.5	15.2	301.0	110.0
6	875.112	H	35.2	0.9	36.1	46.5	10.4	100.0	210.9

* 1 ㎓ ~ 6 ㎓ (SND-6084N)_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]
1	1676.250	H	38.5	54.1	-3.8	34.7	50.3	60.0	80.0	25.3	29.7	100.0	84.0
2	1770.625	H	41.7	58.4	-3.3	38.4	55.1	60.0	80.0	21.6	24.9	100.0	300.6
3	1781.250	H	41.7	57.4	-3.3	38.4	54.1	60.0	80.0	21.6	25.9	100.0	84.0
4	1791.875	H	41.5	54.6	-3.2	38.3	51.4	60.0	80.0	21.7	28.6	100.0	84.0
5	1930.625	V	38.2	51.2	-2.5	35.7	48.7	60.0	80.0	24.3	31.3	100.0	329.3
6	2906.875	H	35.4	48.6	-0.5	34.9	48.1	60.0	80.0	25.1	31.9	100.0	84.0

7. E.U.T. photographs

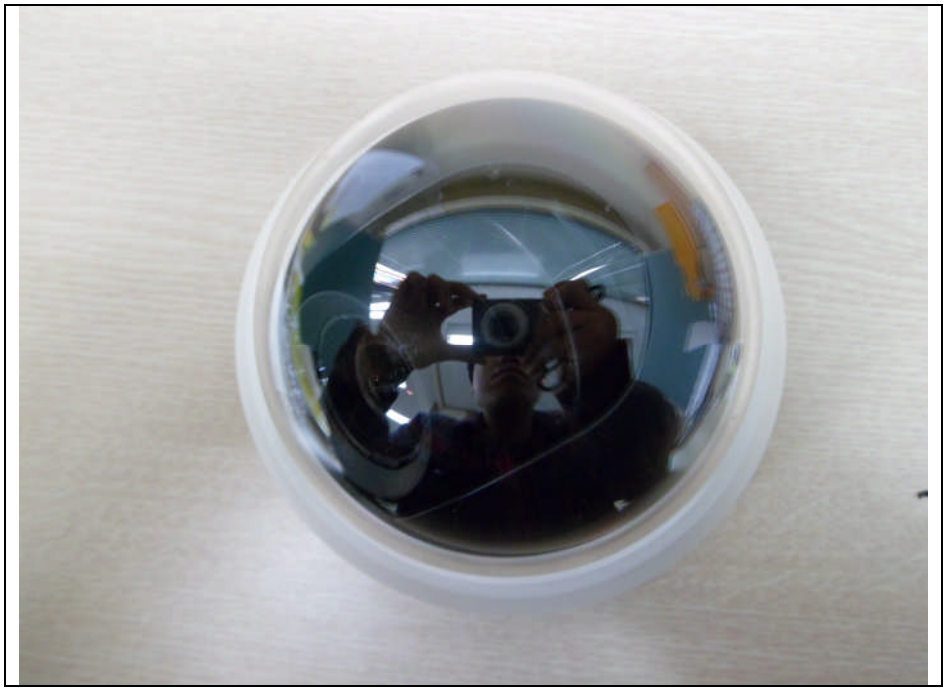
Front View

Rear View

Left View

Right View

Top View



Bottom View

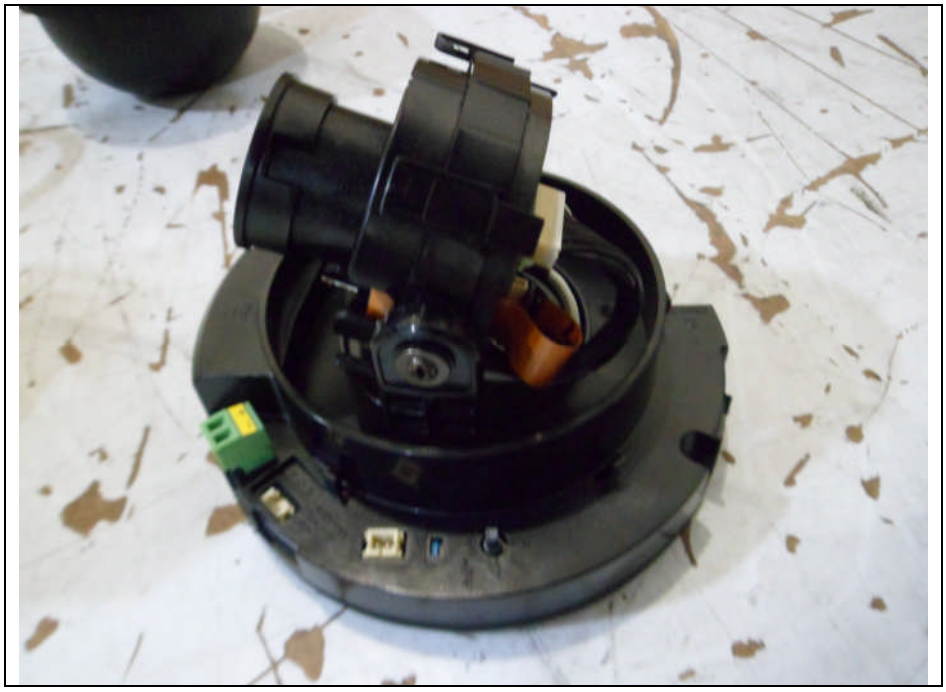
Label

FCC Label Location

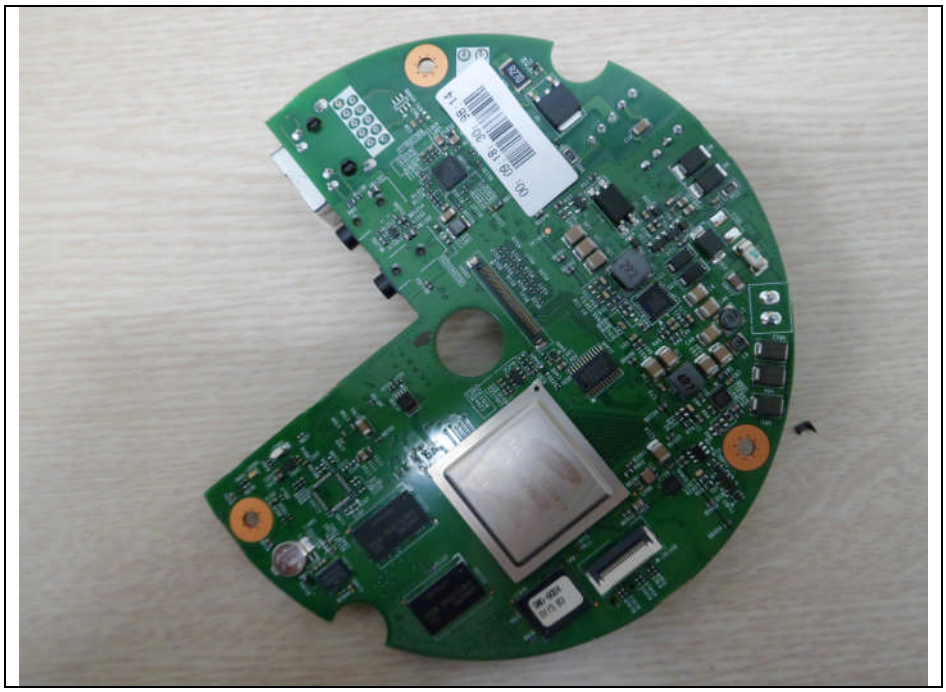
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Port

Inside



Main Board



CCD Board