CERTIFICATE of EMC Compliance

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Report No:	**EMC-FCC-1571**
Type of equipment:	**Network Camera**
Model Name:	**SND-5061N**
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
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EMI TEST REPORT

Test report No.:	**EMC-FCC-1571**
Type of Equipment:	**Network Camera**
Model Name:	**SND-5061N**
Applicant:	**Samsung Techwin Co., Ltd.** **#42 Seongju-Dong, Changwon-Shi,** **Kyungsangnam-Do, Korea**
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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: 2012. 05. 10

Date of testing: 2012. 05. 22

Issued date: 2012. 05. 25

Tested by: JUNG, YOUNG-JUN

Approved by: YEOM, HAN-SEOK

Contents

1. Applicant information

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E-mail: js2002.kang@samsung.com
Contact name: **Kang Jei Soon**

Manufacturer#1: SAMSUNG TECHWIN CO., LTD.
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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
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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
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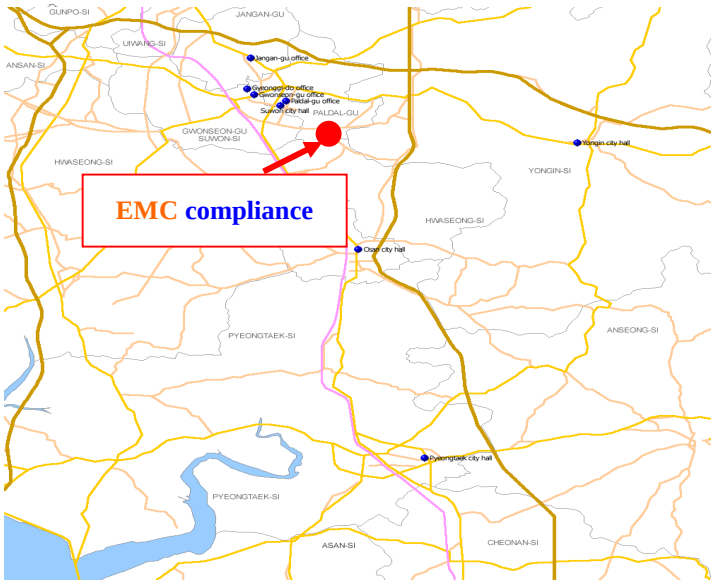
FCC CAB.: KR0040
VCCI Registration No. : R-3327, G-198, C-3706, T-1849
Industry Canada Registration No. : 8035A
KOLAS NO.: 231

SITE MAP



3. Test system configuration

3.1 Operation environment

	Temperature	Humidity	Pressure
Chamber(10 m) :	25 ~ 26 °C	32 ~ 34 % 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 :(k = 2, 95 %)		
Shielded Room (CE#1)	9 ㎑ ~ 150 ㎑: ± 3.77 [dB] 150 ㎑ ~ 30 ㎒: ± 3.35 [dB]	
Shielded Room (CE#2)	9 ㎑ ~ 150 ㎑: ± 3.95 [dB] 150 ㎑ ~ 30 ㎒: ± 3.55 [dB]	
Shielded Room (CE#3)	9 ㎑ ~ 150 ㎑: ± 3.88 [dB] 150 ㎑ ~ 30 ㎒: ± 3.50 [dB]	
Radiated Emission measurement :(k = 2, 95 %)		
10 m Chamber (#F4)	30 ㎒ ~ 300 ㎒	3 m: + 4.29 [dB], - 4.31 [dB] 10 m: + 4.28 [dB], - 4.30 [dB]
	300 ㎒ ~ 1 000 ㎒	3 m: + 4.57 [dB], - 4.57 [dB] 10 m: + 4.42 [dB], - 4.44 [dB]
	1 ㎓ ~ 6 ㎓	3 m: + 5.94 [dB], - 5.95 [dB]
	6 ㎓ ~ 18 ㎓	3 m: + 5.49 [dB], - 5.16 [dB]
10 m Chamber (#F2)	30 ㎒ ~ 300 ㎒	3 m: + 4.28 [dB], - 4.30 [dB] 10 m: + 4.27 [dB], - 4.28 [dB]
	300 ㎒ ~ 1 000 ㎒	3 m: + 4.56 [dB], - 4.57 [dB] 10 m: + 4.41 [dB], - 4.43 [dB]
	1 ㎓ ~ 6 ㎓	3 m: + 5.94 [dB], - 5.95 [dB]
	6 ㎓ ~ 18 ㎓	3 m: + 5.49 [dB], - 5.16 [dB]

4. Description of E.U.T.

4.1 General information

	SND-5011N/P
Video	
Imaging Device	1/3" 1.3M PS CMOS
Total Pixels	1,384(H) x 1,076(V)
Effective Pixels	1,329(H) x 1,049(V)
Scanning System	Progressive
Min. Illumination	Color & B/W : 1.6 Lux (F1.8, 50IRE), 0.027 Lux (Sens up 60X)
S / N Ratio	-
Video Out	CVBS : 1.0 Vp-p / 75Ω composite, 704x480(N), 704x576(P), for
Lens	
Focal Length (Zoom Ratio)	3mm Fixed
Max. Aperture Ratio	F1.8
Angular Field of View	H: 103°, V: 76°, D:131°
Min. Object Distance	400mm
Focus Cotrol	Manual
Zoom Movement Speed	-
Lens Type	-
Mount Type	Board-in Type
Pan / Tilt / Rotate	
Pan Range	0°~352°
Pan Speed	-
Tilt Range	0°~90°
Tilt Speed	-
Rotate Range	0°~352°
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	-
Digital Noise Reduction	SSNR (OFF / ON)
Digital Image Stabilization	-
Motion Detection	Off / On (4 programmable zones, 20fps)
Privacy Masking	Off / On (12 Rectanggular zones)
Sens-up (Frame Integration)	Off / Auto (2X ~ 60X)
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	Tampering (20fps)
Alarm I/O	Input 1ea
Remote Control Interface	-
RS-485 Protocol	-

Network	
Ethernet	RJ-45 (10/100BASE-T)
Video Compression Format	H.264, MJPEG
Resolution	1280x1024, 1280x720P(HD), 1024x768, 800x600, 640x480, 320x240
Max. Framerate	H.264 : 30fps MJPEG : 25fps(1280x1024), 30fps (720P HD)
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	-
Audio Compression Format	-
Audio Communication	-
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, ONVIF
QoS	On/Off
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	-
Remote Recording	-
ONVIF Conformance	Yes
Web Language	English, French, German, Spanish, Italian, Chinese, Korean, Russian, Japanese, Swedish, Denish, Portuguese, Turkish, Polish, Czech, Rumanian, Serbian, Dutch, Croatia, Hungary, Greek, Norway, Finland
Web Viewer	Supported OS : Windows XP / VISTA / 7, MAC OS 10.7 or higher Supported Browser : Internet Explorer 7.0 or Higher, Firefox 9 or higher, Google Chrome 15 or higher, Apple Safari 5.1 or higher
Central Management Software	NET-i viewer
Environmental	
Operating Temperature / Humidity	-10°C ~ +55°C (+14°F ~ +131°F) / ~ 90% RH
Storage Temperature / Humidity	-30°C ~ +60°C / ~ 90% RH
Ingress Protection	-
Electrical	
Input Voltage / Current	12V DC, PoE(IEEE802.3af,Class2)
Power Consumption	Max 3.7W (DC 12V), Max 4.3W (PoE)
Mechanical	
Color / Material	Ivory, Plastic
Dimension (WxHxD)	H83.7 x Ø107.6mm
Weight	285g

4.2 Product description

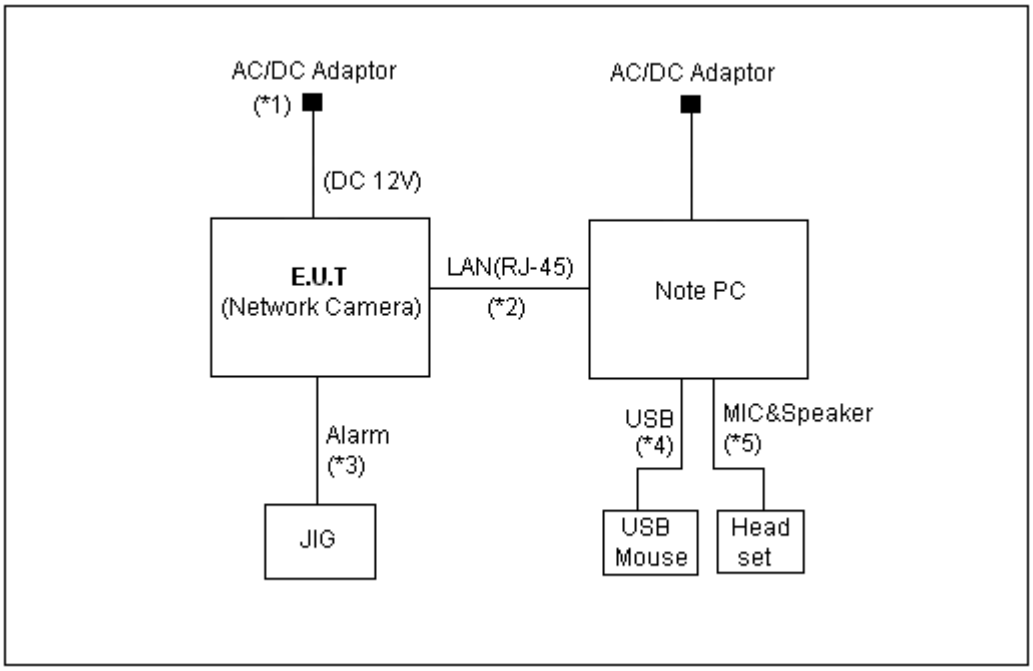
Type of product	Network Camera
Model name (Basic)	SND-5011N
Model name (Variant)	-
Difference	-
Trade name	-
Serial no	Engineering Sample
Testing voltage	DC 12 Ⅴ, PoE
Product rating	DC 12 Ⅴ, PoE
Internal clock frequency	266.5 ㎒
Note	* AC/DC adaptor was not provided by the manufacturer. * PoE Switch was not provided by the manufacturer.

4.3 Auxiliary equipments

Type	Model / Part #	Serial number	Manufacturer
JIG	-	-	-
Note PC	PSLQ0K-02N005	2A046497Q	TOSHIBA
USB Mouse	1088	8165906051282	Microsoft
Headset	SHS-250V	-	SAMSUNG
AC/DC Adaptor (DC 12 V)	DAD 12050DKA	-	SAMSUNG
PoE Switch	Switch Fast Ethernet	ES3108P5AC0400285	EDIMAX

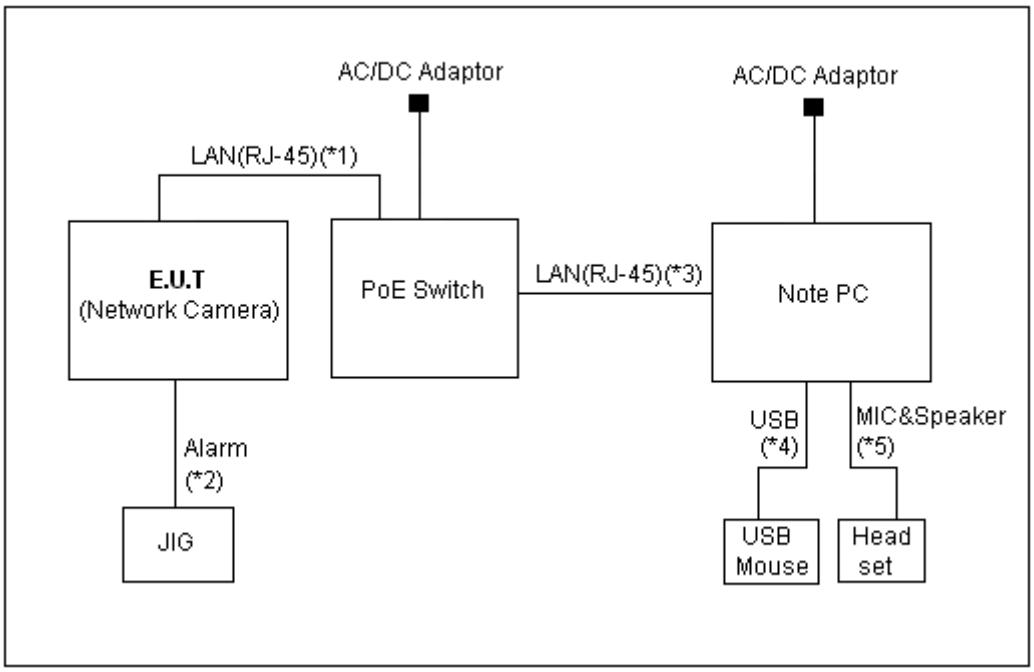
4.4 Test configuration

* 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	1.6	Non-Shield
2		LAN(RJ-45)	Note PC	LAN(RJ-45)	3.0	Non-Shield
3		Alarm	JIG	Alarm	3.0	Non-Shield
4	Note PC	USB	USB Mouse	USB	1.8	Shield
5		MIC&Speaker	Headset	MIC&Speaker	2.0	Non-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)	Note PC	LAN(RJ-45)	3.0	Non-Shield
2		Alarm	JIG	Alarm	3.0	Non-Shield
3	Note PC	LAN(RJ-45)	PoE Switch	LAN(RJ-45)	3.0	Non-Shield
4		USB	USB Mouse	USB	1.8	Shield
5		MIC&Speaker	Headset	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 web wiew monitoring test mode.

* 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 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

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 (#F2, #F4)		
Test distance	10 m, 3 m		
Date	2012. 05. 22		
Temperature (°C)	25 ~ 26 °C	Humidity (% R.H.)	32 ~ 34 % R.H.
Remarks	Complied		

6.1.1 Limits of radiated emission measurement

Frequency [㎒]	Class A (㏈(㎶/m)) @ 10 m	Class B (㏈(㎶/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	100710	R&S	2012.11.28	☒
Bi-Log Antenna	VULB 9168	9168-440	SCHWARZBECK	2013.10.04	☒
Amplifier	310N	293004	SONOMA INSTRUMENT	2012.11.28	☒
3 ㏈ Attenuator	8491A	27444	HP	2012.11.28	☒
Antenna Mast	MA4000-EP	303	Innco Systems	-	☒
Turn Table	DT2000S-1t	079	Innco Systems	-	☒

* 1 ㎓ ~ 5 ㎓

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

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

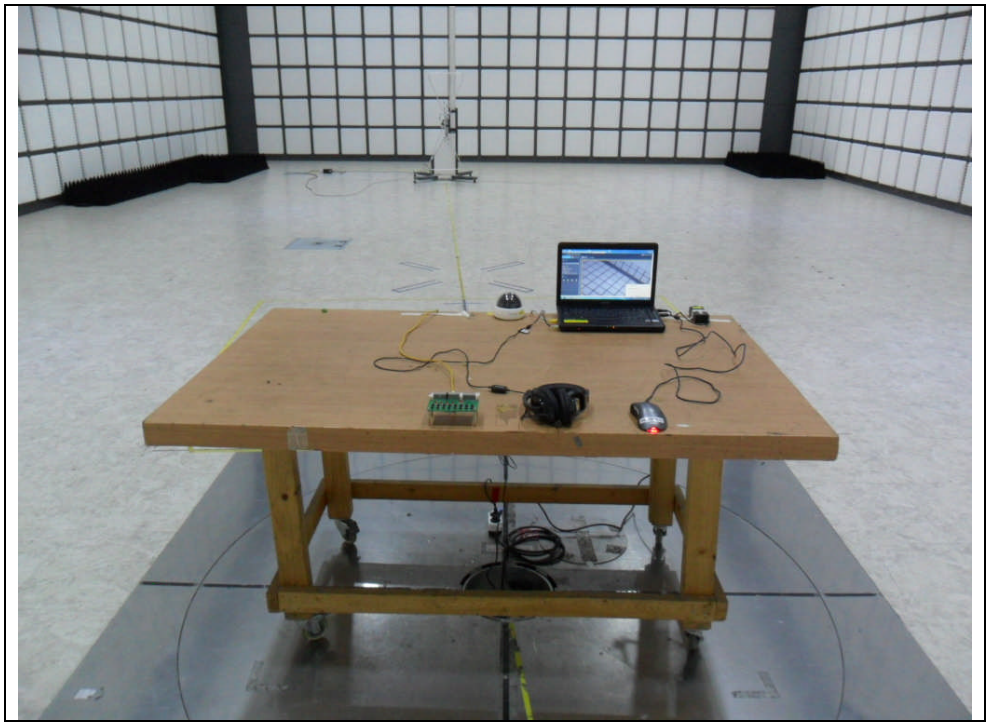
3 ㏈ Att = 3 ㏈ Attenuator

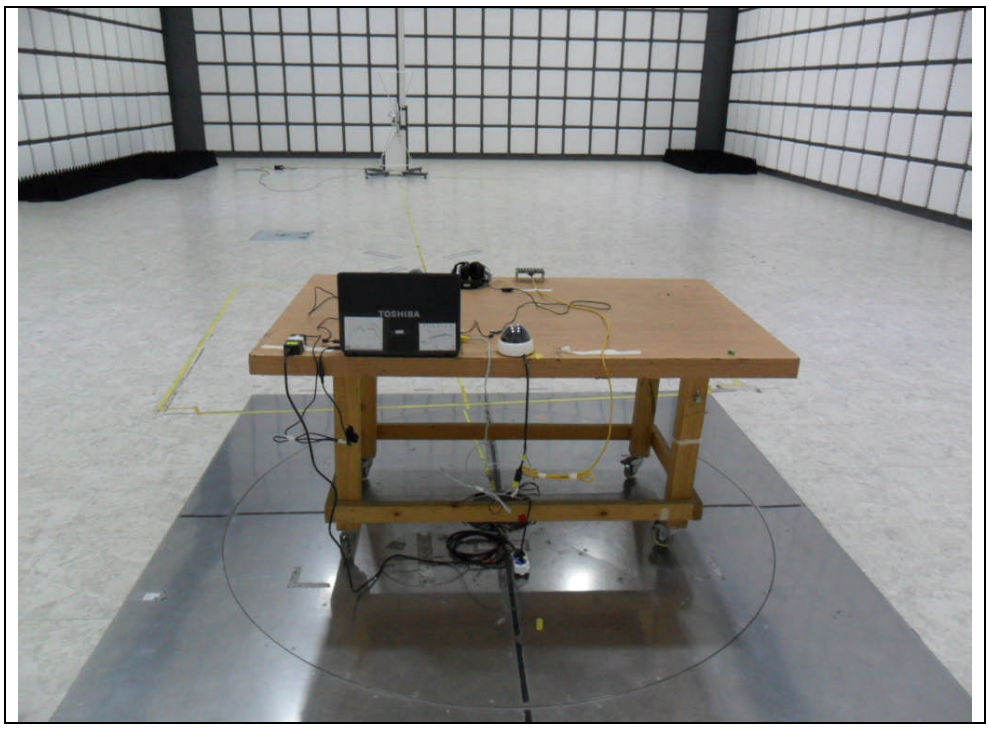
If M.R is 30 ㏈, A.F 12 ㏈, C.L 5 ㏈, 3 ㏈, A.G 35 ㏈

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

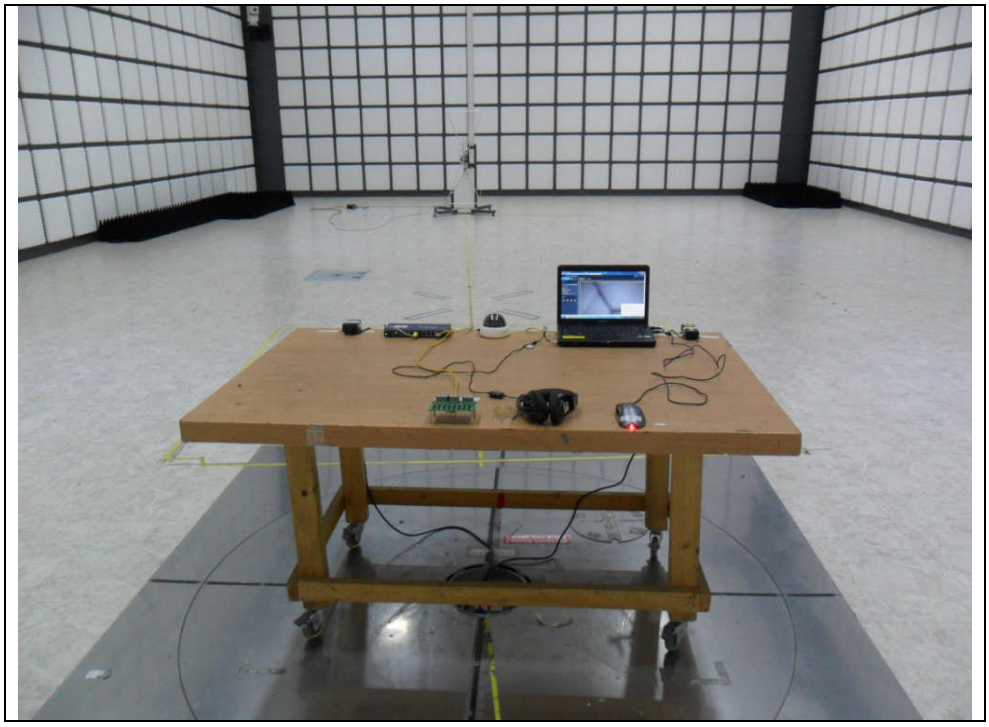
6.1.5 Photographs of test setup

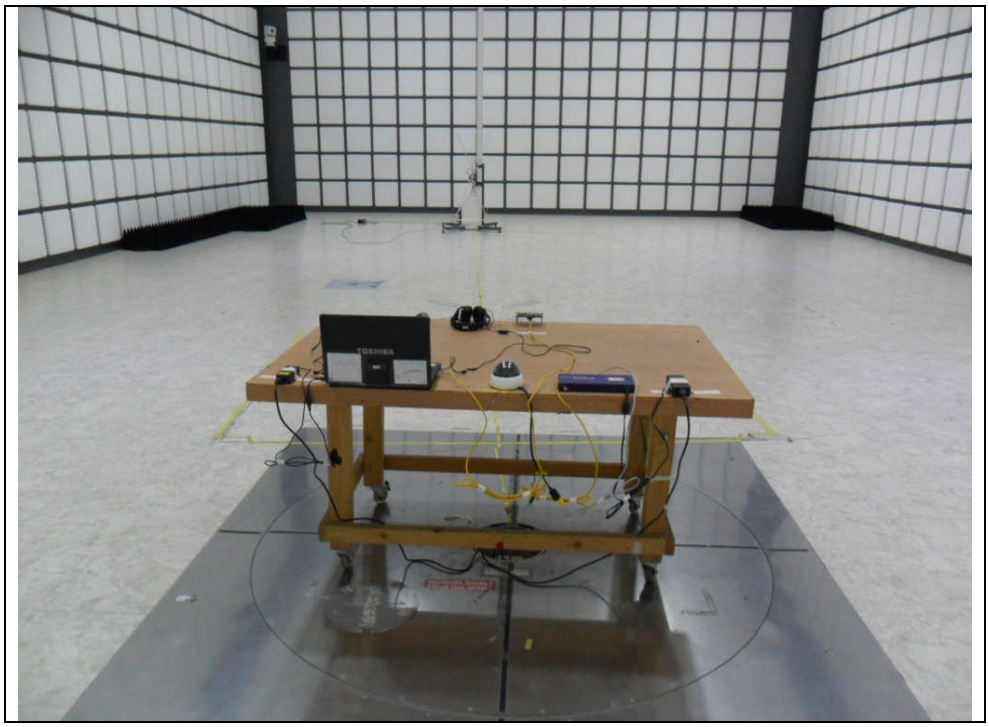
* 30 ㎒ ~ 1 ㎓ (DC 12 Ⅴ)



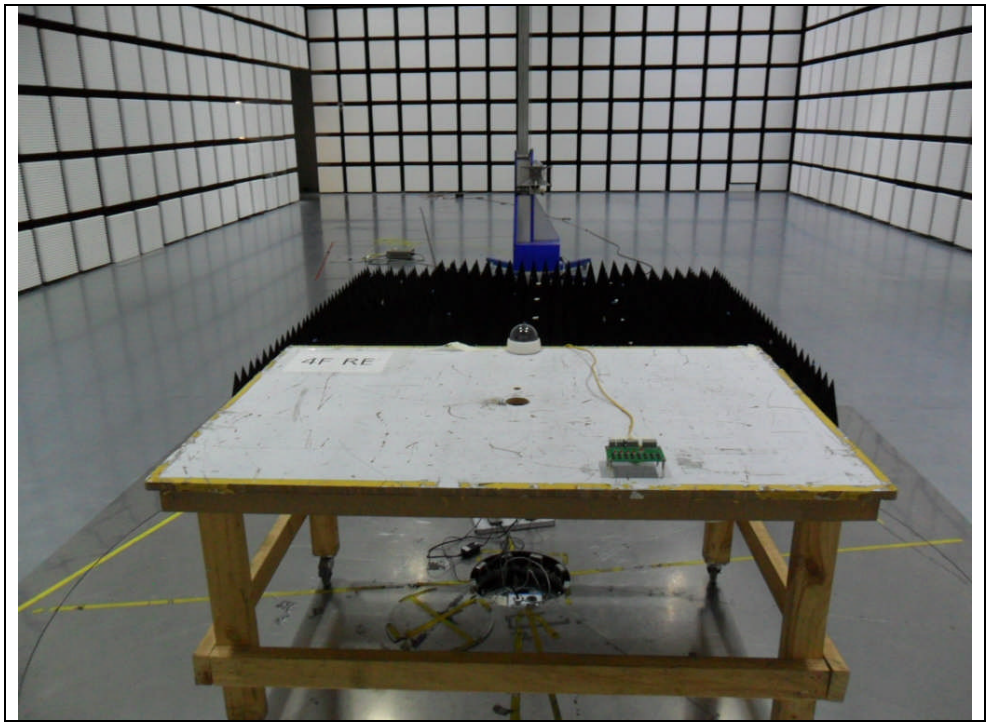


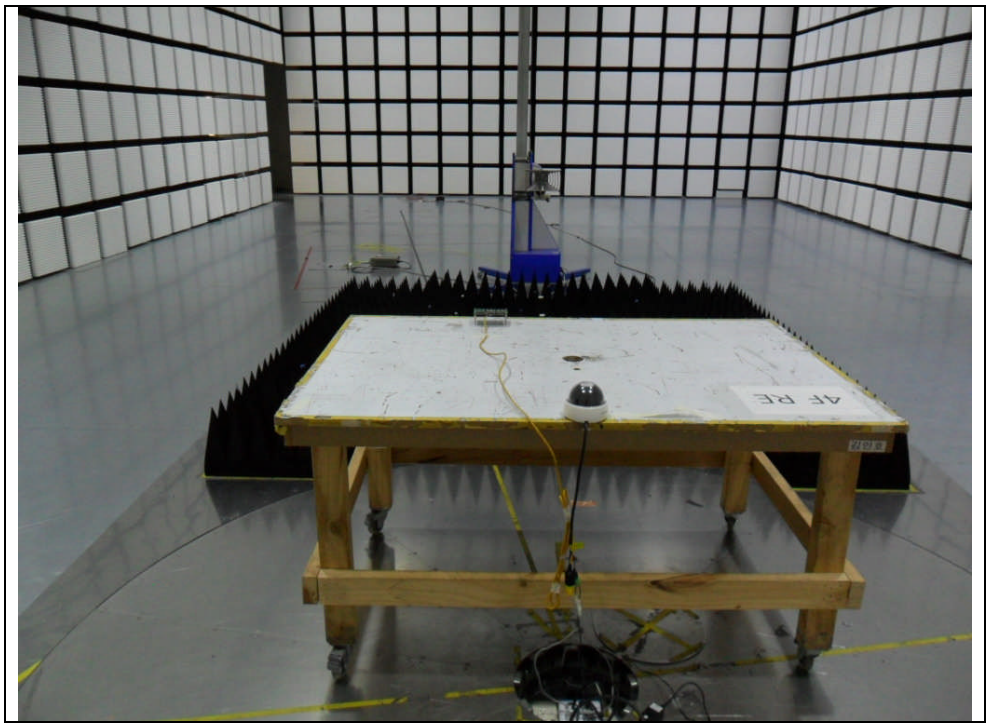
* 30 ㎒ ~ 1 ㎓ (PoE)



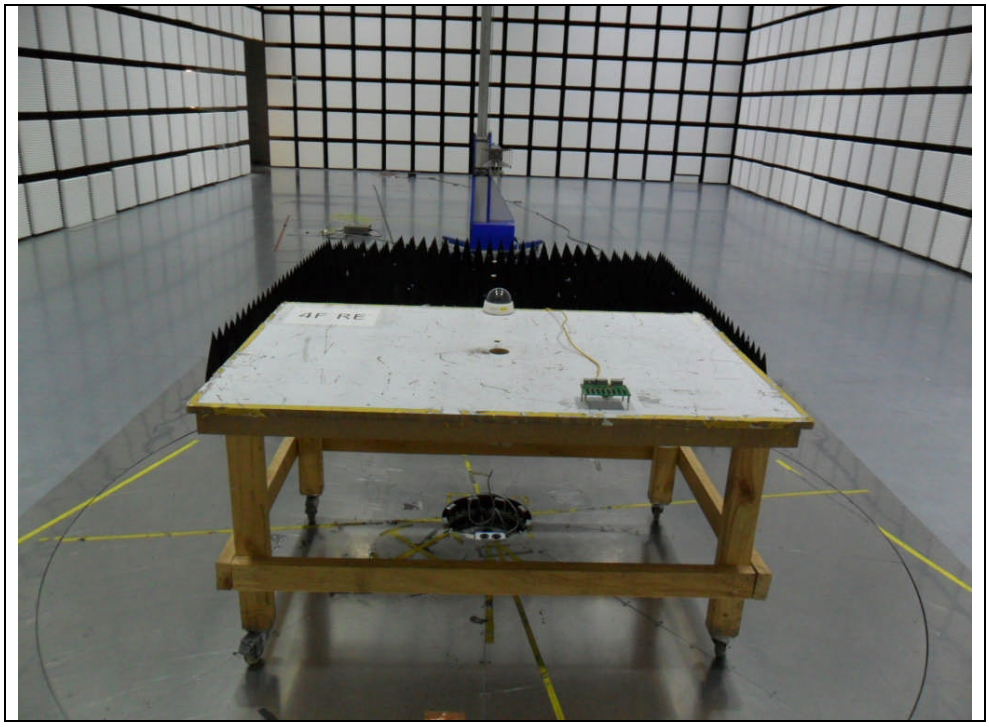


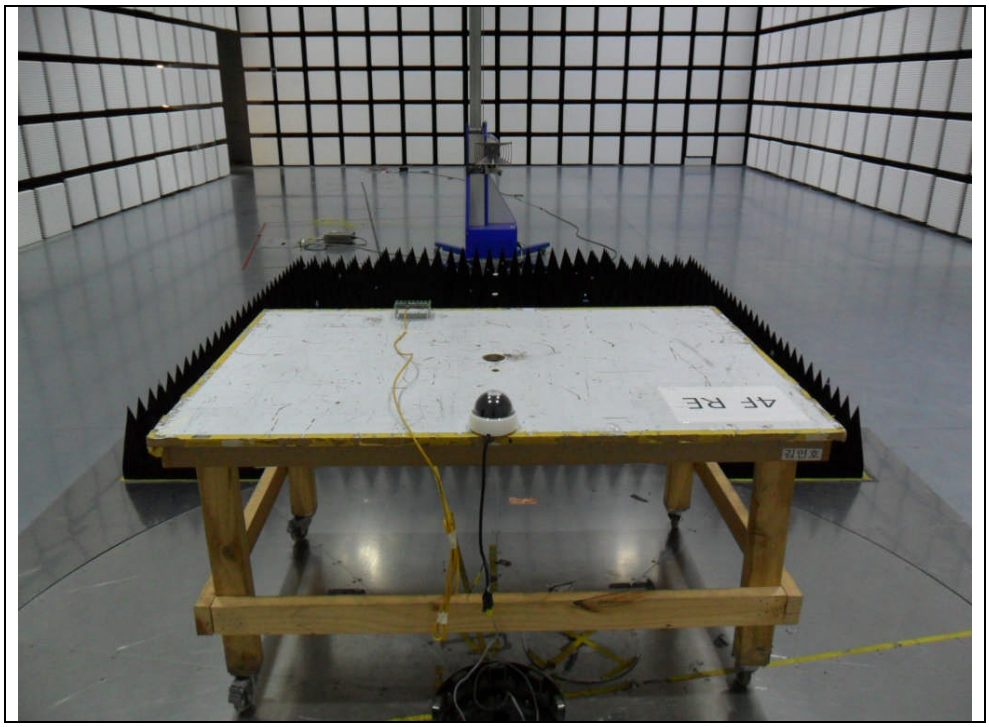
* 1 ㎓ ~ 5 ㎓ (DC 12 Ⅴ)





* 1 ㎓ ~ 5 ㎓ (PoE)

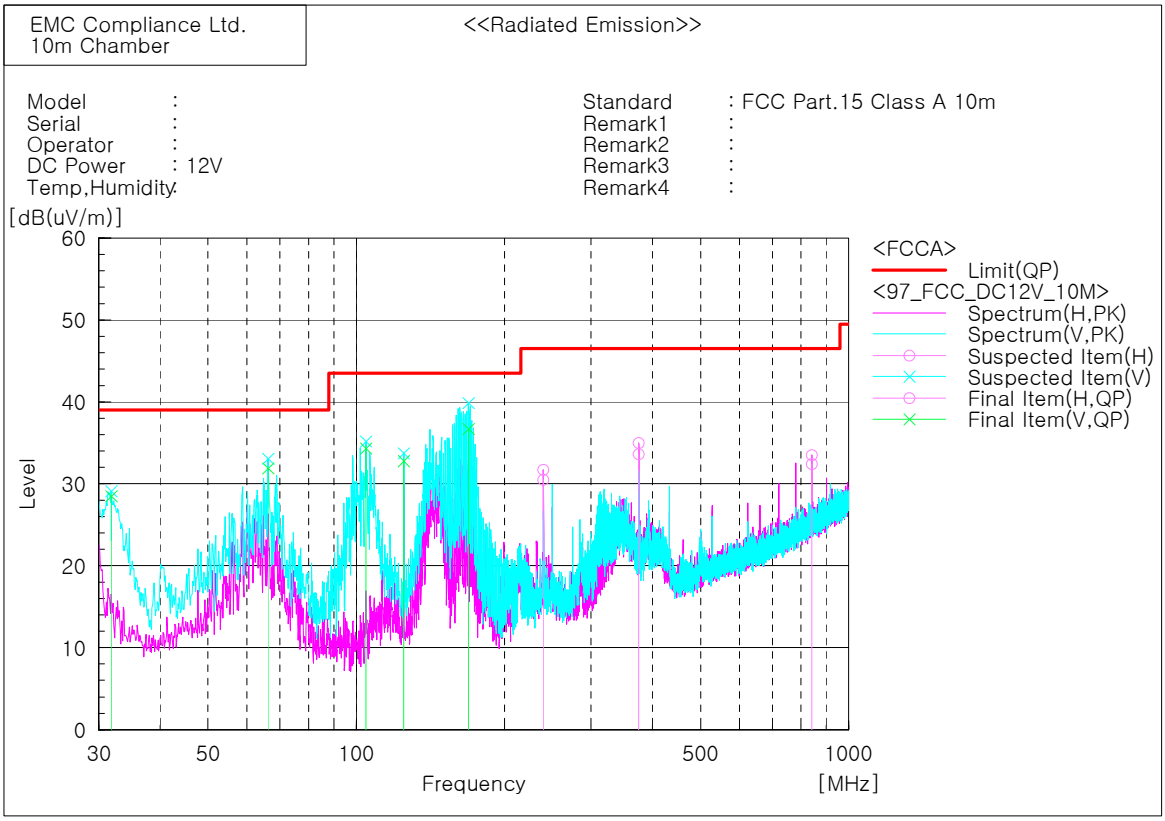




6.1.6 Radiated emission measurement result

*** Graph and Data**

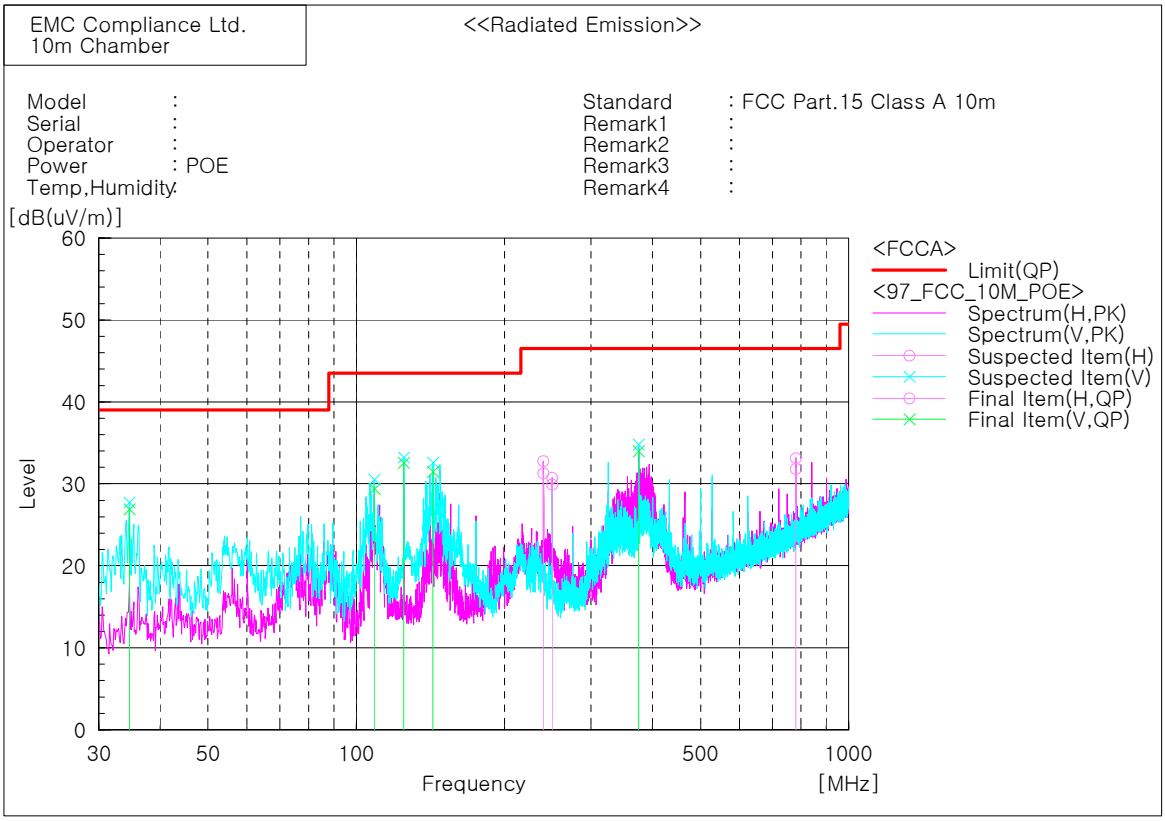
* 30 ㎒ ~ 1 ㎓ (DC 12 Ⅴ)



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]	Remark
1	31.819	V	43.7	-15.2	28.5	39.0	10.5	100.0	355.5	
2	66.254	V	46.6	-14.7	31.9	39.0	7.1	100.0	175.6	
3	104.690	V	51.6	-17.3	34.3	43.5	9.2	100.0	243.2	
4	124.939	V	47.6	-14.8	32.8	43.5	10.7	100.0	49.3	
5	168.953	V	49.8	-13.1	36.7	43.5	6.8	100.0	211.7	
6	240.005	H	44.4	-13.9	30.5	46.5	16.0	400.0	26.4	
7	374.956	H	43.0	-9.4	33.6	46.5	12.9	400.0	190.2	
8	841.405	H	31.9	0.5	32.4	46.5	14.1	400.0	103.1	

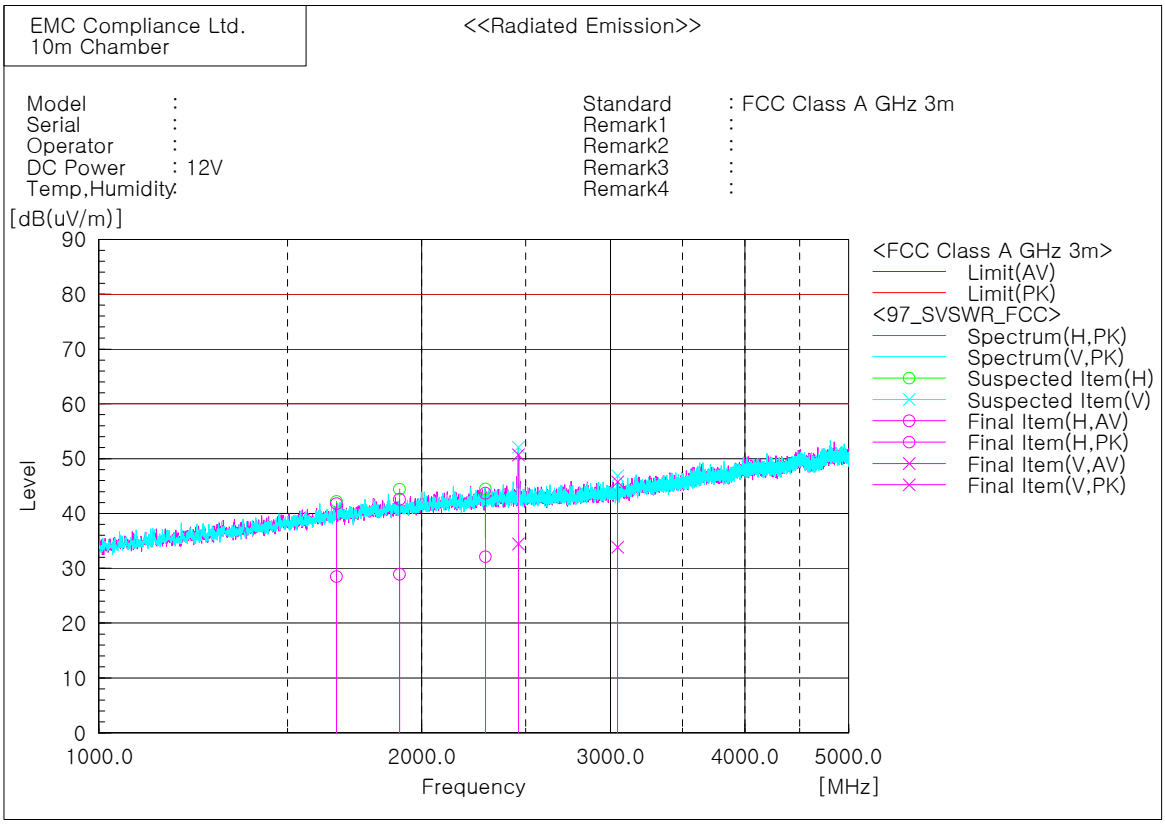
* 30 ㎒ ~ 1 ㎓ (PoE)



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	34.608	V	41.9	-15.0	26.9	39.0	12.1	100.0	309.7	
2	108.813	V	46.2	-16.8	29.4	43.5	14.1	100.0	261.8	
3	124.939	V	47.4	-14.8	32.6	43.5	10.9	100.0	91.0	
4	143.248	V	45.0	-13.5	31.5	43.5	12.0	100.0	290.3	
5	240.005	H	45.2	-13.9	31.3	46.5	15.2	400.0	12.0	
6	249.947	H	43.3	-13.4	29.9	46.5	16.6	400.0	147.7	
7	374.956	V	43.4	-9.4	34.0	46.5	12.5	100.0	35.5	
8	781.386	H	32.3	-0.5	31.8	46.5	14.7	400.0	50.0	

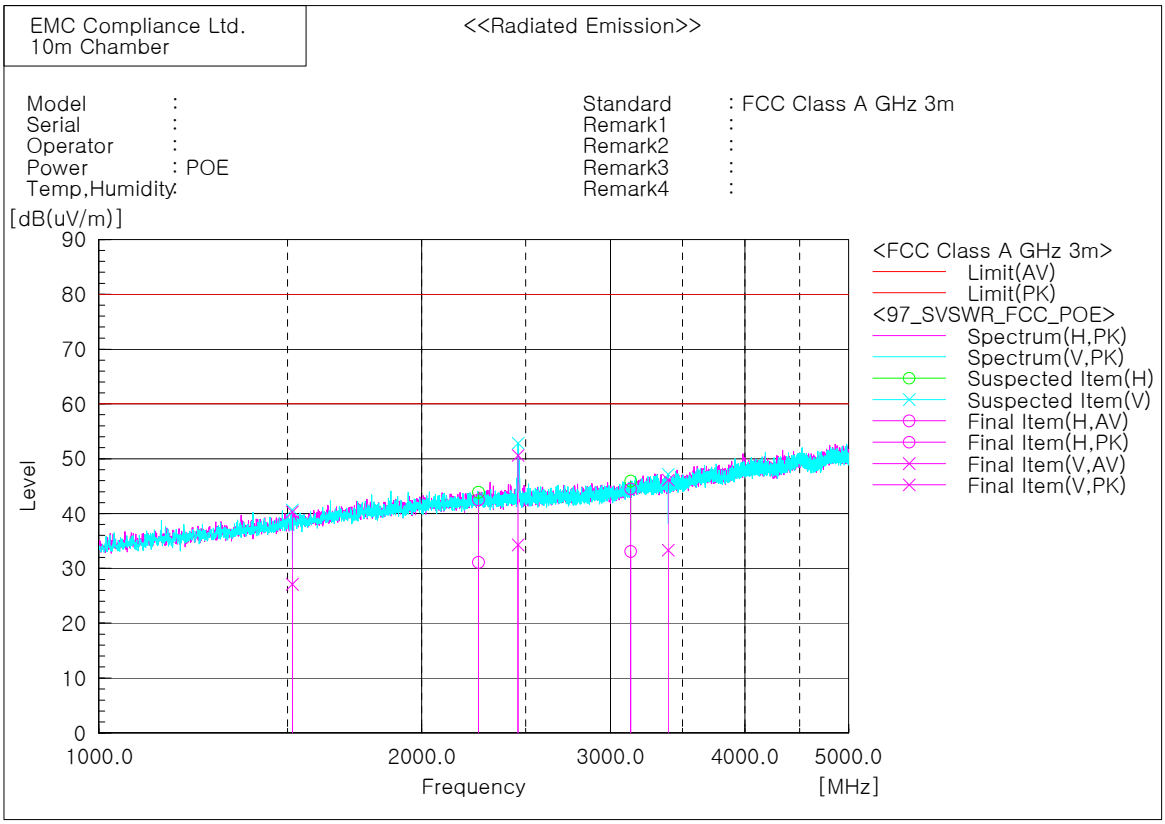
* 1 ㎓ ~ 5 ㎓ (DC 12 V)



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]	Remark
1	1665.000	H	30.4	43.7	-1.9	28.5	41.8	60.0	80.0	31.5	38.2	100.0	130.0	
2	1906.875	H	29.1	42.8	-0.2	28.9	42.6	60.0	80.0	31.1	37.4	100.0	73.0	
3	2291.875	H	30.6	42.2	1.5	32.1	43.7	60.0	80.0	27.9	36.3	100.0	39.3	
4	2460.625	V	32.5	48.7	2.0	34.5	50.7	60.0	80.0	25.5	29.3	100.0	304.9	
5	3043.125	V	30.9	42.8	3.0	33.9	45.8	60.0	80.0	26.1	34.2	100.0	154.9	

* 1 ㎓ ~ 5 ㎓ (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	1514.375	V	30.5	43.7	-3.4	27.1	40.3	60.0	80.0	32.9	39.7	100.0	211.4	
2	2258.750	H	29.8	41.2	1.3	31.1	42.5	60.0	80.0	28.9	37.5	100.0	278.9	
3	2460.000	V	32.3	48.6	2.0	34.3	50.6	60.0	80.0	25.7	29.4	100.0	320.3	
4	3131.875	H	29.6	41.0	3.5	33.1	44.5	60.0	80.0	26.9	35.5	100.0	4.0	
5	3392.500	V	28.1	40.9	5.2	33.3	46.1	60.0	80.0	26.7	33.9	100.0	79.2	

7. E.U.T. photographs

Front View

Rear View

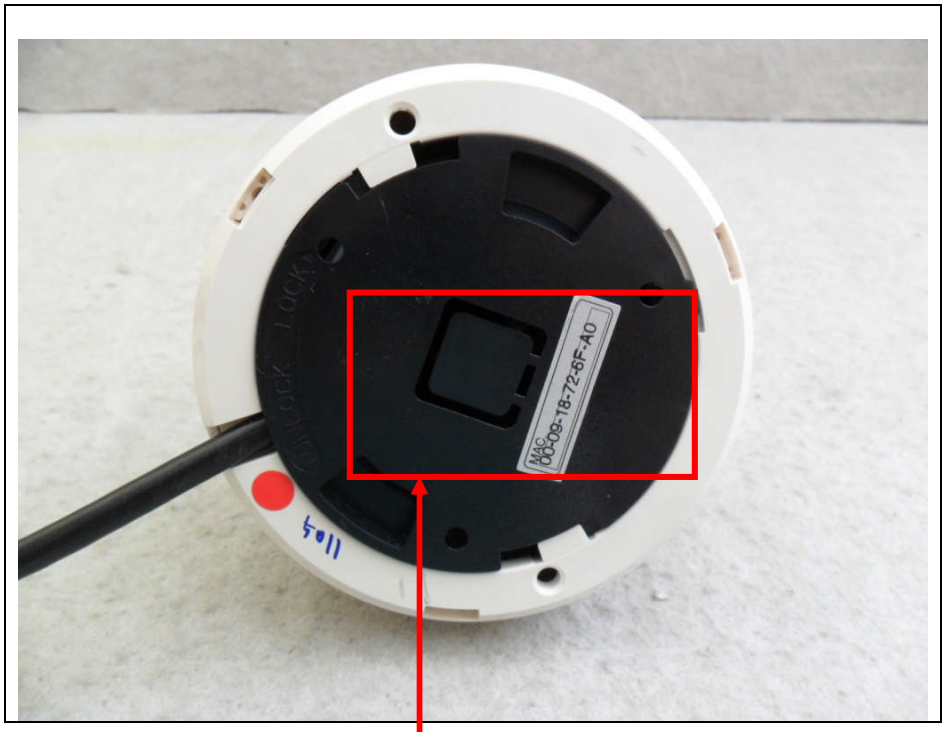
Left View

Right View

Top View

Bottom View

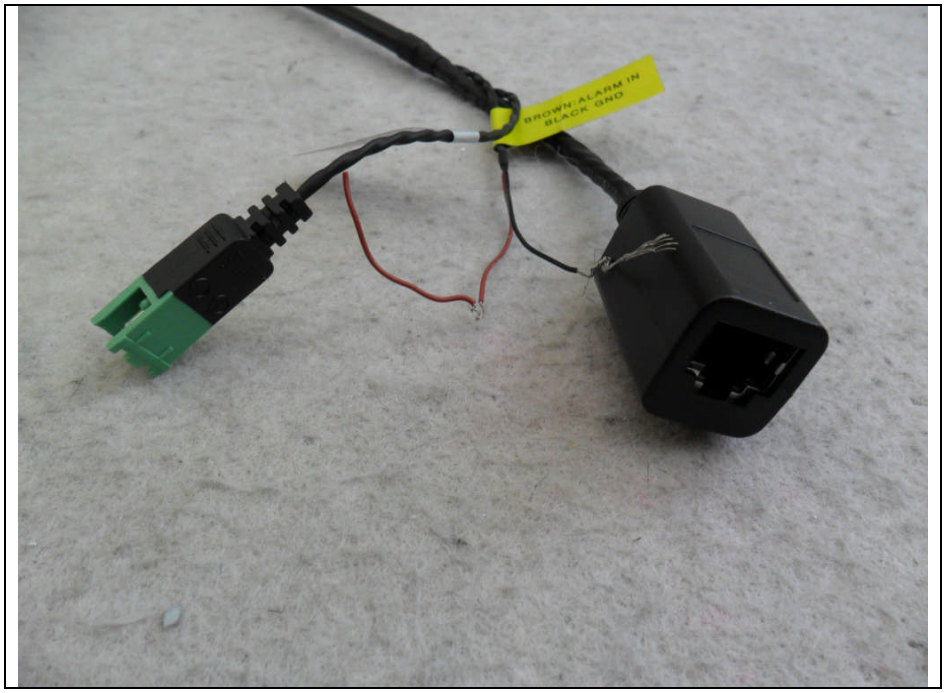
Label



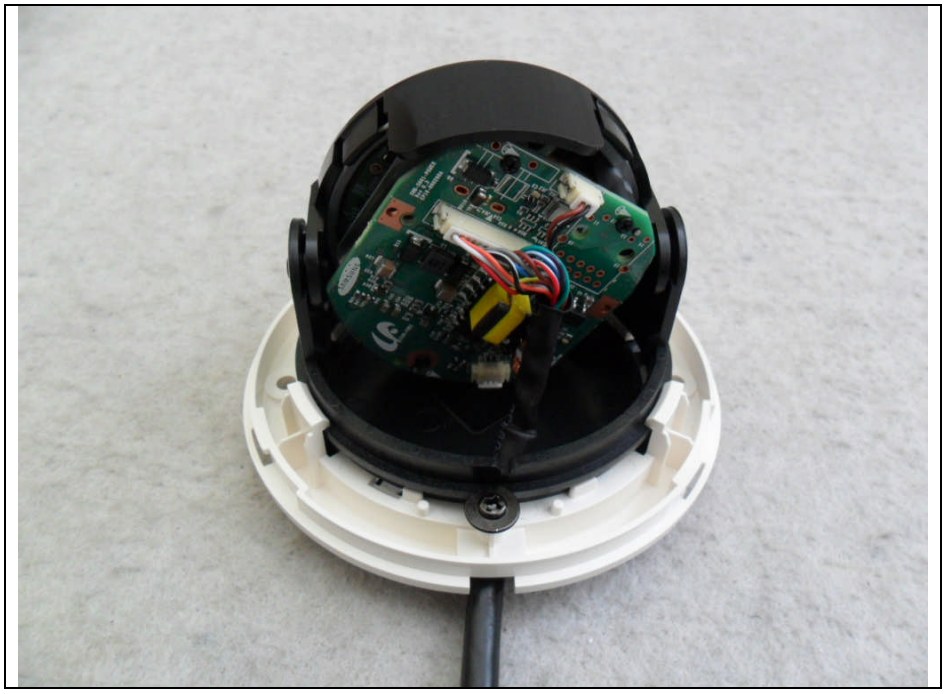
FCC Label Location

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.

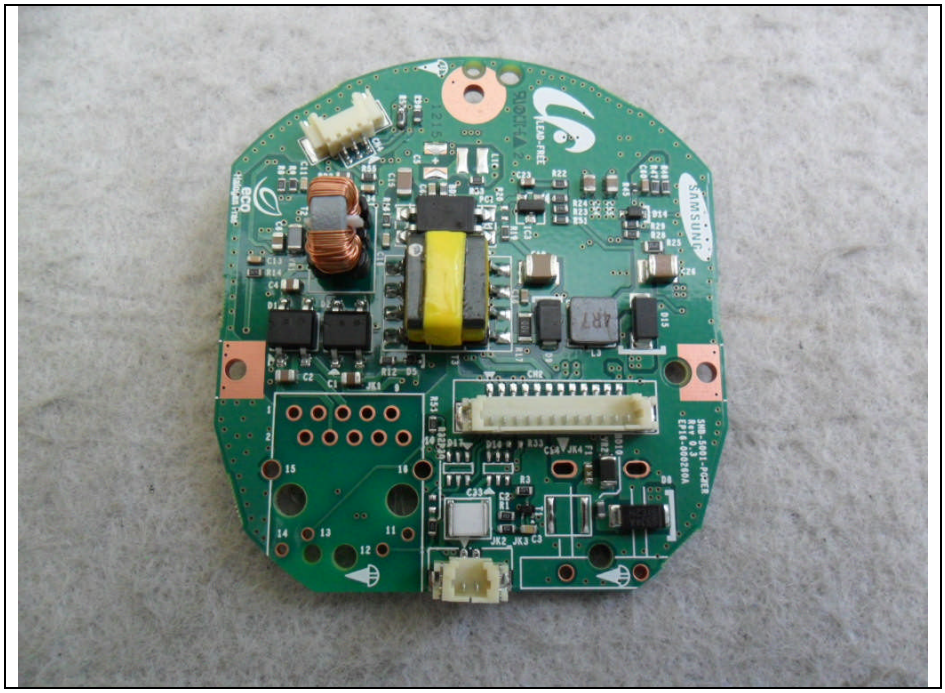
Port

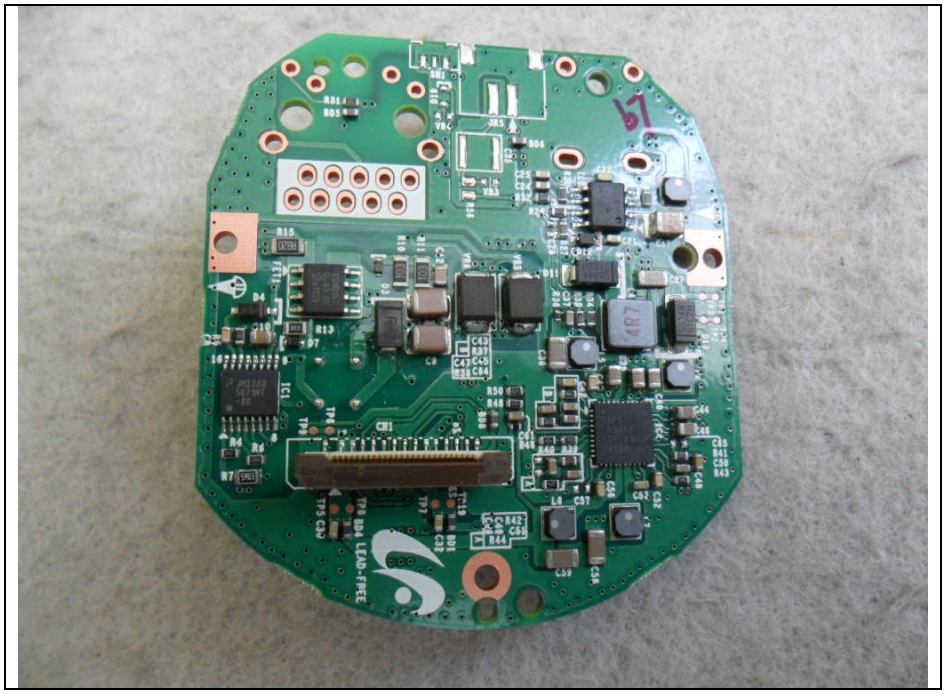


Inside

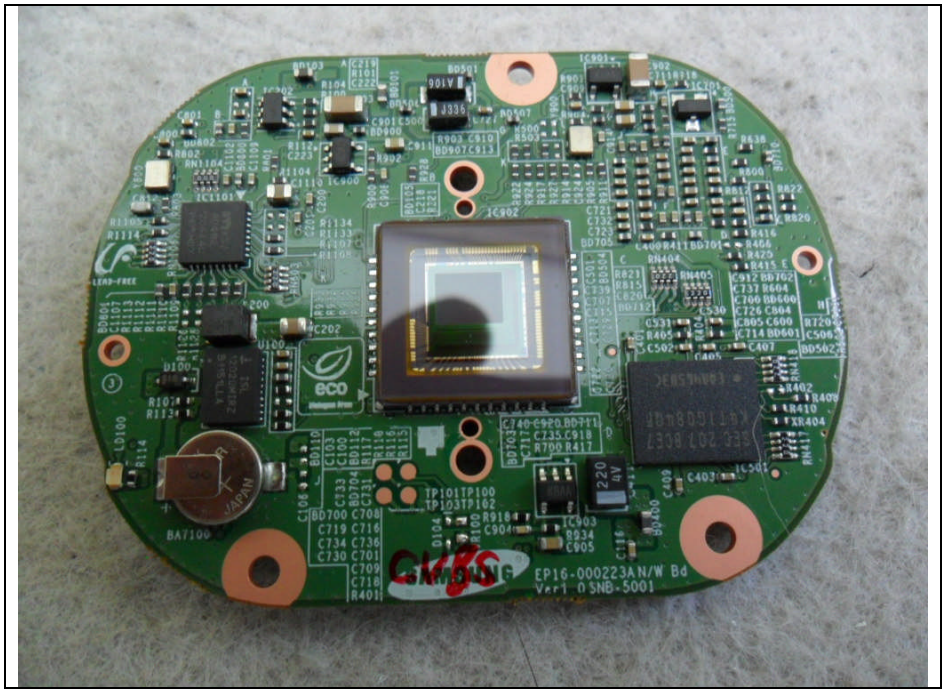


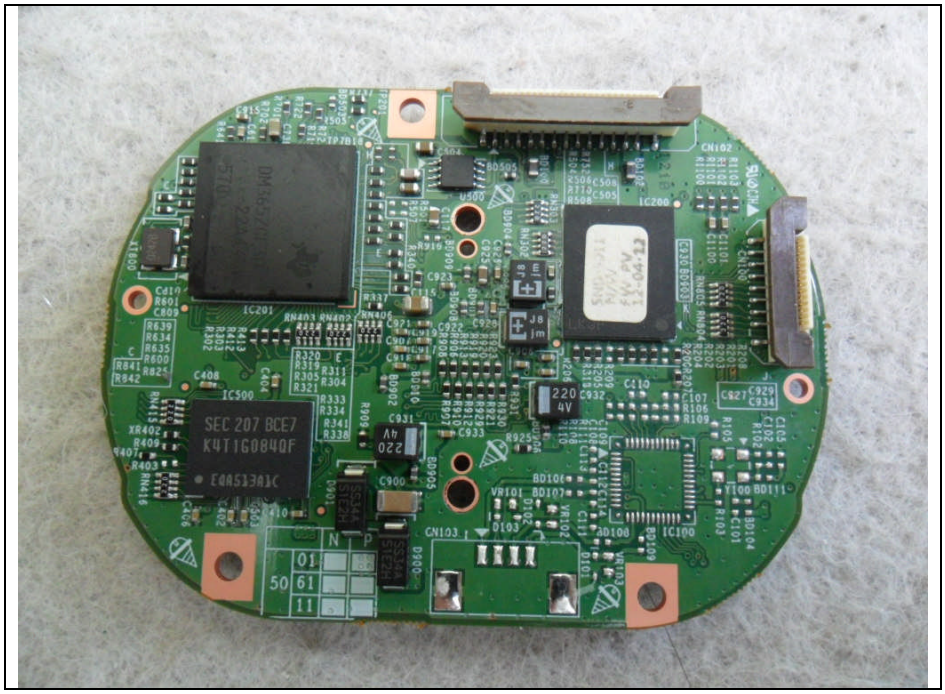
Main Board





CCD Board





SUB Board