

CERTIFICATE of EMC Compliance

Report No: EMC-FCC-1382
Type of equipment: NETWORK CAMERA
Model Name: SNV-1080N
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

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EMI TEST REPORT

Test report No.: EMC-FCC-1382
Type of Equipment: NETWORK CAMERA
Model Name: SNV-1080N
Applicant: Samsung Techwin Co., Ltd.
#42 Seongju-Dong, Changwon-Shi,
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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. 09. 21

Date of testing: 2011. 09. 26

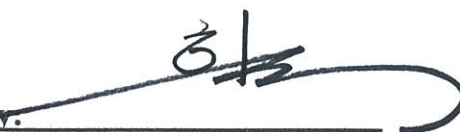
Issued date: 2011. 09. 29

Tested by:



CHO, MOON-SUP

Approved by:



YEOM, HAN-SEOK

Contents

1. Applicant information	3
2. Laboratory information	4
3. Test system configuration.....	5
3.1 Operation environment	5
3.2 Measurement Uncertainty	5
4. Description of E.U.T.	6
4.1 General information.....	6
4.2 Product description	8
4.3 Auxiliary equipments.....	8
4.4 Test configuration	9
4.5 Operating conditions.....	11
5. Summary of test results.....	12
5.1 Modification to the E.U.T.	12
5.2 Summary of EMI emission test results	12
6. Test results	13
6.1 Radiated Emission	13
7. E.U.T. photographs.....	23

1. Applicant information

Applicant: Samsung Techwin Co., Ltd.
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Manufacturer#1: Samsung Techwin Co., Ltd.
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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

Facsimile Number: 82 31 336 4767

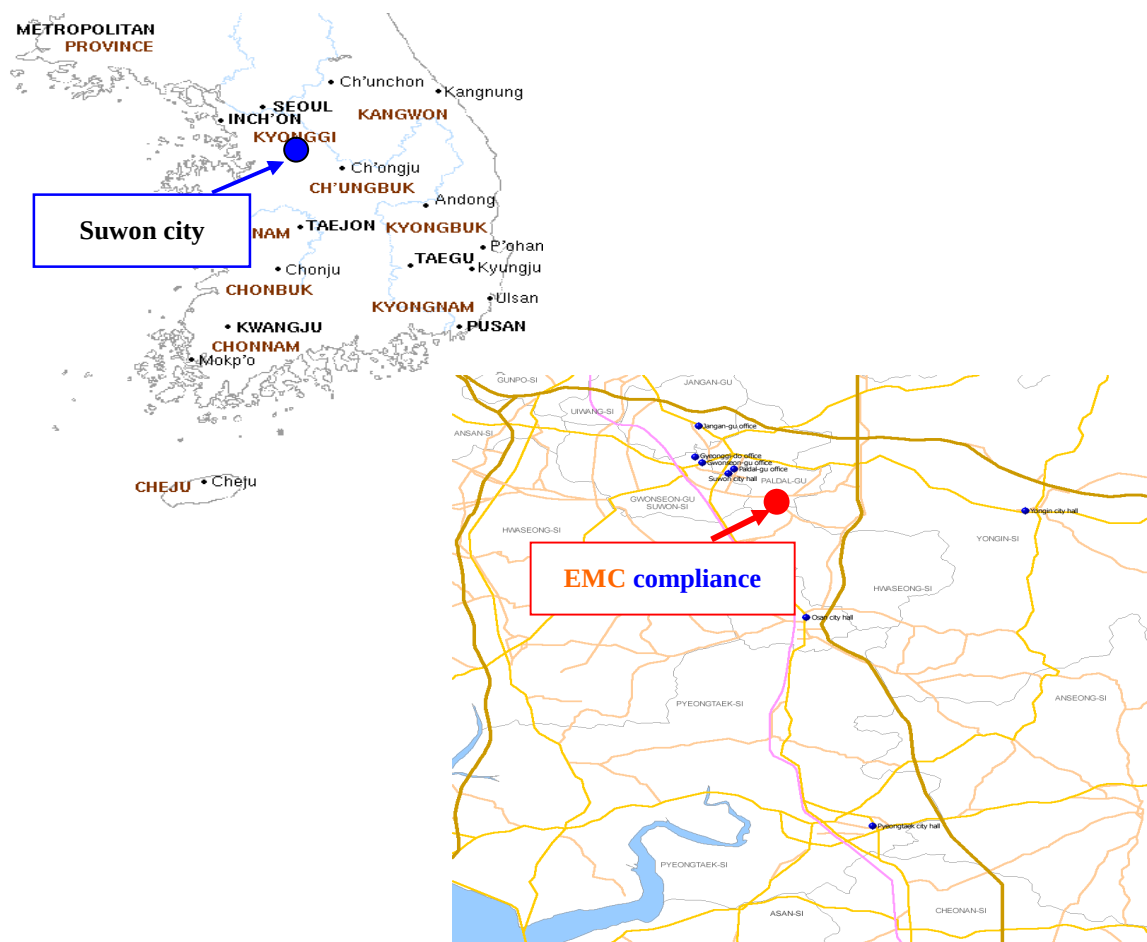
FCC CAB.: KR0040

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

Industry Canada Registration No. : 8035A

KOLAS NO.: 231

SITE MAP



3. Test system configuration

3.1 Operation environment

	Temperature	Humidity	Pressure
Chamber(10 m) :	26 °C	39 % 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 MHz ~ 300 MHz: 3 m: + 4.28 [dB], - 4.30 [dB]

10 m: + 4.27 [dB], - 4.28 [dB]

300 MHz ~ 1 000 MHz: 3 m: + 4.56 [dB], - 4.57 [dB]

10 m: + 4.41 [dB], - 4.43 [dB]

4. Description of E.U.T.

4.1 General information

	SNV-1080(N/P)
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)	2.2~7.7mm (3.5x) Vari-focal
Max. Aperture Ratio	F1.2
Angular Field of View	H : 94° (W) ~ 26.5° (T) , V : 70° (W) ~ 20° (T)
Min. Object Distance	500 mm
Focus Control	-
Zoom Movement Speed	-
Lens Type	DC Auto Iris
Mount Type	Board type(Ø14)
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	-
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	-

Network	
Ethernet	RJ-45 (10/100BASE-T)
Video Compression Format	H.264, MJPEG
Resolution	<H.264> 640x480 / 320x240 / 160x120 <MJPEG> 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, Danish, 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	IP66 Grade (Waterproof)
Electrical	
Input Voltage / Current	12V DC, PoE(IEEE802.3af)
Power Consumption	Max 3.4W (DC 12V), Max 4W (PoE)
Mechanical	
Color / Material	Ivory, Aluminum
Dimension (WxHxD)	H105.9 x Ø137mm
Weight	

4.2 Product description

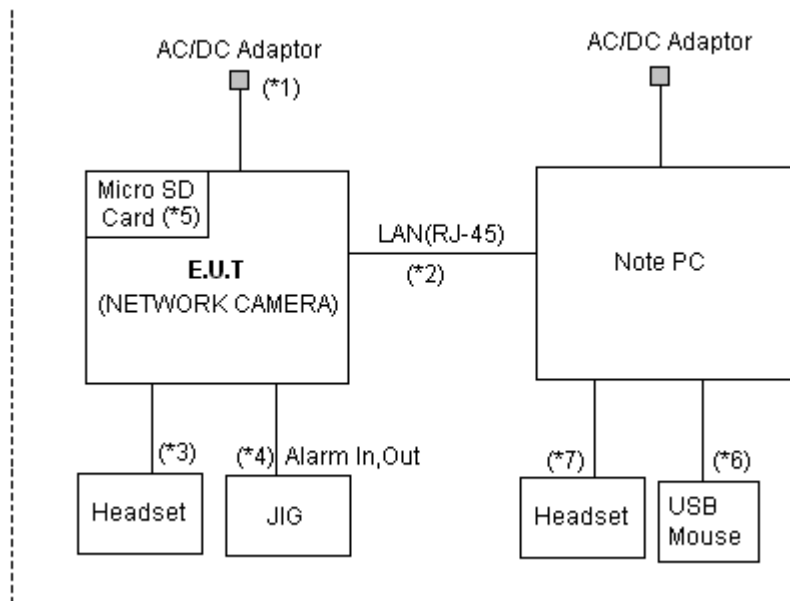
Type of product	NETWORK CAMERA
Model name (Basic)	SNV-1080N
Model name (Variant)	N/A
Difference	-
Trade name	-
Serial no	Engineering Sample
Testing voltage	DC 12 V / PoE
Product rating	DC 12 V / PoE
Internal clock frequency	108 MHz
Note	* AC/DC adaptor was not provided by the manufacturer. * PoE Switch was not provided by the manufacturer.

4.3 Auxiliary equipments

Type	Model / Part #	Serial number	Manufacturer
Note PC	C1410	473680121639	FUJITSU
Headset#1	SHS-250V	-	SAMSUNG
Headset#2	SHS-250V	-	SAMSUNG
USB Mouse	1088	8165900112701	Microsoft
JIG	-	-	-
Micro SD Card(2GB)	-	-	SANDISK
PoE Switch	FS108P	1DL2093R00C1C	NETGEAR
AC/DC Adaptor(DC 12 V)	DAD12050DKA	-	Dream Electronic

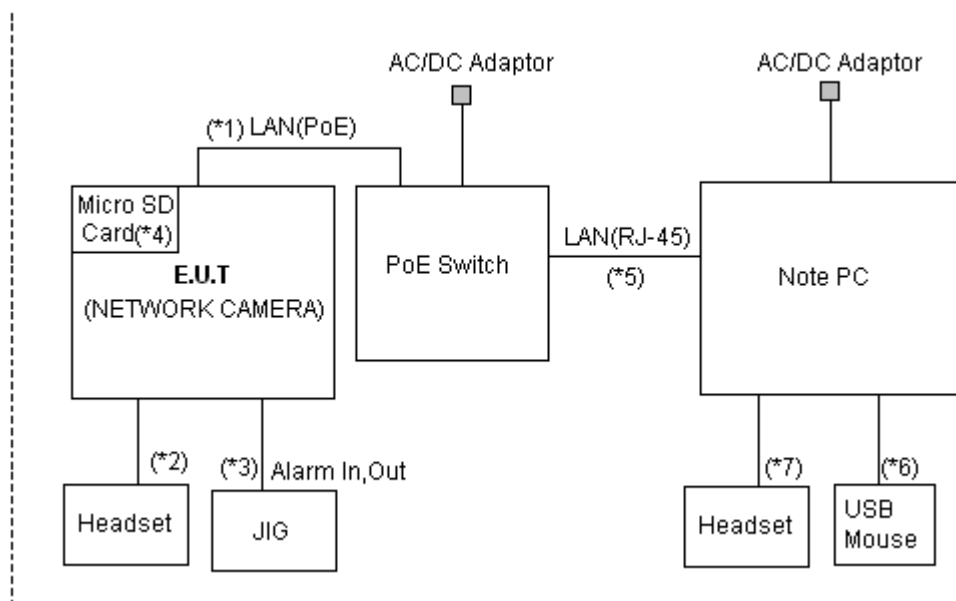
4.4 Test configuration

* 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		Headset	Headset	Headset	2.0	Non-Shield
4		Alarm In,Out	JIG	Alarm In,Out	3.0	Non-Shield
5		Micro SD Slot	Micro SD Card	Micro SD Slot	Direct	-
6	Note PC	USB	USB Mouse	USB	1.6	Shield
7		Headset	Headset	Headset	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(PoE)	PoE Switch	LAN(PoE)	3.0	Non-Shield
2		Headset	Headset	Headset	2.0	Non-Shield
3		Alarm In, Out	JIG	Alarm In, Out	3.0	Non-Shield
4		Micro SD Slot	Micro SD Card	Micro SD Slot	Direct	-
5	Note PC	LAN(RJ-45)	PoE Switch	LAN(RJ-45)	3.0	Non-Shield
6		USB	USB Mouse	USB	1.6	Shield
7		Headset	Headset	Headset	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 operation
1	Web viewer test mode.

* 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

Application	Test method	Test result
Conducted emission	ANSI C63.4 – 2009	N/A
Radiated emission DC 12 V, AC 24 V	ANSI C63.4 – 2009	Complied

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. 09. 26		
Testing voltage	DC 12 V / PoE		
Test facility	10 m Chamber (Test distance: 10 m, 3m)		
Temperature (°C)	26 °C	Humidity (% R.H.)	39 % R.H.
Remarks	Complied 30 MHz ~ 1 GHz Minimum limit margin is 3.0 dB at 79.184 MHz. (DC 12 V) 1 GHz ~ 5 GHz Minimum limit margin is 10.9 dB at 3587.566 MHz. (PoE _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, 3 m distance at 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

Equipment	Model no.	Serial no.	Makers	Next cal. date	Used
Test Receiver	ESCI	100710	R&S	11.12.01	☒
Bi-Log Antenna	VULB 9168	9168-453	SCHWARZBECK	13.08.30	☒
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:

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

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

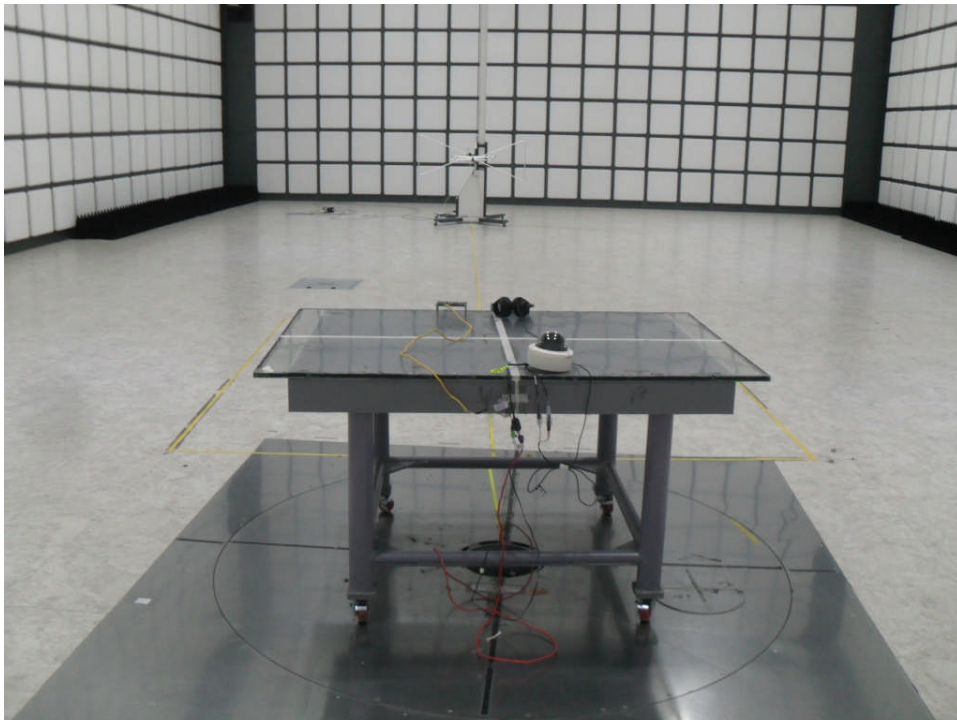
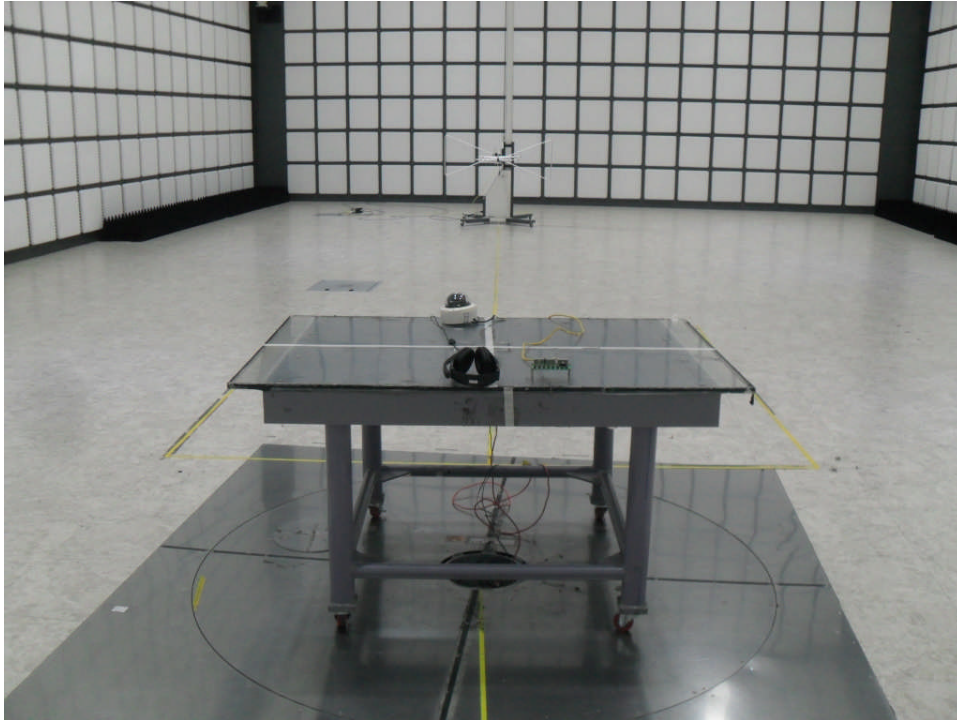
If M.R is 30 dB, A.F 12 dB, C.L 5 dB, 3 dB, A.G 35 dB

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

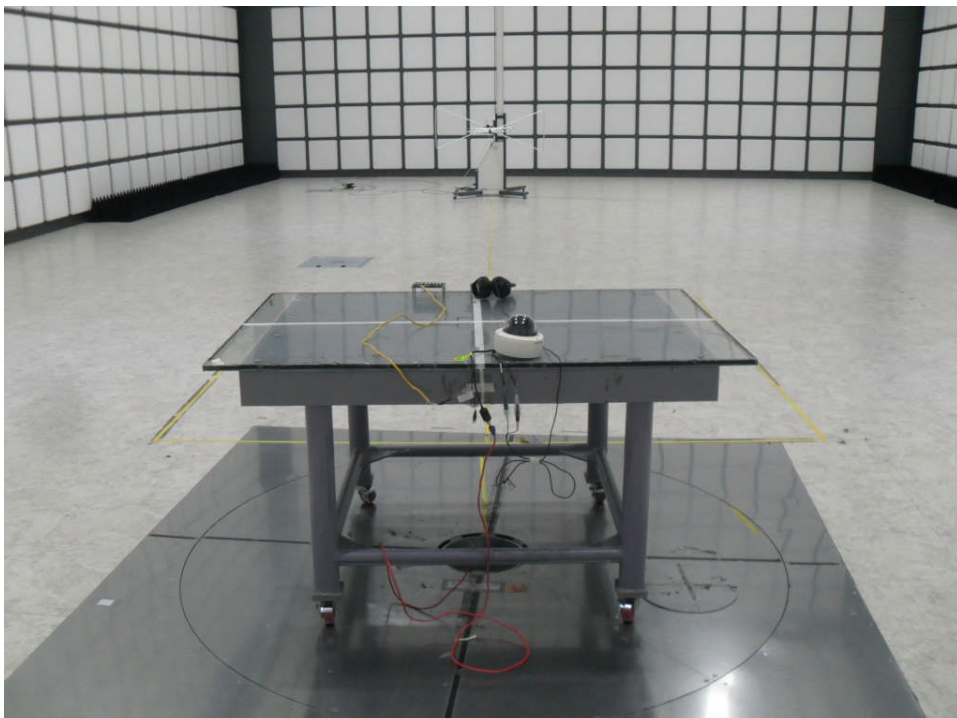
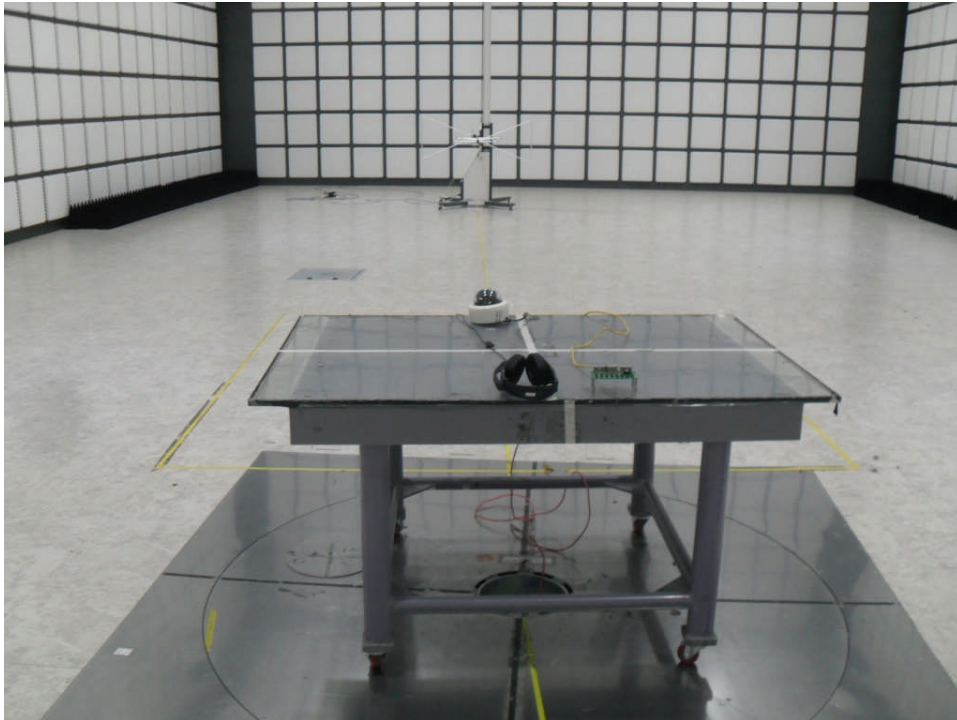
6.1.5 Photographs of test setup

* 30 MHz ~ 1 GHz

* DC 12 V

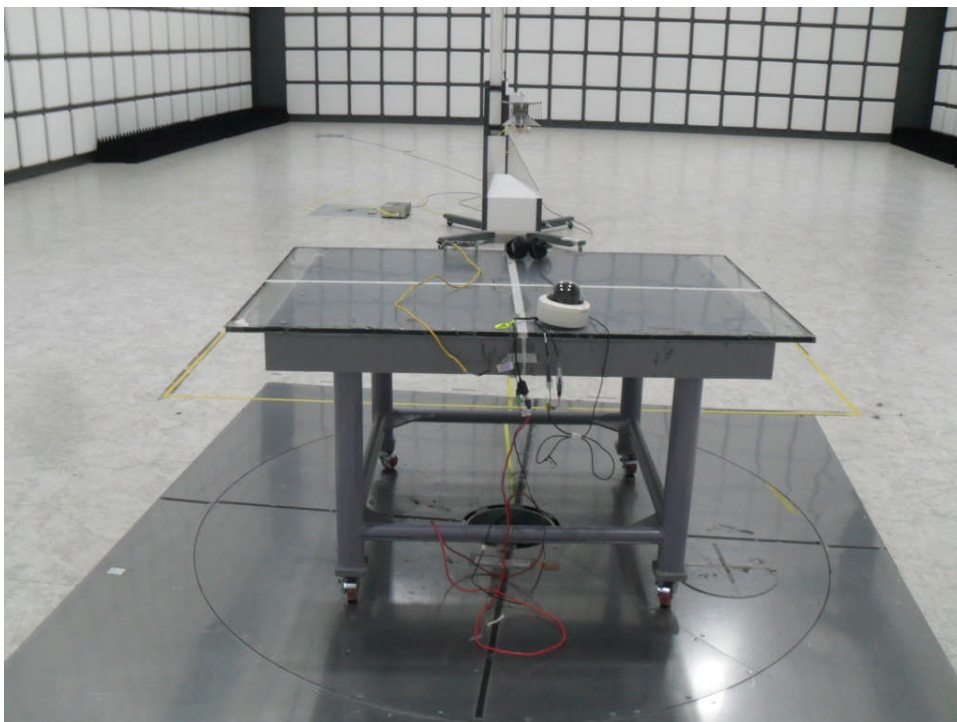
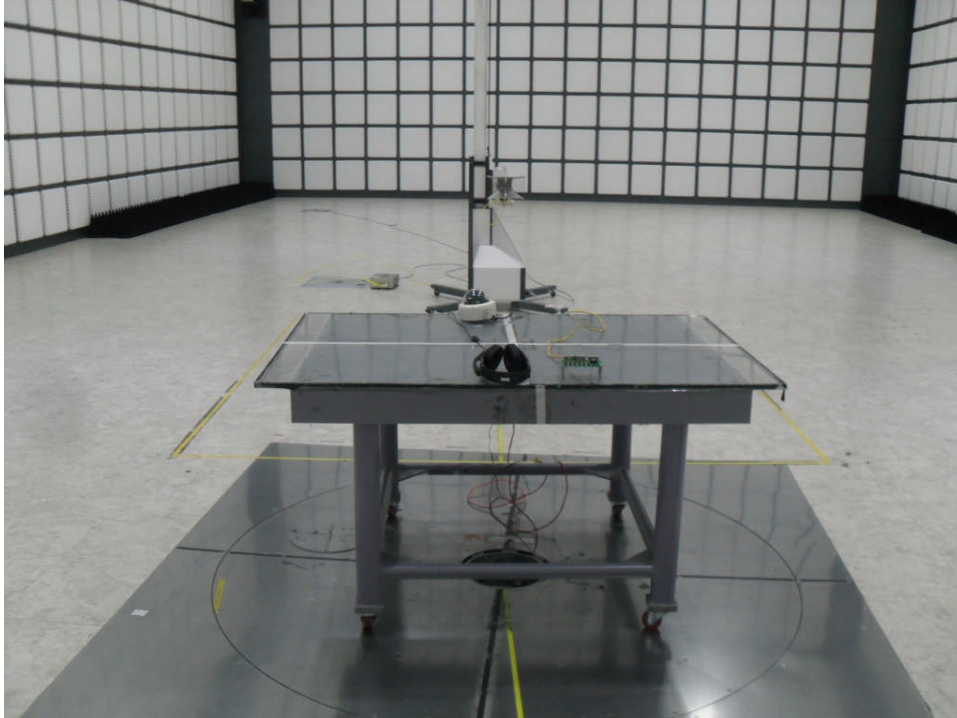


* PoE

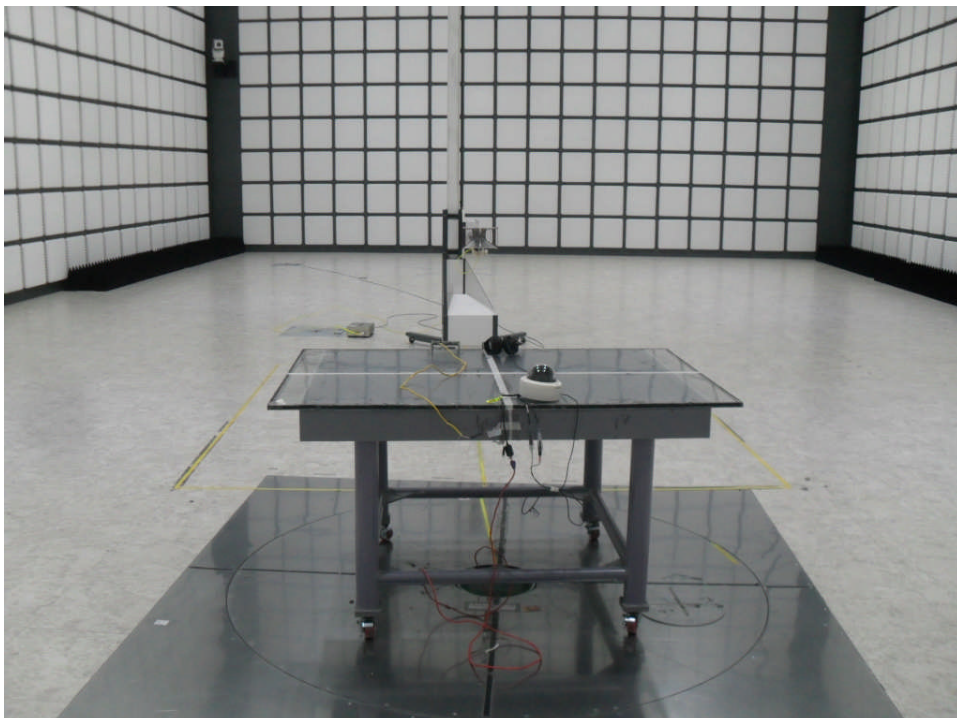
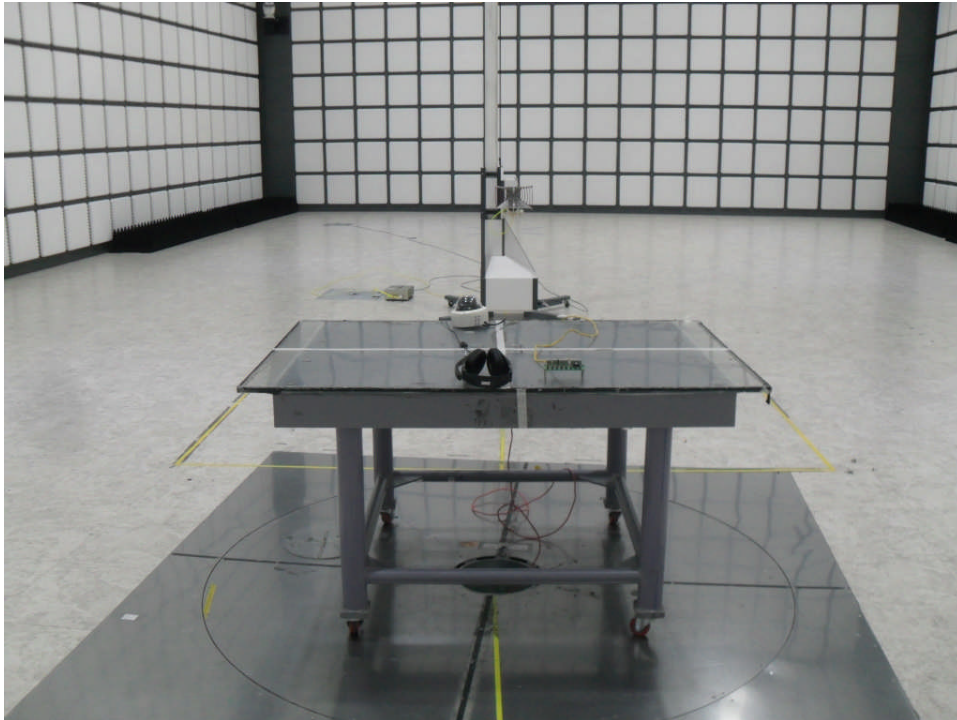


* 1 GHz ~ 5 GHz

* DC 12 V



* PoE

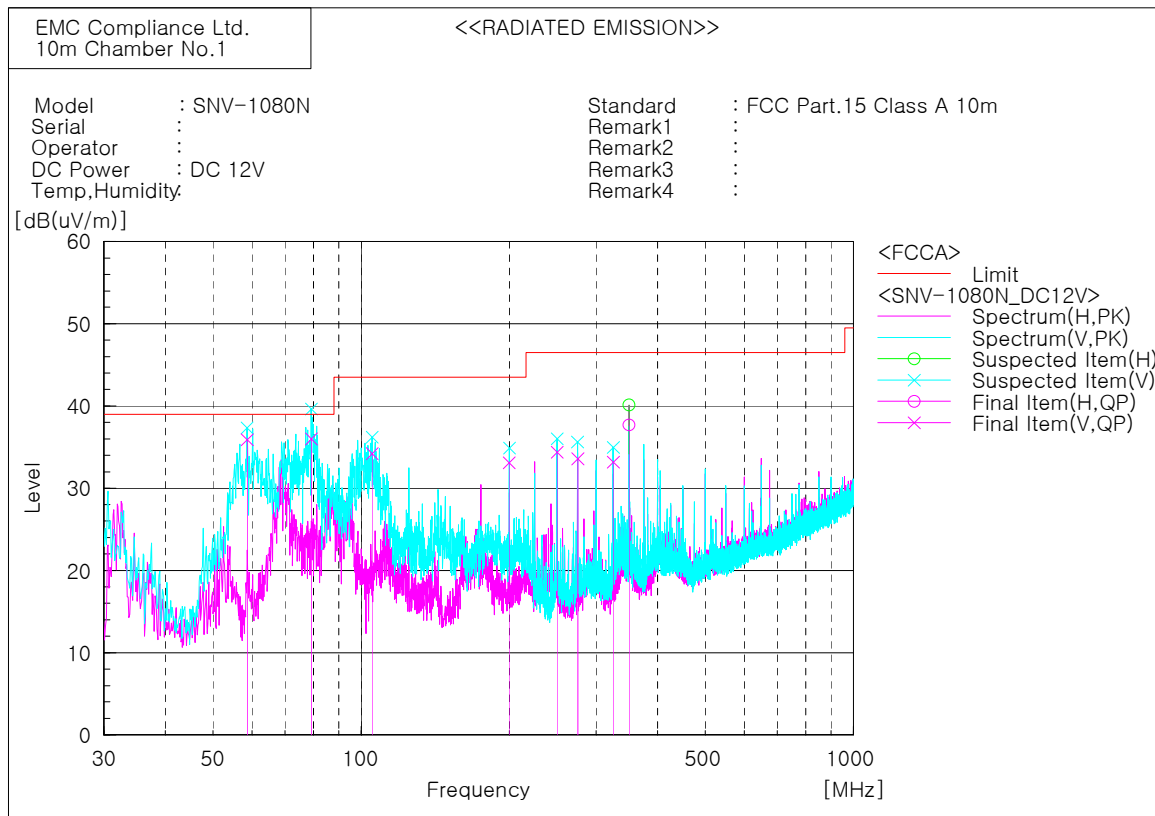


6.2.6 Radiated emission measurement result

* Graph and Data

* 30 MHz ~ 1 GHz

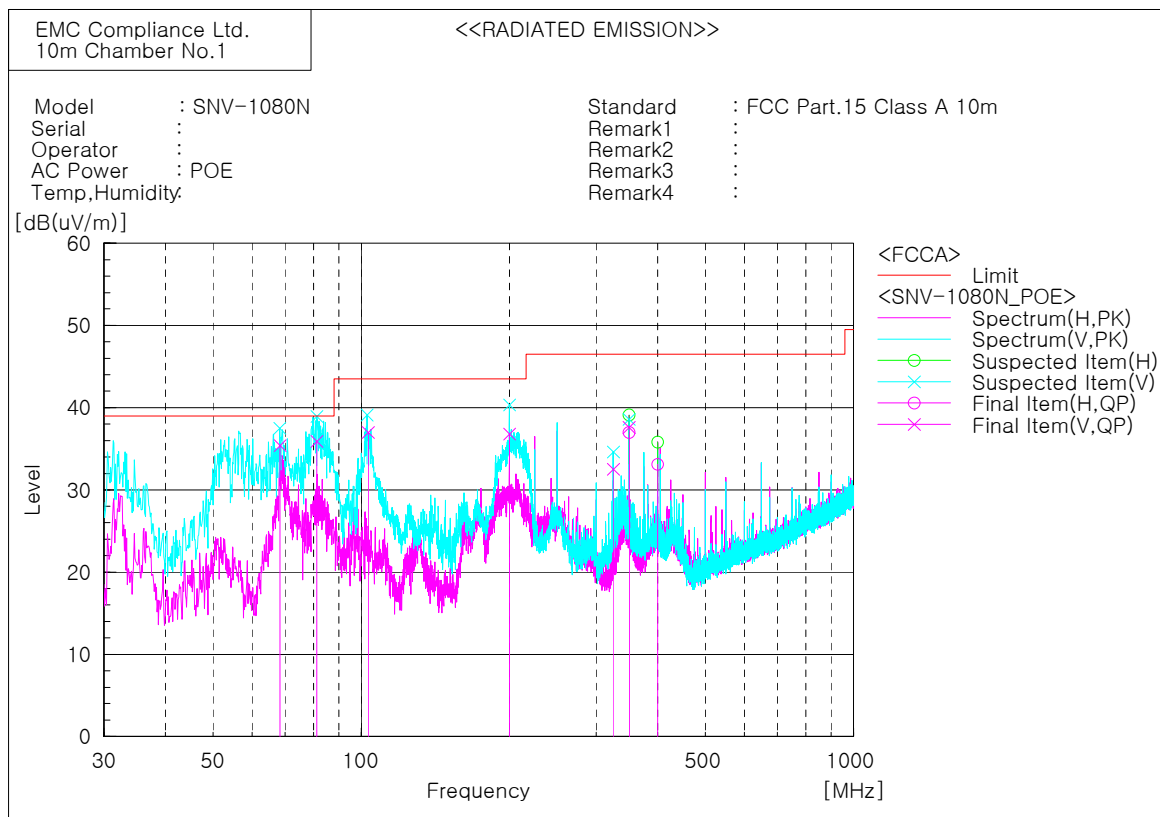
* DC 12 V



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	58.666	V	50.8	-14.9	35.9	39.0	3.1	202.0	55.5
2	79.184	V	54.6	-18.6	36.0	39.0	3.0	202.0	252.3
3	105.244	V	50.2	-16.0	34.2	43.5	9.3	202.0	176.0
4	199.916	V	48.6	-15.5	33.1	43.5	10.4	202.0	37.2
5	249.935	V	47.5	-13.1	34.4	46.5	12.1	202.0	92.8
6	275.154	V	45.5	-11.9	33.6	46.5	12.9	100.0	209.5
7	325.044	V	43.5	-10.3	33.2	46.5	13.3	202.0	179.8
8	350.049	H	47.2	-9.5	37.7	46.5	8.8	302.0	252.1

* PoE

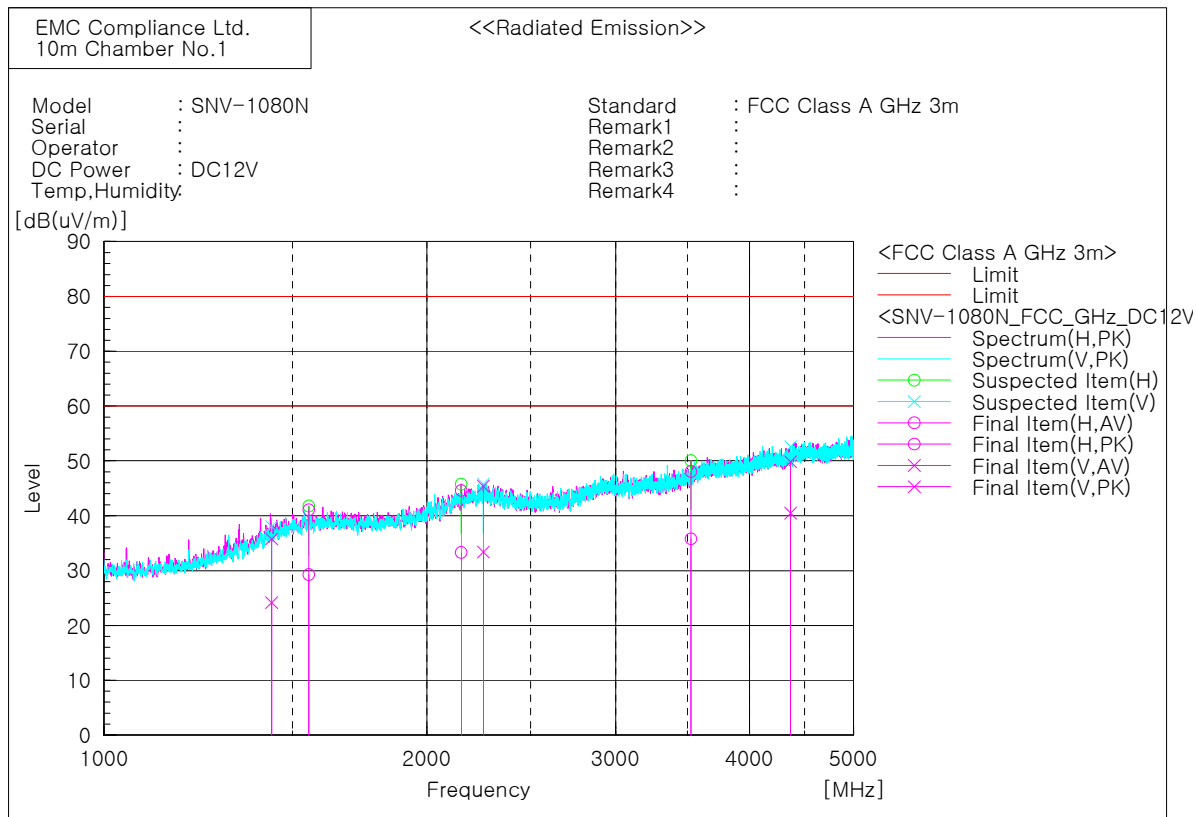


Final Result

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]
1	68.344	V	51.3	-15.9	35.4	39.0	3.6	298.0	146.7
2	81.212	V	54.5	-18.6	35.9	39.0	3.1	400.0	291.9
3	103.313	V	53.4	-16.4	37.0	43.5	6.5	298.0	69.7
4	199.986	V	52.3	-15.5	36.8	43.5	6.7	198.0	76.5
5	325.043	V	42.8	-10.3	32.5	46.5	14.0	100.0	171.4
6	349.917	V	47.1	-9.5	37.6	46.5	8.9	100.0	314.1
7	349.998	H	46.5	-9.5	37.0	46.5	9.5	302.0	250.5
8	400.164	H	41.2	-8.1	33.1	46.5	13.4	202.0	316.8

* 1 GHz ~ 5 GHz

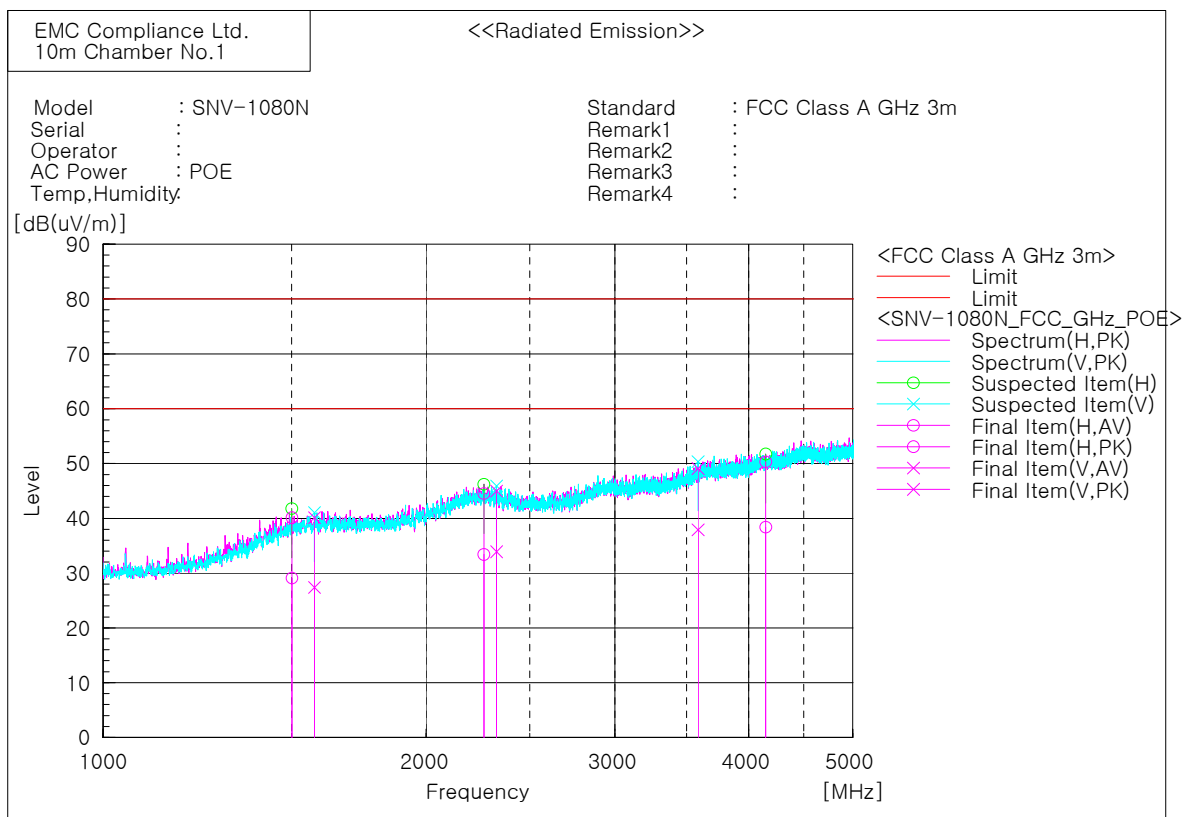
* DC 12 V



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	1433.155	V	31.5	43.1	-7.3	24.2	35.8	60.0	80.0	35.8	44.2	100.0	201.5
2	1552.633	H	35.6	47.4	-6.3	29.3	41.1	60.0	80.0	30.7	38.9	198.0	268.4
3	2152.547	H	35.9	47.2	-2.6	33.3	44.6	60.0	80.0	26.7	35.4	198.0	77.8
4	2257.856	V	35.8	47.8	-2.4	33.4	45.4	60.0	80.0	26.6	34.6	200.0	207.0
5	3526.326	H	34.5	46.8	1.3	35.8	48.1	60.0	80.0	24.2	31.9	100.0	16.8
6	4366.575	V	35.8	45.2	4.7	40.5	49.9	60.0	80.0	19.5	30.1	100.0	341.9

* 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	1500.055	H	35.8	46.8	-6.7	29.1	40.1	60.0	80.0	30.9	39.9	100.0	192.1
2	1574.355	V	33.5	46.2	-6.1	27.4	40.1	60.0	80.0	32.6	39.9	199.0	204.4
3	2265.047	H	35.8	46.9	-2.4	33.4	44.5	60.0	80.0	26.6	35.5	100.0	122.0
4	2326.866	V	36.1	47.2	-2.2	33.9	45.0	60.0	80.0	26.1	35.0	199.0	101.7
5	3587.566	V	47.5	36.3	1.6	49.1	37.9	60.0	80.0	10.9	42.1	100.0	77.5
6	4146.879	H	34.2	46.1	4.2	38.4	50.3	60.0	80.0	21.6	29.7	199.0	27.1

7. E.U.T. photographs

Front View



Rear View



Left View



Right View



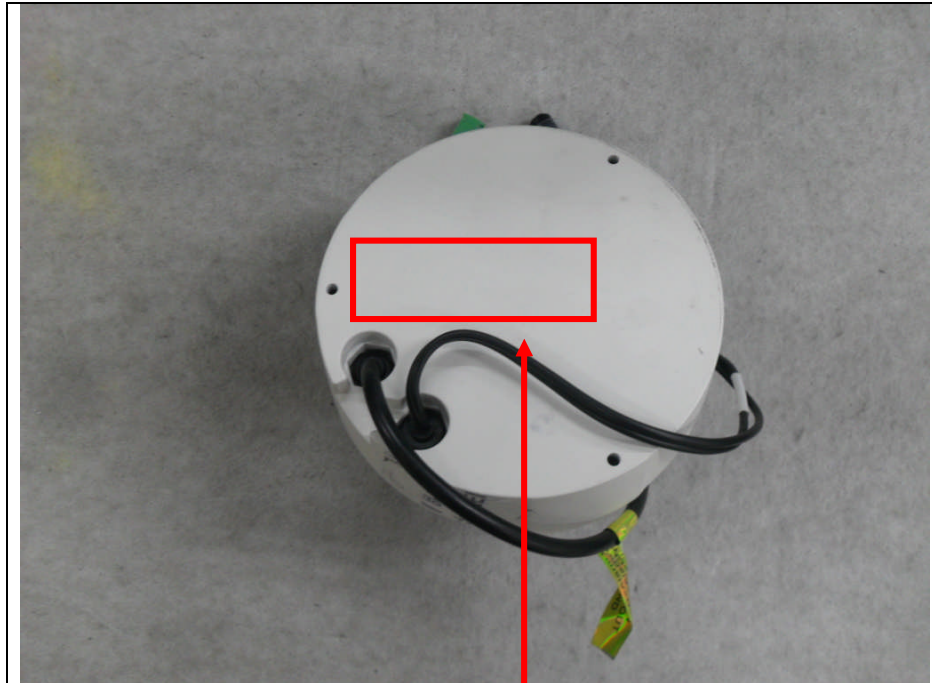
Top View



Bottom View



Label



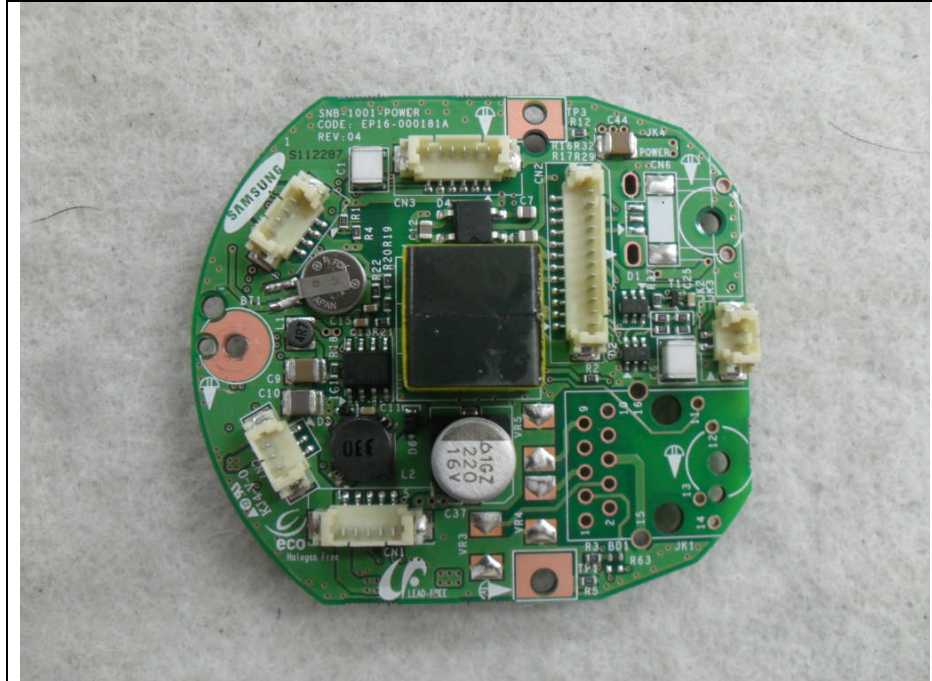
FCC Label Location

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.

Inside



Main Board



Main SUB Board



CCD Board

