

CERTIFICATE of EMC Compliance

Report No : EMC-FCC-2020
Type of equipment : Network Camera
Model Name : SNF-7010VN
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 Tianjn 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.
480-5 Sin-dong, Yeongtong-gu,
Suwon-city, Gyeonggi-do, 443-390, Korea

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Yeom, Han-Seok / Manager

EMI TEST REPORT

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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. 08. 02

Date of testing: 2013. 08. 06

Issued date: 2013. 08. 14

Tested by:



HWANG, SUN-BIN

Approved by:



YEOM, HAN-SEOK

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1. Applicant information

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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
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

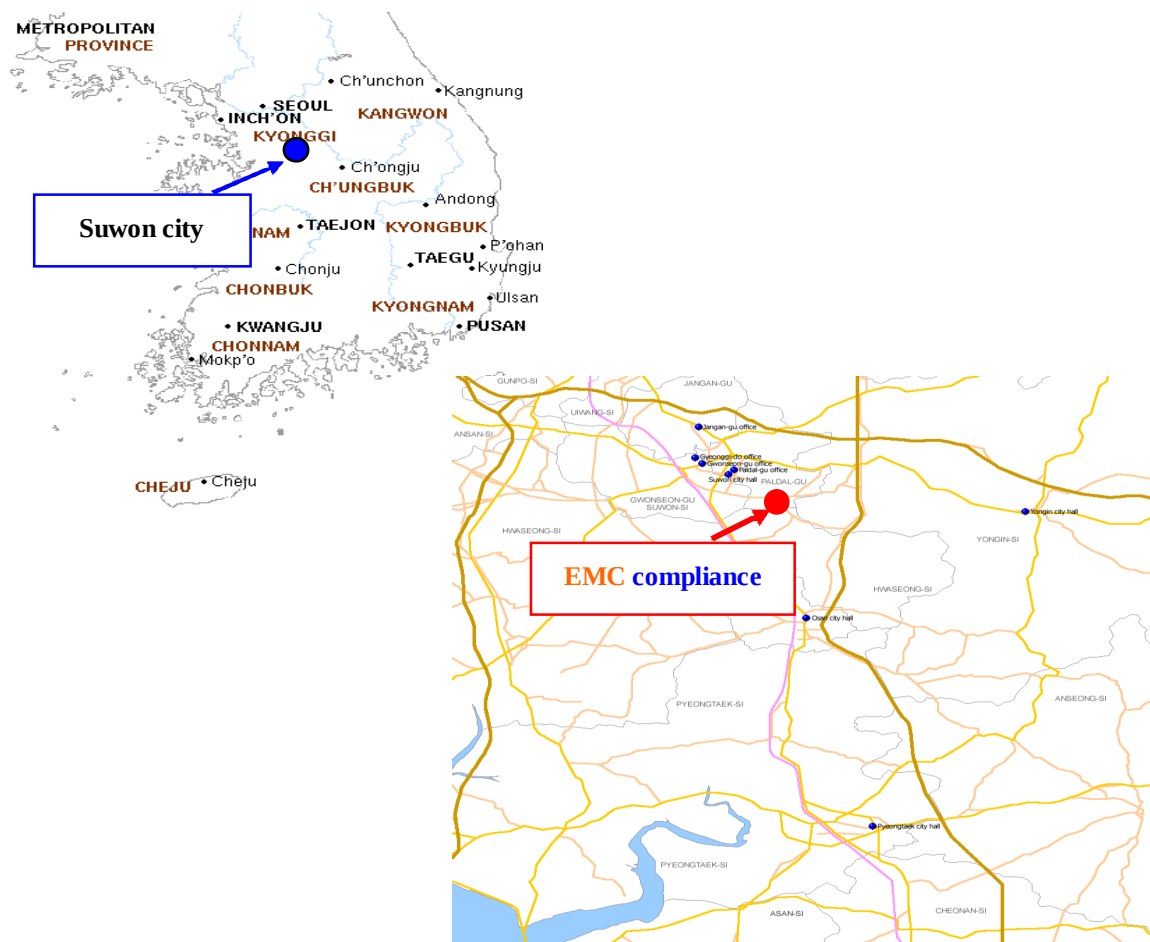
FCC CAB.: KR0040

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)	: 23 °C	63 % R.H.	-
Shielded room(CE)	: -	-	-

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: ± 3.82 dB 150 kHz ~ 30 MHz: ± 3.43 dB	
Shielded Room (CE#2)	9 kHz ~ 150 kHz: ± 3.82 dB 150 kHz ~ 30 MHz: ± 3.43 dB	
Shielded Room (CE#3)	9 kHz ~ 150 kHz: ± 4.00 dB 150 kHz ~ 30 MHz: ± 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 10 m: + 4.56 dB, - 4.56 dB
	300 MHz ~ 1 000 MHz	3 m: + 4.84 dB, - 4.85 dB 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 10 m: + 4.86 dB, - 4.86 dB
	300 MHz ~ 1 000 MHz	3 m: + 4.98 dB, - 4.99 dB 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

Video		
Imaging Device		1/2.8" 3M PS CMOS
Total Pixel		3megapixel
Scanning System		Progressive
Min. Illumination		1.3Lux
S/N Ratio		-
Video Out		-
Lens		
Focal length		1.05mm
Max. Aperture ratio		F2.8
Angleof View	Vertical	170°
	Diagonal	180°
	Horizontal	180°
Min. Object Distance		0.3M
Lens Type		Fixed focal
Mount Type		Board-in type
Lens angle adjustment		Rotation : 0°~ 355°
Operational		
Camera Title		Off / On (Displayed up to 45 characters)
Day & Night		Auto/Color/B/W
Backlight compensation		Off/BLC
Wide Dynamic Range		90dB ↑
Contrast Enhancement		SSDR(Off/on)
Image Enhancement		Defog
Digital Noise Reduction		SSNRⅢ(2D+3D Noise Filter)(Off/On)
Digital Image Stabilization		-
Motion Detection		Off/On(4ea, 4Point Polygonal)
Privacy Masking		Off/On(32-4Point Polygonal)
Gain Control		Off/Low/Middle/High
White Balance		ATW/AWC/Manual/Indoor/Outdoor
Temperature Detector		
Electronic Shutter Speed		Min / Max / Flicker Off / 50Hz / 60Hz / (1s~ 1/12,000s)
Intelligent Video Analytics		Audio Detection, Tampering
Alarm I/O		
Alarm Triggers		Motion Detection,Network disconnection

Network		
Ethernet		RJ-45 (10/100BASE-T)
Video Compression format		H.264, MJPEG
Max. Framerate (Raw)		3M 20fps
Dewarping	On-Board	N/A
	Client	Smart Viewer
Viewing Composition		"=====Camera===== 360° Fisheye =====Client===== Single Panorama Double Panorama Quad User selectable region Single Rectangle 1 Original, 3 Rectangle 1Panorama + 2Rectangle =====
Digital PTZ		Digital PTZ
Smart Codec		-
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 6 Profiles)
Audio I/O		mic in/out
Audio Compression Format		G.711 u-law, G.726 (16Kbps, 24Kbps, 32Kbps, 40Kbps)
Audio Communication		Bi-directional
IP		IPv4, IPv6
Protocol		TTCP/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, UPnP, Bonjour
Security		HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access Log 802.1X Authentication

Encryption	TLS 1.0 SSL VPN Video Data encryption
Streaming Method	
Max. User Access	15 users at Unicast Mode
Memory Slot	SD/SDHC/SDXC Memory Slot
External Storage	-
Webpage Language	English, French, German, Spanish, Italian, Chinese, Korean, Russian, Japanese, Swedish, Danish, 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 (32bit and 64bit OS) Supported Browser : Internet Explorer 7.0 or Higher, Firefox 9.0 or Higher, Chrome 15.0 or Higher, Safari 5.1 or Higher between 64bit OS and 32bit Web Browser
Central Management Software	Smart Viewer
Built-in installation aids	
Environmental	
Operating Temperature / Humidity	PoE : -10°C ~ +55°C (-34°F ~ +140°F) / ~ 90% RH
Ingress Protection	IP66
Vandal Resistance	IK10
Railway certificate	EN50155
Electrical	
Input Voltage / Current	
Power Consumption	7.4W
Mechanical	
Dimension (Ø x H)	128.8Ø x 55.8mm(H)
Color / Material	ALUMINUM
Weight	610g
Release	Sep. '13

4.2 Product description

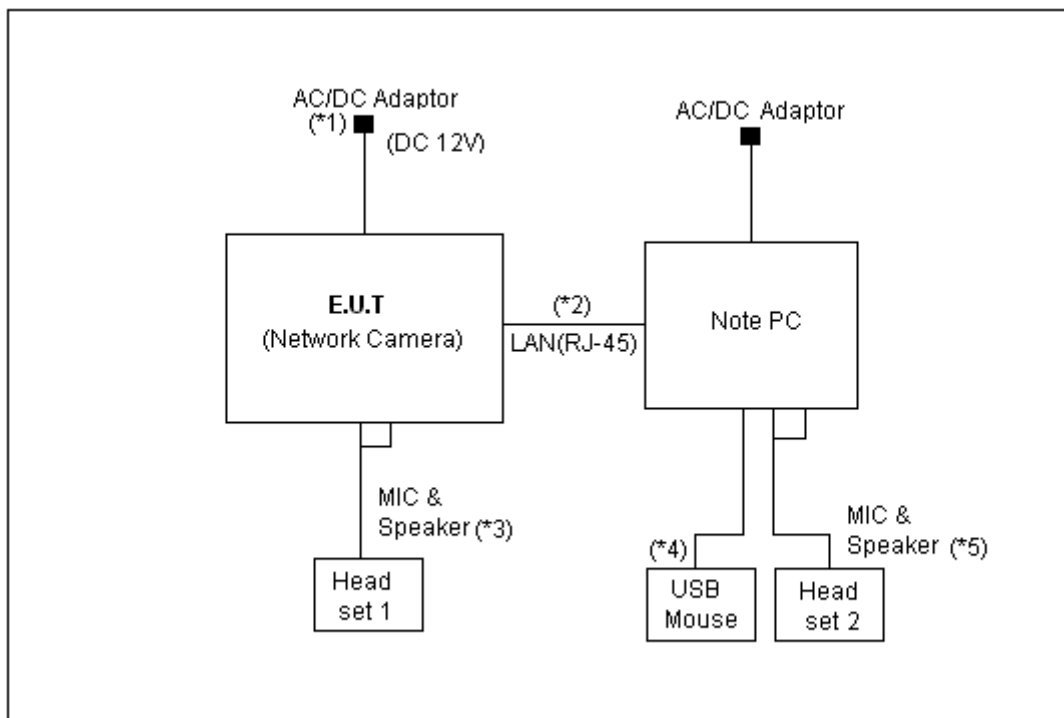
Type of product	Network Camera
Model name (Basic)	SNF-7010VN
Model name (Variant)	-
Difference	-
Trade name	-
Serial no	Engineering Sample
Testing voltage	DC 12 V, PoE
Product rating	DC 12 V, PoE
Internal clock frequency	Above 108 MHz
Note	* AC/DC adaptor was not provided by the manufacturer. * PoE Switch was not provided by the manufacturer.

4.3 Auxiliary equipments

Type	Model / Part #	Serial number	Manufacturer
Note PC	PSLQ0K-02N005	2A046497Q	TOSHIBA
USB Mouse	1088	8165906051134	Microsoft
Headset 1	SHS-250V	-	SAMSUNG
Headset 2	SHS-250V	-	SAMSUNG
AC/DC Adaptor (DC 12V)	DSA-42D-12 1 120300	-	DVE
POE Switch	FS108P	1DL20C3N00544	NETGEAR

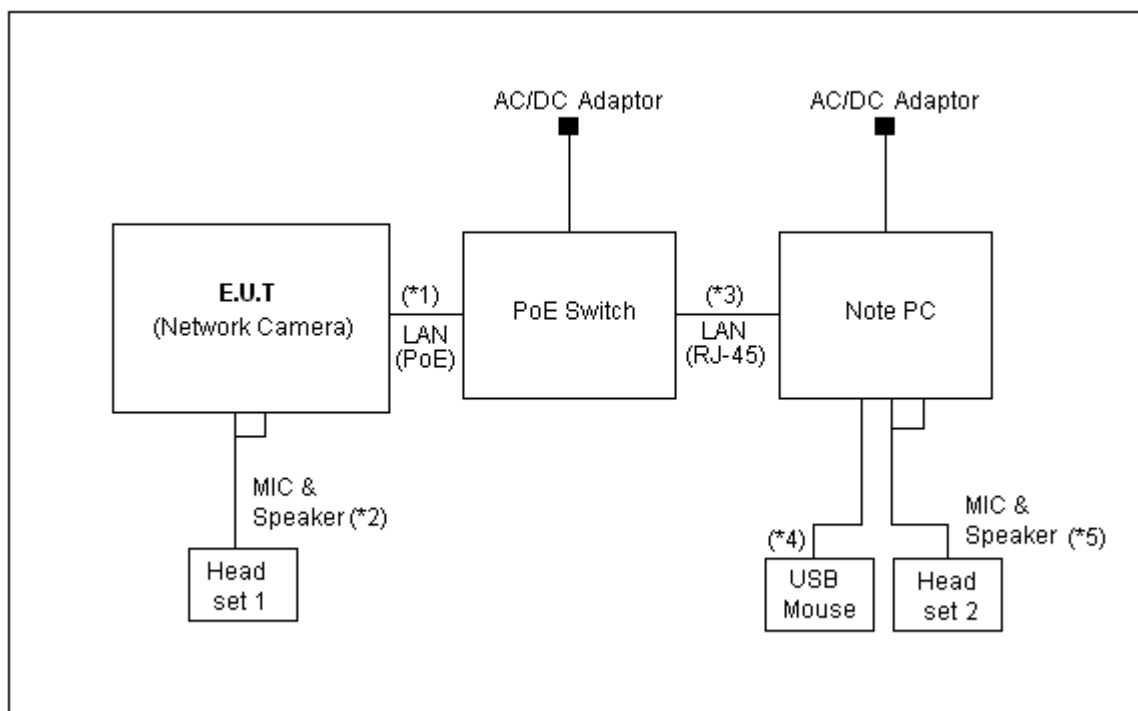
4.4 Test configuration

#1- 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	1.5	Non-Shield
2		LAN(RJ-45)	Note PC	LAN(RJ-45)	3.0	Non-Shield
3		MIC & Speaker	Headset 1	MIC & Speaker	3.0	Non-Shield
4	Note PC	USB	USB Mouse	USB	1.5	Shield
5		MIC & Speaker	Headset 2	MIC & Speaker	1.7	Non-Shield

#2- 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		MIC & Speaker	Headset 1	MIC & Speaker	3.0	Non-Shield
3	Note PC	LAN(RJ-45)	PoE Switch	LAN(RJ-45)	1.5	Non-Shield
4		USB	USB Mouse	USB	1.5	Shield
5		MIC & Speaker	Headset 2	MIC & Speaker	1.7	Non-Shield

4.5 Operating conditions

The EUT was configured as normal intended use.

Test mode	Normal operating
1	Camera monitoring test. (Web view)

* Note: 2 types of powers are available for the product, that are DC 12 V, PoE.

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 (#F2)		
Test distance	10 m, 3 m		
Date	2013. 08. 06		
Temperature (°C)	23 °C	Humidity (% R.H.)	63 % R.H.
Remarks	Complied		

6.1.1 Limits of radiated emission measurement

Frequency [MHz]	Class A (dB(μ V/m)) @ 10 m	Class B (dB(μ 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

Equipment	Model no.	Serial no.	Makers	Next Cal. Date	Used
Test Receiver	ESCI7	100732	R&S	2014.02.18	☒
Test Receiver	ESCI	100001	R&S	2014.07.25	☐
Test Receiver	ESCI	100710	R&S	2013.11.06	☐
Bi-Log Antenna	VULB 9168	440	SCHWARZBECK	2013.10.04	☒
Amplifier	310N	293004	SONOMA INSTRUMENT	2013.11.06	☒
3 dB Attenuator	8491B	22981	HP	2014.03.19	☒
Antenna Mast	MA4000-EP	303	Innco Systems	-	☒
Turn Table	DT2000S-1t	079	Innco Systems	-	☒
Amplifier	8449B	3008A02343	AGILENT	2013.11.06	☒
Horn ANT	3115	00086706	ETS	2013.11.21	☒
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:

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

M.R = Meter Reading

C.F = Correction Factor

A.F = Antenna Factor

C.L = Cable Loss

A.G= Amplifier Gain

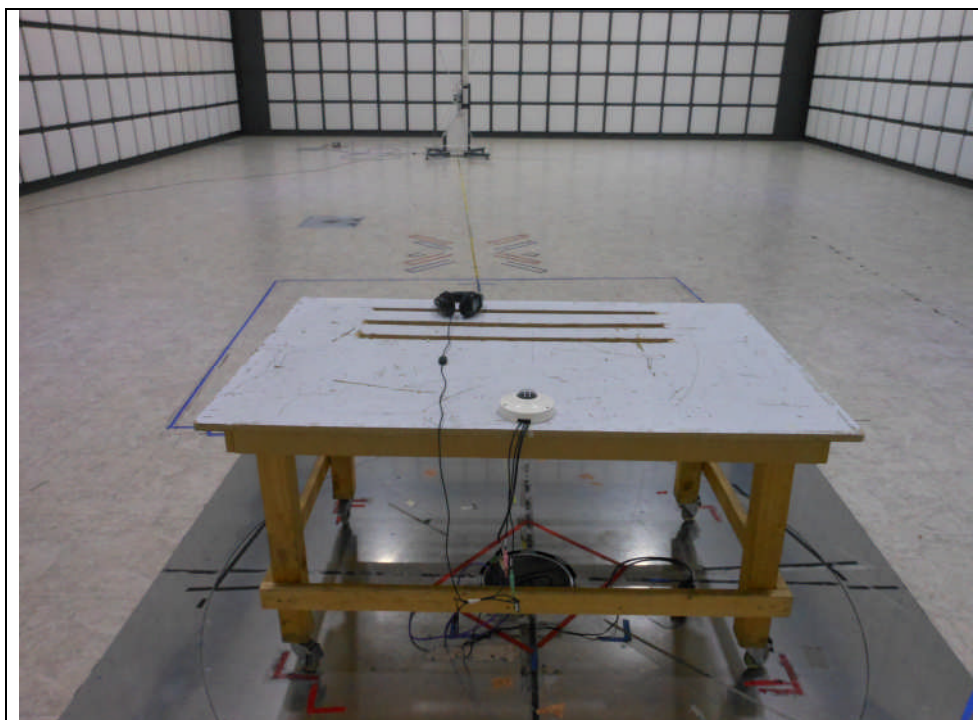
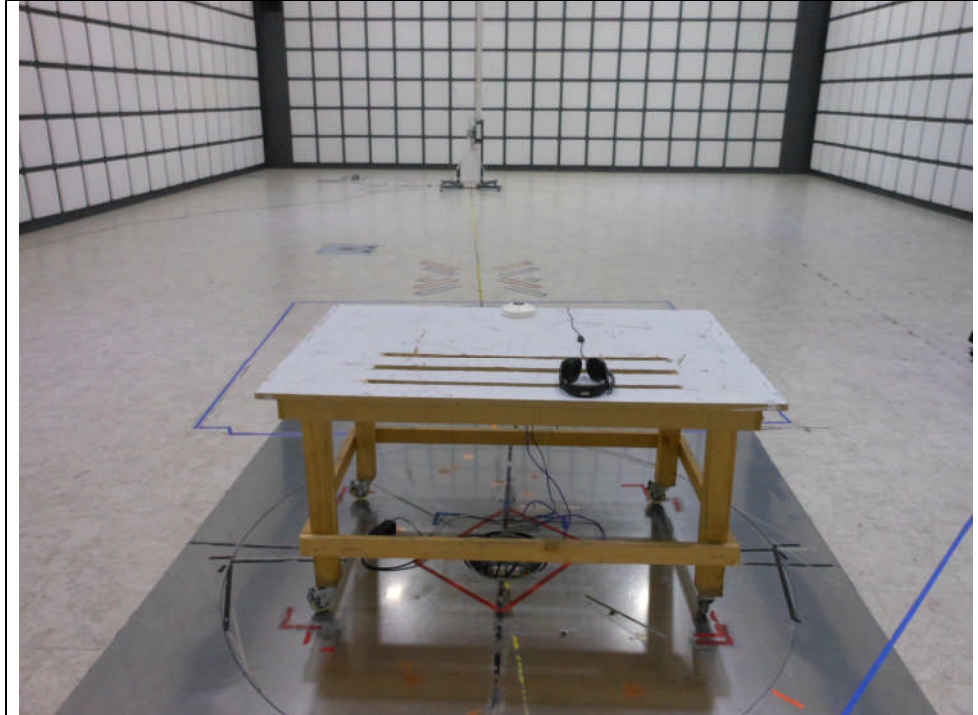
3 dB Att = 3 dB Attenuator

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

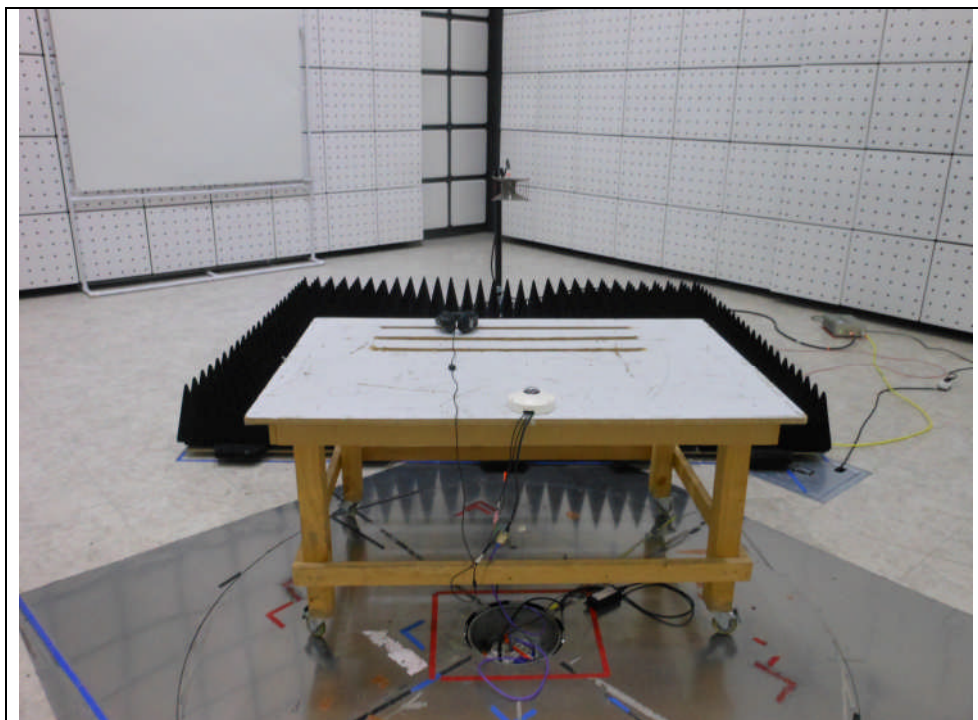
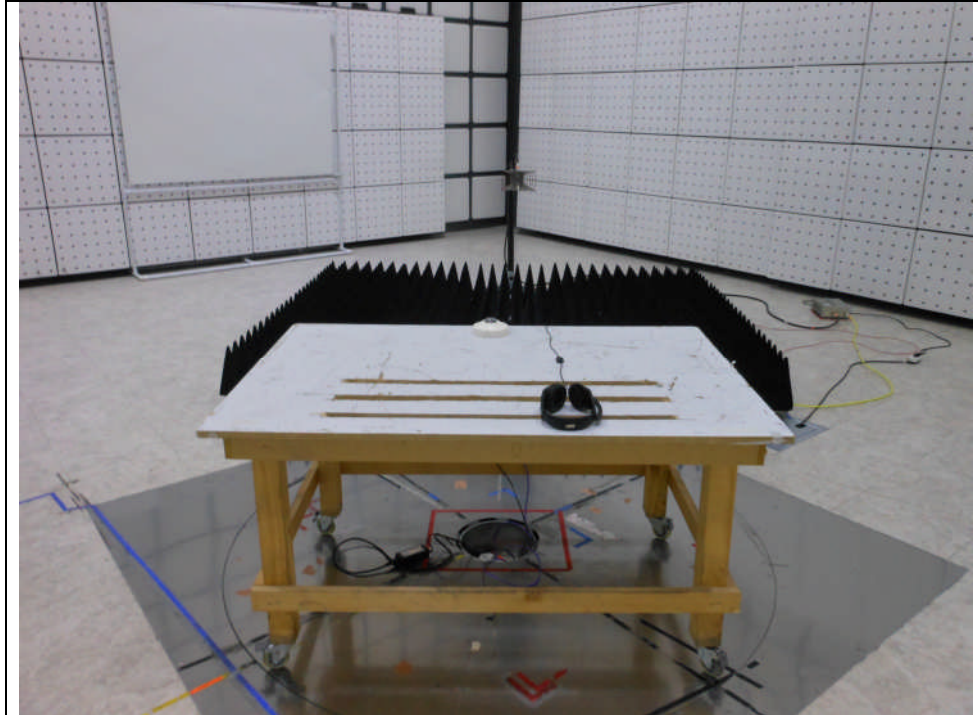
The result is $30 + 12 + 5 + 3 - 35 = 15 \text{ dB}(\mu\text{V/m})$

6.1.5 Photographs of test setup

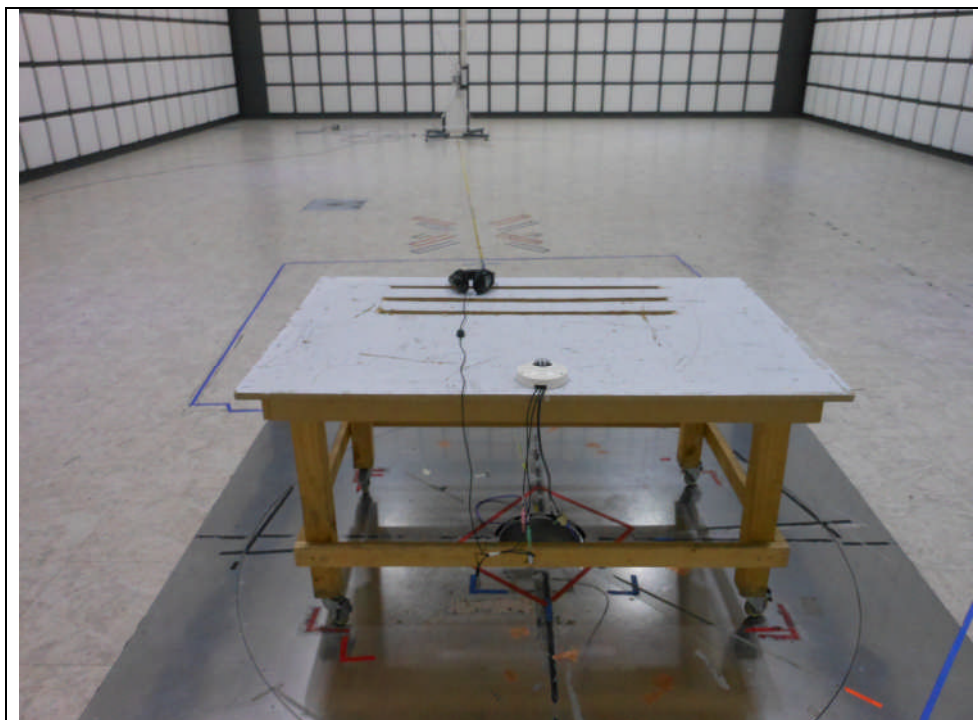
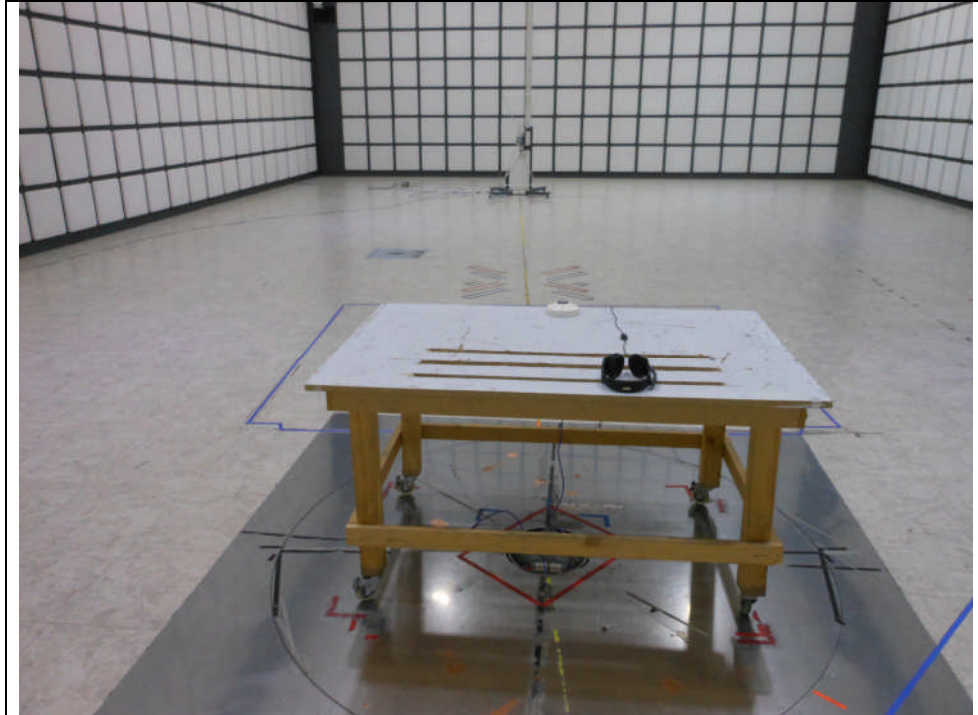
* 30 MHz ~ 1 GHz (#1- DC 12V)



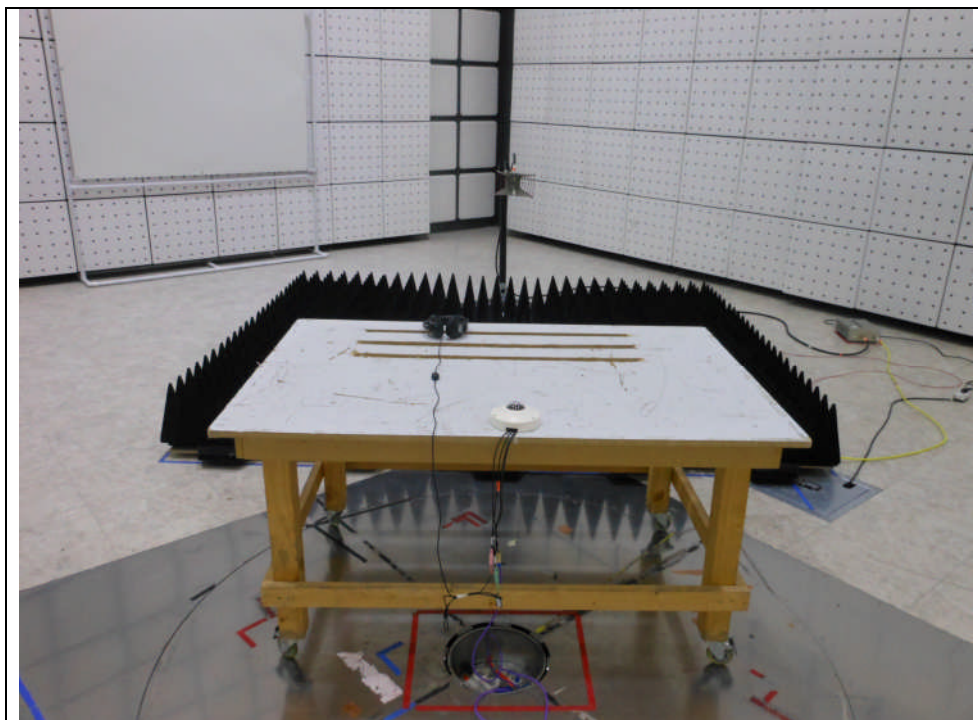
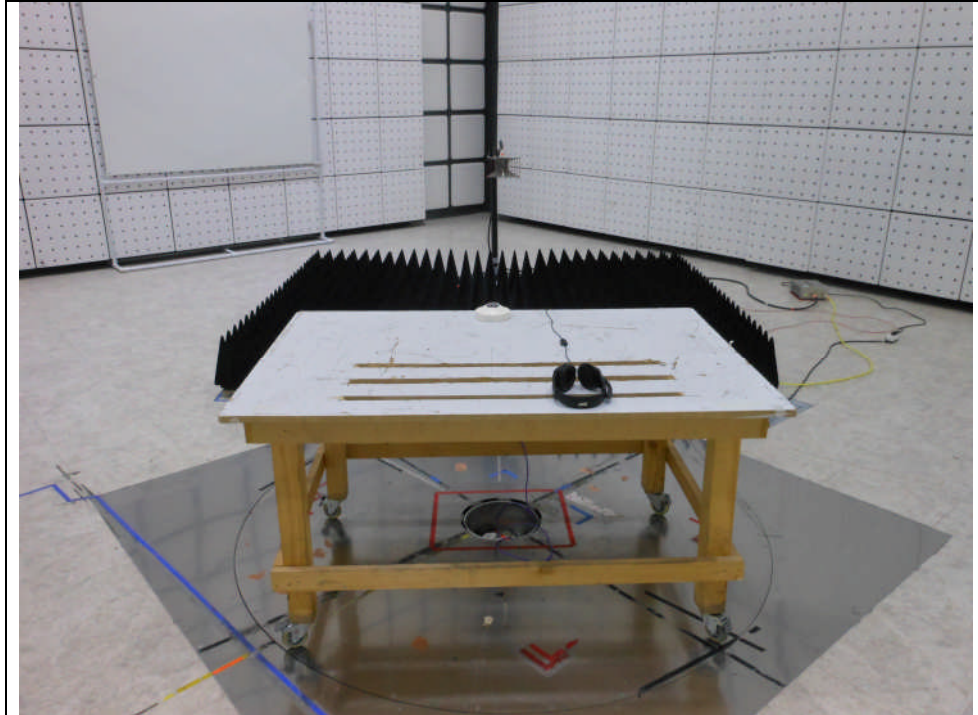
* 1 GHz ~ 6 GHz (#1- DC 12V)



* 30 MHz ~ 1 GHz (#2-PoE)



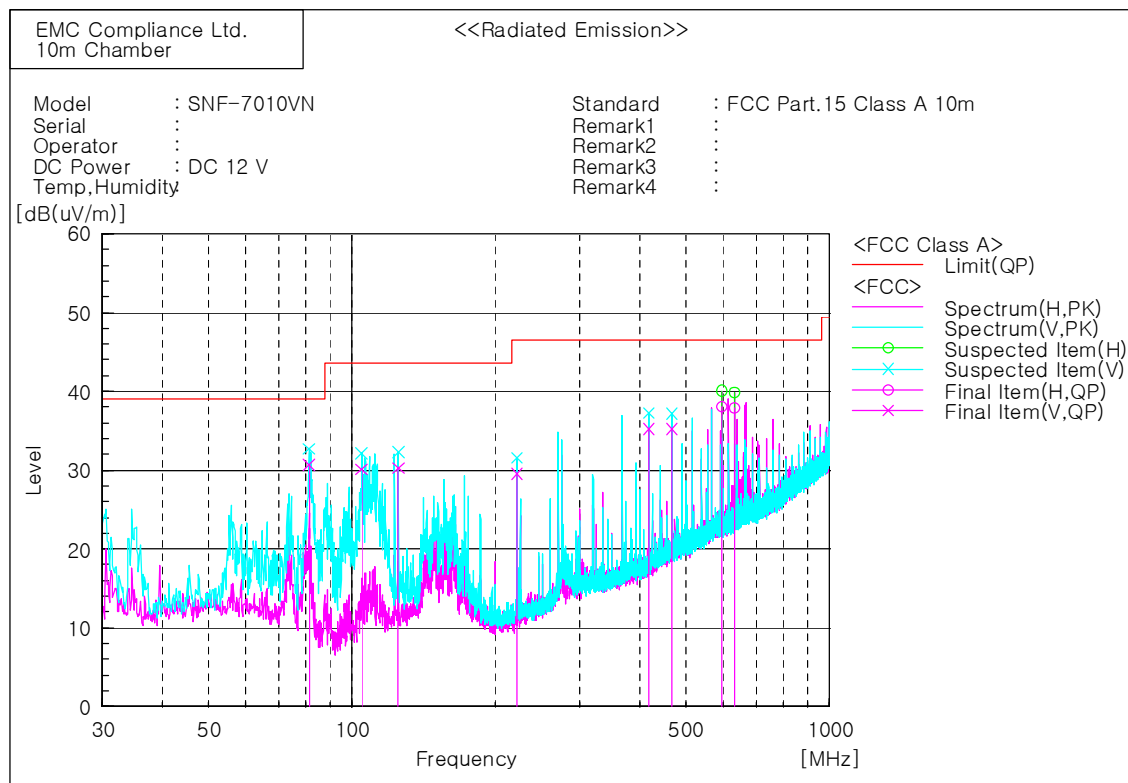
* 1 GHz ~ 6 GHz (#2-PoE)



6.1.6 Radiated emission measurement result

* Graph and Data

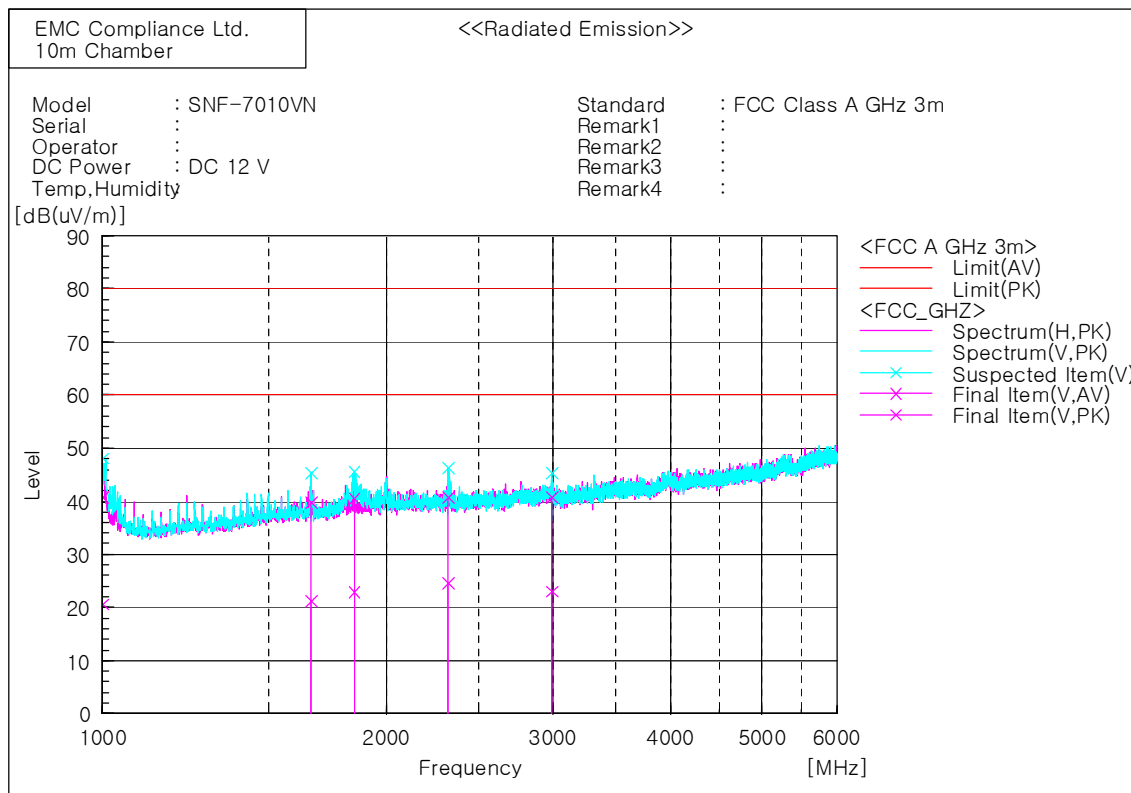
* 30 MHz ~ 1 GHz (#1- DC 12V) _ SNF-7010VN



Final Result

No.	Frequency (P)	Reading	c.f	Result	Limit	Margin	Height	Angle	Remark
	[MHz]	QP [dB(uV)]	[dB(1/m)]	QP [dB(uV/m)]	QP [dB(uV/m)]	QP [dB]	[cm]	[deg]	
1	81.168	V 47.8	-17.1	30.7	39.0	8.3	199.0	240.7	
2	104.690	V 46.9	-16.8	30.1	43.5	13.4	100.0	112.1	
3	124.939	V 44.5	-14.2	30.3	43.5	13.2	100.0	122.6	
4	221.211	V 43.6	-14.0	29.6	46.5	16.9	100.0	157.2	
5	417.758	V 42.1	-6.9	35.2	46.5	11.3	100.0	98.6	
6	466.985	V 40.7	-5.4	35.3	46.5	11.2	100.0	265.4	
7	594.055	H 40.0	-1.9	38.1	46.5	8.4	200.0	266.4	
8	631.158	H 39.2	-1.3	37.9	46.5	8.6	200.0	281.5	

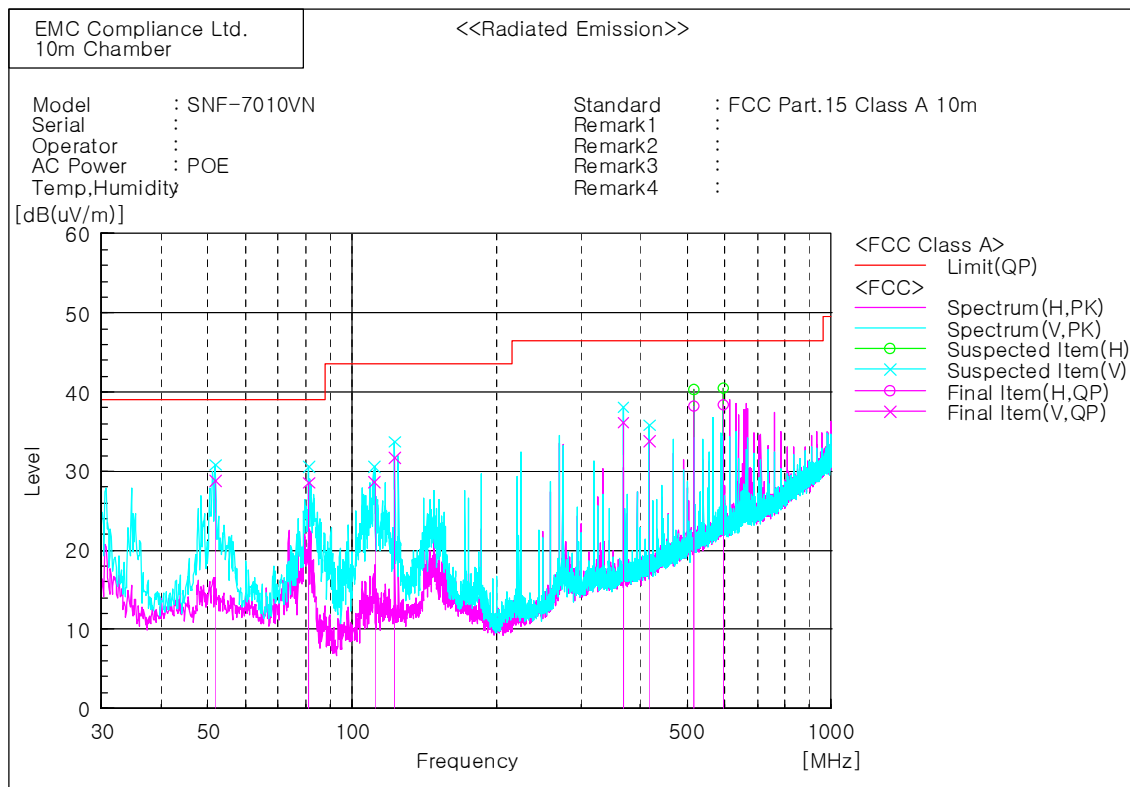
* 1 GHz ~ 6 GHz (#1- DC 12V)_SNF-7010VN



Final Result

No.	Frequency [MHz]	(P)	Reading AV [dB(μV)]	Reading PK [dB(μV)]	c.f [dB(1/m)]	Result AV [dB(μV/m)]	Result PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Limit PK [dB(μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Remark
1	1000.000	V	27.9	48.1	-7.3	20.6	40.8	60.0	80.0	39.4	39.2	100.0	31.0	
2	1665.000	V	24.6	43.2	-3.4	21.2	39.8	60.0	80.0	38.8	40.2	100.0	201.4	
3	1850.625	V	25.0	42.6	-2.1	22.9	40.5	60.0	80.0	37.1	39.5	100.0	126.6	
4	2327.500	V	25.4	41.4	-0.7	24.7	40.7	60.0	80.0	35.3	39.3	100.0	41.5	
5	2996.875	V	22.6	40.4	0.4	23.0	40.8	60.0	80.0	37.0	39.2	100.0	68.3	

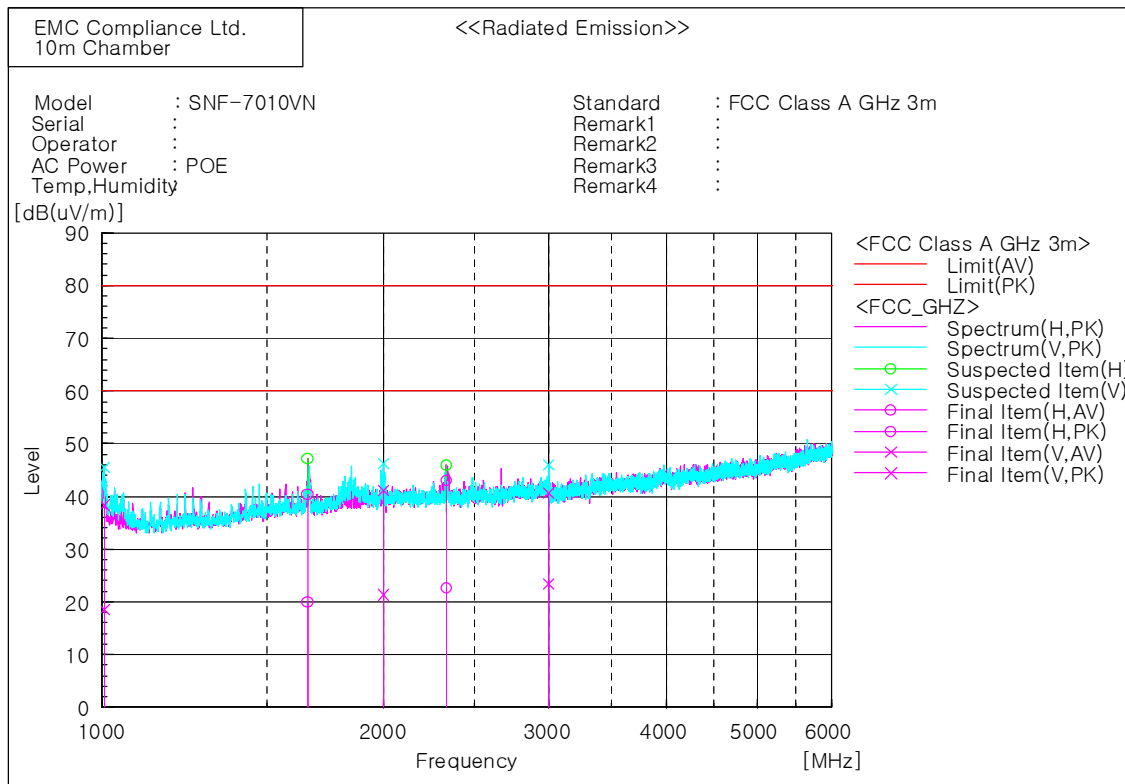
* 30 MHz ~ 1 GHz (#2- PoE) _ SNF-7010VN



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	51.825	V	42.0	-13.2	28.8	39.0	10.2	100.0	229.5	
2	81.168	V	45.6	-17.1	28.5	39.0	10.5	200.0	311.8	
3	111.359	V	44.4	-15.8	28.6	43.5	14.9	100.0	149.8	
4	122.878	V	46.1	-14.4	31.7	43.5	11.8	100.0	128.7	
5	368.651	V	44.5	-8.3	36.2	46.5	10.3	100.0	86.6	
6	417.758	V	40.7	-6.9	33.8	46.5	12.7	200.0	84.7	
7	516.091	H	42.2	-4.0	38.2	46.5	8.3	201.0	302.4	
8	594.055	H	40.3	-1.9	38.4	46.5	8.1	201.0	270.9	

* 1 GHz ~ 6 GHz (#2- PoE) _ SNF-7010VN



Final Result

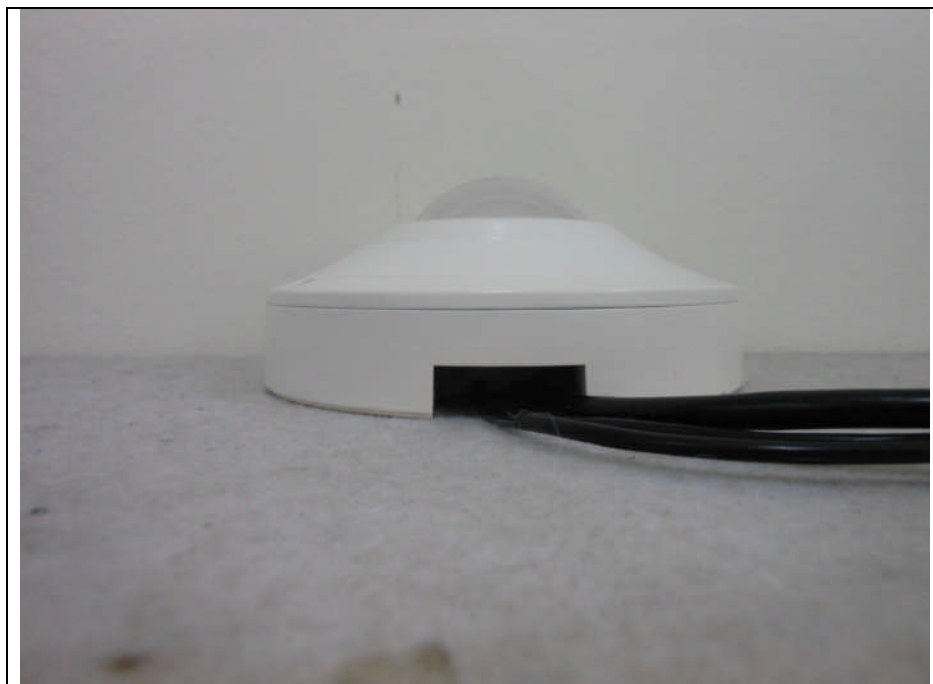
No.	Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	c.f [dB(1/m)]	Result AV [dB(uV/m)]	Result PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]	Remark
1	1006.875	V	26.0	45.8	-7.4	18.6	38.4	60.0	80.0	41.4	41.6	100.0	88.1	
2	1658.750	H	23.5	43.9	-3.4	20.1	40.5	60.0	80.0	39.9	39.5	100.0	49.8	
3	1996.875	V	22.8	42.6	-1.5	21.3	41.1	60.0	80.0	38.7	38.9	100.0	184.2	
4	2331.875	H	23.4	43.7	-0.7	22.7	43.0	60.0	80.0	37.3	37.0	100.0	20.2	
5	2993.750	V	23.1	40.3	0.4	23.5	40.7	60.0	80.0	36.5	39.3	100.0	55.2	

7. E.U.T. photographs

Front View



Rear View



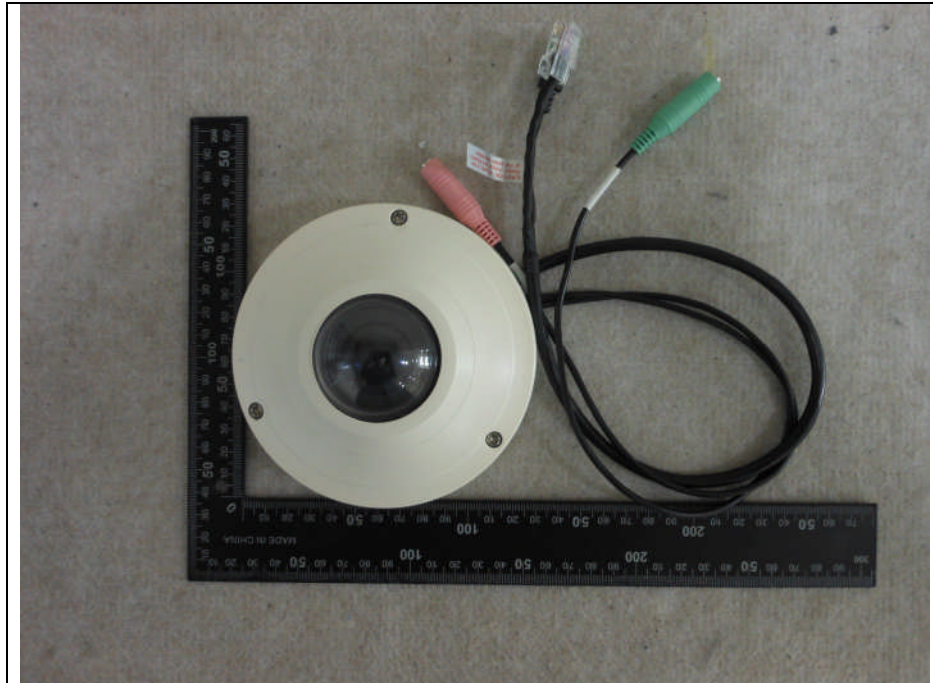
Left View



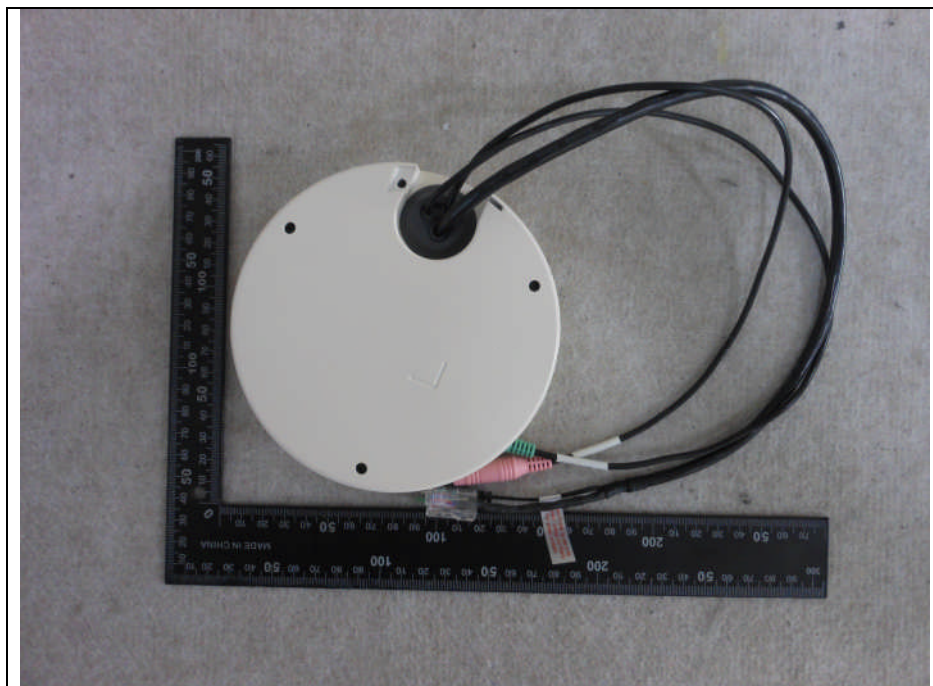
Right View



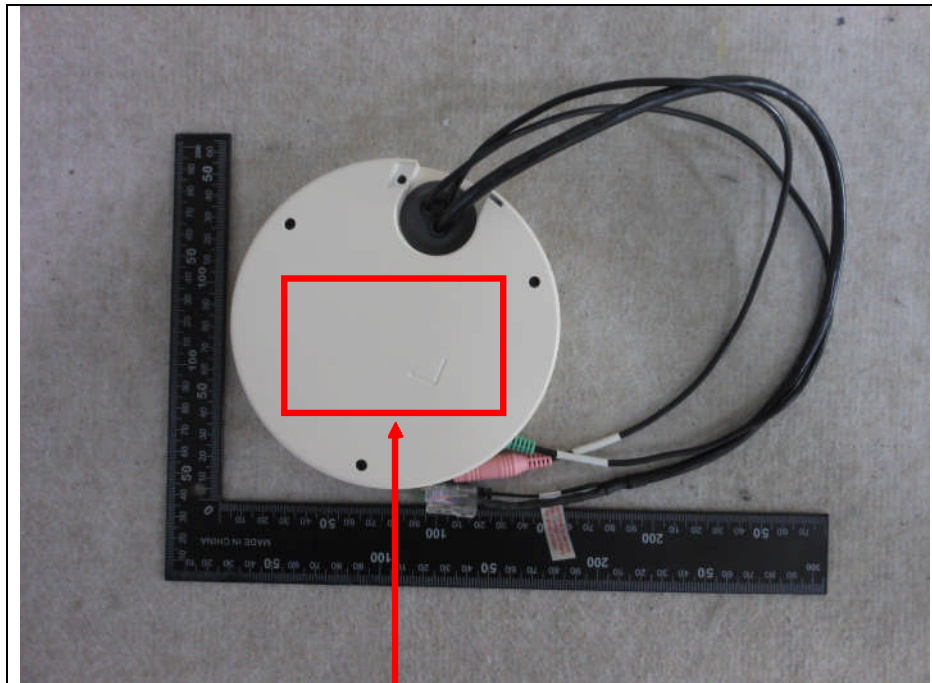
Top View



Bottom View



Label



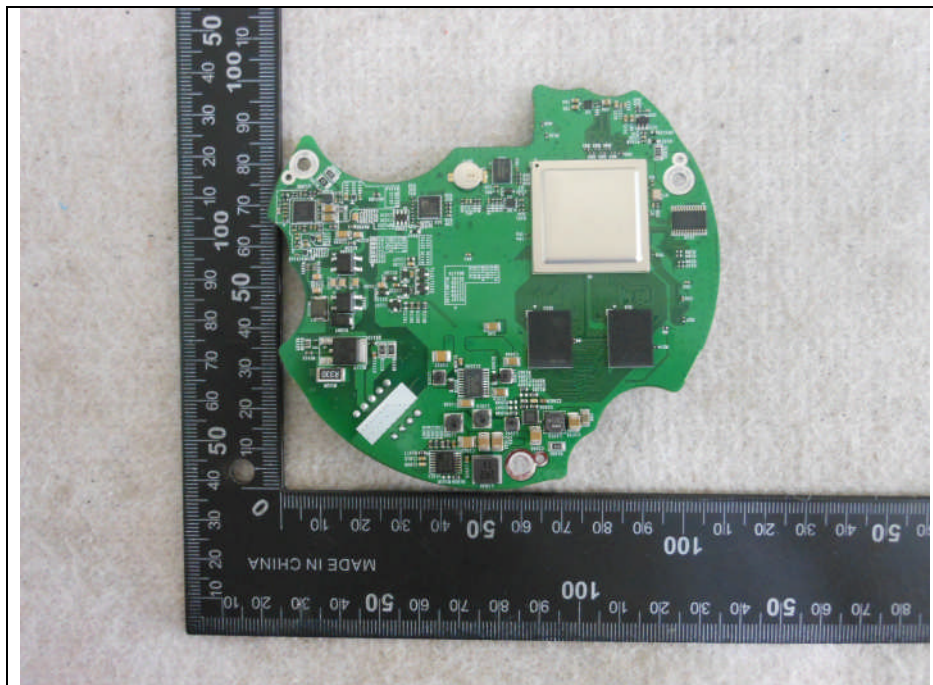
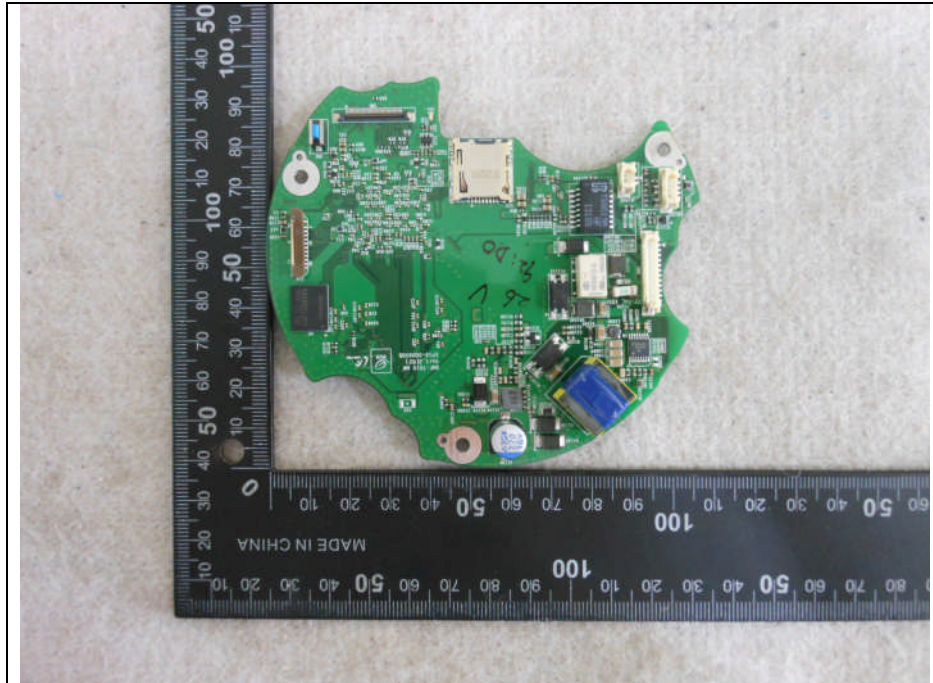
FCC Label Location

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.

Inside



Main Board



CCD Board

