

CERTIFICATE of EMC Compliance

Report No : EMC-FCC-2005
Type of equipment : CCTV Camera
Model Name : SCB-3003N
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.

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



Beak, Jeong-Soo / Manager

EMI TEST REPORT

Test report No : EMC-FCC-2005
Type of Equipment : CCTV Camera
Model Name : SCB-3003N
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
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. 07. 15

Date of testing: 2013. 07. 24

Issued date: 2013. 08. 01

Tested by:


JUNG, HYE-LAN

Approved by:


BEAK, JEONG-SOO

Contents

1. Applicant information	3
2. Laboratory information	4
3. Test system configuration	5
3.1 Operation environment	5
3.2 Measurement Uncertainty	6
4. Description of E.U.T.	7
4.1 General information.....	7
4.2 Product description.....	8
4.3 Auxiliary equipments.....	8
4.4 Test configuration	9
4.5 Operating conditions	9
5. Summary of test results	9
5.1 Summary of EMI emission test results.....	10
6. Test results	11
6.1 Radiated Emission.....	11
7. E.U.T. photographs	19

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

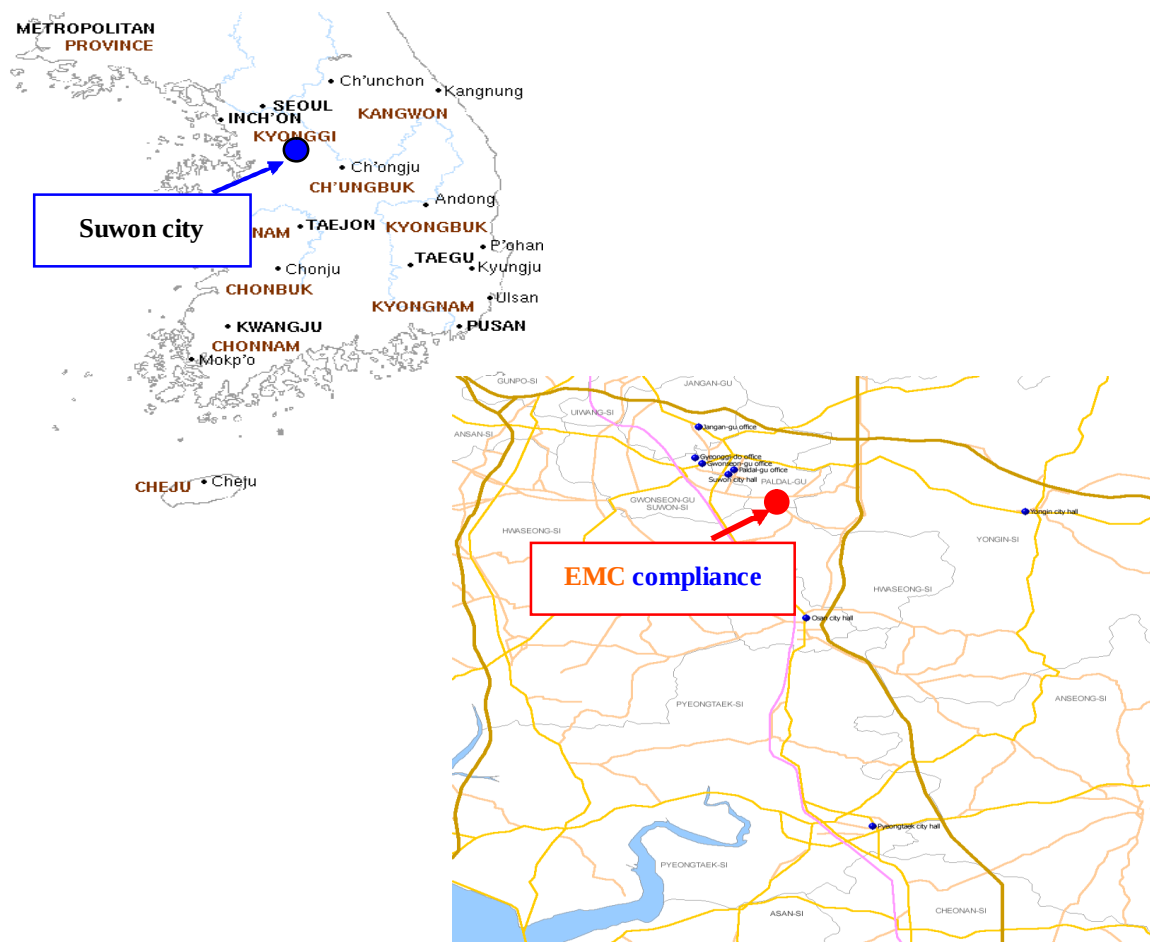
FCC CAB.: KR0040

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)	: 20 °C	54 % 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 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	SCB-3003N	SCB-3003P
Imaging Device	1/3" Super HAD CCD II (Double Scan)	
Total Pixels	1,028(H) x 508(V)	1,028(H) x 596(V)
Effective Pixels	976(H) x 494(V)	976(H) x 582(V)
Scanning System	2 : 1 Interlace	
Synchronization	Internal / Line-Lock / Extern	
Frequency	H : 15.734KHz / V : 59.94Hz	H : 15.625KHz / V : 50Hz
Horizontal Resolution	Color : 680 TV lines(ER mode). B/W : 700 TV lines	
Min. Illumination	Color : 0.1Lux @ F1.2, 0.0002 Lux (Sens-up, 512x) B/W : 0.01 Lux @ F1.2, 0.00002 Lux (Sens-up, 512x)	
S / N Ratio	52dB (AGC off, Weight on)	
Video Output	CVBS : 1.0 Vp-p / 75Ω composite	
Lens Type		
Focus Control	Simple Focus / Manual, Botton Control(Manual, Simple Focus, Day&Night)	
Lens Type	Manual / Auto Iris (Video/DC)	
Mount Type	C/CS	
Operational		
On Screen Display	Multi-language Support English, Japanese, Spanish, French, Portuguese,Korean	Multi-language Support English, French, German, Spanish, Italian, Chinese, Russian, Polish, Czech, Romanian, Serbian, Swedish, Danish, Turkish, Portuguese
Camera Title	Off / On (Displayed 15 characters)	
Day & Night	Auto (ICR) / External / Color / B/W	
Backlight Compensation	Off / User BLC / HLC / SSSDR / WDR	
Wide Dynamic Range	52dB (AGC off, Weight on)	
Contrast Enhancement	SSDR	
Digital Noise Reduction	SSNRⅢ (Off / On)	
Digital Image Stabilization	Off / On	
Motion Detection	Built-in	
Privacy Masking	Off / On (12 programmable zones with polygonal masking)	
Sens-up (Frame Integration)	2x ~ 512x	
Gain Control	Off / Low / High	
White Balance	ATW / Outdoor / Indoor / Manual / AWC (1,700K° ~ 11,000K°)	
Electronic Shutter Speed	1/60 ~ 1/120,000 sec	1/50 ~ 1/120,000 sec
Digital Zoom	Off / On (1x ~ 16x)	
Reverse	Off / H-Rev / V-Rev / HV-Rev	
Profile	Basic, Day & Night, Backlight, ITS, Indoor, User	
VPS	Off / On	
Intelligent Video	Fixed_Moved, Fence, Tracking, Detection, Counting	
PIP	Off / On	
Alarm	1 Out	
Communication	Coaxial Control (SPC-300 Compatible), RS-485	
Protocol	Coax : Pelco-C (Coaxitron) RS-485: Samsung-T, Samsung-E, Pelco-D, Pelco-P, Panasonic, Bosch,	

Environmental	
Operating Temperature / Humidity	-10°C ~ +55°C (+14°F ~ +131°F) / Less than 90% RH
Electrical	
Input Voltage/Current	Dual (24VAC±10% & 12VDC±10%)
Power Consumption	Max. 5.4W
Mechanical	
Color / Material	Black, Silver / Aluminum, Plastic
Dimension (WxHxD)	73.1 x 67.2 x 123.9 mm (2.88" x 2.65" x 4.88") excluding projections
Weight	285g(0.63lb)

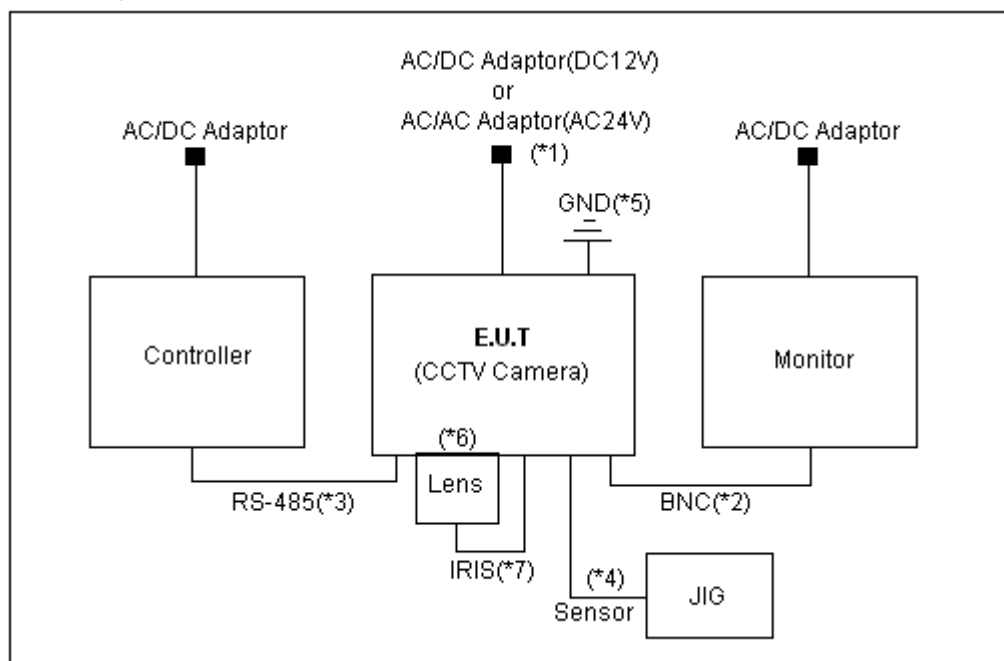
4.2 Product description

Type of product	CCTV Camera
Model name (Basic)	SCB-3003N
Model name (Variant)	-
Difference	-
Trade name	-
Serial no	-
Testing voltage	DC 12 V, AC 24 V
Product rating	DC 12 V, AC 24 V
Internal clock frequency	Above 108 Mhz
Note	* AC/DC adaptor was not provided by the manufacturer. * AC/AC adaptor was not provided by the manufacturer.

4.3 Auxiliary equipments

Type	Model / Part #	Serial number	Manufacturer
Monitor	SMT-171N	-	Samsung
Controller	SCC-1000	EW089028913	SAMSUNG
JIG	-	-	-
Lens	-	-	-
AC/DC Adaptor (DC 12 V)	DAD12050DKA	-	Dream Electronics
AC/AC Adaptor (AC 24 V)	STA-220	-	Dream Electronics

4.4 Test configuration



Note	Start		End		Cable	
	Name	I/O port	Name	I/O port	Length (m)	Spec.
1	EUT (CCTV Camera)	Power	AC/DC Adaptor or AC/AC Adaptor	Power	1.2	Non-Shield
2		BNC	Monitor	BNC	3.0	Shield
3		RS-485	Controller	RS-485	3.0	Non-Shield
4		Sensor	JIG	Sensor	3.0	Non-Shield
5		GND	GND	GND	1.7	Non-Shield
6		Lens	Lens	Lens	Direct	-
7		IRIS	Lens	IRIS	0.1	Non-Shield

4.5 Operating conditions

The EUT was configured as normal intended use.

Test mode	Normal operating
1	Check video output with monitor.

* Note: 2 types of powers are available for the product, that are DC 12 V, AC 24 V.

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, AC 24 V		
Test facility	10 m Chamber (#F2)		
Test distance	10 m, 3 m		
Date	2013. 07. 24		
Temperature (°C)	20 °C	Humidity (% R.H.)	54 % 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	375	SCHWARZBECK	2013.09.21	☒
Amplifier	310N	186280	SONOMA INSTRUMENT	2014.02.15	☒
3 dB Attenuator	8491A	16861	HP	2014.07.08	☒
Antenna Mast	AM4.0	079/3440509	MATURO	-	☒
Turn Table	CO2000-SOFT	-	MATURO	-	☒
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

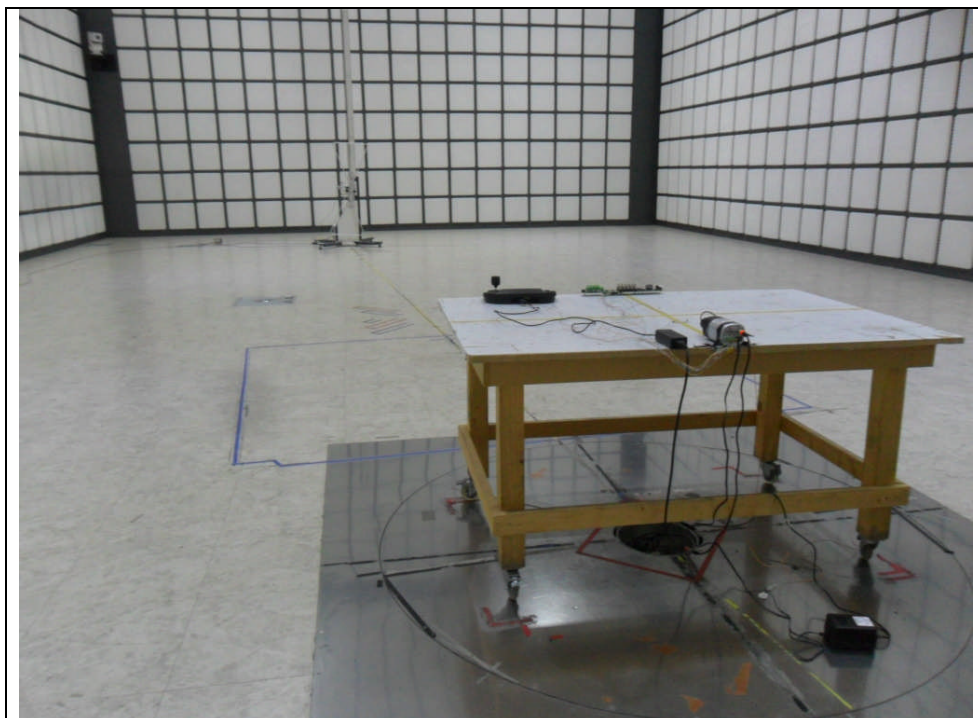
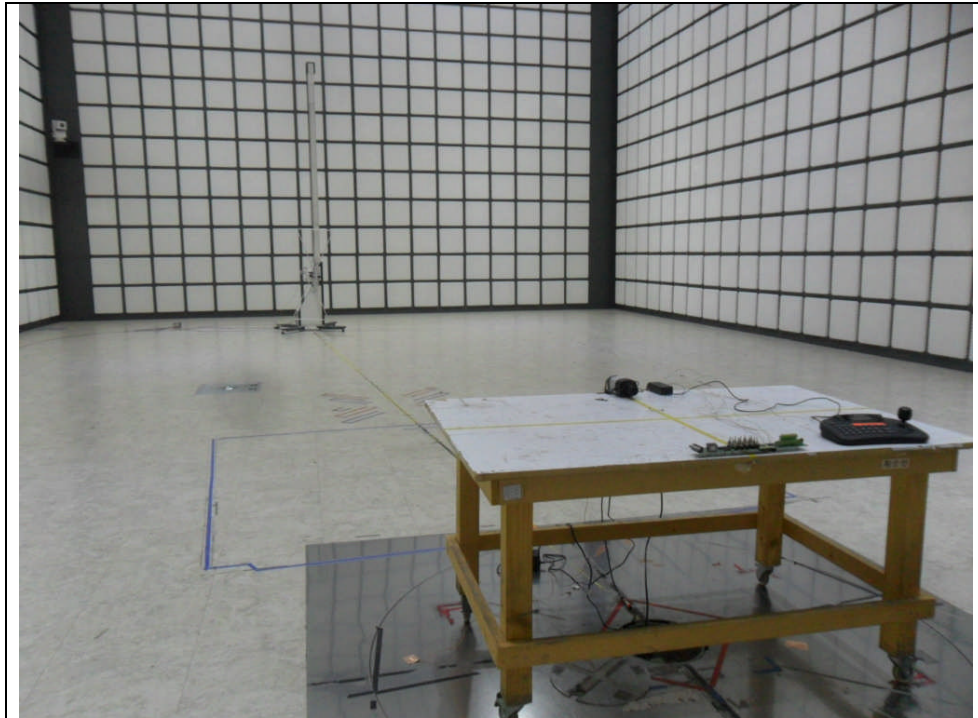
3 dB Att = 3 dB Attenuator

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

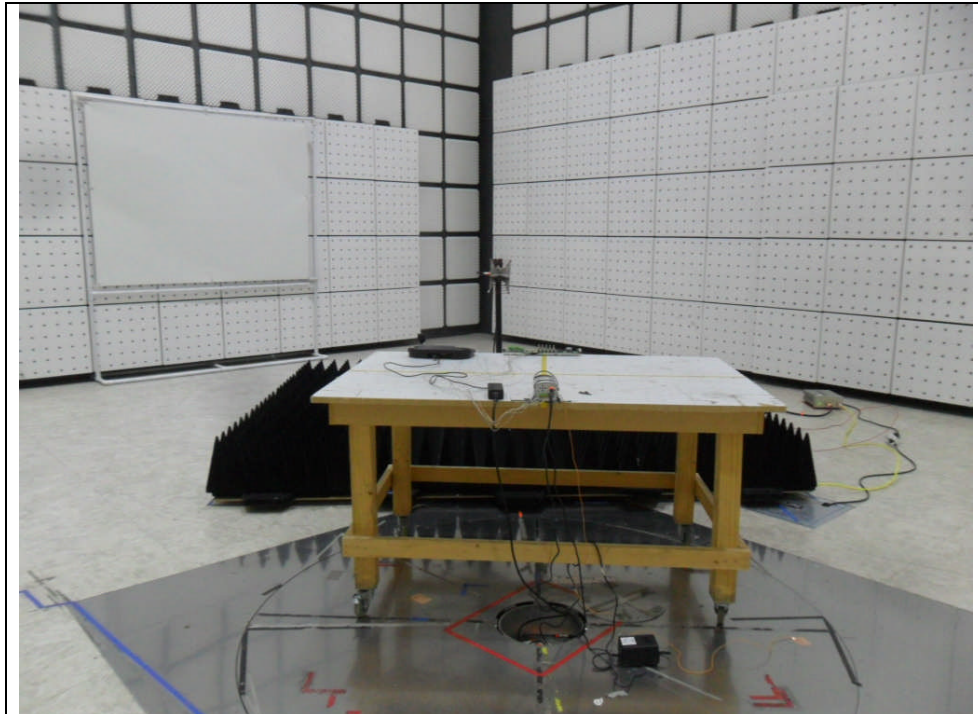
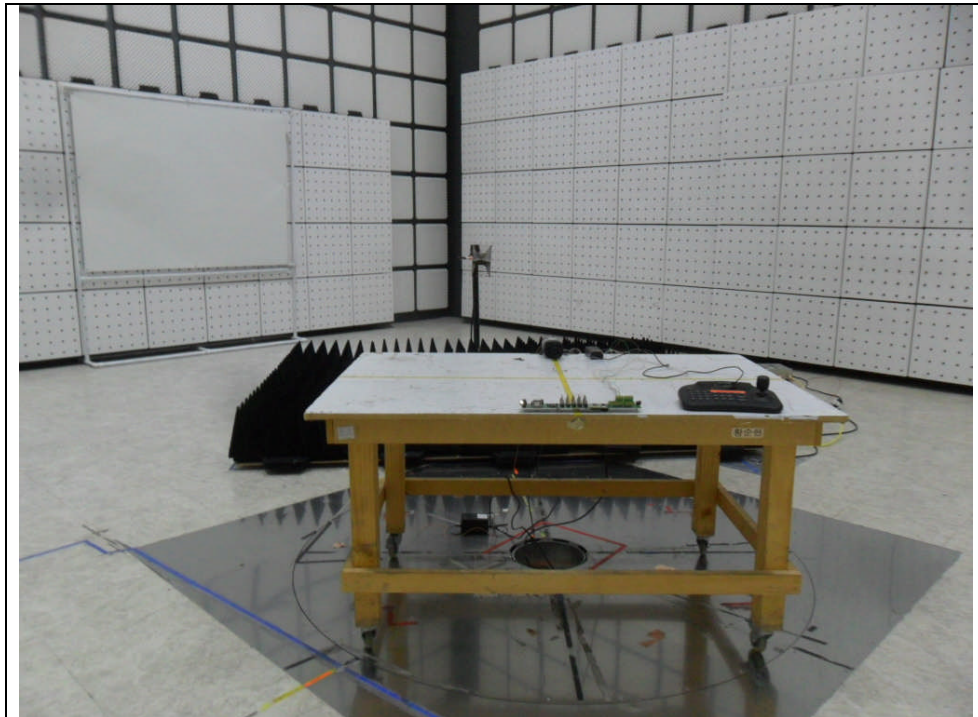
The result is $30 + 12 + 5 + 3 - 35 = 15 \text{ dB}(\mu\text{V/m})$

6.1.5 Photographs of test setup

* 30 MHz ~ 1 GHz



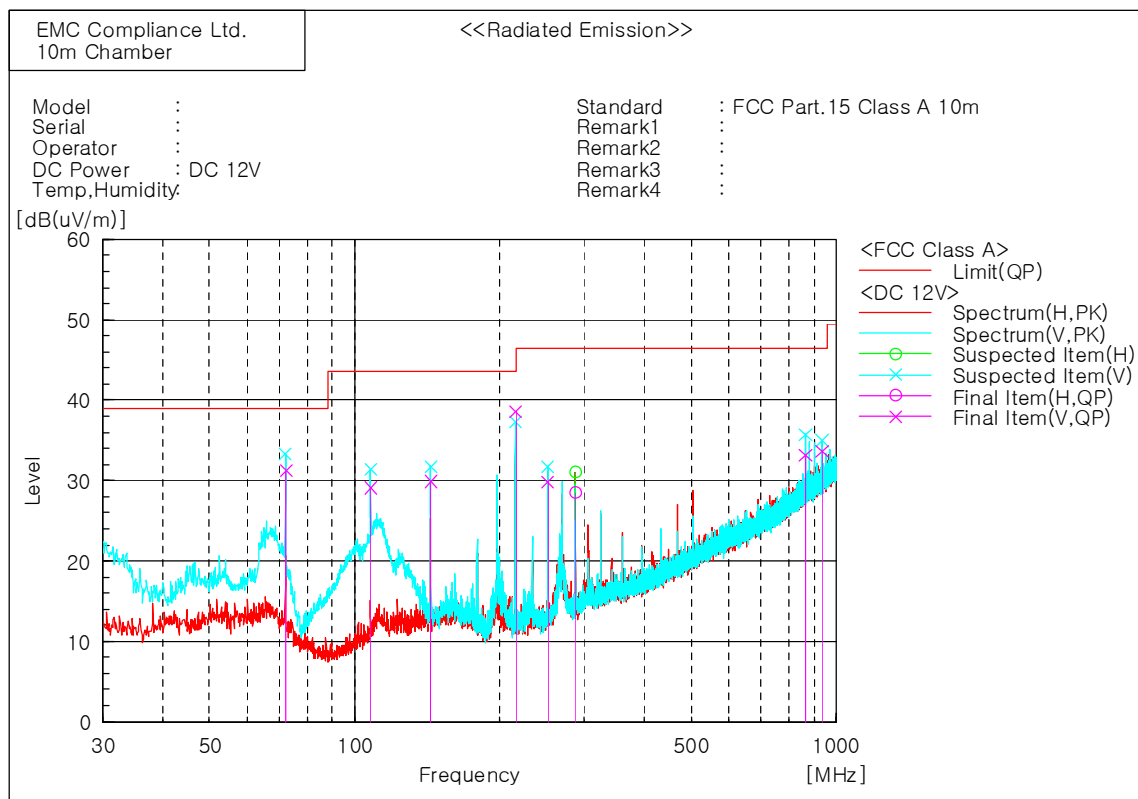
* 1 GHz ~ 7 GHz



6.1.6 Radiated emission measurement result

* Graph and Data

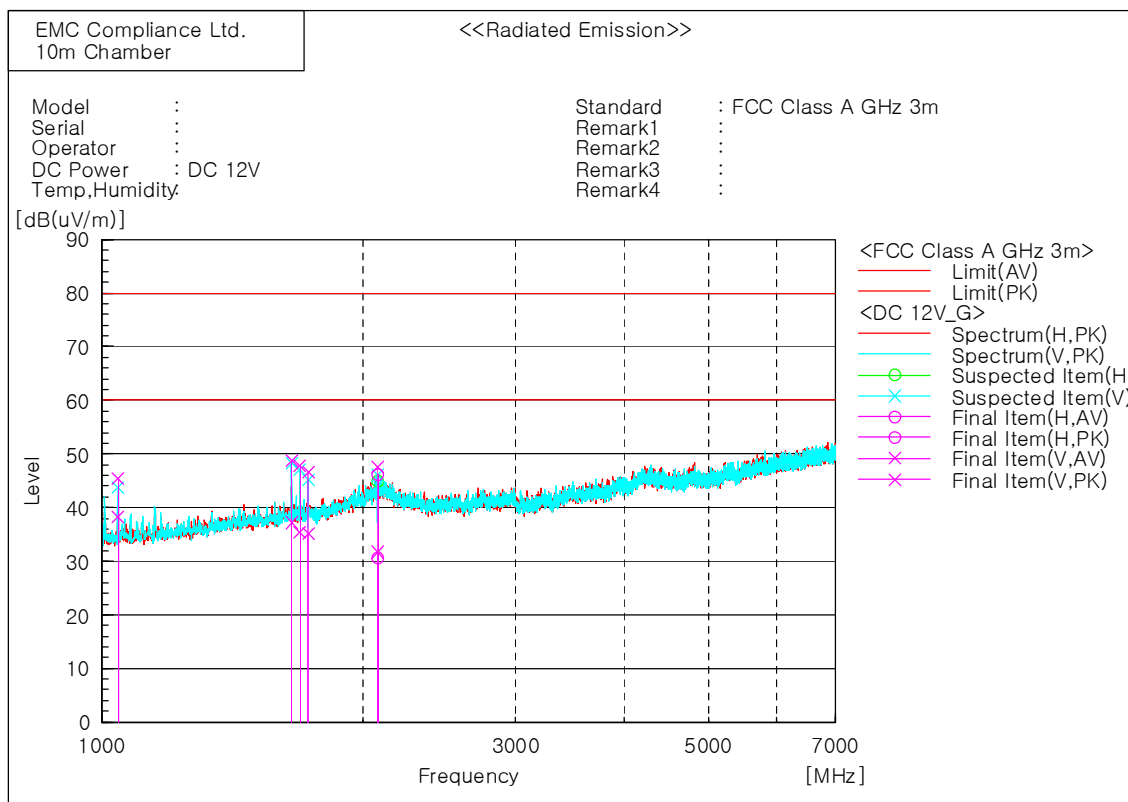
* 30 MHz ~ 1 GHz (SCB-3003N)_DC 12V



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	72.003	V	46.4	-15.2	31.2	39.0	7.8	199.0	336.4
2	108.000	V	45.4	-16.3	29.1	43.5	14.4	100.0	306.7
3	143.928	V	42.7	-12.8	29.9	43.5	13.6	100.0	334.5
4	216.037	V	52.8	-14.2	38.6	46.5	7.9	100.0	294.0
5	252.036	V	42.2	-12.4	29.8	46.5	16.7	100.0	319.4
6	288.061	H	39.3	-10.8	28.5	46.5	18.0	400.0	66.4
7	864.115	V	29.7	3.4	33.1	46.5	13.4	199.0	350.6
8	936.138	V	28.7	4.9	33.6	46.5	12.9	400.0	342.2

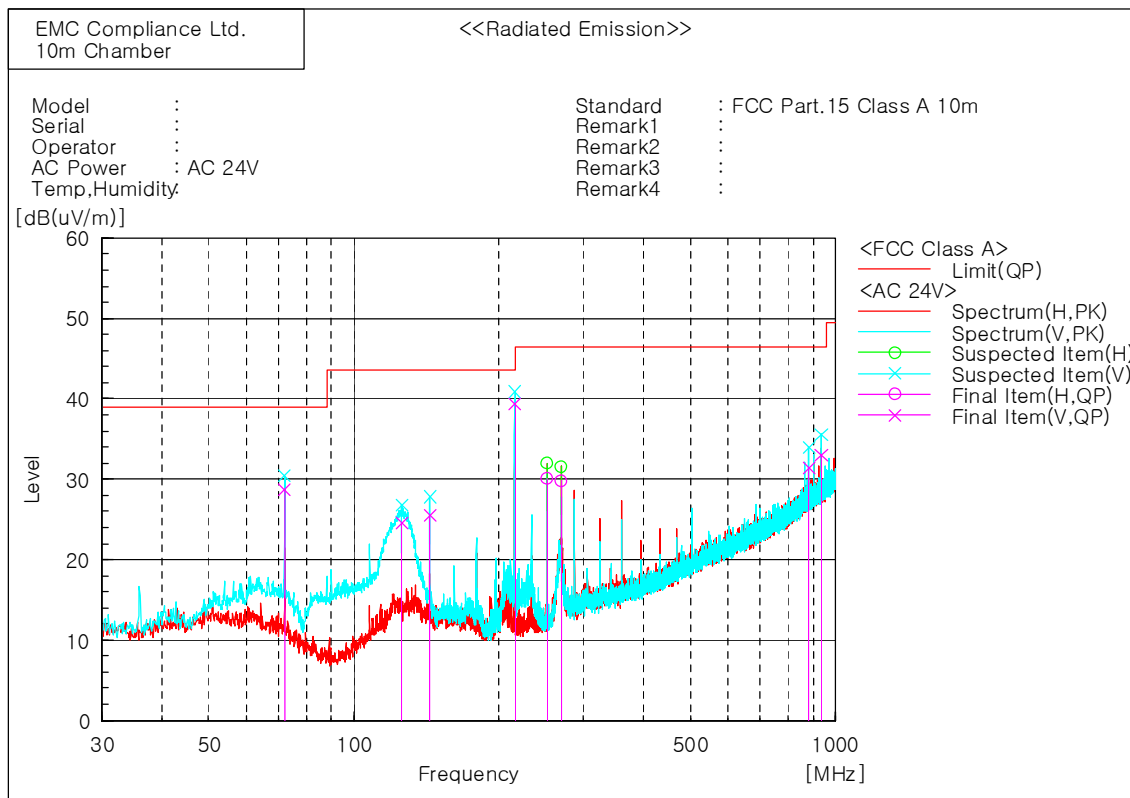
* 1 GHz ~ 7 GHz (SCB-3003N)_DC 12V



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	1043.569	V	47.1	54.3	-8.8	38.3	45.5	60.0	80.0	21.7	34.5	100.0	113.7
2	1655.426	V	40.5	52.0	-3.3	37.2	48.7	60.0	80.0	22.8	31.3	100.0	175.4
3	1691.562	V	38.5	50.9	-3.1	35.4	47.8	60.0	80.0	24.6	32.2	100.0	121.2
4	1728.327	V	38.0	49.5	-2.9	35.1	46.6	60.0	80.0	24.9	33.4	100.0	124.3
5	2076.891	V	29.8	45.7	1.9	31.7	47.6	60.0	80.0	28.3	32.4	100.0	83.8
6	2080.099	H	28.7	44.3	1.9	30.6	46.2	60.0	80.0	29.4	33.8	100.0	239.9

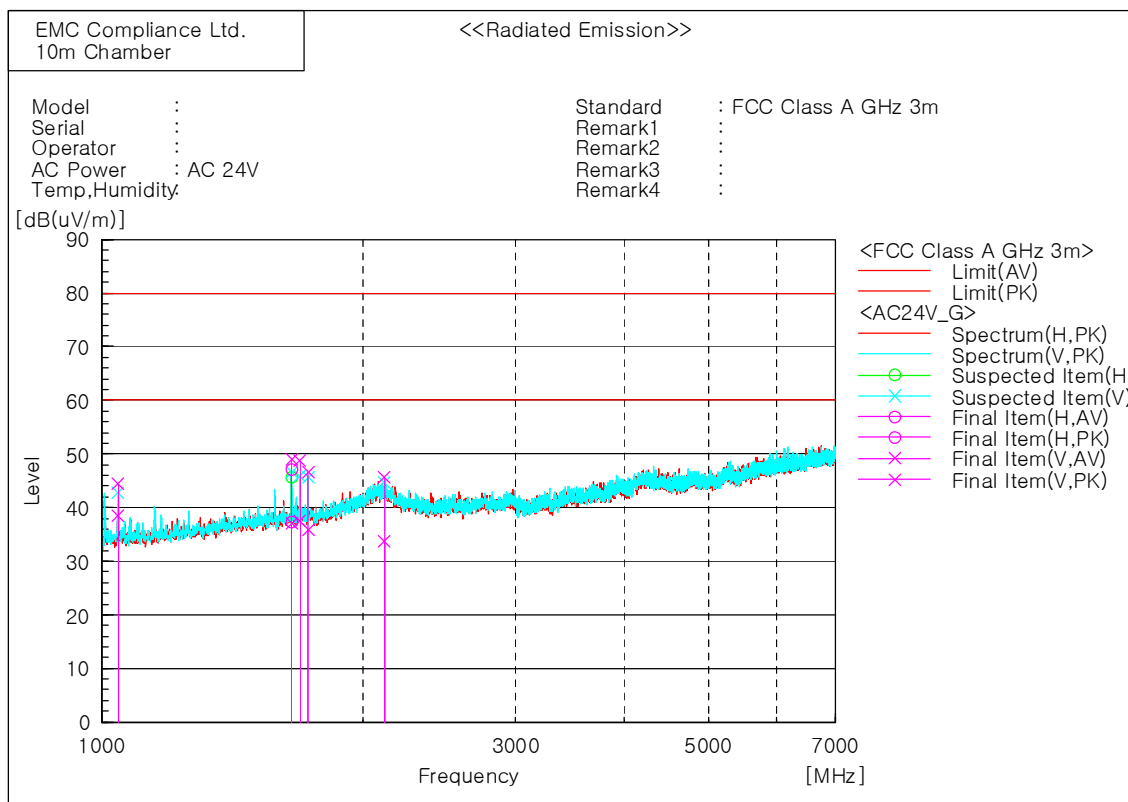
* 30 MHz ~ 1 GHz (SCB-3003N)_AC 24V



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	71.912	V	44.2	-15.5	28.7	39.0	10.3	100.0	94.2
2	125.938	V	39.2	-14.6	24.6	43.5	18.9	200.0	252.8
3	144.018	V	38.7	-13.2	25.5	43.5	18.0	100.0	101.7
4	215.998	V	54.3	-15.0	39.3	43.5	4.2	100.0	38.4
5	252.064	H	43.3	-13.2	30.1	46.5	16.4	301.0	293.9
6	269.895	H	42.1	-12.3	29.8	46.5	16.7	400.0	58.8
7	882.118	V	29.2	2.2	31.4	46.5	15.1	200.0	352.2
8	936.169	V	29.9	3.1	33.0	46.5	13.5	200.0	316.1

* 1 GHz ~ 7 GHz (SCB-3003N)_AC 24V



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	1043.559	V	47.3	53.2	-8.8	38.5	44.4	60.0	80.0	21.5	35.6	100.0	126.8
2	1655.960	V	40.3	52.3	-3.3	37.0	49.0	60.0	80.0	23.0	31.0	100.0	140.4
3	1655.413	H	40.5	50.4	-3.3	37.2	47.1	60.0	80.0	22.8	32.9	100.0	270.6
4	1691.568	V	40.7	51.8	-3.1	37.6	48.7	60.0	80.0	22.4	31.3	100.0	150.9
5	1728.311	V	38.8	49.6	-2.9	35.9	46.7	60.0	80.0	24.1	33.3	100.0	137.3
6	2115.128	V	31.8	43.6	2.0	33.8	45.6	60.0	80.0	26.2	34.4	100.0	170.5

7. E.U.T. photographs

Front View



Rear View



Left View



Right View



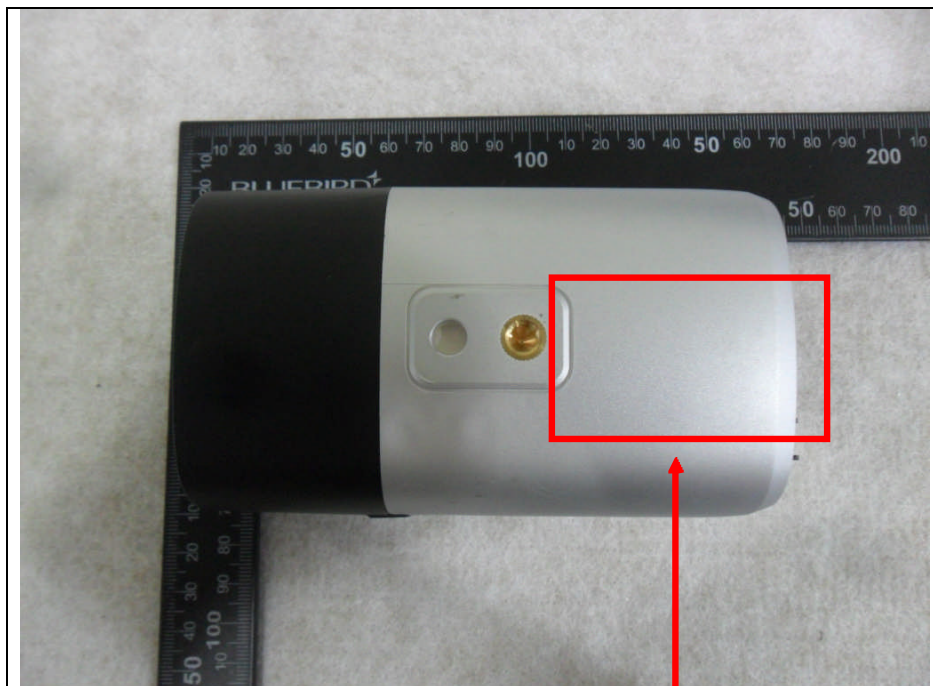
Top View



Bottom View



Label



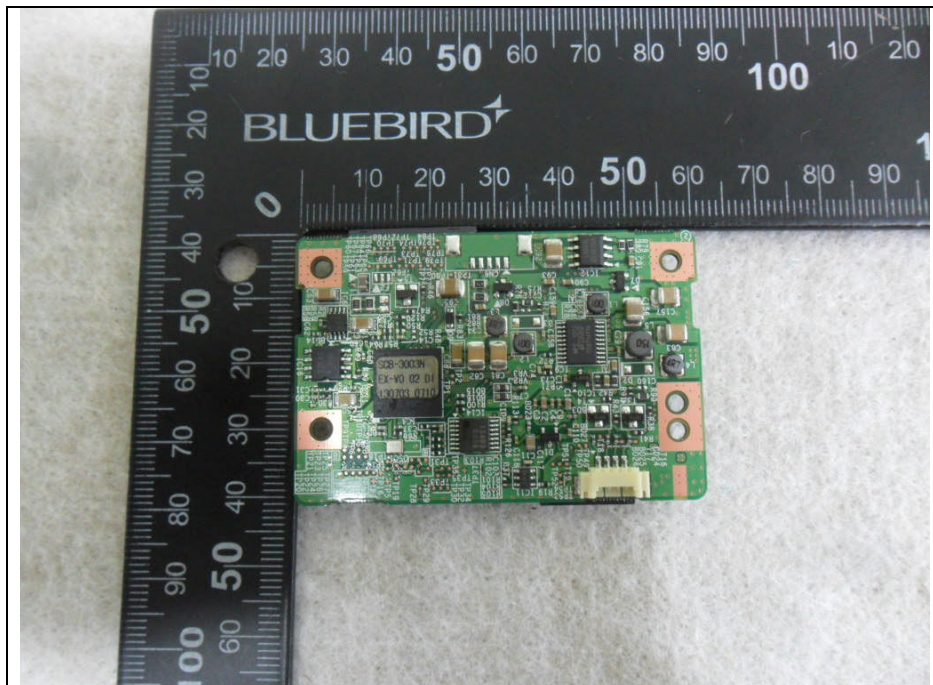
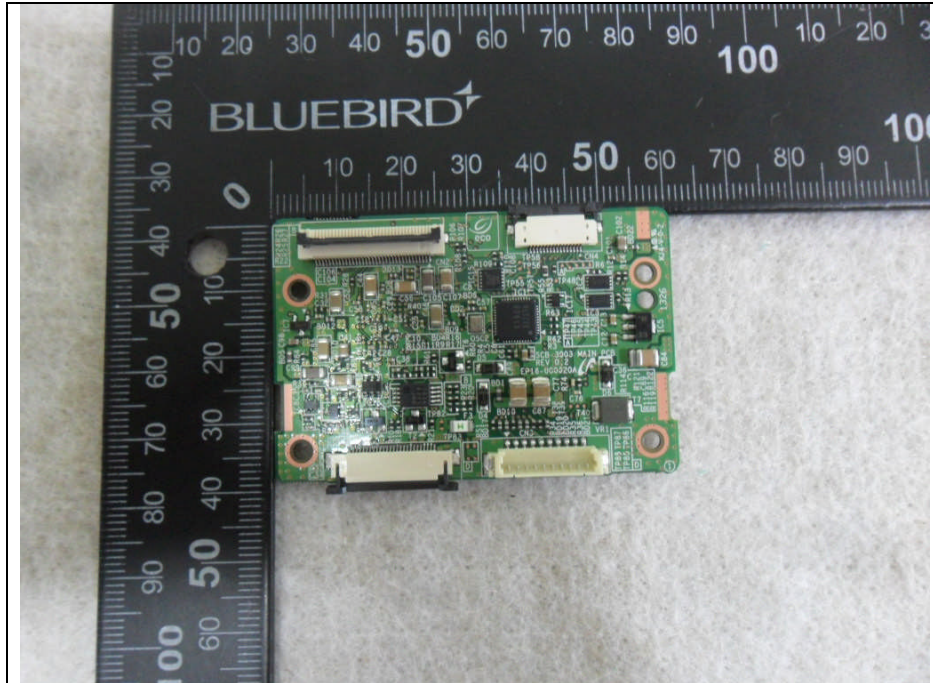
FCC Label Location

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.

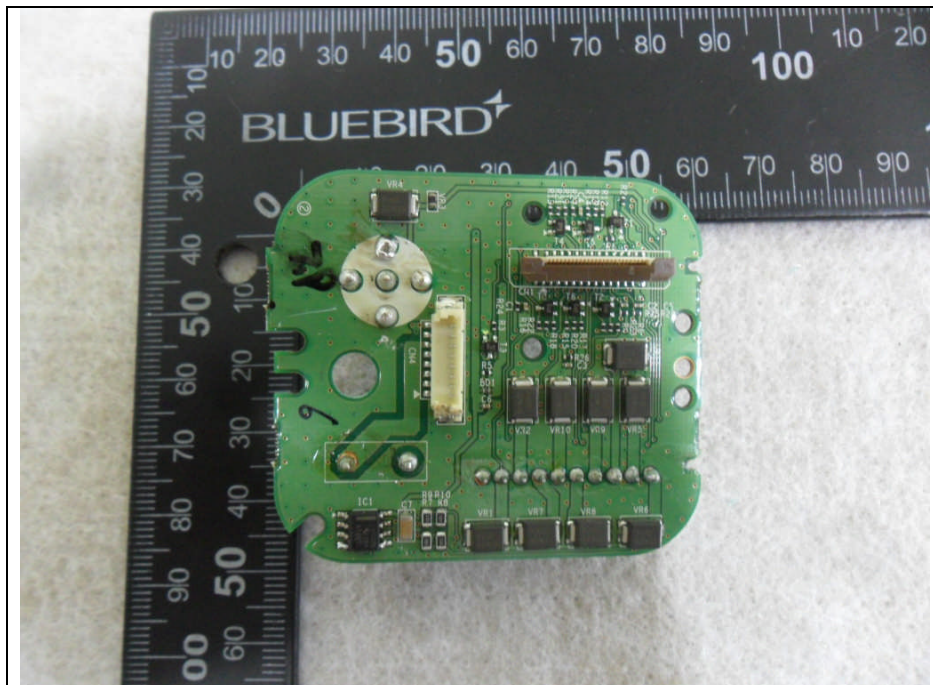
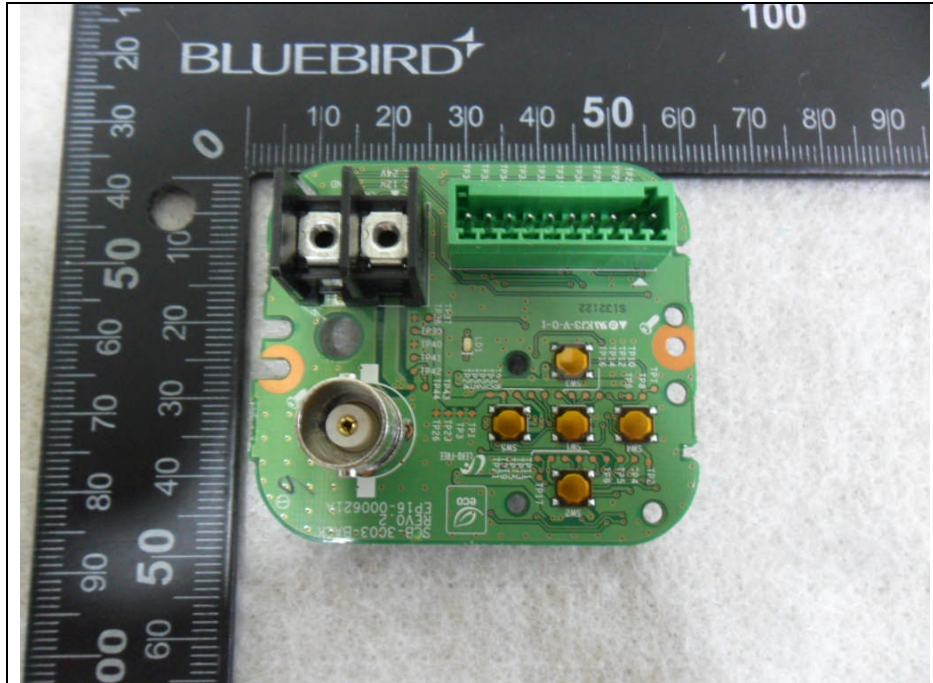
Inside



Main Board



Back Board



Power Board

