

CERTIFICATE of EMC Compliance

Report No: EMC-FCC-1289
Type of equipment: CCTV CAMERA
Model Name: SCD-6080N
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

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

Tel : 82 31 336 9919
Fax : 82 31 336 4767

EMI TEST REPORT

Test report No.: EMC-FCC-1289
Type of Equipment: CCTV CAMERA
Model Name: SCD-6080N
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
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. 05. 23

Date of testing: 2011. 05. 26

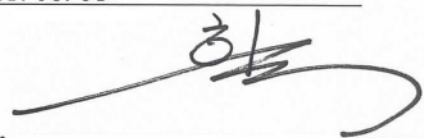
Issued date: 2011. 06. 01

Tested by:



KIM, IN-HO

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.....	9
5. Summary of test results	10
5.1 Modification to the E.U.T.	10
5.2 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: +82-31-277-3695
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: +82-31-277-3695
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 31 336 4767

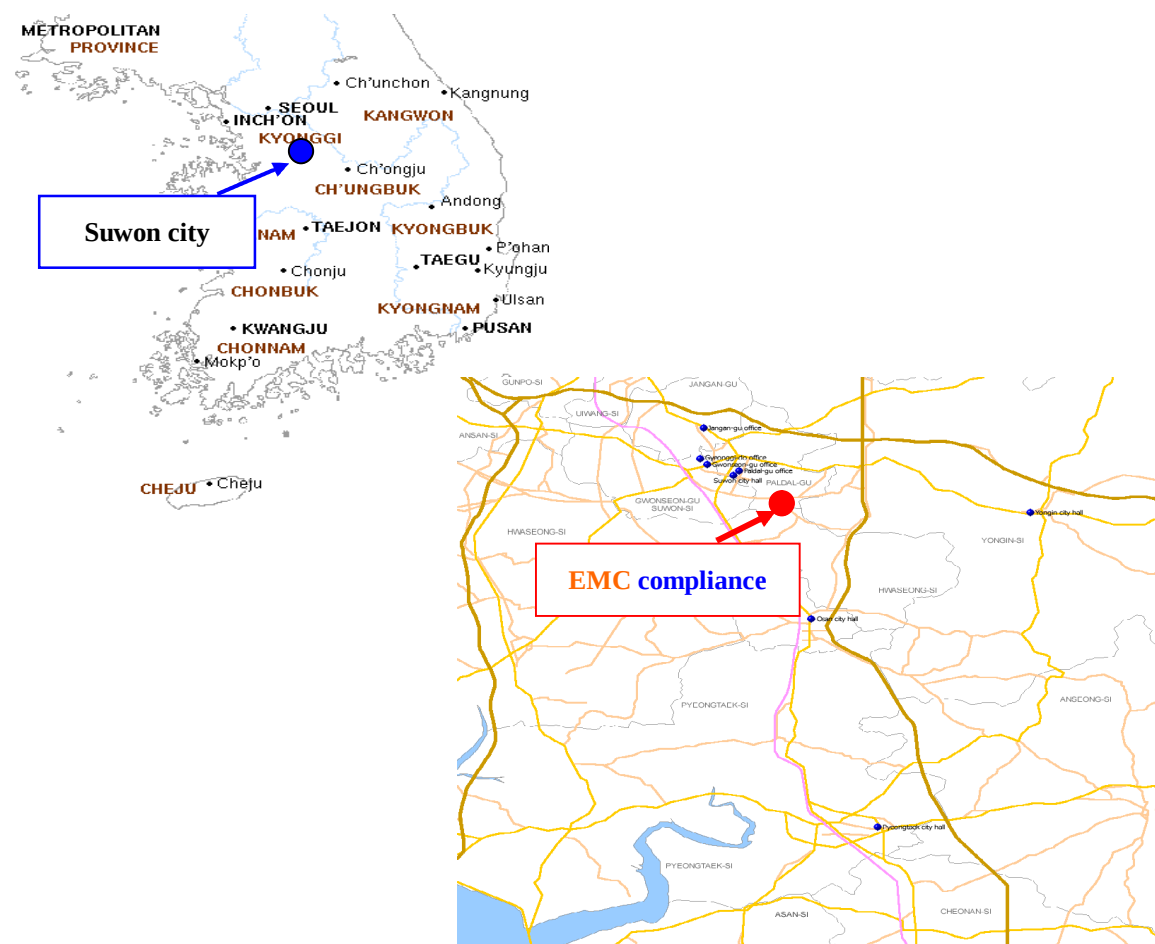
FCC CAB.: KR0040

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)	: 28 °C	30 % R.H.	-

Test site

These testing items were performed following locations;

Chamber (10 m) : Radiated Emission

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: ± 4.3 [dB]

10 m: ± 4.3 [dB]

300 MHz ~ 1 000 MHz: 3 m: ± 4.4 [dB]

10 m: ± 4.3 [dB]

4. Description of E.U.T.

4.1 General information

Video	
Imaging Device	1/3" Progressive Scan CMOS
Total Pixels	2,010(H) x 1,108(V), 2.2M Pixels
Effective Pixels	1,944(H) x 1,092(V), 2.1M Pixels
Scanning System	Progressive Scan
Min. Illumination	Color : 1Lux @ F1.2, 0.017 Lux (Sens-up, 60x) B/W : 0.1Lux@F1.2, 0.0017 Lux(Sens-up, 60x)
S / N Ratio	50dB (AGC off, Weight on)
Video Output	SMPTE292M (HD-SDI)
Lens Type	
Lens Type	DC Auto Iris Lens (3~8.5mm (2.8X) Motorized Vari-focal)
Mount Type	Board type
Operational	
On Screen Display	Multi-language Support English, Korean, Japanese, Spanish, French, Portuguese, Chinese, German, Italian, Russian, Czech, Polish, Romanian, Serbian, Swedish, Danish, Turkish, Thai
Camera Title	Off / On (Displayed 15 characters)
Day & Night	Auto (ICR), Color & B/W, External
Backlight Compensation	Off / User BLC / HLC
Contrast Enhancement	SSDR (Off / On)
Digital Noise Reduction	SSNR III (Off / On)
Motion Detection	Off / On (4 areas)
Privacy Masking	Off / On (16 areas)
Sens-up (Frame Integration)	2x ~ 60x
Gain Control	Off / Low / Medium / High
White Balance	ATW / Outdoor / Indoor / Manual / AWC (1,700K* ~ 10,500K*)
Electronic Shutter Speed	Esc / A.FLK / Manual
Digital Zoom	Off / On (1x ~ 16x)
Reverse	Off / H-Rev / V-Rev / HV-Rev
Alarm	(MD) Output 1, External D/N In 1
Communication	RS-485
Protocol	RS-485: SAMSUNG-T, SAMSUNG-E, Pelco-D, Pelco-P, BOSCH, Honeywell, VICON, PANASONIC, GE, AD

Environmental	
Operating Temperature / Humidity	0° C ~ +50° C (+14° F ~ +122° F) / Less than 90% RH
Electrical	
Input Voltage/Current	Dual (24VAC±10% & 12VDC±10%)
Power Consumption	Max. 6W
Mechanical	
Color / Material	Body: Ivory / Plastic
Dimension (WxHxD)	H129.4 x Ø133mm
Weight	MAX. 550g
Transmission Distance	
L-5C2V(75ohm)	about 70 m

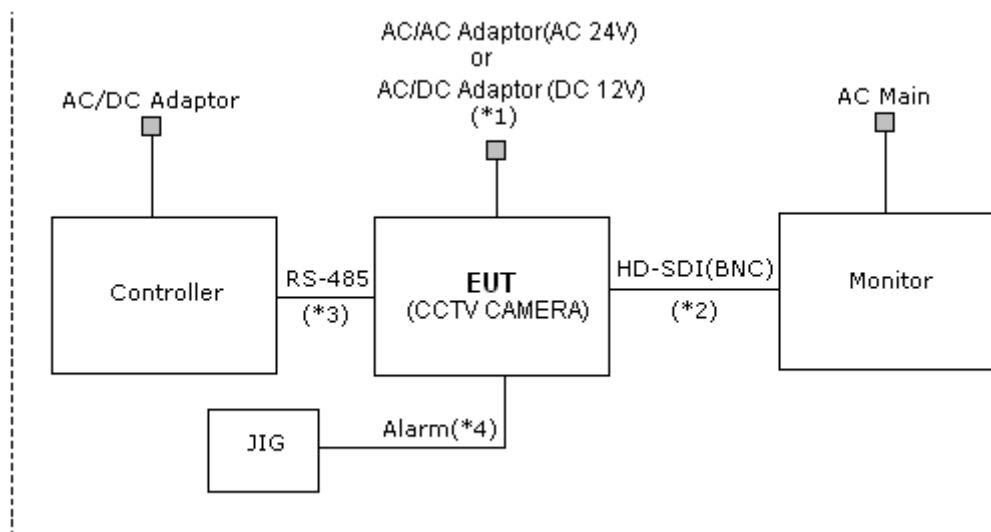
4.2 Product description

Type of product	CCTV CAMERA
Model name (Basic)	SCD-6080N
Model name (Variant)	N/A
Difference	-
Trade name	-
Serial no	Engineering Sample
Testing voltage	AC 24 V , DC 12 V
Product rating	AC 24 V , DC 12 V
Internal clock frequency	120 MHz
Note	AC/AC adaptor, AC/DC adaptor was not provided by the manufacturer.

4.3 Auxiliary equipments

Type	Model / Part #	Serial number	Manufacturer
Monitor	LVM-172W	LVM172JZ185	TVLogic
Controller	SCC-1000	C28667WZ107714Y	SAMSUNG
JIG	-	-	-
AC/AC Adaptor (AC 24 V)	STA-220	-	Dream Electronics
AC/DC Adaptor (DC 12 V)	DSA-60W-12112048	-	DeeVan 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/AC Adaptor or AC/DC Adaptor	Power	1.5	Non-Shield
2		HD-SDI(BNC)	Monitor	BNC	3.0	Shield
3		RS-485	Controller	RS-485	3.0	Non-Shield
4		Alarm	JIG	Alarm	3.0	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	Video monitoring mode
	RS-485, Alarm test mode.

* Note: 2 types of powers are available for the product, that are AC/AC adaptor (AC 24 V), AC/DC adaptor (DC 12 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 Modification to the E.U.T.

- No modifications to the EUT were necessary to comply.

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 AC 24 V, DC 12 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	Operating mode		
Date	2011. 05. 26		
Testing voltage	AC 24 V, DC 12 V		
Test facility	10 m Chamber		
Temperature (°C)	28 °C	Humidity (% R.H.)	30 % R.H.
Remarks	Complied 30 MHz ~ 1 GHz Minimum limit margin is 3.7 dB at 371.198 MHz. (AC 24 V) 1 GHz ~ 2 GHz Minimum limit margin is 10.7 dB at 1187.500 MHz. (AC 24 V_ 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	100001	R&S	11.08.17	☒
Bi-Log Antenna	VULB 9168	375	SCHWARZBECK	11.11.30	☒
Amplifier	310N	284608	SONOMA INSTRUMENT	11.07.08	☒
3 dB Attenuator	8491A	16861	HP	12.01.13	☒
Antenna Mast	AM4.0	079/3440509	MATURO	-	☒
Turn Table	CO2000-SOFT	-	MATURO	-	☒
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

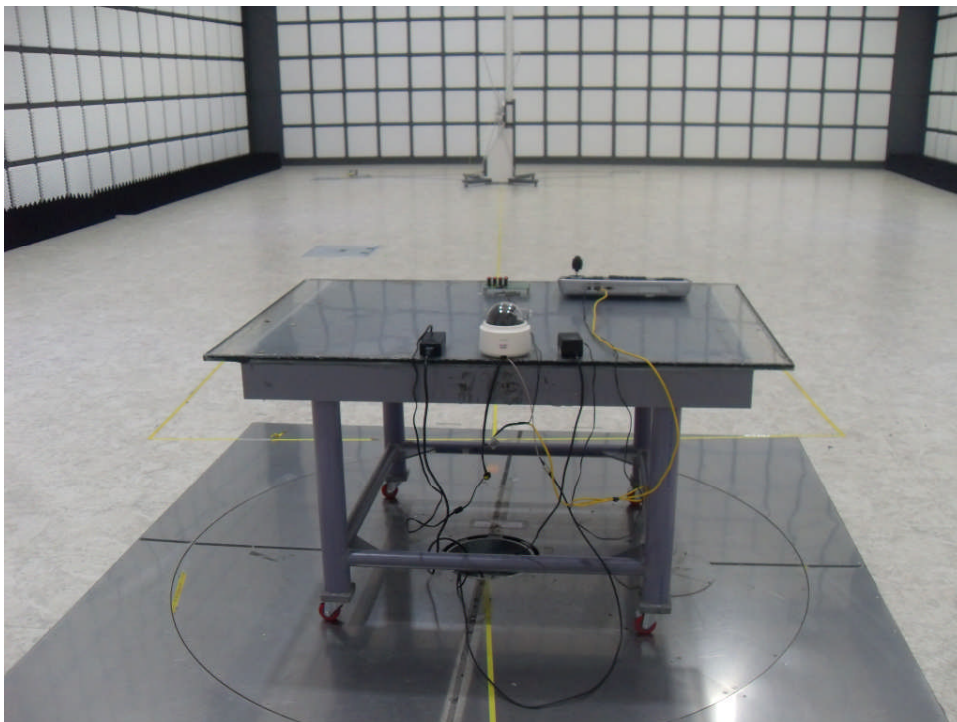
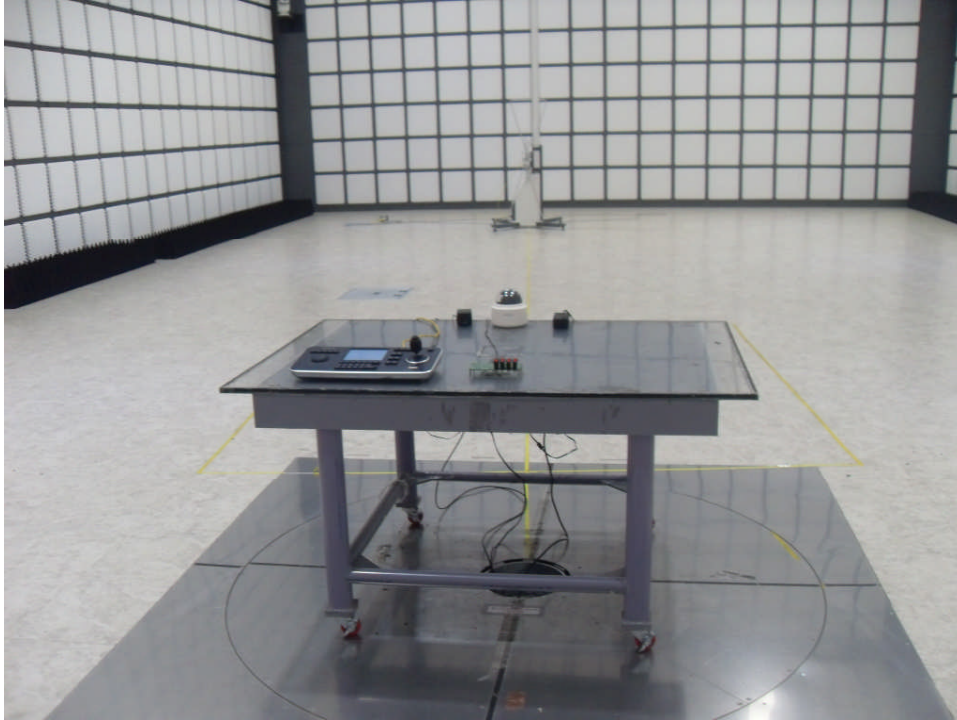
3 dB Att = 3 dB Attenuator

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

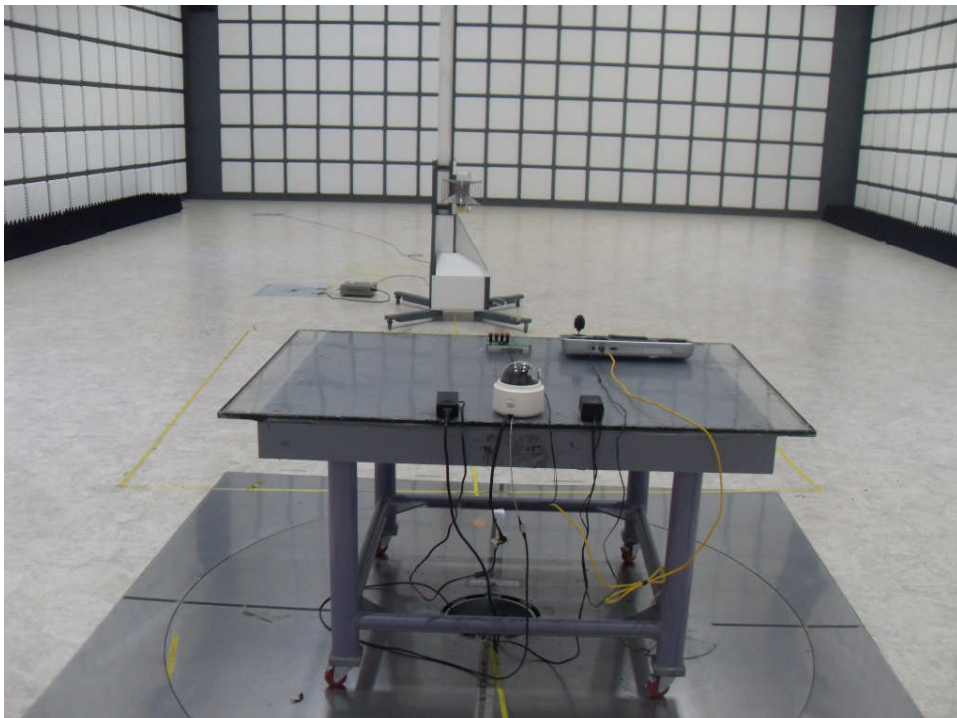
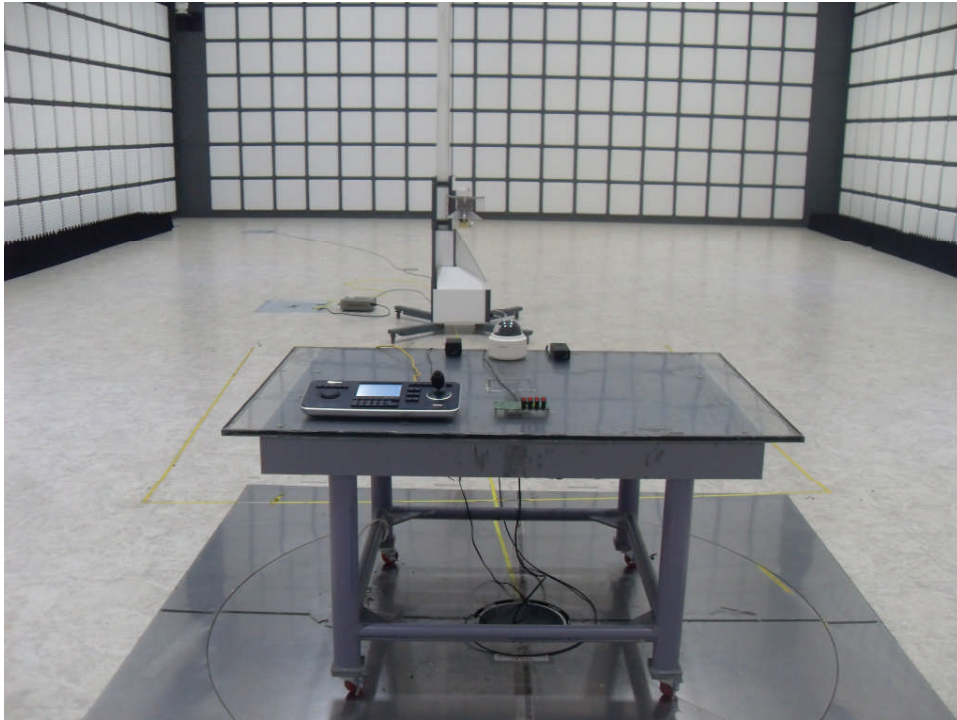
The result is $30 + 12 + 5 + 3 - 35 = 15 \text{ dB}(\mu\text{V/m})$

6.1.5 Photographs of test setup

* 30 MHz ~ 1 GHz



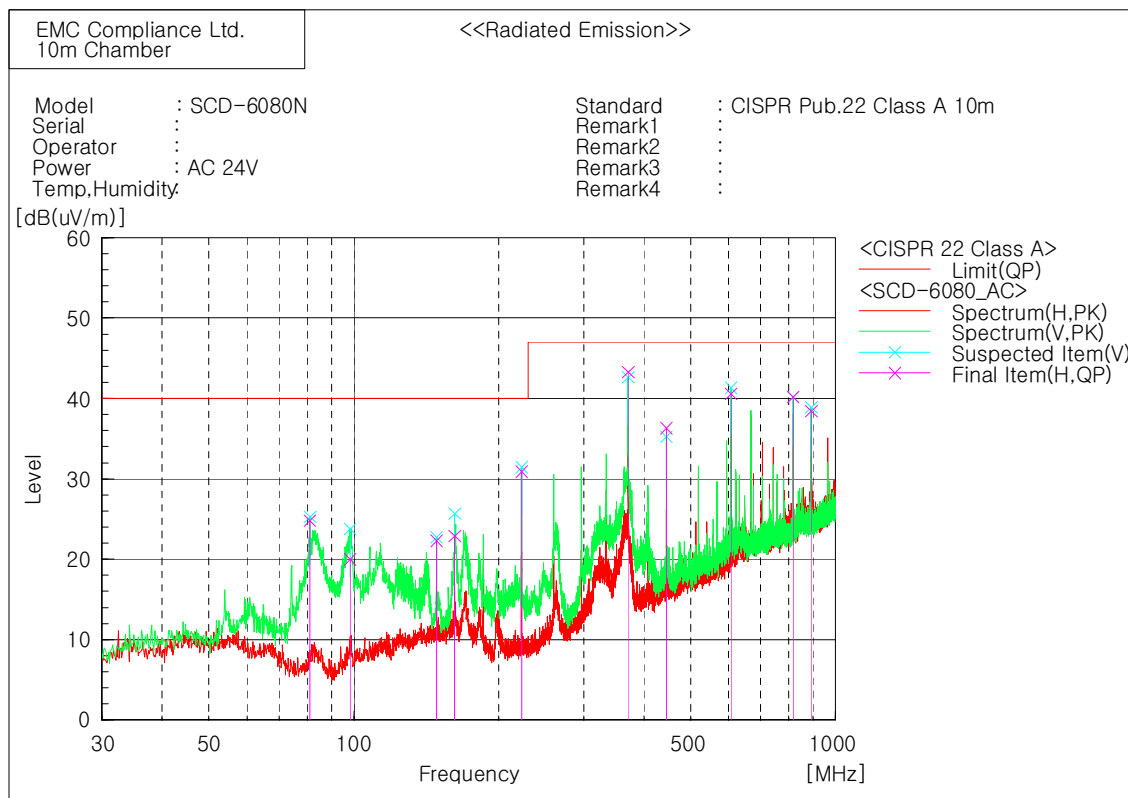
* 1 GHz ~ 2 GHz



6.1.6 Radiated emission measurement result

* Graph and Data

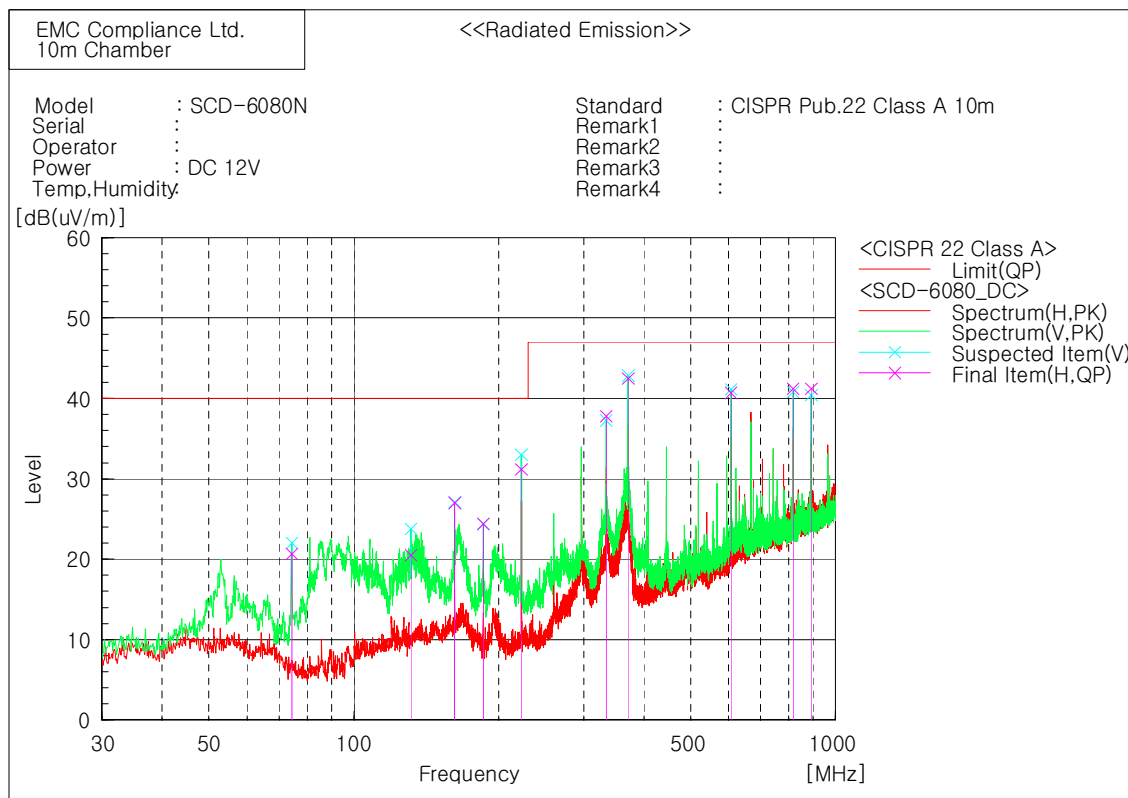
* 30 MHz ~ 1 GHz (AC 24 V)



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c.f [dB(1/m)]	Result QP [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
1	81.046	V	45.5	-20.7	24.8	40.0	15.2	199.0	241.5
2	98.264	V	39.6	-19.6	20.0	40.0	20.0	199.0	147.3
3	148.461	V	37.4	-15.1	22.3	40.0	17.7	199.0	247.5
4	161.920	V	37.7	-14.8	22.9	40.0	17.1	100.0	115.9
5	222.788	V	48.2	-17.3	30.9	40.0	9.1	100.0	352.8
6	371.198	V	55.3	-12.0	43.3	47.0	3.7	100.0	287.4
7	445.524	V	46.5	-10.2	36.3	47.0	10.7	100.0	315.7
8	607.514	V	47.1	-6.5	40.6	47.0	6.4	299.0	340.2
9	816.791	V	43.3	-3.1	40.2	47.0	6.8	199.0	310.3
10	891.117	V	40.1	-1.7	38.4	47.0	8.6	199.0	110.0

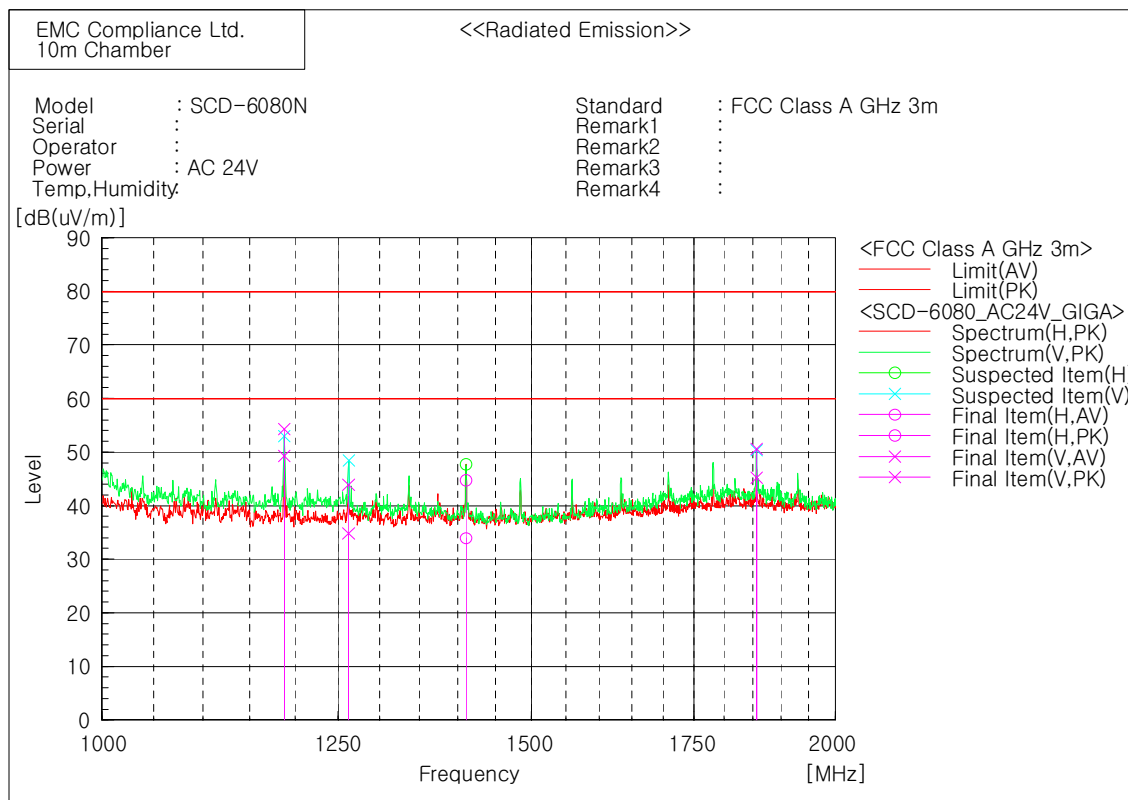
* 30 MHz ~ 1 GHz (DC 12 V)



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c.f [dB(1/m)]	Result QP [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
1	74.256	V	40.4	-19.7	20.7	40.0	19.3	201.0	119.4
2	131.244	V	36.5	-16.0	20.5	40.0	19.5	100.0	242.5
3	162.041	V	41.8	-14.8	27.0	40.0	13.0	100.0	108.0
4	185.685	V	41.3	-16.9	24.4	40.0	15.6	100.0	113.9
5	222.666	V	48.5	-17.3	31.2	40.0	8.8	100.0	176.7
6	334.095	V	50.8	-13.0	37.8	47.0	9.2	400.0	94.4
7	371.198	V	54.5	-12.0	42.5	47.0	4.5	100.0	66.1
8	607.514	V	47.2	-6.5	40.7	47.0	6.3	301.0	342.2
9	816.791	V	44.3	-3.1	41.2	47.0	5.8	201.0	156.7
10	891.117	V	42.9	-1.7	41.2	47.0	5.8	201.0	79.1

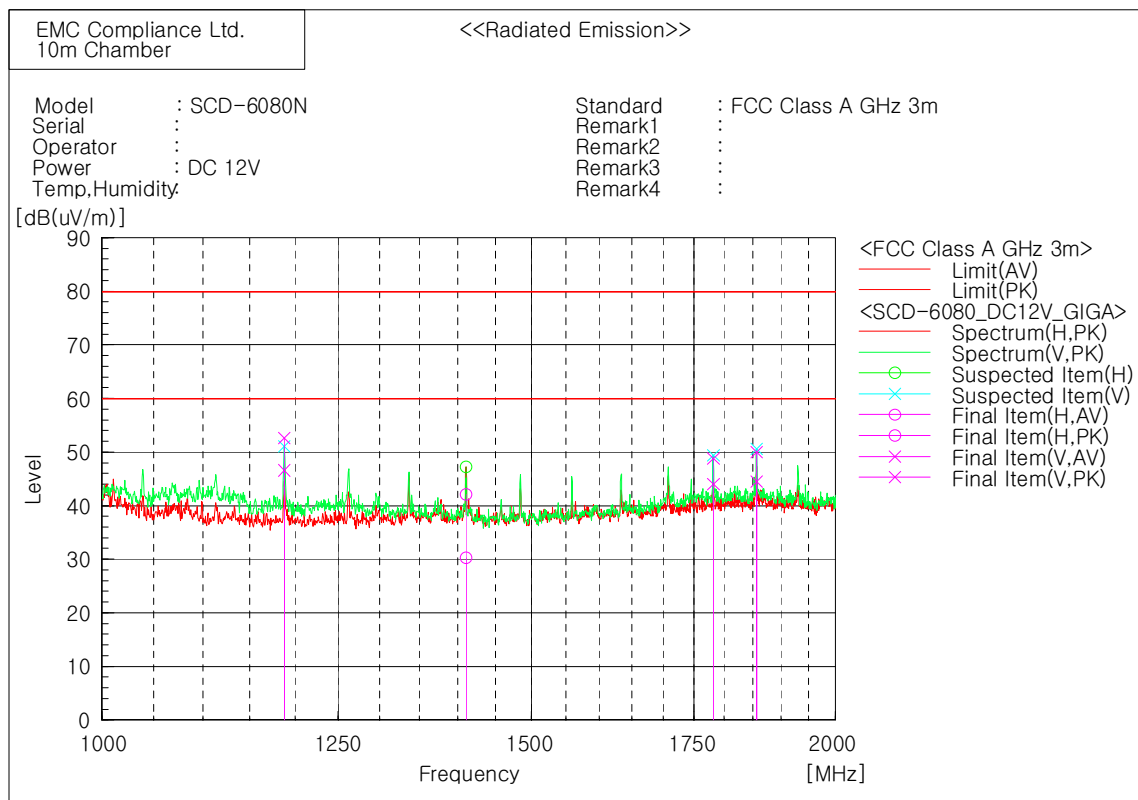
* 1 GHz ~ 2 GHz (AC 24 V)



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]
1	1187.500	V	60.8	65.8	-11.5	49.3	54.3	60.0	80.0	10.7	25.7	100.0	279.4
2	1262.213	V	45.6	54.7	-10.8	34.8	43.9	60.0	80.0	25.2	36.1	100.0	279.4
3	1410.701	H	43.5	54.3	-9.6	33.9	44.7	60.0	80.0	26.1	35.3	100.0	208.6
4	1856.250	V	51.9	57.3	-6.7	45.2	50.6	60.0	80.0	14.8	29.4	100.0	330.2

* 1 GHz ~ 2 GHz (DC 12 V)



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]
1	1187.981	V	58.1	64.1	-11.5	46.6	52.6	60.0	80.0	13.4	27.4	100.0	250.6
2	1410.723	H	39.9	51.7	-9.6	30.3	42.1	60.0	80.0	29.7	37.9	100.0	245.9
3	1781.875	V	51.1	55.9	-7.1	44.0	48.8	60.0	80.0	16.0	31.2	100.0	323.7
4	1856.151	V	51.2	56.7	-6.7	44.5	50.0	60.0	80.0	15.5	30.0	100.0	350.5
5	2376.250	V	48.3	52.9	-5.2	43.1	47.7	60.0	80.0	16.9	32.3	100.0	350.5

7. E.U.T. photographs

Front View



Rear View



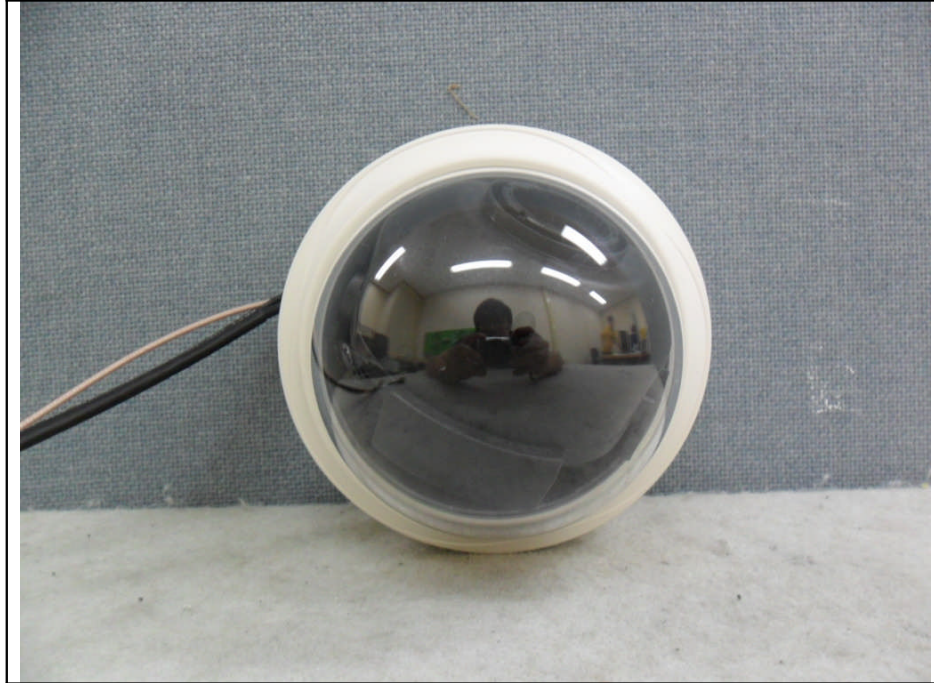
Left View



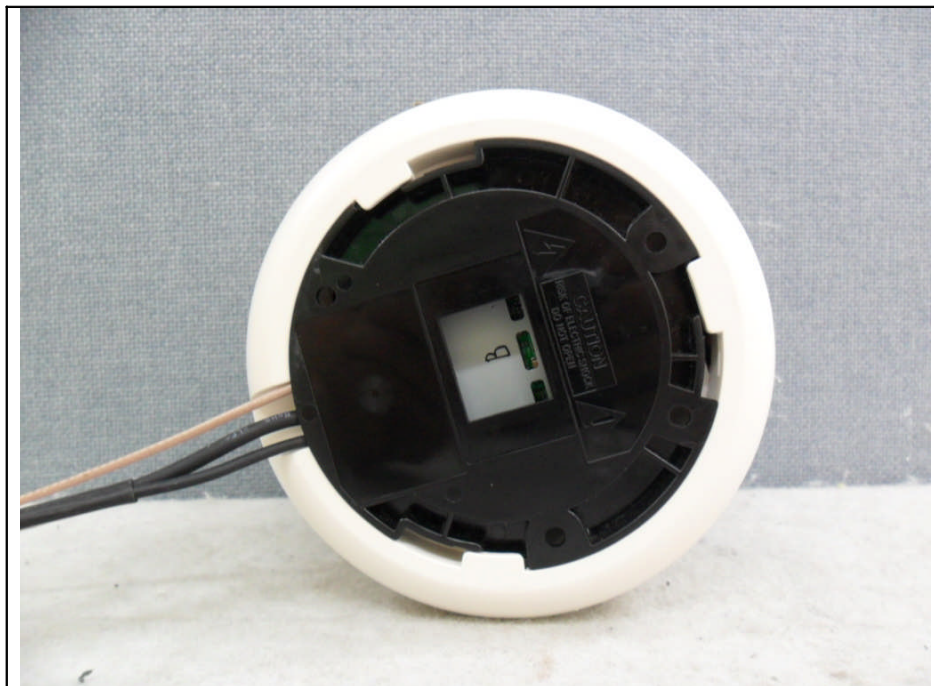
Right View



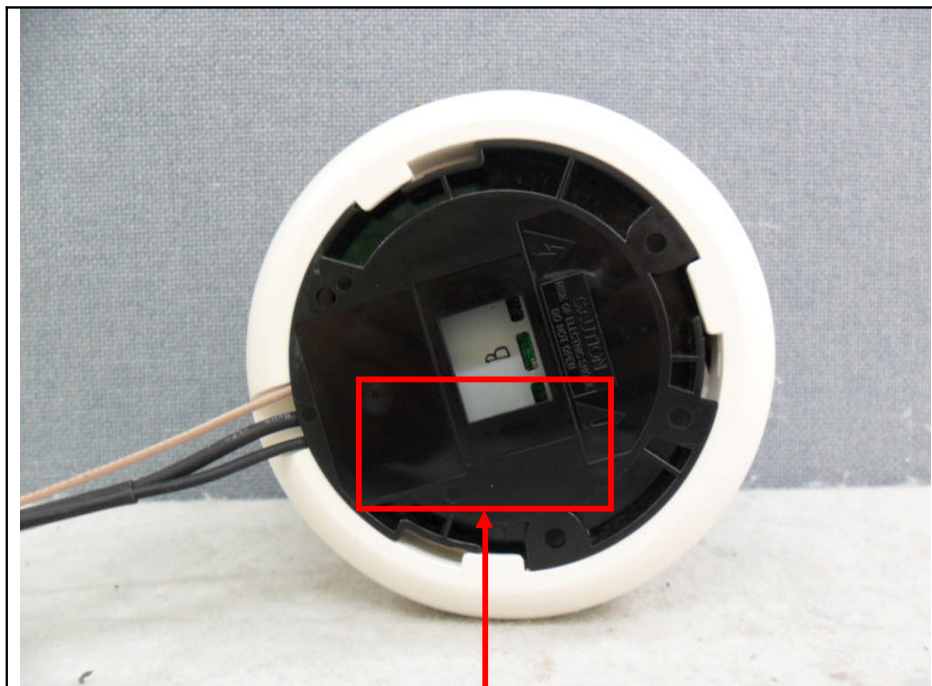
Top View



Bottom View



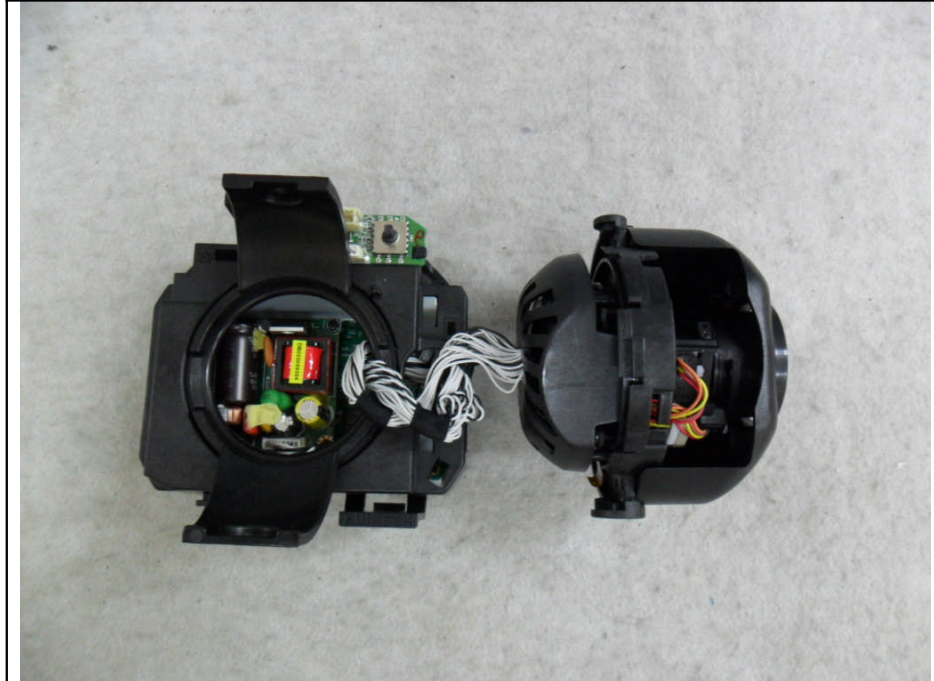
Label



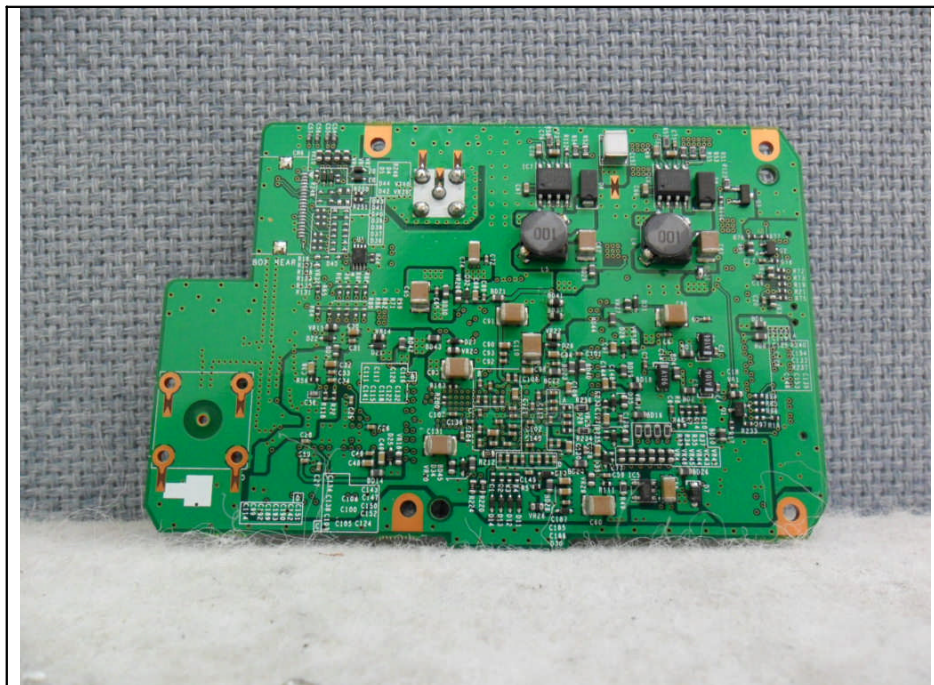
FCC Label Location

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.

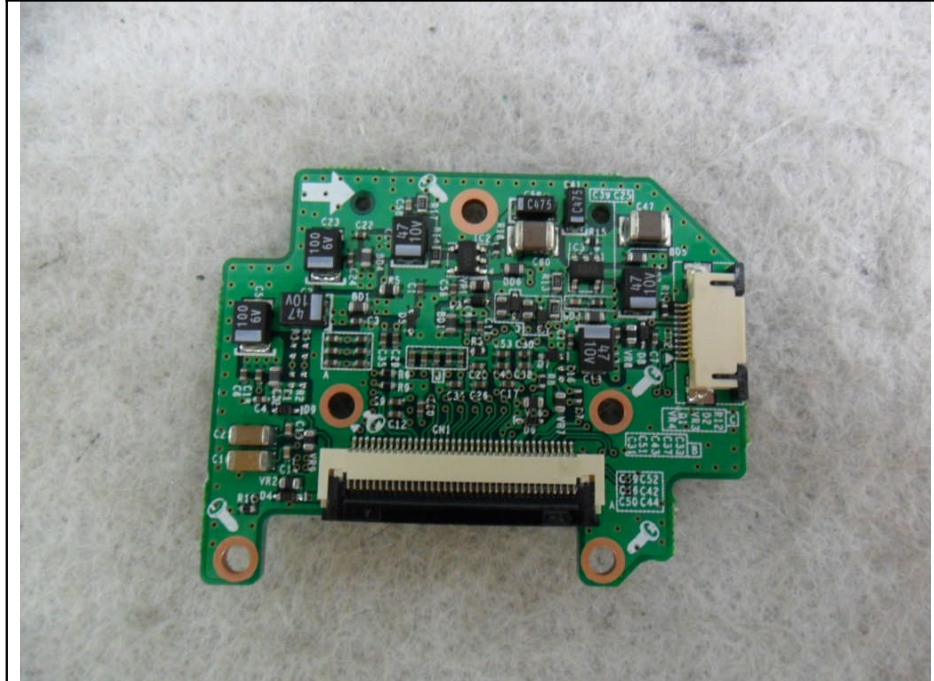
Inside



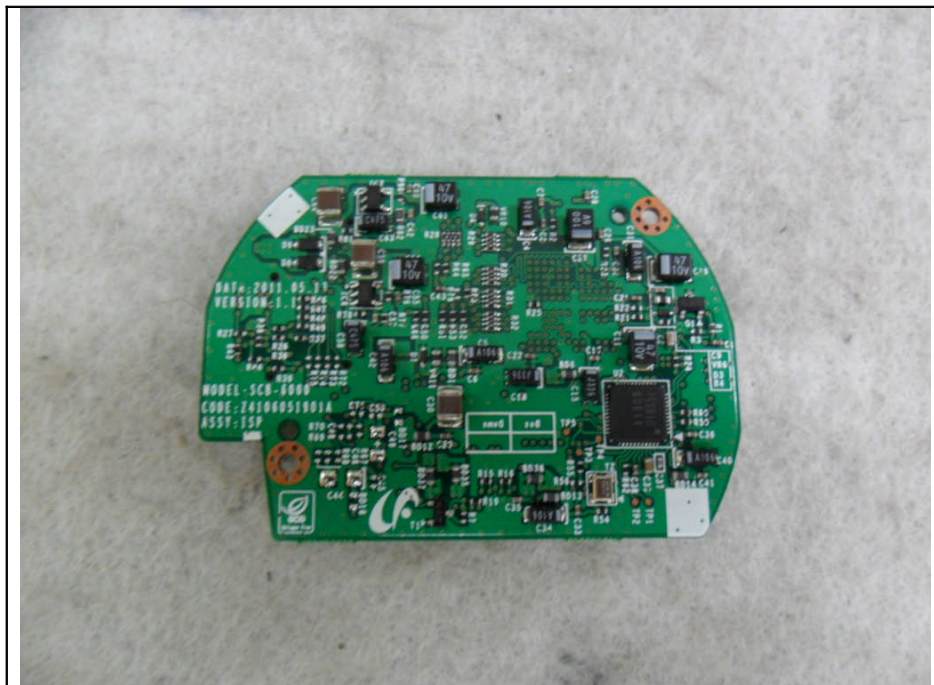
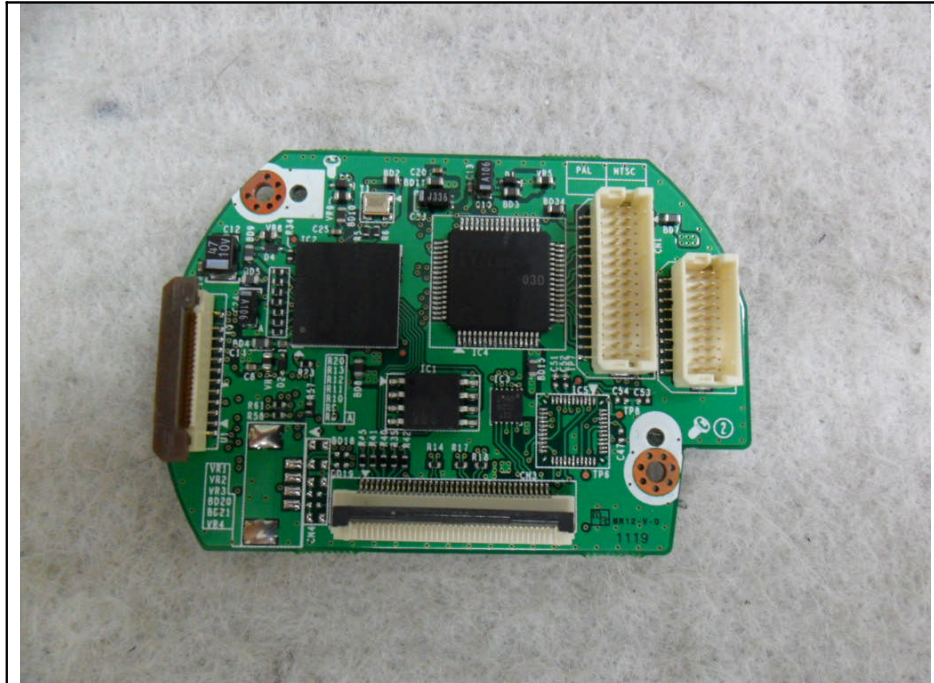
Main Board



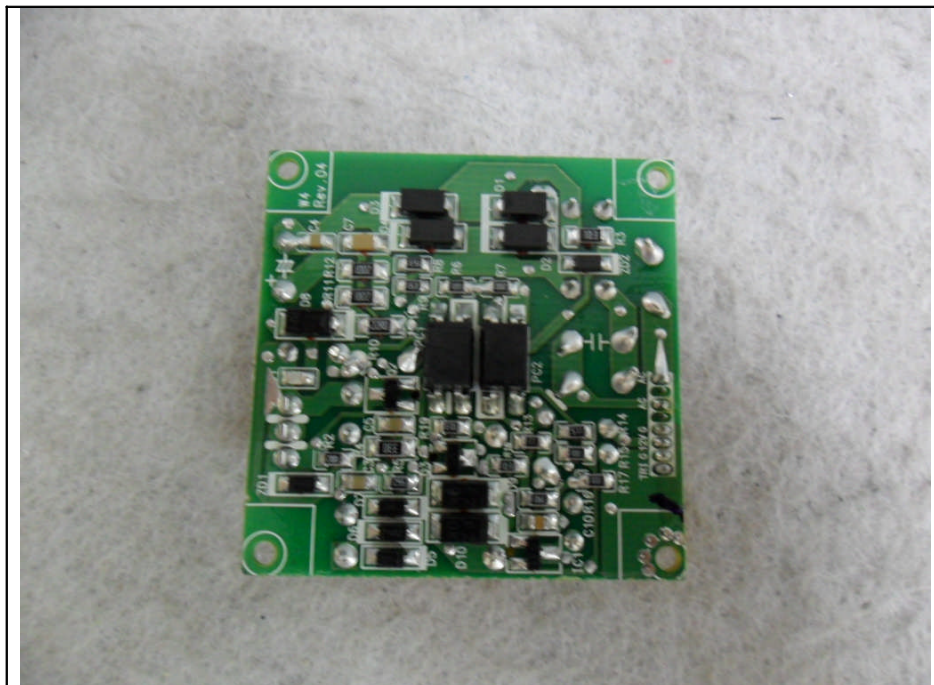
Sensor Board



SUB Board



SMPS



Switch Board

