CERTIFICATE of EMC Compliance

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Report No:	**EMC-FCC-1479**
Type of equipment:	**CCTV CAMERA**
Model Name:	**SCP-2370RH**
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-1479**
Type of Equipment:	**CCTV CAMERA**
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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. 01. 09

Date of testing: 2012. 01. 19

Issued date: 2012. 01. 27

Tested by: JUNG, YOUNG-JUN

Approved by: YEOM, HAN-SEOK

Contents

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

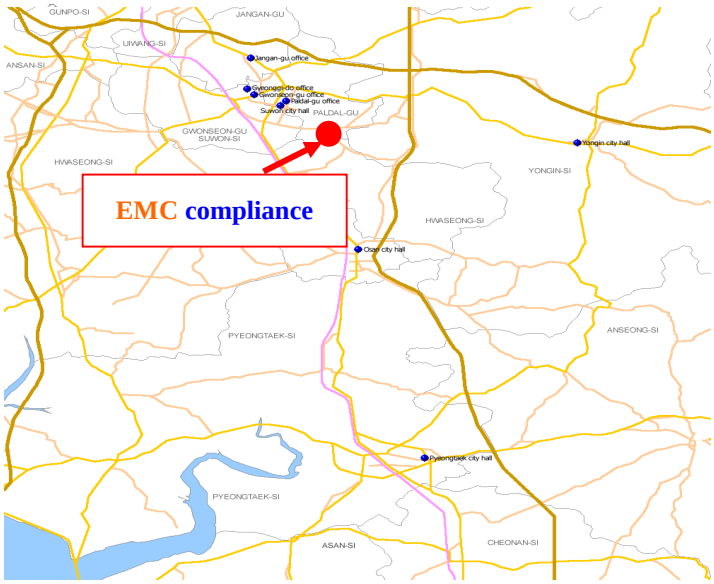
2. Laboratory information

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 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) :	13 ~ 14 °C	16 ~ 18 % R.H.	-

Test site

These testing items were performed following locations;

Test item	Test site
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

Model	SCP-2370RH
Image Device	1/4" Super HAD CCD II
Total Pixels	NTSC : 811(H) x 508(V)
	PAL : 795(H) x 596(V)
Effective Pixels	NTSC : 768(H) x 494(V)
	PAL :752(H) x 582(V)
Scanning System	2:1 Interlace
Synchronization	Internal / Line Lock
Frequency	NTSC : H : 15.734kHz / V : 59.94Hz
	PAL : H : 15.625KHz / V : 50Hz
Horizontal Resolution	Color : 600TV lines / BW : 700TV lines
Min. Illumination	<Use IR Illuminator> 0 Lux <Do not use IR Illuminator> COLOR : 0.2 Lux (50 IRE @ F1.6), 0.0004 Lux (50IRE, Color, Sens-up 512x) B/W : 0.02 Lux (50 IRE @ F1.6), 0.00004 Lux (50IRE, B/W, Sens-up 512x)
S / N Ratio	52 dB (AGC off, Weight On)
Video Output	CVBS : 1.0 Vp-p / 75Ω composite
Focal Length (Zoom Ratio)	3.5~129.5mm
Max. Aperture Ratio	1:1.6 (Wide) ~ 3.9 (Tele)
Angular Field of View	H : 55.5°(Wide) ~ 1.59°(Tele) / V : 42.5°(Wide) ~ 1.19°(Tele)
Min. Object Distance	1800mm
Focus Control	AUTO / MANUAL / ONE SHOT
Zoom Movement Speed	2.8sec
Pan Range	360° Endless
Pan Speed	Preset : 300°/sec, Manual : 0.024°/sec ~ 120°/sec
Tilt Range	-5° ~ 185°
Tilt Speed	Preset : 300°/sec, Manual : 0.024°/sec ~ 120°/sec
Preset	255
Preset Accuracy	±0.1°
OSD	NTSC: ENGLISH, FRENCH, SPANISH, PORTUGUES, KOREAN, JAPANESE, TAIWANESE PAL: ENGLISH, CHINESE, FRENCH, GERMAN, SPANISH, ITALIAN, PORTUGUES, POLISH, RUSIAN, CZECH, TURKISH
Camera Title	Off / On (Displayed 12 Characters)

Model	SCP-2370RH
Day & Night	Auto (ICR) / Color / B/W
Back Light	BLC / HLC / Off
Contrast Enhancement	SSDR (Off/On)
Digital Noise Reduction	SSNR III (Off/On)
Digital Image Stabilization	Off/On
Motion Detection	Off/On
Privacy Masking	Off/On (8 programmable zones)
Sens-up	2x ~ 512x
Gain Control	Off/Low/Medium/High/Manual
White Balance	ATW / ATW (IN) / ATW (OUT) / Manual / AWC
Electronic Shutter Speed	NTSC :1/60~1/120,000sec
	PAL : 1/50~1/120,000sec
Digital Zoom	Off/On (2x ~ 16x)
Digital Flip	Off/On
Schedule	Day/Time
Alarm	8 In 3 Out
Communication	RS-485/422, Coaxial Control
Protocol	Coax : Pelco-C (Coaxitron) RS-485: Auto Detected, SAMSUNG-T, SAMSUNG-E, Pelco(D/P), Panasonic, Vicon,Honeywell,AD,GE,BOSCH
Operating Temperature / Humidity	-50°C ~ +50°C / Less than 90% RH
Ingress Protection	IP66
Input Voltage	24V AC ±10%, 50/60Hz
Power Consumption	Max. 15W / 60W (Fan & Heater)
Color / Material	Ivory, Aluminum
Dimension (Φ×H)	Φ248 x 399.5mm
Weight	6 Kg

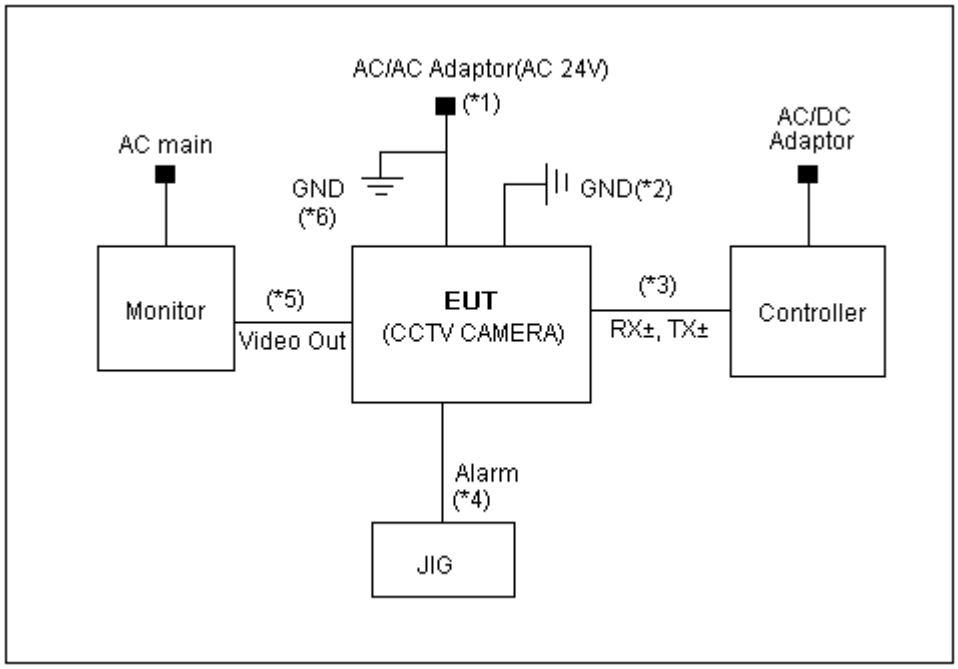
4.2 Product description

Type of product	CCTV CAMERA
Model name (Basic)	SCP-2370RH
Model name (Variant)	-
Difference	-
Trade name	-
Serial no	Engineering Sample
Testing voltage	AC 24 V
Product rating	AC 24 V
Internal clock frequency	27 ㎒
Note	* AC/AC Adaptor was not provided by the manufacturer.

4.3 Auxiliary equipments

Type	Model / Part #	Serial number	Manufacturer
Monitor	DO19WS	N732HIIL900528X	SAMSUNG
Controller	SPC-1010	-	WONWOO Engineering Co.,Ltd.
JIG	-	-	-
AC/AC Adaptor(AC 24 V)	DRL-246000AC	-	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/AC Adaptor	Power	1.8	Non-Shield
2		GND	GND	GND	1.2	Non-Shield
3		RX±, TX±	Controller	RX±, TX±	3.0	Non-Shield
4		Alarm	JIG	Alarm	3.0	Non-Shield
5		Video Out	Monitor	Video In	3.0	Shield
6	AC/AC Adaptor	GND	GND	GND	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	Camera monitoring test mode.
	Camera Control Test Mode

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	AC 24 V		
Test facility	10 m Chamber (#F4, #F2)		
Test distance	10 m		
Date	2012. 01. 19		
Temperature (°C)	13 ~ 14 °C	Humidity (% R.H.)	16 ~ 18 % 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	100001	R&S	2012.07.11	☒
Bi-Log Antenna	VULB 9168	375	SCHWARZBECK	2013.09.21	☒
Amplifier	310N	284608	SONOMA INSTRUMENT	2012.07.11	☒
3 ㏈ Attenuator	8491A	16861	HP	2012.07.11	☒
Antenna Mast	AM4.0	079/3440509	MATURO	-	☒
Turn Table	CO2000-SOFT	-	MATURO	-	☒

* 1 ㎓ ~ 5 ㎓

Equipment	Model no.	Serial no.	Makers	Next cal. date	Used
Antenna Mast	MA4000-EP	303	Innco Systems	-	☒
Turn Table	DT2000S-1t	079	Innco Systems	-	☒
Horn ANT	3115	00086706	ETS	2012.09.16	☐
Amplifier	8449B	3008A01802	AGILENT	2012.05.11	☐
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

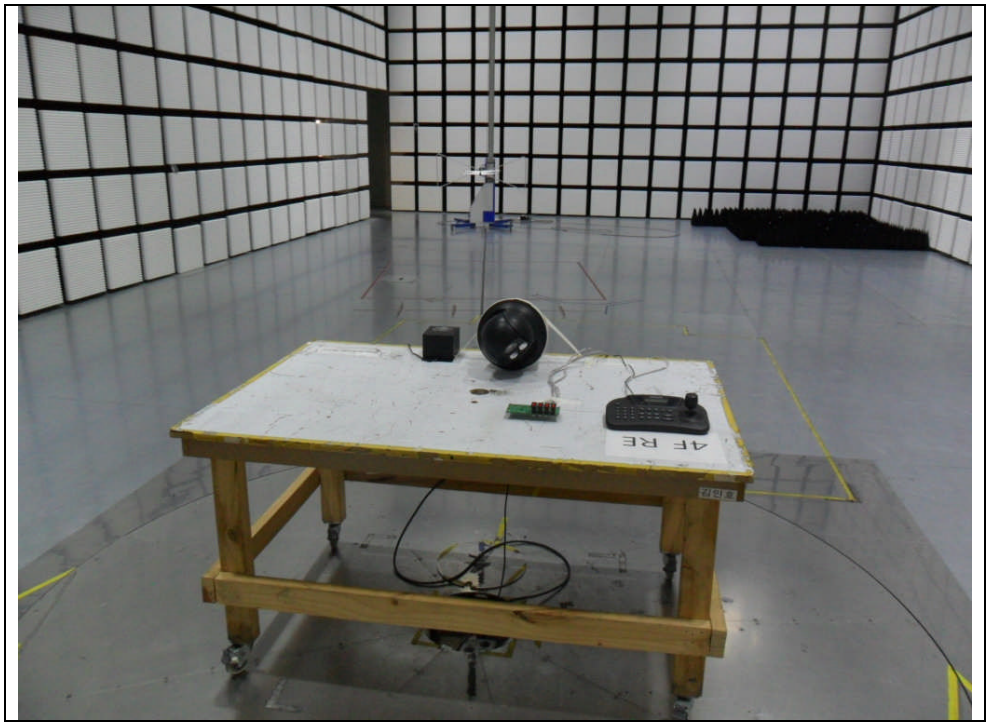
3 ㏈ Att = 3 ㏈ Attenuator

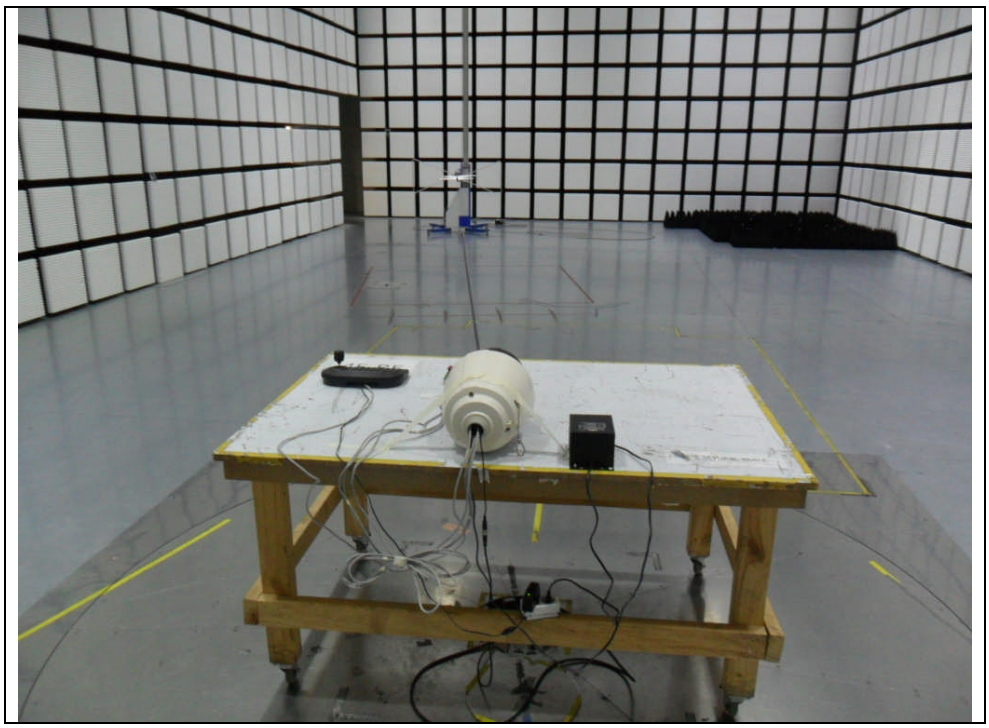
If M.R is 30 ㏈, A.F 12 ㏈, C.L 5 ㏈, 3 ㏈, A.G 35 ㏈

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

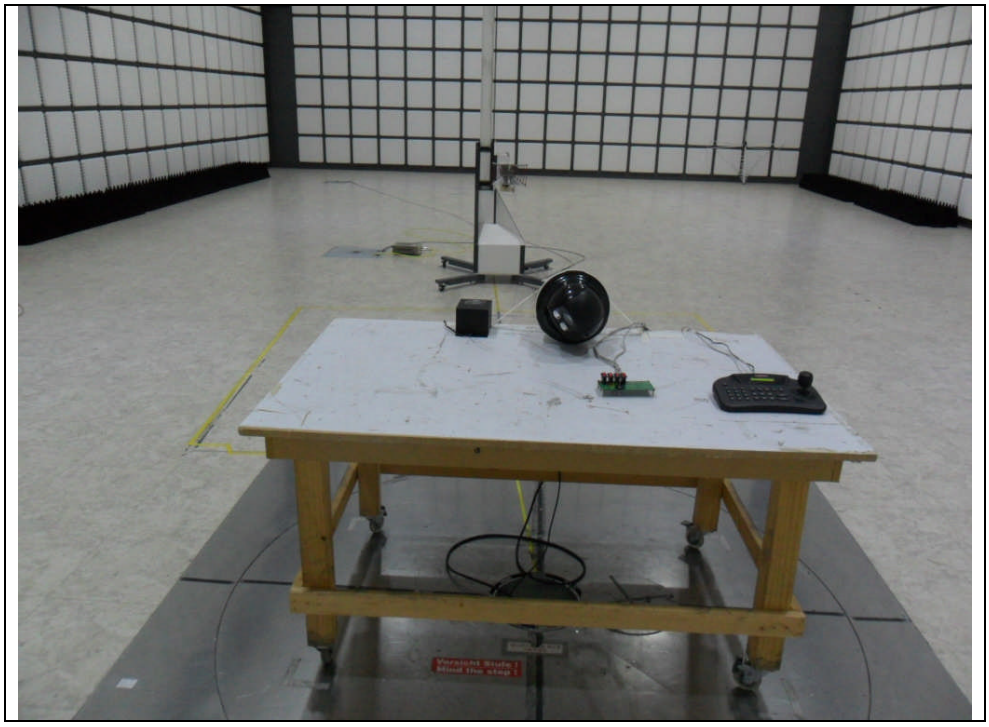
6.1.5 Photographs of test setup

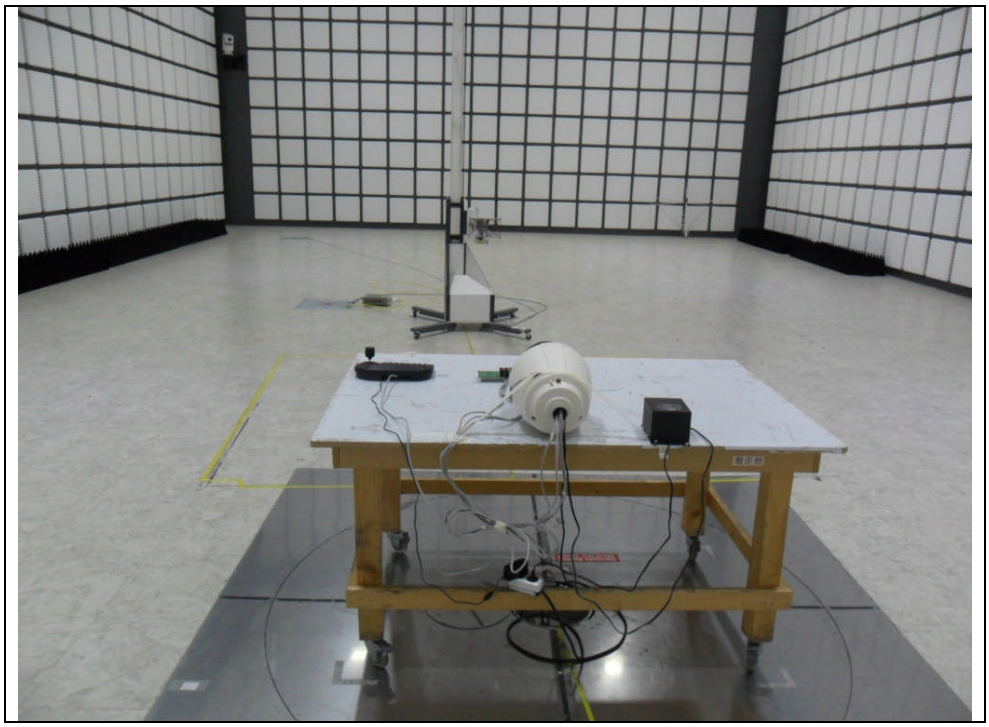
* 30 ㎒ ~ 1 ㎓





* 1 ㎓ ~ 5 ㎓

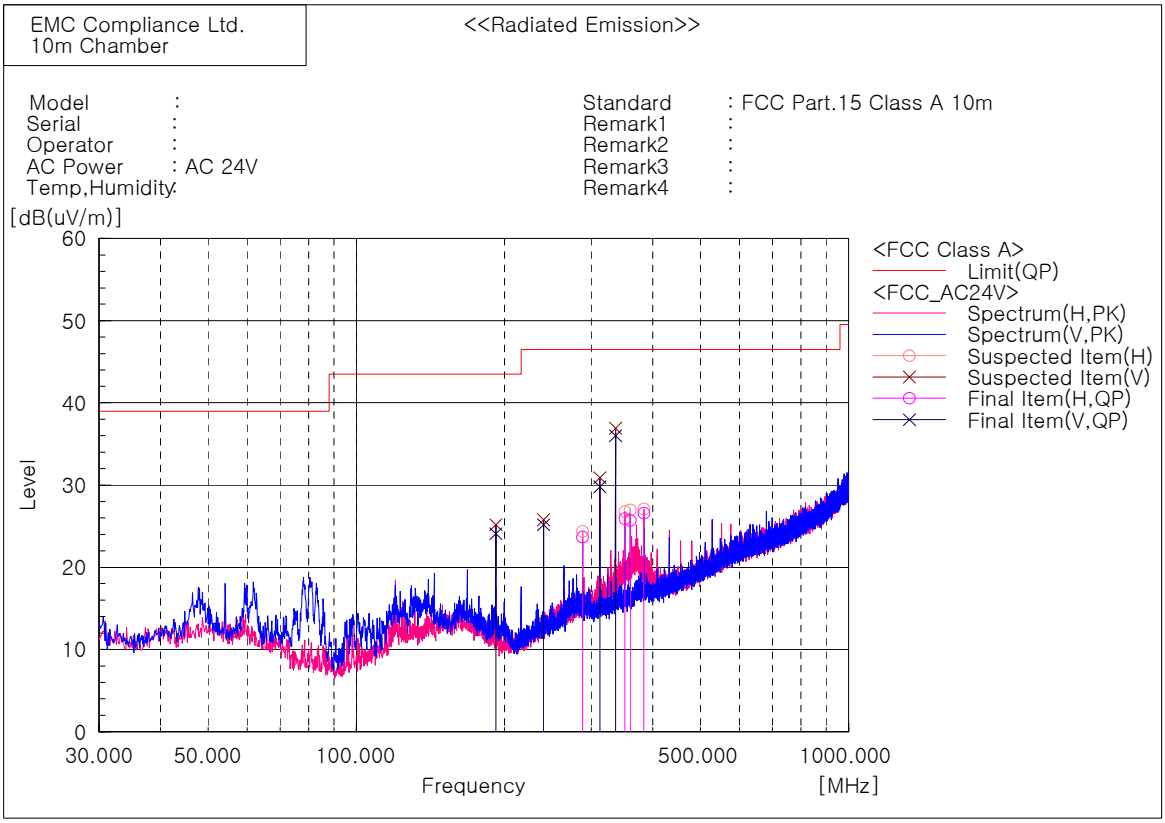




6.1.6 Radiated emission measurement result

*** Graph and Data**

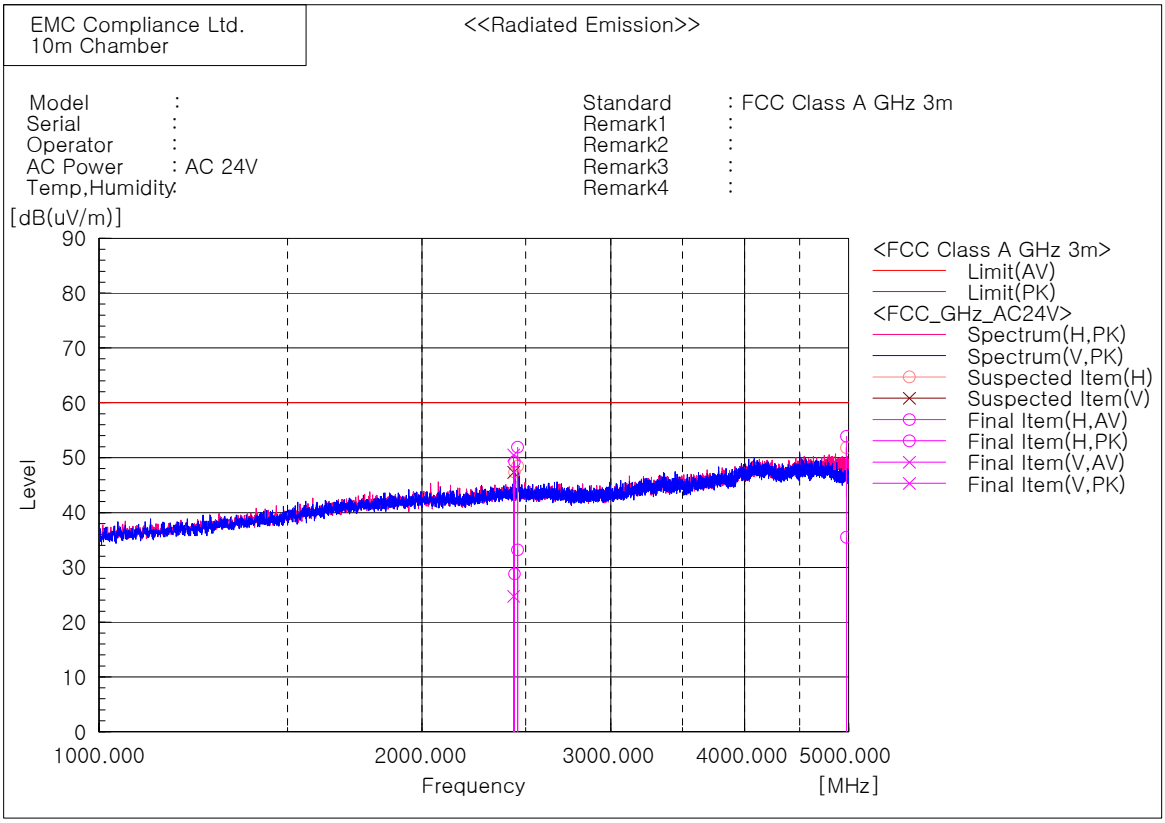
* 30 ㎒ ~ 1 ㎓



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	191.990	V	39.0	-14.9	24.1	43.5	19.4	100.0	212.1
2	240.005	V	38.4	-13.2	25.2	46.5	21.3	100.0	313.8
3	288.020	H	34.7	-11.0	23.7	46.5	22.8	302.0	265.1
4	312.028	V	40.2	-10.4	29.8	46.5	16.7	100.0	200.6
5	335.914	V	45.8	-9.8	36.0	46.5	10.5	100.0	248.0
6	350.949	H	35.4	-9.5	25.9	46.5	20.6	302.0	315.3
7	360.043	H	34.9	-9.2	25.7	46.5	20.8	302.0	148.1
8	383.929	H	35.0	-8.4	26.6	46.5	19.9	400.0	157.3

* 1 ㎓ ~ 5 ㎓



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	2435.000	V	26.6	52.4	-1.9	24.7	50.5	60.0	80.0	35.3	29.5	201.0	24.0
2	2440.500	H	30.7	51.2	-1.9	28.8	49.3	60.0	80.0	31.2	30.7	100.0	24.5
3	2456.000	H	35.1	53.8	-1.9	33.2	51.9	60.0	80.0	26.8	28.1	201.0	72.6
4	4976.000	H	29.7	48.1	5.8	35.5	53.9	60.0	80.0	24.5	26.1	100.0	328.0

7. E.U.T. photographs

Front View

Rear View

Left View

Right View

Top View

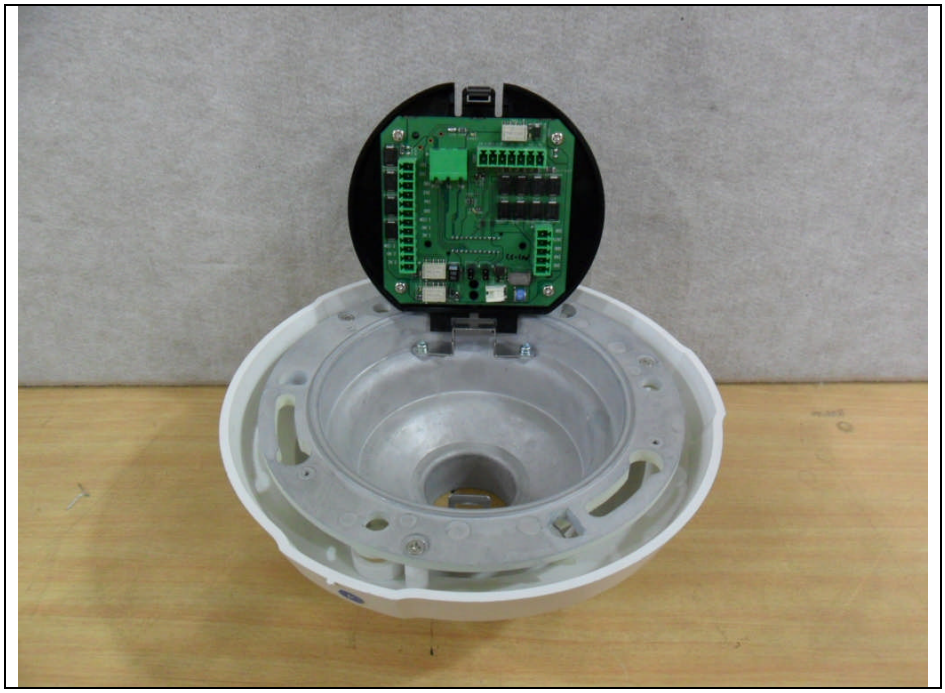
Bottom View

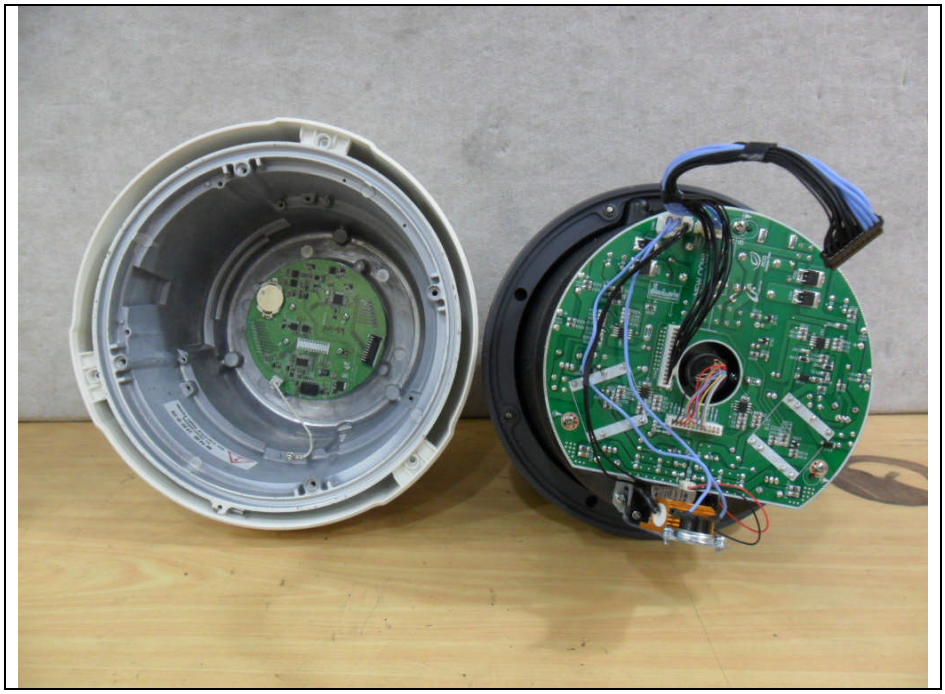
Label

FCC Label Location

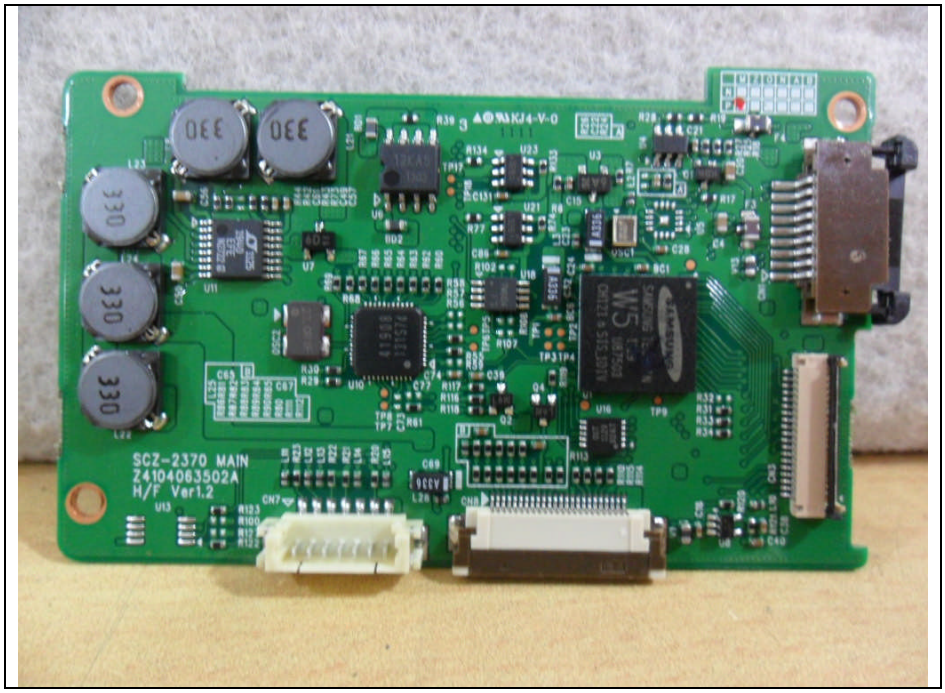
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

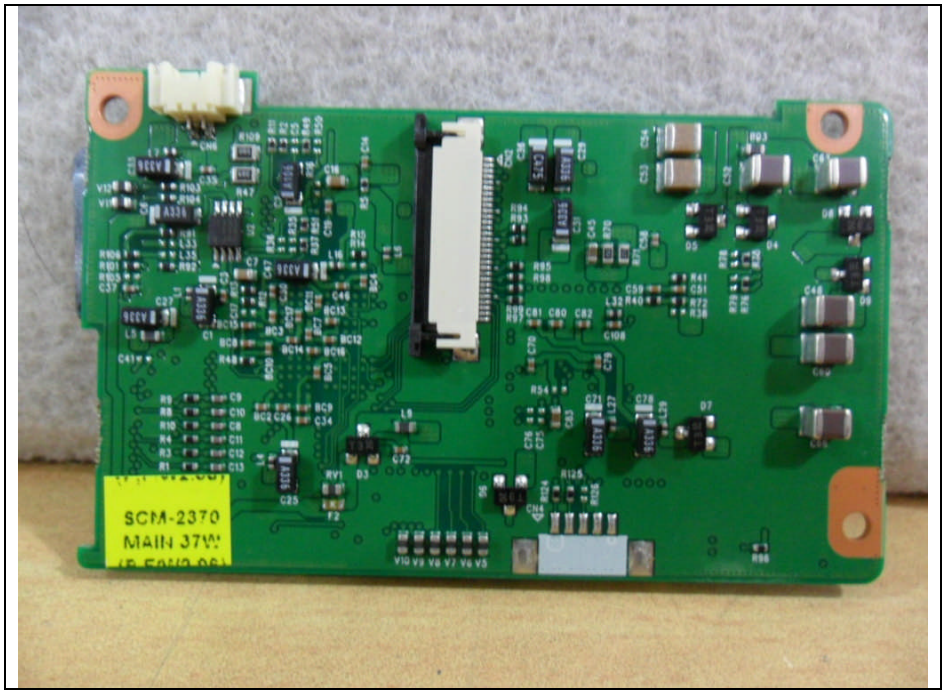
Inside



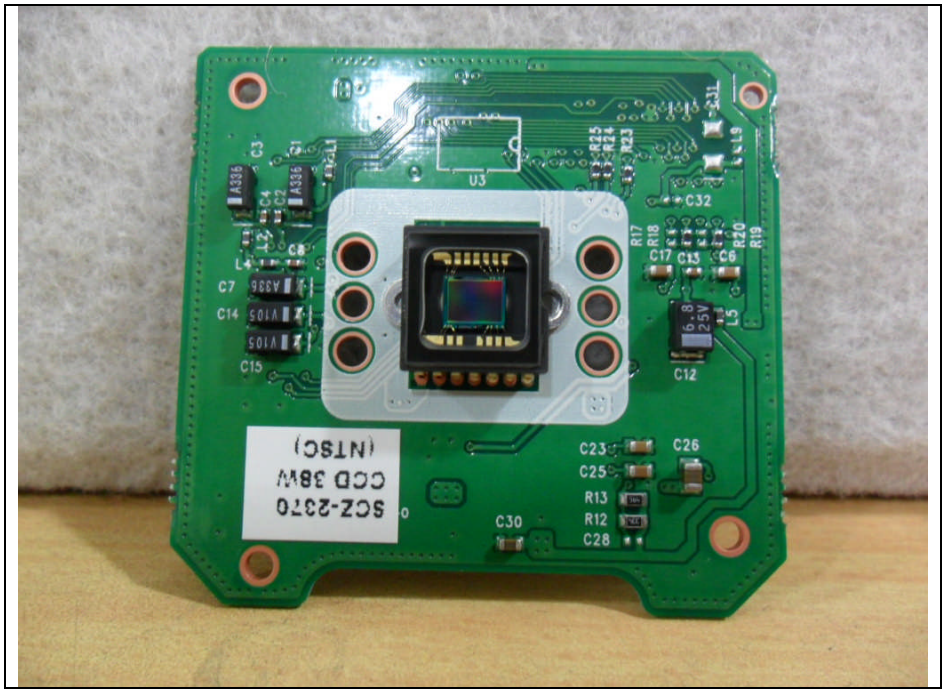


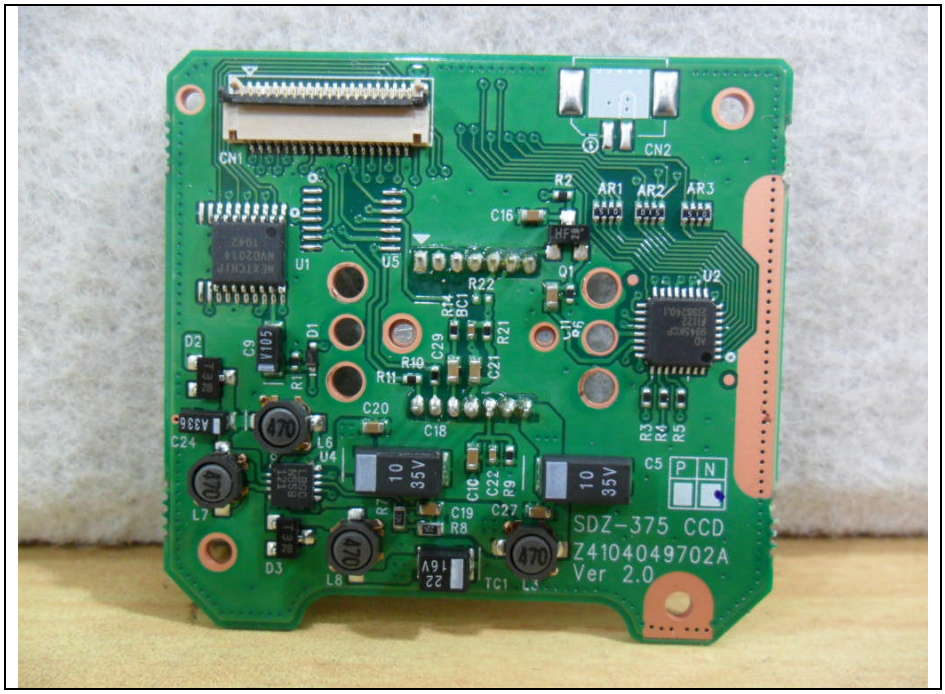
Main Board



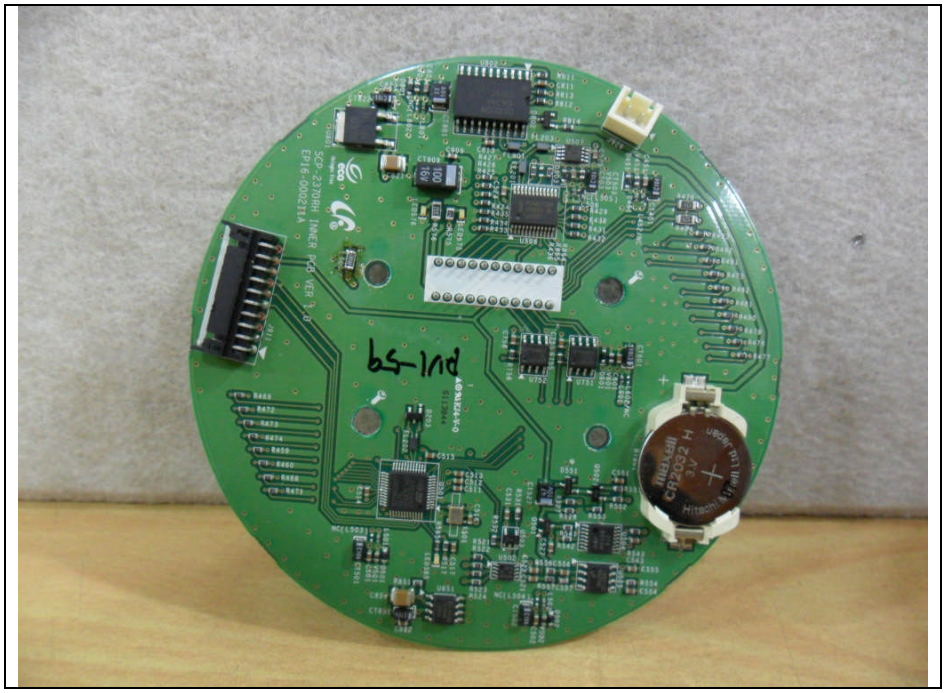


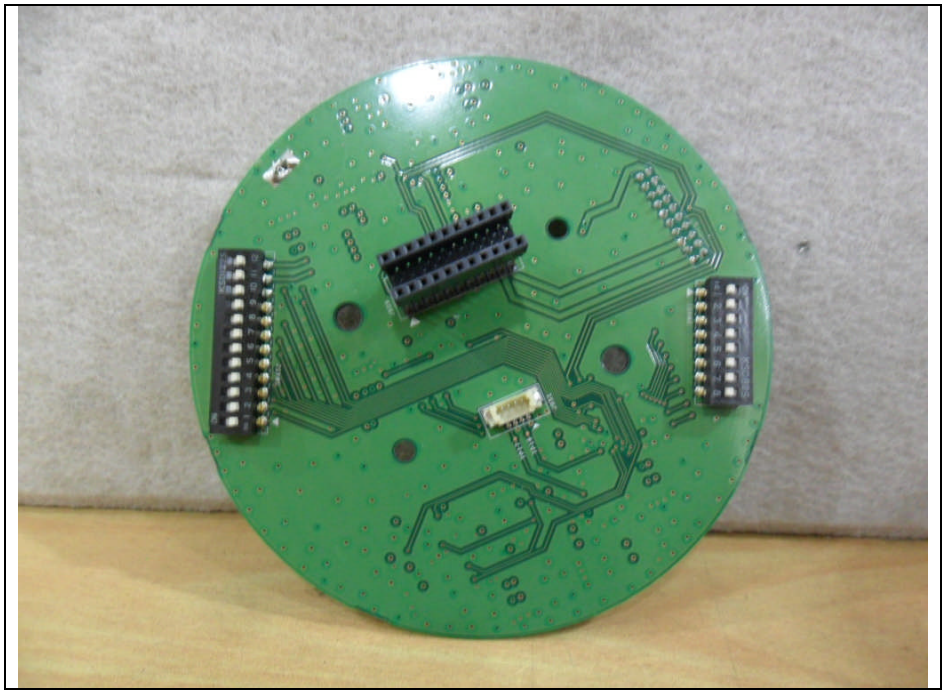
CCD Board



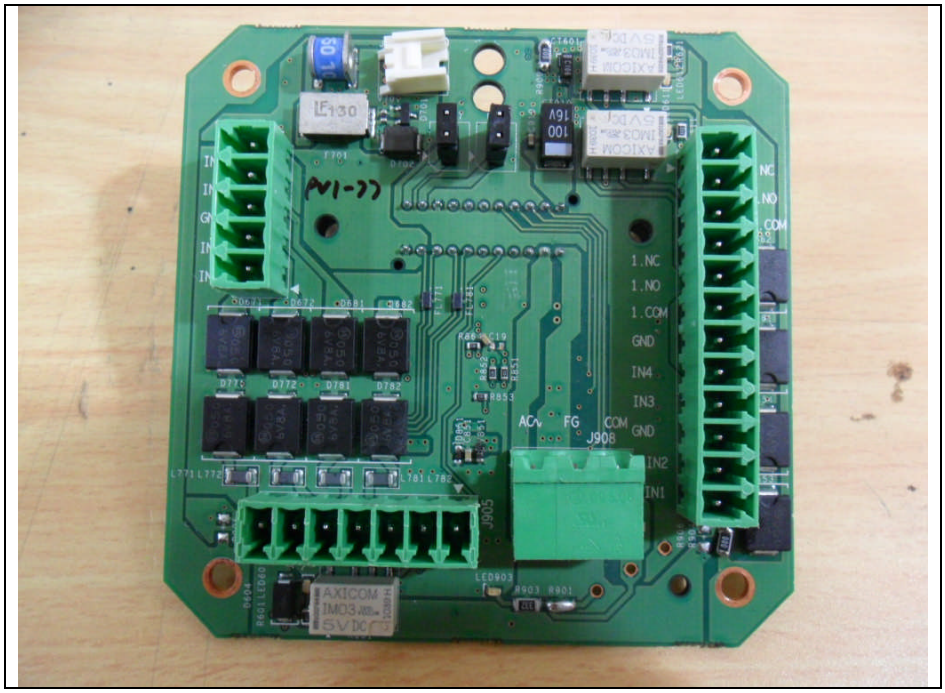


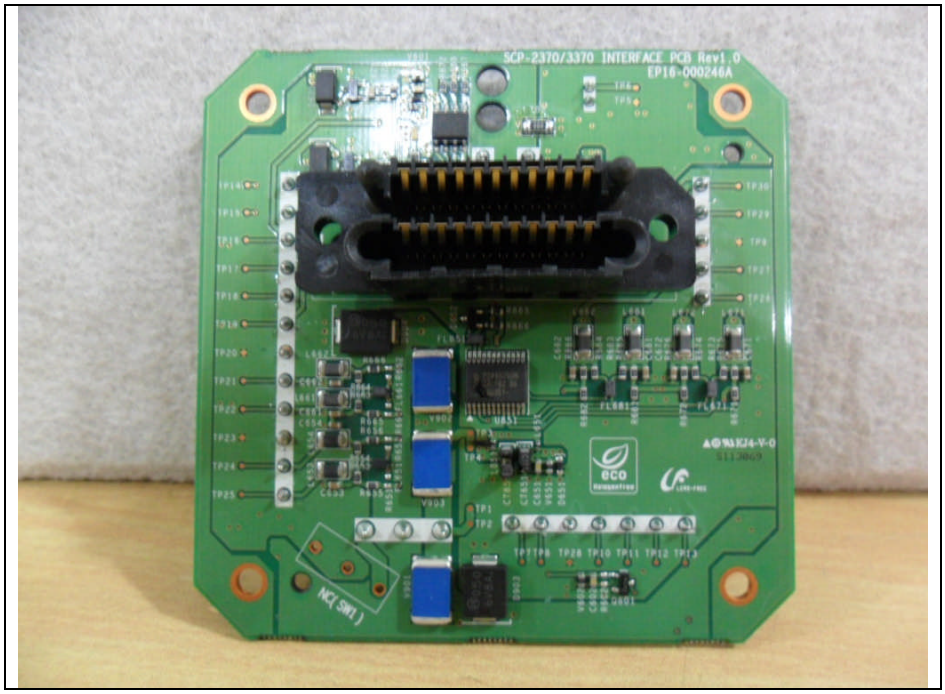
Inner Board



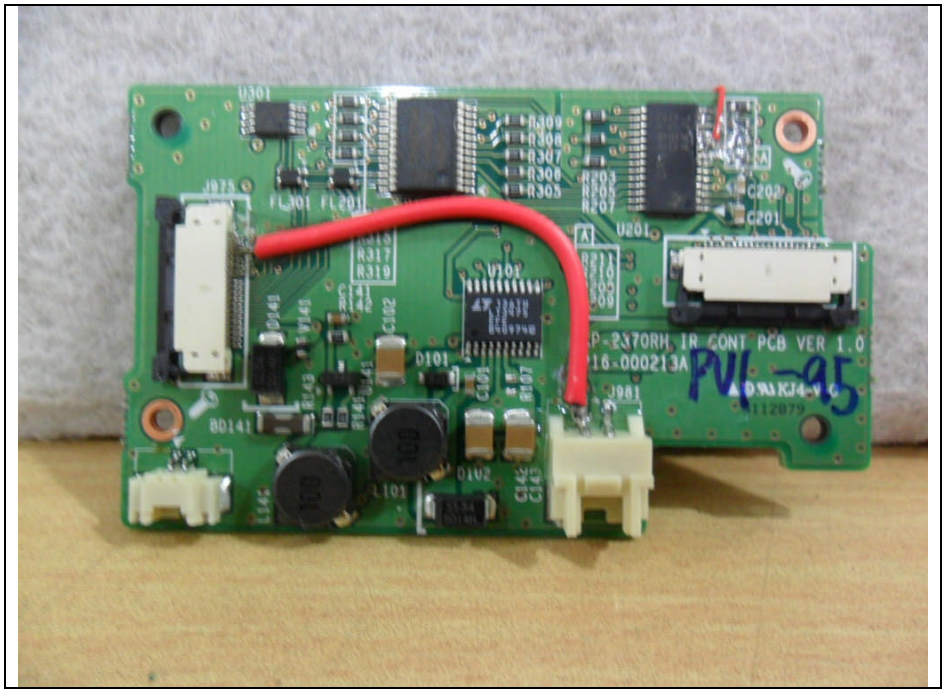


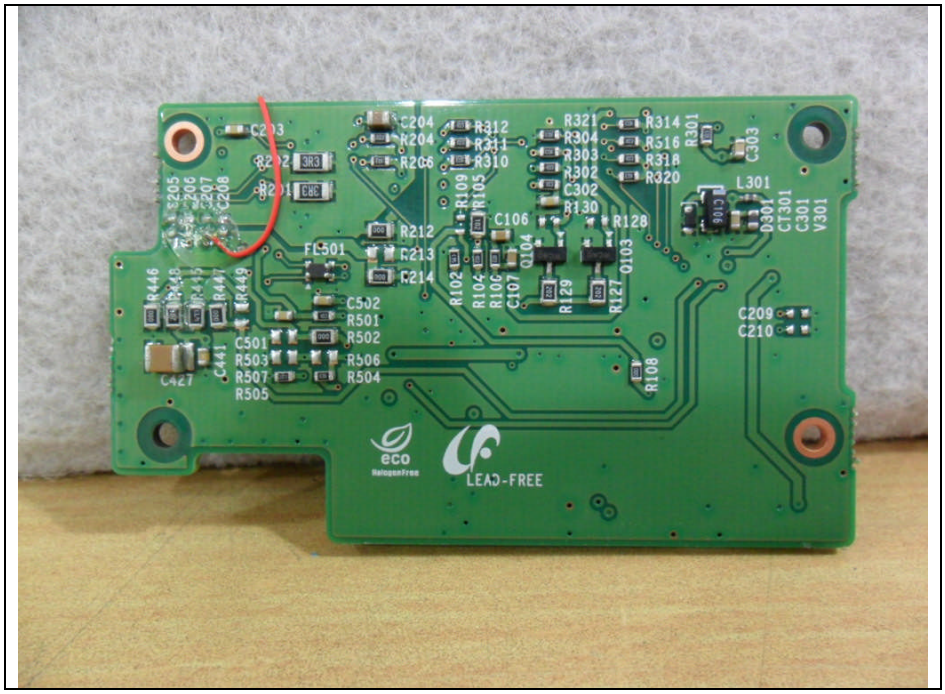
Interface Board



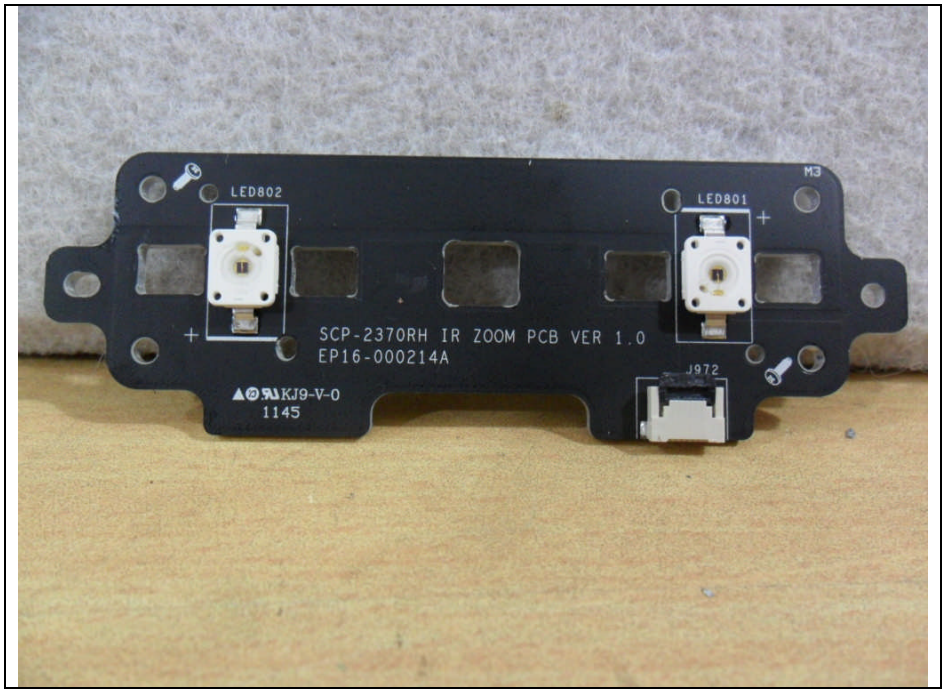


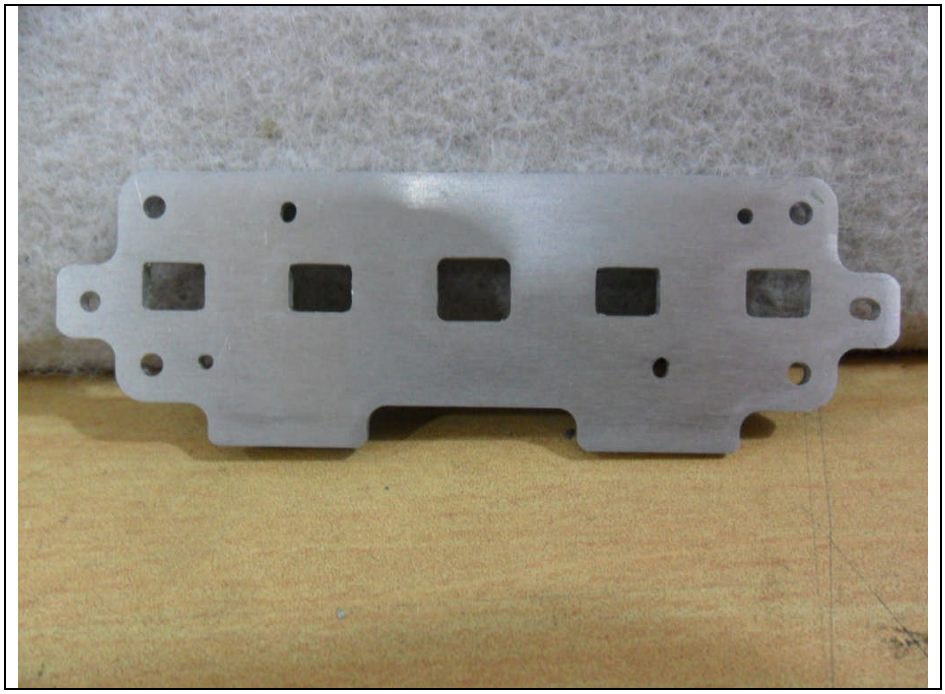
IR Cont Board



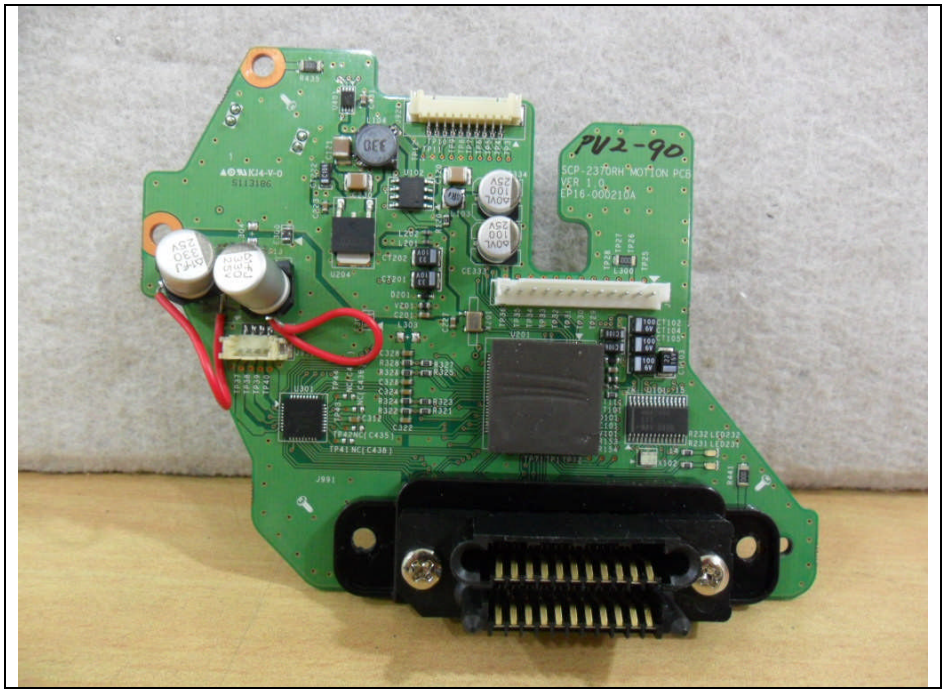


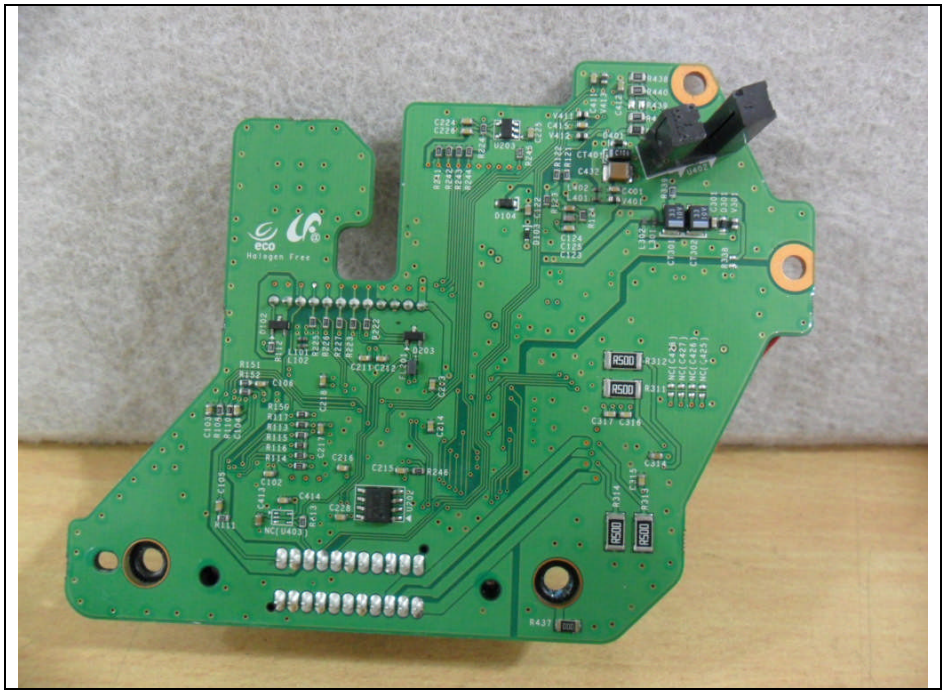
LED Board



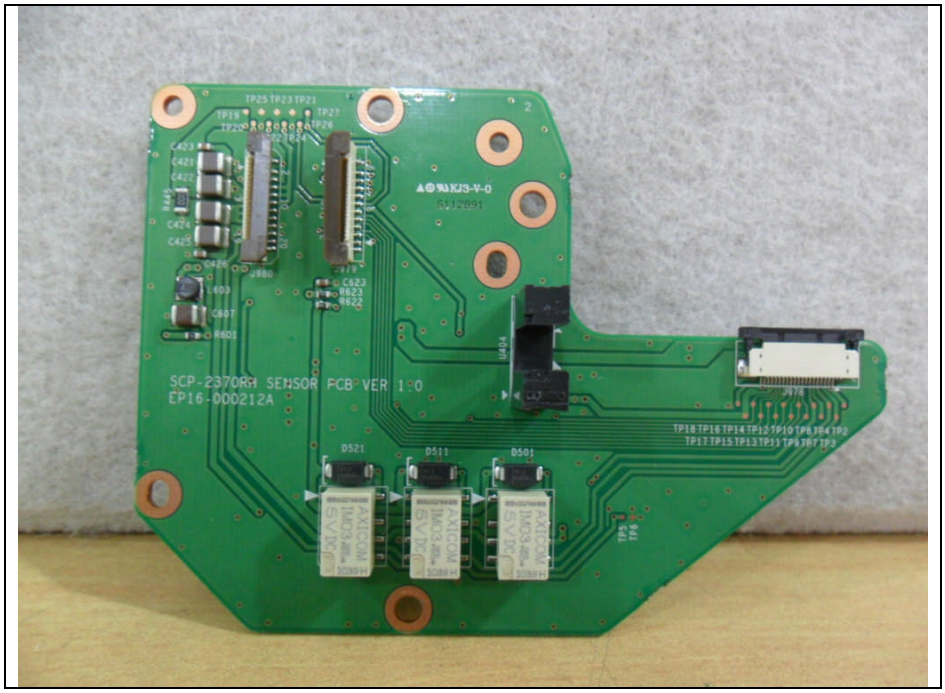


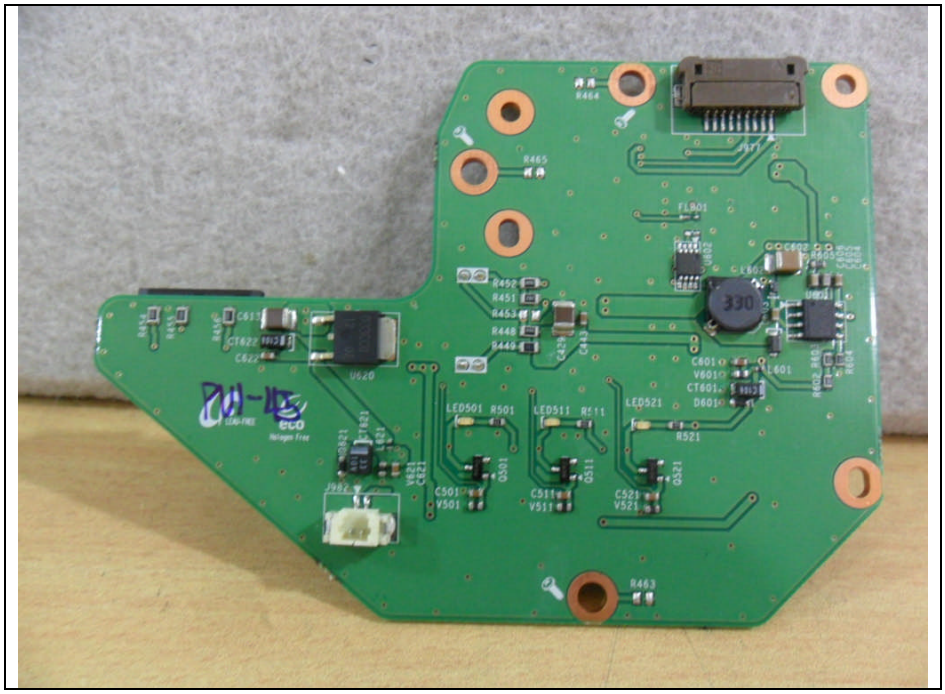
Motion Board



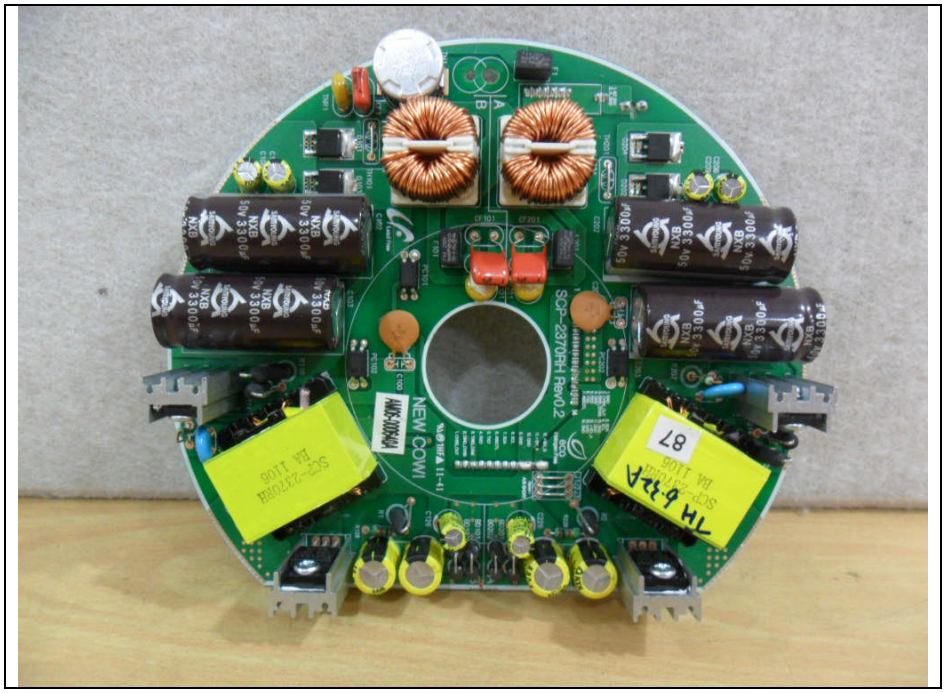


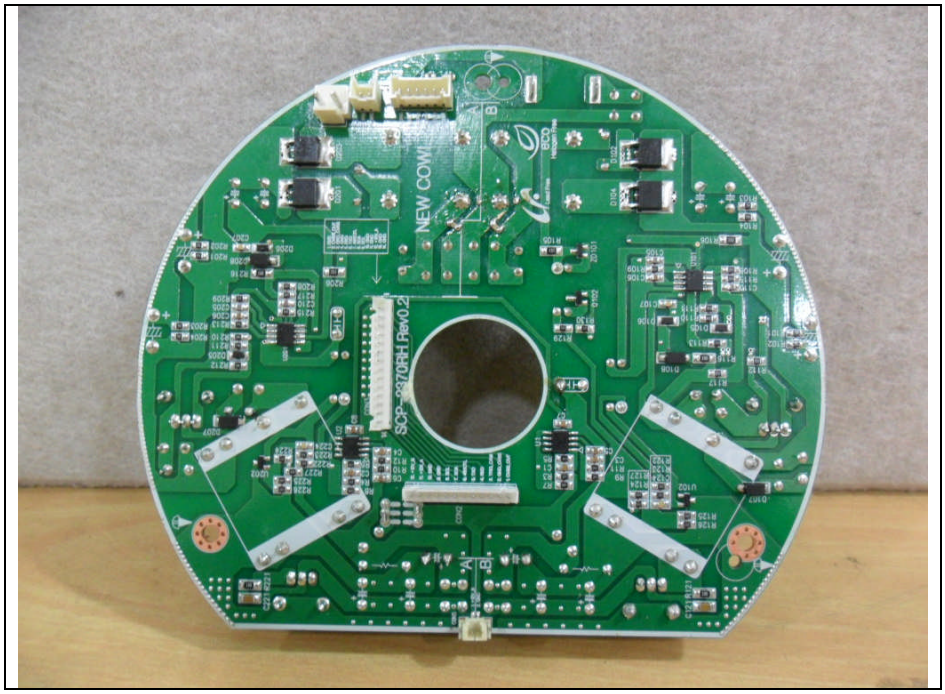
Sensor Board





Power





SUB Board