



Declaration of Conformity



Type of equipment: CCTV CAMERA
Brand Name /Trade Mark: SAMSUNG
Type designation /model: SCP-2370RH
Applicant: SAMSUNG TECHWIN CO., LTD.

In accordance with the following Directives:

2004/108/EC The Electromagnetic Compatibility Directive

Including amendments by the CE Marking Directive 93/68/EEC

The following harmonized European standards or technical specifications have been applied:

EN 55022:2006+A1:2007	Limits and methods of measurement of radio disturbance characteristics of information technology equipment
EN 50130-4:1995 +A1:1998 +A2:2003	Product family standard: Immunity requirements for components of fire, intruder and social alarm systems
EN 61000-4-2:2009	Electrostatic discharge immunity test
EN 61000-4-3:2006	Radiated, radio-frequency, electromagnetic field immunity test
EN 61000-4-4:2004	Electrical fast transient/burst immunity test
EN 61000-4-5:2006	Surge immunity test
EN 61000-4-6:2007	Immunity to conducted disturbances, induced by radio-frequency fields

The CE Marking on the products and/or their packaging signifies that SAMSUNG TECHWIN CO., LTD. holds the reference technical file available to the European Union authorities.

Place and date of issue: #42 Seongju-Dong, Changwon-Shi, Kyungsangnam-Do, Korea
/ January 27, 2012

Authorized Signatory: Name : Jei Soon, Kang
Title : Principal Research Engineer
Signature :

EMC TEST REPORT

Test report No: EMC-CE-2919
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: EN 55022:2006+A1:2007, Class A
EN 50130-4:1995+A1:1998+A2:2003
Testing Laboratory: EMC Compliance Ltd.
Test result: Complied

This product complies with the requirements of the EMC Directive 2004/108/ EC.

The results in this report apply only to the sample tested.

This test report shall not be reproduced, except in full, without the written approval of EMC compliance Laboratory.

Date of receipt: 2012. 01. 09

Date of testing: 2012. 01. 19 ~ 01. 26

Issued date: 2012. 01. 27

Tested by:

JUNG, YOUNG-JUN

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	6
4. Description of E.U.T.	7
4.1 General information	7
4.3 Auxiliary equipments	9
4.4 Test configuration	10
4.5 Operating conditions.....	10
5. Summary of test results	11
5.1 Modification to the E.U.T.	11
5.2 Summary of EMI emission test results	11
5.3 Summary of immunity test results	11
5.4 Performance criteria.....	12
6. Test results	14
6.1 Radiated Emission	14
6.2 Electrostatic Discharge	20
6.3 Radio Frequency Electromagnetic Fields	24
6.4 Electric Fast Transient/BURST.....	27
6.5 Surge	30
6.6 Conducted Immunity	33
7. E.U.T. photographs.....	36

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

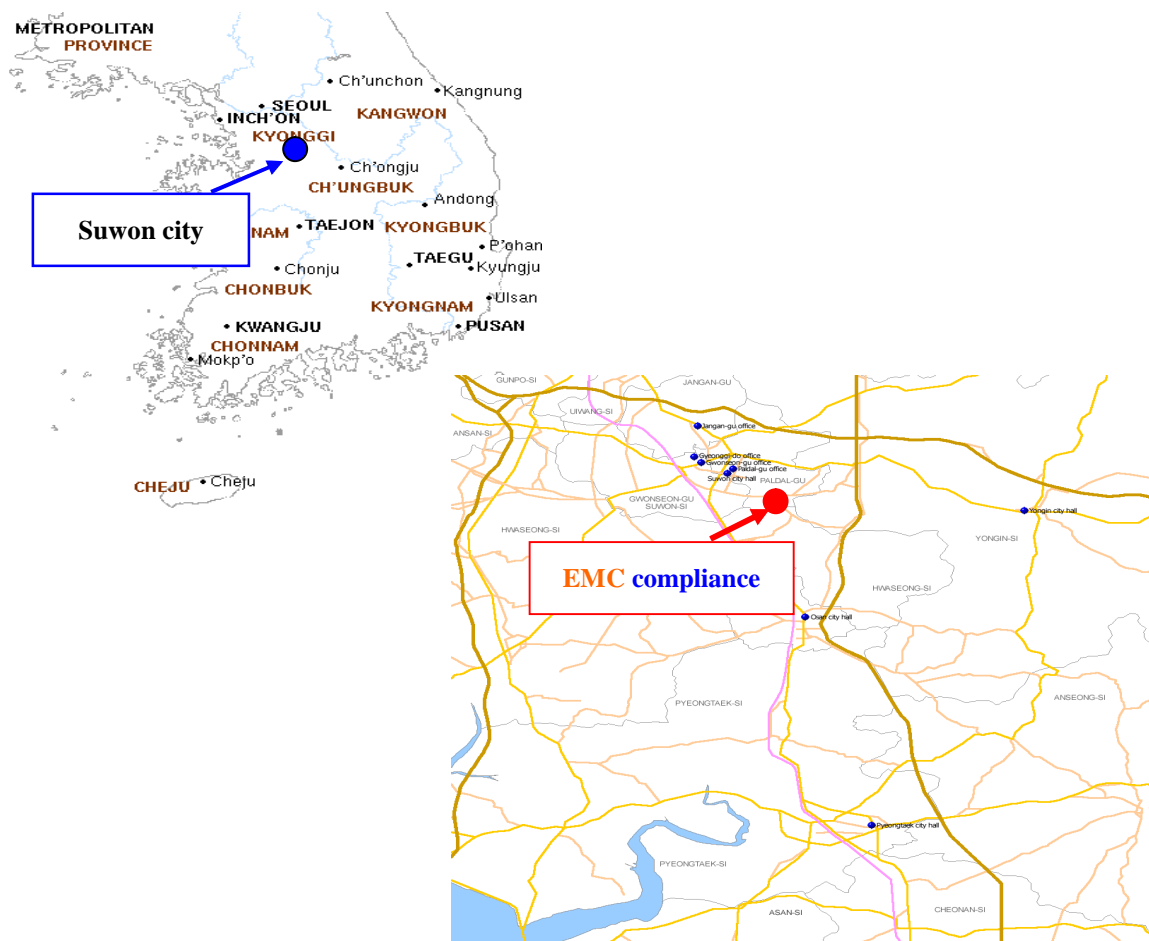
FCC CAB.: KR0040

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.	-
Shielded room(ESD)	: 21 °C	43 % R.H.	101.6 kPa

Test site

These testing items were performed following locations;

Test item	Test site
Conducted Emission	Shielded Room
Radiated Emission	10 m Chamber
Harmonics current	Immunity area
Voltage fluctuations and flickers	Immunity area
Electrostatic discharge	Shielded Room
Radiated RF immunity	Fully anechoic chamber (3 m)
Electric Fast Transient/BURST	Shielded Room
Surge	Shielded Room
Conducted RF immunity	Shielded Room
Voltage dip/interruption	Shielded Room
Mains supply voltage variations	Shielded Room

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 kHz ~ 150 kHz: ± 3.77 [dB] 150 kHz ~ 30 MHz: ± 3.35 [dB]	
Shielded Room (CE#2)	9 kHz ~ 150 kHz: ± 3.95 [dB] 150 kHz ~ 30 MHz: ± 3.55 [dB]	
Shielded Room (CE#3)	9 kHz ~ 150 kHz: ± 3.88 [dB] 150 kHz ~ 30 MHz: ± 3.50 [dB]	
Radiated Emission measurement : ($k = 2$, 95 %)		
10 m Chamber (#F4)	30 MHz ~ 300 MHz	3 m: + 4.29 [dB], - 4.31 [dB] 10 m: + 4.28 [dB], - 4.30 [dB]
	300 MHz ~ 1 000 MHz	3 m: + 4.57 [dB], - 4.57 [dB] 10 m: + 4.42 [dB], - 4.44 [dB]
	1 GHz ~ 6 GHz	3 m: + 5.94 [dB], - 5.95 [dB]
10 m Chamber (#F2)	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]
	1 GHz ~ 6 GHz	3 m: + 5.94 [dB], - 5.95 [dB]
Radio Frequency Electromagnetic Fields : ($k = 2$, 95 %)		
± 1.82 [dB]		
Disturbance power Electromagnetic Fields: ($k = 2$, 95 %)		
± 3.73 [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

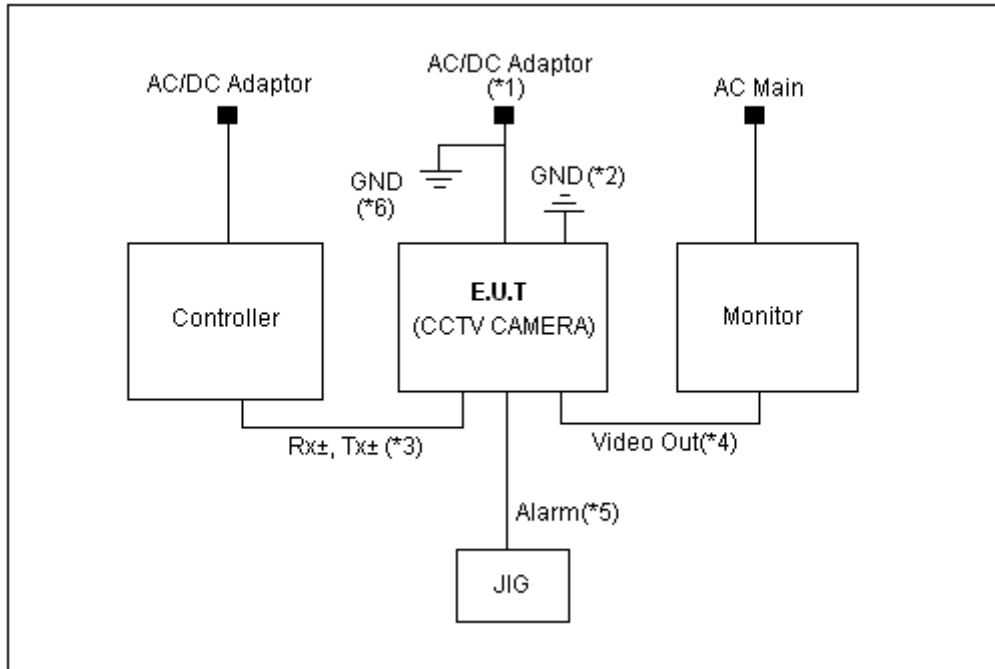
4.2 Product description

Type of product	CCTV CAMERA
Model name (Basic)	SCP-2370RH
Model name (Variant)	N/A
Difference	-
Trade name	-
Serial no	Engineering Sample
Testing voltage	AC 24 V
Product rating	AC 24 V
Internal clock frequency	27 MHz
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
JIG	-	-	-
AC/AC Adaptor	DRL-246000AC	-	Dream Electronics

4.4 Test configuration



Note	Start		End		Cable		
	Name	I/O port	Name	I/O port	Length (m)	Spec.	Cable
1	EUT (CCTV CAMERA)	Power	AC/AC Adaptor	Power	1.6	Non-Shield	-
2		GND	GND	GND	1.2	Non-Shield	-
3		Rx±, Tx±	Controller	Rx±, Tx±	3.0	Non-Shield	Out-door
4		Video Out	Monitor	Video In	3.0	Shield	Out-door
5		Alarm	JIG	Alarm	3.0	Non-Shield	Out-door
6	AC/AC Adaptor	GND	GND	GND	2.0	Non-Shield	

4.5 Operating conditions

The EUT was configured as normal intended use.

Test mode	Normal operating
1	Camera monitoring test mode
	Camera control test mode

5. Summary of test results

5.1 Modification to the E.U.T.

None

5.2 Summary of EMI emission test results

Applied	Test items	Test method	Result
<input checked="" type="checkbox"/>	Conducted Emission	EN 55022:2006+A1:2007	Complied
<input checked="" type="checkbox"/>	Radiated Emission	EN 55022:2006+A1:2007	Complied
<input type="checkbox"/>	Harmonics current	EN 61000-3-2:2006+A2:2009	N/A
<input type="checkbox"/>	Voltage fluctuations and flickers	EN 61000-3-3:2008	N/A

5.3 Summary of immunity test results

Applied	Test items	Test method	Result
<input checked="" type="checkbox"/>	Electrostatic discharge	EN 61000-4-2:2009	Complied
<input checked="" type="checkbox"/>	Radiated RF immunity	EN 61000-4-3:2006	Complied
<input checked="" type="checkbox"/>	Electric Fast Transient/BURST	EN 61000-4-4:2004	Complied
<input checked="" type="checkbox"/>	Surge	EN 61000-4-5:2006	Complied
<input checked="" type="checkbox"/>	Conducted RF immunity	EN 61000-4-6:2007	Complied
<input type="checkbox"/>	Voltage dip/interruption	EN 61000-4-11:2004	N/A
<input type="checkbox"/>	Mains supply voltage variations	EN 50130-4:1995+A1:1998+A2:2003	N/A

5.4 Performance criteria

The variety and the diversity of the apparatus within the scope of this document makes it difficult to define precise criteria for the evaluation of the immunity test results.

If as a result of the application of the tests defined in this standard, the apparatus becomes dangerous or unsafe then the apparatus shall be deemed to have failed the test.

A functional description and a definition of performance by the manufacture and noted in the test report, based on the following criteria:

Electrostatic discharge

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing which could be interpreted by associated equipment as a change,

Radiated electromagnetic fields

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing which could be interpreted by associated equipment as a change, and no such

Flickering of indicators occurs at a field strength of 3 V/m . For components of CCTV systems, where the picture is allowed at 10 V/m , providing.

- (a) there is no permanent damage or change to EUT
(e.g. no corruption of memory or changes to programmable setting etc.)
- (b) at 3 V/m , any deterioration of the picture is so minor that the system could still be used; and
- (c) there is no observable deterioration of the picture at 1 V/m .

Fast transient burst / slow high energy voltage surge

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing

That there is no residual is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as

Conducted RF immunity

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge is permissible, providing

That there is no residual is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change, and no such flickering of indicators oeuvres at $U = 130 \text{ dB}\mu\text{V}$.

For component of CCTV systems, where the status is monitored by observing the TV picture, then deterioration of the picture is allowed at $U = 140 \text{ dB}\mu\text{V}$, providing:

- (a) there is no permanent damage or change to the EUT
(e.g. no corruption of memory or changes to programmable settings etc.)
- (b) at $U = 130 \text{ dB}\mu\text{V}$, any deterioration of the picture is so minor that the system could still be used; and
- (c) there in no observable deterioration of the picture at $U = 120 \text{ dB}\mu\text{V}$.

Voltage dip/interruption / Voltage variation

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change. The EUT shall meet the acceptance criteria for the functional test, after the conditioning.

6. Test results

6.1 Radiated Emission

Test specification	EN 55022:2006+A1:2007, Class A		
Testing voltage	AC 24 V		
Test facility	10 m Chamber (#F4, #F2)		
Test distance	10 m, 3 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

Limits below 1 GHz

Frequency [MHz]	Class A (dB(μ V/m)) @ 10 m	Class B (dB(μ V/m)) @ 10 m
30 ~ 230	40	30
230 ~ 1 000	47	37

Limits above 1 GHz

Frequency [GHz]	Class A @ 3 m		Class B @ 3 m	
	Average limit (dB(μ V/m))	Peak limit (dB(μ V/m))	Average limit (dB(μ V/m))	Peak limit (dB(μ V/m))
1 ~ 3	56	76	50	70
3 ~ 6	60	80	54	74

Note - The lower limit applies at the transition frequency.

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 MHz ~ 1 GHz

Equipment	Model no.	Serial no.	Makers	Next Cal. Date	Used
Test Receiver	ESCI	100001	R&S	2012.07.11	<input checked="" type="checkbox"/>
Bi-Log Antenna	VULB 9168	375	SCHWARZBECK	2013.09.21	<input checked="" type="checkbox"/>
Amplifier	310N	284608	SONOMA INSTRUMENT	2012.07.11	<input checked="" type="checkbox"/>
3 dB Attenuator	8491A	16861	HP	2012.07.11	<input checked="" type="checkbox"/>
Antenna Mast	AM4.0	079/3440509	MATURO	-	<input checked="" type="checkbox"/>
Turn Table	CO2000-SOFT	-	MATURO	-	<input checked="" type="checkbox"/>

* 1 GHz ~ 6 GHz

Equipment	Model no.	Serial no.	Makers	Next Cal. Date	Used
Antenna Mast	MA4000-EP	303	Innco Systems	-	<input checked="" type="checkbox"/>
Turn Table	DT2000S-1t	079	Innco Systems	-	<input checked="" type="checkbox"/>
Horn ANT	3115	00086706	ETS	2012.09.16	<input checked="" type="checkbox"/>
Amplifier	8449B	3008A01802	AGILENT	2012.05.11	<input checked="" type="checkbox"/>
Spectrum Analyzer	FSP7	100289	R&S	2012.12.19	<input checked="" type="checkbox"/>

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

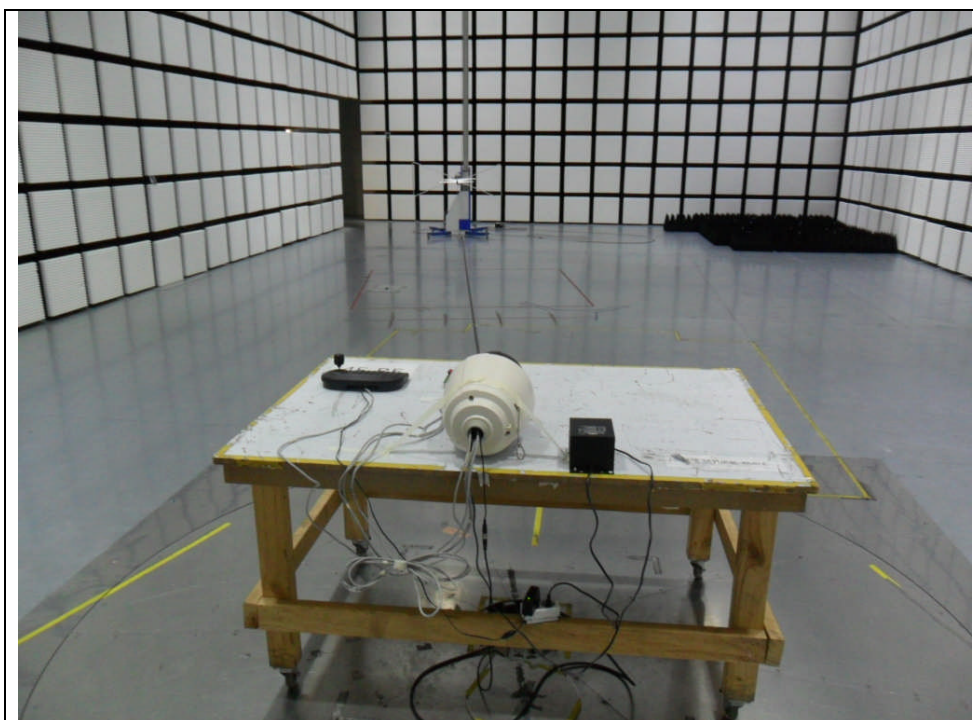
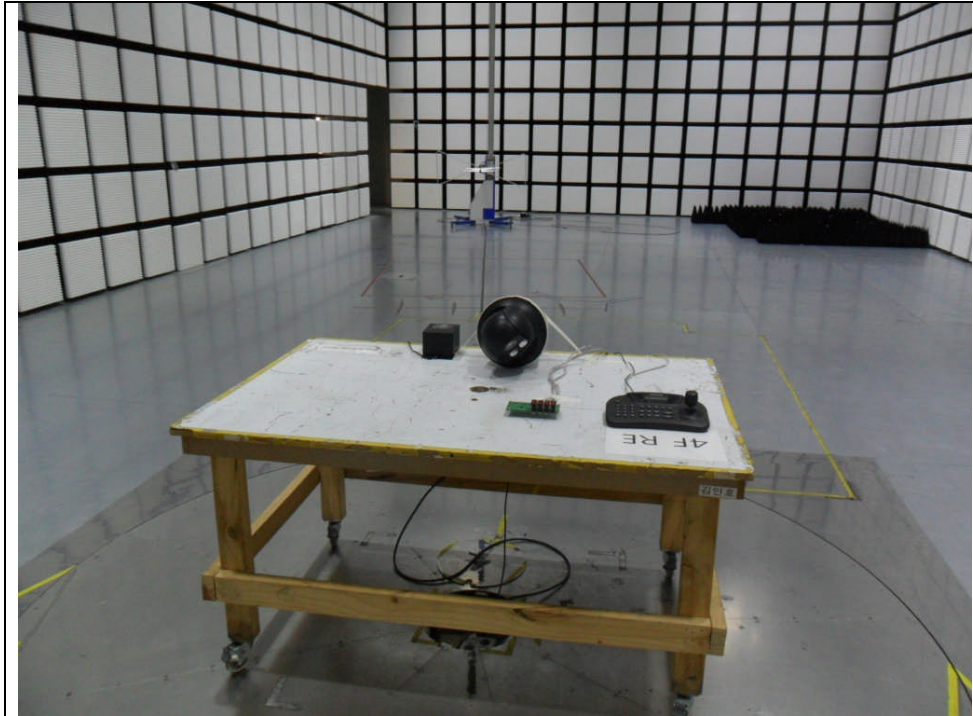
If M.R is 30 dB, A.F 12 dB, C.L 5 dB, 3 dB, A.G 35 dB

The result is

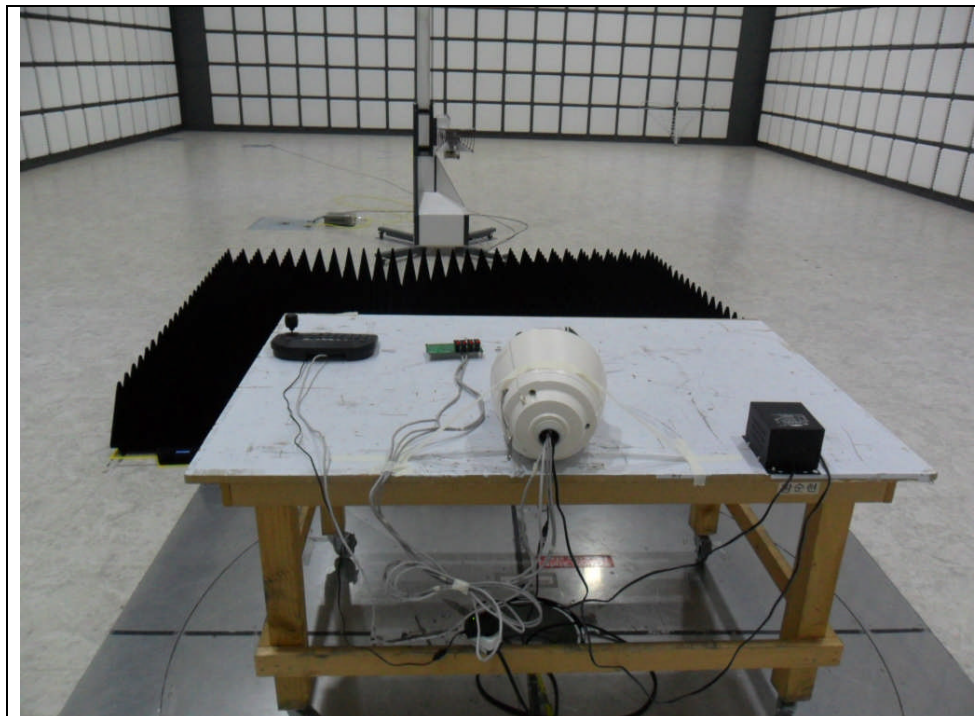
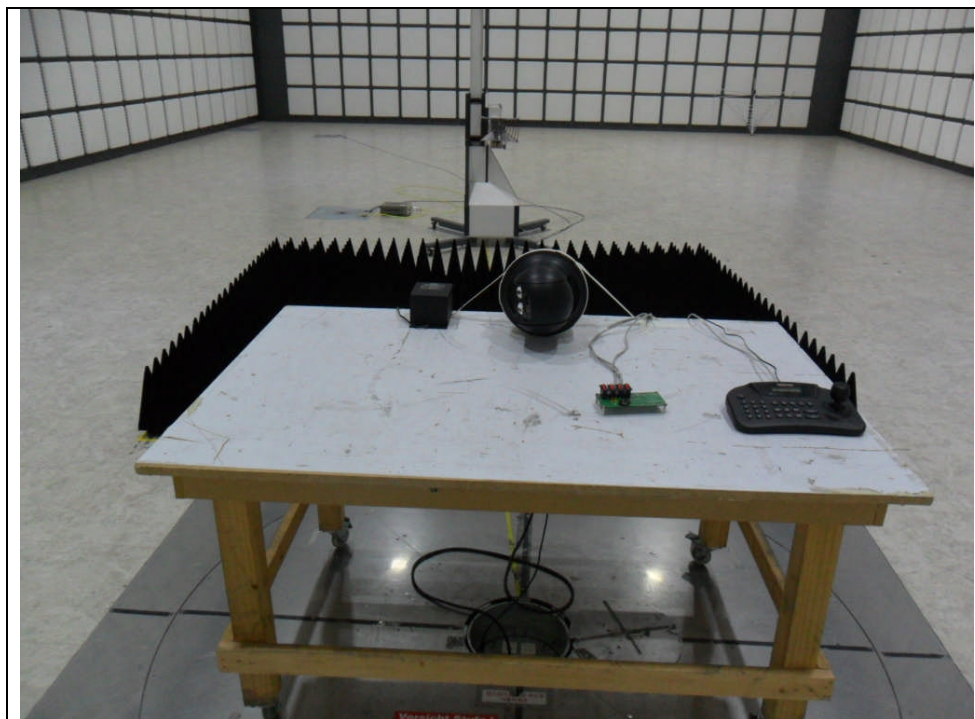
$$6 \quad 12 + 5 + 3 - 35 = 15 \text{ dB}(\mu\text{V/m})$$

6.1.5 Photographs of test setup

* 30 MHz ~ 1 GHz



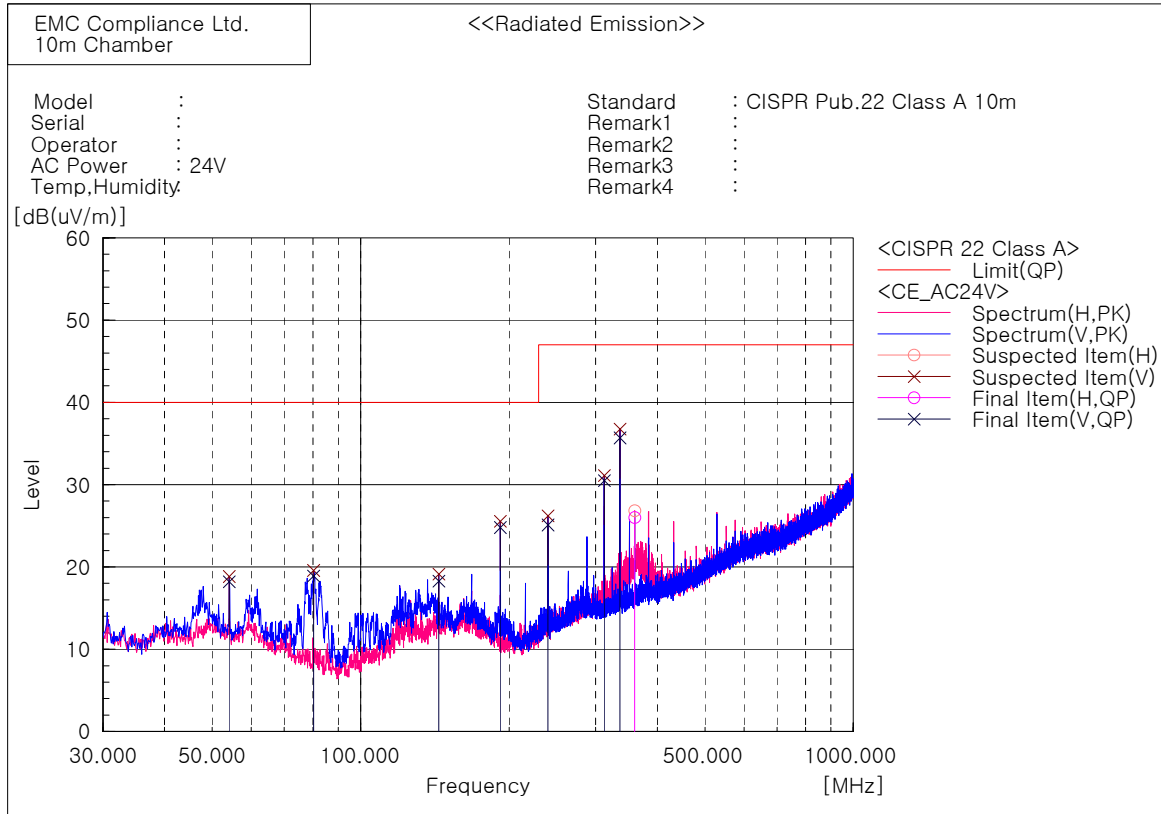
* 1 GHz ~ 6 GHz



6.1.6 Radiated emission measurement result

* Graph and Data

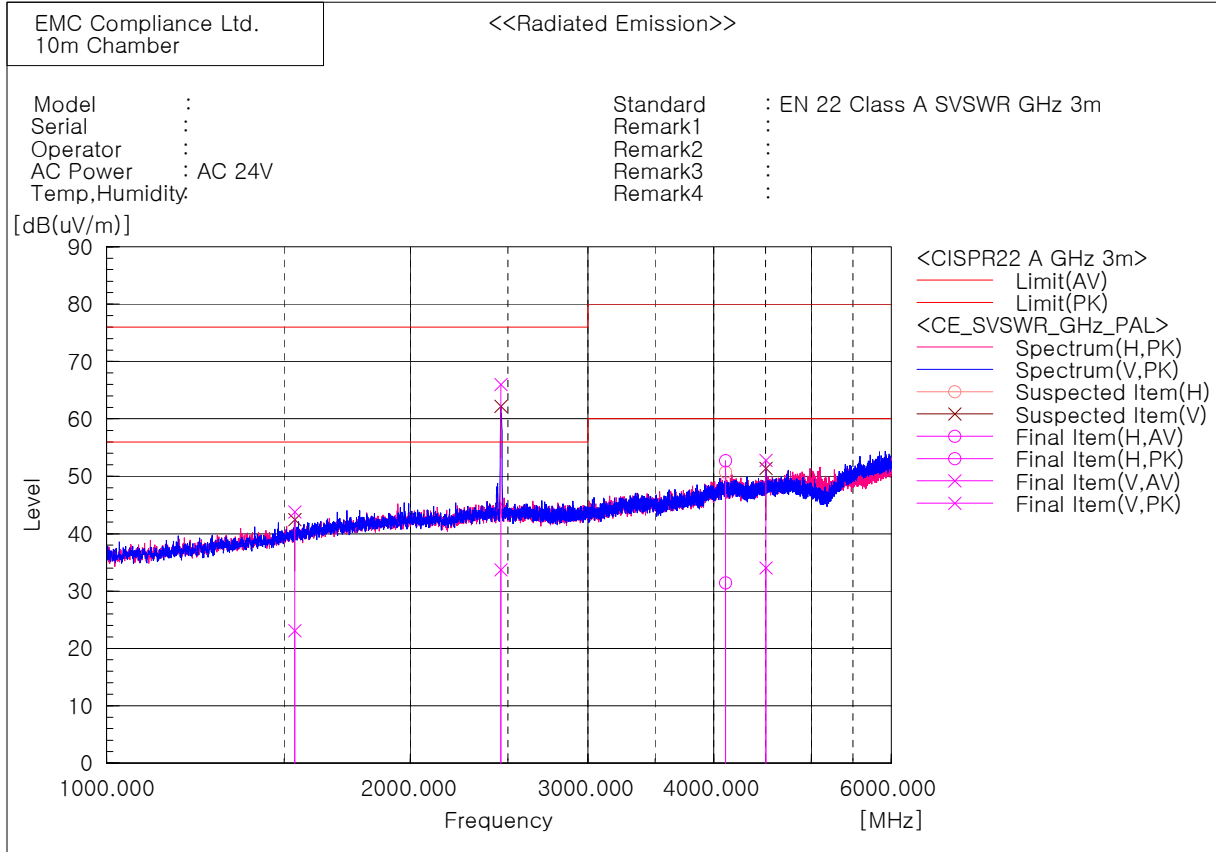
* 30 MHz ~ 1 GHz



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	54.129	V	31.9	-13.7	18.2	40.0	21.8	400.0	27.2
2	80.198	V	36.9	-18.0	18.9	40.0	21.1	100.0	6.3
3	143.975	V	31.2	-12.9	18.3	40.0	21.7	100.0	256.1
4	191.990	V	39.7	-14.9	24.8	40.0	15.2	100.0	325.7
5	240.005	V	38.3	-13.2	25.1	47.0	21.9	100.0	318.8
6	312.028	V	40.9	-10.4	30.5	47.0	16.5	100.0	300.5
7	336.035	V	45.5	-9.8	35.7	47.0	11.3	100.0	304.4
8	359.921	H	35.2	-9.2	26.0	47.0	21.0	400.0	141.2

* 1 GHz ~ 6 GHz



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	1536.250	V	29.5	50.2	-6.4	23.1	43.8	56.0	76.0	32.9	32.2	100.0	32.9
2	2460.625	V	35.6	67.9	-1.9	33.7	66.0	56.0	76.0	22.3	10.0	100.0	210.7
3	4109.375	H	27.5	46.8	3.9	31.4	52.7	60.0	80.0	28.6	27.3	100.0	98.1
4	4507.500	V	29.1	47.9	4.9	34.0	52.8	60.0	80.0	26.0	27.2	100.0	168.9

6.2 Electrostatic Discharge

Test specification	EN 61000-4-2:2009				
Test level	<input checked="" type="checkbox"/> Contact: ± 2 kV, ± 4 kV, ± 6 kV <input checked="" type="checkbox"/> Air: ± 2 kV, ± 4 kV, ± 8 kV <input type="checkbox"/> HCP: ± 2 kV, ± 4 kV, ± 6 kV <input checked="" type="checkbox"/> VCP: ± 2 kV, ± 4 kV, ± 6 kV				
Discharge impedance	330 Ω / 150 pF				
Number of discharge (Each polarity)	<input checked="" type="checkbox"/> Contact: 10 <input checked="" type="checkbox"/> Air: 10 <input checked="" type="checkbox"/> HCP / VCP: 10				
Interval between discharges	1 s				
Testing voltage	AC 24 V				
Test facility	Shielded room				
Date	2012. 01. 26				
Temperature(°C)	21 °C	Humidity (% R.H.)	43 % R.H.	Pressure (kPa)	102.6 kPa
Remarks	Complied - There was no change of operation status during above testing.				

6.2.1 Measurement procedure

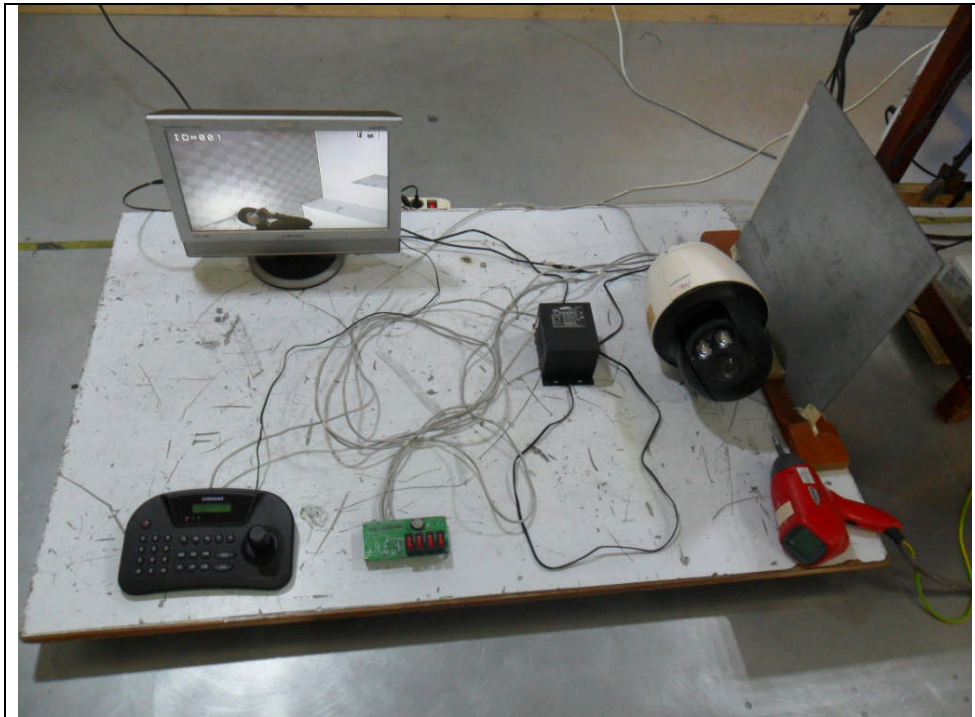
A ground reference plane was located on the floor, and connected to earth via a low Impedance connection. The return cable of the ESD generator was connected to the reference plane.

In case of floor standing equipment, EUT was placed on the reference plane on 0.1 m of insulating Support. In case of table top equipment, EUT was placed on a wooden table 0.8 m above the reference grounded floor. A horizontal coupling plane (HCP) was placed on the table, and Connected to the reference plane via a 470 k Ω resistor located in each end (0.5 mm insulating support between EUT and HCP). In both cases a vertical coupling plane(VCP) OF 0.5 X 0.5 m was located 0.1 m from the EUT's sides. The VCP was connected to the reference plane in the same matter as the HCP.

6.2.2 Used equipments

Equipment	Model No.	Serial No.	Makers	Next Cal. Date	Used
ESD Tester	NSG 437	182	TESEQ	2012.05.23	<input checked="" type="checkbox"/>
HCP	-	-	-	-	<input type="checkbox"/>
VCP	-	-	-	-	<input checked="" type="checkbox"/>

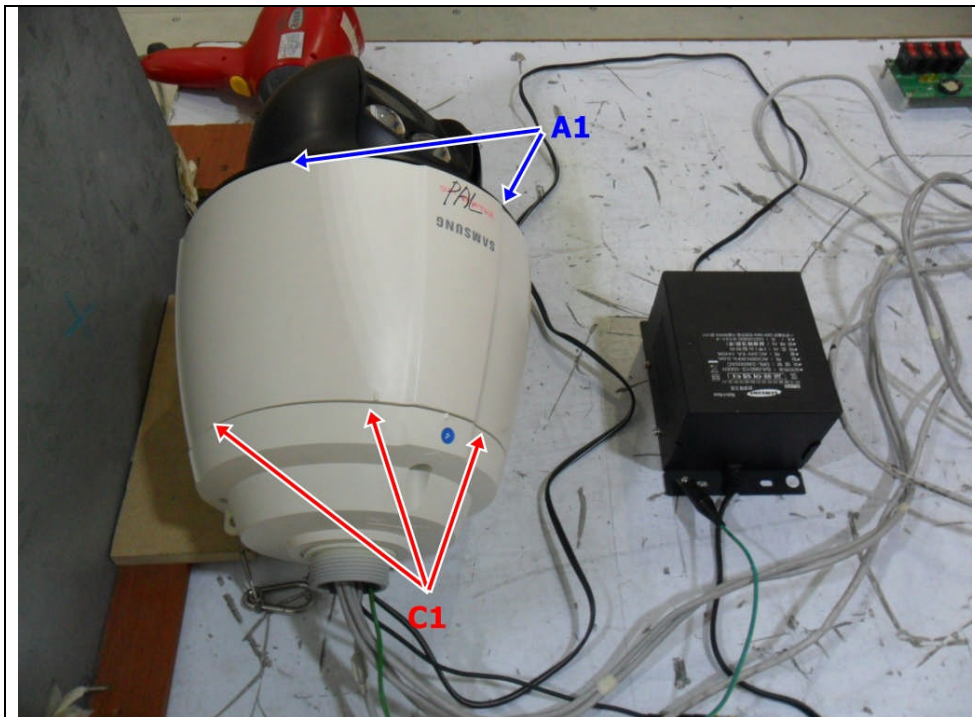
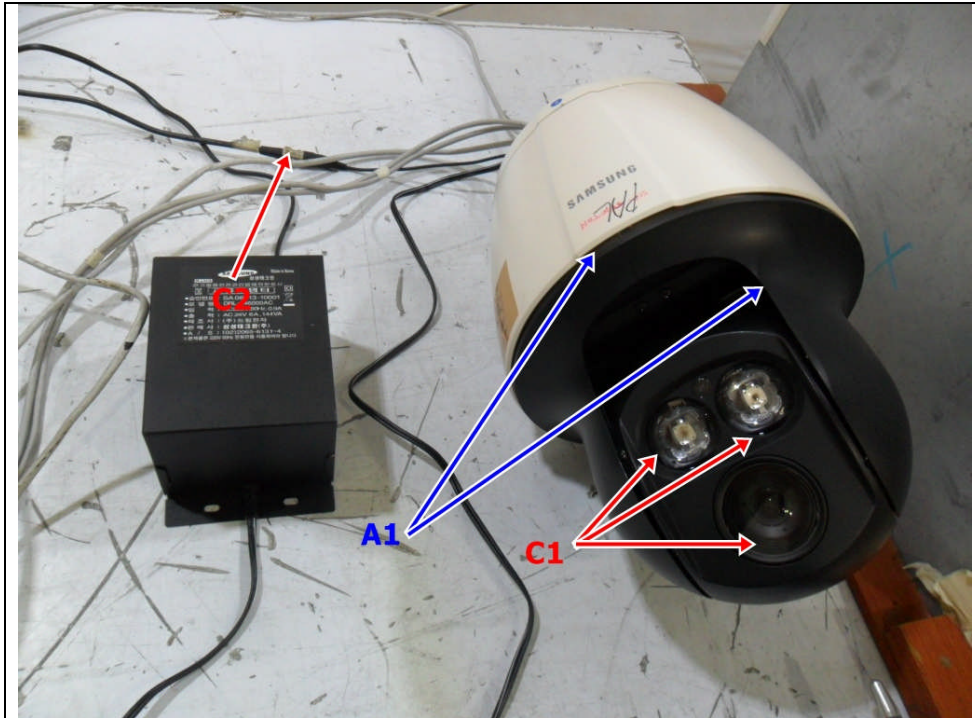
6.2.3 Photographs of test setup



6.2.4 Measurement result

Electrostatic Discharge (Test Point)

Air discharge	➡
Contact discharge	➡



HCP/VCP discharge

Location(EUT)		Applied level (±)	Result
HCP (All 4 sides)		-	-
VCP (All 4 sides)		± 2 kV, ± 4 kV, ± 6 kV	Complied

Contact discharge

Location(EUT)		Applied level (±)	Result
C1	Enclosure(Case)	± 2 kV, ± 4 kV, ± 6 kV	Complied
C2	Video Out Port	± 2 kV, ± 4 kV, ± 6 kV	Complied

Air discharge

Location(EUT)		Applied level (±)	Result
A1	Enclosure(Case)	± 2 kV, ± 4 kV, ± 8 kV	Complied

6.3 Radio Frequency Electromagnetic Fields

Test specification	EN 61000-4-3:2006				
Tested frequency	80 MHz ~ 1 GHz, 1 GHz ~ 2 GHz				
Test level & Modulation	1 V/m, 3 V/m, 10 V/m, 80 % Amplitude Modulation (1 kHz) 1 V/m, 3 V/m, 10 V/m, Pulse Modulation (1 Hz (0.5 s ON: 0.5 s OFF))				
Frequency Step	log 1 % step				
Dwell time	3 s				
Distance	3 m from EUT to tip of antenna				
Testing Voltage	AC 24 V				
Test facility	Fully anechoic chamber (3 m)				
Date	2012. 01. 20				
Temperature(°C)	13 °C	Humidity (% R.H.)	20 % R.H.	Pressure (kPa)	102.7 kPa
Remarks	Complied - There was no change of operation status during above testing.				

6.3.1 Measurement procedure

The test was performed at 3 m full anechoic chamber.

For floor standing equipment, the EUT was standing on the floor.

For tabletop equipment, the EUT was located on a wooden table 0.8 m above the floor.

The EUT was tested all sides, horizontal and vertical polarization.

6.3.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Power meter	PM2002	302852	AR	2012.04.11	<input checked="" type="checkbox"/>
Power sensor	PH2000	303224	AR	2012.04.11	<input checked="" type="checkbox"/>
Power sensor	PH2000	303222	AR	2012.04.11	<input checked="" type="checkbox"/>
Directional coupler	DC6180	303976	AR	2012.04.11	<input checked="" type="checkbox"/>
Directional coupler	DC7144M1	320279	AR	2012.02.23	<input checked="" type="checkbox"/>
Signal generator	E4421B	GB40052295	AGILENT	2012.10.12	<input checked="" type="checkbox"/>
Amplifier	150W1000M2	303843	AR	2012.04.11	<input checked="" type="checkbox"/>
Amplifier	60S1G3M2	320444	AR	2012.04.11	<input checked="" type="checkbox"/>
Broadband Ant.	LPDA-0803	130269	ETS	-	<input checked="" type="checkbox"/>
Field monitor	SI-300	-	TDK	-	<input checked="" type="checkbox"/>
Antenna master	-	-	ETS	-	<input checked="" type="checkbox"/>

6.3.3 Photographs of test setup



6.3.4 Measurement result

Location(EUT)	Antenna polarization	Result
Front side	Horizontal	Complied
	Vertical	Complied
Rear side	Horizontal	Complied
	Vertical	Complied
Left side	Horizontal	Complied
	Vertical	Complied
Right side	Horizontal	Complied
	Vertical	Complied

6.4 Electric Fast Transient/BURST

Test specification	EN 61000-4-4:2004				
Coupling	<input checked="" type="checkbox"/> AC 24 V <input checked="" type="checkbox"/> Signal / Control: Clamp <input type="checkbox"/> Telecommunication: Clamp				
Test level	<input checked="" type="checkbox"/> AC 24 V: ± 1 kV Peak <input checked="" type="checkbox"/> Signal / Control: ± 1 kV Peak <input type="checkbox"/> Telecommunication: ± 1 kV Peak				
Repetition frequency	5 kHz, Tr/Th = 5 / 50 ns				
Coupling time	60 s				
Testing Voltage	AC 24 V				
Test facility	Shielded room				
Date	2012. 01. 26				
Temperature(°C)	20 °C	Humidity (% R.H.)	18 % R.H.	Pressure (kPa)	102.6 kPa
Remarks	Complied - There was no change of operation status during above testing.				

6.4.1 Measurement procedure

A ground reference plane was located on the floor.

EFT generator was connected to reference ground plane via low impedance connection.

For floor standing equipment, EUT was placed on a 0.1 m wooden table.

For tabletop equipment, EUT was placed on a 0.1 m above the ground reference plane.

Test generator and coupling/decoupling network was placed on, and bounded to, the ground reference plane. When using the coupling clamp, the minimum distance between the coupling plates and all other conductive surfaces, except the ground reference plane beneath the coupling clamp, shall be 0.5 m.

6.4.2 Used equipments

Equipment	Model No.	Serial No.	Makers	Next Cal. date	Used
Generator	UCS 500 M6	0701-03	EM TEST	2012.06.14	<input checked="" type="checkbox"/>
Capacitive Coupling Clamp	-	-	EM TEST	-	<input checked="" type="checkbox"/>

6.4.3 Photographs of test setup



6.4.4 Measurement result

* AC Line

EFT coupling point	(+)	(-)	Result
AC 24 V	+ 1 kV	- 1 kV	Complied

* Signal / Control

EFT coupling point	(+)	(-)	Result
Video Out	+ 1 kV	- 1 kV	Complied
Alarm	+ 1 kV	- 1 kV	Complied
Rx±, Tx±	+ 1 kV	- 1 kV	Complied

* Telecommunication

EFT coupling point	(+)	(-)	Result
-	-	-	-

6.5 Surge

Test specification	EN 61000-4-5:2006				
Coupling	<input checked="" type="checkbox"/> AC 24 V : CDN <input checked="" type="checkbox"/> Signal / Control: Direct, CDN				
Test level	<input checked="" type="checkbox"/> AC 24 V : ± 0.5 kV, ± 1 kV <input checked="" type="checkbox"/> Signal / Control: ± 0.5 kV, ± 1 kV				
Coupling Impedance	<input type="checkbox"/> 18 μ F <input checked="" type="checkbox"/> 40 Ω		<input type="checkbox"/> 10 Ω + 9 μ F <input checked="" type="checkbox"/> Direct		
Surge pulse shape	Tr/Th = 1.2 / 50 μ s				
Number of surge	5				
Coupling time	1 min				
Testing Voltage	AC 24 V				
Test facility	Shielded room				
Date	2012. 01. 26				
Temperature(°C)	20 °C	Humidity (% R.H.)	18 % R.H.	Pressure (kPa)	102.6 kPa
Remarks	Complied - There was no change of operation status during above testing.				

6.5.1 Measurement procedure

A ground reference plane was located on the floor. SURGE generator was connected to reference ground plane via low impedance connection. For floor standing equipment & table top equipment, EUT was placed on a wooden table.

6.5.2 Used equipments

Equipment	Model No.	Serial No.	Makers	Next Cal. date	Used
Generator	UCS 500 M6	0701-03	EM TEST	2012.06.14	<input checked="" type="checkbox"/>
CDN	CNV 508 N1	V1108108861	EM TEST	-	<input checked="" type="checkbox"/>

6.5.3 Photographs of test setup



6.5.4 Measurement result

* AC Line

Coupling point	(+)	(-)	Result
AC 24 V	+ 0.5 kV, + 1 kV	- 0.5 kV, - 1 kV	Complied

* Signal / Control

Coupling point	(+)	(-)	Result
Video Out	+ 0.5 kV, + 1 kV	- 0.5 kV, - 1 kV	Complied
Alarm	+ 0.5 kV, + 1 kV	- 0.5 kV, - 1 kV	Complied
Rx±, Tx±	+ 0.5 kV, + 1 kV	- 0.5 kV, - 1 kV	Complied

6.6 Conducted Immunity

Test specification	EN 61000-4-6:2007				
Tested frequency	0.15 MHz ~ 100 MHz				
Test level & Modulation	1 V, 3 V, 10 V, 80 % Amplitude Modulation (1 kHz) 1 V, 3 V, 10 V, Pulse Modulation (1 Hz (0.5 s ON: 0.5 s OFF))				
Frequency Step	log 1 % step				
Coupling method	<input checked="" type="checkbox"/> AC 24 V : CDN(M2) <input checked="" type="checkbox"/> Signal / Control: Clamp <input type="checkbox"/> Telecommunication: Clamp				
Testing Voltage	AC 24 V				
Test facility	Shielded room				
Date	2012. 01. 20				
Temperature(°C)	20 °C	Humidity (% R.H)	42 % R.H	Pressure(kPa)	102.7 kPa
Remarks	Complied - There was no change of operation status during above testing.				

6.6.1 Measurement procedure

A ground reference plane was located on the floor.

The test was performed on a ground reference plane on a 0.1 m wooden table. This test were Performed using CDN for mains, clamp for signal and injection probe. The frequency range was swept from 0.15 MHz to 100 MHz. This frequency range was Modulated with 1 kHz sine wave at 80 %.

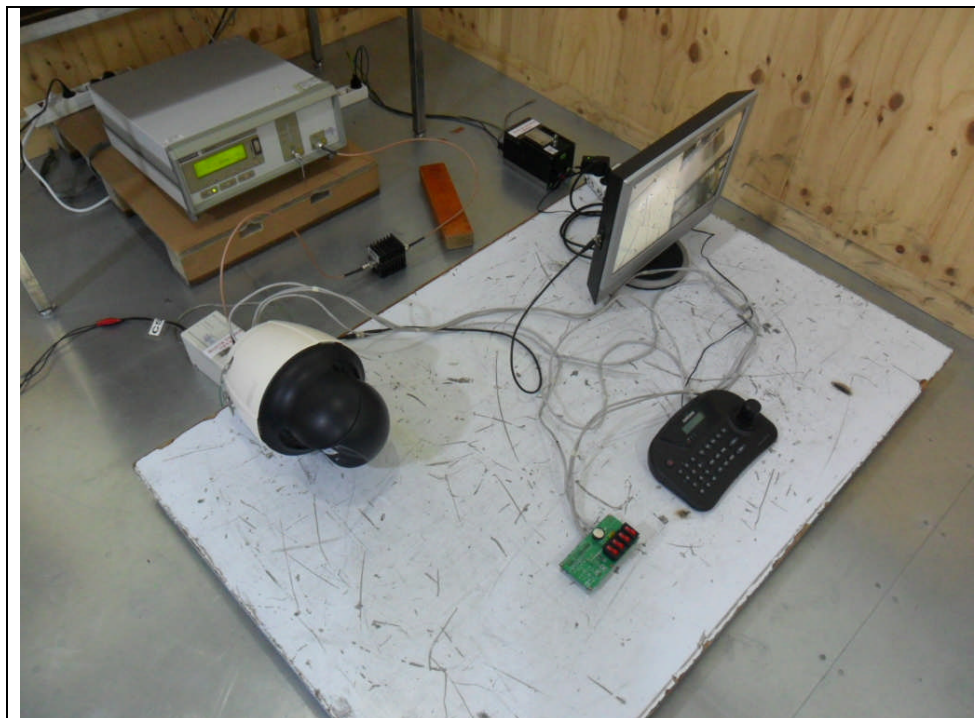
The signal generators provided the modulated frequency at a 1 % step size.

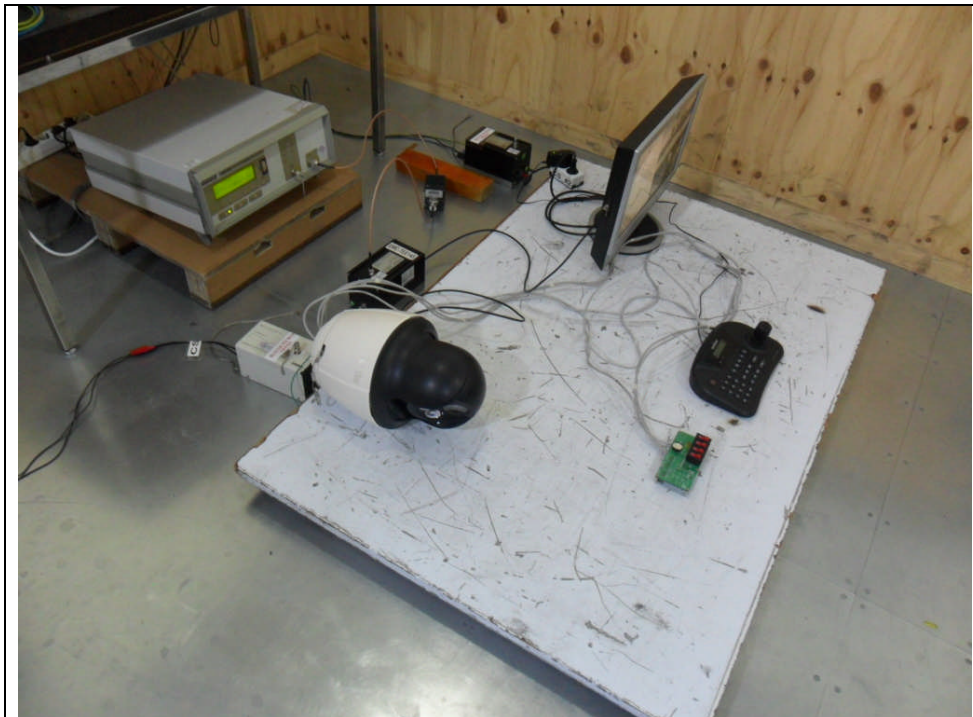
The power and all network cable, I/O cables longer than 3 m length were tested.

6.6.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
CS generator	NSG 2070	1054	Schaffner	2012.05.29	<input checked="" type="checkbox"/>
CDN	M016	16674	Schaffner	2012.03.23	<input checked="" type="checkbox"/>
CDN	CDN M3-32A	0506-29	EM TEST	2012.02.11	<input checked="" type="checkbox"/>
Attenuator	INA2070-1	2054	Schaffner	2012.03.23	<input checked="" type="checkbox"/>
EM Clamp	KEMZ 801	17643	Schaffner	2012.04.25	<input checked="" type="checkbox"/>
CDN	CDN S1/75	0410-28	EM TEST	2012.05.17	<input checked="" type="checkbox"/>
Current probe	MD720	W1345167/M6/ 0068	Schaffner	-	<input type="checkbox"/>

6.6.3 Photographs of test setup





6.6.4 Measurement result

* AC Line

Coupling point	Coupling method	Result
AC 24 V	CDN(M2)	Complied

* Signal / Control

Coupling point	Coupling method	Result
Video Out	CDN(S1/75)	Complied
Alarm	Clamp	Complied
Rx±, Tx±	Clamp	Complied

* Telecommunication

Coupling point	Coupling method	Result
-	-	-

7. E.U.T. photographs

Front View



Rear View



Left View



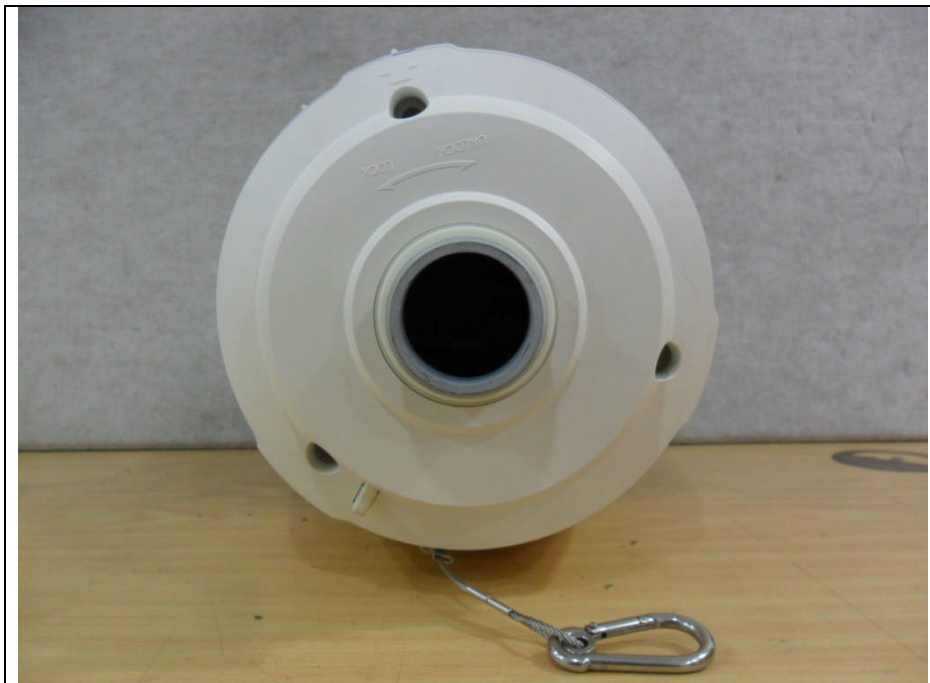
Right View



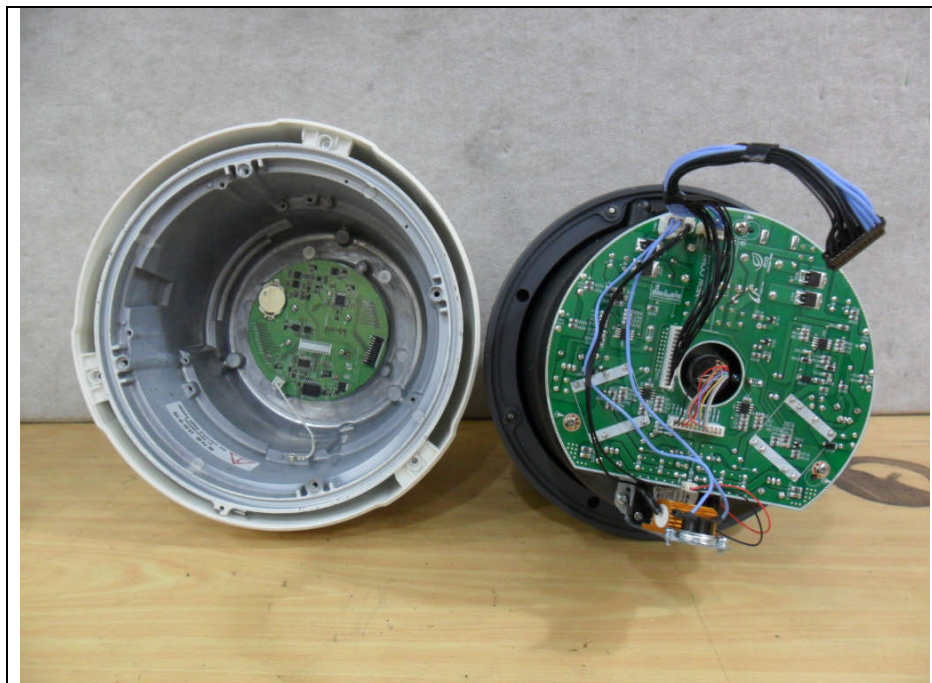
Top View



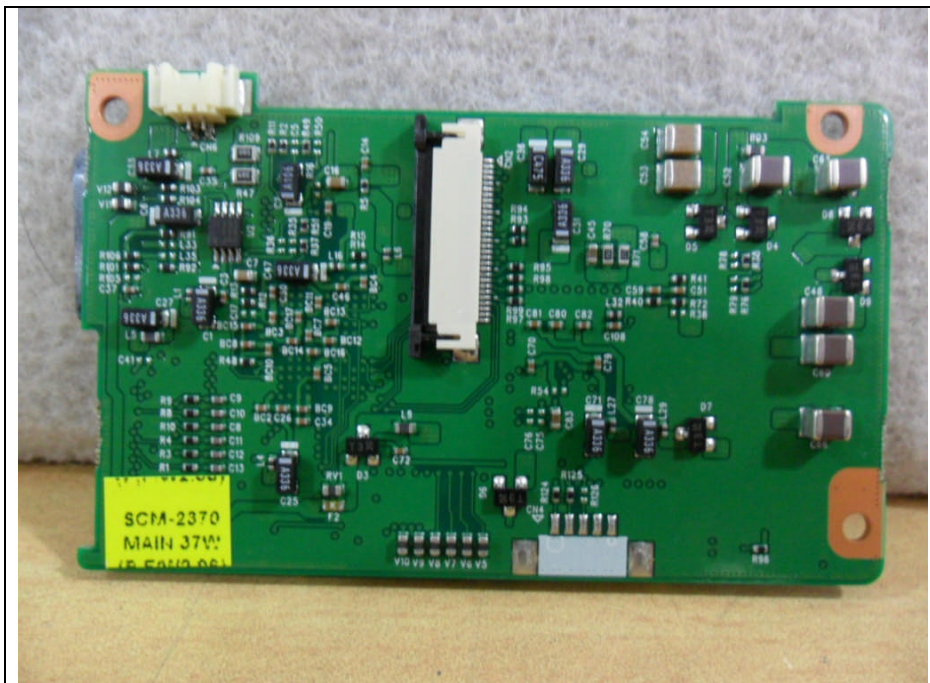
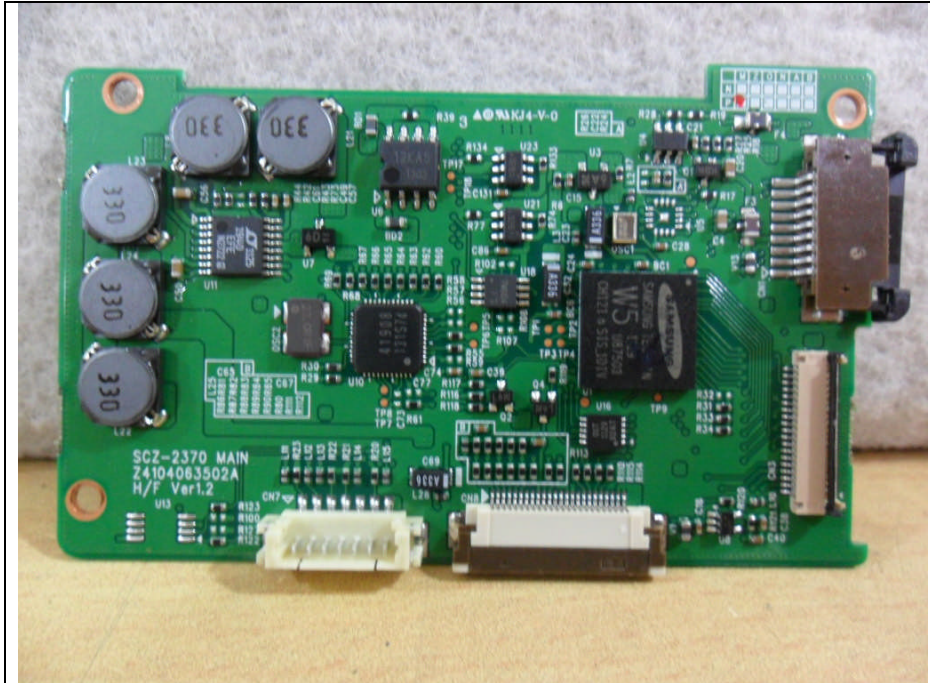
Bottom View



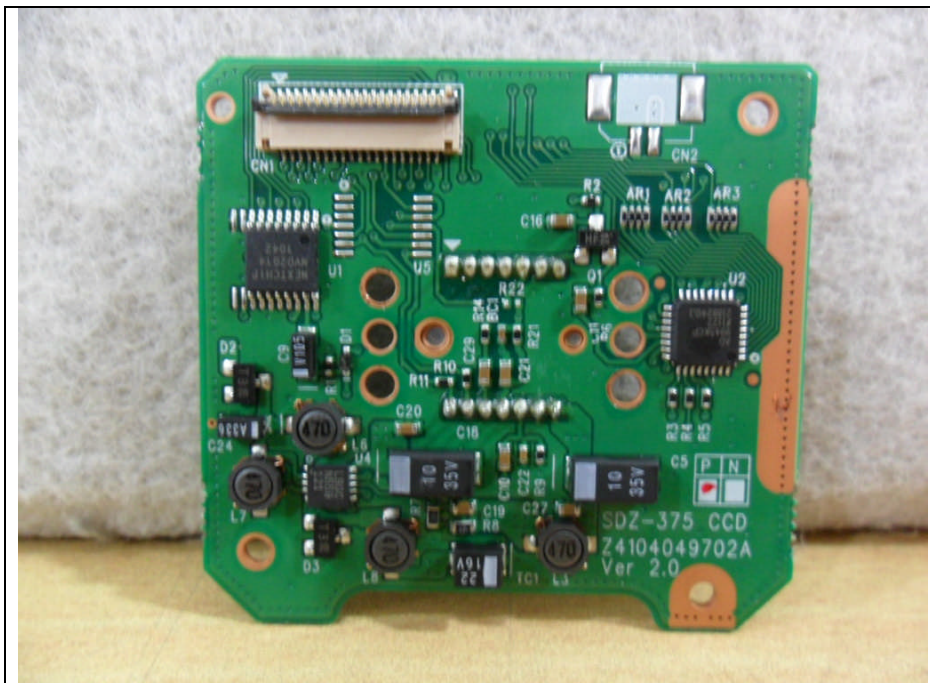
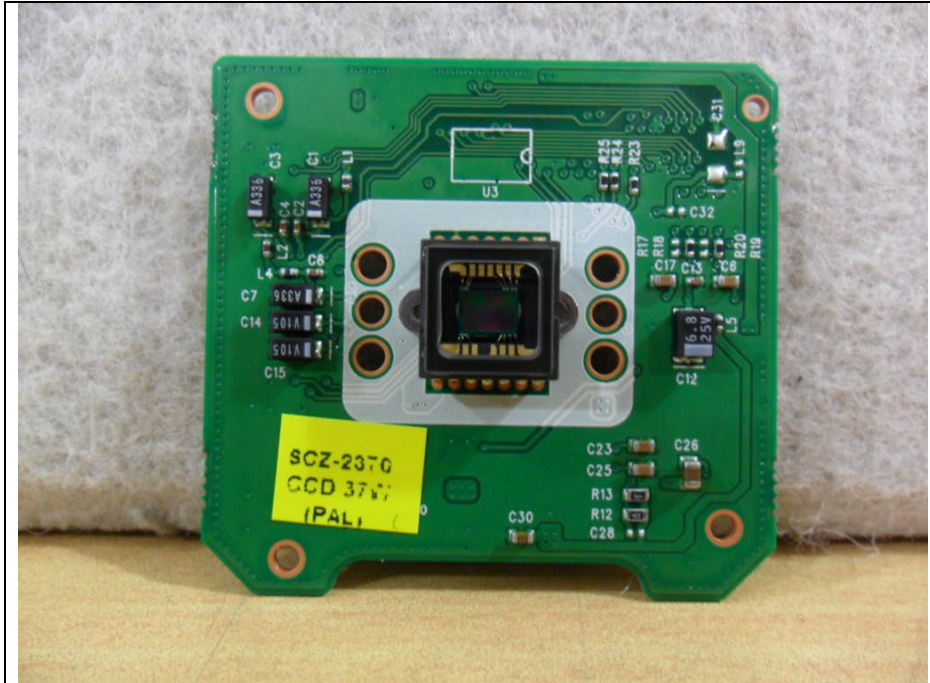
Inside



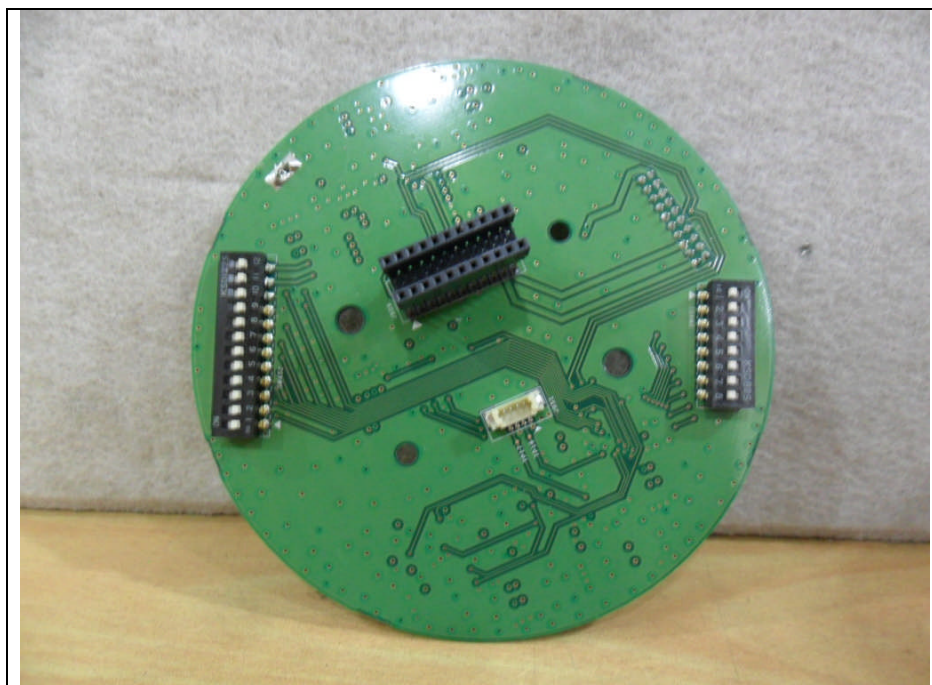
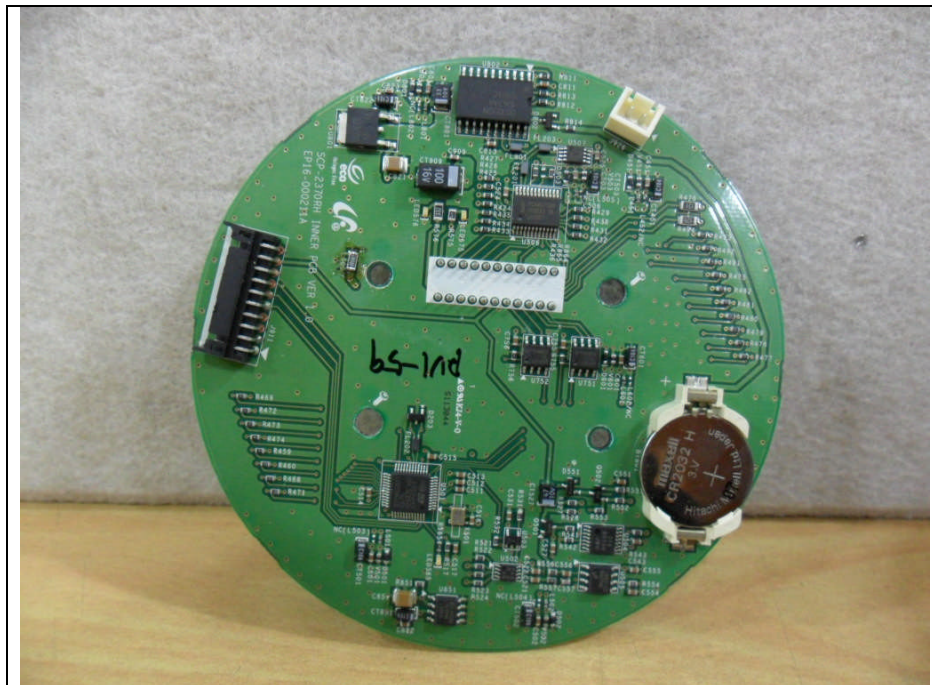
Main Board



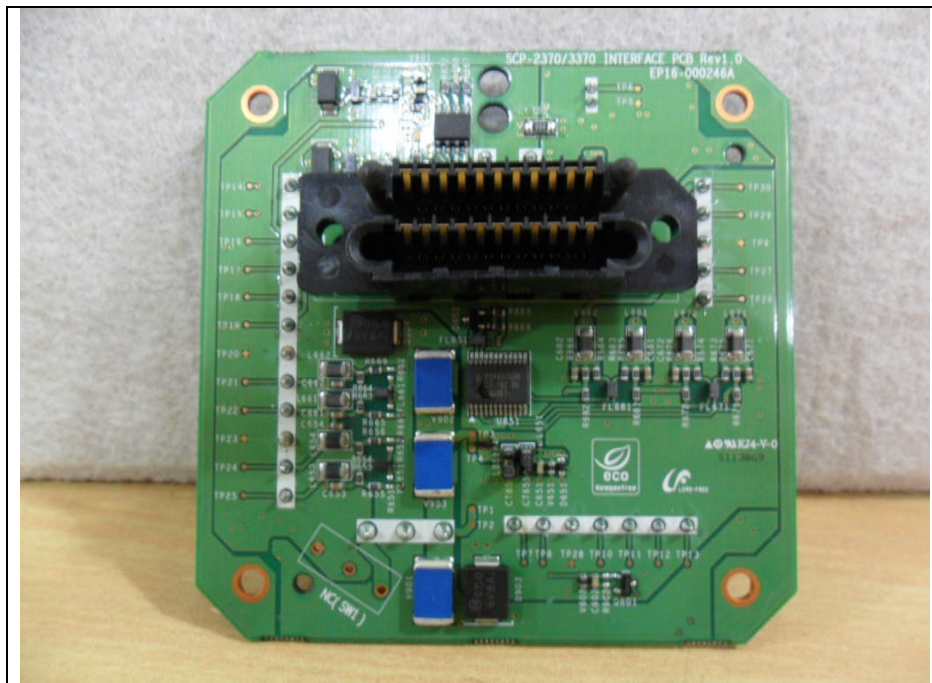
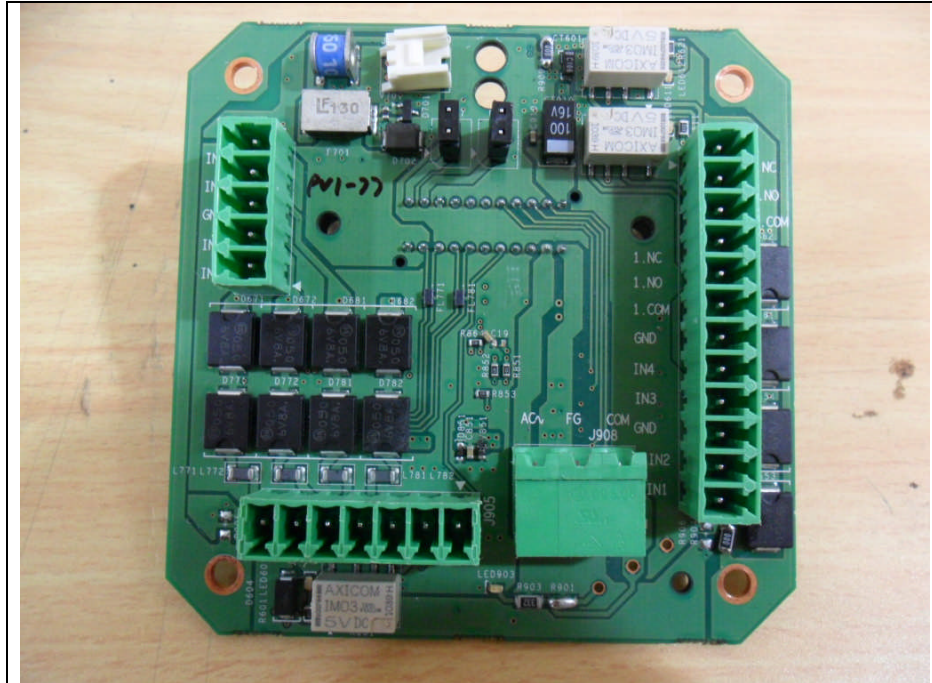
CCD Board



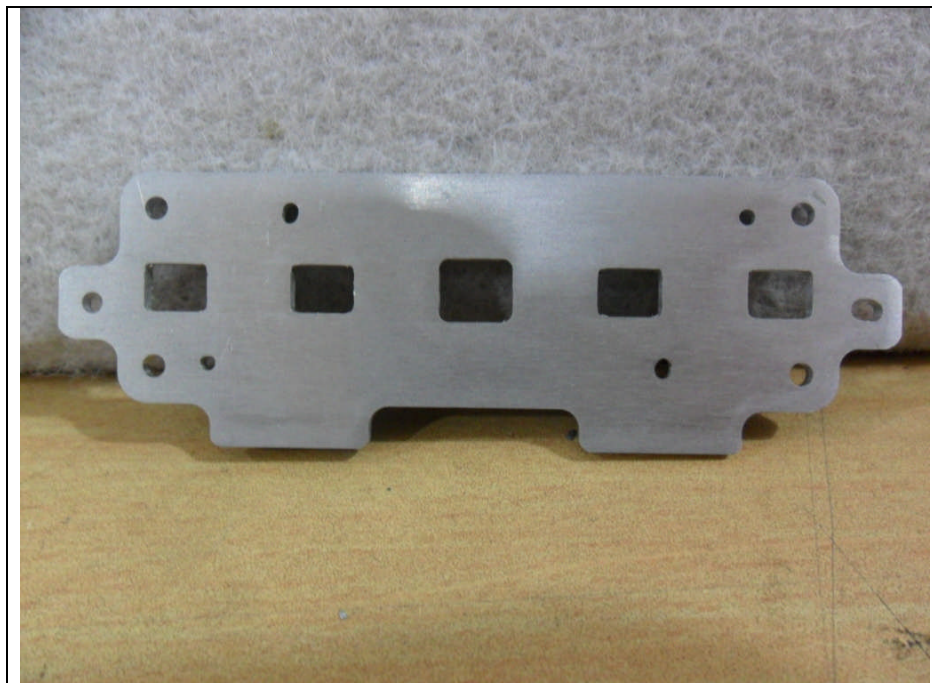
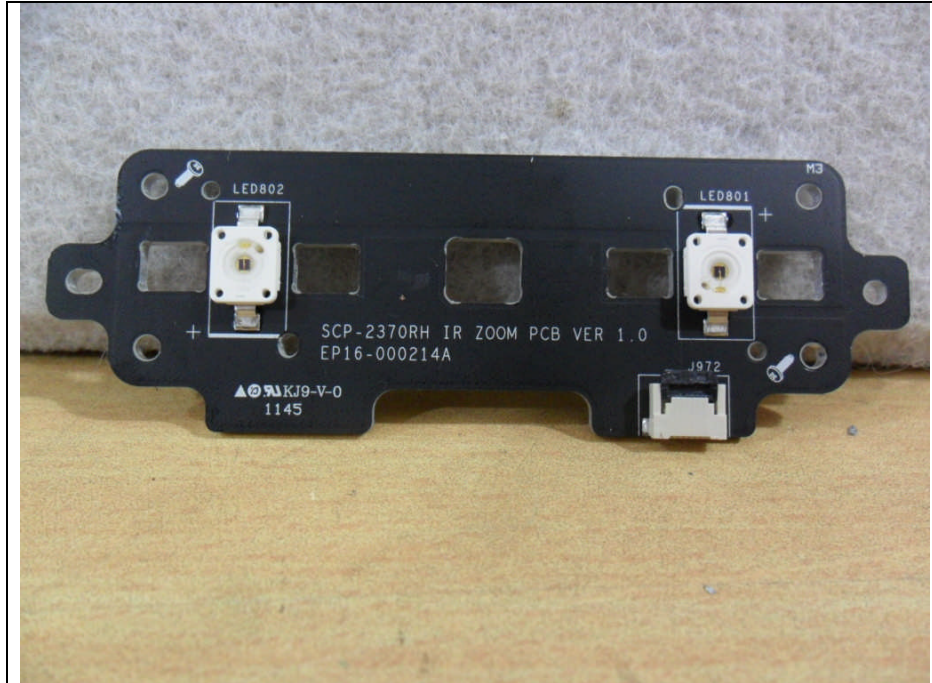
Inner Board



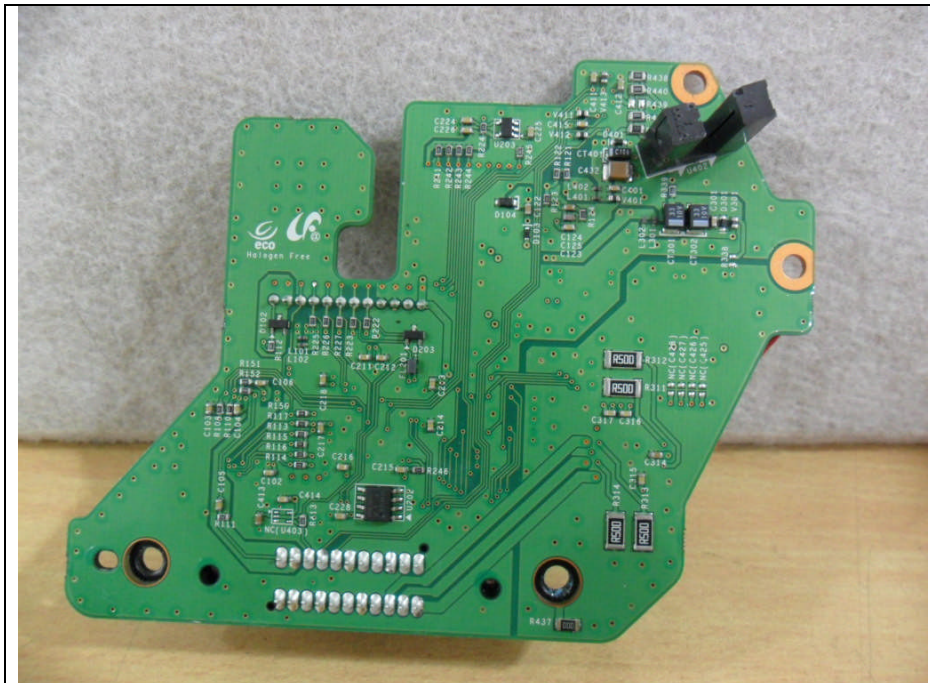
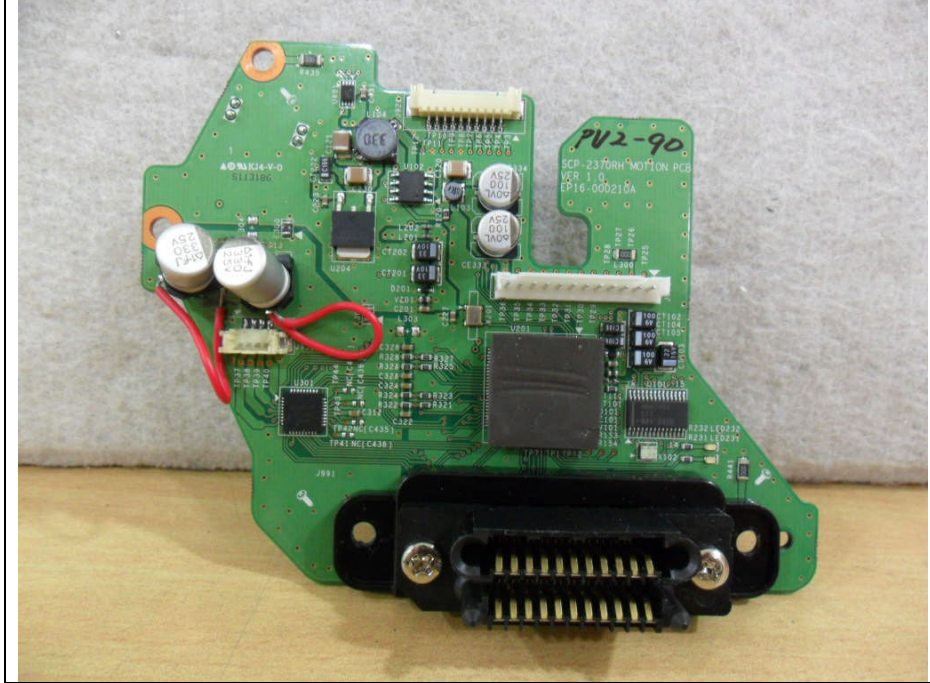
Interface Board



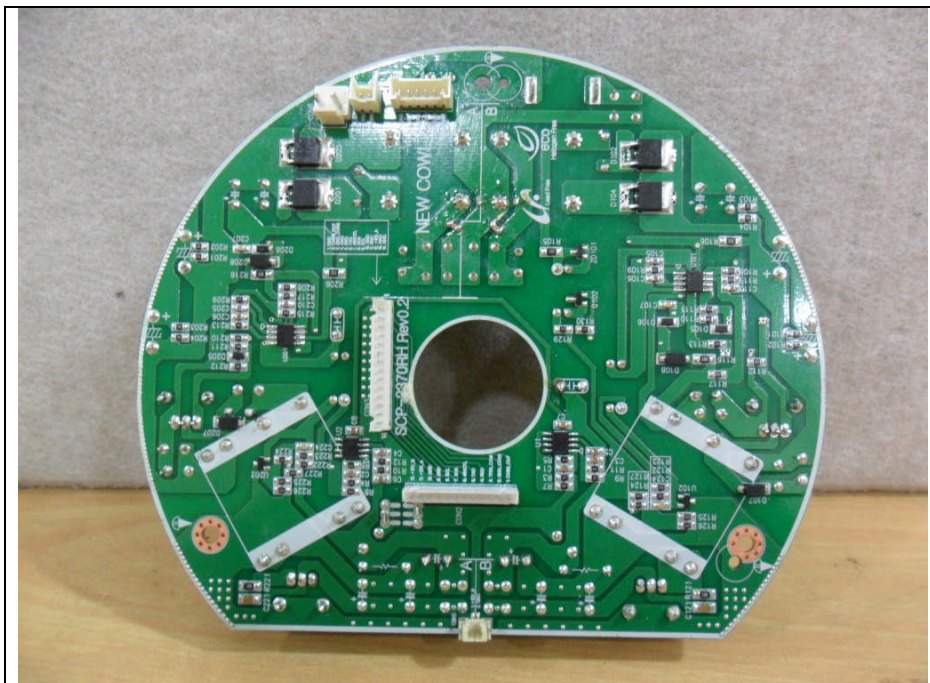
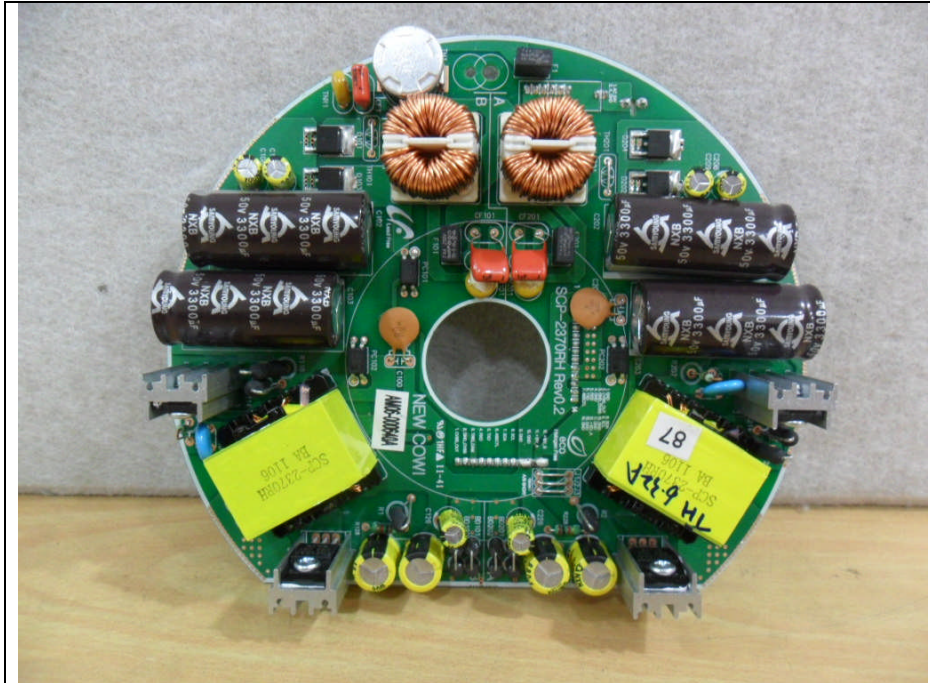
LED Board



Motion Board



Power



SUB Board

