CERTIFICATE of EMC Compliance

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Report No:	**EMC-FCC-1355**
Type of equipment:	**CCTV CAMERA**
Model Name:	**SCD-1020RN**
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,
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EMI TEST REPORT

Test report No.:	**EMC-FCC-1355**
Type of Equipment:	**CCTV CAMERA**
Model Name:	**SCD-1020RN**
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. 08. 23

Date of testing: 2011. 08. 29

Issued date: 2011. 09. 08

Tested by: SUNG, KI-MUN

Approved by: YEOM, HAN-SEOK

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1. Applicant information

Applicant:	Samsung Techwin Co., Ltd.
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	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

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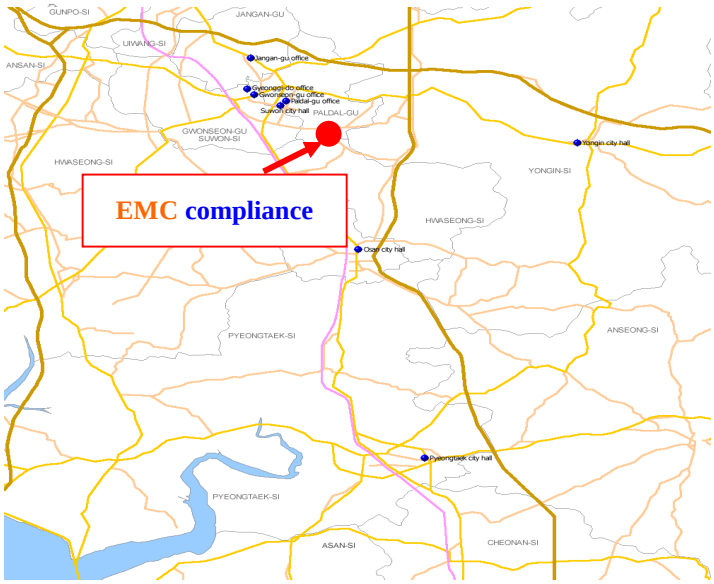
2. Laboratory information

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



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3. Test system configuration

3.1 Operation environment

		Temperature	Humidity	Pressure
Chamber(10 m)	:	23 °C	54 % 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 ㎒ ~ 300 ㎒: 3 m: + 4.29 [㏈], - 4.31 [㏈]
10 m: + 4.28 [㏈], - 4.30 [㏈]
300 ㎒ ~ 1 000 ㎒: 3 m: + 4.57 [㏈], - 4.57 [㏈]
10 m: + 4.42 [㏈], - 4.44 [㏈]

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4. Description of E.U.T.

4.1 General information

Video	SCD-1020R(N)	SCD-1020RP
Imaging Device	1/4" CMOS	
Total Pixels	680(H) x 512(V)	680(H) x 512(V)
Effective Pixels	720(H) x 480(V)	720(H) x 576(V)
Scanning System	2 : 1 Interlace	
Synchronization	Internal	
Frequency	H : 15.734KHz / V : 59.94Hz	H : 15.625KHz / V : 50Hz
Horizontal Resolution	520 TV Lines	
Min. Illumination	0Lux (IR LED on)	
S / N Ratio	46dB (AGC off, Weight on)	
Video Output	CVBS : 1.0 Vp-p / 75Ω composite	
Lens Type		
Focal Length (Zoom Ratio)	3.6mm	
Max. Aperture Ratio	2	
Angular Field of View	79°(H) x 58°(V) x 101°(D)	
Min. Object Distance	200mm	
Lens Type	Fixed	
Mount Type	Board Type	
Pan / Tilt		
Pan Range	0° ~ 352°	
Tilt Range	0° ~ 75°	
Operational		
On Screen Display	None	
Camera Title	None	
Day & Night	Auto	
Backlight Compensation	None	
Contrast Enhancement	None	
Digital Noise Reduction	Auto	
Digital Image Stabilization	None	
Motion Detection	None	
Privacy Masking	None	
Sens-up (Frame Integration)	None	
Gain Control	Auto	
White Balance	Auto (3,200K° ~ 6,500K°)	
Shutter Mode	Auto (Rolling Shutter)	
Digital Zoom	None	
Reverse	None	
Communication	None	
Protocol	None	
IR Distance	10m (IR LED 12 EA)	
Environmental		
Operating Temperature / Humidity	-10°C ~ 50°C / 20% ~ 80% RH	
Electrical		
Input Voltage	12V DC ±10%	
Power Consumption	2.2W	
Mechanical		
Color / Material	Ivory / Plastic (Dome Cover : Clear)	
Dimension (WxHxD)	Φ102 x H 71.7mm	
Weight	160g	

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4.2 Product description

Type of product	CCTV CAMERA
Model name (Basic)	SCD-1020RN
Model name (Variant)	N/A
Difference	-
Trade name	-
Serial no	Engineering Sample
Testing voltage	DC 12 V
Product rating	DC 12 V
Internal clock frequency	27 ㎒
Note	* AC/DC Adaptor was not provided by the manufacturer.

4.3 Auxiliary equipments

Type	Model / Part #	Serial number	Manufacturer
CRT Monitor	GCM-1014SA-D	26090901003	Honeywell
AC/DC Adaptor (DC 12V)	DAD12050DKA	-	Dream Electronic

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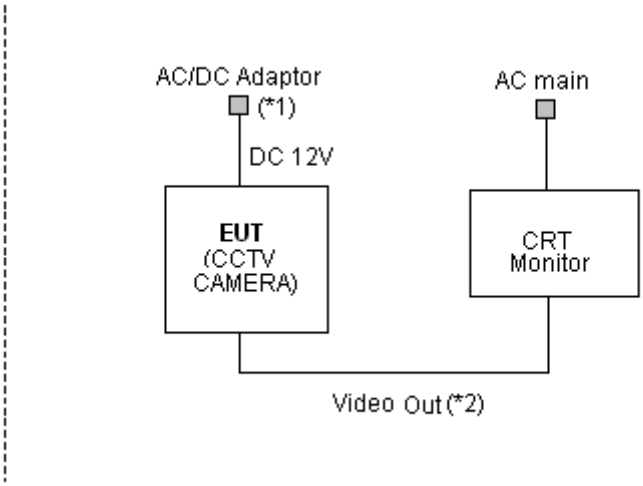
4.4 Test configuration



Note	Start		End		Cable		
*	Name	I/O port	Name	I/O port	Length (m)	Spec.	Cable
1	**EUT** (CCTV CAMERA)	Power	AC/DC Adaptor	Power	1.6	Non-Shield	-
2		Video Out	CRT Monitor	Video In	3.0	Shield	-

4.5 Operating conditions

The EUT was configured as normal intended use.

This test was done at worst case.

Test mode	Normal operating
1	Video Monitoring Test mode.

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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

Application	Test method	Test result
Conducted emission	ANSI C63.4 – 2009	N/A
Radiated emission DC 12 Ⅴ	ANSI C63.4 – 2009	Complied

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6. Test results

6.1 Radiated Emission

Test specification	FCC Part 15, Section 15.109(g), Class A		
Test mode	Video Monitoring Test mode.		
Date	2011. 08. 29		
Testing voltage	DC 12 V		
Test facility	10 m Chamber		
Temperature (°C)	23 °C	Humidity (% R.H.)	54 % R.H.
Remarks	Complied Minimum limit margin is 15.5 dB at 211.548 ㎒.		

6.1.1 Limits of radiated emission measurement

Frequency [㎒]	Class A (dB(㎶/m)) @ 10 m	Class B (dB(㎶/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.

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6.1.3 Used equipments

Equipment	Model no.	Serial no.	Makers	Next cal. date	Used
Test Receiver	ESCI	100001	R&S	12.07.11	☒
Bi-Log Antenna	VULB 9168	375	SCHWARZBECK	11.11.30	☒
Amplifier	310N	284608	SONOMA INSTRUMENT	12.07.11	☒
3 dB Attenuator	8491A	16861	HP	12.07.11	☒
Antenna Mast	AM4.0	079/3440509	MATURO	-	☒
Turn Table	CO2000-SOFT	-	MATURO	-	☒

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 dB Att – 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 dB(μV/m)

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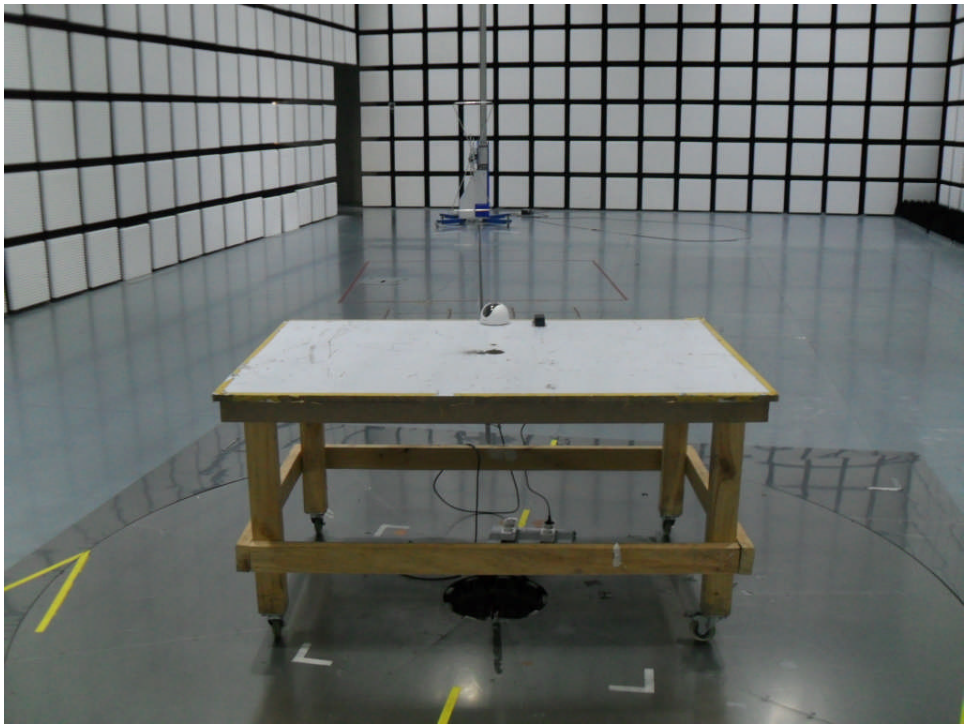
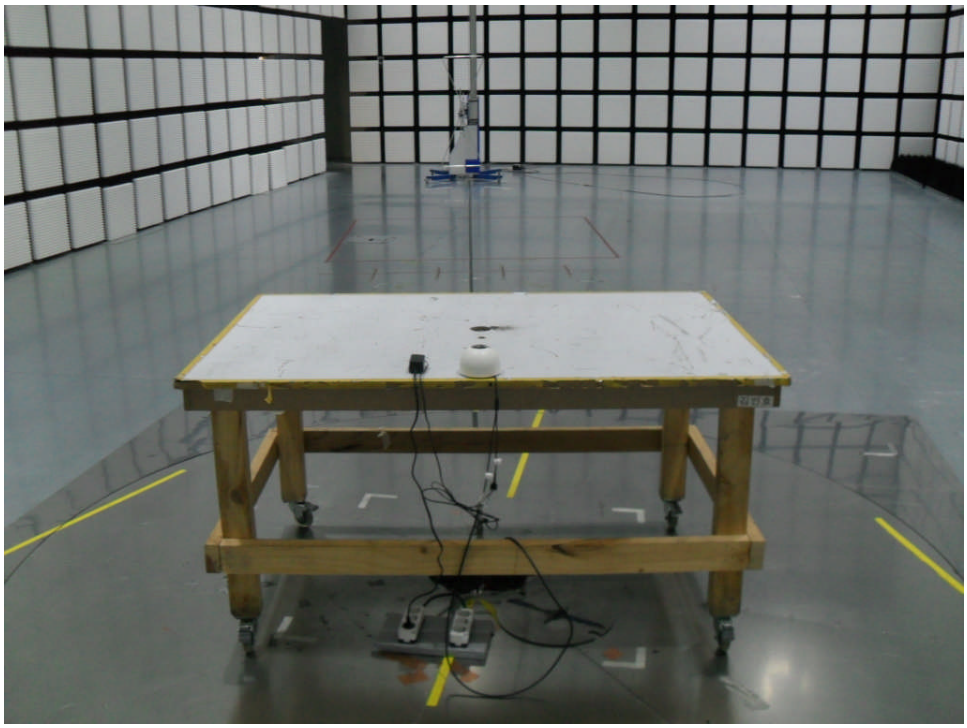
6.1.5 Photographs of test setup





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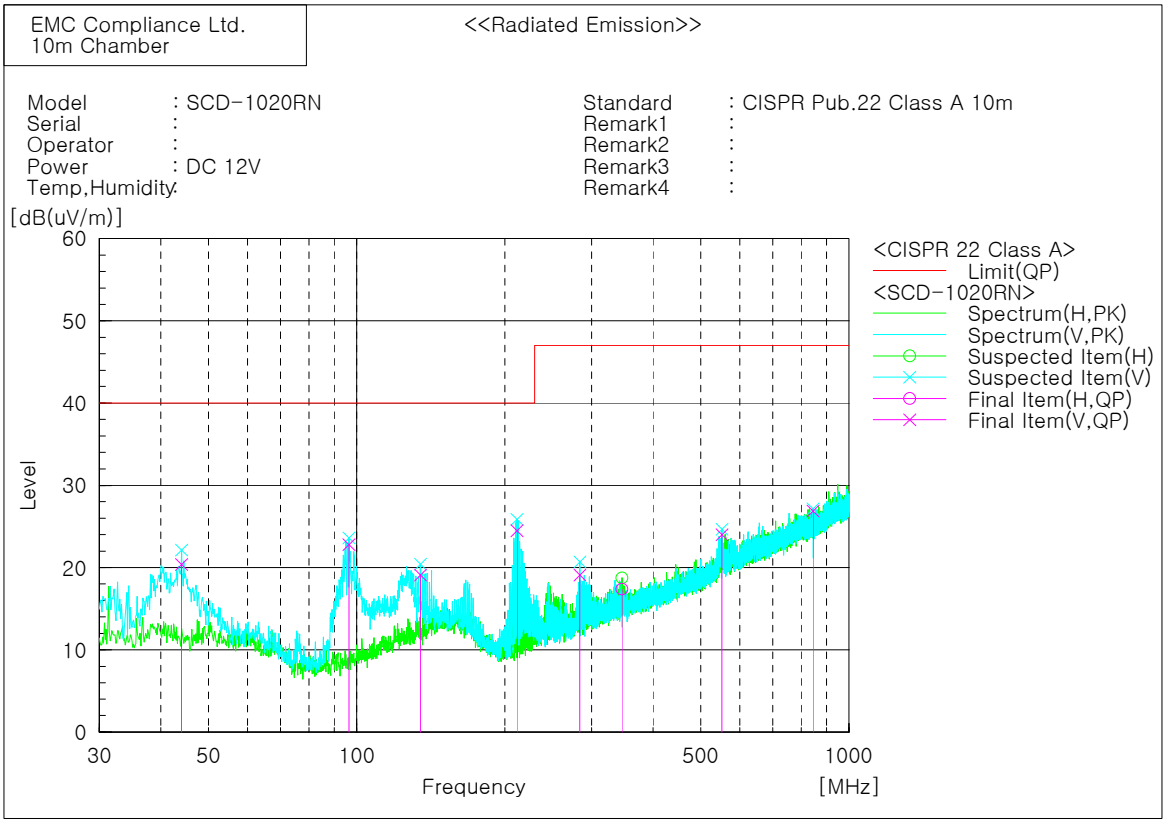
6.1.6 Radiated emission measurement result

*** Graph and Data**



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	44.050	V	34.8	-14.4	20.4	40.0	19.6	100.0	131.9
2	96.490	V	40.2	-17.4	22.8	40.0	17.2	298.0	115.2
3	134.765	V	32.8	-13.7	19.1	40.0	20.9	298.0	262.8
4	211.548	V	40.2	-15.7	24.5	40.0	15.5	100.0	238.3
5	283.879	V	31.5	-12.4	19.1	47.0	27.9	100.0	238.3
6	345.846	H	27.8	-10.4	17.4	47.0	29.6	302.0	77.1
7	551.985	V	29.3	-5.3	24.0	47.0	23.0	100.0	176.0
8	845.085	V	26.8	0.1	26.9	47.0	20.1	298.0	30.7

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7. E.U.T. photographs

Front View

Rear View

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Left View

Right View

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Top View

Bottom View

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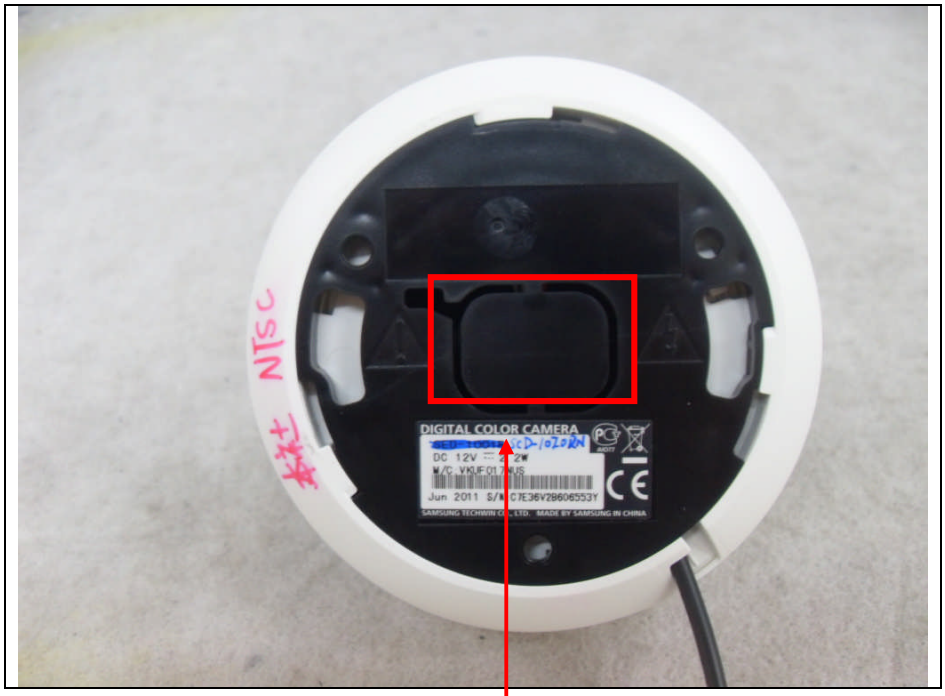
Label



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.

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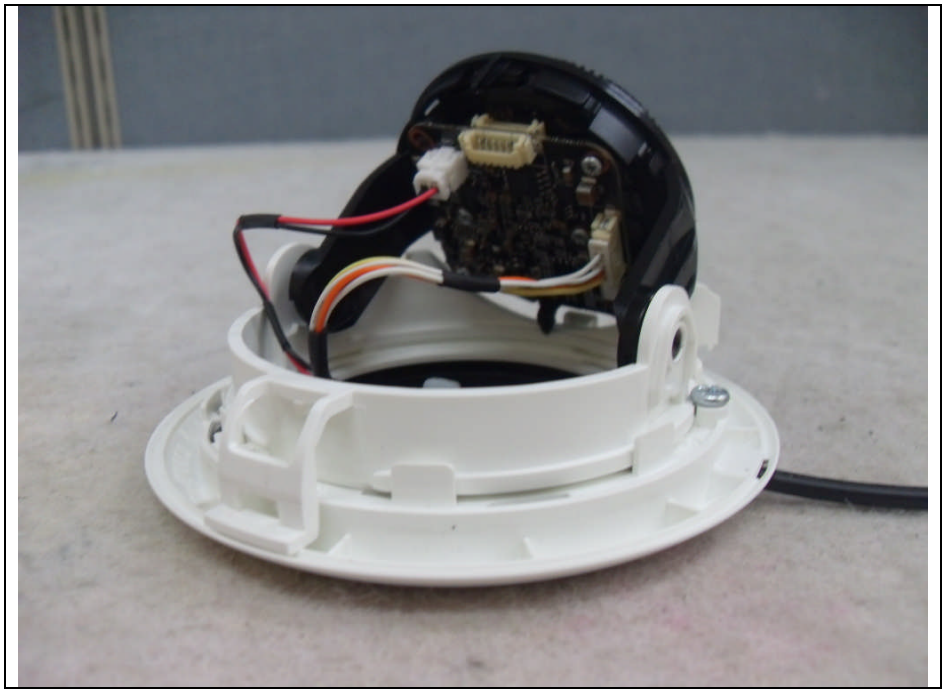
Inside



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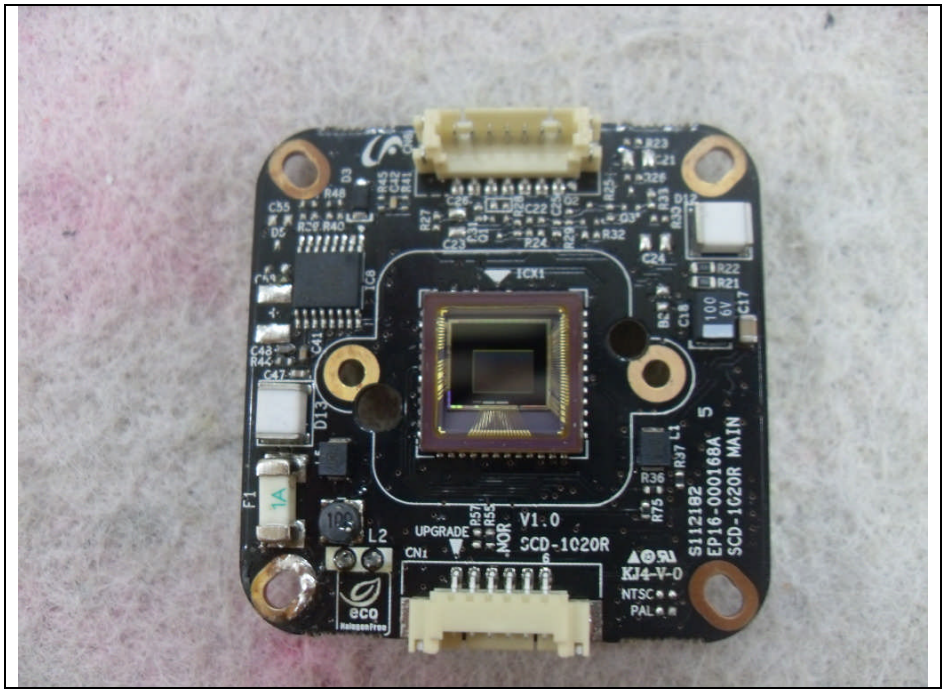
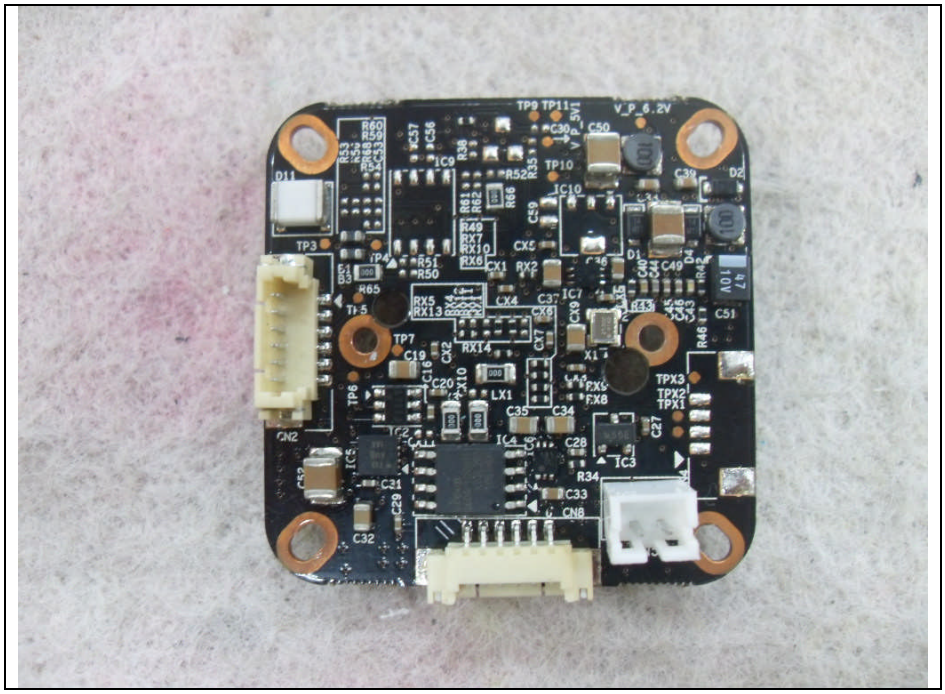
CCD Board





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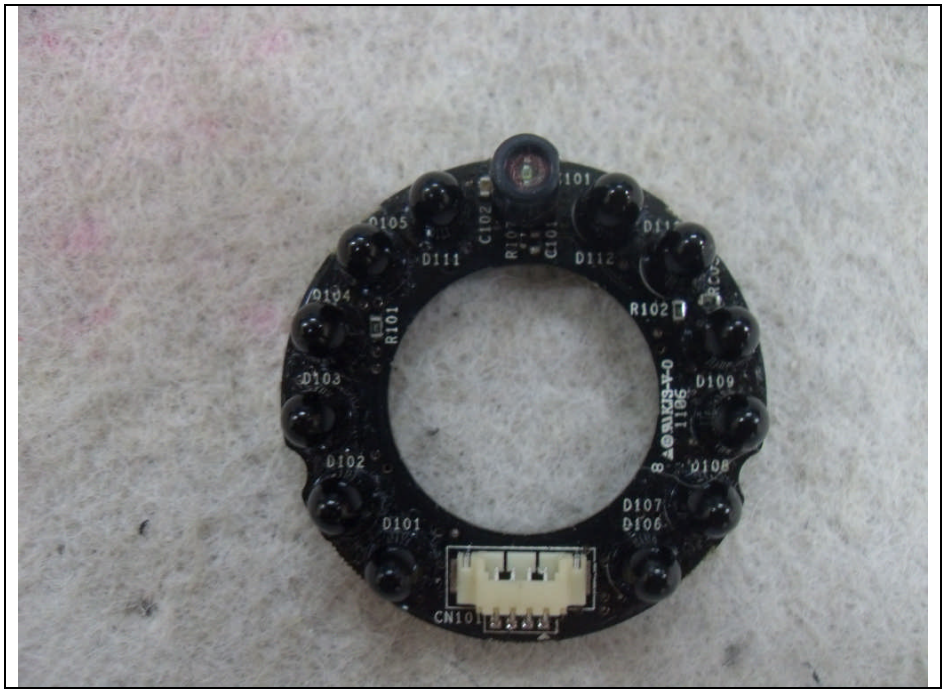
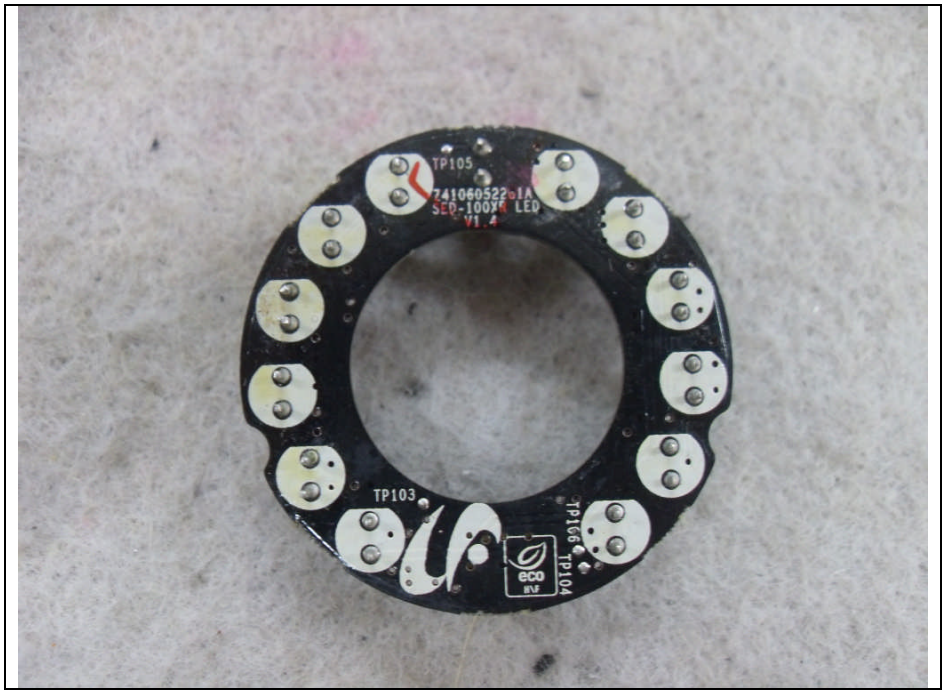
LED Board





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