

CERTIFICATE of EMC Compliance

Report No: EMC-FCC-1411
Type of equipment: Analog Camera
Model Name: SCB-2002N
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.

Laboratory

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

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Yu, Sang-Hoon/ Manager

EMI TEST REPORT

Test report No.: EMC-FCC-1411
Type of Equipment: Analog Camera
Model Name: SCB-2002N
Applicant: Samsung Techwin Co., Ltd.
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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. 10. 31

Date of testing: 2011. 11. 02

Issued date: 2011. 11. 08

Tested by: 

SUNG, KI-MUN

Approved by: 

YU, SANG-HOON

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1. Applicant information

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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

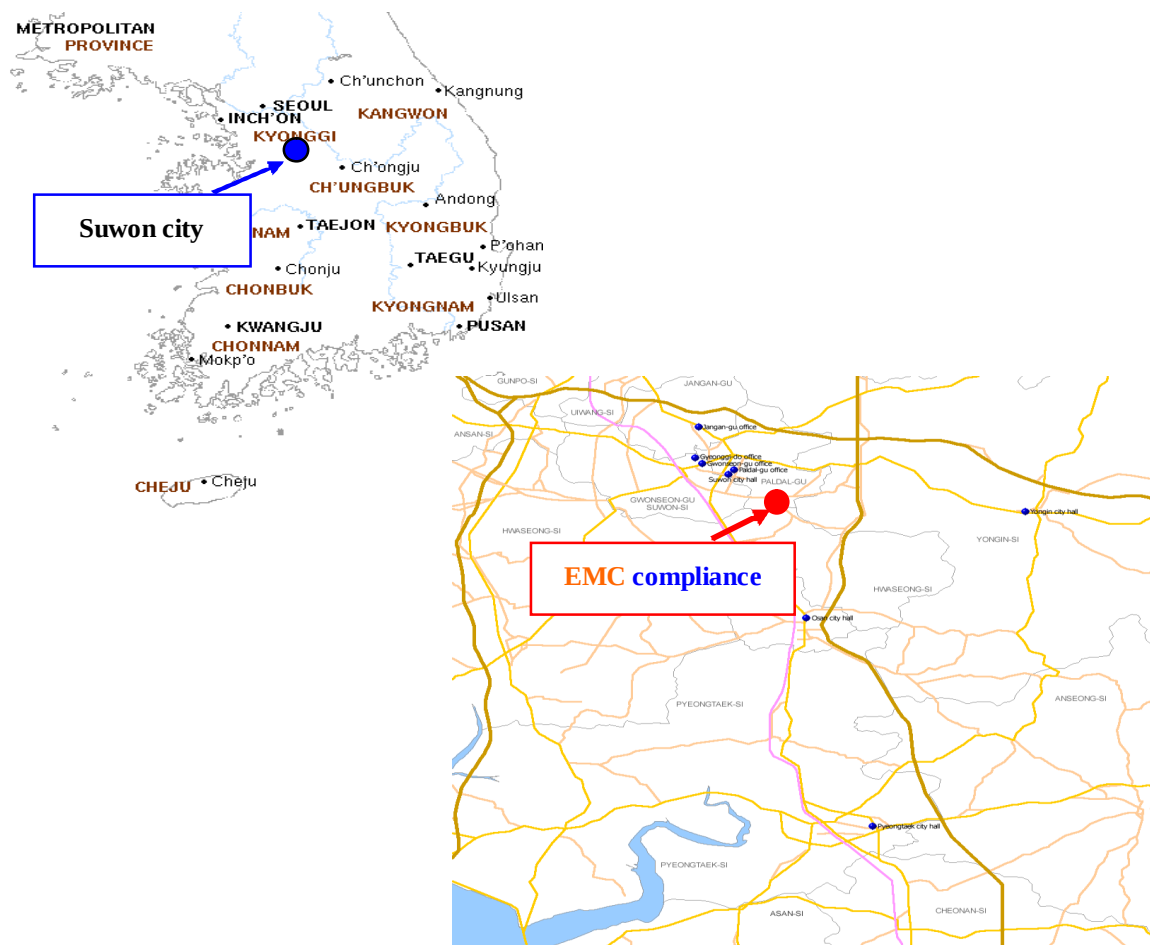
FCC CAB.: KR0040

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)	: 21 °C	48 % R.H.	-

Test site

These testing items were performed following locations;

Chamber (10 m) : Radiated Emission (Test distance: 10 m)

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: + 4.29 [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]

4. Description of E.U.T.

4.1 General information

Product Concept	Premium Resolution Module Camera
Main Features	1. High Resolution of 650TV Lines (Color), 700TV Lines (B/W) 2. Min. Illumination 0.1Lux @F1.2 (Color), 0.01 Lux (B/W) 3. BLC, MD, SSNR.III (3D+2D) 4. Coaxial Control (Pelco C), 12V DC/24V AC

Video	SCB-2002(N)	SCB-2002P
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 : 650 TV lines. 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		
Lens Type	-	
Mount Type	-	
Operational		
On Screen Display	English, Japanese, Spanish, French, Portuguese, Korean	English, French, German, Spanish, Italian, Chinese, Russian, Polish, Czech, Romanian, Serbian, Swedish, Danish, Turkish, Portuguese
Camera Title	Off / On (Displayed 15 characters)	
Day & Night	Color / B/W / Auto / Ext	
Backlight Compensation	Off / User BLC / HLC / SDR	
Wide Dynamic Range	None	None
Contrast Enhancement	SSDR	
Digital Noise Reduction	SSNR.III (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	None	
Intelligent Video	None	
PIP	Off / On	
Alarm	None	
Communication	Coaxial Control (SPC-300 Compatible)	
Protocol	Coax : Pelco-C (Coaxitron)	
Environmental		
Operating Temperature / Humidity	-10°C ~ +50°C (+14°F ~ +122°F) / Less than 90% RH	
Electrical		
Input Voltage/Current	12V DC/24V AC	
Mechanical		
Color / Material		
Dimension (WxVxD)	66(W) x 61(H) x 102(D)mm	
Weight	310g	

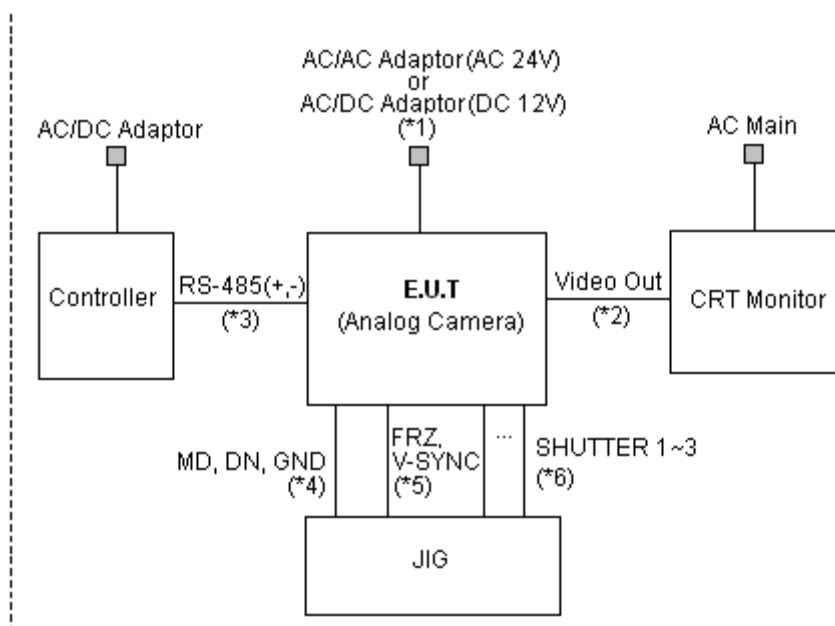
4.2 Product description

Type of product	Analog Camera
Model name (Basic)	SCB-2002N
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	36 MHz
Note	AC/AC adaptor, AC/DC adaptor was not provided by the manufacturer.

4.3 Auxiliary equipments

Type	Model / Part #	Serial number	Manufacturer
CRT Monitor	GCM-1014SA-D	26090901012	Honeywell
JIG	-	-	-
Controller	SCC-2000	-	SAMSUNG
AC/AC Adaptor(AC 24 V)	STA-220	-	Dream Electronic
AC/DC Adaptor(DC 12 V)	DAD12050DKA	-	Dream Electronic

4.4 Test configuration



Note *	Start		End		Cable	
	Name	I/O port	Name	I/O port	Length (m)	Spec.
1	EUT (Analog Camera)	Power	AC/DC Adaptor or AC/DC Adaptor	Power	1.6	Non-Shield
2		Video Out	CRT Monitor	Video Out	3.0	Non-Shield
3		RS-485(+,-)	Controller	RS-485(+,-)	3.0	Non-Shield
4		MD, DN, GND	JIG	MD, DN, GND	3.0	Non-Shield
5		FRZ, V-SYNC	JIG	FRZ, V-SYNC	3.0	Non-Shield
6		SHUTTER 1~3	JIG	SHUTTER	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	Image monitoring 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

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	Image monitoring test mode.		
Date	2011. 11. 02		
Testing voltage	AC 24 V, DC 12 V		
Test facility	10 m Chamber (Test distance: 10 m)		
Temperature (°C)	21 °C	Humidity (% R.H.)	48 % R.H.
Remarks	Complied Minimum limit margin is 4.0 dB at 187.989 MHz. (DC 12 V)		

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	ESCI	100001	R&S	12.07.11	☒
Bi-Log Antenna	VULB 9168	375	SCHWARZBECK	13.09.21	☒
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:

$$\text{Result} = \text{M.R} + \text{C.F}(\text{A.F} + \text{C.L} + 3 \text{ dB Att} - \text{A.G})$$

M.R = Meter Reading

C.F = Correction Factor

A.F = Antenna Factor

C.L = Cable Loss

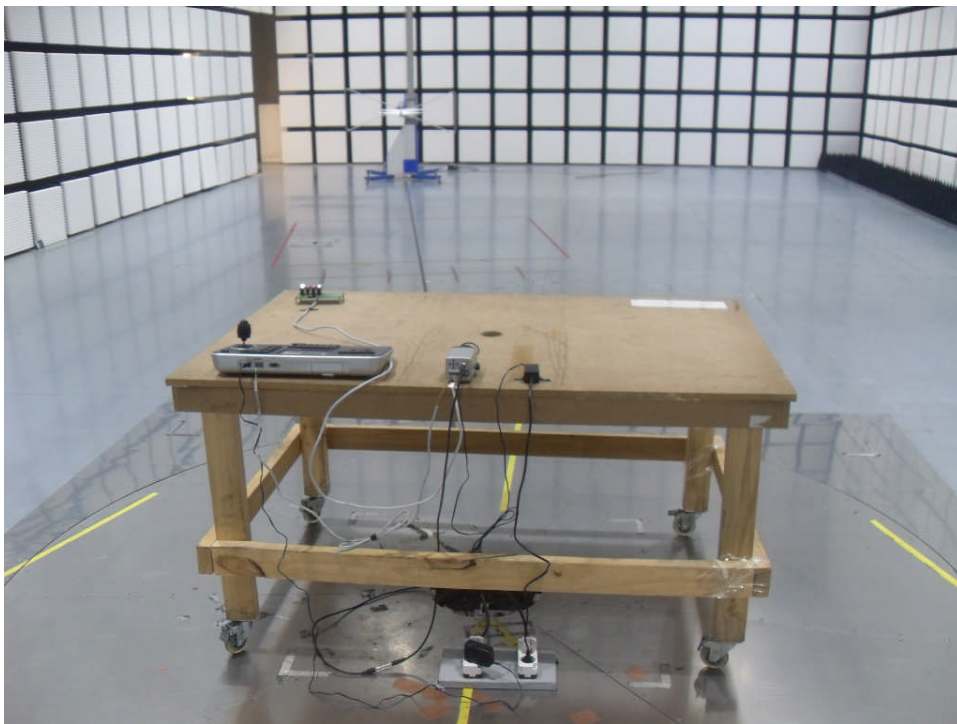
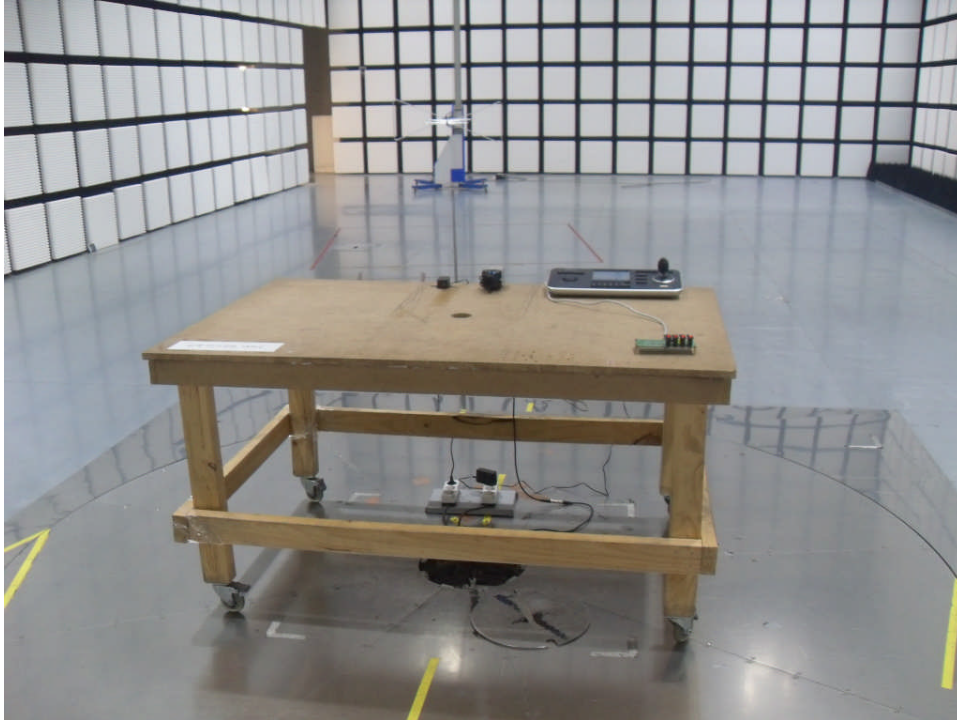
A.G= Amplifier Gain

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

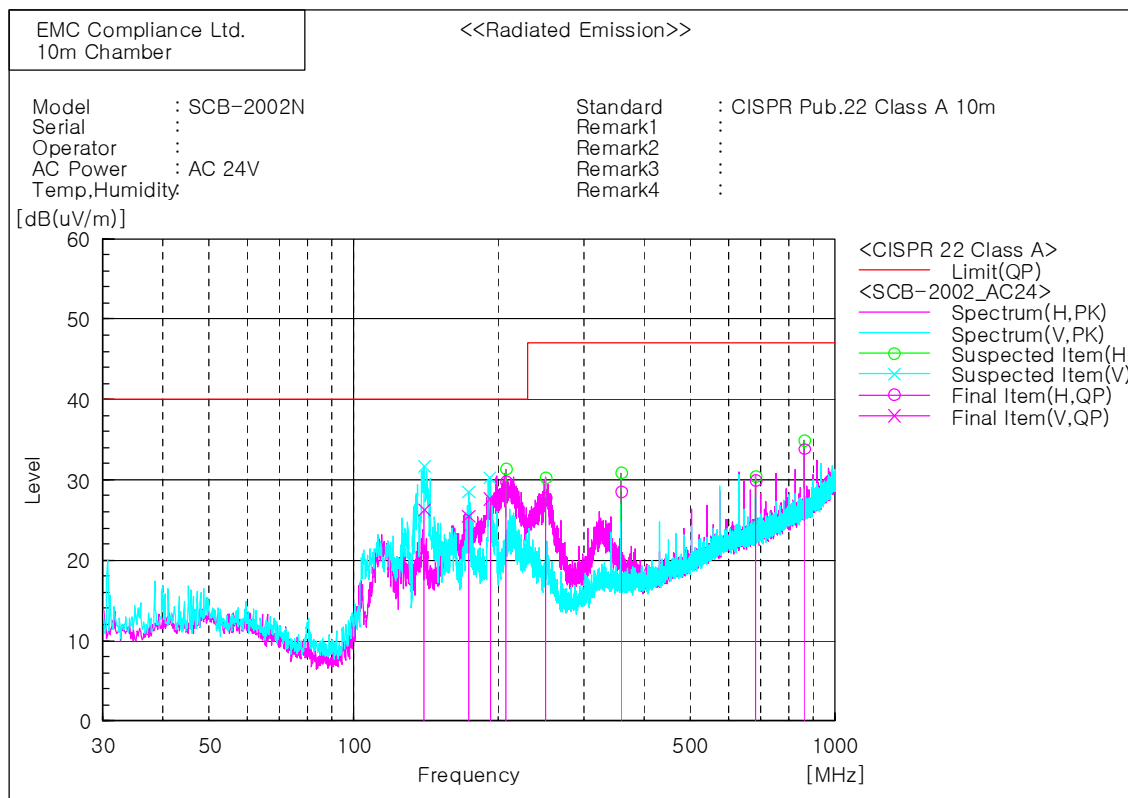
6.1.5 Photographs of test setup



6.2.6 Radiated emission measurement result

* Graph and Data

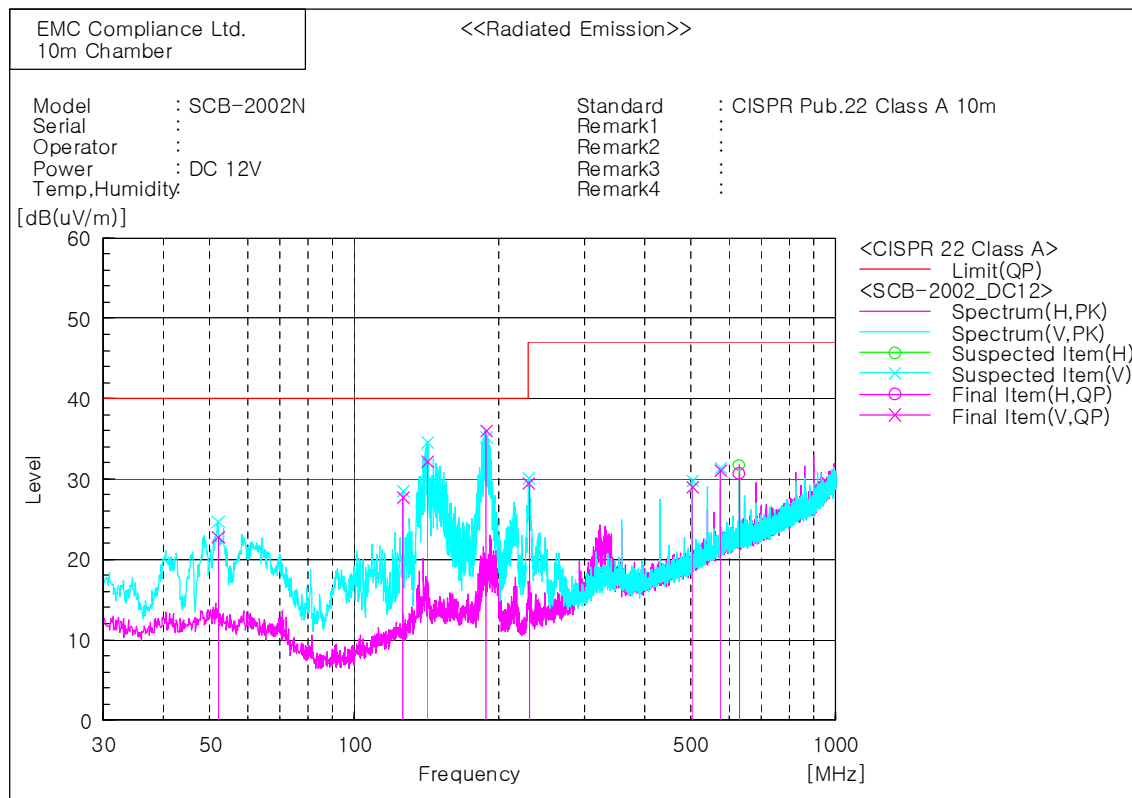
* AC 24 V



Final Result

No.	Frequency (P)	Reading QP	c.f	Result QP	Limit QP	Margin QP	Height	Angle
	[MHz]	[dB(uV)]	[dB(1/m)]	[dB(uV/m)]	[dB(uV/m)]	[dB]	[cm]	[deg]
1	139.853	V 39.4	-13.2	26.2	40.0	13.8	299.0	273.1
2	173.196	V 38.6	-13.1	25.5	40.0	14.5	100.0	237.6
3	191.869	V 42.5	-14.9	27.6	40.0	12.4	100.0	296.1
4	207.025	H 44.7	-15.0	29.7	40.0	10.3	399.0	251.7
5	250.675	H 40.2	-12.5	27.7	47.0	19.3	399.0	292.1
6	359.921	H 37.7	-9.2	28.5	47.0	18.5	202.0	41.8
7	684.023	H 31.7	-1.8	29.9	47.0	17.1	100.0	323.7
8	864.079	H 32.4	1.4	33.8	47.0	13.2	100.0	293.8

* DC 12 V



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	52.068	V	36.4	-13.7	22.7	40.0	17.3	100.0	268.6
2	126.030	V	42.5	-14.8	27.7	40.0	12.3	201.0	66.8
3	141.793	V	45.3	-13.1	32.2	40.0	7.8	100.0	258.0
4	187.989	V	50.6	-14.6	36.0	40.0	4.0	100.0	162.2
5	230.305	V	43.3	-13.8	29.5	47.0	17.5	100.0	301.4
6	503.966	V	34.3	-5.4	28.9	47.0	18.1	100.0	67.1
7	575.989	V	34.4	-3.4	31.0	47.0	16.0	100.0	5.8
8	630.066	H	33.2	-2.5	30.7	47.0	16.3	199.0	70.0

7. E.U.T. photographs

Front View



Rear View



Left View



Right View



Top View



Bottom View



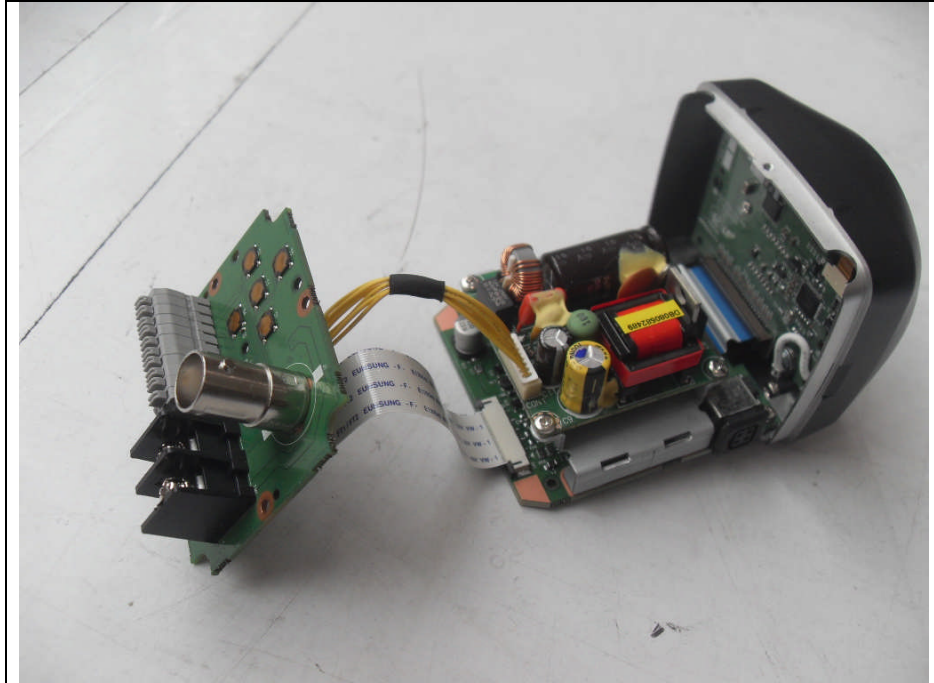
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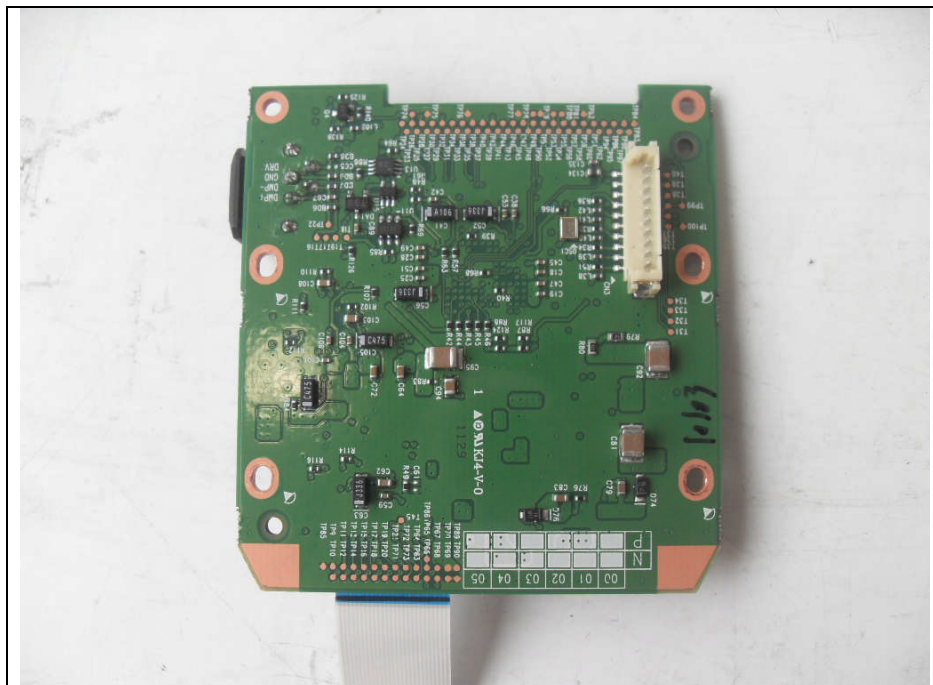
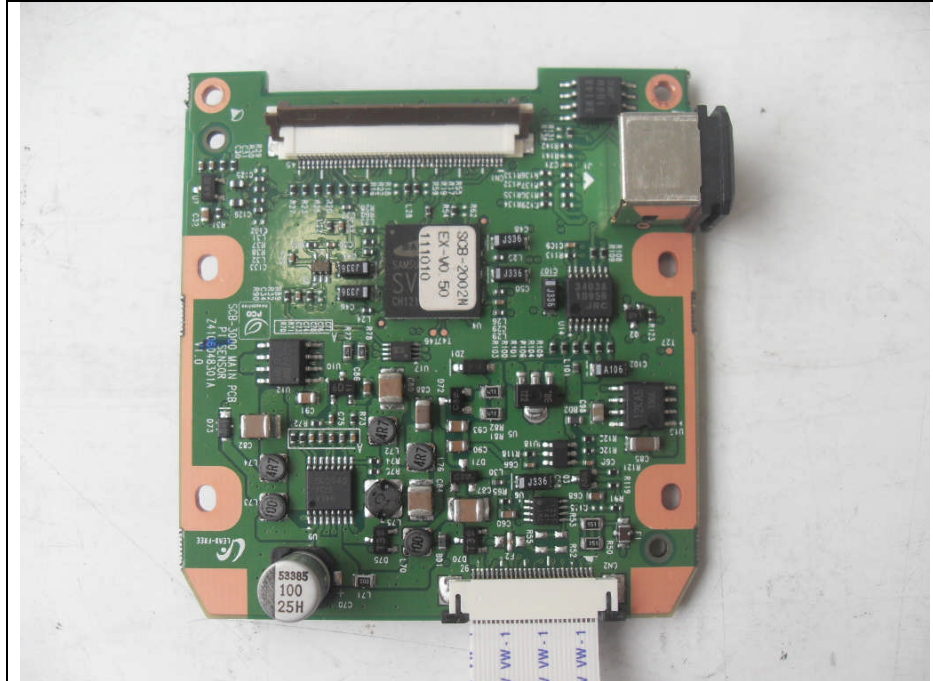
FCC Label Location

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



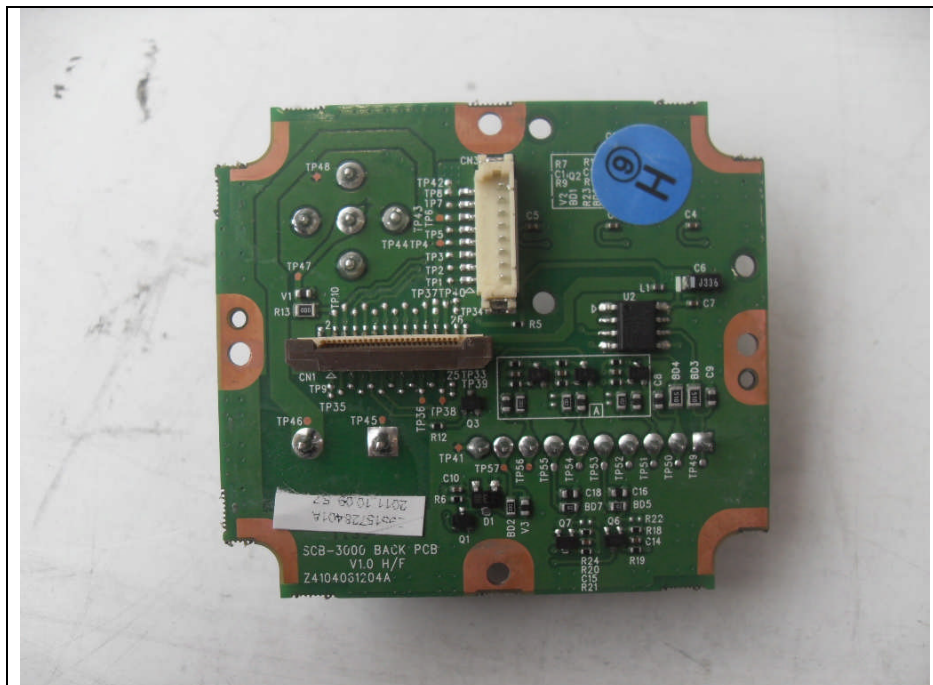
Main Board



CCD Board



Rear Board



SMPS Board

