

CERTIFICATE of EMC Compliance

Report No : EMC-FCC-1954
Type of equipment : CCTV Camera
Model Name : SCB-6001N
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

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EMI TEST REPORT

Test report No : EMC-FCC-1954
Type of Equipment : CCTV Camera
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No.11 Weiliu Road. Micro-Electronic Industrial
Park Jingang Road Tianjin 300385, China
Test standards : FCC part 15 subpart B, Class A
Classification : Verification
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: 2013. 06. 04

Date of testing: 2013. 06. 10

Issued date: 2013. 06. 17

Tested by:

PARK, GUN-SU

Approved by:

YEOM, HAN-SEOK

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1. Applicant information

Applicant: SAMSUNG TECHWIN CO., LTD.
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Contact name: **Kang Jei Soon**

Manufacturer#1: SAMSUNG TECHWIN CO., LTD.
Address: #42 Seongju-Dong, Changwon-Shi,
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Telephone: +82-70-7147-8361
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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: 82 505 299 8311

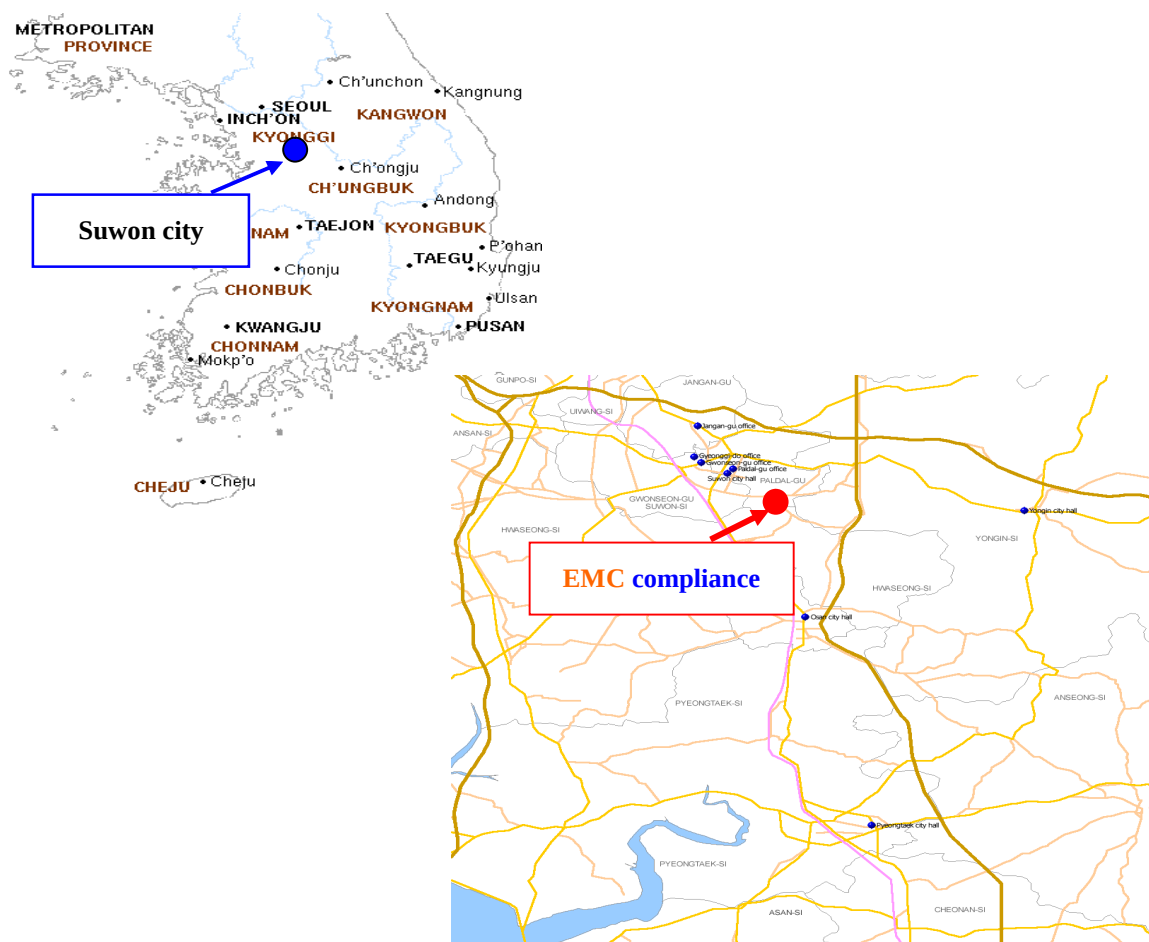
FCC CAB.: KR0040

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)	: 23 °C	36 % R.H.	-

Test site

These testing items were performed following locations;

Test item	Test site
Conducted Emission	Shielded Room
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 (C.L: Approx 95 %, k = 2)		
Shielded Room (CE#1)	9 kHz ~ 150 kHz: ± 3.82 dB 150 kHz ~ 30 MHz: ± 3.43 dB	
Shielded Room (CE#2)	9 kHz ~ 150 kHz: ± 3.82 dB 150 kHz ~ 30 MHz: ± 3.43 dB	
Shielded Room (CE#3)	9 kHz ~ 150 kHz: ± 4.00 dB 150 kHz ~ 30 MHz: ± 3.63 dB	
Radiated Emission measurement (C.L: Approx 95 %, k = 2)		
10 m Chamber (#F4)	30 MHz ~ 300 MHz	3 m: + 4.56 dB, - 4.58 dB 10 m: + 4.56 dB, - 4.56 dB
	300 MHz ~ 1 000 MHz	3 m: + 4.84 dB, - 4.85 dB 10 m: + 4.71 dB, - 4.72 dB
	1 GHz ~ 6 GHz	3 m: + 6.19 dB, - 6.20 dB
	6 GHz ~ 18 GHz	3 m: + 6.41 dB, - 6.53 dB
10 m Chamber (#F2)	30 MHz ~ 300 MHz	3 m: + 4.86 dB, - 4.88 dB 10 m: + 4.86 dB, - 4.86 dB
	300 MHz ~ 1 000 MHz	3 m: + 4.98 dB, - 4.99 dB 10 m: + 4.85 dB, - 4.87 dB
	1 GHz ~ 6 GHz	3 m: + 6.19 dB, - 6.20 dB
	6 GHz ~ 18 GHz	3 m: + 6.41 dB, - 6.53 dB

4. Description of E.U.T.

4.1 General information

Items		Description
Video	Video	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	Progressiv Scan
	Min. Illumination	Color : 1Lux @ F1.2, 0.017 Lux (Sens-up, 60x) B/W : 0.1 Lux @ F1.2, 0.0017 Lux (Sens-up, 60x)
	S / N Ratio	50dB (AGC off, Weight on)
	Video Output	SMPTE292M (HD-SDI), Monotoring CVBS
Lens Type	Lens Type	Manual / DC Auto Iris
	Mount Type	C/CS
Operational	On Screen Display	Multi-language Support English, Korean, Japanese, Spanish, French, Portuguese, Chinese, German, Italian, Russian, Czech, Polish, Rumanian, Serbian, Swedish, Denish, Turkish, Thai, Taiwanese
	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	Motion Detection(Off/On)

Items		Description
Operational	Privacy Masking	Off / On (16 Rect-angle zones)
	Sens-up (Frame Integration)	2x ~ 60x
	Gain Control	Off / Low / Middle / High
	White Balance	ATW / Outdoor / Indoor / Manual / AWC (1,700K° ~ 11,000K°)
	Electronic Shutter Speed	Esc / A.FLK / Manual
	Digital Zoom	Off / On (1x ~ 16x)
	Reverse	Off / H-Rev / V-Rev / HV-Rev
	Communication	RS-485
	Protocol	RS-485 : SAMSUNG-T, SAMSUNG-E, Pelco-D, Pelco-P, Bosch, Honeywell, Vicon, Panasonic, GE, AD
Environmenta	Operating Temperature / Humidity	0°C ~ +50°C / ~ 90% RH
Electrical	Input Voltage/Current	Dual (24VAC±10% & 12VDC±10%)
	Power Consumption	Max. 6W
Mechanica	Color / Material	Body : Dark Gray / Aluminum, Steel
	Dimension (WxHxD)	W72 x H60 x D136.8mm
	Weight	434g
HD-SDI Transmission Distance	L-5C2V (75ohm)	Max. 100~140m
	L-6CHD (75 ohm)	Max. 200m

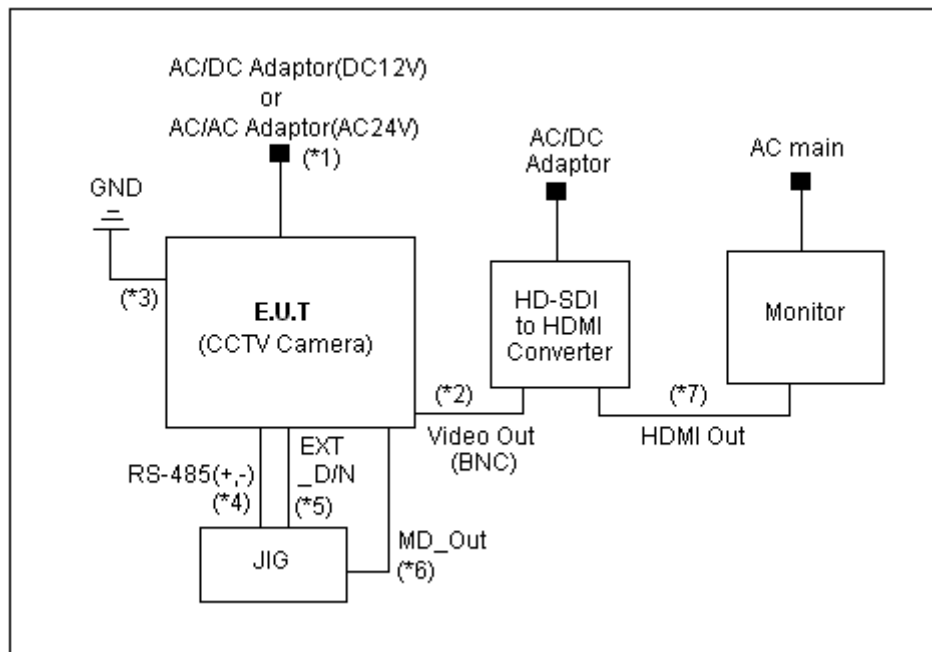
4.2 Product description

Type of product	CCTV Camera
Model name (Basic)	SCB-6001N
Model name (Variant)	-
Difference	-
Trade name	-
Serial no	-
Testing voltage	DC 12 V , AC 24 V
Product rating	DC 12 V , AC 24 V
Internal clock frequency	Above 108 MHz
Note	* AC/DC adaptor was not provided by the manufacturer. * AC/AC adaptor was not provided by the manufacturer.

4.3 Auxiliary equipments

Type	Model / Part #	Serial number	Manufacturer
Monitor	CF23MS	NC07H1KZ602039A	SAMSUNG
HD-SDI to HDMI Converter	SPH-110C	C8DN67GD401013J	Samsung Techwin
JIG	-	-	-
AC/DC Adaptor (DC 12 V)	DAD12050DKA	-	Samsung Techwin
AC/AC Adaptor (AC 24 V)	STA-220	-	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/DC Adaptor or AC/AC Adaptor	Power	1.7	Non-Shield
2		Video Out (BNC)	HD-SDI to HDMI Converter	Video In (BNC)	3.0	Shield
3		GND	GND	GND	1.5	Non-Shield
4		RS-485(+,-)	JIG	RS-485(+,-)	3.0	Non-Shield
5		EXT_D/N		EXT_D/N	3.0	Non-Shield
6		MD_Out		MD_In	3.0	Non-Shield
7	HD-SDI to HDMI Converter	HDMI Out	Monitor	HDMI In	1.8	Shield

4.5 Operating conditions

The EUT was configured as normal intended use.

Test mode	Normal operating
1	Check video output with monitor.

* Note: 2 types of powers are available for the product, that are DC 12 V, AC 24 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 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	DC 12 V, AC 24 V		
Test facility	10 m Chamber (#F2)		
Test distance	10 m, 3 m		
Date	2013. 06. 10		
Temperature (°C)	23 °C	Humidity (% R.H.)	36 % R.H.
Remarks	Complied		

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	ESCI7	100732	R&S	2014.02.18	☒
Bi-Log Antenna	VULB 9168	440	SCHWARZBECK	2013.10.04	☒
Amplifier	310N	293004	SONOMA INSTRUMENT	2013.11.06	☒
3 dB Attenuator	8491B	22981	HP	2014.03.19	☒
Antenna Mast	MA4000-EP	303	Innco Systems	-	☒
Turn Table	DT2000S-1t	079	Innco Systems	-	☒
Amplifier	8449B	3008A02343	AGILENT	2013.11.06	☒
Horn ANT	3115	00086706	ETS	2013.11.21	☒

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

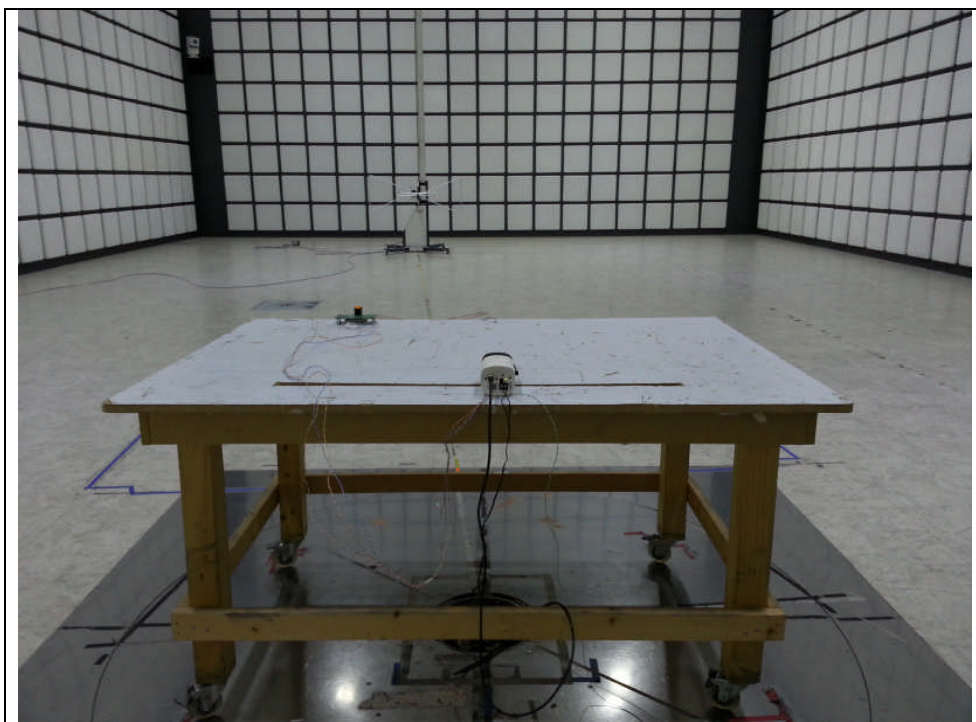
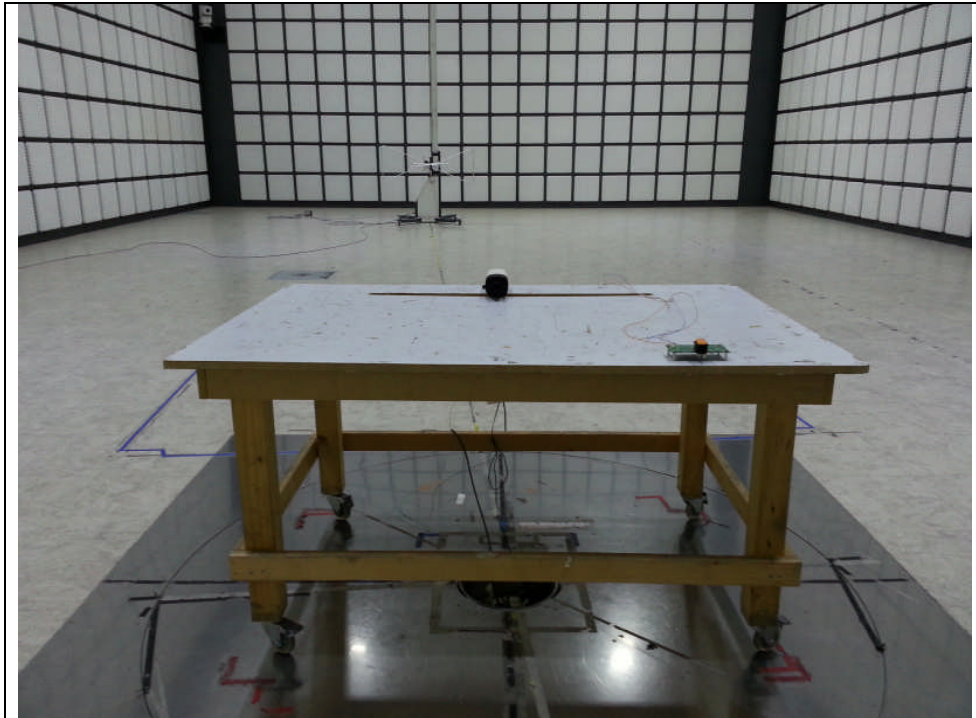
3 dB Att = 3 dB Attenuator

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

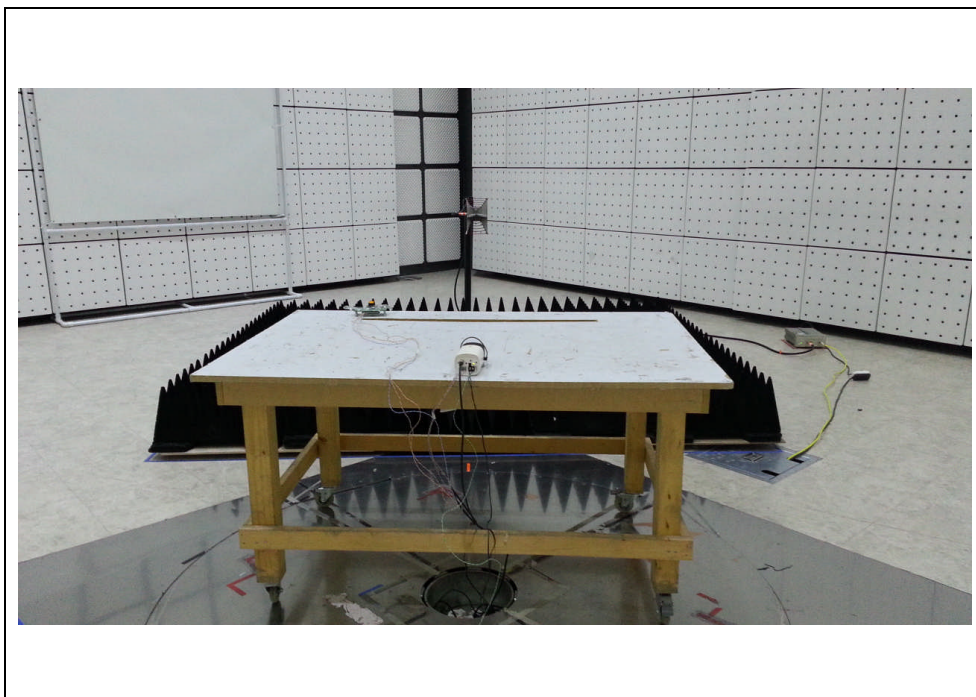
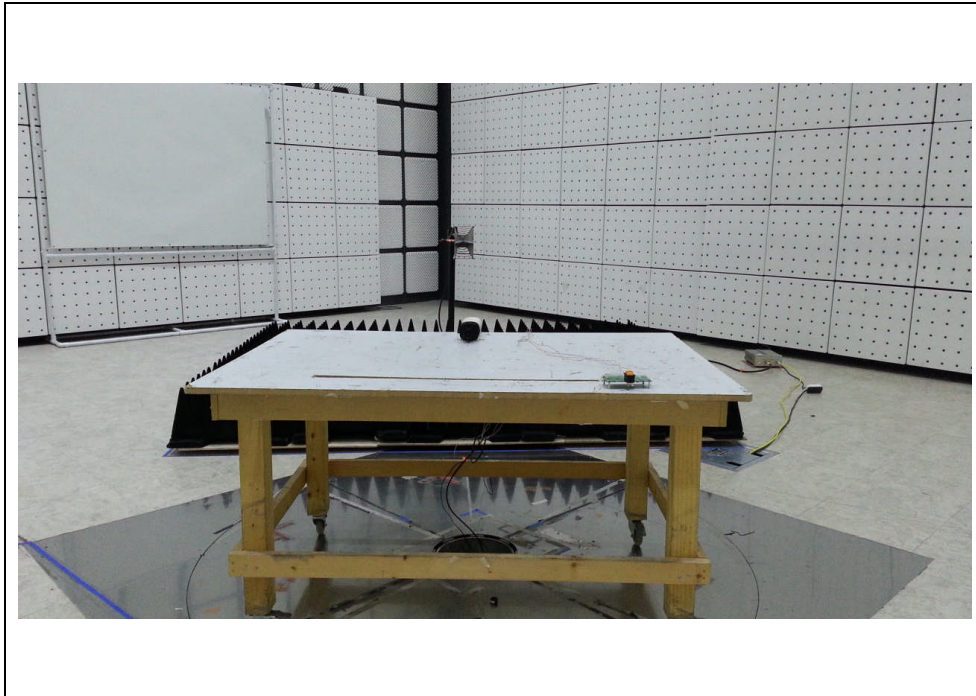
The result is $30 + 12 + 5 + 3 - 35 = 15 \text{ dB}(\mu\text{V/m})$

6.1.5 Photographs of test setup

* 30 MHz ~ 1 GHz



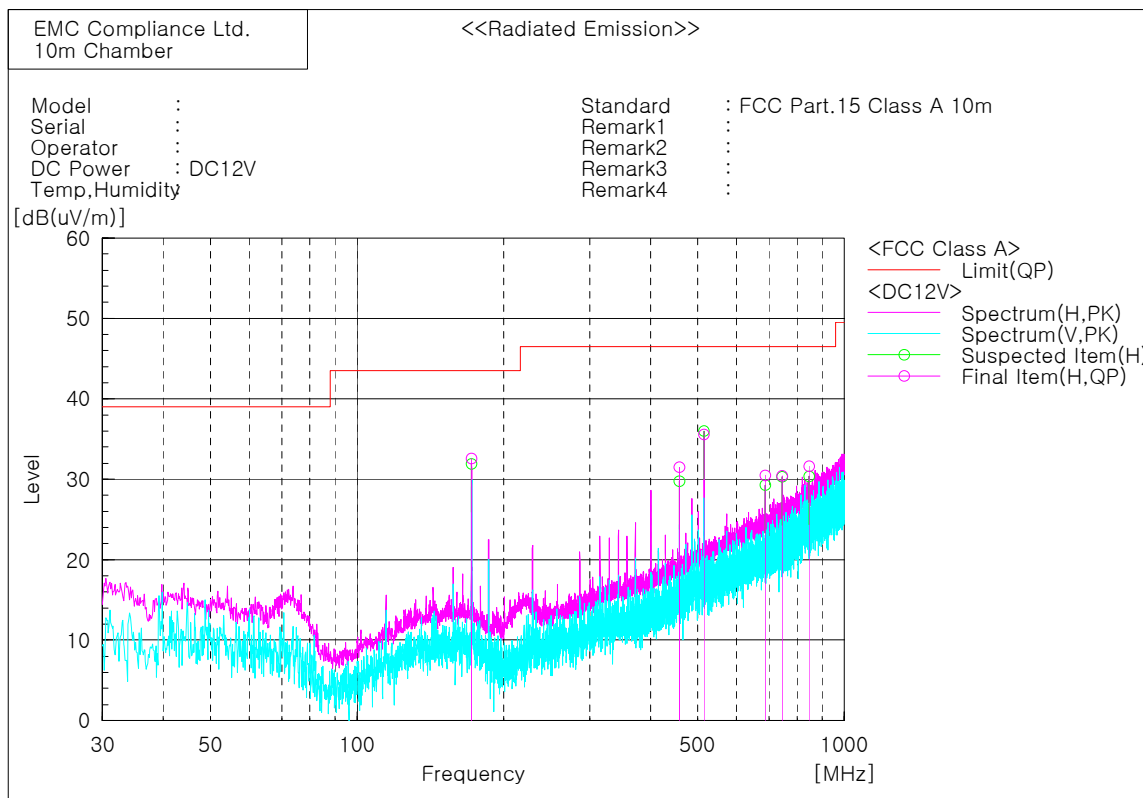
* 1 GHz ~ 6 GHz



6.1.6 Radiated emission measurement result

* Graph and Data

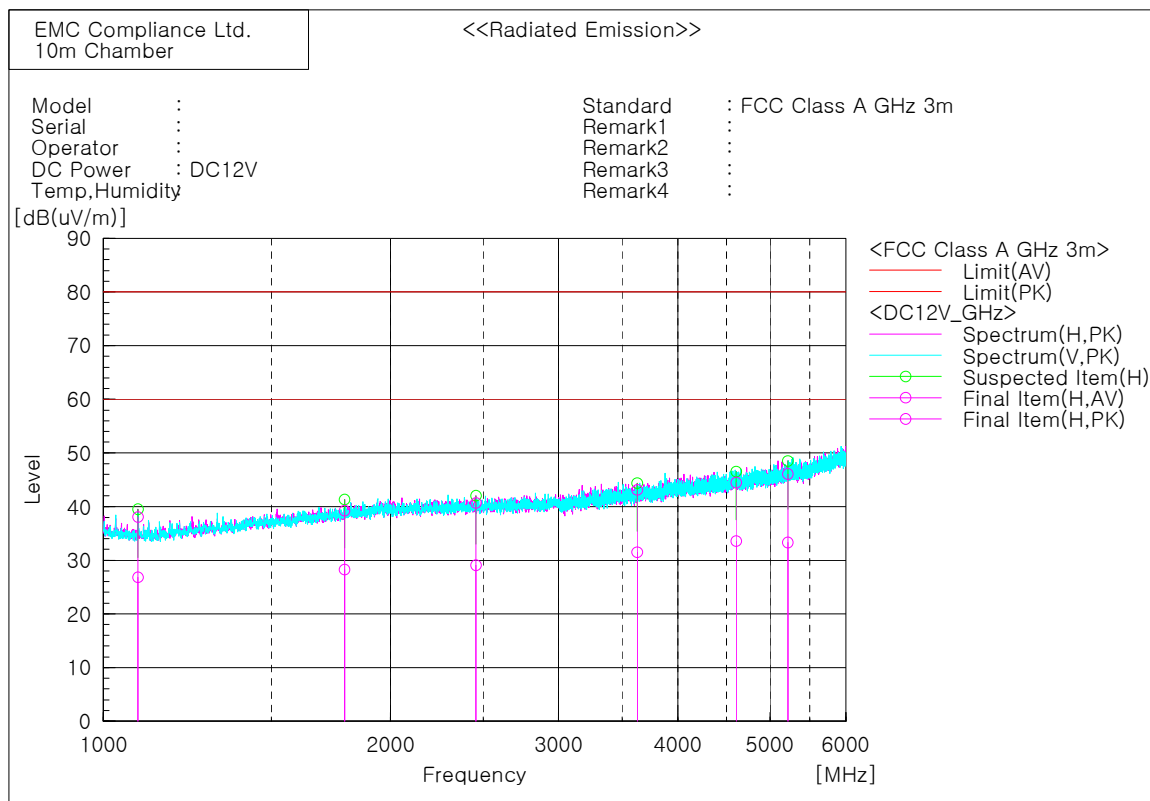
* 30 MHz ~ 1 GHz (SCB-6001N)_DC 12V



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]	Remark
1	171.741	H	45.2	-12.6	32.6	43.5	10.9	300.0	104.2	
2	458.134	H	37.2	-5.7	31.5	46.5	15.0	200.0	51.7	
3	515.485	H	39.6	-4.0	35.6	46.5	10.9	100.0	206.3	
4	687.296	H	30.9	-0.4	30.5	46.5	16.0	200.0	345.6	
5	744.648	H	29.6	0.8	30.4	46.5	16.1	400.0	347.4	
6	846.983	H	28.4	3.2	31.6	46.5	14.9	100.0	86.1	

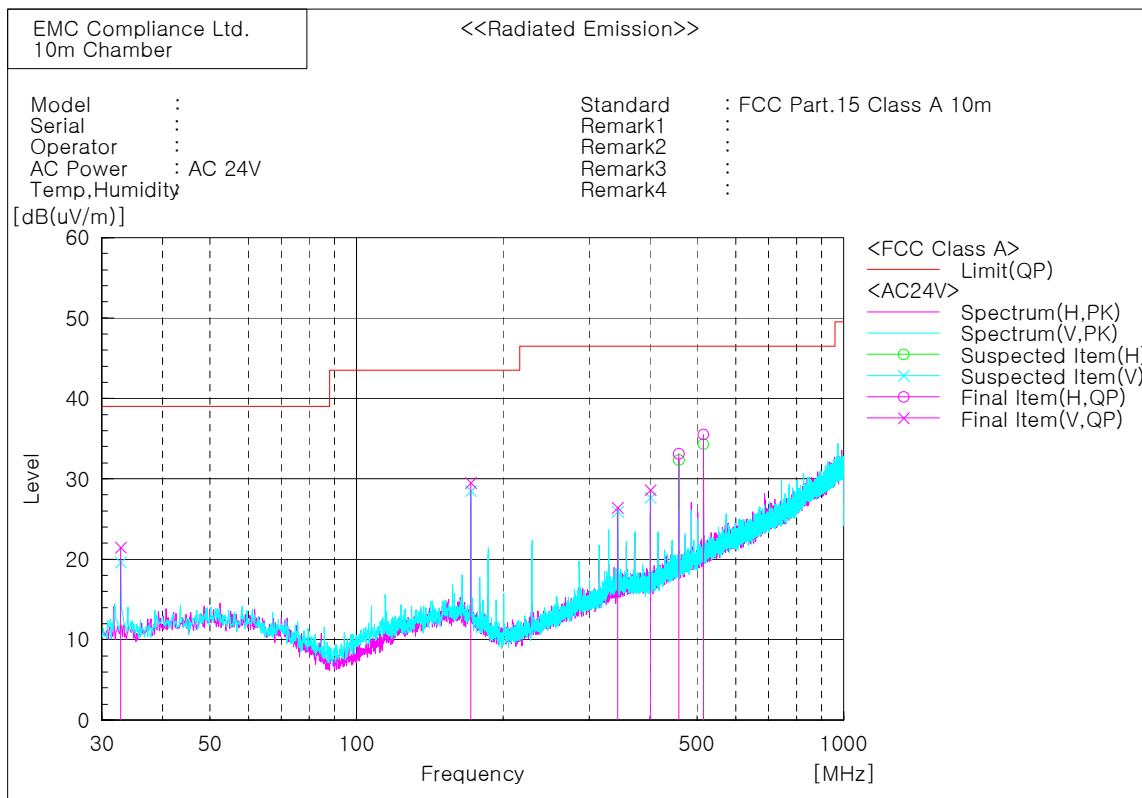
* 1 GHz ~ 6 GHz (SCB-6001N)_DC 12V



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]	Remark
1	1088.125	H	34.8	46.1	-8.0	26.8	38.1	60.0	80.0	33.2	41.9	99.0	205.1	
2	1790.625	H	30.8	41.7	-2.5	28.3	39.2	60.0	80.0	31.7	40.8	99.0	124.1	
3	2456.875	H	29.5	41.1	-0.4	29.1	40.7	60.0	80.0	30.9	39.3	99.0	151.1	
4	3629.375	H	28.5	40.1	3.0	31.5	43.1	60.0	80.0	28.5	36.9	99.0	229.1	
5	4608.125	H	27.4	38.3	6.2	33.6	44.5	60.0	80.0	26.4	35.5	99.0	188.6	
6	5218.750	H	25.3	38.1	8.0	33.3	46.1	60.0	80.0	26.7	33.9	99.0	60.9	

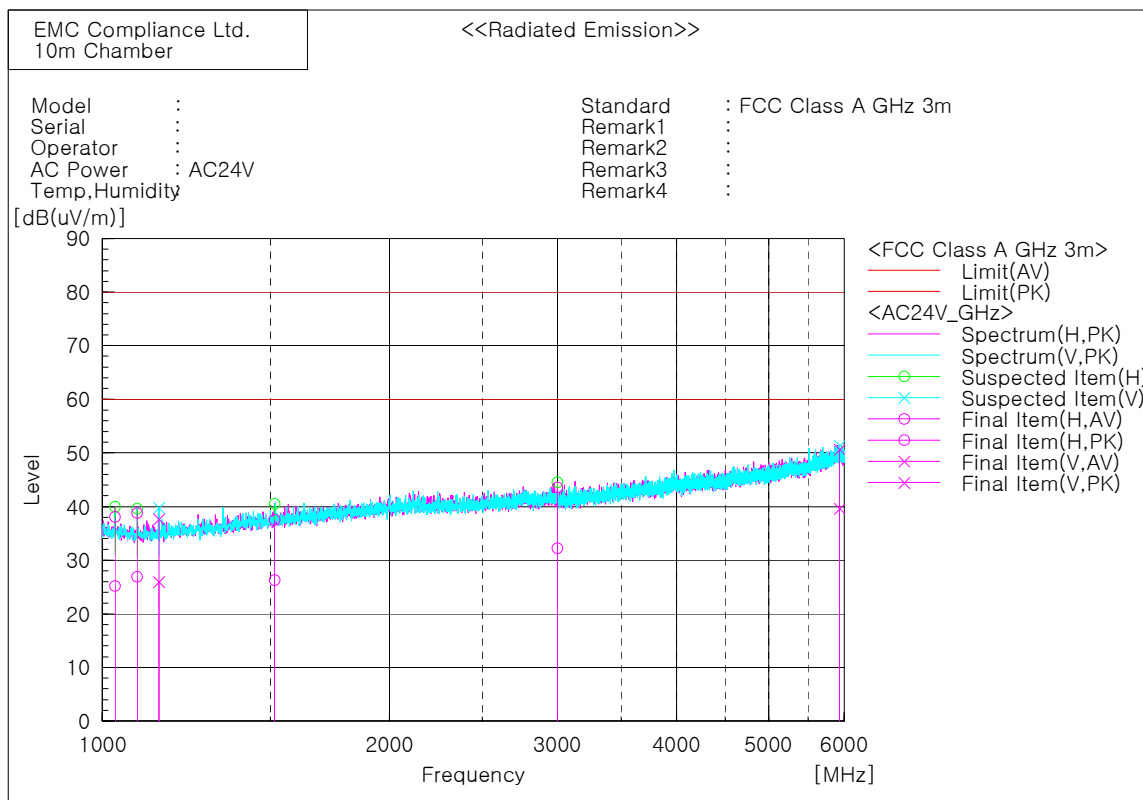
* 30 MHz ~ 1 GHz (SCB-6001N)_AC 24V



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]	Remark
1	32.817	V	36.4	-14.9	21.5	39.0	17.5	400.0	34.5	
2	171.812	V	42.1	-12.6	29.5	43.5	14.0	100.0	253.8	
3	343.626	V	35.4	-9.0	26.4	46.5	20.1	100.0	333.4	
4	400.939	V	36.0	-7.4	28.6	46.5	17.9	400.0	199.8	
5	458.129	H	38.8	-5.7	33.1	46.5	13.4	202.0	249.2	
6	515.441	H	39.5	-4.0	35.5	46.5	11.0	202.0	23.5	

* 1 GHz ~ 6 GHz (SCB-6001N)_AC 24V



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]	Remark
1	1030.625	H	32.9	45.8	-7.7	25.2	38.1	60.0	80.0	34.8	41.9	100.0	44.4	
2	1068.125	H	34.9	46.8	-8.0	26.9	38.8	60.0	80.0	33.1	41.2	100.0	101.3	
3	1145.625	V	33.5	45.2	-7.6	25.9	37.6	60.0	80.0	34.1	42.4	100.0	63.1	
4	1515.625	H	30.5	41.7	-4.2	26.3	37.5	60.0	80.0	33.7	42.5	100.0	119.3	
5	3000.625	H	31.9	43.3	0.3	32.2	43.6	60.0	80.0	27.8	36.4	100.0	114.8	
6	5931.250	V	28.5	39.6	11.1	39.6	50.7	60.0	80.0	20.4	29.3	100.0	212.4	

7. E.U.T. photographs

Front View



Rear View



Left View



Right View



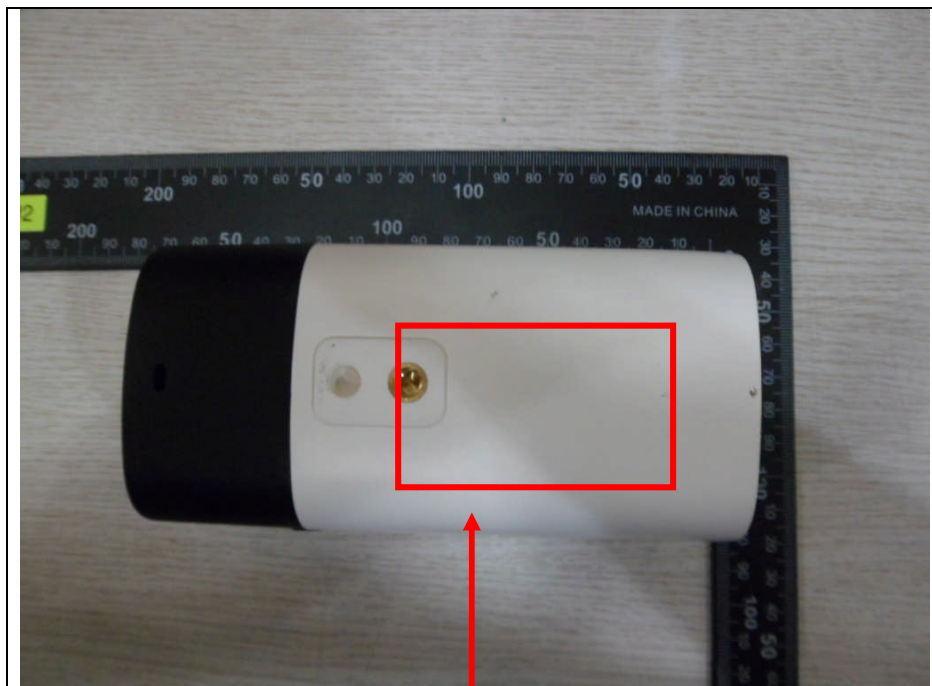
Top View



Bottom View



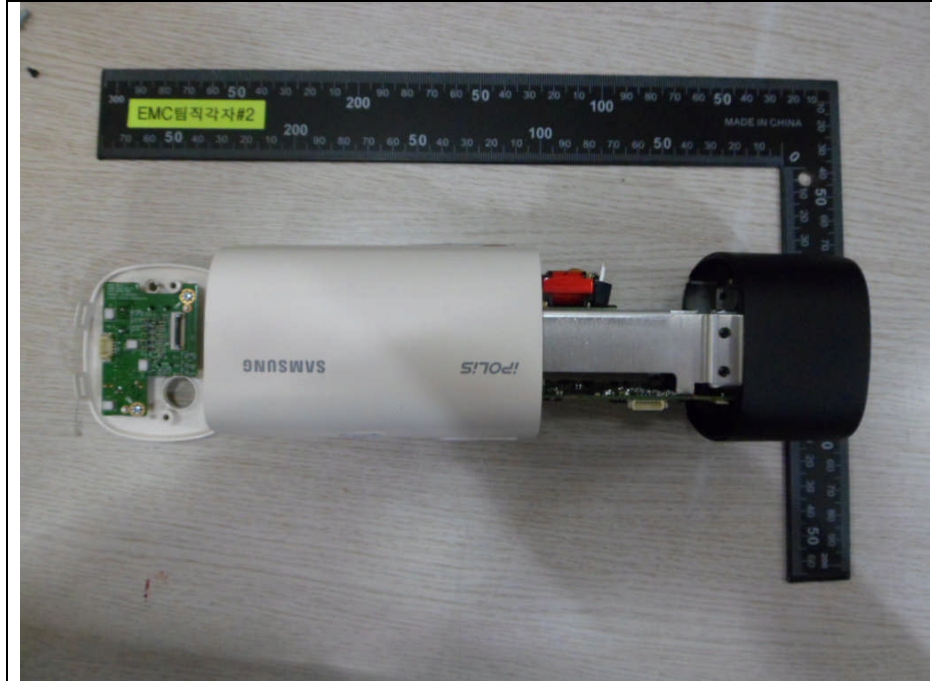
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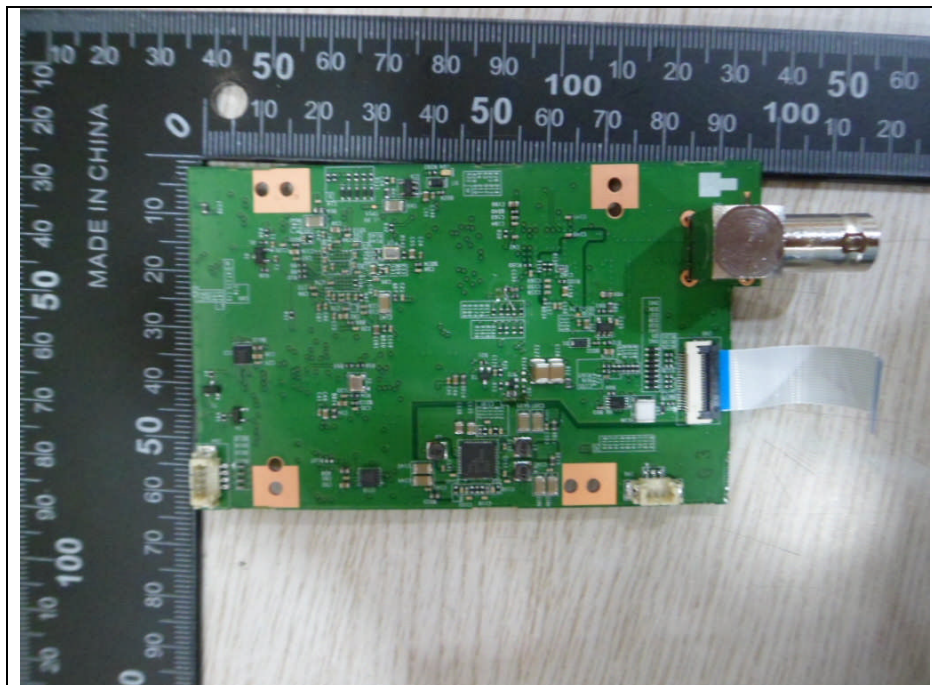
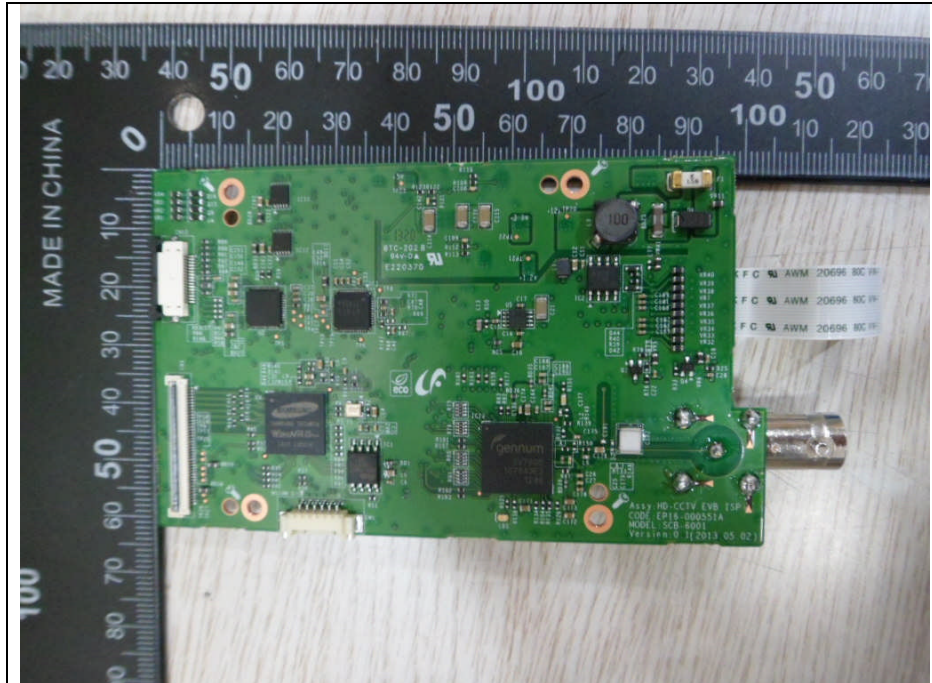
FCC Label Location

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.

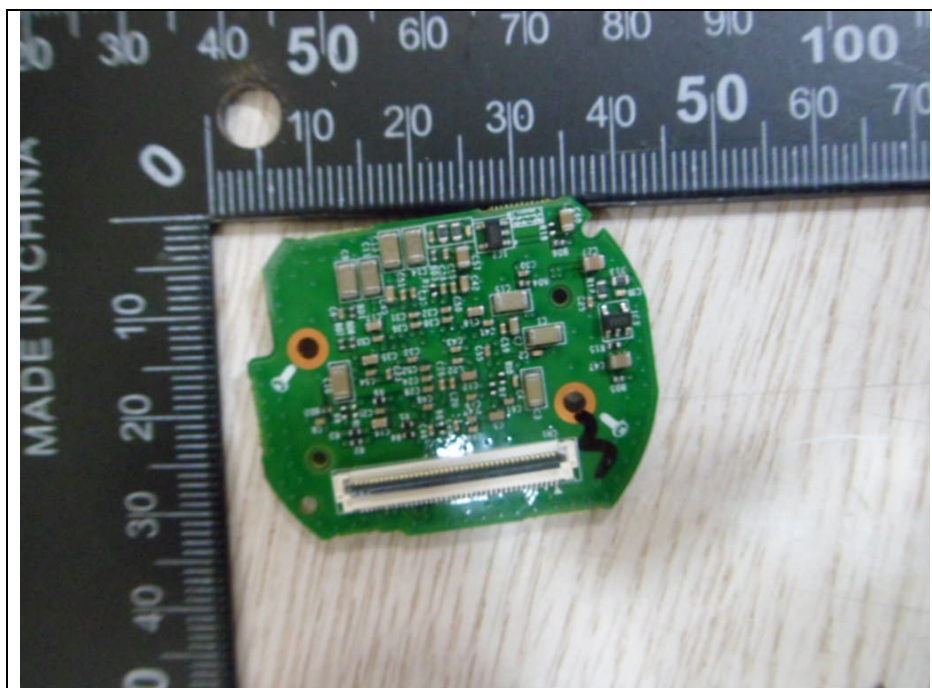
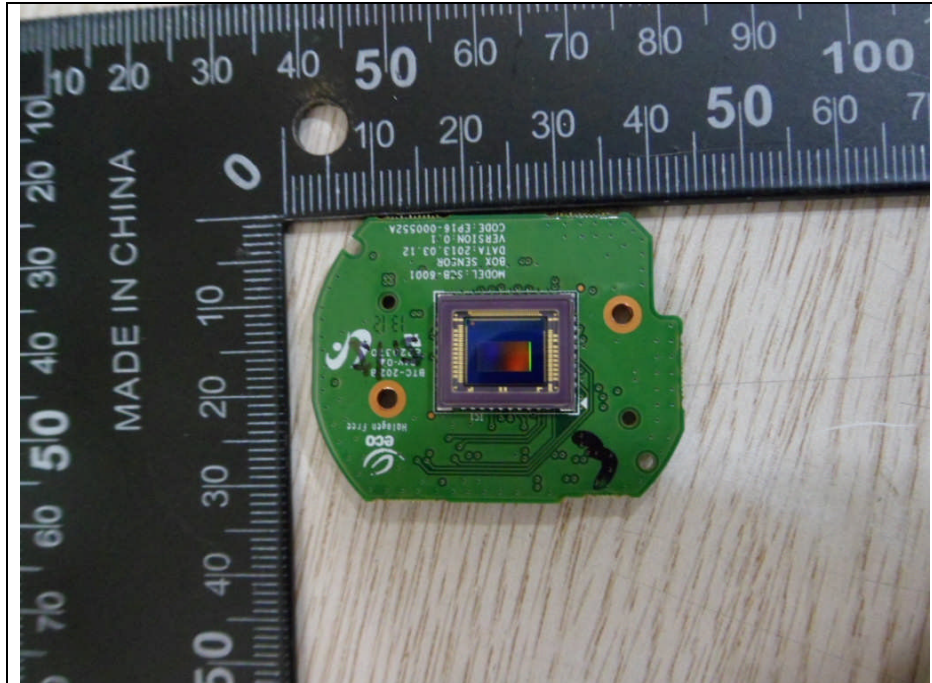
Inside



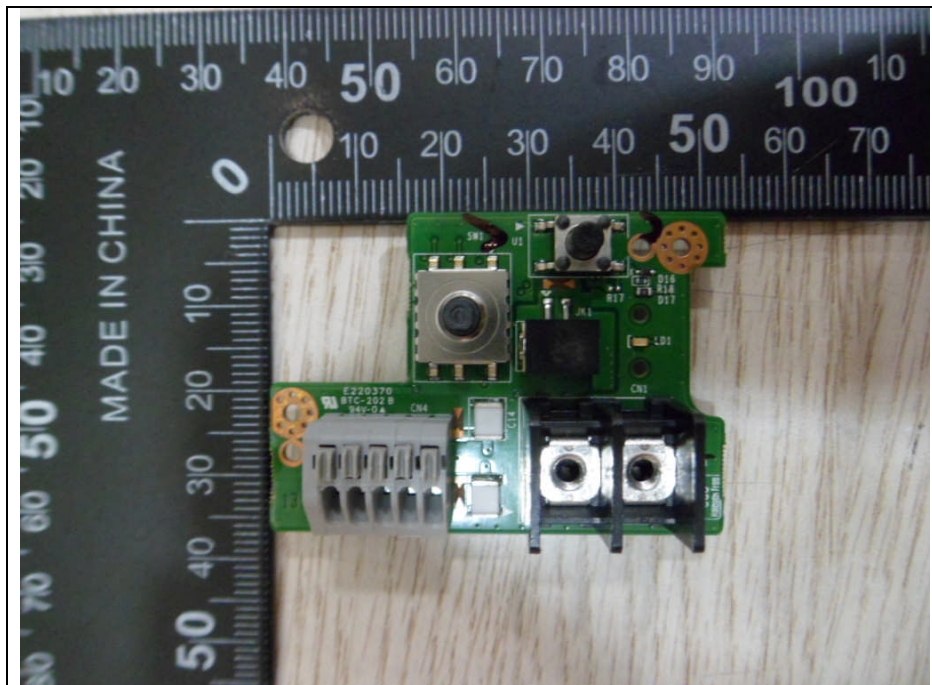
Main Board



CCD Board



SUB Board



Power Board

