

EMC TEST REPORT

Test report No : EMC-VCCI-0321
Type of Equipment : CCTV Camera
Model Name : SCD-3083N
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 : VCCI V-3 / 2012.04, Class A
Testing Laboratory : EMC Compliance Ltd.
Test result : Complied

The above equipment was tested by EMC compliance Testing Laboratory for compliance with the requirements of VCCI 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.

Date of receipt: 2013. 08. 12

Date of testing: 2013. 08. 14

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Tested by:

KIM, JIN-WON

Approved by:

YEOM, HAN-SEOK

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1. Applicant information

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Manufacturer#2: TIANJIN SAMSUNG TECHWIN OPTO-ELECTRONIC CO., LTD
Address: No.11 Weiliu Road, Micro-Electronic Industrial Park
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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

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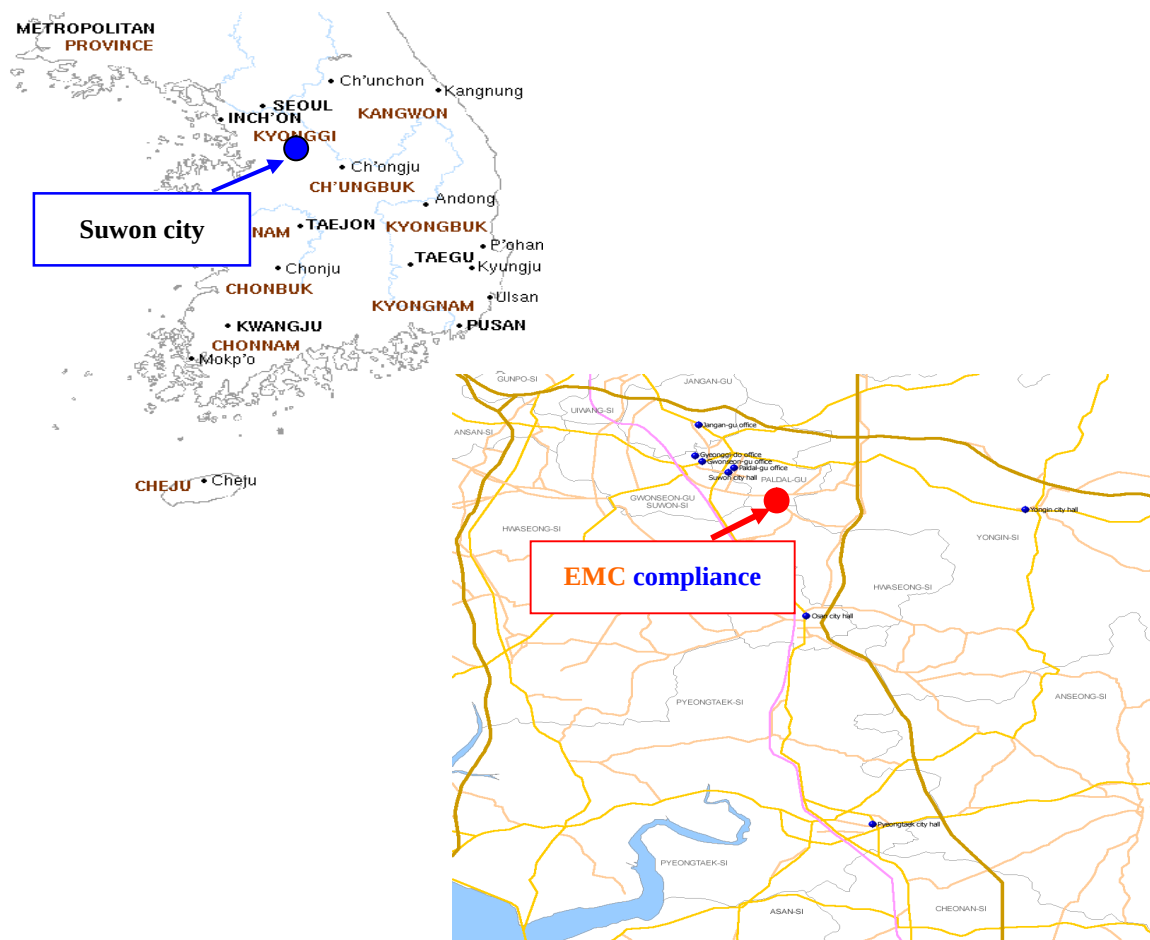
FCC CAB.: KR0040

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)	: 27 °C	55 % 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

Video	SCD-3083N	SCD-3083P
Imaging Device	1/3" Super HAD CCD II (Double Scan)	
Total Pixels	811(H) x 508(V)	795(H) x 596(V)
Effective Pixels	768(H) x 494(V)	752(H) x 582(V)
Scanning System	2 : 1 Interlace	
Synchronization	Internal/Line Lock	
Frequency	H : 15.734KHz / V : 59.94Hz	H : 15.625KHz / V : 50Hz
Horizontal Resolution	Color : 700 TV lines(ER mode). B/W : 700 TV lines	
Min. Illumination	Color : 0.1Lux (50IRE@F1.2), 0.0002Lux(Sens-up, x512) B/W : 0.01Lux(50IRE@F1.2), 0.00002Lux(Sens-up, x512)	
S / N Ratio	52dB (AGC off, Weight on)	
Video Output	CVBS : 1.0 Vp-p / 75Ω composite	
UTP Output	-	
Lens Type		
Focal Length (Zoom Ratio)	2.8 - 10mm (3.6x) motorized varifocal	
Max. Aperture Ratio	1:1.2(Wide) - 2.8(Tele)	
Angular Field of View	H: 94.0°(Wide) - 26.0°(Tele) / V: 67.0°(Wide) - 20.0°(Tele)	
Min. Object Distance	0.2m	
Focus Control	-	
Zoom Movement Speed	-	
Lens Type	DC Auto Iris	
Mount Type	Board Type	
Pan / Tilt		
Pan Range	0° - 340°	
Pan Speed	-	
Tilt Range	0° - 73°	
Tilt Speed	-	
Rotate Range	0° - 340°	
Preset	-	
Preset Accuracy	-	
Auto Tracking	-	

Operational		
On Screen Display	Multi-language Support by Coaxial Cable English, Japanese, Spanish, French, Portuguese, Korean	Multi-language Support by Coaxial Cable English, French, German, Spanish, Italian, Chinese, Russian, Polish, Czech, Romanian, Serbian, Swedish, Danish, Turkish, Portuguese
Camera Title	Off / On (Displayed 15 characters)	
Day & Night	Auto (ICR) / External / Color / B/W	
Backlight Compensation	Off / User BLC / HLC / SSDR / WDR	
Wide Dynamic Range	128x	160x
Contrast Enhancement	SSDR	
Digital Noise Reduction	SSNR _{III} (Off / On)	
Digital Image Stabilization	Off / On	
Motion Detection	Off / On (8 programmable zones)	
Privacy Masking	Off / On (12 programmable zones)	
Sens-up (Frame Integration)	2x ~ 512x	
Gain Control	Off / Low / High	
White Balance	/ 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	Off / On	
Intelligent Video	Fixed_Moved, Area, Fence, Detection, Counting	
PIP	Off / On	
Schedule	-	
Alarm	1 Out	
Communication	Coaxial Control (SPC-300 Compatible)	
Protocol	Coax : Palco-C (Coaxitron)	

Environmental	
Operating Temperature / Humidity	10°C ~ +50°C (+14°F ~ +122°F) / Less than 90% RH
Ingress Protection	-
Electrical	
Input Voltage	Dual (24VAC±10% & 12VDC±10%)
Power Consumption	TBD
Mechanical	
Color / Material	Ivory, Plastic (Dome Cover : Clear)
Dimension (WxH)	Φ115.8x92.7mm
Weight	TBD

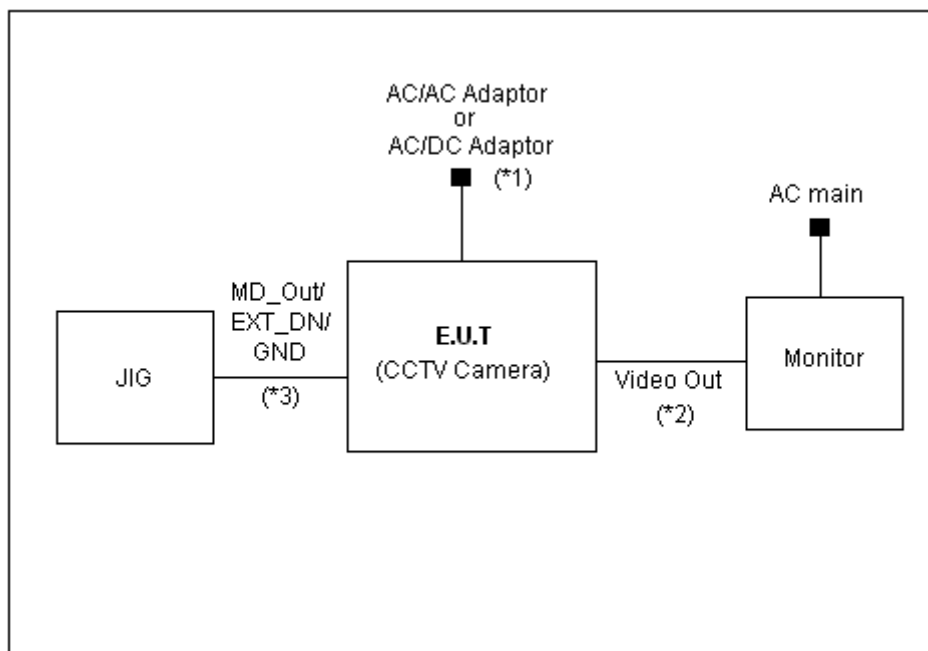
4.2 Product description

Type of product	CCTV Camera
Model name (Basic)	SCD-3083N
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	PM24KO	YER8HVDBA00057E	SAMSUNG
JIG	-	-	-
AC/AC Adaptor (AC 24V)	DRL-241500AC	SA06013-4002	SAMSUNG
AC/DC Adaptor (DC 12V)	DAD12050DKA	SA10022-8001	SAMSUNG

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	1.5	Non-Shield
2		Video Out	Monitor	Video In	3.0	Shield
3		MD_Out/EXT_DN/GND	JIG	MD_In/EXT_DN/GND	3.0	Non-Shield

4.5 Operating conditions

The EUT was configured as normal intended use.

Test mode	Normal operating
1	Check the 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

5.1 Summary of EMI emission test results

Applied	Test items	Test method	Result
☐	Conducted Emission	VCCI V-3 / 2012.04, Class A	N/A
☒	Radiated Emission	VCCI V-3 / 2012.04, Class A	Complied

6. Test results

6.1 Radiated Emission

Test specification	VCCI V-3 / 2012.04, Class A		
Testing voltage	DC 12 V, AC 24 V		
Test facility	10 m Chamber (#F2)		
Test distance	10 m, 3 m		
Date	2013. 08. 14		
Temperature (°C)	27 °C	Humidity (% R.H.)	55 % R.H.
Remarks	Complied		

6.1.1 Limits of radiated emission measurement

☒ Limits below 1 GHz

Frequency [MHz]	Class A (dB(μV/m)) @10 m	Class B (dB(μV/m)) @10 m
30 ~ 230	40	30
230 ~ 1000	47	37

☒ Limits above 1 GHz

Frequency [GHz]	Class A @ 3 m		Class B @ 3 m	
	Average limit (dB(μV/m))	Peak limit (dB(μV/m))	Average limit (dB(μV/m))	Peak limit (dB(μV/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

Equipment	Model no.	Serial no.	Makers	Next Cal. Date	Used
Test Receiver	ESCI7	100732	R&S	2014.02.18	☒
Test Receiver	ESCI	100001	R&S	2014.07.25	☐
Test Receiver	ESCI	100710	R&S	2013.11.06	☐
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	☒
Spectrum Analyzer	FSP7	100289	R&S	2013.12.14	☐

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

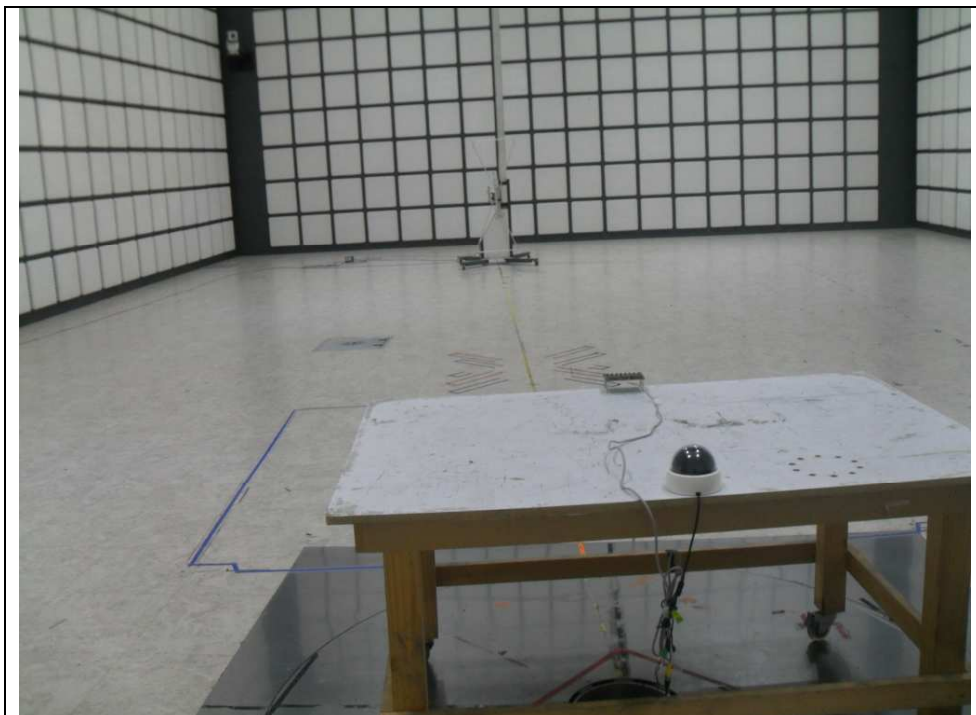
3 dB Att = 3 dB Attenuator

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

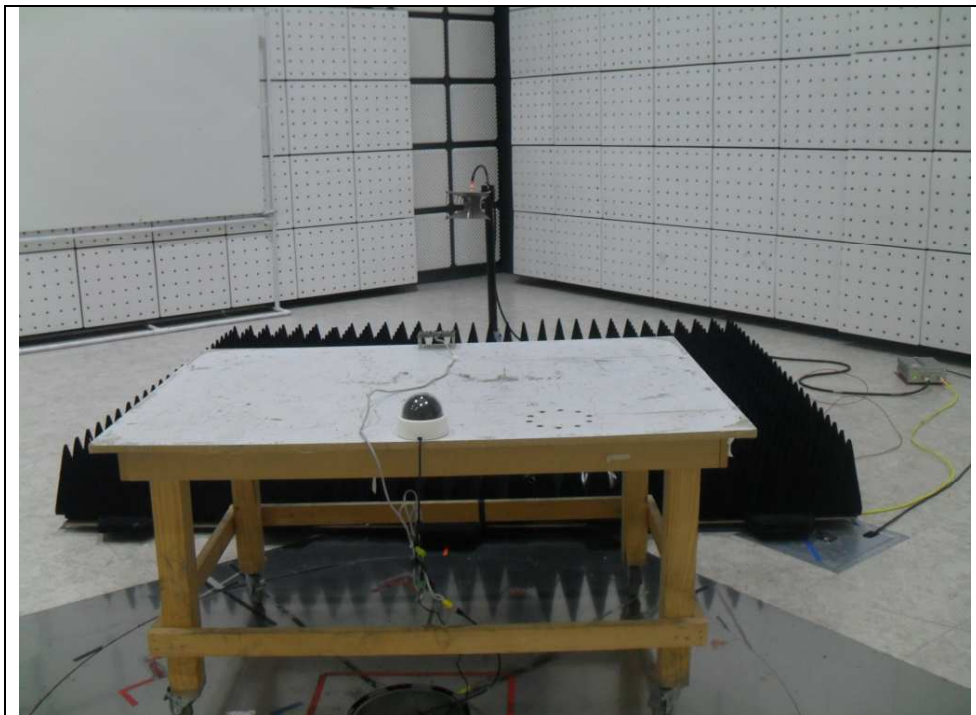
The result is $30 + 12 + 5 + 3 - 35 = 15 \text{ dB}(\mu\text{V/m})$

6.1.5 Photographs of test setup

* 30 MHz ~ 1 GHz



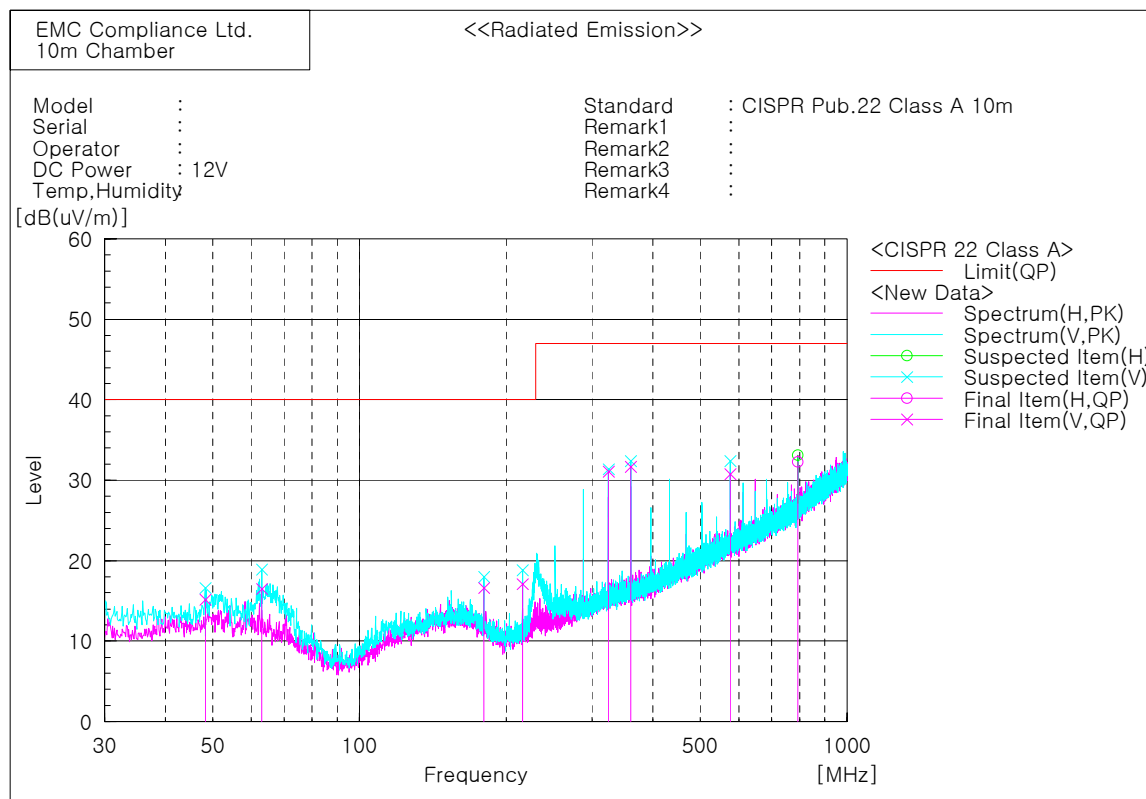
* 1 GHz ~ 6 GHz



6.2.6 Radiated emission measurement result

* Graph and Data

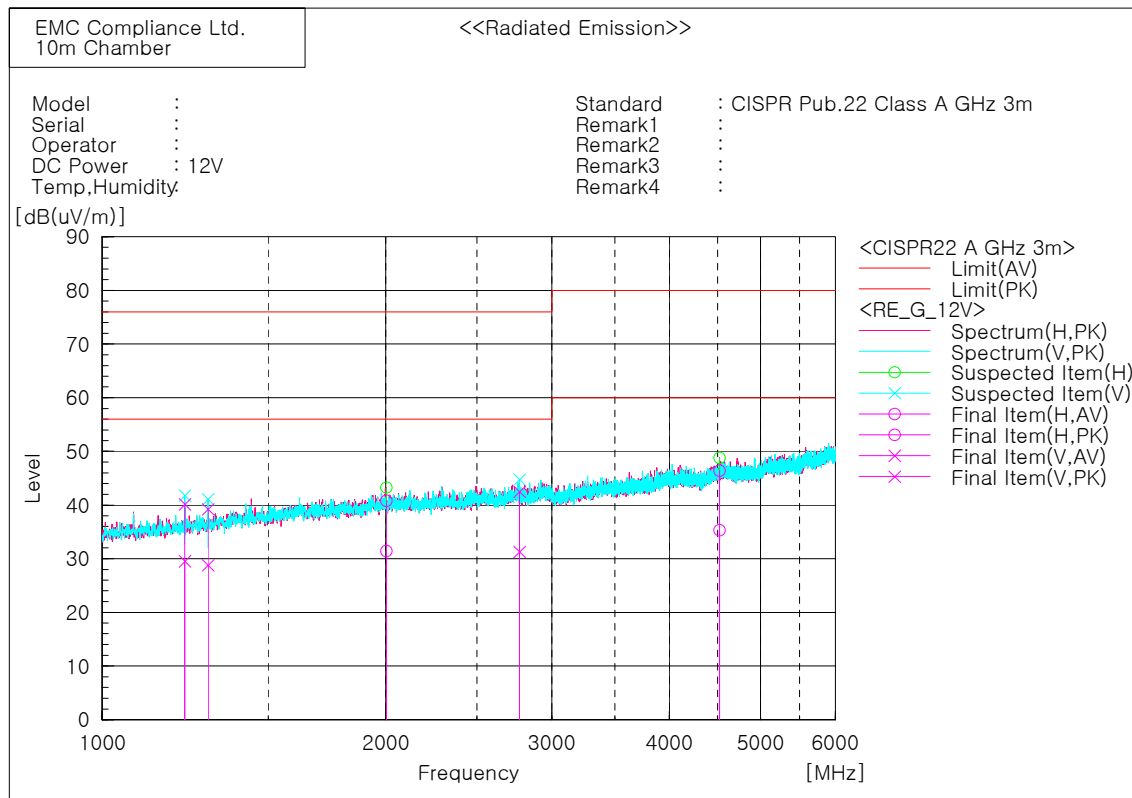
* 30 MHz ~ 1 GHz (SCD-3083N)_DC 12V



Final Result

No.	Frequency	(P)	Reading	c.f	Result	Limit	Margin	Height	Angle	Remark
	[MHz]		QP		QP	QP	QP			
			[dB(uV)]	[dB(1/m)]	[dB(uV/m)]	[dB(uV/m)]	[dB]	[cm]	[deg]	
1	48.327	V	28.5	-13.3	15.2	40.0	24.8	100.0	96.5	
2	63.116	V	30.3	-13.8	16.5	40.0	23.5	100.0	28.2	
3	179.871	V	30.0	-13.4	16.6	40.0	23.4	100.0	96.5	
4	215.978	V	31.3	-14.2	17.1	40.0	22.9	100.0	214.9	
5	323.999	V	40.6	-9.5	31.1	47.0	15.9	100.0	6.7	
6	360.043	V	40.2	-8.5	31.7	47.0	15.3	400.0	170.9	
7	575.910	V	33.1	-2.3	30.8	47.0	16.2	299.0	306.3	
8	792.107	H	30.4	1.9	32.3	47.0	14.7	400.0	355.6	

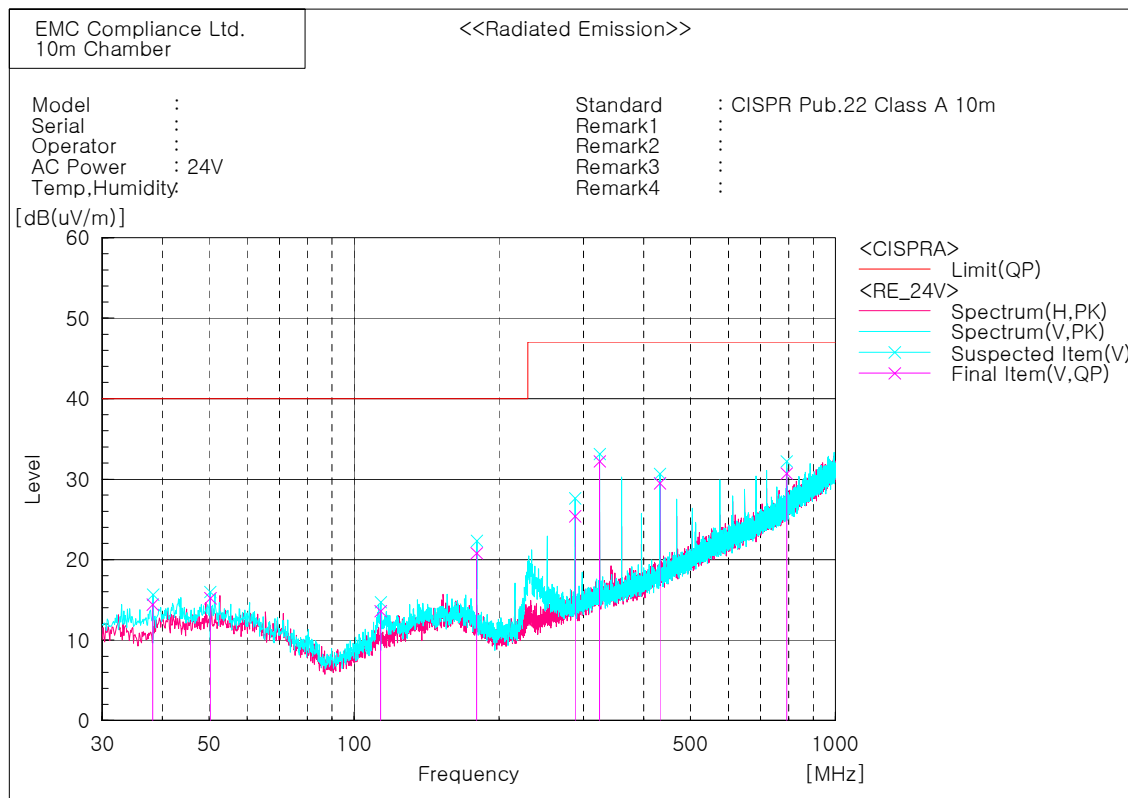
* 1 GHz ~ 6 GHz (SCD-3083N)_DC 12V



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]
1	1223.750	V	36.3	46.9	-6.8	29.5	40.1	56.0	76.0	26.5	35.9	100.0	108.1
2	1295.625	V	35.0	45.4	-6.2	28.8	39.2	56.0	76.0	27.2	36.8	100.0	100.6
3	2001.875	H	32.6	42.0	-1.2	31.4	40.8	56.0	76.0	24.6	35.2	100.0	276.5
4	2772.500	V	31.3	42.5	0.0	31.3	42.5	56.0	76.0	24.7	33.5	100.0	322.6
5	4520.000	H	28.8	39.9	6.5	35.3	46.4	60.0	80.0	24.7	33.6	100.0	193.9

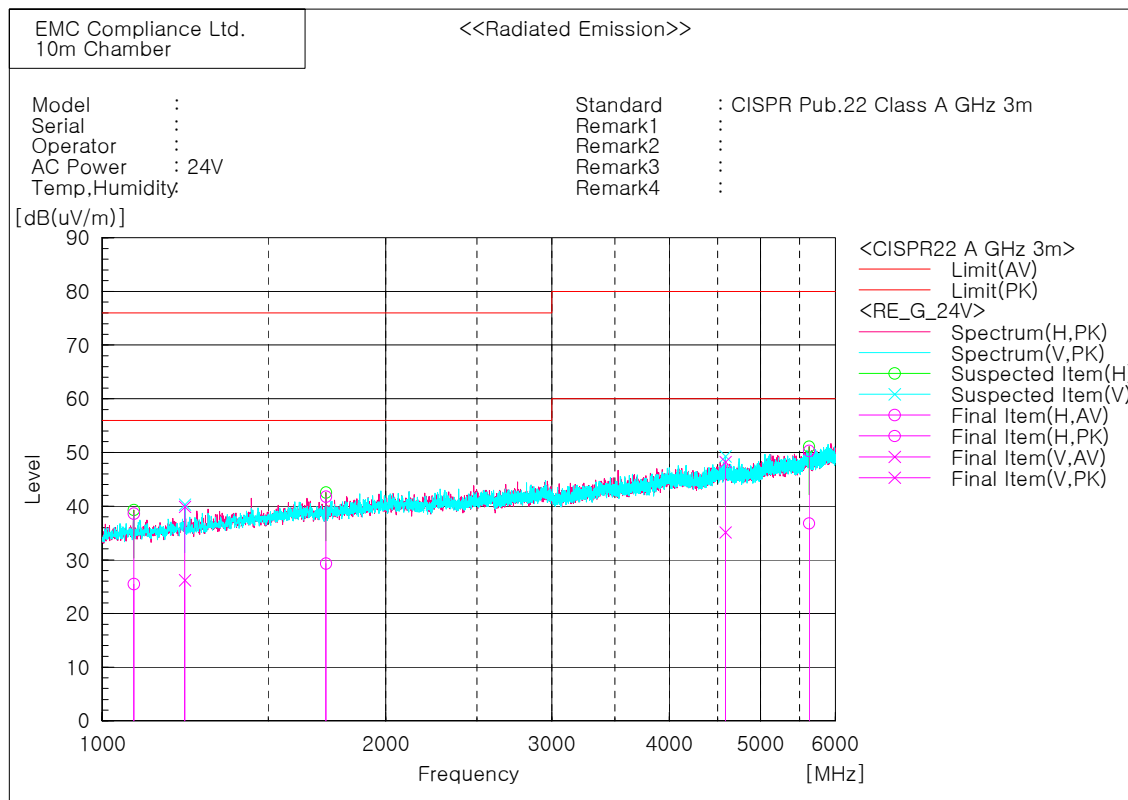
* 30 MHz ~ 1 GHz (SCD-3083N)_AC 24V



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c.f [dB(1/m)]	Result QP [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
1	38.188	V	28.8	-14.4	14.4	40.0	25.6	100.0	260.4
2	50.317	V	28.5	-13.3	15.2	40.0	24.8	299.0	156.8
3	113.527	V	29.1	-15.5	13.6	40.0	26.4	400.0	263.5
4	179.765	V	34.2	-13.4	20.8	40.0	19.2	100.0	84.2
5	288.149	V	36.2	-10.8	25.4	47.0	21.6	100.0	172.4
6	323.997	V	41.7	-9.5	32.2	47.0	14.8	100.0	182.4
7	431.977	V	35.9	-6.4	29.5	47.0	17.5	100.0	247.8
8	792.114	V	28.8	1.9	30.7	47.0	16.3	299.0	6.2

* 1 GHz ~ 6 GHz (SCD-3083N)_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]
1	1080.000	H	33.7	46.8	-8.2	25.5	38.6	56.0	76.0	30.5	37.4	100.0	270.2
2	1223.750	V	33.0	46.7	-6.8	26.2	39.9	56.0	76.0	29.8	36.1	100.0	97.4
3	1728.125	H	32.4	44.9	-3.1	29.3	41.8	56.0	76.0	26.7	34.2	100.0	240.2
4	4586.875	V	28.4	41.5	6.7	35.1	48.2	60.0	80.0	24.9	31.8	100.0	49.2
5	5626.875	H	26.9	40.4	9.9	36.8	50.3	60.0	80.0	23.2	29.7	100.0	79.7

7. E.U.T. photographs

Front View



Rear View



Left View



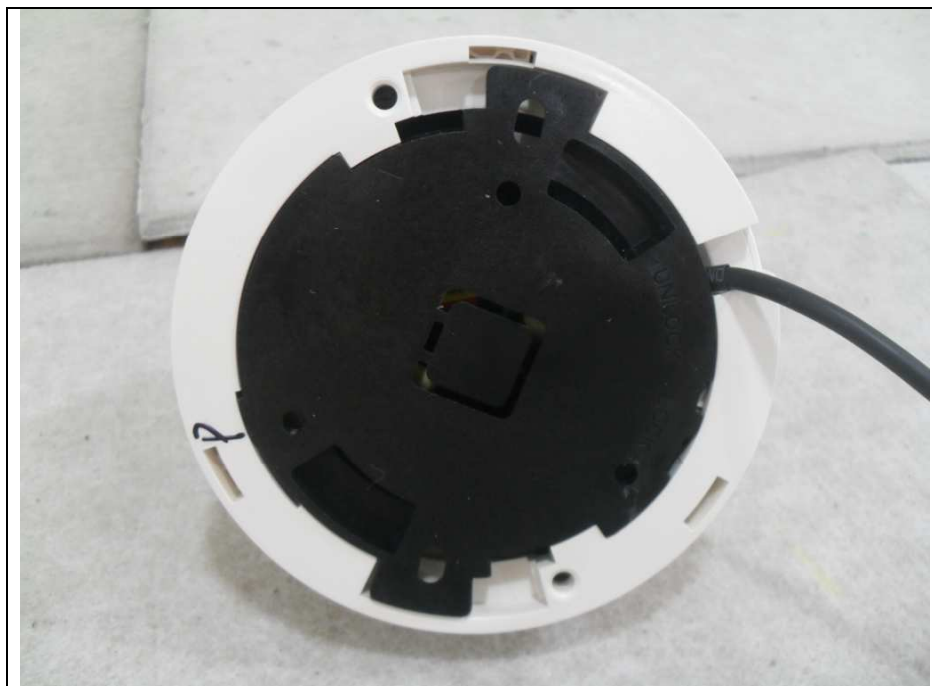
Right View



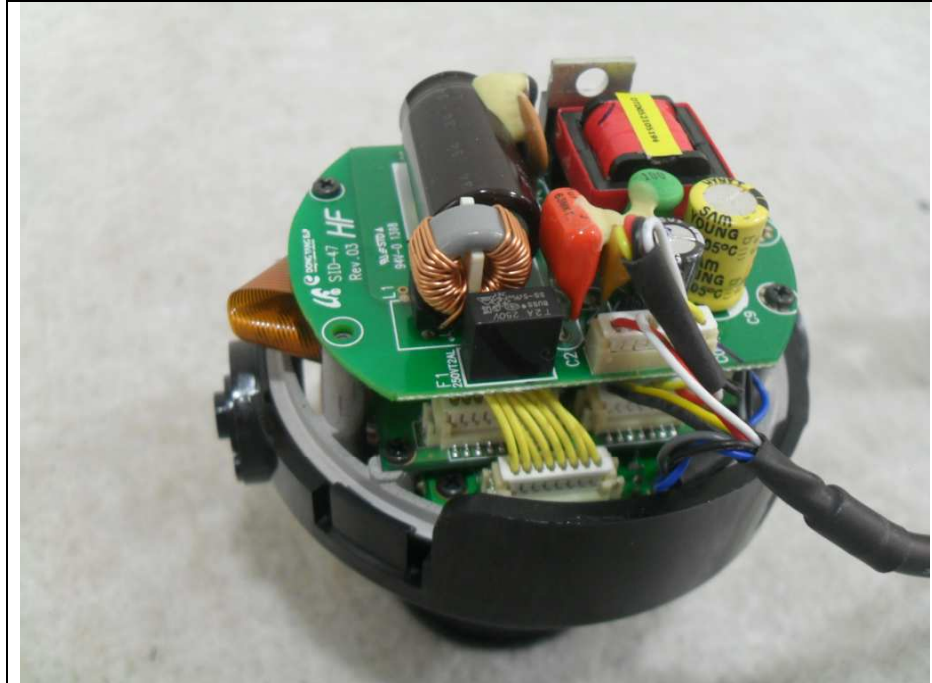
Top View



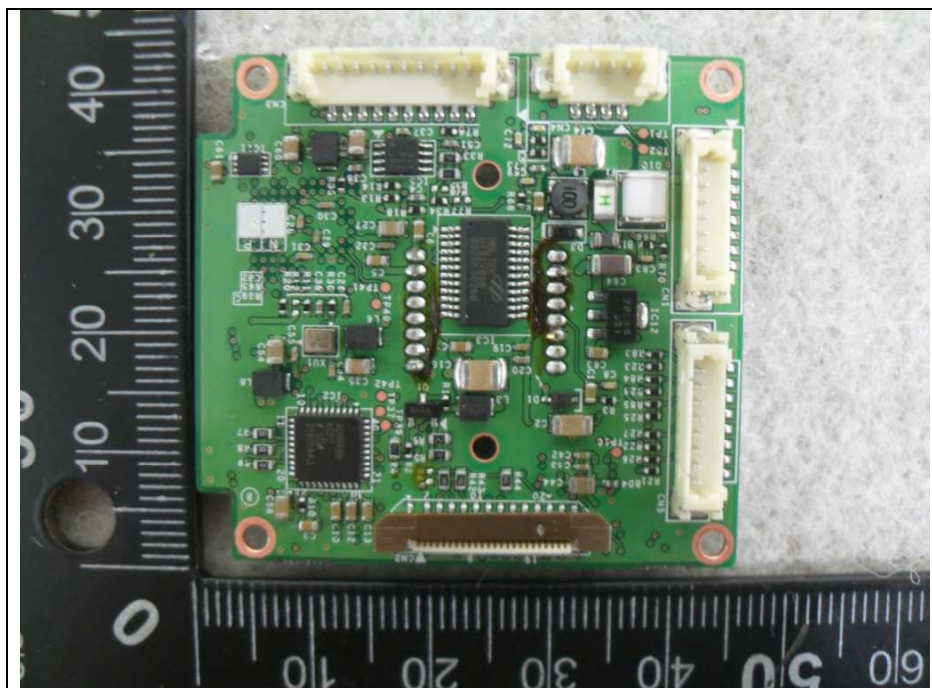
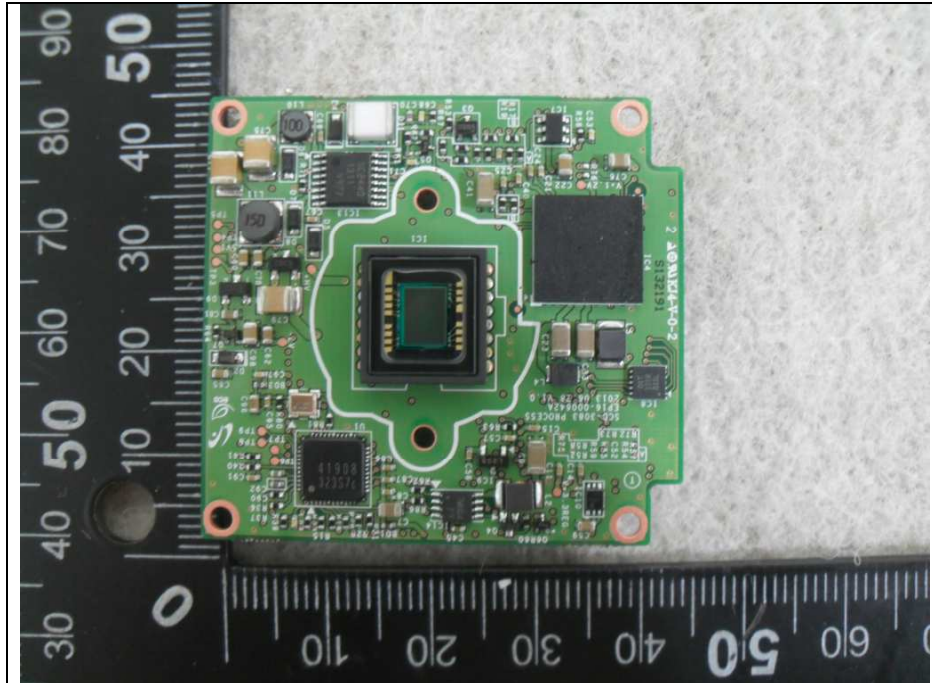
Bottom View



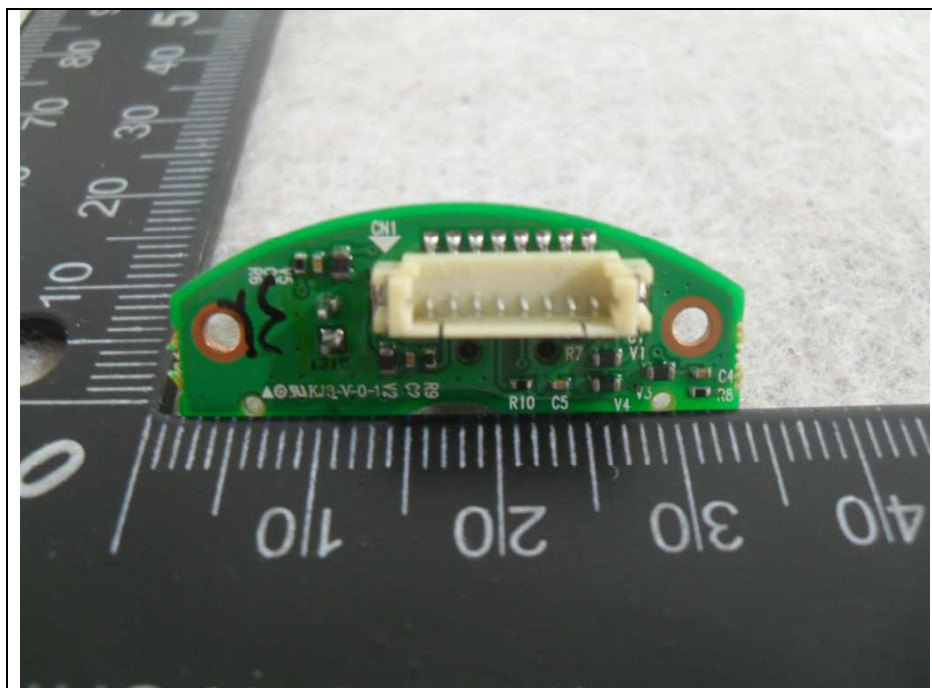
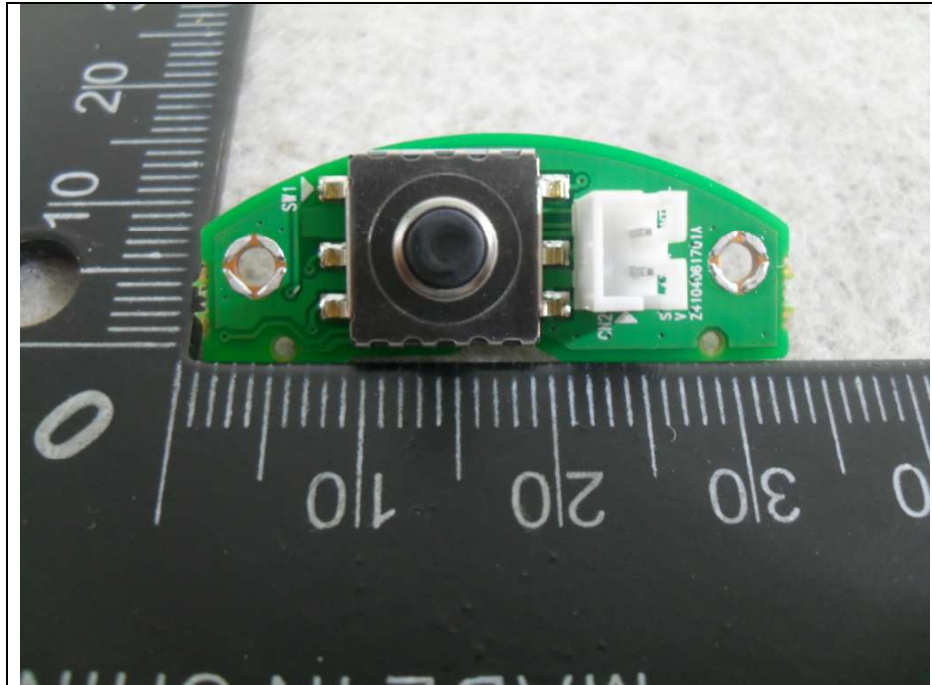
Inside



CCD Board



SUB Board



Power Board

