

# TESTING CERTIFICATE

## EMC Compliance Ltd.

480-5 Sin-dong, Yeongtong-gu,  
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443-390, Korea  
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Certificate No.: EMC-CE-4231

Page( 1 ) / (28) Pages



### 1. Applicant

Name: Samsung Techwin Co., Ltd.  
Address: #42 Seongju-Dong, Changwon-Shi,  
Kyungsangnam-Do, Korea  
Date of Receipt: July 31, 2013

### 2. Manufacturer

Name#1: Samsung Techwin Co., Ltd.  
Name#2: TIANJIN SAMSUNG TECHWIN  
OPTO-ELECTRONIC CO., LTD

### 3. Use of Report:

Completed report

### 4. Test Sample:

CCTV Camera, SCZ-2373P

### 5. Date of Test:

August 05, 2013

### 6. Test method used:

AS/NZS CISPR 22:2009, Class A

### 7. Testing Environment:

Temperature: (20.0) °C,  
Relative Humidity: (58) % R.H.

### 8. Test Results:

Refer to page 12 ~ page 19  
(Measurement uncertainty: Refer to page 6)

This result shown in this report refer only to the sample(s) tested unless otherwise stated.

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EMC Compliance Laboratory.

Affirmation	Tested by  Name: JUNG, HYE-LAN	Technical Manager  Name: YEOM, HAN-SEOK
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The above test certificate is the accredited test results by Korea Laboratory Accreditation Scheme, which signed the ILAC-MRA.

2013. 08. 09  
**EMC Compliance Ltd.**

Accredited by KOLAS, Republic of KOREA

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## 1. Applicant information

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**Contact name:** **Kang Jei Soon**

**Manufacturer#1:** SAMSUNG TECHWIN CO., LTD.  
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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

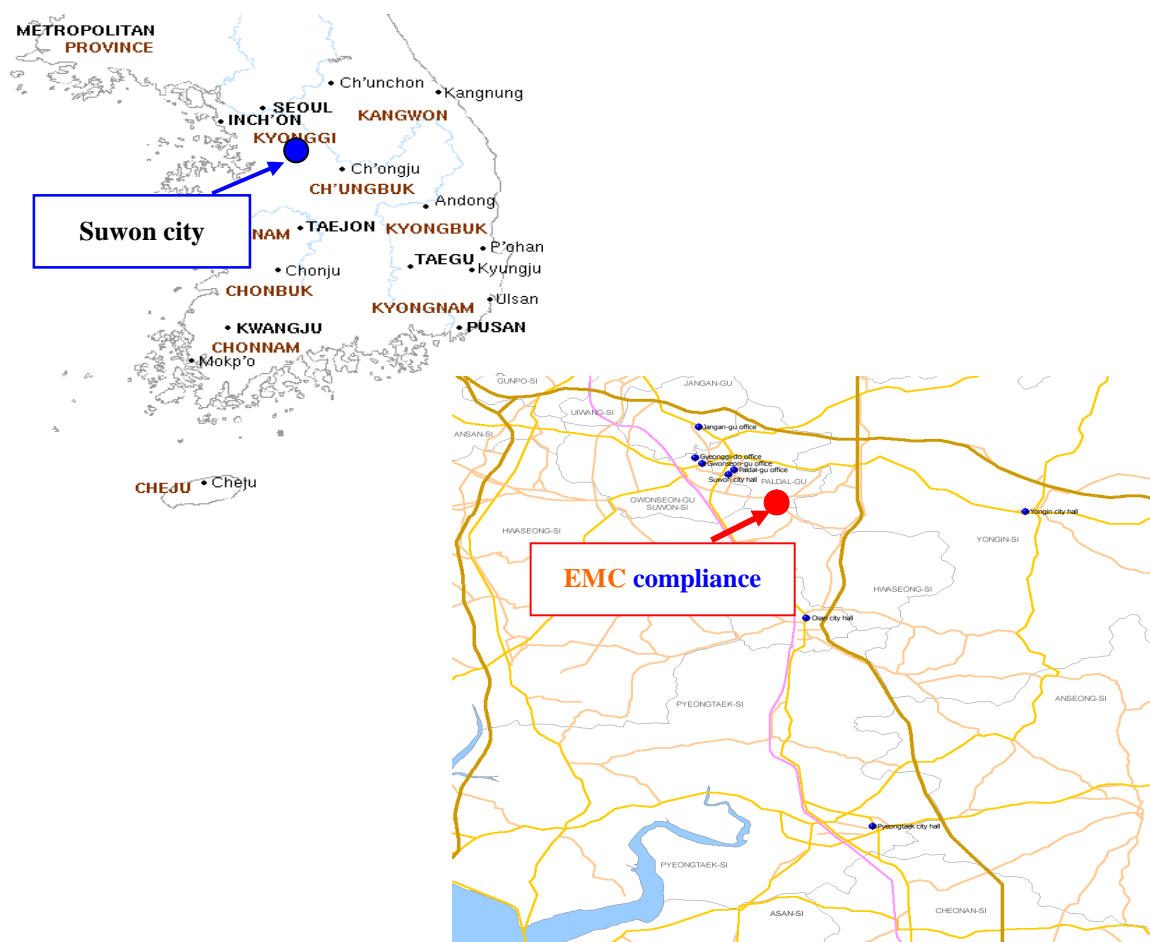
FCC CAB.: KR0040

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)	: 20 °C	58 % 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
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

## 4. Description of E.U.T.

### 4.1 General information

Video	Spec	
Imaging Device	1/4" Sony 960H Exview HAD CCD II	
	NTSC	PAL
Total Pixels	1020(H) x 508(V), 520K	1020(H) x 596(V), 610k
Effective Pixels	976(H) x 494(V), 480K	976(H) x 582(V), 570K
Scanning System	2:1 Interlace	
Scanning Frequency	H:15.734 KHz V:59.95 Hz	H:15.625 KHz V:50.00 Hz
Synchronization	Internal/Line-Lock	
Min. Illumination	Color : 0.2 Lux @ F1.6 (Wide,50IRE) B/W : 0.01 Lux @ F1.6 (Wide,50IRE)	
Resolution	680TVL (ER mode ON)	
S / N Ratio	52dB (AGC Off, Weight ON)	
Video Output	CVBS:1.0 Vp-p/75Ω	
Lens Type		
	SCZ-2273	SCZ-2373
Focal Length (Zoom Ratio)	3.5~94.5mm, 27x	3.5~129.5mm, 37x
Max. Aperture Ratio	1:1.6 (Wide) ~ 2.8 (Tele)	1:1.6 (Wide) ~ 3.9 (Tele)
	H: 56.26(Wide)/2.24(Tele) V:43.28(Wide)/1.67(Tele) D:67.56(Wide)/2.80(Tele)	H: 56.26(Wide)/1.62(Tele) V:43.28(Wide)/1.22(Tele) D:67.56(Wide)/2.02(Tele)
Min. Object Distance	1.5m	
Focus Control	Auto / Manual / One Push	
Zoom Movement Speed	3.1sec (Wide to Tele)	
Operational		
	NTSC	PAL
On Screen Display	Built-In OSD Korean, Japanese, English, Spanish, Portuguese, French, Taiwanese	Built-In OSD English, French, German, Italian, Spanish, Chinese, Portuguese, Danish, Swedish, Russian, Serbian, Polish, Czech, Turkish, Romanian
Camera Title	On/Off (Displayed 15 characters)	
Day & Night	Auto (ICR) / Color / B/W / EXT	
Backlight Compensation	Off / BLC / HLC	
Contrast Enhancement	SSDR - Level adjustable	
Digital Noise Reduction	SSNRⅢ (OFF / LOW / MEDIUM / HIGH)	
Digital Image Stabilization	Off / On	
Motion Detection	Off / On (4 programmable zones)	
Privacy Masking	Off / On (12 Rectangle)	
Sens-up (Frame Integration)	Auto/Off( selectable limit ~S12X)	
Gain Control	High / Medium / Low / Manual	
White Balance	ATW / Indoor / Outdoor / AWC / Manual / Mercury	
Electronic Shutter Speed	Esc / A.FLK / Manual	
Digital Zoom	Off / On (1x ~ 16x)	



Reverse	Off / H-Rev / V-Rev / HV-Rev
Preset	128 Position (Store with Internal EEPROM)
Communication	Coaxial control(SPC-300 compatible, Pelco C) RS-485 : Samsung T/E, Pelco D/P, Panasonic, Bosch,Honeywell,AD,Vicon,GE
<b>Environmental</b>	
Operating Temperature / Humidity	-10°C ~ +55°C (+14°F ~ +131°F) / Less than 90% RH
<b>Electrical</b>	
Input Voltage/Current	Dual : 24V AC & 12VDC±10%
Power Consumption	Max 5.8W
<b>Mechanical</b>	
Dimension (WxHxD)	67.6 x 67.6 x 147.7
Weight	520g



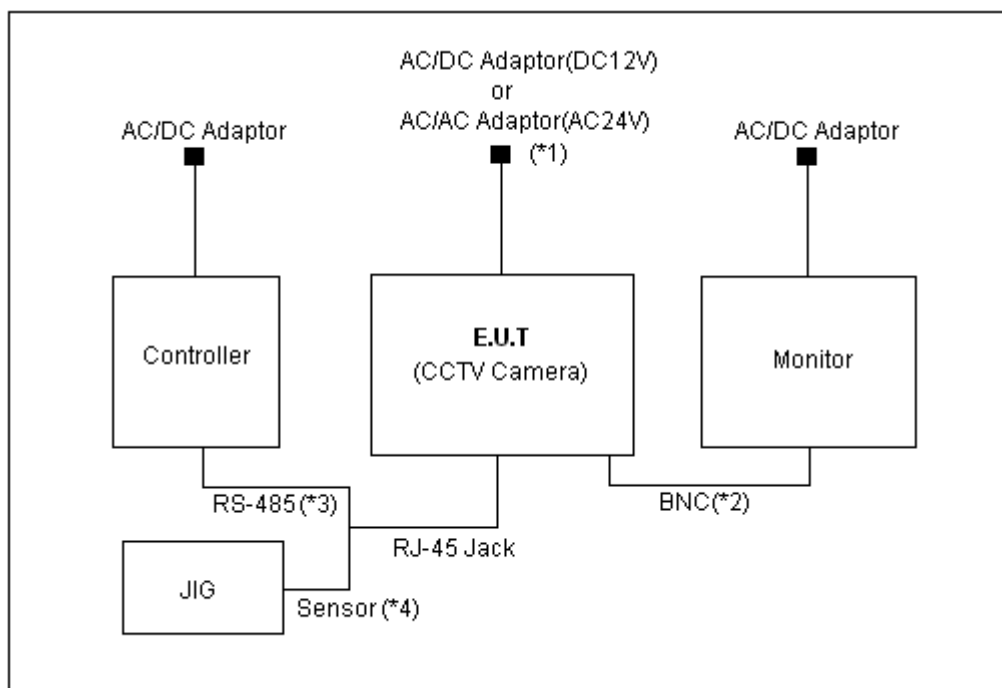
## .2 Product description

Type of product	CCTV Camera
Model name (Basic)	SCZ-2373P
Model name (Variant)	SCZ-2273P
Difference	Zoom ratio 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	SMT-171N	-	Samsung
Controller	SCC-2000	-	SAMSUNG
JIG	-	-	-
AC/DC Adaptor (DC 12 V)	DAD12050DKA	-	Dream Electronics
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	<b>EUT</b> (CCTV Camera)	Power	AC/DC Adaptor or AC/AC Adaptor	Power	1.6	Non-Shield
2		BNC	Monitor	BNC	3.0	Shield
3		RJ-45 Jack	Controller	RS-485	3.0	Non-Shield
4			JIG	Sensor	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
<input type="checkbox"/>	Conducted Emission	AS/NZS CISPR 22:2009, Class A	N/A
<input checked="" type="checkbox"/>	Radiated Emission	AS/NZS CISPR 22:2009, Class A	12 Page ~ 19 Page

## 6. Test results

### 6.1 Radiated Emission

Test specification	AS/NZS CISPR 22:2009, 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. 05		
Temperature (°C)	20 °C	Humidity (% R.H.)	58 % R.H.
Remarks	Complied		

#### 6.1.1 Limits of radiated emission measurement

☒ Limits below 1 GHz

Frequency MHz	Class A dB $\mu$ V/m @ 10 m	Class B dB $\mu$ V/m @ 10 m
30 ~ 230	40	30
230 ~ 1 000	47	37

☒ Limits above 1 GHz

Frequency MHz	Class A @ 3 m		Class B @ 3 m	
	Average limit dB $\mu$ V/m	Peak limit dB $\mu$ V/m	Average limit dB $\mu$ V/m	Peak limit dB $\mu$ 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

Equipment	Model no.	Serial no.	Makers	Next Cal. Date	Used
Test Receiver	ESCI7	100732	R&S	2014.02.18	<input type="checkbox"/>
Test Receiver	ESCI	100001	R&S	2014.07.25	<input type="checkbox"/>
Test Receiver	ESCI	100710	R&S	2013.11.06	<input checked="" type="checkbox"/>
Bi-Log Antenna	VULB 9168	440	SCHWARZBECK	2013.10.04	<input checked="" type="checkbox"/>
Amplifier	310N	293004	SONOMA INSTRUMENT	2013.11.06	<input checked="" type="checkbox"/>
3 dB Attenuator	8491B	22981	HP	2014.03.19	<input checked="" type="checkbox"/>
Antenna Mast	MA4000-EP	303	Innco Systems	-	<input checked="" type="checkbox"/>
Turn Table	DT2000S-1t	079	Innco Systems	-	<input checked="" type="checkbox"/>
Amplifier	8449B	3008A02343	AGILENT	2013.11.06	<input checked="" type="checkbox"/>
Horn ANT	3115	00086706	ETS	2013.11.21	<input checked="" type="checkbox"/>
Spectrum Analyzer	FSP7	100289	R&S	2013.12.14	<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

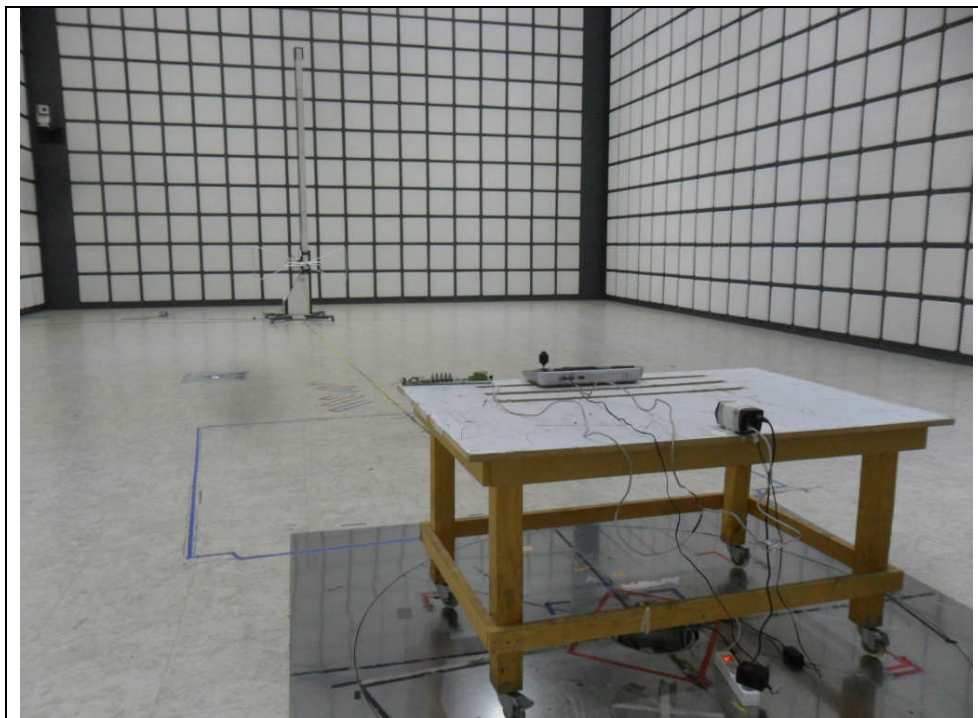
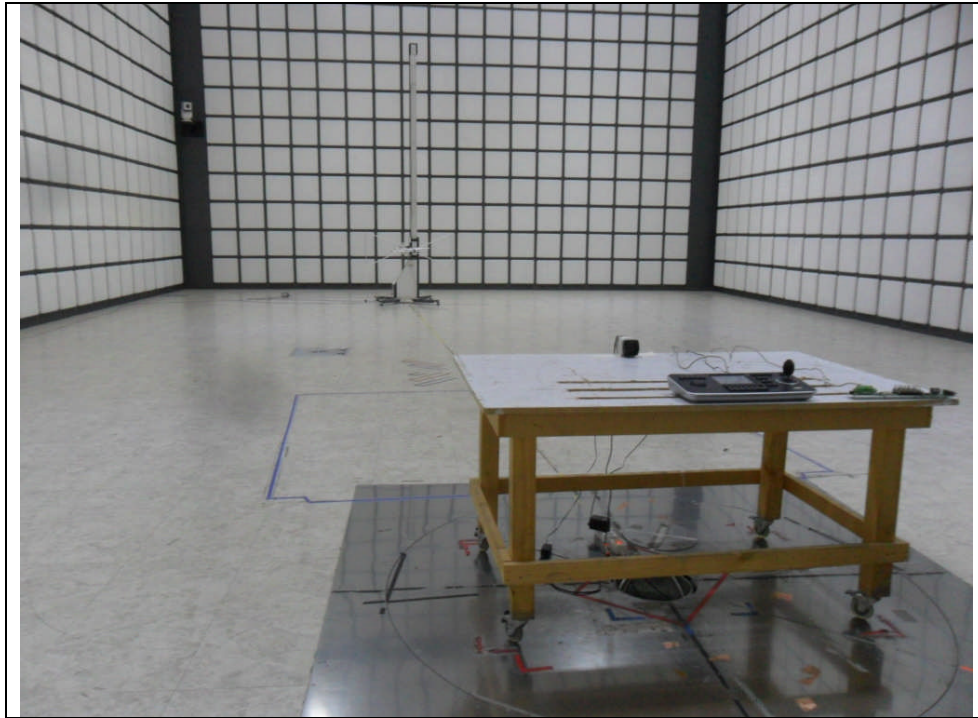
If M.R is 30 dB, A.F 12 dB, C.L 5 dB, 3 dB, A.G 35 dB

The result is

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

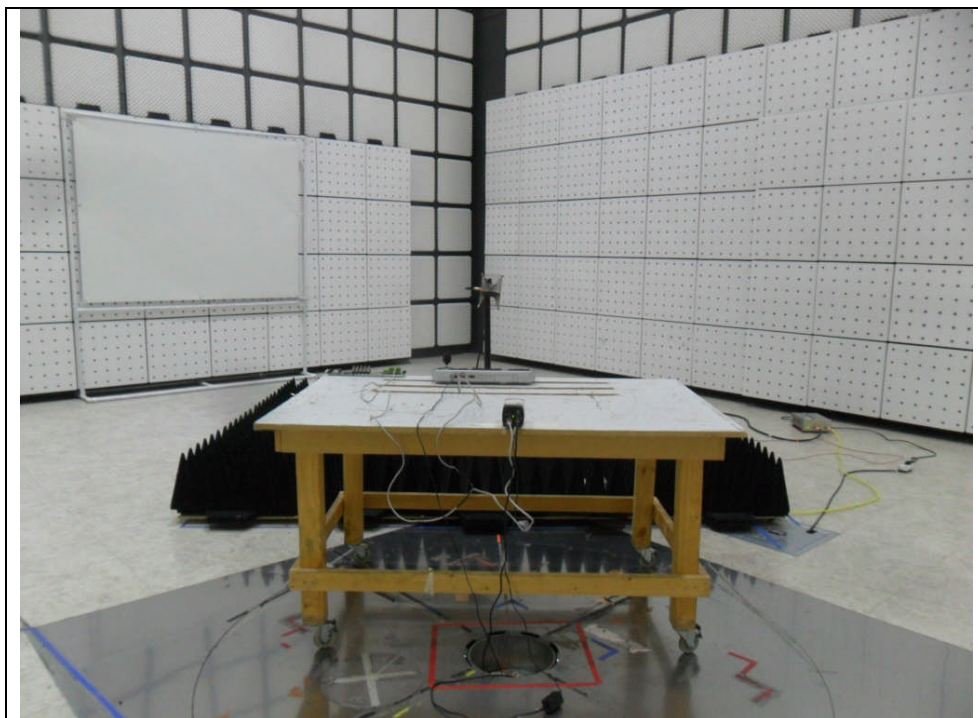
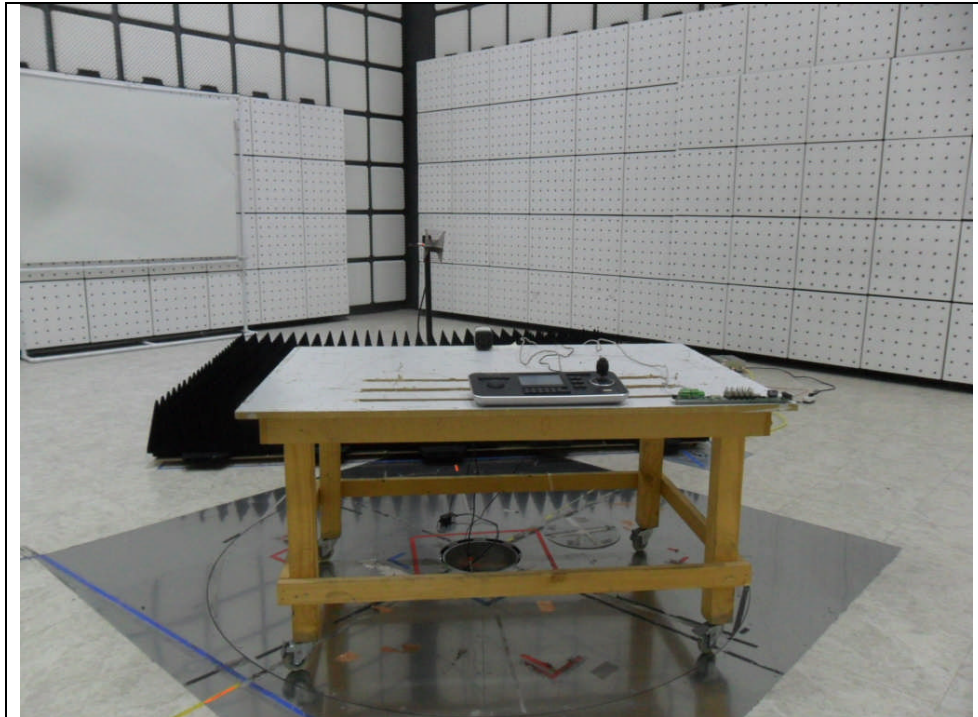
### 6.1.5 Photographs of test setup

\* 30 MHz ~ 1 GHz





\* 1 GHz ~ 6 GHz

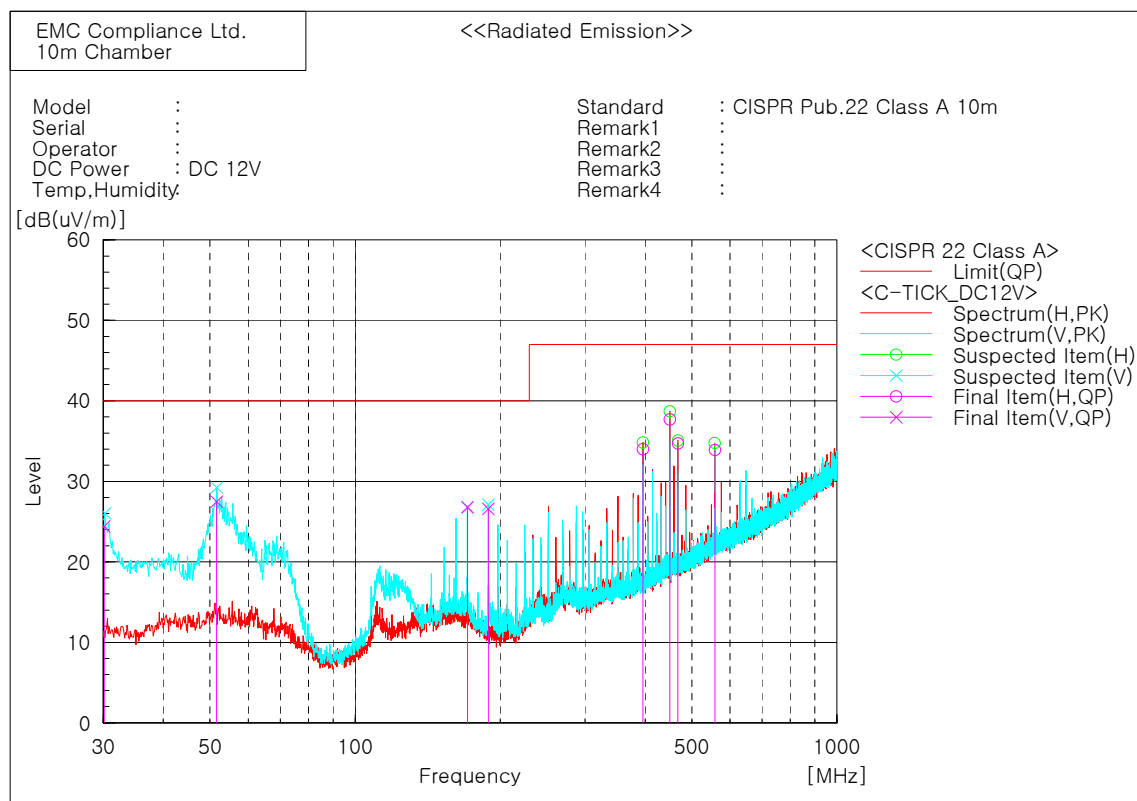




## 6.1.6 Radiated emission measurement result

### \* Graph and Data

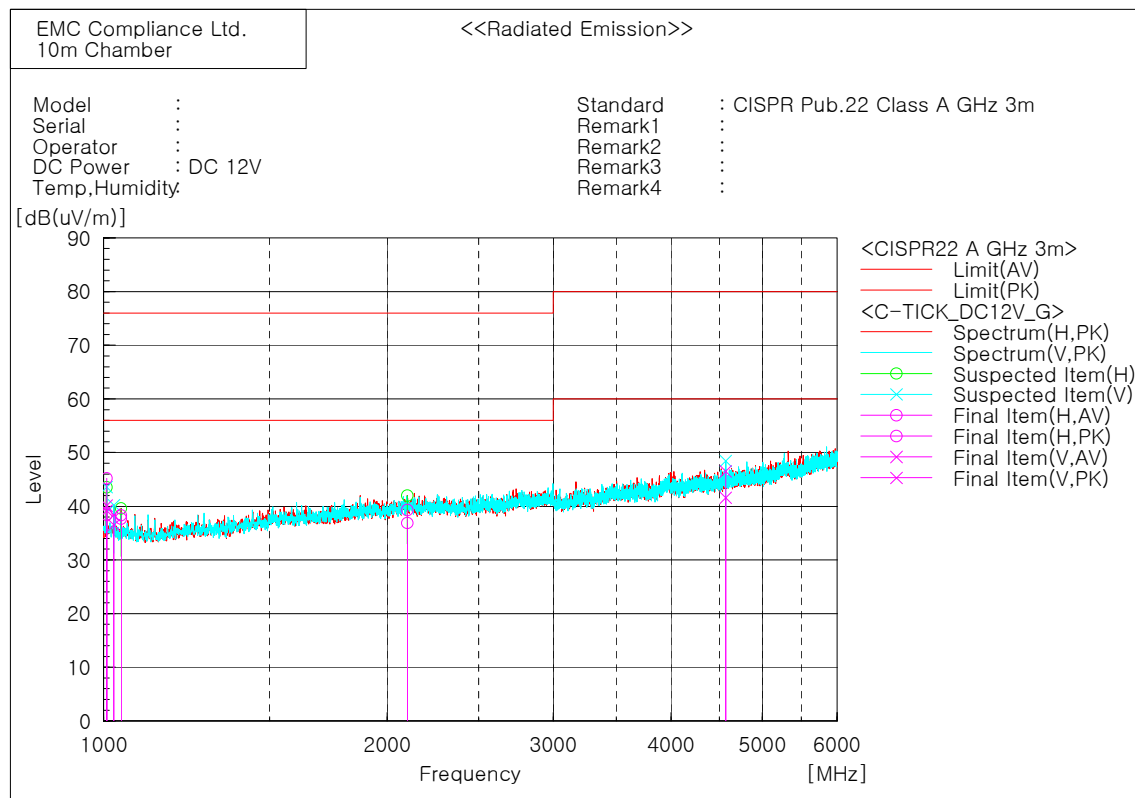
\* 30 MHz ~ 1 GHz (SCZ-2373P)\_DC 12V



### 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]
1	30.158	V	39.6	-15.2	24.4	40.0	15.6	100.0	250.2
2	51.607	V	40.7	-13.2	27.5	40.0	12.5	100.0	349.4
3	170.982	V	39.3	-12.5	26.8	40.0	13.2	100.0	181.3
4	189.002	V	40.9	-14.3	26.6	40.0	13.4	299.0	226.1
5	395.995	H	41.6	-7.6	34.0	47.0	13.0	201.0	250.7
6	449.994	H	43.6	-5.9	37.7	47.0	9.3	201.0	93.2
7	467.901	H	40.1	-5.4	34.7	47.0	12.3	201.0	93.2
8	558.104	H	36.7	-2.8	33.9	47.0	13.1	201.0	84.1

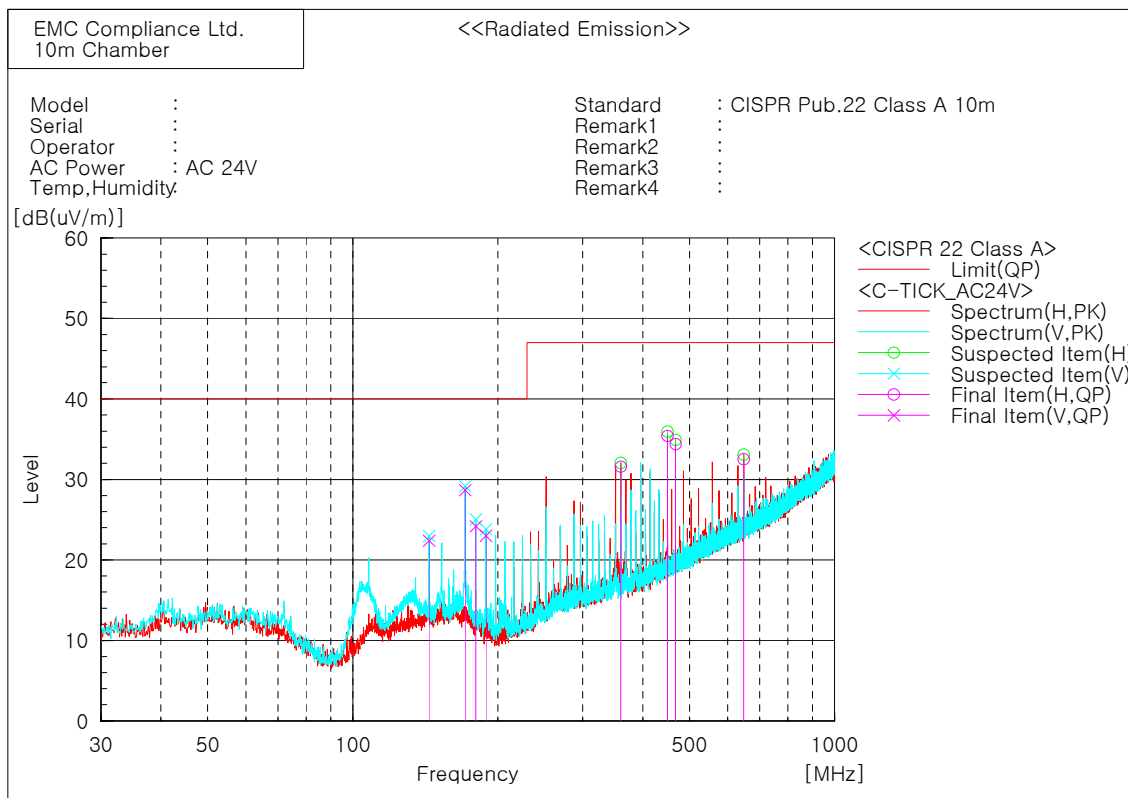
\* 1 GHz ~ 6 GHz (SCZ-2373P)\_DC 12V



Final Result

No.	Frequency [MHz]	(P)	Reading AV [dB(μV)]	Reading PK [dB(μV)]	c. f [dB(1/m)]	Result AV [dB(μV/m)]	Result PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Limit PK [dB(μV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]
1	1008.056	V	46.6	47.5	-7.4	39.2	40.1	56.0	76.0	16.8	35.9	100.0	328.9
2	1008.014	H	45.8	52.6	-7.4	38.4	45.2	56.0	76.0	17.6	30.8	100.0	254.6
3	1025.692	V	44.2	46.1	-7.7	36.5	38.4	56.0	76.0	19.5	37.6	100.0	142.9
4	1043.816	H	45.6	46.2	-7.9	37.7	38.3	56.0	76.0	18.3	37.7	100.0	268.2
5	2100.240	H	37.8	40.2	-0.9	36.9	39.3	56.0	76.0	19.1	36.7	100.0	209.5
6	4570.583	V	35.6	40.5	6.0	41.6	46.5	60.0	80.0	18.4	33.5	100.0	24.3

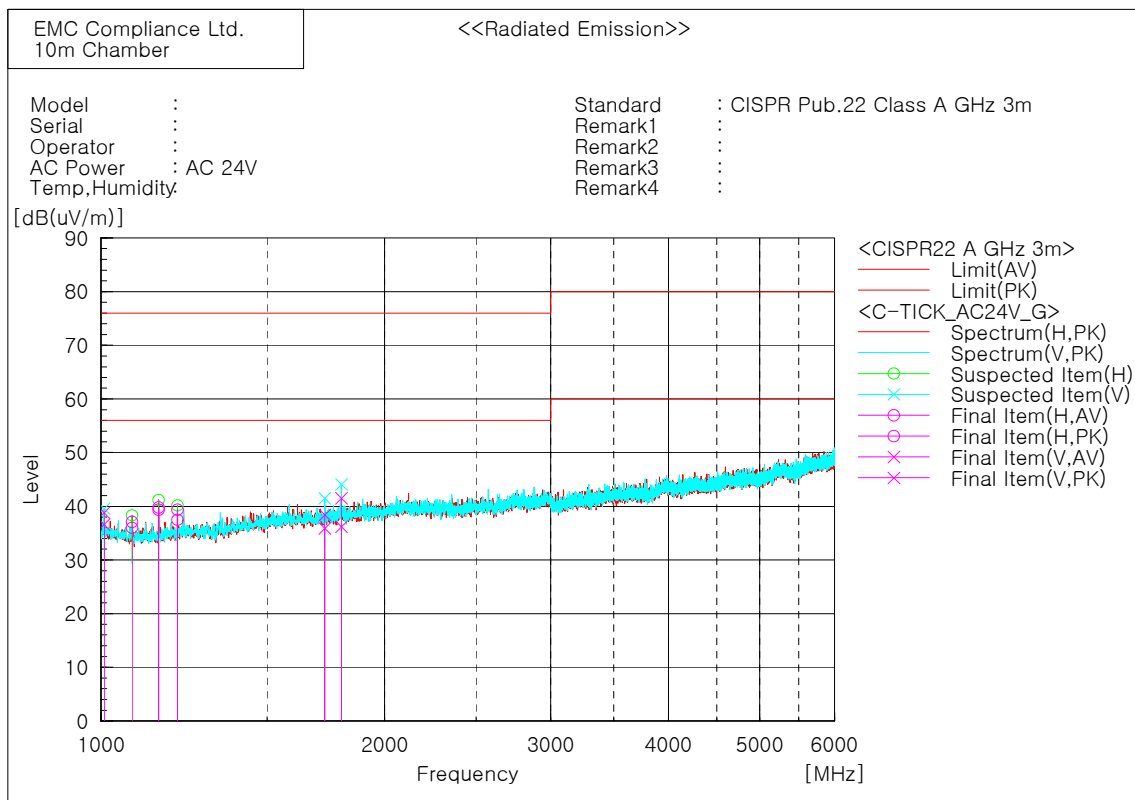
\* 30 MHz ~ 1 GHz (SCZ-2373P)\_AC 24V



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]
1	144.005	V	35.2	-12.8	22.4	40.0	17.6	100.0	347.5
2	171.063	V	41.3	-12.6	28.7	40.0	11.3	100.0	274.0
3	180.017	V	37.6	-13.4	24.2	40.0	15.8	100.0	350.5
4	188.890	V	37.3	-14.3	23.0	40.0	17.0	100.0	311.5
5	360.069	H	40.1	-8.5	31.6	47.0	15.4	301.0	261.0
6	450.084	H	41.3	-5.9	35.4	47.0	11.6	201.0	104.4
7	467.995	H	39.8	-5.4	34.4	47.0	12.6	201.0	81.8
8	647.983	H	33.6	-1.1	32.5	47.0	14.5	201.0	287.1

\* 1 GHz ~ 6 GHz (SCZ-2373P)\_AC 24V

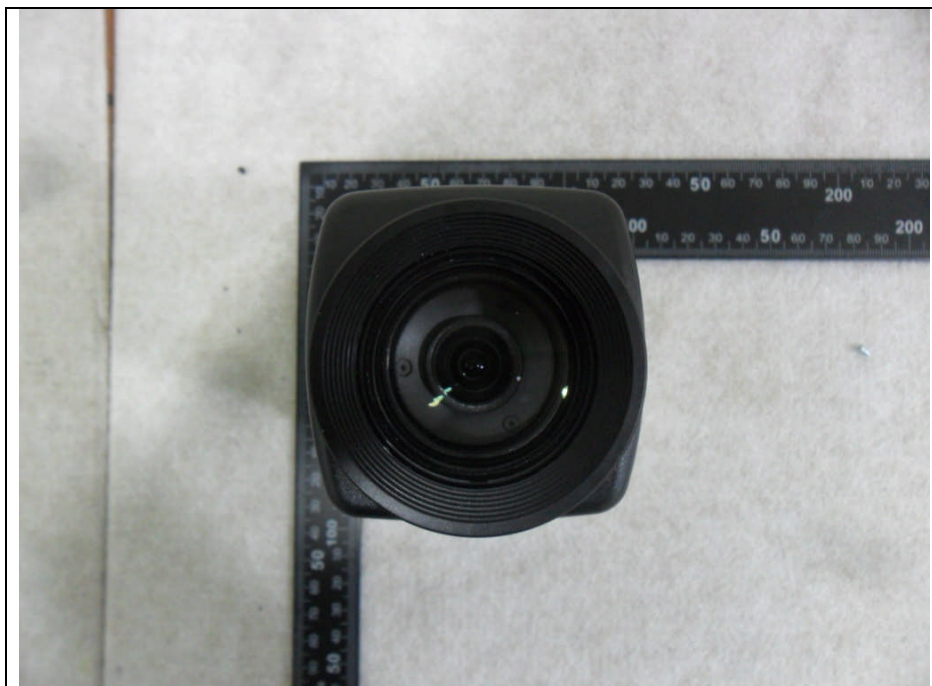


Final Result

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	1008.169	V	44.0	46.2	-7.4	36.6	38.8	56.0	76.0	19.4	37.2	100.0	347.9
2	1079.300	H	44.1	45.2	-8.1	36.0	37.1	56.0	76.0	20.0	38.9	100.0	249.6
3	1151.957	H	47.4	47.0	-7.6	39.8	39.4	56.0	76.0	16.2	36.6	100.0	164.2
4	1206.138	H	44.4	46.3	-6.9	37.5	39.4	56.0	76.0	18.5	36.6	100.0	161.2
5	1728.006	V	39.0	41.5	-3.1	35.9	38.4	56.0	76.0	20.1	37.6	100.0	328.8
6	1800.047	V	38.7	44.0	-2.5	36.2	41.5	56.0	76.0	19.8	34.5	100.0	328.8

## 7. E.U.T. photographs

### Front View



### Rear View





Left View



Right View



Top View



Bottom View

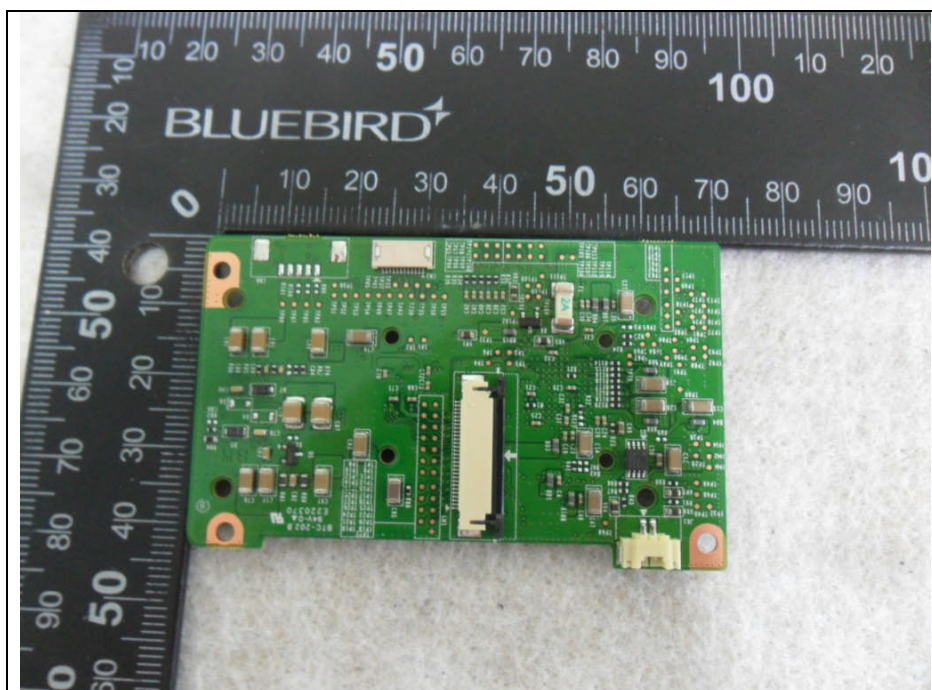
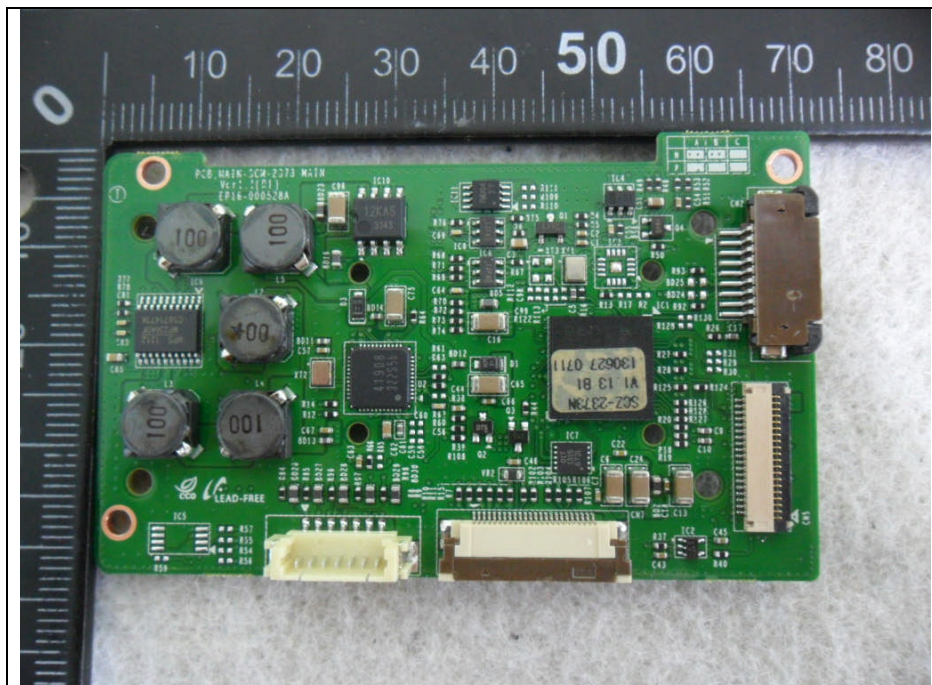




Inside

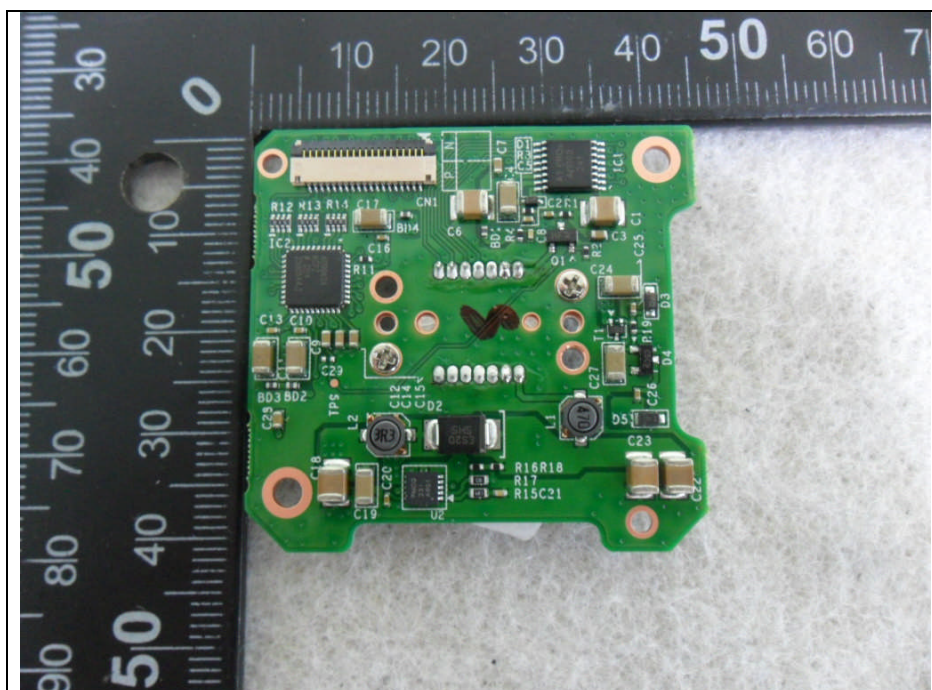
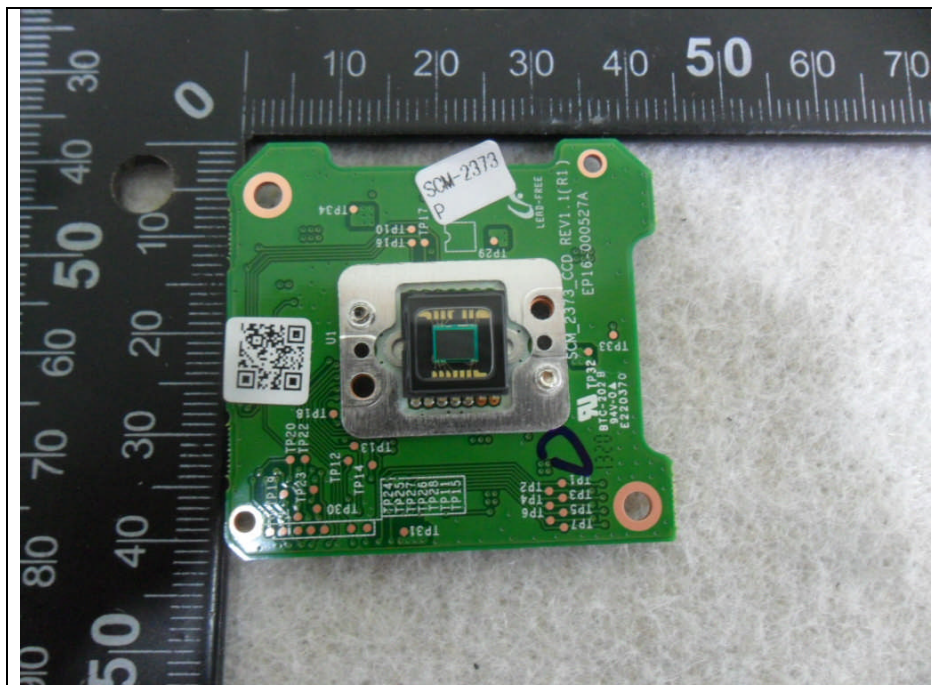


Main Board

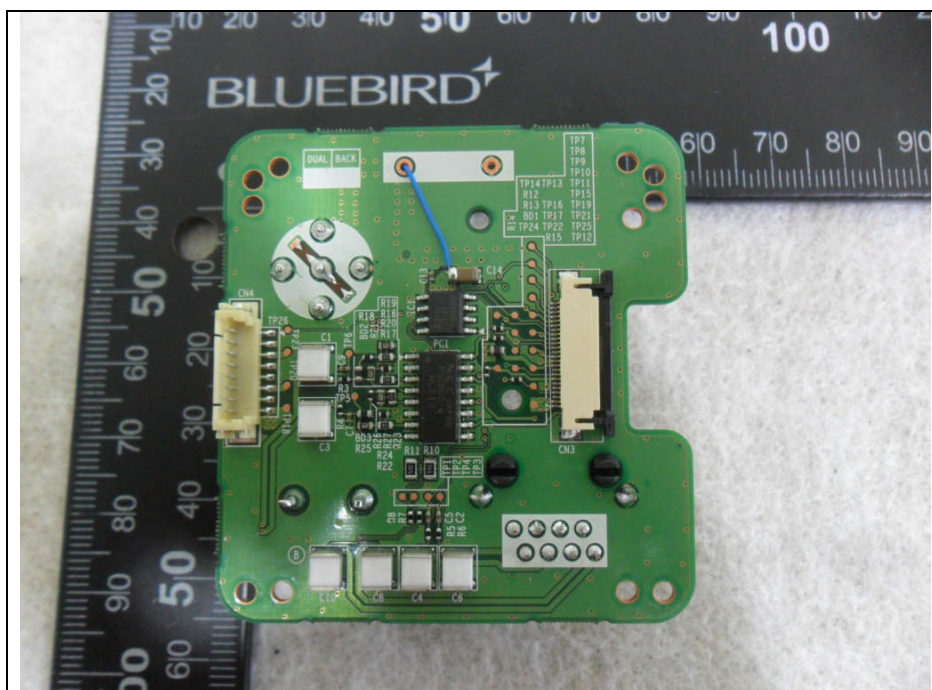
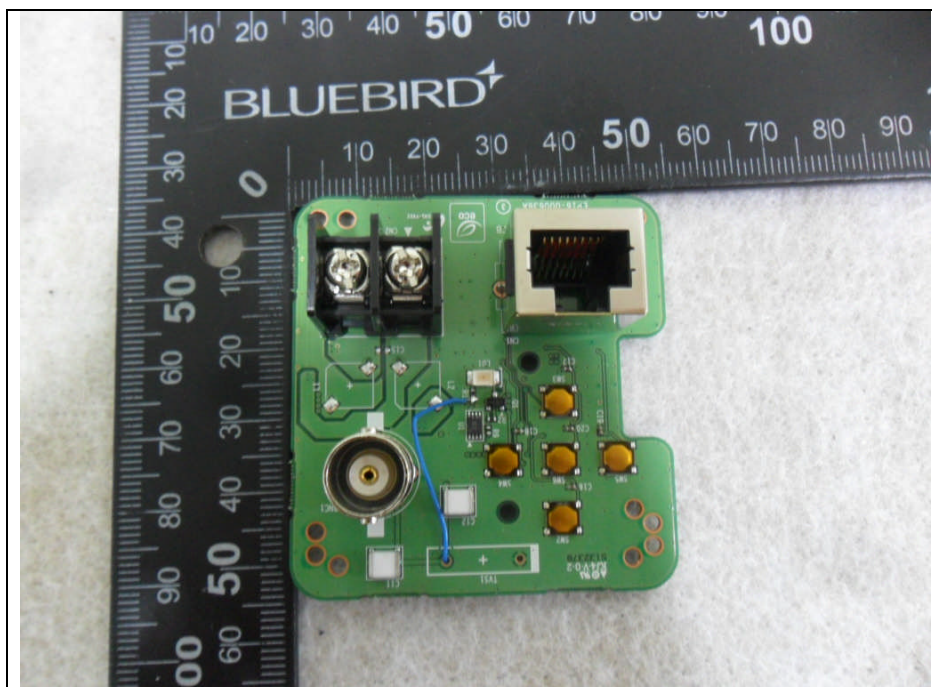




CCD Board

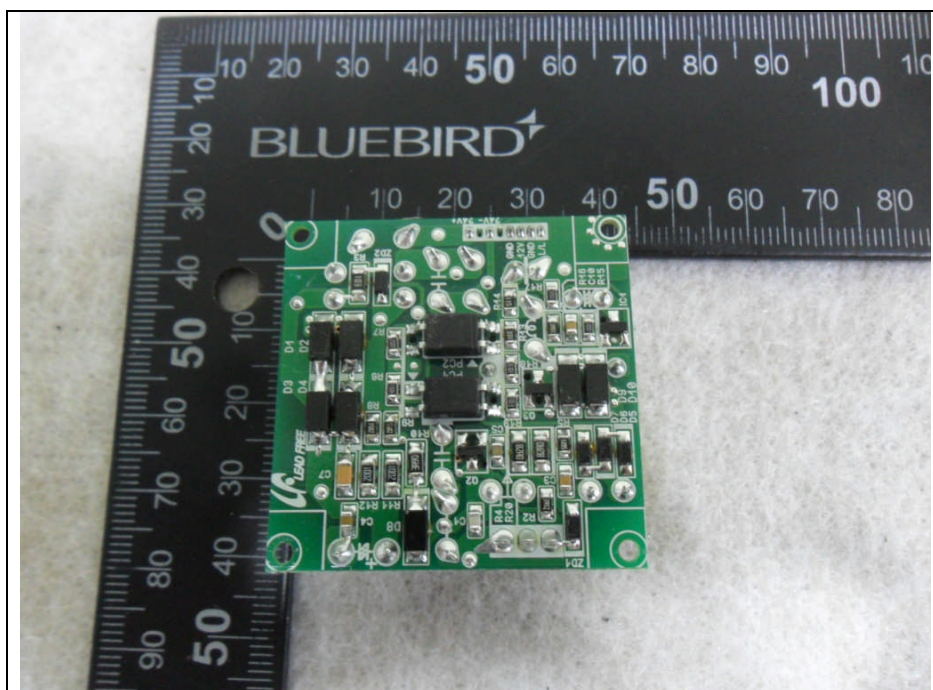
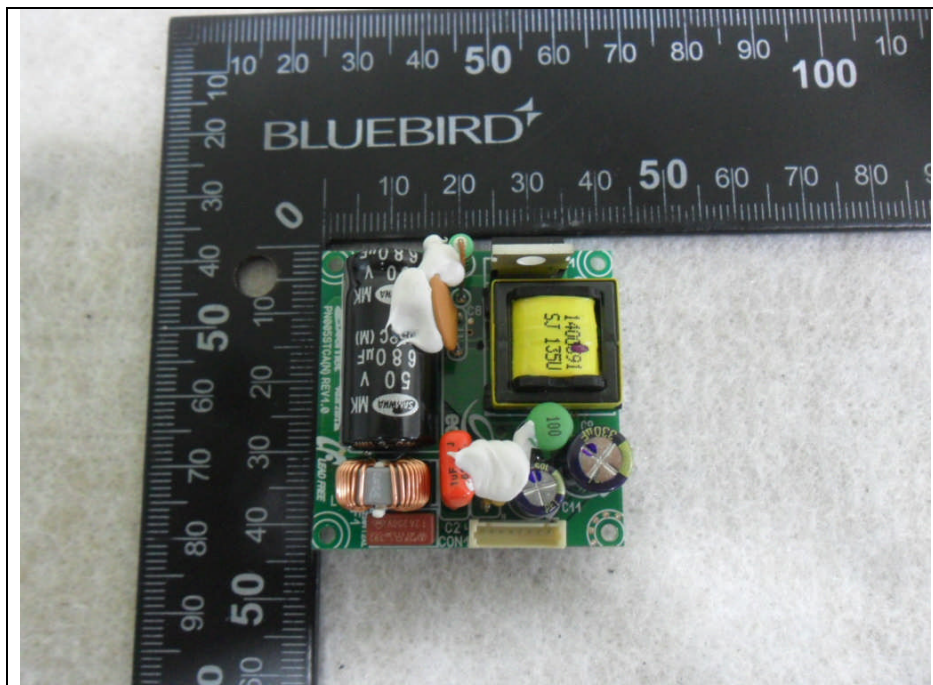


Rear Board





Power Board



Cable

