EMC TEST REPORT

Test report No:	**EMC-CE-1709**
Type of Equipment:	**CCTV CAMERA**
Model Name:	**SCC-B2035P**
Variant Model Name:	**SCC-B2033P, SCC-B2037P, B2031P, B1031P, SCC-A2033P**
Applicant:	**Samsung Electronics Co., Ltd. 416 Maetan3-Dong, Yeongtong-Gu, Suwon-City, Gyeonggi-Do, Korea, 443-742**
Manufacturer:	**Tianjin Samsung Electronics Co., Ltd. 300457 TSEC No.12 FOURTH AVENUE, TEDA,TIANJIN, CHINA**

Test standards :

EN 55022:2006, Class A, EN 50130-4:1995+A1:1998+A2:2003
EN 61000-3-2:2006, EN 61000-3-3/A2:2005

Testing Laboratory:	**EMC Compliance Ltd.**
Test result :	**Complied**

This product complies with the requirements of the EMC Directive 2004/108/ EC.
The results in this report apply only to the sample tested.
This test report shall not be reproduced except in full, without the written approval of EMC compliance Laboratory.

Date of testing: 2009. 05. 07 ~ 05. 11

Issued date: 2009. 05. 12

Tested by: BAEK, JEONG-SOO

Approved by: CHUNG, MIN-SEOK

Contents

1. Applicant information

Applicant:	Samsung Electronics Co., Ltd.
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Manufacturer:	Tianjin Samsung Electronics Co., Ltd
Address:	300457 TSEC No.12 FOURTH AVENUE, TEDA,TIANJIN, CHINA

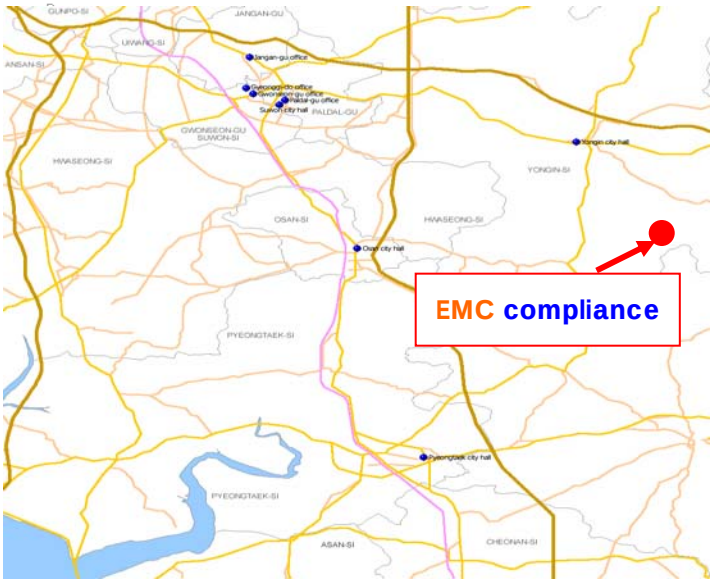
2. Laboratory information

Address

EMC compliance Ltd.
82-1 Jeil-ri, Yangji-myun, Churingu, Yongin-city, Kyunggi-do 449-825, Korea
Telephone Number: 82 31 336 9919
Facsimile Number: 82 31 336 4767

FCC CAB.: KR0040
VCCI Registration No. : C-1713, R-2710
Industry Canada Registration No. : 8035
KOLAS NO.: 231

SITE MAP



3. Test system configuration

3.1 Operation environment

	Temperature	Humidity	Pressure
OATS :	11 °C	35 % R.H.	-
Shielded room :	17 °C	41 % R.H.	-
Immunity area :	18 °C	31 % R.H.	100.7 kPa

Test site

These testing items were performed following locations;

Shielded Room : Conducted Emission
OATS (10 m) : Radiated Emission (#2)
Anechoic chamber (3 m): RS
Immunity area : ESD, EFT/Burst, Surge, CS, Dip/Interruption, Variation, Harmonics, Flicker

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 :(k = 2, 95 %)

9 ㎑ ~ 150 ㎑: ± 3.05 [dB㎶]

150 ㎑ ~ 30 ㎒: ± 2.53 [dB㎶]

Radiated Emission measurement :(k = 2, 95 %)

30 ~ 300 ㎒ : 3 m: ± 3.53 [dB㎶/m], 10 m: ± 3.52 [dB㎶/m]

300 ~ 1000 ㎒: 3 m: ± 3.70 [dB㎶/m], 10 m: ± 3.69 [dB㎶/m]

Radio Frequency Electromagnetic Fields :(k = 2, 95 %)

± 1.0234 [dB㎶/m]

4. Description of E.U.T.

4.1 General information

- SCC-B2035P is a CCTV Camera.

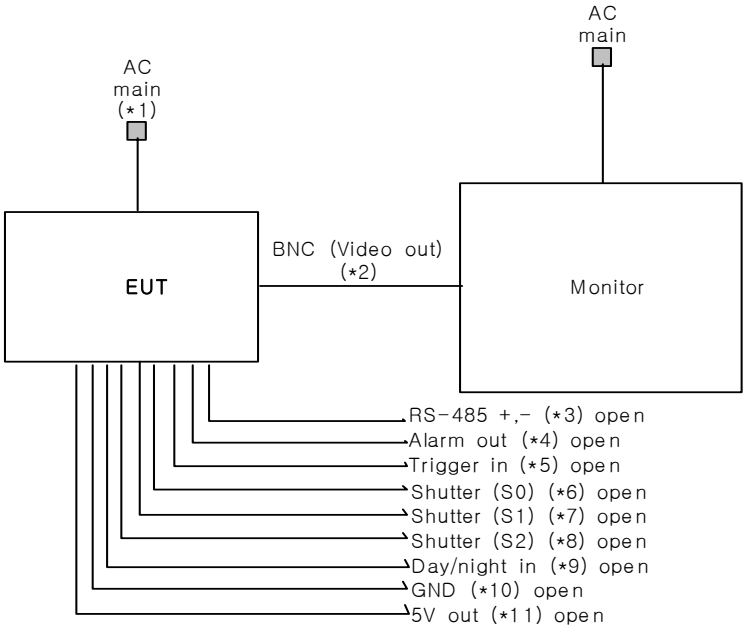
4.2 Product description

Type of product:	CCTV CAMERA
Model name (Basic):	SCC-B2035P
Model name (Variant):	SCC-B2033P, SCC-B2037P, B2031P, B1031P, SCC-A2033P
Difference:	Model name difference.
Trade name :	-
Testing Voltage:	230 Ⅴ, 50 Hz
Product rating:	AC 220 - 240 Ⅴ
Note :	This test was done with SCC-B2035P

4.3 Auxiliary equipments

Type	Model / Part #	Serial number	Manufacturer
Monitor	CX911MW	N732H1IL900530W	SAMSUNG

4.4 Test configuration



Note	Start		End		Cable		
*	Name	I/O port	Name	I/O port	Length (m)	Spec.	Cable
1	EUT	Power	AC main	Power	1.5	Non- Shield	In-Door
2		BNC (video out)	Monitor	BNC (video out)	3.0	Shield	Out- Door
3		Terminal (RS-485 +,-)	Open	-	3.0	Non- Shield	In-Door
4		Terminal (Alarm out)	Open	-	3.0	Non- Shield	In-Door
5		Terminal (Trigger in)	Open	-	3.0	Non- Shield	In-Door
6		Terminal (Shutter (S0))	Open	-	3.0	Non- Shield	In-Door
7		Terminal (Shutter (S1))	Open	-	3.0	Non- Shield	In-Door
8		Terminal (Shutter (S2))	Open	-	3.0	Non- Shield	In-Door
9		Terminal (Day/Night in)	Open	-	3.0	Non- Shield	In-Door
10		Terminal (GND)	Open	-	3.0	Non- Shield	In-Door
11		Terminal (5V out)	Open	-	3.0	Non- Shield	In-Door

4.5 Operating conditions

The EUT was configured as normal intended use.

Test mode	Normal operation
1	Camera operation mode.

5. Summary of test results

5.1 Modification to the E.U.T.

None

5.2 Summary of EMI emission test results

Application	Test method	Test result
Conducted emission - AC main	EN 55022:2006, Class A	Complied
Radiated emission	EN 55022:2006, Class A	Complied
Harmonics current	EN 61000-3-2:2006	Complied
Voltage fluctuations and flickers	EN 61000-3-3/A2:2005	Complied

5.3 Summary of immunity test results

Items	Application	Test method	Test result
Electrostatic discharge	Enclosure	EN 61000-4-2:1995+A1+1998+A2:2001	Complied
Radiated RF immunity	Enclosure	EN 61000-4-3:2006	Complied
Fast transient	AC main Signal	EN 61000-4-4:2004	Complied
Surge	AC main Signal	EN 61000-4-5:1995+A1:2001	Complied
Conducted RF immunity	AC main Signal	EN 61000-4-6:1996+A1:2001	Complied
Voltage dip/interruption	AC main	EN 61000-4-11:2004	Complied

5.4 Performance criteria

The variety and the diversity of the apparatus within the scope of this document makes it difficult to define precise criteria for the evaluation of the immunity test results.
If as a result of the application of the tests defined in this standard, the apparatus becomes dangerous or unsafe then the apparatus shall be deemed to have failed the test. A functional description and a definition of performance by the manufacture and noted in the test report, based on the following criteria:

Electrostatic discharge

There shall be no damage, malfunction or change of status due to the conditioning.
Flickering of an indicator during the application of discharge is permissible, providing which could be interpreted by associated equipment as a change,

Radiated electromagnetic fields

There shall be no damage, malfunction or change of status due to the conditioning.
Flickering of an indicator during the application of discharge is permissible, providing which could be interpreted by associated equipment as a change, and no such Flickering of indicators occurs at a field strength of 3 V/m. For components of CCTV systems, where the picture is allowed at 10 V/m, providing.

(a) there is no permanent damage or change to EUT (e.g. no corruption of memory or changes to programmable setting etc.)
(b) at 3 V/m, any deterioration of the picture is so minor that the system could still be used; and
(c) there is no observable deterioration of the picture at 1 V/m.

Fast transient burst / slow high energy voltage surge

There shall be no damage, malfunction or change of status due to the conditioning.
Flickering of an indicator during the application of discharge is permissible, providing
That there is no residual is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as

Conducted RF immunity

There shall be no damage, malfunction or change of status due to the conditioning.
Flickering of an indicator during the application of discharge is permissible, providing
That there is no residual is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change, and no such flickering of indicators oeuvres at U = 130 dBμV.
For component of CCTV systems, where the status is monitored by observing the TV picture, then deterioration of the picture is allowed at U = 140 dBμV, providing:

(a) there is no permanent damage or change to the EUT (e.g. no corruption of memory or changes to programmable settings etc.):
(b) at U = 130 dBμV, any deterioration of the picture is so minor that the system could still be used; and
(c) there in no observable deterioration of the picture at U = 120 dBμV.

Voltage dip/interruption / Voltage variation

There shall be no damage, malfunction or change of status due to the conditioning.
Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change. The EUT shall meet the acceptance criteria for the functional test, after the conditioning.

6. Test results

6.1 Conducted Emission

Test specification	EN 55022:2006, Section 5, Class A		
Test mode	Camera operation mode		
Date:	2009. 05. 08		
Power supply	230 V, 50 Hz		
Test facility	Shielded room (CE#1)		
Temperature (°C)	21 °C	Humidity (% R.H.)	45 % R.H.
Remarks	Complied Minimum limit margin is 8.50 dB at 1.779 MHz. (Average)		

6.1.1 Limits of conducted emission measurement

Frequency [MHz]	Class A (dBμV)		Class B (dBμV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 ~ 0.5	79	66	66 ~ 56 *	56 ~ 46*
0.5 ~ 5	73	60	56	46
5 ~ 30	73	60	60	50

*The limit decreases linearly with the logarithm of frequency.

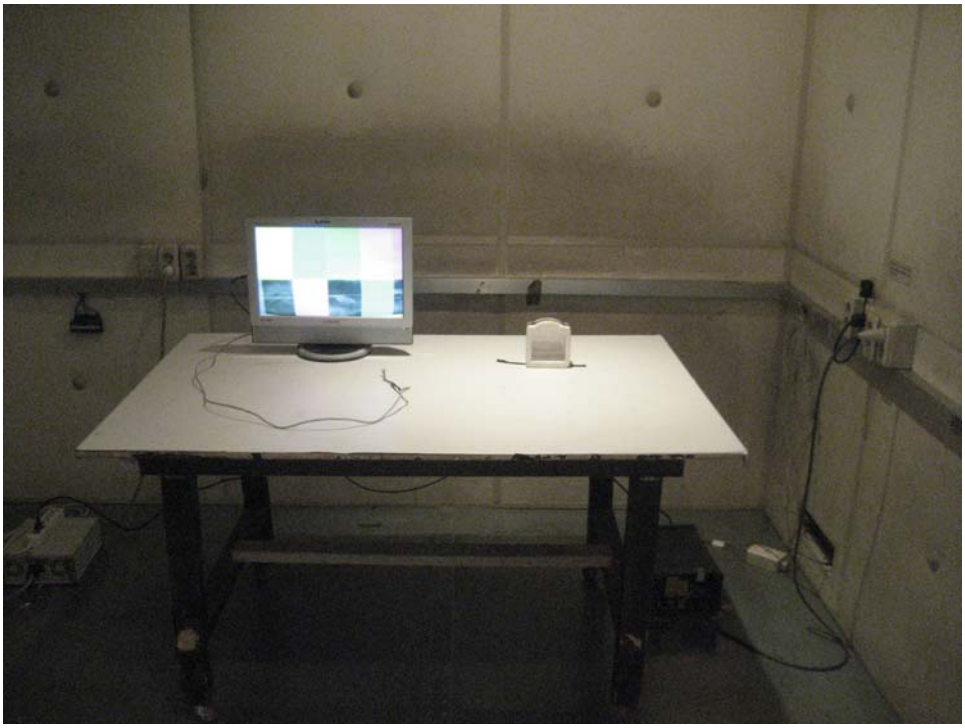
6.1.2 Measurement procedure

The measurements were performed in a shielded room. EUT was setup as shown in photograph and placed on a non-metallic table height of 0.8 m above the reference ground plane. The rear of table was located 0.4 m to the vertical conducted plane. EUT was power through the LISN, which was bonded to the ground plane. The LISN power was filtered. Each EUT power lead, except ground (safety) lead was individually connected through a LISN to input power source. EUT signal cables that hung closer than 0.4 m to the Horizontal metal ground 0.3 m ~ 0.4 m long. The power cord was bundles in the center. All peripheral equipment was powered from a sub LISN. The LISN and ISN were positioned 0.8 m from the EUT. Peak and Average detection were used in preliminary testing and Quasi-peak and Average detections were used at final measurement.
Both lines of power cord, hot and neutral, were measured.

6.1.3 Used equipments

Equipment	Model	Serial No.	Makers	Next Cal. Date	Used
Test Receiver	ESHS10	843276/003	R&S	09.05.29	☒
LISN	ESH3-Z5	100267	R&S	09.07.04	☒
LISN	L2-16A	0000J10705	PMM	-	☒

6.1.4 Photographs of test setup



6.1.5 Conducted emission measurement result

Frequency	Correction Factor		Line	Quasi-peak			Average		
				Limit	Reading	Result	Limit	Reading	Result
[㎒]	LISN	Cable		[dB㎶]	[dB㎶]	[dB㎶]	[dB㎶]	[dB㎶]	[dB㎶]
0.180	0.08	0.4	H	79.00	44.48	44.96	66.00	40.32	40.80
0.237	0.08	0.4	H		37.74	38.22		34.97	35.45
0.297	0.07	0.4	N		45.40	45.87		42.67	43.14
0.357	0.07	0.4	N		49.70	50.17		45.23	45.70
0.414	0.08	0.5	N		54.00	54.58		50.74	51.32
0.474	0.08	0.5	N		48.62	49.20		45.33	45.91
1.011	0.10	0.5	H	73.00	51.64	52.24	60.00	47.01	47.61
1.068	0.09	0.5	N		52.62	53.21		48.55	49.14
1.779	0.11	0.6	N		56.38	57.09		50.79	51.50
2.253	0.13	0.6	H		55.38	56.11		47.78	48.51
2.310	0.11	0.6	N		55.38	56.09		48.00	48.71
16.510	0.63	0.8	N		46.86	48.29		40.66	42.09

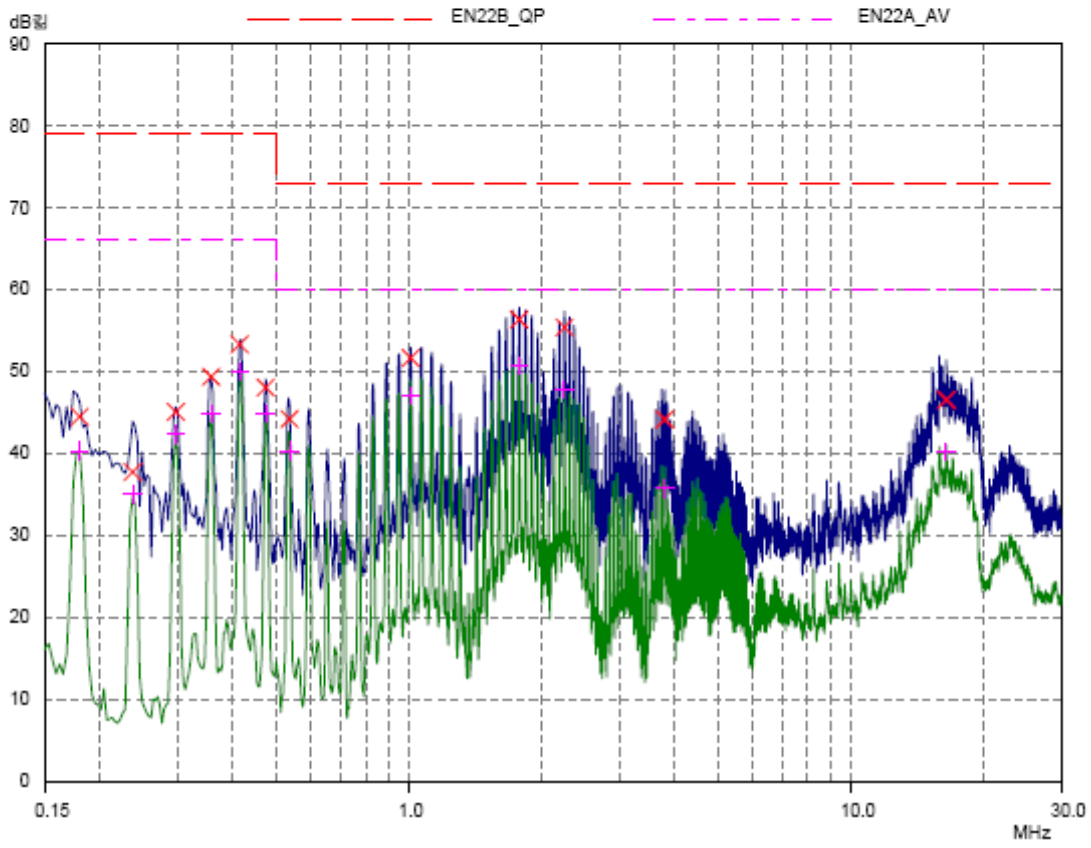
EUT: SCC-B2035P
Manuf: SAMSUNG
Op Cond: H
Operator:
Test Spec: EN55022 Class A Conducted Emission
Comment:

Result File: b2035ph.dat : SAMSUNG SCC-B2035P H

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	3MHz	3kHz	10kHz	PK+AV	10msec	Auto	OFF	60dB
3MHz	30MHz	10kHz	10kHz	PK+AV	5msec	Auto	OFF	60dB

Final Measurement:
Detectors: X QP / + AV
Meas Time: 1sec
Peaks: 8
Acc Margin: 25 dB



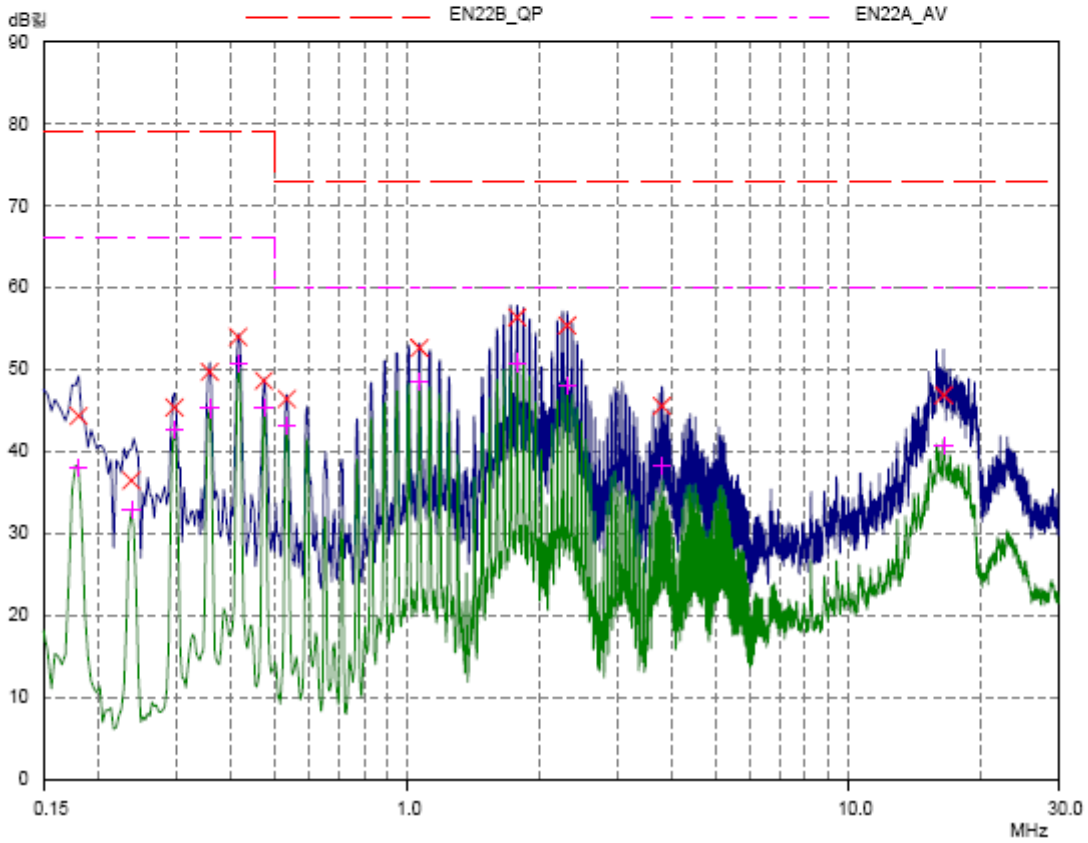
EUT: SCC-B2035P
Manuf: SAMSUNG
Op Cond: N
Operator:
Test Spec: EN55022 Class A Conducted Emission
Comment:

Result File: b2035pn.dat : SAMSUNG SCC-B2035P N

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	3MHz	3kHz	10kHz	PK+AV	10msec	Auto	OFF	60dB
3MHz	30MHz	10kHz	10kHz	PK+AV	5msec	Auto	OFF	60dB

Final Measurement: Detectors: X QP / + AV
Meas Time: 1sec
Peaks: 8
Acc Margin: 25 dB



6.2 Radiated Emission

Test specification	EN 55022:2006 Sections 6, Class A		
Test mode	Camera operation mode		
Date:	2009. 05. 07		
Power supply	230 V, 50 Hz		
Test facility	10 m OATS		
Temperature (°C)	23 °C	Humidity (% R.H.)	42 % R.H.
Remarks	Complied Minimum limit margin is 11.12 dB at 200.00 MHz.		

6.2.1 Limits of radiated emission measurement

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

6.2.2 Measurement procedure

A pretest was performed at 3 m distance in a semi-anechoic chamber for searching correct frequency. The final test was done at a 10 m open area test site 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.

6.2.3 Used equipments

Equipment	Model no.	Serial no.	Makers	Next cal. date	Used
Test Receiver	ESCI	100001	R&S	09.08.18	☒
TRILOG SUPER BROADBAND ANT	VULB9160	3228	Schwarz beck	10.09.30	☒
Antenna Mast	A109	N/A	DAEIL	-	☒
Turn Table	TS25	N/A	DAEIL	-	☒
AMPLIFIER	310N	284608	SONOMA INSTRUMENT	09.12.09	☒
3 ㏈ Attenuator	8491A	16861	HP	10.01.09	☒
10 m OATS	-	-	EMC Compliance	-	☒

6.2.4 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:

FS = MR + AF + CL + 3 ㏈ Att - AG

MR = Meter Reading

AF = Antenna Factor

CL = Cable Loss

AG= Amplifier Gain

3 ㏈ Att = 3 ㏈ Attenuator

If MR is 30 ㏈, AF 12 ㏈, CL 5 ㏈, 3 ㏈, AG 35 ㏈

The result (MR) is

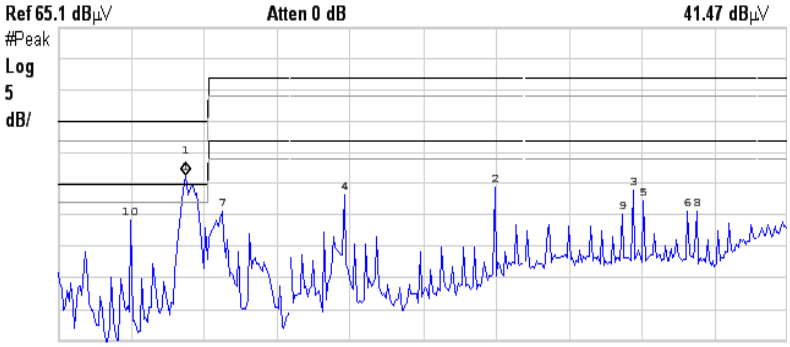
30 + 12 + 5 + 3 – 35 = 15 ㏈㎶/m

6.2.5 Photographs of test setup

6.2.6 Radiated emission measurement result

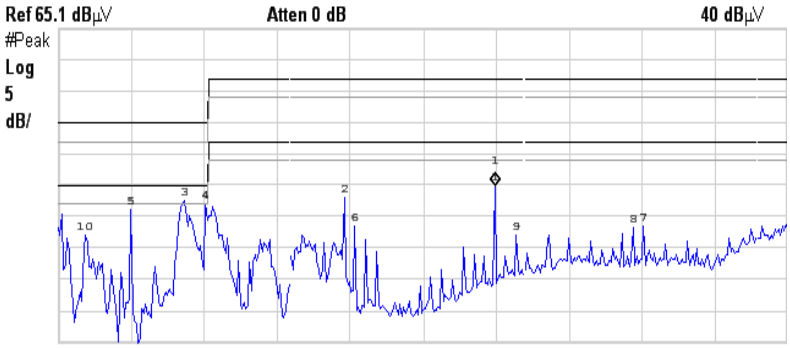
*** 3 m Semi-anechoic chamber Pre-scan Data**

-Horizontal



Pk	X Axis	Amplitude	Pk	X Axis	Amplitude
1	199.8 MHz	41.47 dBµV	6	866.6 MHz	35.61 dBµV
2	609.6 MHz	39.62 dBµV	7	248.3 MHz	35.59 dBµV
3	793.9 MHz	39.04 dBµV	8	878.8 MHz	35.56 dBµV
4	410.7 MHz	38.31 dBµV	9	779.3 MHz	35.14 dBµV
5	808.4 MHz	37.28 dBµV	10	127.0 MHz	34.13 dBµV

-Vertical



Pk	X Axis	Amplitude	Pk	X Axis	Amplitude
1	609.6 MHz	40 dBµV	6	425.3 MHz	33.54 dBµV
2	410.7 MHz	38.04 dBµV	7	808.4 MHz	33.45 dBµV
3	197.3 MHz	37.7 dBµV	8	793.9 MHz	33.39 dBµV
4	226.4 MHz	37.15 dBµV	9	638.7 MHz	32.2 dBµV
5	127.0 MHz	36.22 dBµV	10	66.4 MHz	32.2 dBµV

*** 10 m OATS measurement data**

Frequency	Reading	Pol.	Height	angle	Att	Correction Factor			Limits	Result	Margin
[㎒]	[dB㎶/m]		[m]		[3dB]	Amp Gain	Antenna	Cable	[dB㎶/m]	[dB㎶/m]	[dB]
41.63	36.4	V	1.0	125	3	32.80	12.38	1.62	40.0	20.60	19.40
67.43	42.1	V	1.0	252	3	32.80	10.20	2.14	40.0	24.64	15.36
127.12	39.4	V	1.0	331	3	32.75	11.83	3.22	40.0	24.70	15.30
200.00	43.5	H	4.0	221	3	32.60	11.09	3.89	40.0	28.88	11.12
248.41	40.0	V	1.0	133	3	32.60	12.41	4.38	47.0	27.19	19.81
411.31	38.4	V	1.4	264	3	32.80	15.96	5.99	47.0	30.55	16.45
610.00	36.8	V	3.0	281	3	32.92	19.31	7.52	47.0	33.71	13.29
793.61	29.5	H	1.0	226	3	32.81	21.27	8.84	47.0	29.80	17.20

* Note: Reading = Test Receiver value.

6.3 Harmonics

Test specification	EN 61000-3-2:2006				
Test mode	Camera operation mode				
Date	2009. 05. 08				
Power supply	230 V, 50 Hz				
Test facility	Immunity area				
Temperature(°C)	23 °C	Humidity (% R.H.)	44 % R.H.	Pressure (kPa)	999 kPa
Remarks	Complied				

6.3.1 Measurement procedure

The equipment is supplied in series with shunt(s) Rm or current transformer(s) from a source having the same nominal voltage and frequency as the rated supply voltage and frequency of the equipment. Measurements shall be made under normal load, or conditions for adequate heat discharge, and under normal operating conditions. User's operation controls or automatic programmers shall be set to produce the maximum harmonic component, for each successive harmonic component in turn. For the purpose of harmonic current limitation, equipment is classified as follows :

Class A : Equipment not specified in one of the three other Classes shall be considered as Class A equipment.

- Balanced three-phase equipment;
- Household appliances excluding equipment identified as Class D;
- Tools excluding portable tools;
- Dimmers for incandescent lamps;
- Audio equipment.

Class B : Portable tools; Arc welding equipment which is not professional equipment.

Class C : Lighting equipment.

Class D : Equipment having a specified power according to 6.2.2 less than or equal to 600 w, of the following types:

- Personal computers and personal computer monitors;
- Television receivers.

6.3.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Harmonics/Flicker meter	5001x-CTS -400-413	54984	C.I.	09.05.13	☒

6.3.3 Photographs of test setup

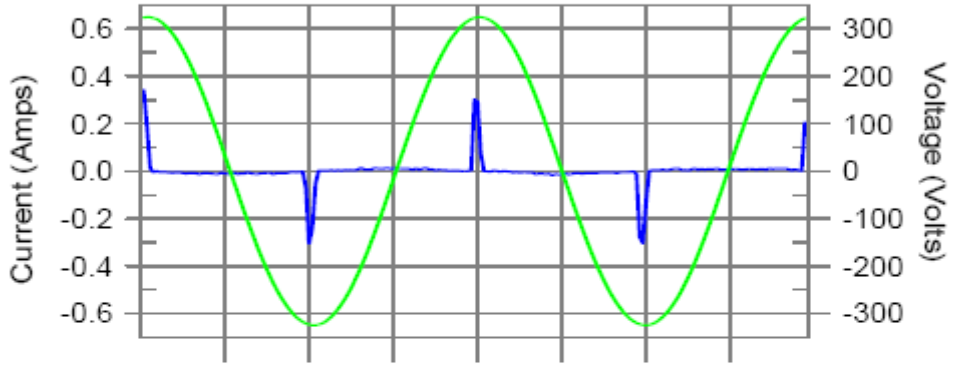
6.3.4 Measurement result

Harmonics – Class-A per Ed. 3.0 (2005-11)(Run time) incl. inter-harmonics

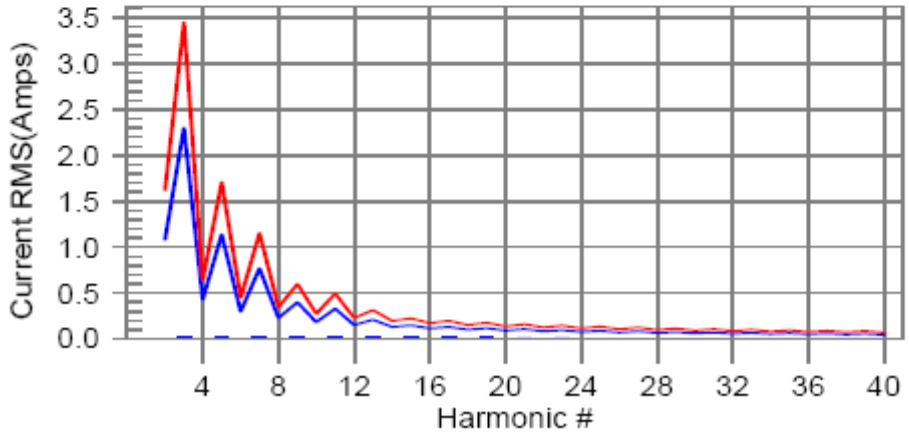
EUT: SCC-B2035P Tested by: EMC compliance
Test category: Class-A per Ed. 3.0 (2005-11) (European limits) Test Margin: 100
Test date: 2009-05-08 Start time: 오후 1:02:26 End time: 오후 1:05:16
Test duration (min): 2.5 Data file name: H-000368.cts_data
Comment: Comments
Customer: SAMSUNG

Test Result: Pass Source qualification: Normal

Current & voltage waveforms



Harmonics and Class A limit line European Limits



Test result: Pass Worst harmonic was #21 with 11.09% of the limit.

Current Test Result Summary (Run time)

EUT: SCC-B2035P Tested by: EMC compliance
Test category: Class-A per Ed. 3.0 (2005-11) (European limits) Test Margin: 100
Test date: 2009-04-30 Start time: 오후 1:02:26 End time: 오후 1:05:16
Test duration (min): 2.5 Data file name: H-000368.cts_data
Comment: Comments
Customer: SAMSUNG

Test Result: Pass Source qualification: Normal
THC(A): 0.05 I-THD(%): 271.06 POHC(A): 0.025 POHC Limit(A): 0.251
Highest parameter values during test:

V_RMS (Volts):	229.56	Frequency(Hz):	50.00
I_Peak (Amps):	0.396	I_RMS (Amps):	0.060
I_Fund (Amps):	0.021	Crest Factor:	6.743
Power (Watts):	4.4	Power Factor:	0.322

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	1.080	0.1	0.001	1.620	0.08	Pass
3	0.019	2.300	0.8	0.019	3.450	0.55	Pass
4	0.001	0.430	0.2	0.001	0.645	0.19	Pass
5	0.018	1.140	1.6	0.018	1.710	1.08	Pass
6	0.001	0.300	0.2	0.001	0.450	0.20	Pass
7	0.018	0.770	2.3	0.018	1.155	1.56	Pass
8	0.001	0.230	0.3	0.001	0.345	0.21	Pass
9	0.017	0.400	4.3	0.017	0.600	2.91	Pass
10	0.001	0.184	0.3	0.001	0.276	0.24	Pass
11	0.017	0.330	5.0	0.017	0.495	3.39	Pass
12	0.001	0.153	0.3	0.001	0.230	0.27	Pass
13	0.016	0.210	7.5	0.016	0.315	5.07	Pass
14	0.000	0.131	0.3	0.000	0.197	0.25	Pass
15	0.015	0.150	9.9	0.015	0.225	6.71	Pass
16	0.000	0.115	0.4	0.000	0.173	0.29	Pass
17	0.014	0.132	10.6	0.014	0.199	7.10	Pass
18	0.000	0.102	0.4	0.001	0.153	0.35	Pass
19	0.013	0.118	10.9	0.013	0.178	7.36	Pass
20	0.001	0.092	0.6	0.001	0.138	0.42	Pass
21	0.012	0.107	11.1	0.012	0.161	7.47	Pass
22	0.001	0.084	0.7	0.001	0.125	0.49	Pass
23	0.011	0.098	11.0	0.011	0.147	7.44	Pass
24	0.001	0.077	0.9	0.001	0.115	0.63	Pass
25	0.010	0.090	10.8	0.010	0.135	7.29	Pass
26	0.001	0.071	1.0	0.001	0.106	0.75	Pass
27	0.009	0.083	10.4	0.009	0.125	7.01	Pass
28	0.001	0.066	1.2	0.001	0.099	0.88	Pass
29	0.008	0.078	9.8	0.008	0.116	6.64	Pass
30	0.001	0.061	1.4	0.001	0.092	1.07	Pass
31	0.007	0.073	9.1	0.007	0.109	6.13	Pass
32	0.001	0.058	1.6	0.001	0.086	1.16	Pass
33	0.006	0.068	8.2	0.006	0.102	5.59	Pass
34	0.001	0.054	1.8	0.001	0.081	1.26	Pass
35	0.005	0.064	7.4	0.005	0.096	5.03	Pass
36	0.001	0.051	2.0	0.001	0.077	1.38	Pass
37	0.004	0.061	6.5	0.004	0.091	4.42	Pass
38	0.001	0.048	2.1	0.001	0.073	1.47	Pass
39	0.003	0.058	5.6	0.003	0.087	3.80	Pass
40	0.001	0.046	2.1	0.001	0.069	1.51	Pass

Voltage Source Verification Data (Run time)

EUT: SCC-B2035P Tested by: EMC compliance
Test category: Class-A per Ed. 3.0 (2005-11) (European limits) Test Margin: 100
Test date: 2009-05-08 Start time: 오후 1:02:26 End time: 오후 1:05:16
Test duration (min): 2.5 Data file name: H-000368.cts_data
Comment: Comments
Customer: SAMSUNG

Test Result: Pass Source qualification: Normal

Highest parameter values during test:

Voltage (Vrms):	229.56	Frequency(Hz):	50.00
I_Peak (Amps):	0.396	I_RMS (Amps):	0.060
I_Fund (Amps):	0.021	Crest Factor:	6.743
Power (Watts):	4.4	Power Factor:	0.322

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.101	0.459	22.04	OK
3	0.581	2.066	28.12	OK
4	0.021	0.459	4.56	OK
5	0.022	0.918	2.42	OK
6	0.023	0.459	5.08	OK
7	0.015	0.689	2.23	OK
8	0.017	0.459	3.72	OK
9	0.023	0.459	4.95	OK
10	0.005	0.459	1.15	OK
11	0.021	0.230	9.10	OK
12	0.023	0.230	9.86	OK
13	0.034	0.230	14.66	OK
14	0.003	0.230	1.52	OK
15	0.015	0.230	6.64	OK
16	0.024	0.230	10.63	OK
17	0.014	0.230	6.19	OK
18	0.011	0.230	4.85	OK
19	0.018	0.230	8.05	OK
20	0.015	0.230	6.73	OK
21	0.011	0.230	4.82	OK
22	0.008	0.230	3.56	OK
23	0.016	0.230	6.90	OK
24	0.011	0.230	4.68	OK
25	0.014	0.230	5.89	OK
26	0.005	0.230	2.08	OK
27	0.021	0.230	9.06	OK
28	0.012	0.230	5.29	OK
29	0.006	0.230	2.79	OK
30	0.011	0.230	4.68	OK
31	0.017	0.230	7.37	OK
32	0.012	0.230	5.43	OK
33	0.007	0.230	2.93	OK
34	0.006	0.230	2.78	OK
35	0.009	0.230	4.06	OK
36	0.006	0.230	2.61	OK
37	0.008	0.230	3.28	OK
38	0.009	0.230	3.89	OK
39	0.008	0.230	3.38	OK
40	0.008	0.230	3.29	OK

6.4 Flicker

Test specification	EN 61000-3-3/A2:2005				
Test mode	Camera operation mode				
Date	2009. 05. 08				
Power supply	230 V, 50 Hz				
Test facility	Immunity area				
Temperature(°C)	23 °C	Humidity (% R.H.)	44 % R.H.	Pressure (kPa)	999 kPa
Remarks	Complied				

6.4.1 Measurement procedure

EUT was connected to the power analyzer system.

Measurement was performed to obtain the desired flicker parameters.

The measuring time depends on which parameters are to be measured.

P_{lt} = 2 h

P_{st} = 10 min

Controls and automatic programs shall be set to produce the most unfavorable sequence of voltage changes, using only those combinations of controls and programs are mentioned by the manufacturer in the instruction manual.

6.4.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Harmonics/Flicker meter	5001x-CTS-400-413	54984	C.I.	09.05.13	☒

6.4.3 Photographs of test setup

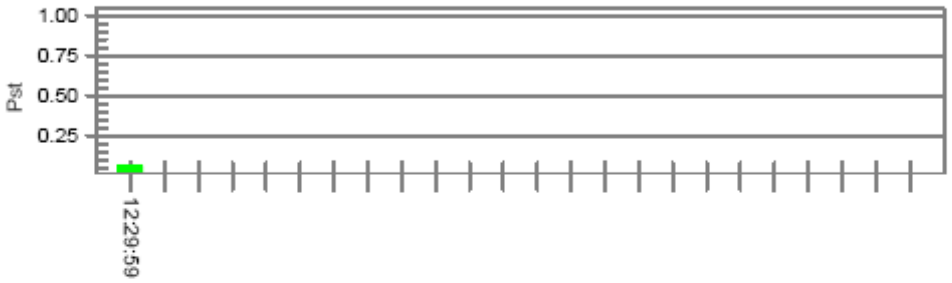
6.4.4 Measurement result

Flicker Test Summary per EN/IEC61000-3-3 (Run time)

EUT: SCC-B2035P
Test category: All parameters (European limits)
Tested by: EMC compliance
Test Margin: 100
Test date: 2009-05-08
Start time: 오후 12:19:40
End time: 오후 12:30:01
Test duration (min): 10
Data file name: F-000367.cts_data
Comment: Comments
Customer: SAMSUNG

Test Result: Pass
Status: Test Completed

Pst, and limit line
European Limits



Plt and limit line

Parameter values recorded during the test:

Vrms at the end of test (Volt):	229.47			
Highest dt (%):	0.00	Test limit (%):	3.30	Pass
Time(mS) > dt:	0.0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	0.00	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.064	Test limit:	1.000	Pass

6.5 Electrostatic Discharge test result

Test specification	EN 61000-4-2:1995+A1+1998+A2:2001				
Test level	Contact: ± 2, 4, 6 ㎸ Air: ± 2, 4, 8 ㎸ HCP / VCP: ± 2, 4, 6 ㎸				
Discharge impedance	330 Ω / 150 ㎊				
Power supply	230 V, 50 ㎐				
Date	2009. 05. 08				
Number of discharge	10				
Interval between discharges	: ≥ 1 s				
Temperature(°C)	20 °C	Humidity (% R.H.)	46 % R.H.	Pressure (㎪)	998 ㎪
Remarks	Complied - There was no change of operation status during above testing.				

6.5.1 Measurement procedure

A ground reference plane was located on the floor, and connected to earth via a low Impedance connection. The return cable of the ESD generator was connected to the reference plane. In case of floor standing equipment, EUT was placed on the reference plane on 0.1 ㎡ of insulating Support. In case of table top equipment, EUT was placed on a wooden table 0.8 ㎡ above the reference grounded floor. A horizontal coupling plane (HCP) was placed on the table, and Connected to the reference plane via a 470 ㏀ resistor located in each end (0.5 ㎜ insulating support between EUT and HCP).
In both cases a vertical coupling plane(VCP) OF 0.5 X 0.5 ㎡ was located 0.1 ㎡ from the EUT's sides. The VCP was connected to the reference plane in the same matter as the HCP.

6.5.2 Used equipments

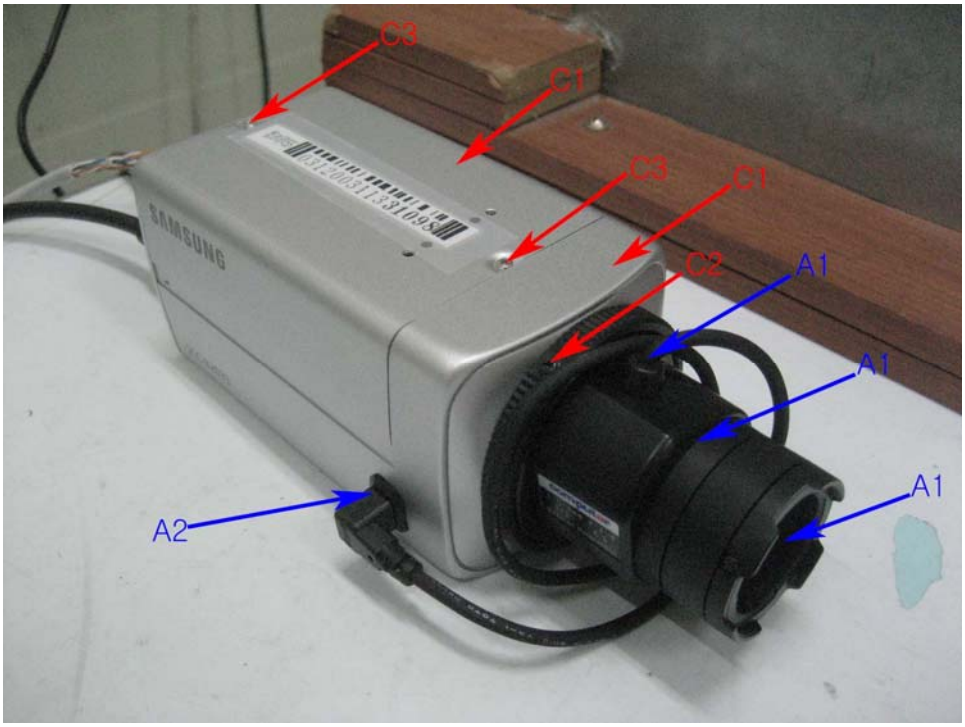
Equipment	Model No.	Serial No.	Makers	Next Cal. Date	Used
ESD Tester	NSG 437	182	TESEQ	09.05.20	☒
HCP	-	-	-	-	☒
VCP	-	-	-	-	☒

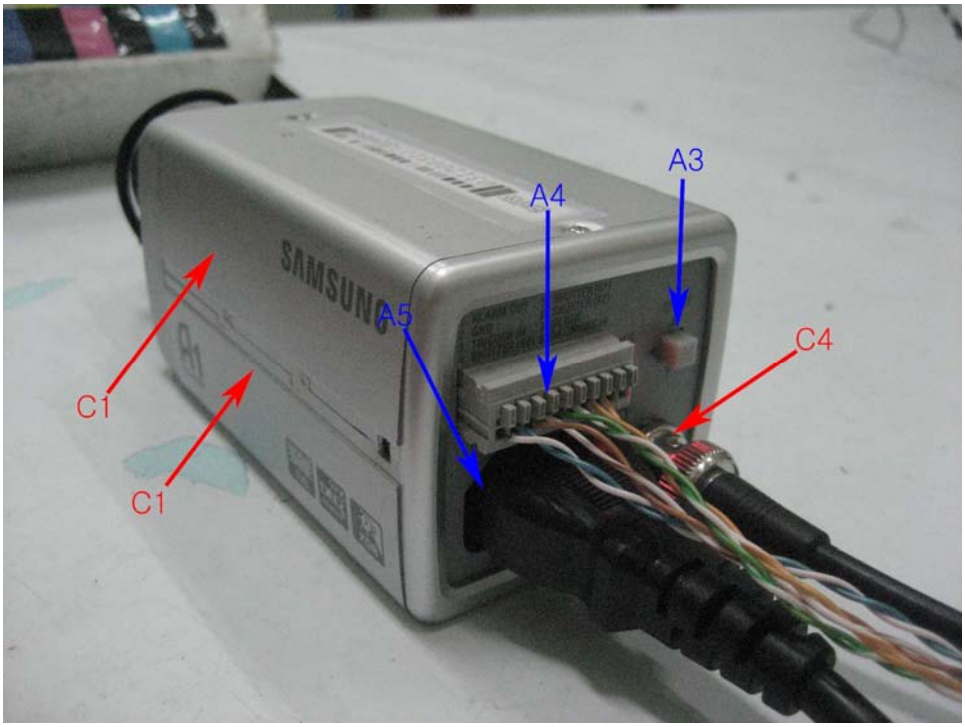
6.5.3 Photographs of test setup

6.5.4 Measurement result

Electrostatic Discharge (Test Point)

Air discharge →
Contact discharge →





Contact discharge

Location(EUT)		Applied level (±)	Result
C1	Enclosure	± 2, 4, 6 kV	Complied
C2	Lens screw	± 2, 4, 6 kV	Complied
C3	EUT screw	± 2, 4, 6 kV	Complied
C4	BNC port	± 2, 4, 6 kV	Complied
	HCP (All 4 sides)	± 2, 4, 6 kV	Complied
	VCP (All 4 sides)	± 2, 4, 6 kV	Complied

Air discharge

Location(EUT)		Applied level (±)	Result
A1	Lens enclosure	± 2, 4, 8 kV	Complied
A2	IRIS port	± 2, 4, 8 kV	Complied
A3	Switch	± 2, 4, 8 kV	Complied
A4	Terminal (video out, RS-485 +,-, Alarm out, Trigger in, Shutter (S0), Shutter (S1), Shutter (S2), Day/Night in, GND, 5V out) port	± 2, 4, 8 kV	Complied
A5	Power port	± 2, 4, 8 kV	Complied

6.6 Radio Frequency Electromagnetic Fields

Test specification	EN 61000-4-3:2006				
Tested frequency	80 ㎒ ~ 2000 ㎒ log 1 % step				
Test level & Modulation	1, 3, 10 V/m, 80 % Amplitude Modulation (1 ㎑) 1, 3, 10 V/m, Pulse Modulation (1 Hz (0.5 s ON: 0.5 s OFF))				
Distance	3 m from EUT to tip of antenna				
Dwell time	3 s				
Step size	log 1 % step				
Power supply	230 V, 50 Hz				
Date	2009. 05. 11				
Temperature(°C)	22 °C	Humidity (% R.H.)	48 % R.H.	Pressure (㎪)	989 ㎪
Remarks	Complied - There was no change of operation status during above testing.				

6.6.1 Measurement procedure

The test was performed at 3 m full anechoic chamber.

For floor standing equipment, the EUT was standing on the floor.

For tabletop equipment, the EUT was located on a wooden table 0.8 m above the floor.

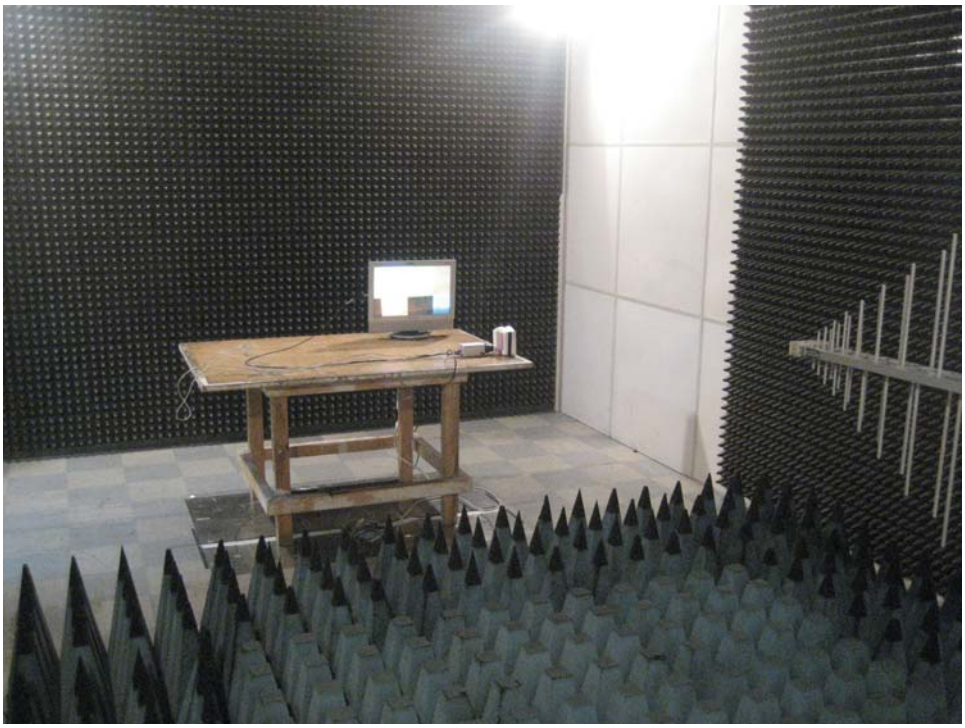
The EUT was tested all sides, horizontal and vertical polarization.

6.6.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Power meter	PM2002	302852	AR	10.04.13	☒
Power sensor (with adapter)	PH2000	303224	AR	10.04.13	☒
Power sensor (with adapter)	PH2000	303222	AR	10.04.13	☒
Directional coupler	DC6180	303976	AR	10.04.13	☒
Signal generator	E4421B	GB40052295	AGILENT	09.10.24	☒
Amplifier	150W1000M2	303843	AR	10.04.13	☒
Directional Coupler	DC7144M1	320279	AR	10.02.20	☒

Amplifier	60S1G3M2	320444	AR	10.04.13	☒
BiconiLog Ant.	LPDA-0803	130269	ETS	-	☒
BiconiLog Antenna	3142B	1786	EMCO	-	☒
Field monitor	SI-300	-	TDK	-	☒
Controller	HD 100	-	Deisel	-	☒
Turn table	DS 412S	-	Deisel	-	☒
Antenna mast	MA 220	-	Deisel	-	☒

6.6.3 Photographs of test setup



6.6.4 Measurement result

Location(EUT)	Antenna polarization	Result
Front side	Horizontal	Complied
	Vertical	Complied
Rear side	Horizontal	Complied
	Vertical	Complied
Left side	Horizontal	Complied
	Vertical	Complied
Right side	Horizontal	Complied
	Vertical	Complied

6.7 Electric Fast Transient/BURST

Test specification	EN 61000-4-4:2004				
Coupling	AC main Signal: clamp				
Test level	AC main: ± 2 ㎸ Peak Signal: ± 1 ㎸ Peak				
Repetition frequency	5 ㎑, Tr/Th = 5 / 50 ㎱				
Coupling time	60 ㎝				
Power supply	230 Ⅴ, 50 ㎐				
Date	2009. 05. 08				
Temperature(°C)	21 °C	Humidity (% R.H.)	46 % R.H.	Pressure (㎪)	998 ㎪
Remarks	Complied - There was no change of operation status during above testing.				

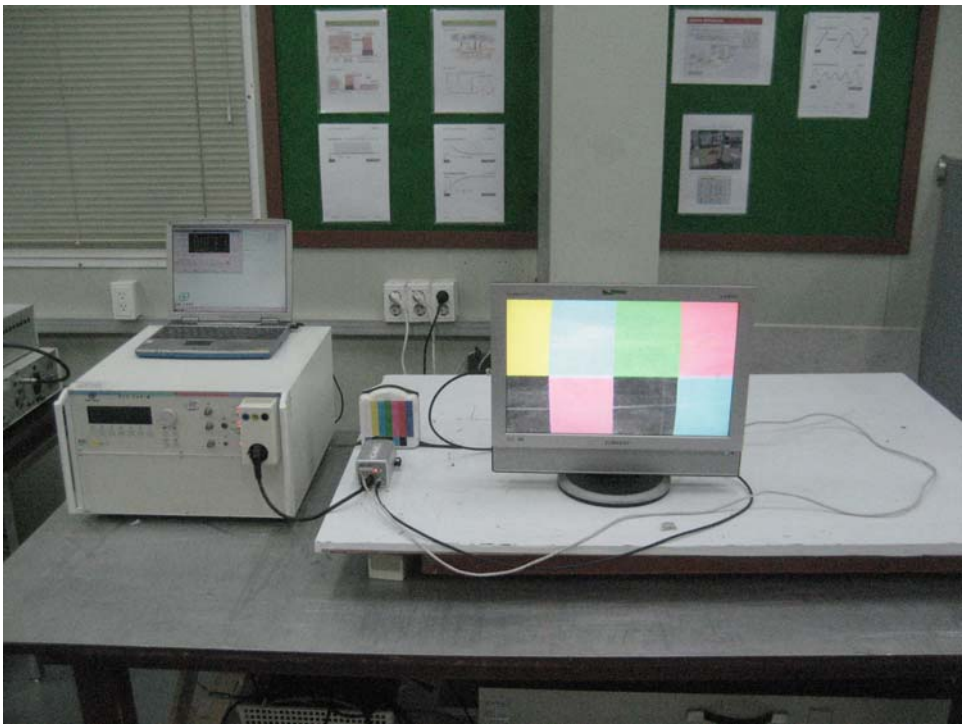
6.7.1 Measurement procedure

A ground reference plane was located on the floor.
EFT generator was connected to reference ground plane via low impedance connection.
For floor standing equipment, EUT was placed on a 0.1 ㎝ wooden table.
For tabletop equipment, EUT was placed on a 0.1 ㎝ above the ground reference plane.
Test generator and coupling/decoupling network was placed on, and bounded to, the ground reference plane. When using the coupling clamp, the minimum distance between the coupling plates and all other conductive surfaces, except the ground reference plane beneath the coupling clamp, Shall be 0.5 ㎝.

6.7.2 Used equipments

Equipment	Model No.	Serial No.	Makers	Next Cal. date	Used
Generator	UCS 500 M6	V0545100858	EM TEST	10.01.21	☒
Capacitive Coupling Clamp	-	-	EM TEST	-	☒

6.7.3 Photographs of test setup



6.7.4 Measurement result

* AC main

EFT coupling point	(+)	(-)	Result
Live + Neutral	+ 2 ㎸	- 2 ㎸	Complied

* Signal

EFT coupling point	(+)	(-)	Result
BNC (video out)	+ 1 ㎸	- 1 ㎸	Complied
video out Cable	+ 1 ㎸	- 1 ㎸	Complied
RS-485 +,- Cable	+ 1 ㎸	- 1 ㎸	Complied
Alarm out Cable	+ 1 ㎸	- 1 ㎸	Complied
Trigger in Cable	+ 1 ㎸	- 1 ㎸	Complied
Shutter (S0) Cable	+ 1 ㎸	- 1 ㎸	Complied
Shutter (S1) Cable	+ 1 ㎸	- 1 ㎸	Complied
Shutter (S2) Cable	+ 1 ㎸	- 1 ㎸	Complied
Day/Night in Cable	+ 1 ㎸	- 1 ㎸	Complied
GND Cable	+ 1 ㎸	- 1 ㎸	Complied
5V out Cable	+ 1 ㎸	- 1 ㎸	Complied

6.8 Surge

Test specification	EN 61000-4-5:1995+A1:2001				
Coupling	AC main Signal : CDN				
Test level	AC main Differential mode: ± 0.5, 1 ㎸ Signal: ± 0.5, 1 ㎸				
Surge pulse shape	Tr/Th = 1.2 / 50 ㎲				
Coupling Impedance	AC main Differential mode: 18 ㎌ BNC: Direct				
Number of surge & Coupling time	5 T/ 1 min				
Angles	0 °, 90 °, 180 °, 270 °				
Power supply	230 Ⅴ, 50 ㎐				
Date	2009. 05. 11				
Temperature(°C)	22 °C	Humidity (% R.H.)	48 % R.H.	Pressure (㎪)	989 ㎪
Remarks	Complied - There was no change of operation status during above testing.				

6.8.1 Measurement procedure

A ground reference plane was located on the floor. SURGE generator was connected to reference ground plane via low impedance connection. For floor standing equipment, EUT was placed on a 0.1㎡ wooden table. For tabletop equipment, EUT was placed on a wooden table (0.8 ㎡) above the reference plane.

6.8.2 Used equipments

Equipment	Model No.	Serial No.	Makers	Next Cal. date	Used
Generator	UCS 500 M6	V0545100858	EM TEST	10.01.21	☒
CDN	CNV 508	1001-10	EM TEST	-	☒

6.8.3 Photographs of test setup

6.8.4 Measurement result

* AC main

Coupling point	(+)	(-)	Result
L-N	+ 0.5, 1 ㎸	- 0.5, 1 ㎸	Complied

* Signal

Coupling point	(+)	(-)	Result
BNC(video out) Cable	+ 0.5, 1 ㎸	- 0.5,1 ㎸	Complied

6.9 Conducted Immunity

Test specification	EN 61000-4-6:1996+A1:2001				
Tested frequency	150 ㎑ ~ 100 ㎒ log 1 % step				
Test level & Modulation	1, 3, 10 Ⅴ, 80 % Amplitude Modulation (1 ㎑) 1, 3, 10 Ⅴ, Pulse Modulation (1 ㎐ (0.5 s ON: 0.5 s OFF))				
Coupling method	AC mian: M2 Signal: Clamp				
Power supply	230 Ⅴ, 50 ㎐				
Date	2009. 05. 08				
Temperature(°C)	22 °C	Humidity (% R.H.)	44 % R.H.	Pressure (㎪)	999 ㎪
Remarks	Complied - There was no change of operation status during above testing.				

6.9.1 Measurement procedure

A ground reference plane was located on the floor.
The test was performed on a ground reference plane on a 0.1 m wooden table.
This test were performed using CDN for mains, clamp for signal and injection probe.
The frequency range was swept from 150 ㎑ to 100 ㎒. This frequency range was
Modulated with 1 ㎑ sine wave at 80 %.
The signal generators provided the modulated frequency at a 1 % step size.
The power and all network cable, I/O cables longer than 3 m length were tested.

6.9.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
CS generator	NSG 2070	1054	Schaffner	09.05.19	☒
CDN	M016	16674	Schaffner	10.03.25	☒
Attenuator	INA2070-1	2054	Schaffner	10.03.24	☒
EM Clamp	KEMZ 801	17643	Schaffner	10.04.08	☒
EM Clamp	KEMA 801	17899	Scahffner	-	☐
Current probe	MD720	W1345167/M6/0068	Schaffner	-	☒

6.9.3 Photographs of test setup

6.9.4 Measurement result

Coupling point	Coupling method	Result
Power	CDN (M2)	Complied
BNC (video out)	Clamp	Complied
video out Cable	Clamp	Complied
RS-485 +,- Cable	Clamp	Complied
Alarm out Cable	Clamp	Complied
Trigger in Cable	Clamp	Complied
Shutter (S0) Cable	Clamp	Complied
Shutter (S1) Cable	Clamp	Complied
Shutter (S2) Cable	Clamp	Complied
Day/Night in Cable	Clamp	Complied
GND Cable	Clamp	Complied
5V out Cable	Clamp	Complied

6.10 Dips and Interruptions

Test specification	EN 61000-4-11:2004				
Number of dips	3 T				
Duration	60 s				
Phase	Zero crossing (0 °, 180 °)				
Power supply	230 V, 50 Hz				
Date	2009. 05. 08				
Temperature (°C)	23 °C	Humidity (% R.H)	44 % R.H	Pressure (kPa)	999 kPa
Remarks	Complied - There was no change of operation status during above testing.				

6.10.1 Measurement procedure

The dips/interruption test is only applicable to AC mains.

The dips/interruptions were applied at zero crossing.

6.10.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Generator	UCS 500 M6	V0545100858	EM TEST	10.01.21	☒

6.10.3 Photographs of test setup

6.10.4 Measurement result

***** 230 V, 50 Hz

Test Level (%UT)	Dip/Int. (%UT)	Duration /Period	Phase (°)	Count number	Result
70 %	30 %	0.5, 1, 5, 10 Period	0 / 180	3T	Complied
40 %	60 %	0.5, 1, 5, 10 Period	0 / 180	3T	Complied
0 %	100 %	0.5, 1, 5 Period	0 / 180	3T	Complied

Comment:

- There was no change of operation status during above testing.

6.11 Mains supply voltage variations

Test specification	EN 50130-4:2003				
Tested Voltage	*U nom* + 10 %, *U nom* - 15 %				
Power supply	220 V, 50 Hz, 240 V, 50 Hz				
Date	2009. 05. 08				
Temperature (°C)	23 °C	Humidity (% R.H)	44 % R.H	Pressure (kPa)	999 kPa
Remarks	Complied - There was no change of operation status during above testing.				

6.11.1 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. Date	Used
Generator	UCS 500 M6	V0545100858	EM TEST	10.01.21	☒

6.11.2 Measurement result

Tested voltage: 240 V, 50 Hz

Supply voltage		Result
+ 10 %	264 V	Complied
- 15 %	204 V	Complied

Tested voltage: 220 V, 50 Hz

Supply voltage		Result
+ 10 %	242 V	Complied
- 15 %	187 V	Complied

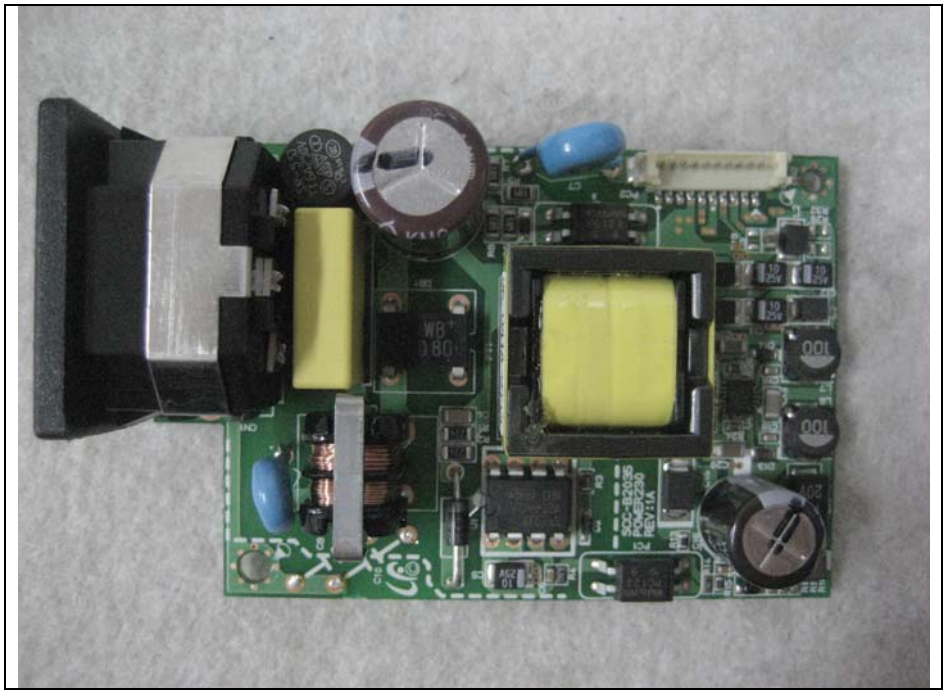
7. E.U.T. photographs

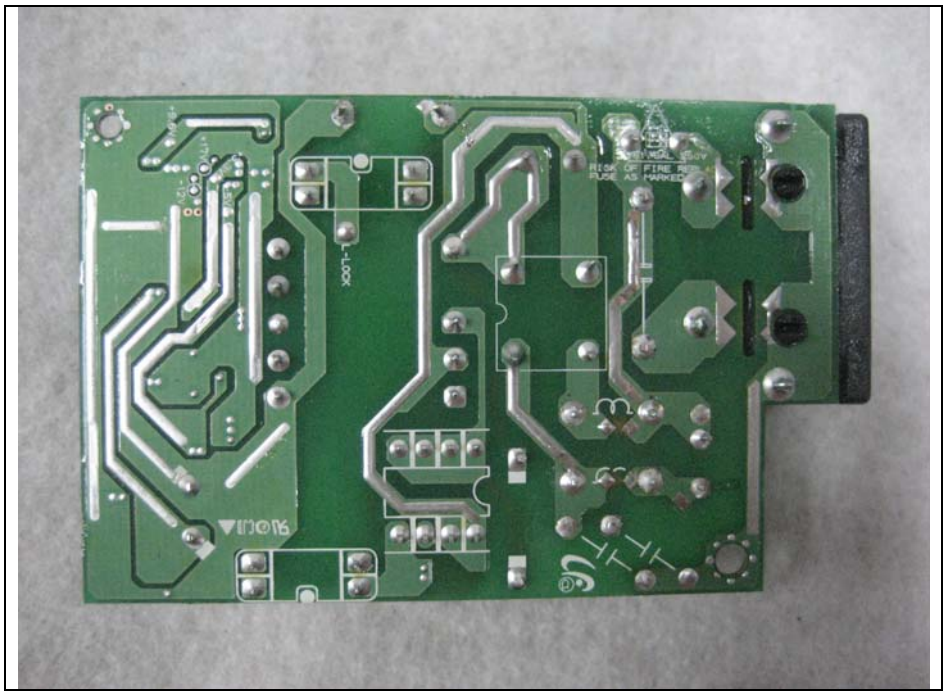
Front View

Rear View

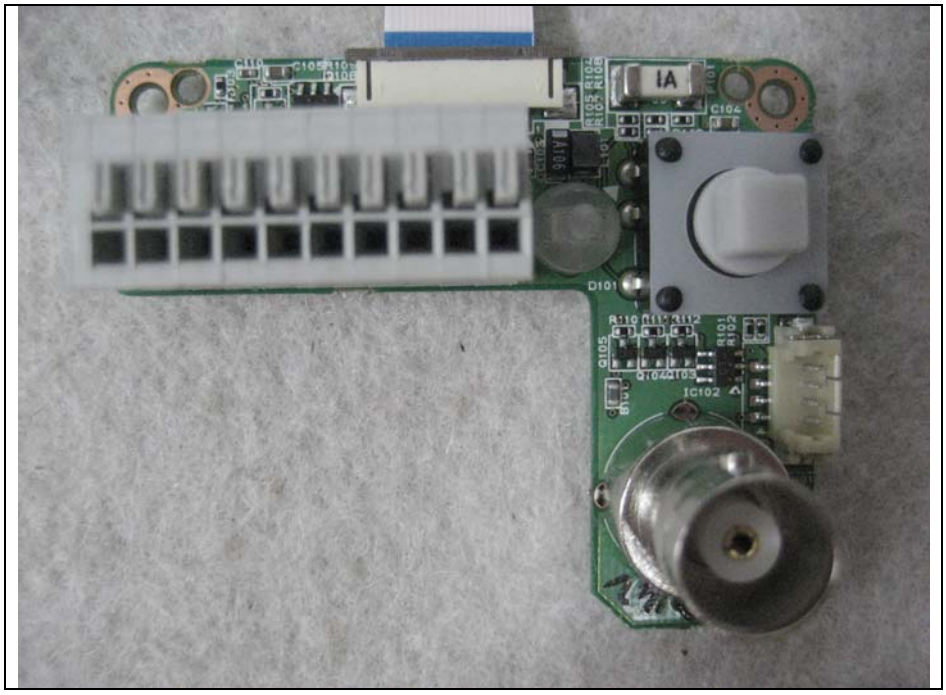
Inside

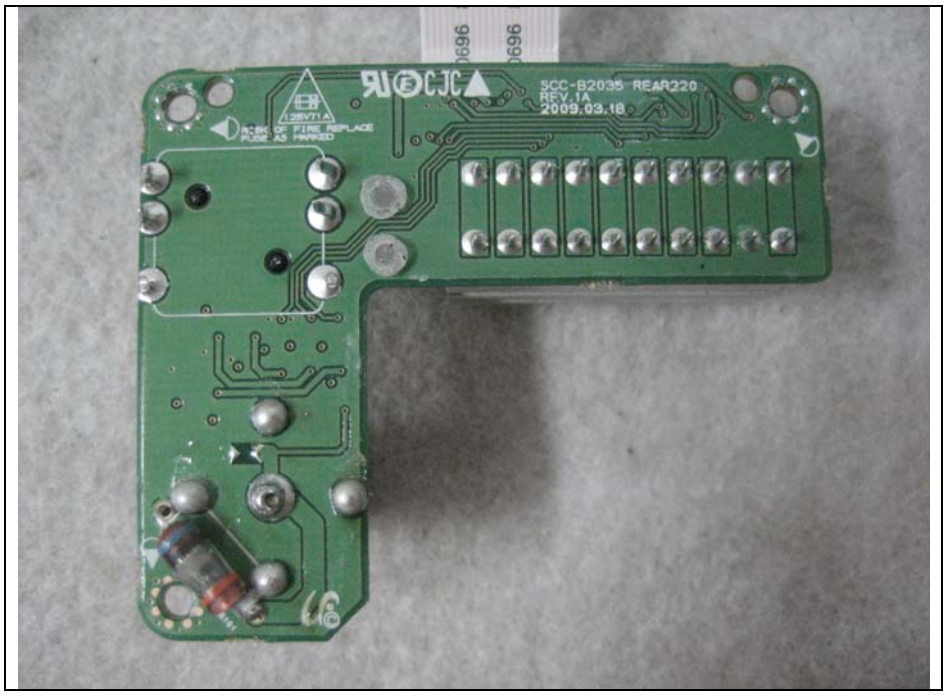
Main Board



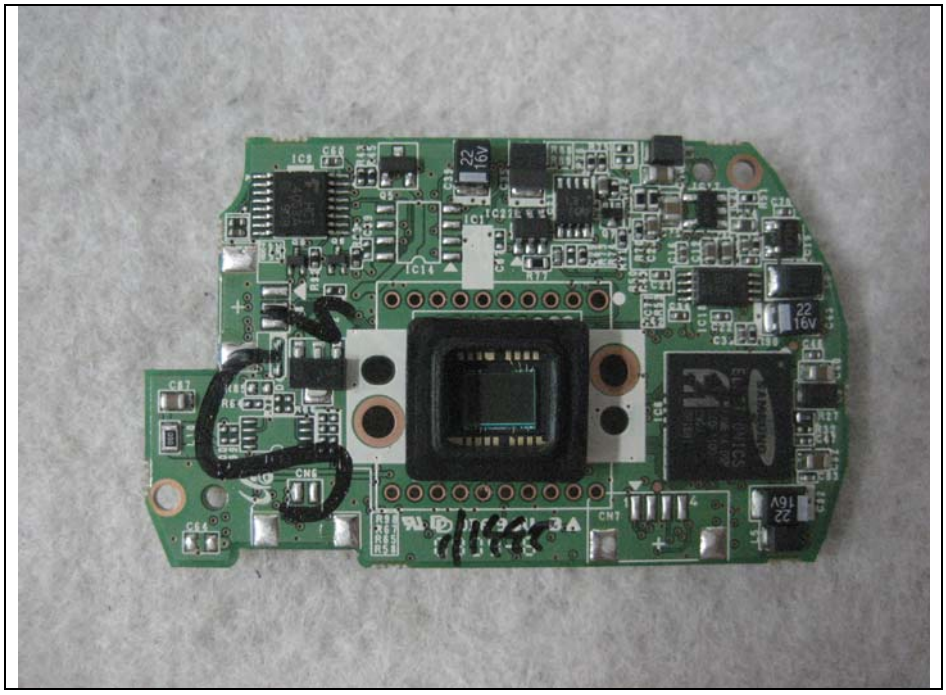


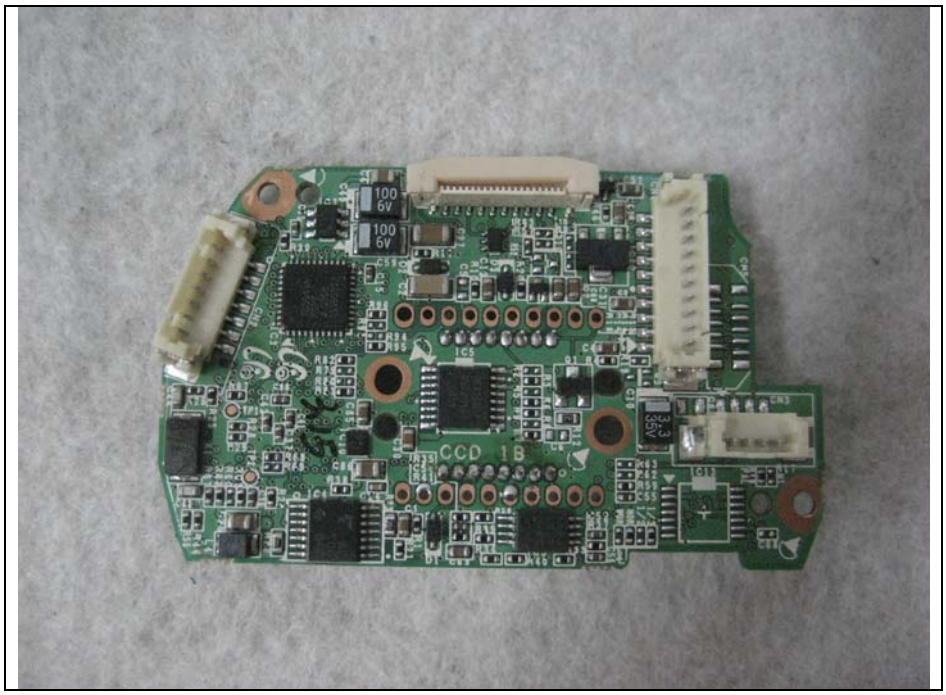
Port Board





Main SUB Board





Lens

BNC (video out) Cable

Terminal Cable