

# EMC Test Report

<b>Project No.</b>	LBE051019
<b>Equipment under Test</b>	
<b>Applicant</b>	Samsung Electronics Co., Ltd
<b>Address</b>	416 Maetan3-Dong, Yeongtong-Gu, Suwon-City, Gyeonggi-Do, Korea, 443-742
<b>Product Name</b>	CCTV Camera
<b>Model Name</b>	SCC-B2091P
<b>Manufacturer</b>	Samsung Electronics Co., Ltd
<b>Brand Name</b>	SAMSUNG
<b>Variant Model</b>	See Page 3
<b>Date of Test</b>	May 11 ~ May 14, 2005
<b>Issued Date</b>	May 16, 2005

<b>Applied Standards</b>	EN 61000-6-3:2001, EN61000-3-2: 2000, EN61000-3-3: 1995+A1:2001, EN50130-4: 1995 + A1:1998
<b>Result</b>	<b>Passed</b> The equipment under test has found to be compliant with the applied standards.

	<b>Name/Position</b>	<b>Signature</b>
<b>Tested by</b>	Tae Young, Jang Test Engineer	
<b>Reviewed by</b>	No Cheon, Park Manager of EMC Lab.	
<b>Authorized by</b>	Seung Kyu, Cha Chief of EMC Lab.	

<b>SAMSUNG ELECTRONICS Co., Ltd. SUWON EMC Test Lab.</b>		
<b>Address</b>	416 Maetan3-Dong, Yeongtong-Gu, Suwon-City, Gyeonggi-Do, Korea, 443-742	
<b>Telephone No.</b>	82-31-200-2135	
<b>Fax No.</b>	82-31-200-2189	

## Table of Contents

### **1. General Information**

- 1.1 Basic Information related Product
- 1.2 Detail Information related Product
- 1.3 Test Block Diagram
- 1.4 Test Configuration
- 1.5 Applied Standard
- 1.6 Test Facility

### **2. Summary of Test Results**

### **3. Description of individual tests**

- 3. 1 Conducted Emission
- 3. 2 Radiated Emission
- 3. 3 Harmonics
- 3. 4 Flicker
- 3. 5 ESD
- 3. 6 Radiated Immunity
- 3. 7 EFT
- 3. 8 SURGE
- 3. 9 Conducted Immunity
- 3. 10 Voltage Dip

### **4. Appendix**

- 4.1 Test Photography
- 4.2 EUT Photography

# 1. General Information

## 1.1 Basic Information related Product

<b>Applicant</b>	Samsung Electronics Co., Ltd
<b>Model name</b>	SCC-B2091P
<b>Applicant Address</b>	416 Maetan3- Dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, Korea, 443-742
<b>Contact Person</b>	Jong Wook, Kim
<b>Kind of Product</b>	CCTV Camera
<b>Valiant Model List</b>	None
<b>Manufacturer</b>	Samsung Electronics Co., Ltd

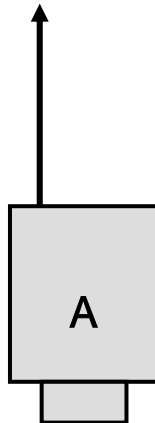
## 1.2 Detail Information related Product

### Specification

<b>Product Type</b>	Color CCTV Camera (PAL Type)
<b>Power Consumption</b>	4W
<b>Imaging Device</b>	1/3 Inch S-HAD CCD
<b>Lens Mount</b>	CS/c (Mount Adapter)
<b>Scanning System</b>	2:1 Interlace
<b>Synchronous System</b>	INT/LINELOCK (V-Phase VR control)
<b>Signal Output</b>	Composite Video Out : 1.0 Vp-p 75 /BNC
<b>Lowest illumination</b>	0.3/0.06 Lux (Color/BW) (F1.2, 30IRE)

### 1.3 Test Block Diagram

**Block Diagram**



### 1.4 Test Configuration

**Used EUT and Peripherals**

Seq	Device	Model Name	Serial #	Maker	Note
A	CCTV Camera	SCC-B2091P	-	SAMSUNG	EUT

### 1.5 Applied Standards

**List**

Product or Generic Standards	Basic Standards
EN61000-6-3:2001	EN61000-4-2:1995
EN61000-3-2: 2000	EN61000-4-3:1996
EN61000-3-3: 1995+A1:2001	EN61000-4-4:1995
EN50130-4:1995+A1:1998	EN61000-4-5:1995
	EN61000-4-6:1996
	EN61000-4-11:1994

**Performance Criteria**

- A. normal performance within the specification limits
- B. temporary degradation or less of function or performance which is self-recoverable
- C. temporary degradation or less of function or performance which require operator intervention or system reset

**1.6 Test Facility**

**General Information**

The EMI/EMS measurement facilities used to collect the tested data are located at 416 Maetan 3 Dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, Korea. This sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1 & 16-2.

SAMSUNG Electronics Co.,Ltd is accredited by Korea Laboratory Accreditation scheme(KOLAS) which signed the International Laboratory Accreditation Cooperation(ILAC) Mutual Recognition Arrangement (MRA) for the above test item(s) and test method(S).

**Accreditation and Listing**



**Uncertainty**

(According to NAMAS Pub.NIS81)

Test Item	Expanded Uncertainty
Radiated Disturbance	±5.09
Disturbance voltage at the mains terminals	± 1.64

## 2. Summary of Test Results

Result : **PASS**

The equipment under test(EUT) has been found to comply with the applied standards.

Section of the Product Standard		Applied Standard	Result
<b>Electromagnetic Emission Test</b>			
3.1	Conducted Emission	EN61000-6-3:2001	Complied
3.2	Radiated Emission	EN61000-6-3:2001	Complied
3.3	Harmonics	EN61000-3-2: 2000	Complied
3.4	Flicker	EN61000-3-3: 1995+A1:2001	Complied
<b>Electromagnetic Susceptibility(Immunity) Test</b>			
3.5	ESD	EN61000-4-2:1995	Complied
3.6	Radiated Immunity	EN61000-4-3:1996	Complied
3.7	EFT	EN61000-4-4:1995	Complied
3.8	SURGE	EN61000-4-5:1995	Complied
3.9	Conducted Immunity	EN61000-4-6:1996	Complied
3.10	Voltage Dip	EN61000-4-11:1994	Complied

### 3. Description of Individual Tests

#### 3.1 Conducted Emission

Test Information	
Test Engineer	Tae Young, Jang
Test Date	May 11, 2005
Climate Condition	Ambient Temperature : 23 (EN Limit : 15 ~35 ) Relative Humidity : 34% (EN Limit : 30%~60%) Atmospheric Pressure 1004 mbar (EN Limit : 860~1060)
Test Place	Shield Room #5

#### Test Equipments

Equipment	Model Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
RF Relais Matrix	PSU	R&S	861206/024	N / A	N / A
EMC Analyzer	E7405A	Agilent	MY42000052	2005-08-26	12
EMI Test Receiver	ESS	R&S	844661/005	2006-01-11	12
L.I.S.N	ESH3-Z5	R&S	100261	2005-07-23	12
Test Software	EP5CE	TOYO	Ver. 2.0.860	N / A	N / A

#### EUT Test Setup

The EUT was set up as per normal use on a 0.8m wooden table, at least 0.8m from other conduction surfaces and 0.8m from the LISN.

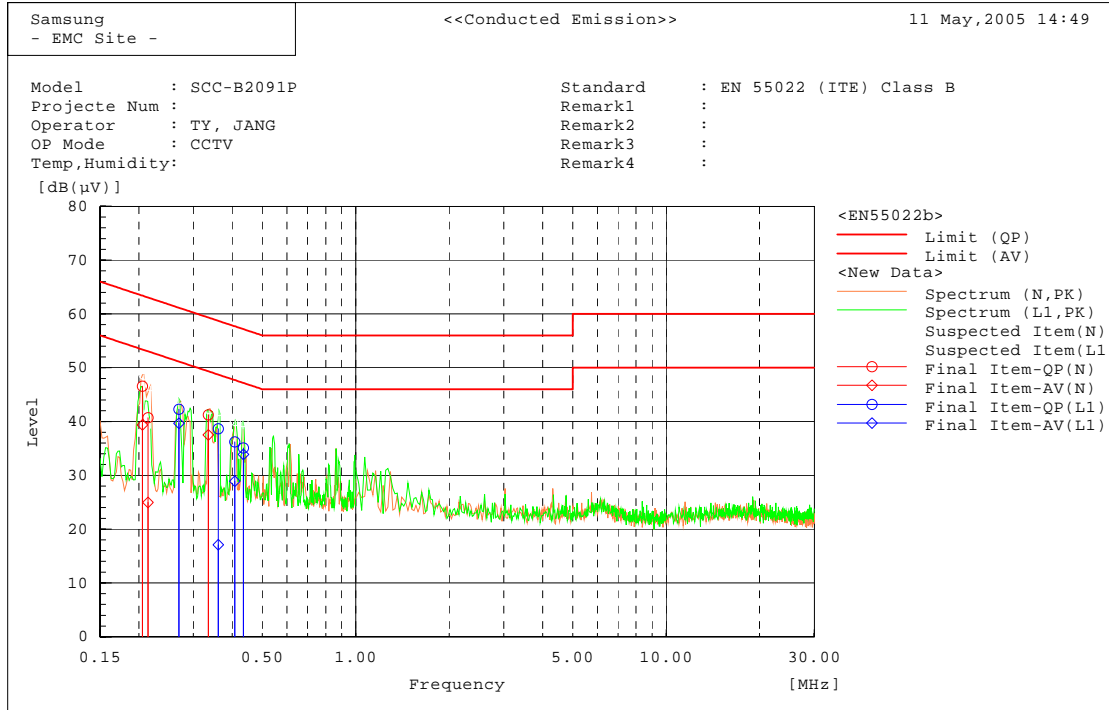
See photo.

#### Test Result

<b>Measurement Results</b>	<p><b>Pass</b></p> <p>The measured emissions of the EUT have found to be below the specified limits.</p>
----------------------------	--

**Test Data**

**[Graph and Data]**



Final Result

--- N Phase ---

No.	Frequency [MHz]	Reading QP [dB(µV)]	Reading AV [dB(µV)]	c.f [dB]	Result QP [dB(µV)]	Result AV [dB(µV)]	Limit QP [dB(µV)]	Limit AV [dB(µV)]	Margin QP [dB]	Margin AV [dB]
1	0.20542	46.5	39.3	0.1	46.6	39.4	63.4	53.4	16.9	14.0
2	0.21418	40.6	24.9	0.1	40.7	25.0	63.0	53.0	22.3	28.0
3	0.33466	41.1	37.3	0.2	41.3	37.5	59.3	49.3	18.1	11.8

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(µV)]	Reading AV [dB(µV)]	c.f [dB]	Result QP [dB(µV)]	Result AV [dB(µV)]	Limit QP [dB(µV)]	Limit AV [dB(µV)]	Margin QP [dB]	Margin AV [dB]
1	0.2693	42.2	39.6	0.1	42.3	39.7	61.1	51.1	18.9	11.4
2	0.36029	38.5	16.9	0.2	38.7	17.1	58.7	48.7	20.1	31.6
3	0.40776	36.0	28.7	0.2	36.2	28.9	57.7	47.7	21.5	18.8
4	0.43426	34.9	33.7	0.2	35.1	33.9	57.2	47.2	22.1	13.3

### 3.2 Radiated Emission

Test Information	
Test Engineer	Tae Young, Jang
Test Date	May 14, 2005
Climate Condition	Ambient Temperature : 24 (EN Limit : 15 ~35 ) Relative Humidity : 32% (EN Limit : 30%~60%) Atmospheric Pressure 1012 mbar (EN Limit : 860~1060)
Test Place	10m Semi Anechoic Chamber

#### Test Equipments

Equipment	Model Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
EMI Test Receiver	ESCS30	R&S	839809/002	2006-04-28	12
RF Selector	NS4900	TOYO	0303-015	N / A	N / A
Mast Controller	HD100	HD	HD1001001231	N / A	N / A
Biconilog Antenna	6112B	SCHAFFNER	2766	2005-07-06	12
EMC Analyzer	E7405A	Agilent	US41110272	2005-06-30	12
Amplifier	8447D	Agilent	2944A10430	2005-07-20	12
Test Software	EP5RE	TOYO	Ver. 2.0.870	N/A	N/A

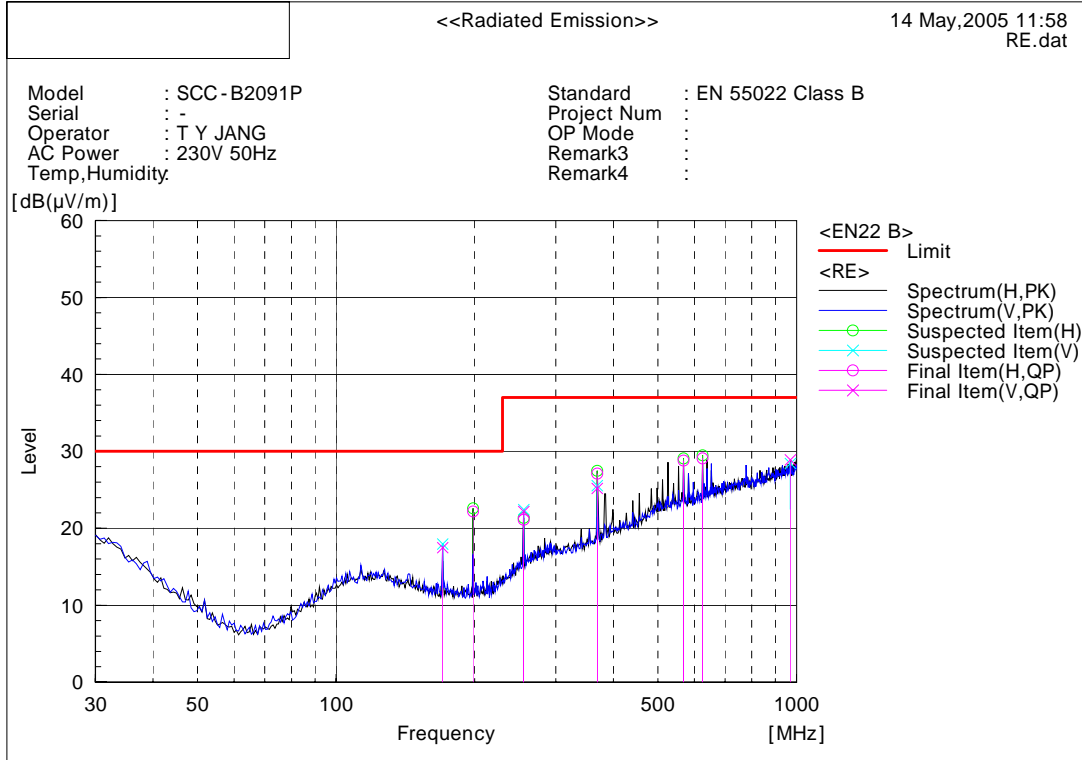
#### EUT Test Setup

EUT set up in semi-anechoic chamber. EUT in center of table positioned at 10m from antenna.  
All ports terminated into characteristic loads.

#### Test Result

<b>Measurement Results</b>	<p><b>Pass</b></p> <p>The measured emissions of the EUT have found to be below the specified limits.</p>
----------------------------	--

**Test Data**



--- Horizontal Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(µV)]	c.f [dB(1/m)]	Result [dB(µV/m)]	Limit [dB(µV/m)]	Margin [dB]	Remark
1	198.392	38.3	-16.1	22.2	30.0	7.8	
2	625.220	33.2	-4.1	29.1	37.0	7.9	
3	568.660	33.6	-4.8	28.8	37.0	8.2	
4	368.933	36.0	-8.9	27.1	37.0	9.9	
5	255.659	33.0	-11.9	21.1	37.0	15.9	

--- Vertical Polarization (QP)---

No.	Frequency [MHz]	Reading [dB(µV)]	c.f [dB(1/m)]	Result [dB(µV/m)]	Limit [dB(µV/m)]	Margin [dB]	Remark
1	969.883	27.7	1.2	28.9	37.0	8.1	
2	368.933	34.1	-8.9	25.2	37.0	11.8	
3	170.441	33.8	-16.3	17.5	30.0	12.5	
4	255.659	34.1	-11.9	22.2	37.0	14.8	

### 3.3 Harmonics

Test Information	
Test Engineer	Tae Young, Jang
Test Date	May 11, 2005
Climate Condition	Ambient Temperature : 23 (EN Limit : 15 ~35 ) Relative Humidity : 34% (EN Limit : 30%~60%) Atmospheric Pressure 1004 mbar (EN Limit : 860~1060)
Test Place	Harmonic & Flicker Test Room

#### Test Equipments

Equipment	Model Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
Power Analyzer	PM3000A	Voltech	AU112/9229	2005-07-30	12
Reference Impedance Network	NI2415	ZIMMER	-	N/A	N/A

#### EUT Test Setup

The EUT was set up in accordance with the requirements of the applied standard.

The power consumption, steady state harmonic currents were measured in the tested operating mode(s).

#### Test Result

<b>Measurement Results</b>	<p><b>Pass</b></p> <p>The measured emissions of the EUT have found to be below the specified limits.</p>
----------------------------	--

**Test Data**

<b>SCC-B2091P</b>	
Product: CCD CAMERA	2005 May 11 4:44pm
Serial no:	Page 1 of 1
Description:	
Result Name: SCC-B2091P(HARMONICS)	
Voltech IEC1000-3 Windows Software 3.11.07	Test Date: 2005 May 11 4:42pm
Type of Test: Steady State Harmonics Test - Table (1995)	
Power Analyzer: Voltech PM3000A v2.20 s/n 9229	
AC Source: Mains / Manual Source	
Overall Result: <b>PASS</b>	Notes: Below Class D power limit

Class	D
Class Multiplier	1
Power	3.6 W

Harmonic	Reading	Limit	Result	Harmonic	Reading	Limit	Result
2	0.22mA	None	N/A	3	13.90mA	2.300A	Pass
4	0.22mA	None	N/A	5	13.47mA	1.140A	Pass
6	0.23mA	None	N/A	7	12.78mA	770mA	Pass
8	0.23mA	None	N/A	9	11.90mA	400mA	Pass
10	0.23mA	None	N/A	11	10.89mA	330mA	Pass
12	0.22mA	None	N/A	13	9.74mA	210mA	Pass
14	0.21mA	None	N/A	15	8.54mA	150mA	Pass
16	0.21mA	None	N/A	17	7.30mA	132mA	Pass
18	0.19mA	None	N/A	19	6.10mA	118mA	Pass
20	0.18mA	None	N/A	21	4.94mA	107mA	N/A
22	0.17mA	None	N/A	23	3.90mA	98mA	N/A
24	0.15mA	None	N/A	25	3.01mA	90mA	N/A
26	0.14mA	None	N/A	27	2.32mA	83mA	N/A
28	0.12mA	None	N/A	29	1.86mA	78mA	N/A
30	0.11mA	None	N/A	31	1.63mA	73mA	N/A
32	0.11mA	None	N/A	33	1.56mA	68mA	N/A
34	0.10mA	None	N/A	35	1.56mA	64mA	N/A
36	0.09mA	None	N/A	37	1.53mA	61mA	N/A
38	0.09mA	None	N/A	39	1.46mA	58mA	N/A
40	0.08mA	None	N/A				

**This EUT don't need to test. Because the Power of EUT is below 75W.**

### 3.4 Flicker

Test Information	
Test Engineer	Tae Young, Jang
Test Date	May 11, 2005
Climate Condition	Ambient Temperature : 23 (EN Limit : 15 ~35 ) Relative Humidity : 34% (EN Limit : 30%~60%) Atmospheric Pressure 1004 mbar (EN Limit : 860~1060)
Test Place	Harmonic & Flicker Test Room

### Test Equipments

Equipment	Model Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
Power Analyzer	PM3000A	Voltech	AU112/9229	2005-07-30	12
Reference Impedance Network	NI2415	ZIMMER	-	N/A	N/A

### EUT Test Setup

The EUT was set up in accordance with the requirements of the applied standard.

### Test Result

<b>Measurement Results</b>	<p><b>Pass</b></p> <p>The measured emissions of the EUT have found to be below the specified limits.</p>
----------------------------	--

**Test Data**

<b>SCC-B2091P</b>				
Product:	CCD CAMERA			2005 May 11 4:41pm
Serial no:				Page 1 of 1
Description:				
Result Name:	SCC-B2091P(Flicker)			
Voltech IEC1000-3 Windows Software 3.11.07				Test Date: 2005 May 11 4:14pm
Type of Test:	Flickermeter Test - Table			
Power Analyzer:	Voltech PM3000A v2.20 s/n 9229			
AC Source:	Mains / Manual Source			
Overall Result:	Notes:			
<b>PASS</b>	Measurement method - Voltage			
	Pst	dc (%)	dmax (%)	d(t) > 3.3%(ms)
Limit	N/A	3.300	4.000	500
Reading 1	N/A	0.017	0.040	0

**The measured value of dmax(%) is 0.040.**

### 3.3 ESD

Test Information	
Test Engineer	Tae Young, Jang
Test Date	May 11, 2005
Climate Condition	Ambient Temperature : 23 (EN Limit : 15 ~35 ) Relative Humidity : 34% (EN Limit : 30%~60%) Atmospheric Pressure 1004 mbar (EN Limit : 860~1060)
Test Place	Shield Room #2

#### Test Equipments

Equipment	Model Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
ESD Tester	ESD30	EM Test	0901-23	2006-01-24	12

#### EUT Test Setup

The EUT was operated on a wooden table 0.8 meter above the reference ground. A HCP is lying on the table. Between the EUT and the HCP 0.5 mm is isolated base.

#### Test Result

<b>Measurement Results</b>	<p><b>Pass</b></p> <p>No Operation errors were detected during or after the applied test.</p>
----------------------------	---

**Test Data**

	No	Applied Point Name	Discharge Method	Test Level	Tested No	Criteria	Result
Indirect		Horizontal Plane	Contact	$\pm 2 \pm 4 \pm 6 \text{ kV}$	150	B	A
Indirect		Vertical Plane	Contact	$\pm 2 \pm 4 \pm 6 \text{ kV}$	450	B	A
Direct	1	Focus Switch	Contact	$\pm 2 \pm 4 \pm 6 \text{ kV}$	60	B	A
Direct	2	Body Case	Contact	$\pm 2 \pm 4 \pm 6 \text{ kV}$	60	B	B
Direct	3	Screw	Contact	$\pm 2 \pm 4 \pm 6 \text{ kV}$	60	B	B
Direct	4	Video Out Port	Air	$\pm 2 \pm 4 \pm 6 \pm 8 \text{ kV}$	80	B	B
Direct	5	Day/Night Cable Port	Air	$\pm 2 \pm 4 \pm 6 \pm 8 \text{ kV}$	80	B	A
Direct	6	Switch	Air	$\pm 2 \pm 4 \pm 6 \pm 8 \text{ kV}$	80	B	A
Direct	7	Mode Selection Switch	Air	$\pm 2 \pm 4 \pm 6 \pm 8 \text{ kV}$	80	B	A
Direct	8	DC-IRIS	Air	$\pm 2 \pm 4 \pm 6 \pm 8 \text{ kV}$	80	B	A

When EUT is provided ESD, most of cases were normal condition.

But when body case, screw and video out port are provided ESD, some noises and shaking of screen occurred on screen of EUT.

So the test results of body Case, screw, video out port were 'B'.

**Test Points**

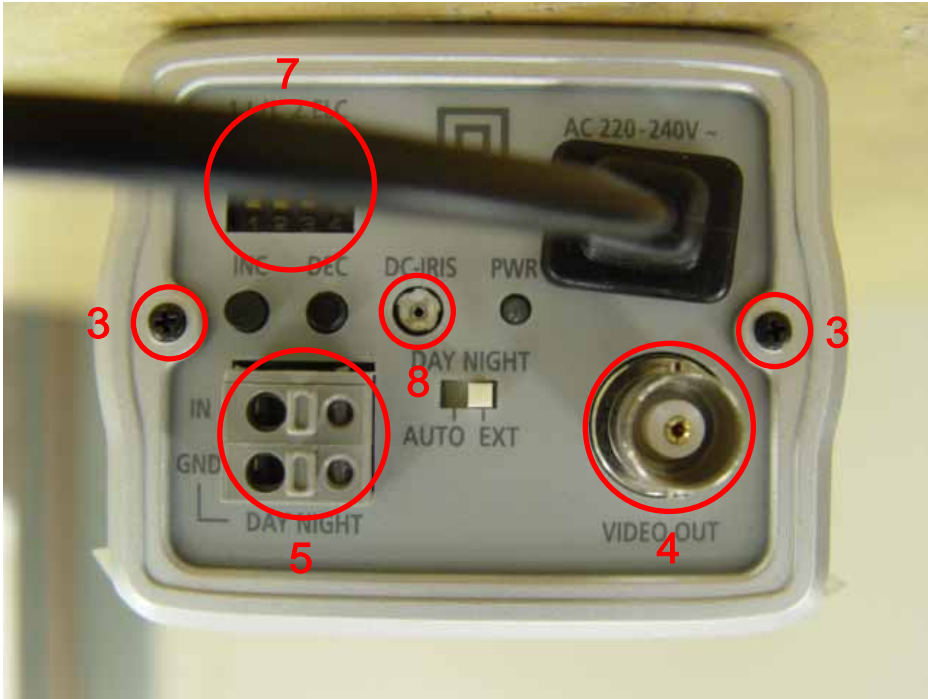
FRONT



LEFTSIDE-REAR



REAR



### 3.4 Radiated Immunity

Test Information	
Test Engineer	Tae Young, Jang
Test Date	May 13, 2004
Climate Condition	Ambient Temperature : 23 (EN Limit : 15 ~35 ) Relative Humidity : 31% (EN Limit : 30%~60%) Atmospheric Pressure 1014 mbar (EN Limit : 860~1060)
Test Place	Fully Anechoic Chamber

### Test Equipments

Equipment	Model Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
Amplifier	250W1000A	AR	310655	N/A	N/A
Dual Directional Coupler	DCU	R&S	316976/001	2005.11.04	12
Signal Generator	SML03	R&S	101279	2005.11.04	12
RMS/PEAK VOLTMETER	URE3	R&S	839432/032	2005.11.05	12
Power Meter	NRVD	R&S	841501/010	2005.11.05	12
Antenna	AT1080	AR	16511	N/A	N/A
Test Software	EMS K-1	R&S	Ver. 1.2	N/A	N/A

### EUT Test Setup

The EUT was operated on a wooden table 0.8 meter above the reference ground. The test distance was 3 meter.

### Test Result

<b>Measurement Results</b>	<b>Pass</b> No Operation errors were detected during or after the applied test.
----------------------------	--

**Test Data**

Test Level	Freq. Range	Modulation	Dwell Time	Test Side	Criteria		Result	
					Ver	Hor	Ver	Hor
[V/m]	[MHz]							
10 V/m	80 ~ 1000	PM with 1HZ(0.5s ON: 0.5s OFF)	3 s	Front	C	C	B	B
			3 s	Left	C	C	B	B
			3 s	Back	C	C	B	B
			3 s	Right	C	C	B	B
3 V/m	80 ~ 1000	PM with 1HZ(0.5s ON: 0.5s OFF)	3 s	Front	B	B	B	B
			3 s	Left	B	B	A	A
			3 s	Back	B	B	A	A
			3 s	Right	B	B	A	A
1 V/m	80 ~ 1000	PM with 1HZ(0.5s ON: 0.5s OFF)	3 s	Front	A	A	A	A
			3 s	Left	A	A	A	A
			3 s	Back	A	A	A	A
			3 s	Right	A	A	A	A

Test Level	Freq. Range	Modulation	Dwell Time	Test Side	Criteria		Result	
					Ver	Hor	Ver	Hor
[V/m]	[MHz]							
10 V/m	80 ~ 1000	80% AM @1KHz	3 s	Front	C	C	B	B
			3 s	Left	C	C	B	B
			3 s	Back	C	C	B	B
			3 s	Right	C	C	B	B
3 V/m	80 ~ 1000	80% AM @1KHz	3 s	Front	B	B	B	B
			3 s	Left	B	B	A	A
			3 s	Back	B	B	B	B
			3 s	Right	B	B	A	A
1 V/m	80 ~ 1000	80% AM @1KHz	3 s	Front	A	A	A	A
			3 s	Left	A	A	A	A
			3 s	Back	A	A	A	A
			3 s	Right	A	A	A	A

### 3.5 EFT

Test Information	
Test Engineer	Tae Young, Jang
Test Date	May 12, 2005
Climate Condition	Ambient Temperature : 21 (EN Limit : 15 ~35 ) Relative Humidity : 38% (EN Limit : 25%~75%) Atmospheric Pressure 1011 mbar (EN Limit : 860~1060)
Test Place	Shield Room #2

### Test Equipments

Equipment	Model Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
EFT/Burst Generator	NSG2025	SCHAFFNER	19872	2005-06-01	12
Test Software	WIN2025	SCHAFFNER	Ver. 4.00	N/A	N/A

### EUT Test Setup

The EUT was operated on a wooden table 0.8 meter above the reference ground.

### Test Result

<b>Measurement Results</b>	<p><b>Pass</b></p> <p>No Operation errors were detected during or after the applied test.</p>
----------------------------	---

<b>Test Data</b>
------------------

Port	Coupling	Test Level		Phase wave shape (kHz)	Polarity	Criteria	Result
		Voltage (kV)	Frequency (kHz)				
AC Port	Live	1	5	5/50	+/-	B	A
AC Port	Neutral	1	5	5/50	+/-	B	A
AC Port	Live to Neutral	1	5	5/50	+/-	B	A

### 3.6 Immunity to Surge

Test Information	
Test Engineer	Tae Young, Jang
Test Date	May 12, 2005
Climate Condition	Ambient Temperature : 21 (EN Limit : 15 ~35 ) Relative Humidity : 38% (EN Limit : 25%~75%) Atmospheric Pressure 1011 mbar (EN Limit : 860~1060)
Test Place	Shield Room #2

#### Test Equipments

Equipment	Modal Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
Surge Tester	NSG2050	SCHAFFNER	200242-146AR	2005-06-01	12
CDN	131	SCHAFFNER	34307	2005-06-01	12
Measurement Software	WIN2050	SCHAFFNER	-	N/A	12

#### EUT Test Setup

The EUT was operated on a wooden table 0.8 meter above the reference ground.

#### Test Result

<b>Measurement Results</b>	<p><b>Pass</b></p> <p>No Operation errors were detected during or after the applied test.</p>
----------------------------	---

<b>Test Data</b>
------------------

Port	Coupling	Test Level			Phase wave shape ( $\mu$ s)	Polarity	Criteria	Result
		Voltage (kV)	Repetition Time(sec)	No				
AC Port	Live to Neutral	0.5, 1	60	40	1.2/50(8/20)	+/-	B	A

### 3.7 Conducted Immunity

Test Information	
Test Engineer	Tae Young, Jang
Test Date	May 13, 2005
Climate Condition	Ambient Temperature : 23 (EN Limit : 15 ~35 ) Relative Humidity : 31% (EN Limit : 30%~60%) Atmospheric Pressure 1014 mbar (EN Limit : 860~1060)
Test Place	Conducted Immunity Room

#### Test Equipments

Equipment	Model Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
Amplifier	150A220	AR	17077	N/A	N/A
Dual Directional Coupler	DCU	R&S	316976/001	2005.11.04	12
Signal Generator	SML03	R&S	101279	2005.11.04	12
RMS/PEAK VOLTMETER	URE3	R&S	839432/032	2005.11.05	12
Power Meter	NRVD	R&S	841501/010	2005.11.05	12
Antenna	AT1080	AR	16511	N/A	N/A
CDN	M016	SCHAFFNER	20571	2006.4.26	12
CDN	M016	SCHAFFNER	20573	2006.4.26	12
CDN	M016	SCHAFFNER	20574	2005.5.25	12
Test Software	EMS K-1	R&S	Ver. 1.2	N/A	N/A

#### EUT Test Setup

The EUT was operated on a wooden table 0.8 meter above the reference ground.

#### Test Result

<b>Measurement Results</b>	<b>Pass</b> No Operation errors were detected during or after the applied test.
----------------------------	--

<b>Test Data</b>
------------------

Port Coupling	Freq. Range	Level	Dwell Time	Modulation	Coupling	Criteria	Result
AC Mains	0.15~100MHz	10 V	3 s	80% AM @1KHz	CDN	C	B
AC Mains	0.15~100MHz	3 V	3 s	80% AM @1KHz	CDN	B	B
AC Mains	0.15~100MHz	1 V	3 s	80% AM @1KHz	CDN	A	A

Port Coupling	Freq. Range	Level	Dwell Time	Modulation	Coupling	Criteria	Result
AC Mains	0.15~100MHz	10 V	3 s	PM with 1HZ (0.5s ON: 0.5s OFF)	CDN	C	B
AC Mains	0.15~100MHz	3 V	3 s	PM with 1HZ (0.5s ON: 0.5s OFF)	CDN	B	B
AC Mains	0.15~100MHz	1 V	3 s	PM with 1HZ (0.5s ON: 0.5s OFF)	CDN	A	A

### 3.8 Voltage Dip

Test Information	
Test Engineer	Tae Young, Jang
Test Date	May 12, 2005
Climate Condition	Ambient Temperature : 21 (EN Limit : 15 ~35 ) Relative Humidity : 38% (EN Limit : 25%~75%) Atmospheric Pressure 1011 mbar (EN Limit : 860~1060)
Test Place	Shield Room #2

### Test Equipments

Equipment	Model Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
Test Software	WIN2120	SCHAFFNER	Ver. 2.01	N/A	N/A
Voltage Dip & Interruption	NSG1007	SCHAFFNER	55407	2005-07-31	12
Voltage Dip & Interruption	NSG1007	SCHAFFNER	55408	2005-07-31	12

### EUT Test Setup

The EUT was operated on a wooden table 0.8 meter above the reference ground.

### Test Result

<b>Measurement Results</b>	<p><b>Pass</b></p> <p>No Operation errors were detected during or after the applied test.</p>
----------------------------	---

**Test Data**

**Voltage Dips/Interference**

Test Voltage		Number of Applications	Time Between Application	Angle (Degrees)	Criteria	Result
Reduction Level	Duration of reduction (s)					
Reduction 60%	0.5 / 1 / 10	10	10 s	0 / 180	B/C	A
Reduction 100%	0.5 / 1 / 5	10	10 s	0	B/C	A

**While EUT get voltage interruptions tested, The power of EUT turned on and off.  
But it got to be self-recoverable without operator's intervention.**

## 4. Appendix A

### 4.1 Test Photography



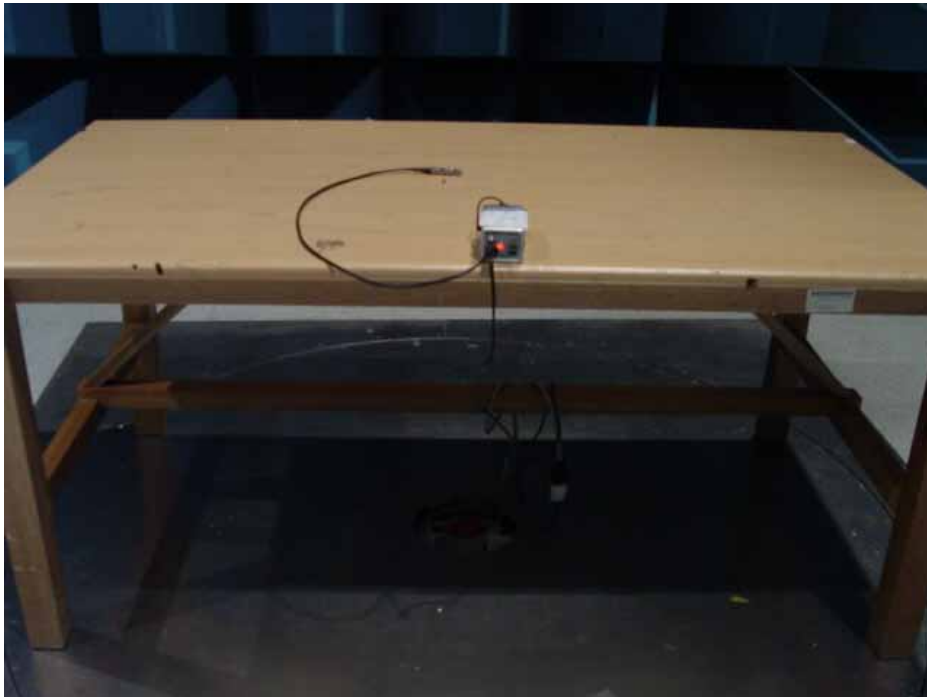
Picture 1. Conducted Emission (Front)



Picture 2. Conducted Emission (Rear)



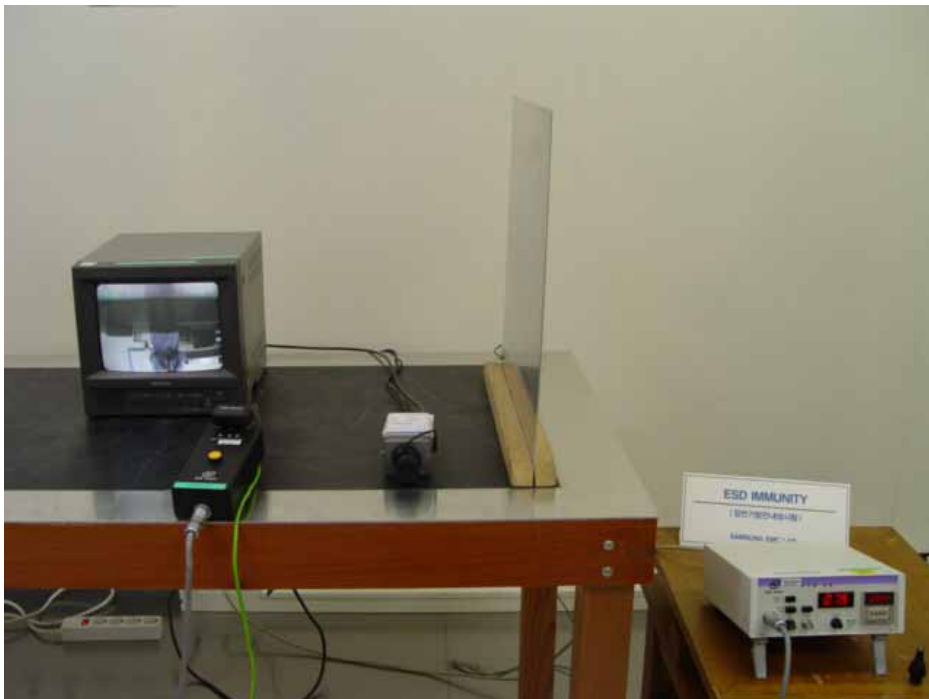
Picture 3. Radiated Emission (Front)



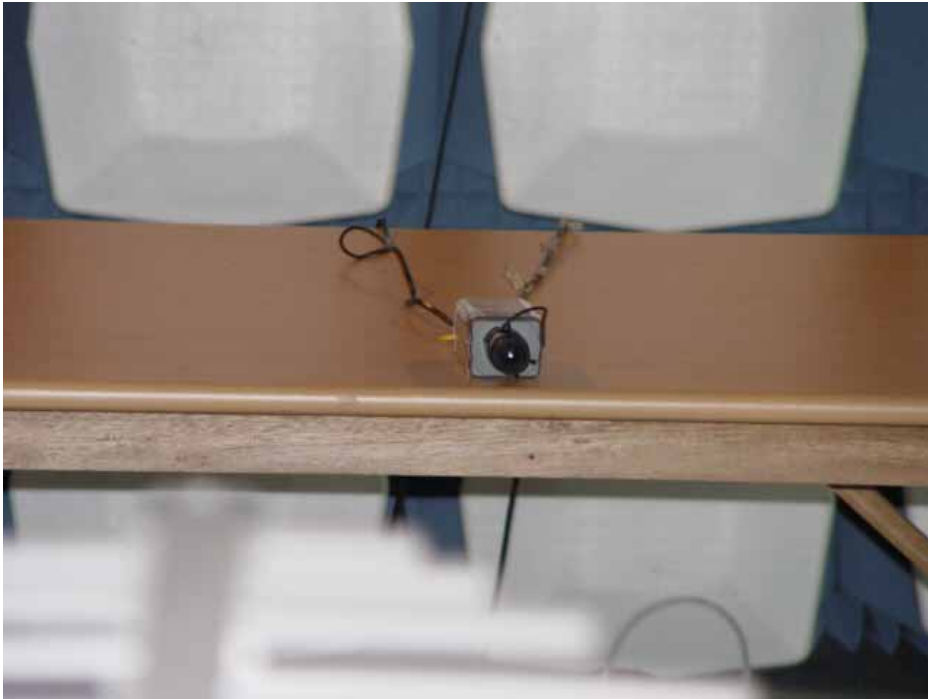
Picture 4. Radiated Emission (Rear)



Picture 5. Harmonics & Flicker



Picture 6. ESD



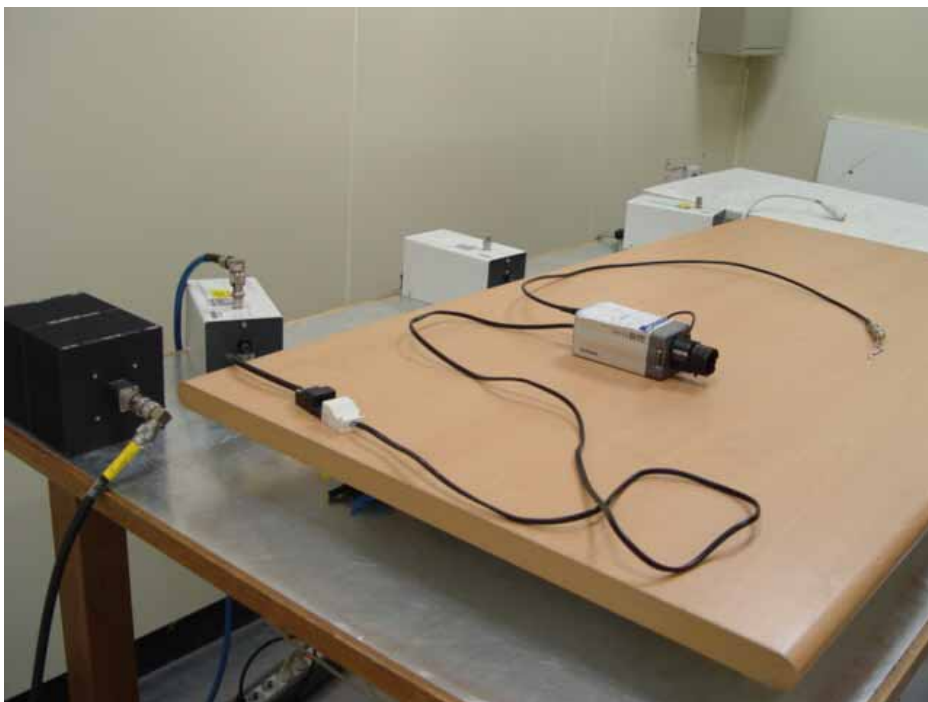
Picture 7. Radiated Immunity



Picture 8. EFT



Picture 9. Surge



Picture 10. Conducted Immunity



Picture 11. Voltage Dip

## 4.2 EUT Photography



Picture 12. EUT (Rightside-front)



Picture 13. EUT (rear)



Picture 14. EUT (Leftside-rear)