

EMC TEST REPORT For FCC



Test Report No. : 2004120015

Date of Issue : December 15, 2004

FCC ID : NLMDIGIMAXU-CA5

Model/Type No. : Digimax U-CA 5

Kind of Product : Digital Camera

Applicant : Samsung Techwin Co., Ltd.

Applicant Address : 145-3, Sangdaewon 1-Dong, Jungwon-Gu, Sungham-City,
Kyungki-Do, Korea

Manufacturer : 1) Samsung Techwin Co., Ltd.
2) Tianjin Samsung Opto-Electronics Co., Ltd.

Manufacturer Address : 1) 42, Sungju-dong, Changwon City, Kyungnam, Korea
2) 7 Pingchang Road, Nankai Dist., Tianjin, China

Contact Person : Mr. WonKyu, Jang/Research Engineer

Telephone : +82-31-740-8354

Received Date : December 10, 2004

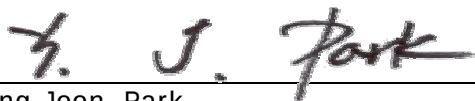
Test period : Start : December 11, 2004 End : December 14, 2004

Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

The test results presented in this report relate only to the object tested.

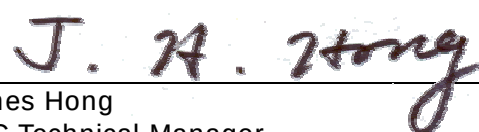
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Tested by



Young-Joon, Park
EMC Test Engineer
Date: December 15, 2004

Reviewed by



James Hong
EMC Technical Manager
Date: December 15, 2004

REPORT REVISION HISTORY

Date	Revision	Page No
December 15, 2004	Issued (2004120015)	All

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1.0 General Product Description

1.0.1 Tested Equipment

- ☒ Unless otherwise indicated, all tests were conducted on Model Digimax U-CA 5.
- ☐ Tests performed on Model _____ were considered to be representative of Model(s) _____.

1.0.2 Equipment Size, Mobility and Identification

Dimensions: 103.1(W) by 56(H) by 31.4(D) ☒ mm ☐ in

Mobility: ☒ Hand-held ☒ Table-top ☐ Built-in

☐ Traveling ☐ Floor-standing

Serial No.: Prototype

1.0.3 Electrical Ratings

Input: Adapter – AC 100-240V, 50/60Hz
EUT - DC 4.2V

Output: Adapter – DC 4.2V, 750mA
EUT - Not applicable

1.0.4 Test Voltage & Frequency

Unless indicated otherwise on the individual data sheet or test results, the test voltage and frequency was as indicated below.

Voltage: 120Vac
Frequency: 60Hz

1.0.5 Clock & Other Frequencies Utilized

12.00MHz, 32.768MHz, 54MHz

1.1 Model Differences

Not applicable

1.2 Device Modifications

The following modifications were necessary for compliance:

Not applicable

1.3 EUT Configuration(s)

See Appendix A for individual test set-up configuration(s). The following peripheral devices and/or interface cables were connected during the measurement:

[PC mode]

☒ Peripheral Devices

Device	Manufacturer	Model No.	Serial No.	FCC ID or DoC
Cradle	Tianjin Samsung Opto-Electronics Co., Ltd.	SCC-U1	-	-
Charger	DONGYANG INSTRUMENT INC.	SAC-41	14600079	-
Personal Computer	Hewlett-Packard Company	PD1059P	-	DoC
LCD Monitor	SAMSUNG	GH17US	N372HVEX225526	DoC
Adapter	Anam Instruments (Shen Zhen) Co., Ltd.	AP04214-UV	0312103885AC	-
Keyboard	CHCONY ELECTRONICS(MAINLAND CHINA)CO. LTD	KB-0133	B55680FGAO 958M	DoC
Mouse (PS/2 type)	SUZHOU LOGITECH ELECTRONICS CO., LTD	M-S69	F466B0MN 30517VN	DoC
Serial Mouse	Microsoft	BASM1	4476266-20000	DoC

☒ Cable Description

#	Description	Ferrite Core	Length (m)	Other Details
1	AC power cable, Unshielded	No	1.5	Connect to AC power
2	AC power cable, Unshielded	No	1.8	Connect to AC power
3	AC power cable, Unshielded	No	1.8	Connect to AC power
4	DC output cable, Unshielded	No	1.5	Between the LCD Monitor and Adapter
5	DC output cable, Unshielded	Yes	1.5	Between the Cradle and Charger
6	Monitor cable, Shielded	No	1.8	Between the PC and LCD Monitor
7	USB cable, Shielded	Yes	1.5	Between the Cradle and PC
8	Keyboard cable, Shielded	No	1.5	PS/2 type
9	Mouse cable, Shielded	No	1.5	PS/2 type
10	Mouse cable, Shielded	No	1.5	Serial type

[CCTV mode]

☒ Peripheral Devices

Device	Manufacturer	Model No.	Serial No.	FCC ID or DoC
Cradle	Tianjin Samsung Opto-Electronics Co., Ltd.	SCC-U1	-	-
Charger	DONGYANG INSTRUMENT INC.	SAC-41	14600079	-
CCTV Monitor	HITRON SYSTEMS INC.	CVM54X	M3020003	-

☒ Cable Description

#	Description	Ferrite Core	Length (m)	Other Details
1	AC power cable, Unshielded	No	1.5	Connect to AC power
2	AC power cable, Unshielded	No	1.8	Connect to AC power
3	DC output cable, Unshielded	Yes	1.5	Between the Cradle and Charger
4	A/V cable, Shielded	Yes	1.5	Between the Cradle and CCTV Monitor

1.4 Test Software

- ☐ EMC Test V 1.0
- ☐ Display Test Patterns – V1.5
- ☐ Ping.exe
- ☒ Not applicable

1.5 EUT Operating Mode(s)

Equipment under test was operated during the measurement under the following conditions:

- ☐ Standby
- ☐ Display circles pattern
- ☒ Practice operation – [PC mode] Charging and USB downloading mode
[CCTV mode] Charging and AV output monitoring mode
- ☐ Scrolling 'H'
- ☐ Read / Write

1.6 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.

1.7 Test Facility

The measurement facility is located at 386-1, Ho-Dong, Yongin-City, Kyungki-Do, Korea 449-100. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

1.8 Measurement Procedure

Preliminary AC power line conducted emissions tests were performed shielded room. To find worst mode, several typical mode and typical cable position were tested. Final AC power line conducted emissions test was performed shielded room. (location is same as Preliminary test)

Based on the preliminary tests of the EUT, final test was proceeded worst case test mode and cable configuration.

Preliminary radiated emissions test were performed anechoic chamber (Distance of antenna and EUT was 3 m). To find worst mode, several typical mode and typical cable position were tested and peak level and frequency were recorded.

Final radiated emissions test was performed Open Area Test Site. Based on the preliminary tests of the EUT, final test was proceeded worst case test mode and cable configuration.

* Measurement procedures was In accordance with ANSI C63.4-2001 7.2.3, 7.2.4, 8.3.1.1, 8.3.1.2

1.9 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3 & 10 meter Open Area Test Sites and one conducted site to perform FCC Part 15/18 measurements.	 93250
JAPAN	VCCI	10 meter Open Area Test Site and one conducted site.	 R-948, C-986
KOREA	MIC	EMI (10 meter Open Area Test Site and two conducted sites) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 No. 51, KR0025
International	KOLAS	EMC	 NO. 179
Europe	GLAS	EMC EN 55011, EN 55022, EN 61000-6-3, EN 61000-6-4, EN 61000-3-2, EN 61000-3-3, EN 61000-6-1, EN 61000-6-2, EN 50130-4, EN 55024, EN 61204-3, EN 60601-1-2, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11	 No.13000796-02

2.0 Emissions Test Regulations

The emissions tests were performed according to following regulations:

- | | | |
|--|----------------------------------|---|
| ☐ EN 50081-1:1992 | ☐ Class A | ☐ Class B |
| ☐ EN 61000-6-3:2001 | ☐ Class A | ☐ Class B |
| ☐ EN 50081-2:1993 | ☐ Class A | ☐ Class B |
| ☐ EN 61000-6-4:2001 | ☐ Class A | ☐ Class B |
| ☐ EN 50083-2:2001 | | |
| ☐ EN 55011:1998 +A1:1999 | ☐ Group 1 | ☐ Group 2 |
| | ☐ Class A | ☐ Class B |
| ☐ EN 55013:1990 +A12:1994 +A13:1996 +A14:1999 | | |
| ☐ EN 55013:2001 | | |
| ☐ EN 55014-1:2000 | | |
| ☐ EN 55014-1:2000 +A1:2001 | | |
| ☐ EN 55015:2000 | | |
| ☐ EN 55015:2000 +A1:2001 | | |
| ☐ EN 55022:1994 +A1:1995 +A2:1997 | ☐ Class A | ☐ Class B |
| ☐ EN 55022:1998 | ☐ Class A | ☐ Class B |
| ☐ EN 55022:1998 +A1:2000 | ☐ Class A | ☐ Class B |
| ☐ EN 61000-3-2:1995 +A1:1998 +A2:1998 +A14:2000 | | |
| ☐ EN 61000-3-2:2000 | | |
| ☐ EN 61000-3-3:1995 | | |
| ☐ EN 61000-3-3:1995 +A1:2001 | | |
| ☐ VCCI V-3/2003.04 | ☐ Class A | ☐ Class B |
| ☐ AS/NZS 3548:1995 +A1:1997 +A2:1997 | ☐ Class A | ☐ Class B |
| ☒ FCC Part 15 Subpart B | ☐ Class A | ☒ Class B |
| ☒ CISPR 22:1997 | ☐ Class A | ☒ Class B |
| The unit was tested to CISPR 22 and complied with the alternate methods allowed by FCC under paragraphs 15.107 and 15.109. | | |
| ☐ CISPR 22:1997 +A1:2000 | ☐ Class A | ☐ Class B |

2.1 Conducted Voltage Emissions

Test Date

December 12, 2004 [PC mode]

December 12, 2004 [CCTV mode]

Test Location

Shielded Room

Test Equipment

	Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
☒	Field Strength Meter	Rohde & Schwarz	ESHS30	828144/002	2005-02-07
☒	LISN	EMCO	3825/2	9607-2574	2005-09-03
☒	LISN	EMCO	3825/2	9409-2246	2005-09-03
☐	Field Strength Meter	Rohde & Schwarz	ESHS30	862024/001	2005-02-24
☐	LISN	Rohde & Schwarz	ESH3-Z5	100207	2005-12-15
☐	LISN	EMCO	3825/2	9206-1971	2005-12-15

Frequency Range of Measurement

150 kHz to 30 MHz

Test Results

The requirements are:

☒ MET

Frequency (MHz)	Measured Data (dBuV)	Margin (dB)	Remark
0.37	52.0	6.6	Quasi-Peak [PC mode]
2.02	49.2	6.8	Quasi-Peak [CCTV mode]

☐ NOT MET

Frequency (MHz)	Measured Data (dBuV)	Margin (dB)	Remark

☐ NOT APPLICABLE

Remarks

See Appendix A for test data.

2.2 Radiated Electric Field Emissions

Test Date

December 12, 2004 [PC mode]

December 12, 2004 [CCTV mode]

Test Location

☒ Testing was performed at a test distance of 10 meter Open Area Test Site

Test Equipment

	Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
☒	Field Strength Meter	Rohde & Schwarz	ESVS30	826638/008	2005-04-08
☒	ULTRA Broadband Antenna	Rohde & Schwarz	HL562	361324/014	2005-05-21
☐	Biconical Antenna	EMCO	3110	9202-1510	2005-04-09
☐	Log-periodic Antenna	EMCO	3146	9607-4567	2005-04-06

Frequency Range of Measurement

30 MHz to 1 GHz

Test Results

The requirements are:

☒ MET

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
216.30	26.9	3.1	Quasi-Peak [PC mode]
594.00	33.9	3.1	Quasi-Peak [CCTV mode]

☐ NOT MET

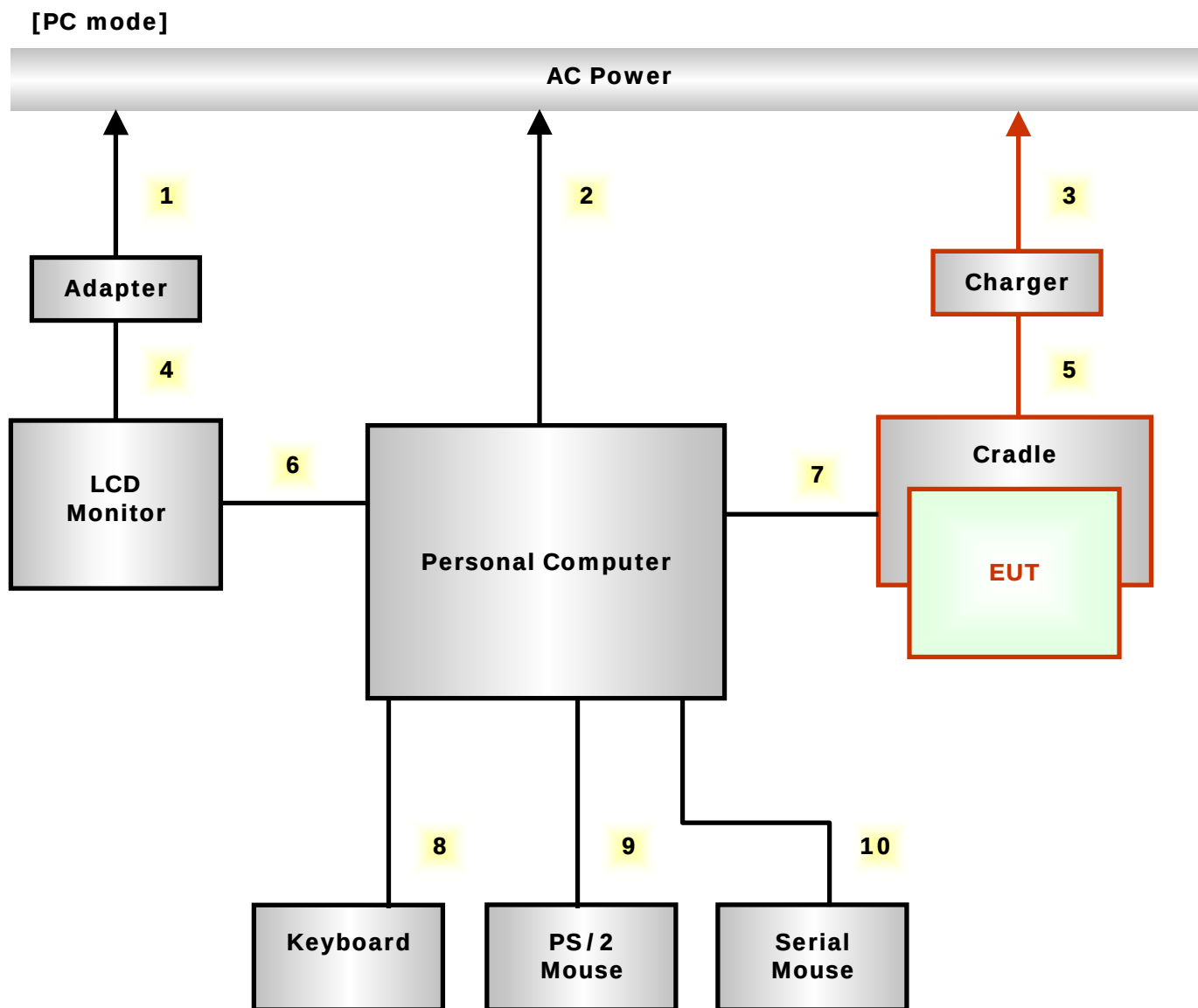
Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark

☐ NOT APPLICABLE

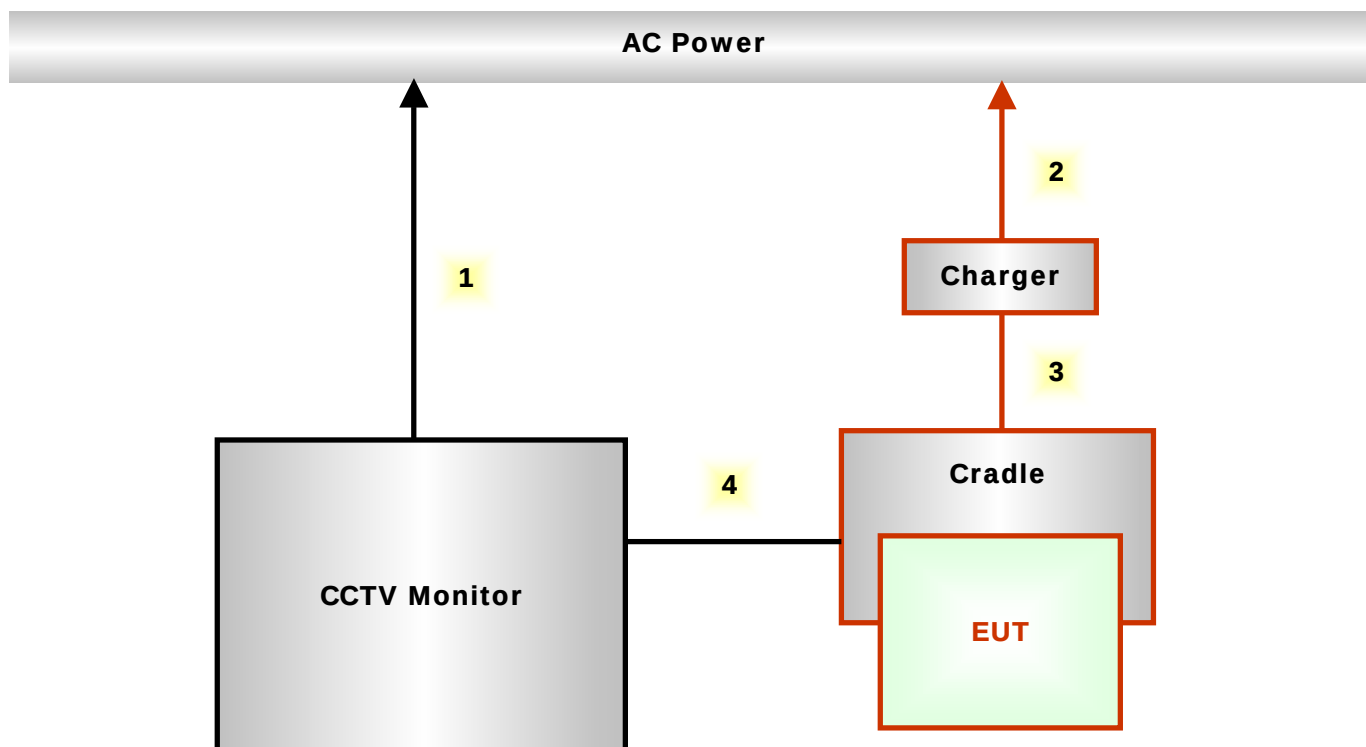
Remarks

See Appendix A for test data

Configuration



[CCTV mode]



APPENDIX A – TEST DATA

Conducted Voltage Emissions (Quasi-Peak reading)

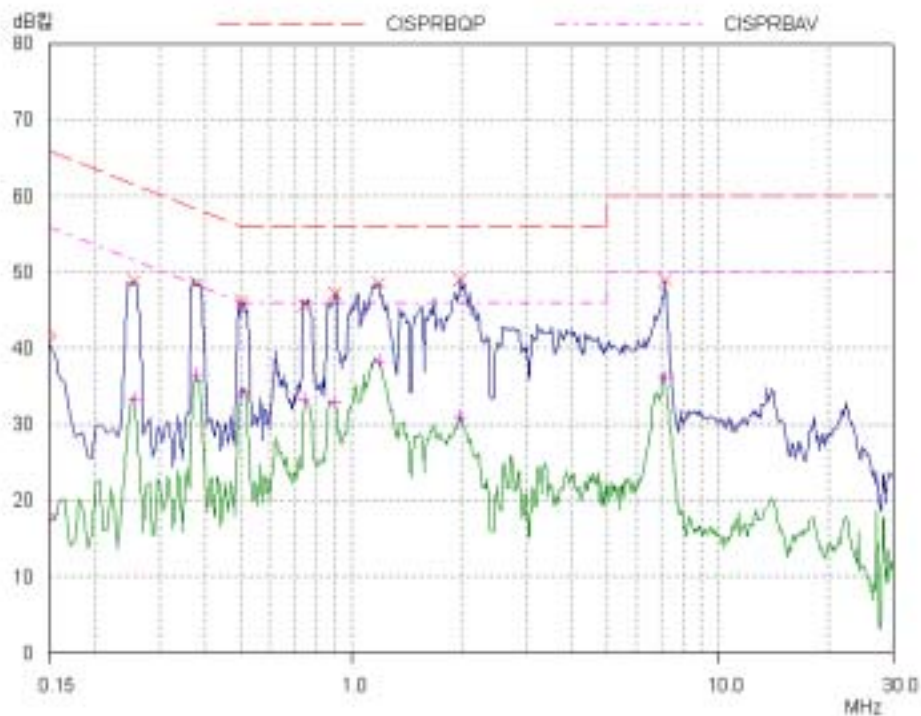
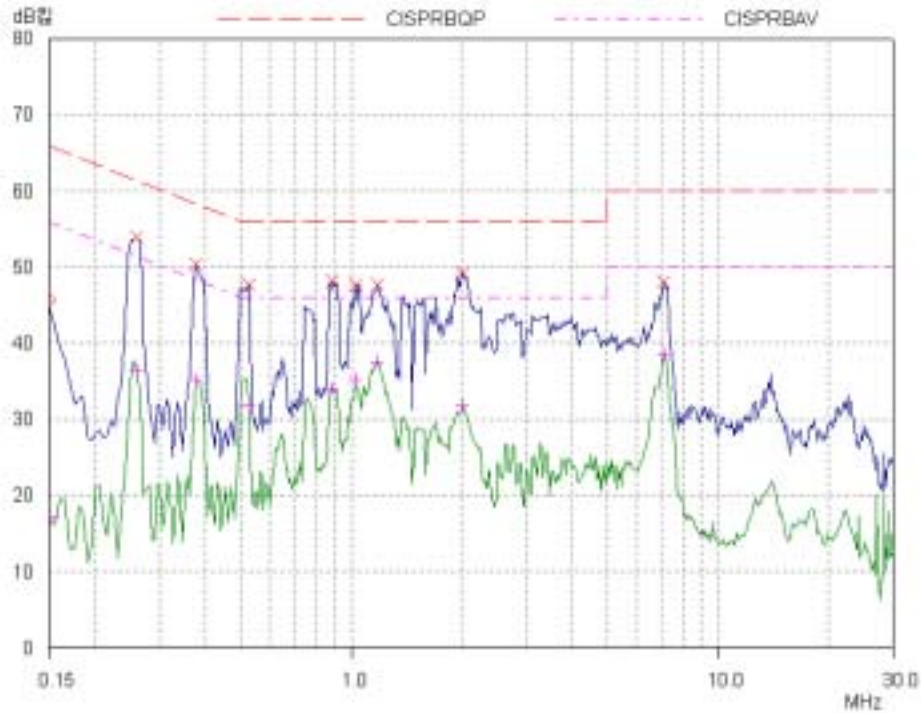
[PC mode]

Frequency [MHz]	Correction Factor		Line	Quasi-peak				Average			
				Limit	Reading	Result	Margin	Limit	Reading	Result	Margin
	LISN	Cable		[dBuV]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dB]
0.25	0.1	0.1	L	61.8	51.4	51.6	10.2	51.8	36.3	36.5	15.3
0.37	0.1	0.1	L	58.5	51.8	52.0	6.6	48.5	37.2	37.4	11.1
0.52	0.1	0.1	L	56.0	49.0	49.2	6.8	46.0	35.2	35.4	10.7
1.13	0.1	0.1	N	56.0	48.6	48.8	7.2	46.0	37.9	38.0	8.0
1.97	0.1	0.2	L	56.0	49.0	49.3	6.7	46.0	31.0	31.3	14.7
6.66	0.1	0.2	L	60.0	50.9	51.2	8.8	50.0	41.6	41.9	8.1

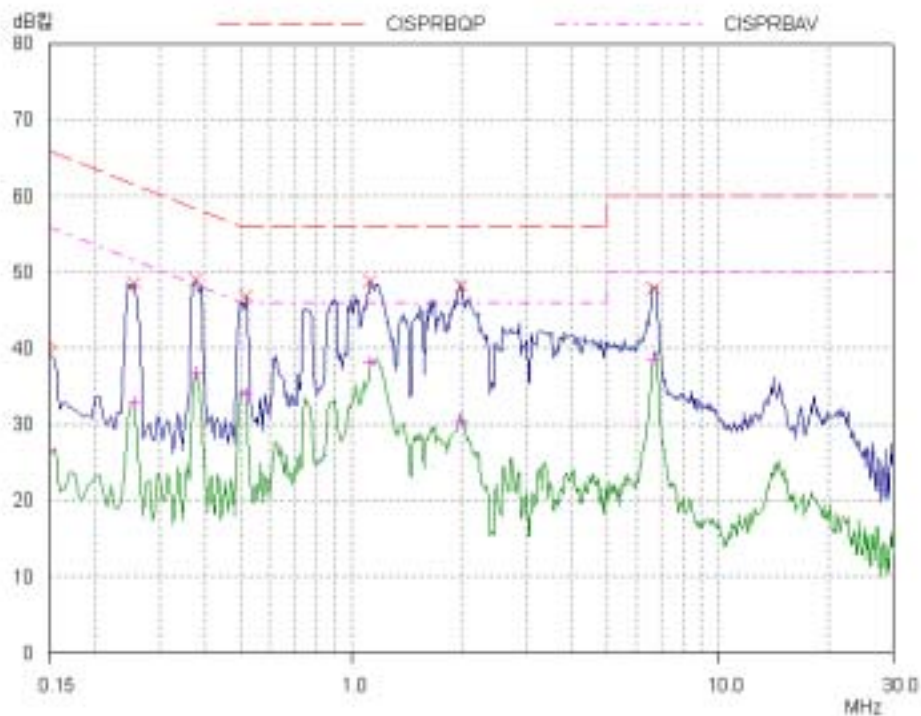
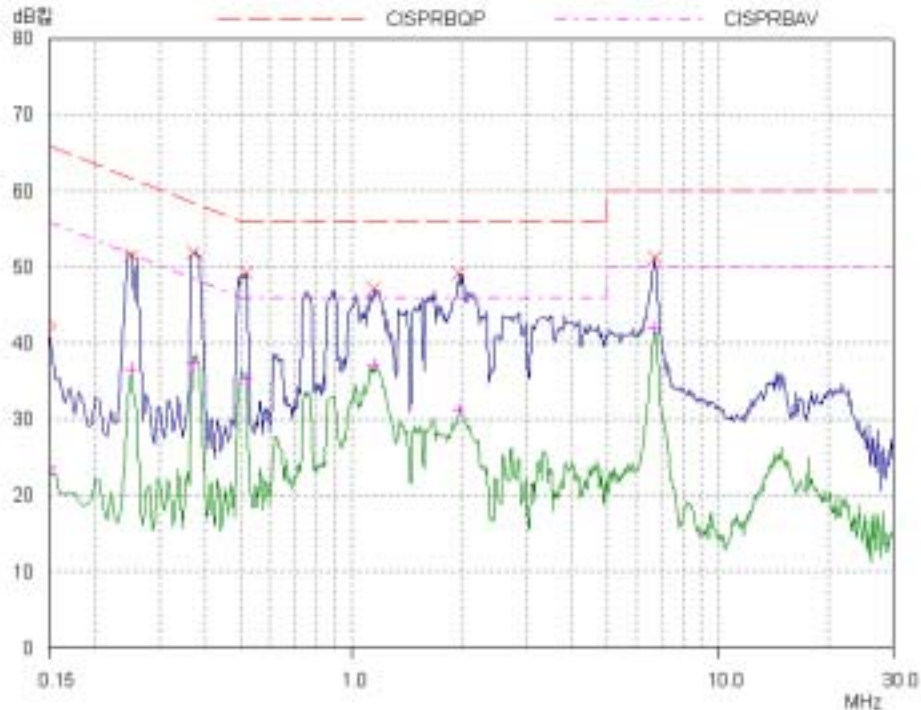
[CCTV mode]

Frequency [MHz]	Correction Factor		Line	Quasi-peak				Average			
				Limit	Reading	Result	Margin	Limit	Reading	Result	Margin
	LISN	Cable		[dBuV]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dB]
0.26	0.1	0.1	L	61.4	53.8	54.0	7.4	51.4	36.2	36.4	15.0
0.38	0.1	0.1	L	58.4	50.1	50.3	8.1	48.4	35.0	35.2	13.2
0.89	0.1	0.1	L	56.0	47.9	48.1	7.9	46.0	33.8	34.0	12.0
1.19	0.1	0.1	N	56.0	48.4	48.6	7.4	46.0	38.1	38.3	7.7
1.98	0.1	0.2	N	56.0	48.7	49.0	7.0	46.0	30.6	30.9	15.1
2.02	0.1	0.2	L	56.0	48.9	49.2	6.8	46.0	31.4	31.7	14.3

[PC mode]



CCTV mode]



Radiated Electric Field Emissions (Quasi-Peak reading)

[PC mode]

Frequency [MHz]	Reading [dBuV / m]	Pol.	Height [m]	Correction Factor		Limits [dBuV / m]	Result [dBuV / m]	Margin [dB]
				Antenna	Cable			
165.68	16.5	H	1.5	7.3	2.5	30.0	26.3	3.7
166.35	16.5	V	2.1	7.2	2.4	30.0	26.1	3.9
189.31	15.3	V	1.8	7.0	2.7	30.0	25.0	5.0
216.30	16.2	H	4.0	8.0	2.8	30.0	26.9	3.1
324.53	18.6	V	3.6	11.6	3.4	37.0	33.6	3.4
539.75	13.3	H	2.0	16.1	4.4	37.0	33.8	3.2
594.01	10.3	H	1.1	17.0	4.7	37.0	32.0	5.0
648.25	11.0	V	2.3	17.8	5.0	37.0	33.8	3.2

[CCTV mode]

Frequency [MHz]	Reading [dBuV / m]	Pol.	Height [m]	Correction Factor		Limits [dBuV / m]	Result [dBuV / m]	Margin [dB]
				Antenna	Cable			
39.45	7.2	V	3.1	14.3	1.1	30.0	22.6	7.4
135.31	6.8	H	1.8	8.4	2.1	30.0	17.3	12.7
189.35	15.3	V	4.0	7.0	2.7	30.0	25.0	5.0
216.30	16.0	V	1.0	8.0	2.8	30.0	26.8	3.2
539.75	11.0	H	3.2	16.1	4.4	37.0	31.5	5.5
594.00	12.2	H	4.0	17.0	4.7	37.0	33.9	3.1
648.25	10.9	H	1.6	17.8	5.0	37.0	33.7	3.3
835.50	7.4	V	1.7	20.0	5.8	37.0	33.2	3.9