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EMC TEST REPORT For FCC

Test Report No.	:	2004060044
Date of Issue	:	June 29, 2004
FCC ID	:	NLMDIGIMAXU-CA4
Model/Type No.	:	Digimax U-CA4
Kind of Product	:	Digital Camera
Applicant	:	Samsung Techwin Co., Ltd.
Applicant Address	:	145-3, Sangdaewon 1-Dong, Jungwon-Gu, Sungnam-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	:	Kun-Sop, Kim (Manager)
Telephone	:	+82-31-740-8253
Received Date	:	June 16, 2004
Test period	:	Start : June 22, 2004 End : June 23, 2004
Test Results	:	☒ **In Compliance** ☐ **Not in Compliance**

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

CERTiTEK Standards Laboratory 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).

Tested by

Young-Joon, Park
EMC Test Engineer
Date: June 29, 2004

Reviewed by

James Hong
EMC Technical Manager
Date: June 29, 2004

REPORT REVISION HISTORY

Date	Revision	Page No
June 29, 2004	Issued (2004060044)	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-CA4.
☐ Tests performed on Model _____ were considered to be representative of Model(s) _____.

1.0.2 Equipment Size, Mobility and Identification

Dimensions: 102(W) by 53.8(H) by 31.6(D) ☒ mm ☐ in
Mobility: ☐ Hand-Held ☒ Table-top ☐ Floor-standing
Serial No.: Prototype

1.0.3 Electrical Ratings

Adaptor	Input:	100-250Vac, 50/60Hz, 0.3A
	Output:	3.3Vdc, 2.0A
EUT	Input:	3.3Vdc
	Output:	-

1.0.4 Test Voltage & Frequency (Using the adaptor)

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

32.768kHz, 11.2896MHz, 27.00MHz, 48.00MHz, 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:

☒ Peripheral Devices

Device	Manufacturer	Model No.	Serial No.	FCC ID or DoC
Adaptor (for EUT)	AULT INC.	PW137	-	-
Personal Computer	Hewlett-Packard Company	PD1059P	-	DoC
LCD Monitor	TIANJIN SAMSUNG ELECTRONICS DISPLAY	176T-DZ/KOR	N372HVEX225526	DoC
Adaptor	Anam Instruments (Shen Zhen) Co., Ltd.	AP04214-UV	-	-
Keyboard (PS/2 type)	COMPAQ	KB-0133	B55680FGA0985M	DoC
Mouse (PS/2 type)	SAMSUNG	OMS3CB	0303009873	DoC
Mouse (USB type)	SAMSUNG	OMS3CB	0303009881	DoC
Mouse (Serial type)	SAMSUNG	BASM1	4476257-20000	DoC
Printer (Parallel type)	Seiko Epson Corp.	Stylus Color 460	BWCE136524	DoC

☒ Cable Description

#	Description	Ferrite Core	Length (m)	Other Details
1	USB cable, Shielded	Yes	1.3	Between the EUT and PC
2	DC In Cable, Unshielded	Yes	1.5	Between the EUT and Adaptor
3	Adaptor Power Cable, Unshielded	No	1.5	Connect to AC power
4	Mouse cable, Shielded	No	1.5	USB type
5	Mouse cable, Shielded	No	2.1	Serial type
6	Mouse cable, Shielded	No	1.5	PS/2 type
7	Keyboard cable, Shielded	No	1.5	PS/2 type
8	Monitor cable, Shielded	Yes	1.5	Between the PC and LCD Monitor
9	DC In Cable, Unshielded	Yes	1.5	Between the LCD Monitor and Adaptor
10	Printer cable, Shielded	No	1.5	Between the PC and Printer
11	Adaptor Power Cable, Unshielded	No	1.5	Connect to AC power
12	AC power cable, Unshielded	No	1.5	Connect to AC power
13	AC power cable, Unshielded	No	1.5	Connect to AC power

1.4 Test Software

☐ Pinging
☒ Not applicable

1.5 EUT Operating Mode(s)

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

☐ Test program (H-Pattern)
☐ Test program (color bar)
☐ Standby
☐ Test program (customer specific)
☒ Practice operation – USB downloading mode.
AV output monitoring mode.

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 and 10 meter Open Area Test Sites 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 (CE, RE) EMS (ESD, Burst, RS, Surge, CS, Power-Frequency Susceptibility, Voltage Dips and Short Interruptions)	No. 51, KR0025
International	**KOLAS**	EMC	
Europe	**GLAS**	EMC EN 55011, EN 55022, EN 55024, EN 61326, EN 50130-4, EN 50081-1, EN 50081-2, EN 50082-1, EN 50082-2, EN 61000-6-2, 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, EN 61000-3-2, EN 61000-3-3	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 ☐ Class A	☐ Group 2 ☐ 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
June 22, 2004

Test Location
EMI-CE: Shielded Room

Test Instruments

☒ Field Strength Meter	Rohde & Schwarz	ESHS30	828144/002

Test Accessories

☐ LISN	EMCO	3825/2	9206-1971
☒ LISN	EMCO	3825/2	9409-2246
☒ LISN	EMCO	3825/2	9607-2574
☒ Control PC	HP	Vectra 500	SG72000192

Frequency Range of Measurement
☒ 150 kHz to 30 MHz
☐ 450 kHz to 30 MHz
☐ _____

Instrument Settings
IF Band Width: 9 kHz

Test Results
The requirements are:

☒ MET minimum margin is 15.4 dBuV at 3.25 MHz
☐ NOT MET limit exceeded by maximum of ___ dBuV at _____ MHz
☐ NOT APPLICABLE

Remarks
See Appendix A for test data.

2.2 Radiated Electric Field Emissions

Test Date
June 23, 2004

Test Location
☒ EMI-OATS: Testing was performed at a test distance of 10 m
☐ EMI-OATS: Testing was performed at a test distance of 3 m

Test Instruments

☒ Field Strength Meter	Rohde & Schwarz	ESVS30	826638/008

Test Accessories

☒ ULTRA Broadband Antenna	Rohde & Schwarz	HL562	361324/014
☐ Biconical Antenna	Schwarzbeck	BBA9106	41-00201
☐ Biconical Antenna	EMCO	3110B	9607-2564
☐ Log-periodic Antenna	EMCO	3146	9607-4567

Frequency Range of Measurement
30 MHz to 1 GHz

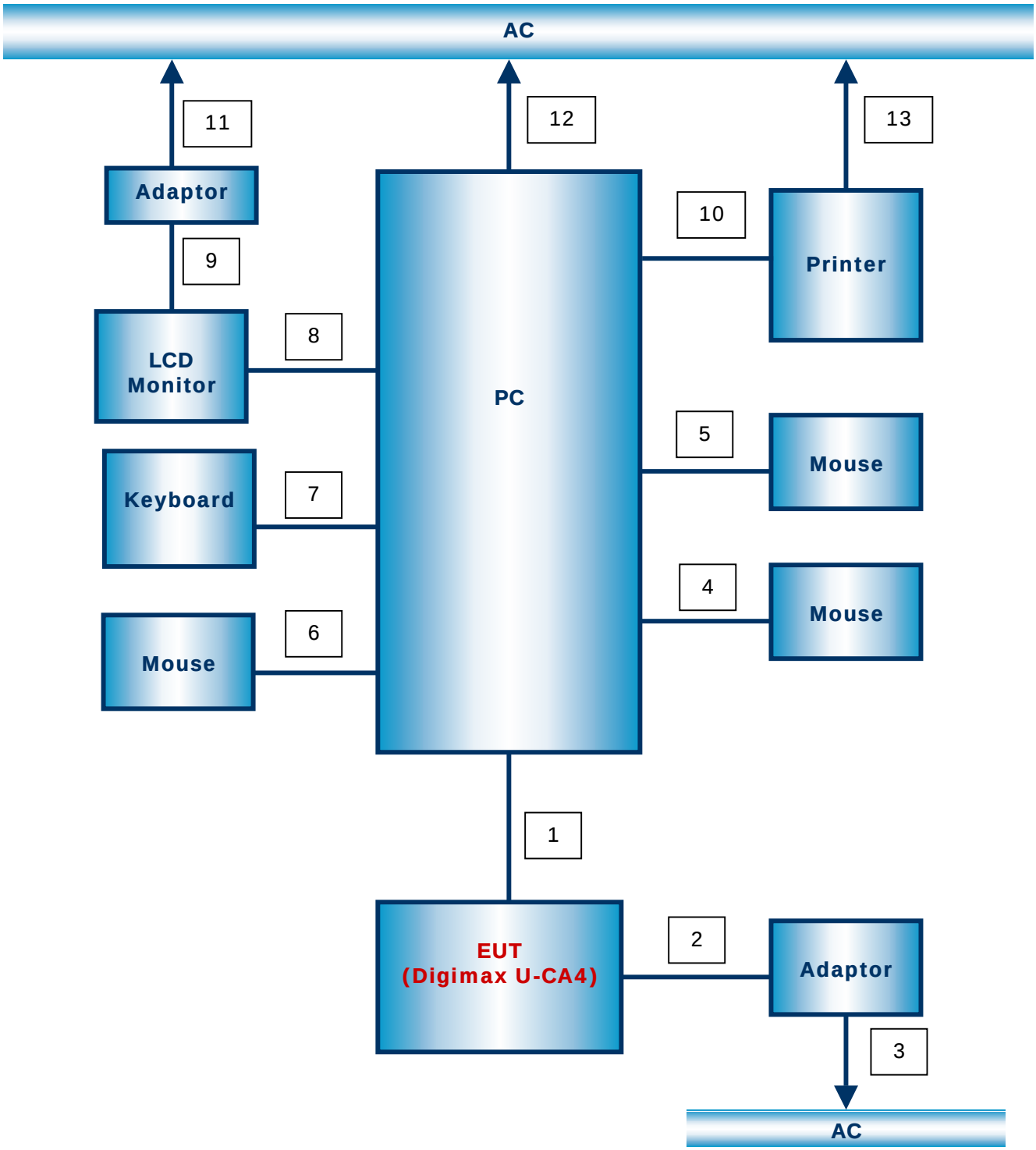
Instrument Settings
IF Band Width: 120 kHz

Test Results
The requirements are:

☒ MET minimum margin is 4.1 dBuV/m at 81.06 MHz
☐ NOT MET limit exceeded by maximum of ___ dBuV/m at _____ MHz
☐ NOT APPLICABLE

Remarks
See Appendix A for test data

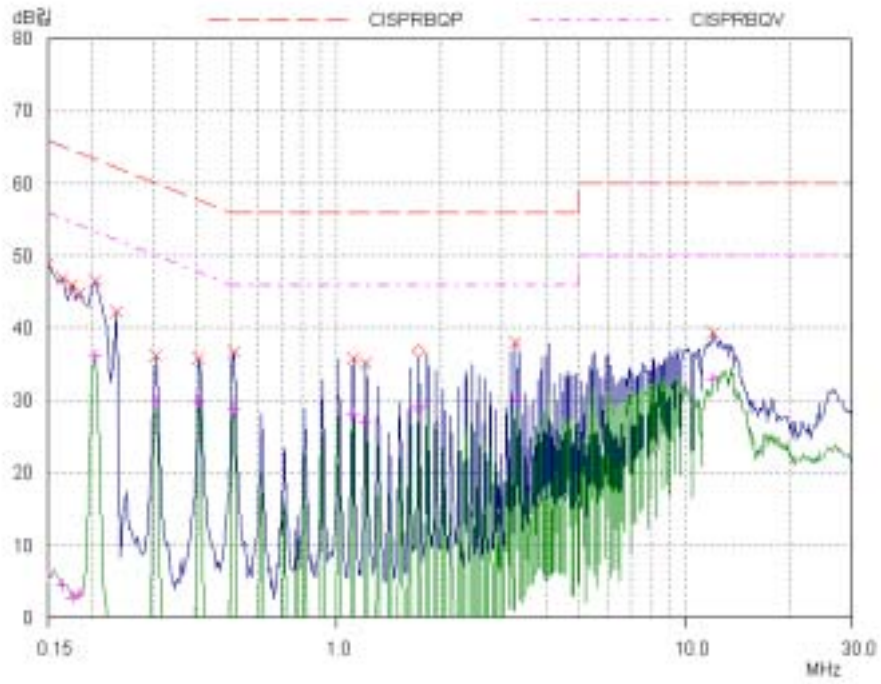
Configuration

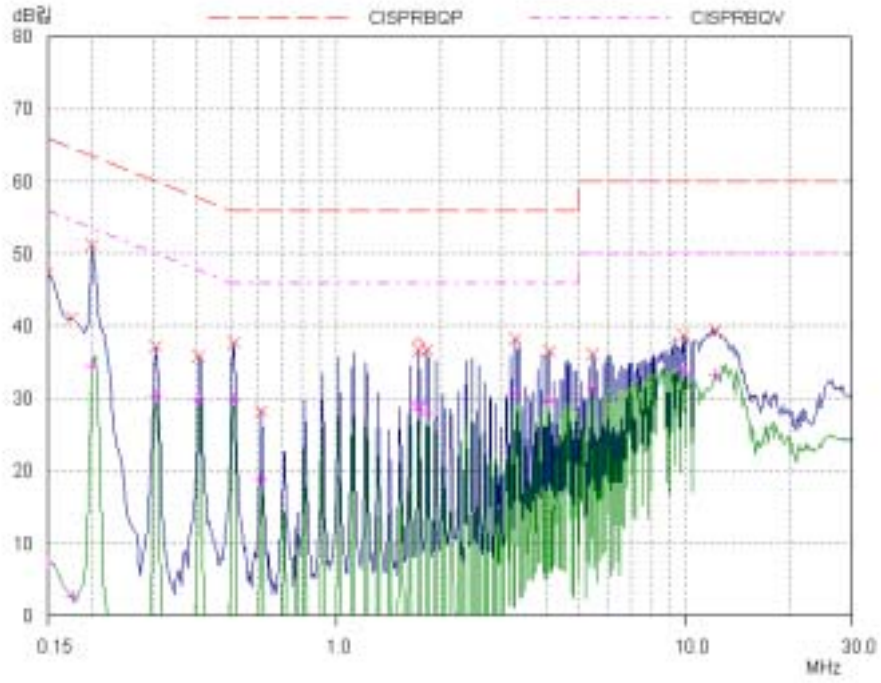


APPENDIX A – TEST DATA

Conducted Voltage Emissions (Quasi-Peak reading)

Frequency	Correction Factor		Line	Quasi-peak				Average			
				Limit	Reading	Result	Margin	Limit	Reading	Result	Margin
[MHz]	LISN	Cable		[dBuV]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dB]
0.51	0.1	0.1	H	56.0	36.4	36.6	19.4	46.0	28.5	28.7	17.3
0.20	0.2	0.1	H	63.6	46.2	46.5	17.1	53.6	35.9	36.2	17.4
3.25	0.1	0.2	N	56.0	37.9	38.2	17.8	46.0	30.3	30.6	15.4
4.07	0.1	0.2	N	56.0	36.2	36.5	19.5	46.0	29.2	29.5	16.5
9.87	0.1	0.2	N	60.0	38.5	38.8	21.2	50.0	33.4	33.7	16.3
12.11	0.1	0.2	N	60.0	39.1	39.4	20.6	50.0	32.9	33.2	16.8





Radiated Electric Field Emissions (Quasi-Peak reading)

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor		Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Cable			
81.06	15.8	V	1.0	8.4	1.7	30.0	25.9	4.1
108.42	13.1	V	4.0	9.5	1.9	30.0	24.5	5.5
161.92	15.8	H	4.0	7.3	2.4	30.0	25.5	4.5
269.53	17.9	H	1.8	10.1	3.2	37.0	31.2	5.8
296.42	17.5	V	2.0	10.9	3.2	37.0	31.6	5.4
475.23	10.7	V	2.0	15.2	4.3	37.0	30.2	6.8