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EMC TEST REPORT For FCC

Test Report No.	:	CTK04-F003
Date of Issue	:	January 7, 2004
Model/Type No:	:	Digimax 430
Kind of Product	:	Digital Camera
Applicant	:	Samsung Techwin Co., Ltd.
Applicant Address	:	145-3 Sangdaewon 1 dong, Chungwon-ku, 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	:	January 3, 2004
Test period	:	Start: January 3, 2004 End: January 3, 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: January 7, 2004

Reviewed by

James Hong
EMC Technical Manager
Date: January 7, 2004

REPORT REVISION HISTORY

Date	Revision	Page No
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1.0 General Product Description

1.0.1 Tested Equipment

☒ Unless otherwise indicated, all tests were conducted on Model Digimax 430.
☐ Tests performed on Model _____ were considered to be representative of Model(s) _____.

1.0.2 Equipment Size, Mobility and Identification

Dimensions: 106.8(W) by 55.5(H) by 32.2(D) ☒ mm ☐ in
Mobility: ☒ Hand-Held ☐ Table-top ☐ Floor-standing ☐ -
Serial No.: Prototype

1.0.3 Electrical Ratings

EUT :
Input : 3.3Vdc
Output : -

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

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

COACH 6 : 13.5MHz, 27.000MHz
TG/CDS/AGC : 49.0909MHz
RTC : 32.768kHz

1.1 Model Differences

Not applicable

1.2 Device Modifications

The following modifications were necessary for compliance:

Copper tapes are inserted additionally.

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(1)	Ault Inc.	PW137KA0300N52	13502619	DoC
Desk Top PC	Hewlett-Packard Company	PD1059P	-	DoC
Monitor	Hewlett-Packard Company	P4829	TW14383731	DoC
Adaptor(2)	DELTA ELECTRONICS INC	ADP-70RB	ODD0144008814	DoC
Keyboard	Samsung	SEM-DT35	33008109	DoC
Mouse (PS/2 type)	Samsung	OMS3CB	0303009873	DoC
Mouse (USB type)	Samsung	OMS3CB	0303009881	DoC
Mouse (USB type)	Samsung	OMS3CB	0303009883	DoC
Printer	SEIKO EPSON CORP.	EPSON STYLUS COLOR	BWCE143331	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	AC power cable, Unshielded	No	1.8	Connect to AC power
5	DC output cable, Unshielded	Yes	1.5	Between the EUT and Adaptor
6	DC output cable, Unshielded	Yes	1.5	Between the Monitor and Adaptor
7	USB cable, Shielded	Yes	1.2	Between the EUT and PC
8	Monitor cable, Shielded	Yes	1.8	Between the PC and Monitor
9	Mouse cable, Shielded	No	1.5	PS/2 type
10	Mouse cable, Shielded	No	1.5	USB type
11	Mouse cable, Shielded	No	1.5	USB type
12	Keyboard cable, Shielded	No	1.5	PS/2 type
13	Printer cable, Shielded	Yes	1.8	Between the Printer and PC

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 : PC mode (Downloading stored images)

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 C63.4-1992 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

☐ 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 55014-1:1993 +A1:1997 +A2:1999 ☐ Household appliances and similar
☐ Portable tools
☐ Semiconductor devices

☐ EN 55014-1:2000
☐ EN 55014-2:1997

☐ EN 55015:1996 +A1:1997 +A2:1999
☐ EN 55015:2000

☐ EN 55020:1994 +A11:1996 +A13:1999 +A14:1999
☐ EN 55020:1994 +A11:1996 +A12:1999 +A13:1999 +A14:1999

☐ EN 55022:1994 +A1:1995 +A2:1997 ☐ Class A ☐ Class B
☐ EN 55022:1998 +A1:2000 ☐ Class A ☐ Class B

☐ EN 61000-3-2:1995 +A1:1998 +A2:1998
☐ EN 61000-3-2:1995 +A1:1998 +A2:1998 +A14:2000
☐ EN 61000-3-2:2000
☐ EN 61000-3-3:1995

☐ VCCI V-3/99.05 : 1999 ☐ Class A ☐ Class B

☒ FCC Part 15 Subpart B ☐ Class A ☒ Class B

☐ AS 3548 (1992) ☐ 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.

2.1 Conducted Voltage Emissions

Test Date
January 3, 2004

Test Location
EMI-CE: Shielded Room

Test Instruments

☒ Field Strength Meter	Rohde & Schwarz	ESHS30	828144/002

Test Accessories

☒ 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 7.2 dBuV (average)at 3.78 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
January 3, 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
☐ Bi-conical Antenna	Schwarzbeck	BBA9106	41-00201
☐ Bi-conical Antenna	EMCO	3110B	9607-2564
☐ Log-periodic Antenna	EMCO	3146	9607-4567

Frequency Range of Measurement
30 MHz to 1 GHz

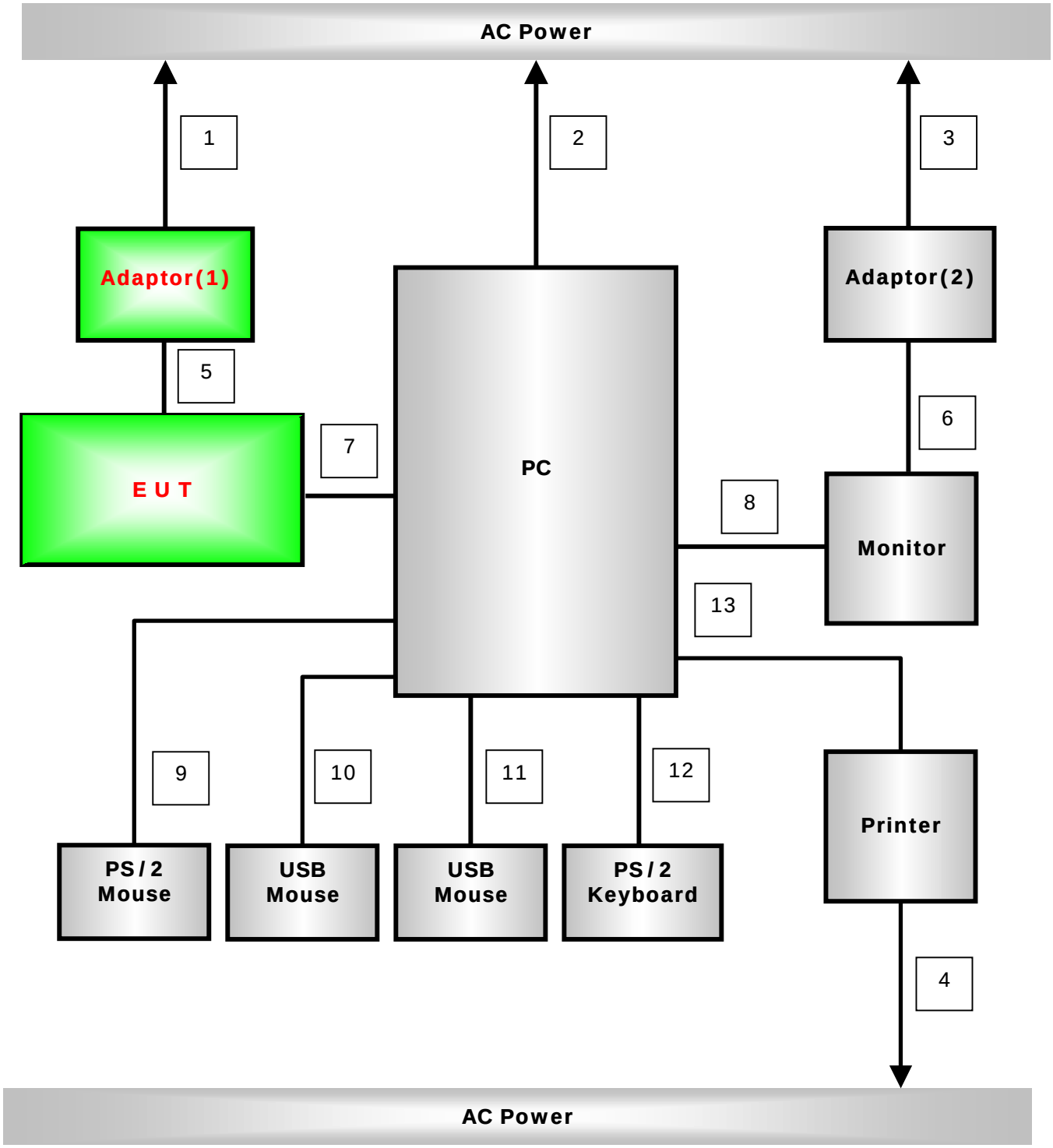
Instrument Settings
IF Band Width: 120 kHz

Test Results
The requirements are:

☒ MET minimum margin is 5.2 dBuV/m at 216.34 MHz
☐ NOT MET limit exceeded by maximum of ___ dBuV/m at _____ MHz
☐ NOT APPLICABLE

Remarks
See Appendix A for test data

Configuration

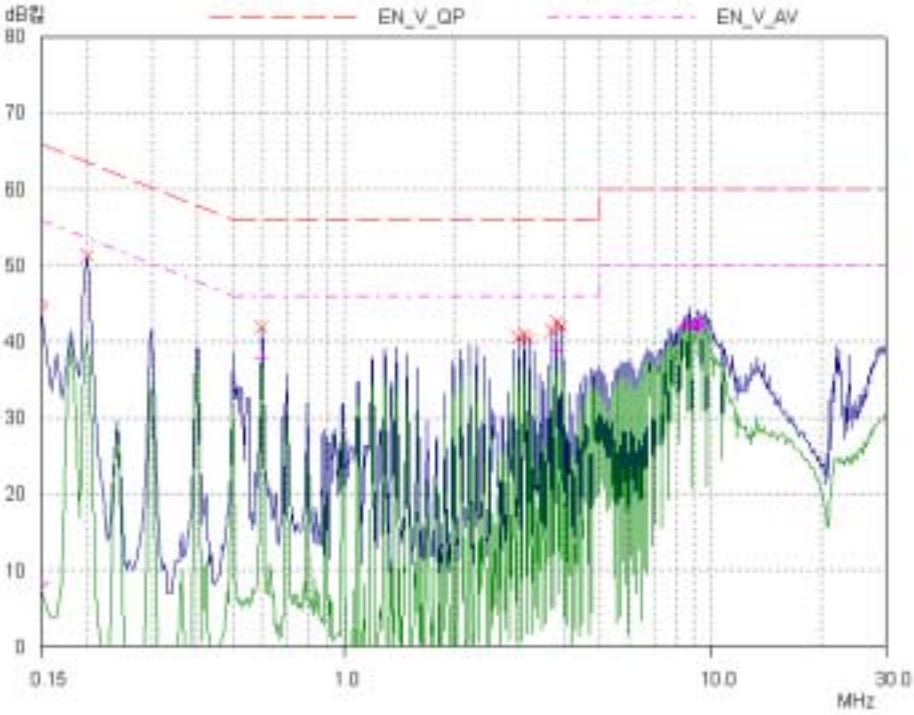


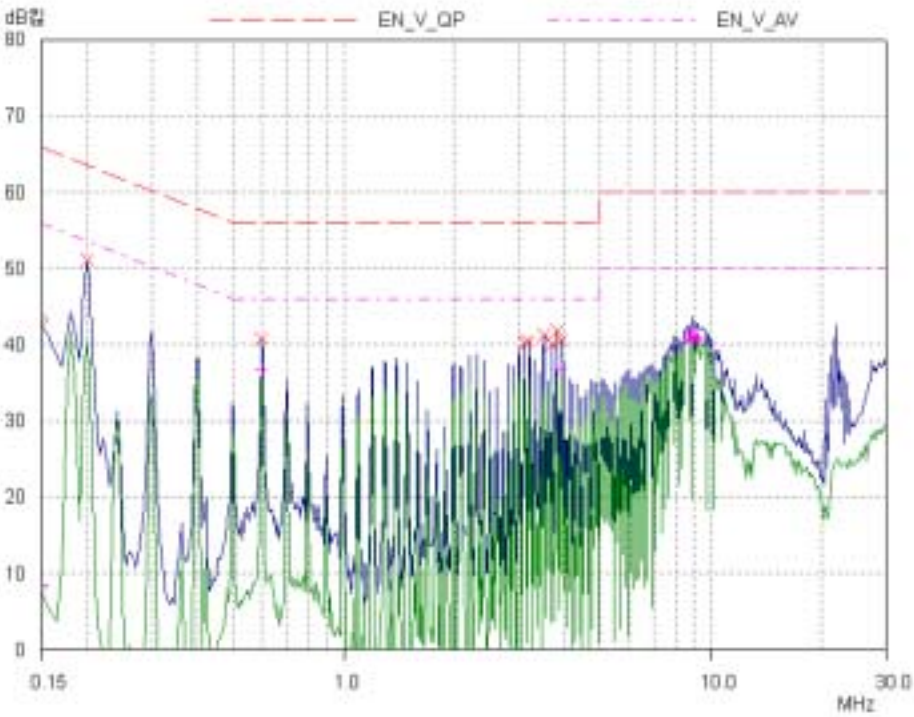
APPENDIX A – TEST DATA

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]
0.20	1.7	0.1	H	63.6	49.5	51.3	12.3	53.6	38.4	40.2	13.4
0.60	0.5	0.1	H	56.0	41.4	42.0	14.0	46.0	37.4	38.0	8.0
2.98	0.3	0.1	H	56.0	40.2	40.6	15.4	46.0	36.0	36.4	9.7
3.08	0.3	0.1	H	56.0	40.5	40.9	15.1	46.0	36.4	36.8	9.2
3.48	0.3	0.1	N	56.0	40.8	41.2	14.8	46.0	33.7	34.1	11.9
3.68	0.3	0.1	H	56.0	41.0	41.4	14.6	46.0	35.9	36.3	9.7
3.78	0.3	0.1	H	56.0	42.3	42.7	13.3	46.0	38.5	38.9	7.2
3.88	0.3	0.1	H	56.0	41.5	41.9	14.1	46.0	35.7	36.1	9.9

* If the average limit is met when a quasi-peak detector is used, the EUT shall be deemed to meet both limit and measurement with the average detector is unnecessary.





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			
95.52	11.5	V	1.0	8.9	1.8	30.0	22.2	7.8
119.81	9.5	V	1.0	9.7	2.0	30.0	21.2	8.8
216.34	14.0	H	4.0	8.0	2.9	30.0	24.8	5.2
433.07	9.9	H	1.0	14.1	4.2	37.0	28.2	8.8
757.04	4.3	H	1.5	19.0	6.1	37.0	29.4	7.6
764.12	2.9	H	1.2	19.0	6.1	37.0	28.0	9.0
801.03	2.6	H	3.2	19.5	6.6	37.0	28.7	8.4
846.14	2.0	V	2.0	20.0	6.5	37.0	28.5	8.5
972.09	1.0	H	2.0	21.1	7.0	37.0	29.1	7.9