

EMC TEST REPORT For FCC



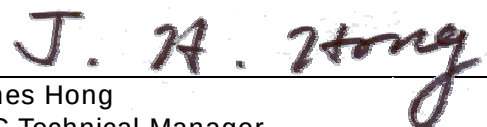
Test Report No. : 2005120014
Date of Issue : December 16, 2005
FCC ID : NLMDIGIMAXS500
Model/Type No. : Digimax S500
Kind of Product : Digital Camera
Applicant : Samsung Techwin Co., Ltd.
Applicant Address : 145-3 Sangdaewon 1-Dong, Jungwon-Gu, Sunghnam-City,
Kyungki-Do, Korea
Manufacturer : 1) Samsung Techwin Co., Ltd.
2) Tianjin Samsung Opto-Electronics Co., LTD.
Manufacturer Address : 1) 42, Sungju-dong, Changwon City, Kyungnam, Korea
2) 7 Pingchang Road, Nabkai Dist., Tianjin, China
Contact Person : Jae-Hyun, Cho (Manager)
Telephone : +82-31-740-8256
Received Date : December 7, 2005
Test period : Start : December 14, 2005 End : December 14, 2005
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

Reviewed by



Young-Kug, Song
EMC Test Engineer
Date: December 16, 2005

James Hong
EMC Technical Manager
Date: December 16, 2005

REPORT REVISION HISTORY

Date	Revision	Page No
December 16, 2005	Issued (2005120014)	All

This report shall not be reproduced except in full, without the written approval of CERTiTEK Standards Laboratory Co., Ltd. This document may be altered or revised by CERTiTEK Standards Laboratory Co., Ltd. personnel only, and shall be noted in the revision section of the document. Any alteration of this document not carried out by CERTiTEK Standards Laboratory Co., Ltd. will constitute fraud and shall nullify the document.

TABLE OF CONTENTS

REPORT REVISION HISTORY	2
1.0 General Product Description	4
1.1 Model Differences	4
1.2 Device Modifications	5
1.3 EUT Configuration(s)	6
1.4 Test Software	6
1.5 EUT Operating Mode(s)	6
1.6 Configuration	7
1.7 Calibration Details of Equipment Used for Measurement	8
1.8 Test Facility	8
1.9 Measurement Procedure	8
1.10 Laboratory Accreditations and Listings	9
2.0 Emissions Test Regulations	10
2.1 Conducted Voltage Emissions	11
2.2 Radiated Electric Field Emissions	12
APPENDIX A – TEST DATA	13
Conducted Voltage Emissions	13
Radiated Electric Field Emissions	15
APPENDIX B - Test Setup Photos and Configuration	16
Conducted Voltage Emissions	16
Radiated Electric Field Emissions	17
APPENDIX C – EUT Photographs	18
EUT External Photographs	19
EUT Internal Photographs	21
PCB	22
Photographs related to Label	26
FCC ID label location	27

1.0 General Product Description

1.0.1 Tested Equipment

- ☒ Unless otherwise indicated, all tests were conducted on Model Digimax S500.
- ☐ Tests performed on Model _____ were considered to be representative of Model(s) _____.

1.0.2 Equipment Size, Mobility and Identification

Dimensions: Approx. 96.8 by 61.8 by 32.8 ☒ mm ☐ inch
Mobility: ☒ Hand-held ☐ Table-top ☐ Built-in
 ☐ Traveling ☐ Floor-standing
Serial No.: Prototype

1.0.3 Electrical Ratings

Adaptor	Input:	100-240 Vac, 50-60 Hz, 0.15 A
	Output:	3.0 Vdc, 700 mA
EUT	Input:	3.0 Vdc
	Output:	-

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: 120 Vac
Frequency: 60 Hz

1.0.5 Clock & Other Frequencies Utilized

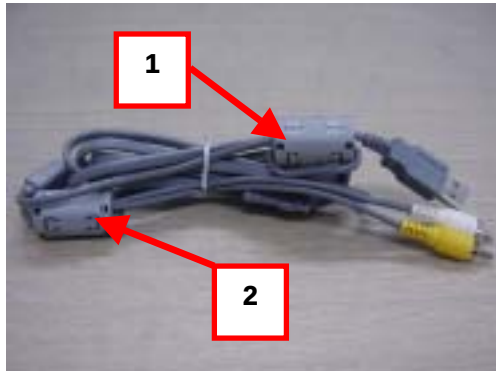
12 MHz, 54 MHz, 108 MHz

1.1 Model Differences

Not applicable

1.2 Device Modifications

The following modifications were necessary for compliance:



Ferrite Cores were inserted additionally.

Core location	Manufacturer	Part No.	Number of Cable Turn
1	TDK Corporation	ZCAT2032-0930	1
2	TDK Corporation	ZCAT2032-0930	1

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.
Cradle (for EUT)	TIANJIN H&T ELECTRONICS CO., LTD.	SCC-S4	-
Personal Computer	Hewlett-Packard Company	PD1059P	-
LCD Monitor	TIANJIN SAMSUNG ELECTRONICS DISPLAY	GH17US	N372HVEX225526
Adaptor	Anam Instruments (Shen Zhen) Co., Ltd.	AP04214-UV	0312103885AC
Keyboard (PS/2 type)	CHCONY ELECTRONICS(MAINLAND CHINA)CO. LTD	KB-0133	B55680FGAO 958M
Mouse (PS/2 type)	SUZHOU LOGITECH ELECTRONICS CO., LTD	M-S69	F466B0MN 30517VN
Printer (Parallel type)	Seiko Epson Corp.	Stylus Color 460	BWCE136524

☒ Cable Description

#	Description	Ferrite Core	Length (m)	Other Details
1	AC power cable, Unshielded	No	1.8	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	Cradle Power Cable, Unshielded	No	1.5	Connect to AC power
5	USB cable, Shielded	Yes	1.5	Between the Cradle and PC
6	AV cable, Shielded	Yes	1.5	Between the Cradle and PC
7	Monitor cable, Shielded	Yes	1.5	Between the PC and LCD Monitor
8	Adaptor cable, Unshielded	Yes	1.8	Between the Adaptor and Monitor
9	Printer cable, Shielded	No	1.5	Between the PC and Printer
10	Keyboard cable, Shielded	No	1.5	PS/2 type
11	Mouse cable, Shielded	No	1.5	PS/2 type

1.4 Test Software

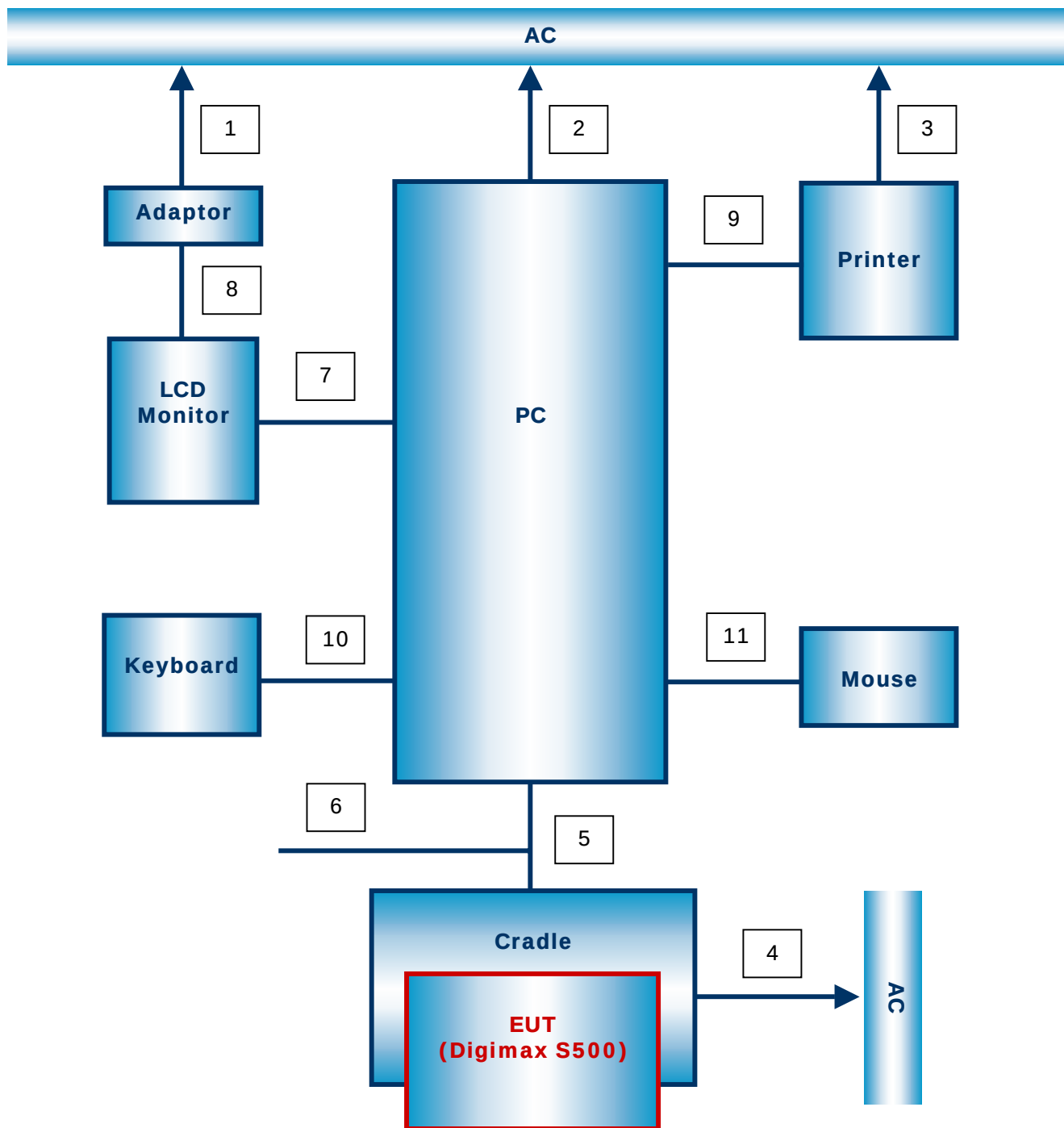
- ☐ EMC Test V 1.0
☐ Display Test Patterns – V1.5
☐ Ping.exe
☒ Not applicable

1.5 EUT Operating Mode(s)

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

- ☐ Standby
☐ Display circles pattern
☒ Practice operation – USB downloading mode.
☐ Scrolling 'H'
☐ Read / Write
 AV output monitoring mode.

1.6 Configuration



1.7 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.

1.8 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.

1.9 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

1.10 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	
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 61000-6-3:2001 | ☐ 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 55011:1998 +A1:1999 +A2:2002 | ☐ 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 55022:1998 +A1:2000 +A2:2003 | ☐ Class A | ☐ Class B |
| ☐ EN 61000-3-2:2000 | | |
| ☐ EN 61000-3-3:1995 +A1:2001 | | |
| ☐ VCCI V-3/2004.04 | ☐ 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 14, 2005

Test Location

Shielded Room

Test Equipment

	Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
☒	Field Strength Meter	Rohde & Schwarz	ESHS30	828144/002	2006-02-01
☒	LISN	EMCO	3825/2	9607-2575	2006-09-03
☒	LISN	EMCO	3825/2	9409-2246	2006-09-03

Frequency Range of Measurement

150 kHz to 30 MHz

Test Results

The requirements are:

☒ MET

Frequency (MHz)	Measured Data (dBuV)	Margin (dB)	Remark
4.72	50.4	5.6	Quasi-peak

☐ 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 14, 2005

Test Location

☒ Testing was performed at a test distance of 3 & 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	2006-04-14
☒	EMC Analyzer	Agilent Technologies	E7403A	MY42000054	2006-01-15
☒	ULTRA Broadband Antenna	Rohde & Schwarz	HL562	361324/014	2006-05-27
☐	Biconical Antenna	EMCO	3110	9202-1510	2006-04-13
☐	Log-periodic Antenna	EMCO	3146	9607-4567	2006-04-08

Frequency Range of Measurement

30 MHz to 1 GHz: 10 meter Open Area Test Site

1 GHz to 2 GHz: 3 meter Open Area Test Site

Test Results

The requirements are:

☒ MET

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
497.74	33.5	3.5	Quasi-peak

☐ NOT MET

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

☐ NOT APPLICABLE

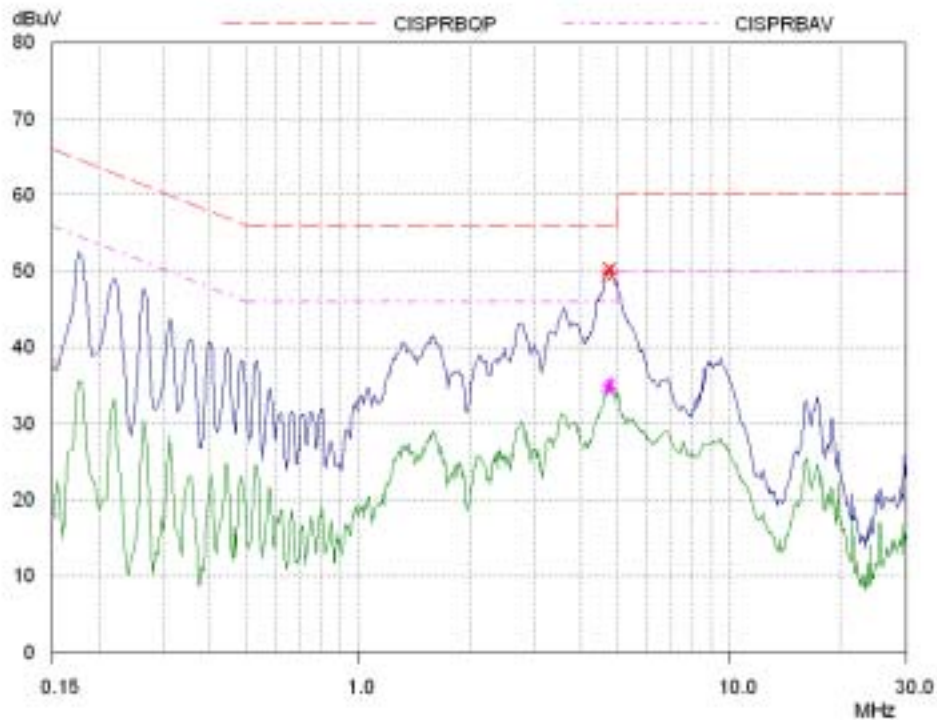
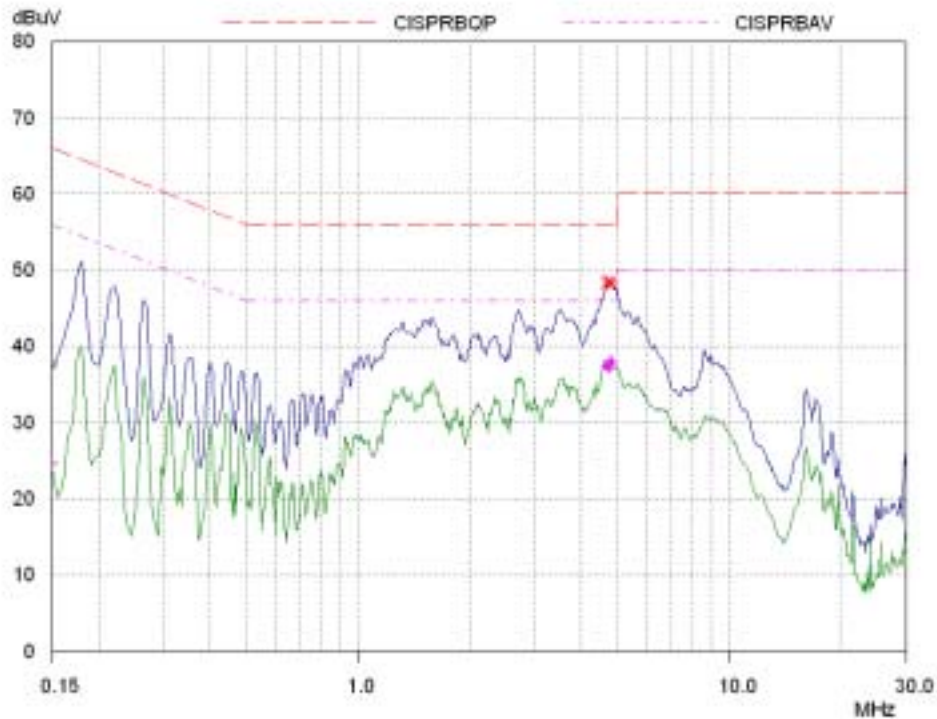
Remarks

See Appendix A for test data

APPENDIX A – TEST DATA

Conducted Voltage Emissions

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]
4.66	0.1	0.2	N	56.0	49.0	49.3	6.7	46.0	33.8	34.1	11.9
4.67	0.1	0.2	N	56.0	49.6	49.9	6.1	46.0	34.6	34.9	11.1
4.72	0.1	0.2	N	56.0	50.1	50.4	5.6	46.0	34.8	35.1	10.9
4.75	0.1	0.2	N	56.0	50.0	50.3	5.7	46.0	34.2	34.5	11.5
4.76	0.1	0.2	N	56.0	49.8	50.1	5.9	46.0	34.7	35.0	11.0
4.81	0.1	0.2	N	56.0	49.0	49.3	6.7	46.0	34.1	34.4	11.6



Radiated Electric Field Emissions

Frequency [MHz]	Reading [dBuV / m]	Pol.	Height [m]	Correction Factor		Limits [dBuV / m]	Result [dBuV / m]	Margin [dB]
				Antenna	Cable			
389.25	14.4	H	3.5	13.3	3.8	37.0	31.5	5.5
433.15	15.3	H	4.0	14.1	3.9	37.0	33.3	3.7
475.23	12.1	V	1.0	15.2	4.3	37.0	31.6	5.4
497.74	13.5	V	2.6	15.6	4.4	37.0	33.5	3.5
539.65	12.4	V	1.5	16.1	4.4	37.0	32.9	4.1
562.52	9.6	V	1.0	16.4	4.5	37.0	30.5	6.5