

**Test Report
Application for Certification
Class II Permissive Change**

**On Behalf Of
SPOT Technology Inc.**

**Scanner
FCC ID: MLDSF-600E**

**Model No.: SF-600EFX, SF-1200EFX
(X=0~9)**

**Prepared for:
SPOT Technology Inc.
No. 115, Community 4, Chang 16, Tung Kuang Li,
Kuan His Town, Hsinchu Hsien, Taiwan, R.O.C.**



**Report By : Global EMC Standard Tech. Corp.
No.3 Pau-Tou-Tsuo Valley, Chia-Pau
Tsuen, Lin Kou Hsiang, Taipei Country,
Taiwan, R.O.C.
Tel : (02) 603-5321
Fax : (02) 603-5325**

Test results given in this report only relate to the specimen(s) tested, calibrated or measured.
This report shall not be reproduced other than in full without the written consent of Gestek.
This report must not be used to claim product endorsement by NVLAP or any agency of the U.S. Government.

TABLE OF CONTENTS

	Description	Page
1.	Test Report Certification.....	3
2.	General Information	4
2.1	Production Description.....	4
2.2	Tested System Details	5
2.3	Test Methodology	7
2.4	Test Facility.....	7
3.	Conducted Power Line Test.....	8
3.1	Test Equipments.....	8
3.2	Block Diagram of Test Setup.....	8
3.3	Conducted Powerline Emission Limit	9
3.4	EUT Configuration on Measurement.....	9
3.5	EUT Exercise Software.....	10
3.6	Conducted Emission Data	10
4.	Radiation Emission Test.....	12
4.1	Test Equipment	13
4.2	Test Setup.....	13
4.3	Radiated Emission Limit.....	14
4.4	EUT Configuration.....	15
4.5	Operating Condition of EUT.....	15
4.6	Radiated Emission Data	15
5.	Photographs.....	16
5.1	Test Photographs	20
6.	EMI Reduction Method During Compliance Testing	34
	Appendix A.....	35
	Circuit (Block) Diagram.....	35
	Appendix B	36
	User Manual	36

GESTEK 18-F008

1. Test Report Certification

Applicant : SPOT Technology Inc.

Manufacturer : SPOT Technology Inc.

EUT Description : Scanner

(A) Model No. : SF-600EFX, SF-1200EFX (X=0~9)

(B) FCC ID : MLDSF-600E

(C) Serial No. : ProtoType

(D) Power : 110V/60Hz

MEASUREMENT PROCEDURE USED :

CFR 47, Part 15 Radio Frequency Device Subpart B Unintentional Radiators Class **B** :1996

CISPR 22 Limits and methods of measurement of radio disturbance characteristics of information technology equipment: 1993

ANSI C63.4 Methods of Measurements of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9kHz to 40GHz. :1992

THE MEASUREMENT SHOWN IN THE ATTACHMENT WERE MADE IN ACCORDANCE WITH THE PROCEDURES INDICATED, AND THE MAXIMUM ENERGY EMITTED BY THE EQUIPMENT WAS FOUND TO BE WITHIN THE FCC LIMITS APPLICABLE.



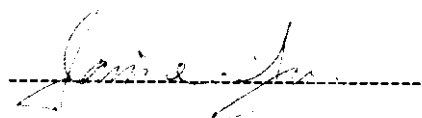
Sample Received Date : Mar. 23, 1998

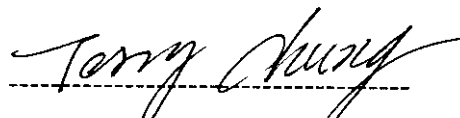
Final Test Date : Apr. 07, 1998

Documented by : Winnie Chiu

Test Engineer :

Approve & Authorized Signer :


JANICE YU


TERRY CHUNG

This test data shown below is traceable to NIST.

2. General Information

2.1 Production Description

Description	: Scanner
Model Number	: SF-600EFX, SF-1200EFX
FCC ID	: MLDSF-600E
Serial Number	: ProtoType
Applicant	: SPOT Technology Inc.
Address	: No. 115, Community 4, Chang 16, Tung Kuang Li, Kuan His Town, Hsinchu Hsien, Taiwan, R.O.C.
Manufacturer	: SPOT Technology Inc.
Address	: No. 115, Community 4, Chang 16, Tung Kuang Li, Kuan His Town, Hsinchu Hsien, Taiwan, R.O.C.
Adaptor	: 1. KENTEX, Model No.: WA15-120 2. SYN, Model No.: 1089-1518-W2

Test Mode :

Mode 1: SF-600EFX, SF-1200EFX & KENTEX ADAPTOR.

Mode 2: SF-600EFX, SF-1200EFX & SYN ADAPTOR.

Note:

- 1.The data show in this test report reflects the worst-case data for each operation mode.
- 2.This devise apply for Class II permissive change due to stepping motor input DC 19VConverts to DC 12V.

2.2 Tested System Details

The FCC IDs/Types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards, which have grants) are:

☒ Host Personal Computer

System Model Number :D3496A
Serial Number :SG53000668
System FCC ID :HCJVECTRAVE4
Manufacturer :HP
Floppy Disk Driver : Manufacturer: HP
3.5" #1 Model: D2035-60121
HDD : Manufacturer: Quantum,
Model: Sirocco
Disk Ctrl Card : On board
I/O Card : On board
VGA Card : On board
Switching Power Supply :Manufacturer: DELTA
Model: DPS-100TB-1
Power Cord : Non-Shielded, Detachable, 1.5m
FCC ID: CIGE03633

☒ Monitor : Targa.
Model:TM4217 ONLD
Serial No.: MH45G 9001636

☒ Keyboard

Model Number : E036330LTWQ
Serial Number : 84925508
FCC ID : CIGE03614
Manufacturer : HP
Data Cable : Sheiled, Undetachable, 1.2 m

☒ Modem 1

Model Number : 1414
Serial Number : 960018041
FCC ID : IFAXDM1414
Manufacturer : ACEEX
Adaptor & Power Cord : Non-Shielded, Detachable, 1.5m
Data Cable : Shielded, Detachable, 1.2m

☒ Modem 2

Model Number : 1414
Serial Number : 960018052
FCC ID : IFAXDM1414
Manufacturer : ACEEX
Adaptor & Power Cord : Non-Shielded, Detachable, 1.5m
Data Cable : Shielded, Detachable, 1.2m

☒ Mouse

Model Number : M-S34
Serial Number : LCA52707145
FCC ID : DZL210582
Manufacturer : HP
Data Cable : Shielded, Undetachable, 1.5m

☒ Scanner (EUT)

Model Number : SF-600EFX
FCC ID : MLDSF-600E
Serial No. : S9654191
Manufacturer : SPOT Technology Inc.
Data Cable : Shielded, Undetachable, 1.2m
Power Cord : Shielded, Detachable, 1.8m

2.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4-1992.

Radiated testing was performed at an antenna to EUT distance of 10 meters.

2.4 Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	25.5-28
Humidity (%RH)	25-75	42-70
Barometric pressure (mbar)	860-1060	950-1000

FCC Site Description : Aug. 10, 1995 File on
Federal Communication Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046
Reference 31040/SIT1300F2

NVLAP Lab Code : 200085-0
United States Department of commerce
National Institute of Standards and Technology
National Voluntary Laboratory Accreditation Program

Name of firm : Global EMC Standard Tech. Corp.

Site location : No. 3 Pau-Tou Valley, Chia-Pau Tsuen, Lin Kou
Tsiang, Taipei Country, Taiwan, R.O.C.

3. Conducted Power Line Test

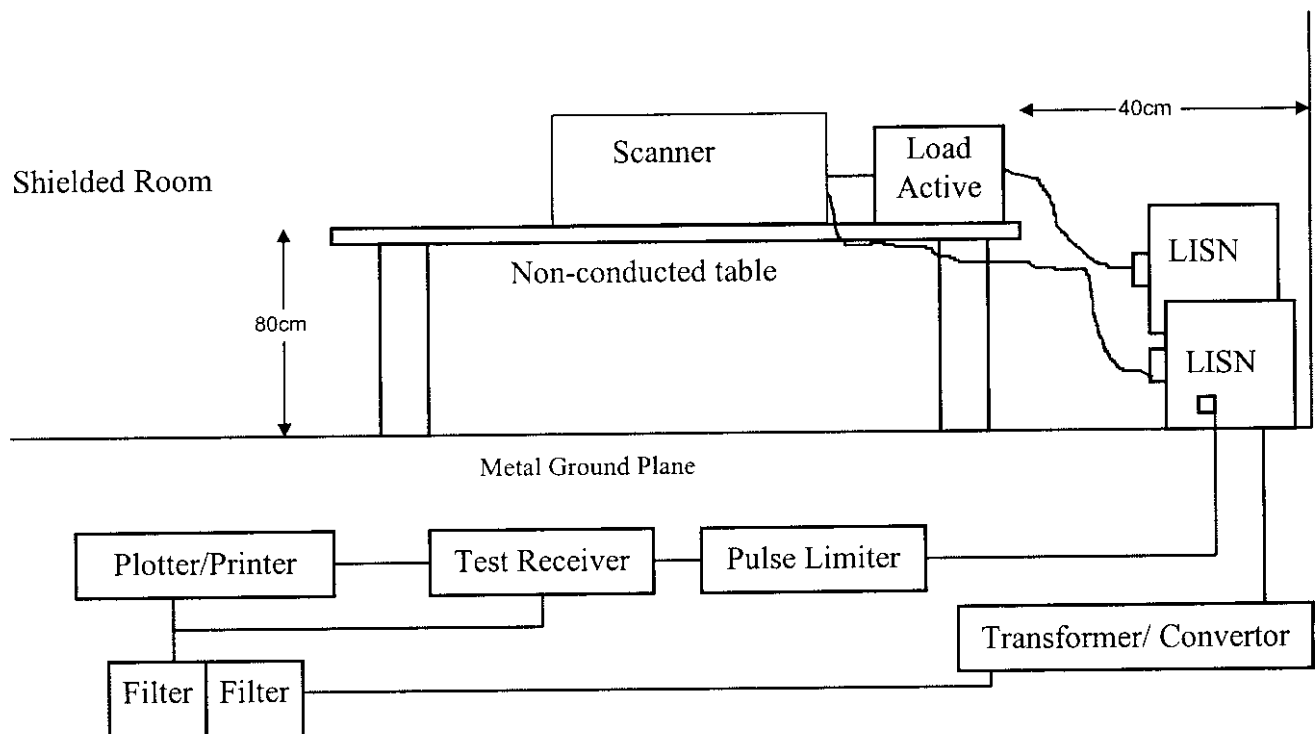
3.1 Test Equipments

The following test equipments are used during the conducted power line tests:

Instrument	Manufacturer	Type /Serial No.	Last Calibration	Location	C.E.
Test Receiver	Rohde & Schwarz	ESHS 30 / 8281091010	Oct.1997	Shield Room #1	✓
L.I.S.N.	Kyoritsu	KNW-407	Jul.1997	Shield Room #1	
L.I.S.N.	Solar	8012-50-R24 / 90038	N/A(Peripheral use)	Shield Room #1	✓
L.I.S.N.	EMCO	3825/2 / 91111-1902	Jul.1997	Shield Room #1	
L.I.S.N.	Rohde & Schwarz	ESH3-Z5 / 840567/002	Jan.1998	Shield Room #1	✓
L.I.S.N.	Schwarzbeck	NNLK 8121	Apr. 1997	Shield Room #1	
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	N/A	Shield Room #1	✓

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

3.2 Block Diagram of Test Setup



3.3 Conducted Powerline Emission Limit

3.3.1 FCC Limits

Frequency	Maximum RF Line Voltage			
	Class A		Class B	
MHz	uV	dBuV	uV	dBuV
0.45 - 1.705	1000	60.0	250	48.0
1.705 - 30	3000	69.5	250	48.0

Remarks : 1. RF Line Voltage (dBuV) = $20 \log$ RF Line Voltage (uV)
 2. In the Above Table, the tighter limit applies at the band edges.

3.3.2 CISPR Limits

Frequency	Maximum RF Line Voltage dB(uV)			
	Class A		Class B	
MHz	QUASI-PEAK	AVERAGE	QUASI-PEAK	AVERAGE
0.15 - 0.50	79	66	66-56	56-46
0.50-5.0	73	60	56	46
5.0 - 30	73	60	60	50

Remarks : In the Above Table, the tighter limit applies at the band edges.

3.4 EUT Configuration on Measurement

The equipments which is listed 3.2 are installed on Conducted Power Line Test to meet the Commission requirement and operating in a manner which tends to maximize its emission characteristics in a normal application.

3.5 EUT Exercise Software

The EUT exercise program used during conducted testing was designed to exercise the EUT in a manner similar to a typical use. The exercise sequence is listed as below:

- 3.5.1 Setup the EUT and simulators as shown on 3.2.
- 3.5.2 Turn on the power of all equipments.
- 3.5.3 Boot the PC from Hard Disk .
- 3.5.4 PC reads video software from the Scanner .
- 3.5.5 The (EUT) will start to operate and read the video figure into PC.
- 3.5.6 PC will display "video figure" on monitor.
- 3.5.7 Printer and modem will keep at standby . mode during Scanner operation.
- 3.5.8 Repeat the above procedure 3.5.4 to 3.5.6

3.6 Conducted Emission Data

The measurement range of conducted emission which is from **0.15 MHz to 30 MHz** was investigated. All readings are quasi-peak and average values with a resolution Bandwidth of 9 KHz. The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range for all the test modes. Then the worst modes were reported the following data pages.

The total uncertainty for this test is as follows:

- Uncertainty in the field strength measured: $< \pm 2.0$ dB

The uncertainty is calculated in accordance with NAMAS document NIS 81, and is given as 2 standard deviations.

CONDUCTED EMISSION DATA

Date of Test	:	Apr. 01, 1998	Temperature	:	24.3 °C
EUT	:	Scanner	Humidity	:	64 %
Test Mode	:	Mode 1	Display Pattern	:	Video Figure

FREQUENCY MHz	READING LEVEL dBuV				LIMITS	
	LINE1 QP	LINE1 AV	LINE2 QP	LINE2 AV	QP	AV
**0.21618	53.3	47.9	50.6	43.0	62.971	52.971
0.43494	45.1	35.3	46.2	37.3	57.176	47.176
0.55238	44.4	*	44.1	*	56.0	46.0
0.75110	39.8	25.7	44.3	32.4	56.0	46.0
2.17245	36.3	*	40.5	*	56.0	46.0
4.05177	33.8	*	35.7	*	56.0	46.0

Remarks : 1. All readings are Quasi-peak and average values.

2. “ * ” means that the quasi-peak reading level is lower then the average limits, it is not necessary to measure the average level.

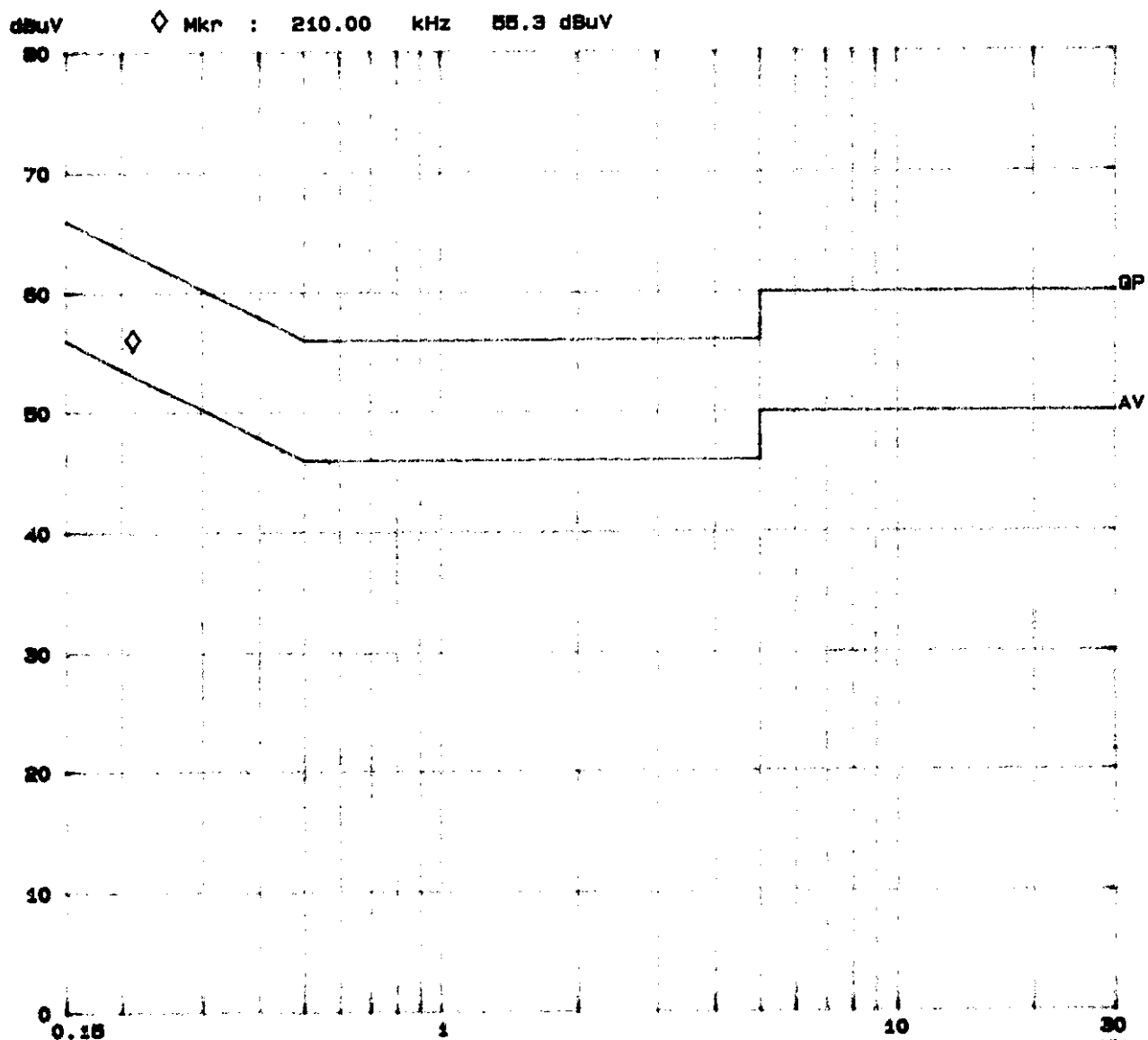
3. “ ** ” means that this data is the worse case emission level.

Attached 2 individual pages of peak scan curve data sheets.

ROHDE & SCHWARZ ESHS 30

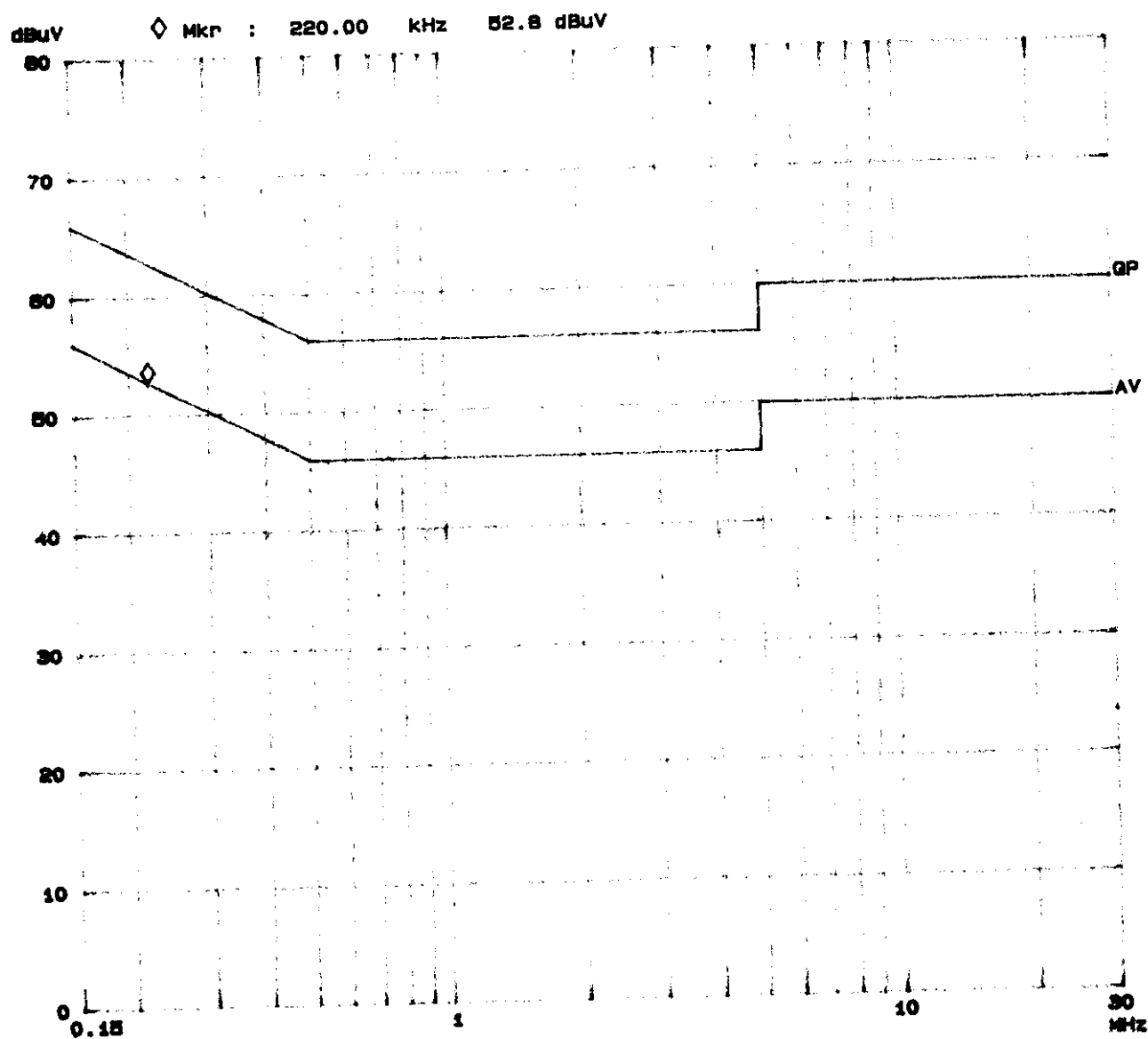
GesTek, PowerLine Conducted Emission

EUT: SCANNER
Manuf: SPOT
Operator: JANICE
Test Spec: FCC B
Comment: Line 1
ADAPTOR KENTEX



ROHDE & SCHWARZ ESHS 30
GesTek, PowerLine Conducted Emission

EUT: SCANNER
Manuf: SPOT
Operator: JANICE
Test Spec: FCC B
Comment: Line 2
ADAPTOR KENTEX



CONDUCTED EMISSION DATA

Date of Test	: Apr. 01, 1998	Temperature	: 24.1 °C
EUT	: Scanner	Humidity	: 64 %
Test Mode	: Mode 2	Display Pattern	: Video Figure

FREQUENCY MHz	READING LEVEL dBuV				LIMITS	
	LINE1 QP	LINE1 AV	LINE2 QP	LINE2 AV	QP	AV
**0.15019	48.8	*	51.9	*	66.0	56.0
0.52851	38.5	*	37.2	*	56.0	46.0
0.98029	38.4	*	35.9	*	56.0	46.0
1.87895	34.0	*	33.4	*	56.0	46.0
3.94709	37.6	*	35.9	*	56.0	46.0
16.0008	33.9	*	34.1	*	60.0	50.0

Remarks : 1. All readings are Quasi-peak and average values.

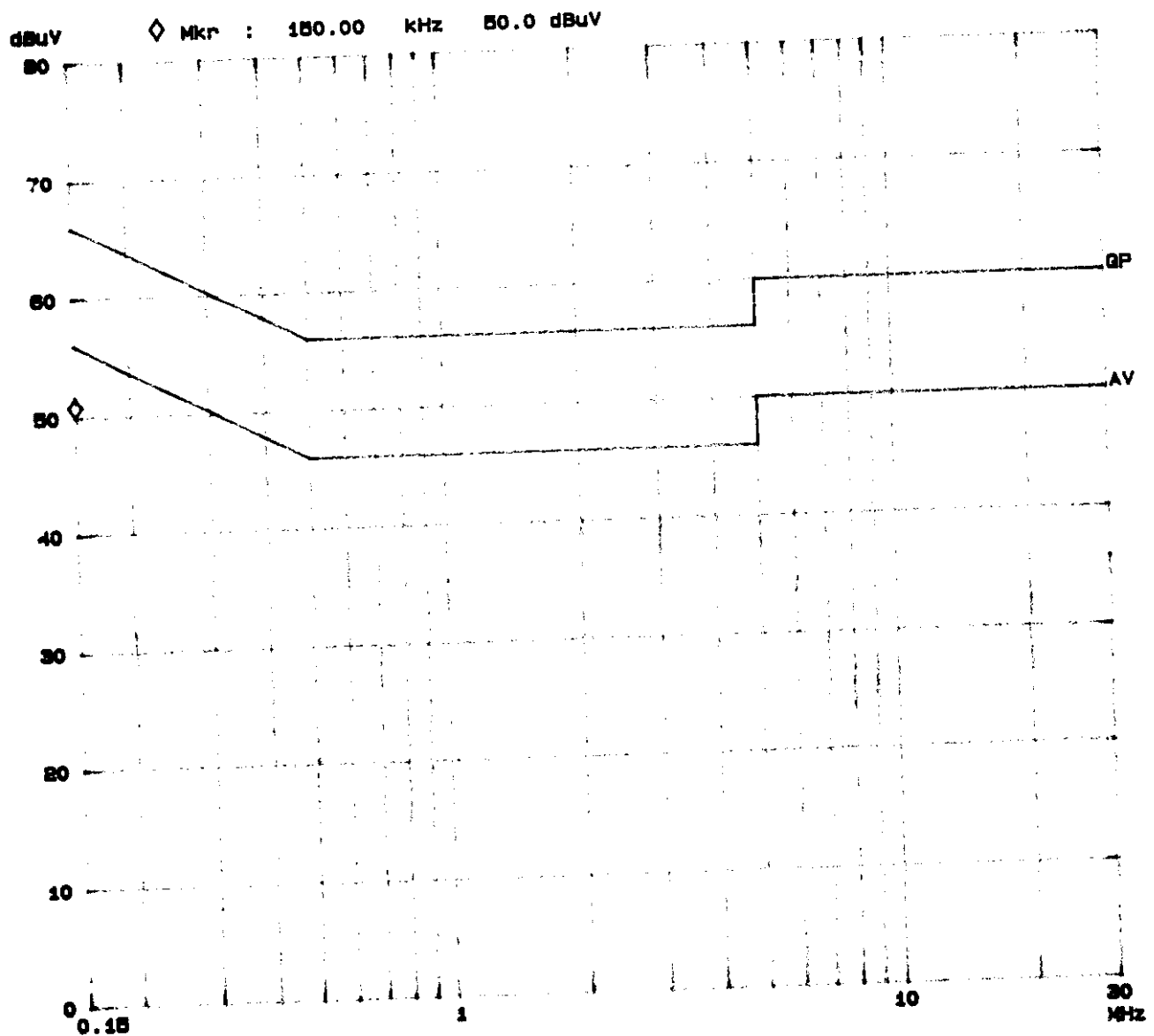
2. “ * ” means that the quasi-peak reading level is lower then the average limits, it is not necessary to measure the average level.

3. “ ** ” means that this data is the worse case emission level.

Attached 2 individual pages of peak scan curve data sheets.

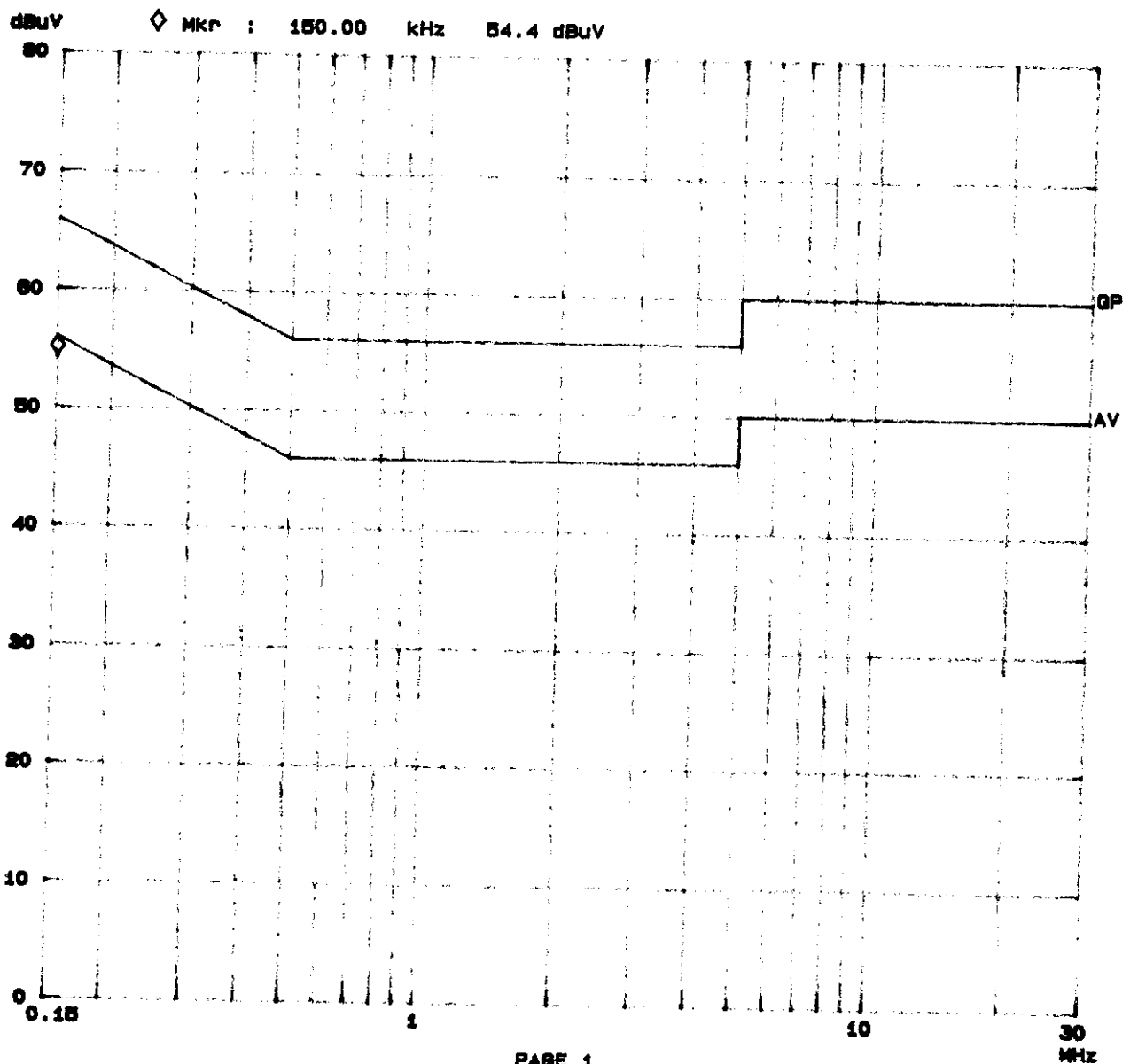
ROHDE & SCHWARZ ESHS 30
GesTek, PowerLine Conducted Emission

EUT: SCANNER
Manuf: SPOT
Operator: JANICE
Test Spec: FCC B
Comment: Line 1
ADAPTOR SYS



ROHDE & SCHWARZ ESHS 30
GesTek, PowerLine Conducted Emission

EUT: SCANNER
Manuf: SPOT
Operator: JANICE
Test Spec: FCC B
Comment: Line 2
ADAPTOR SYS



4. Radiation Emission Test

4.1 Test Equipment

The following test equipments are used during the radiated emission tests:

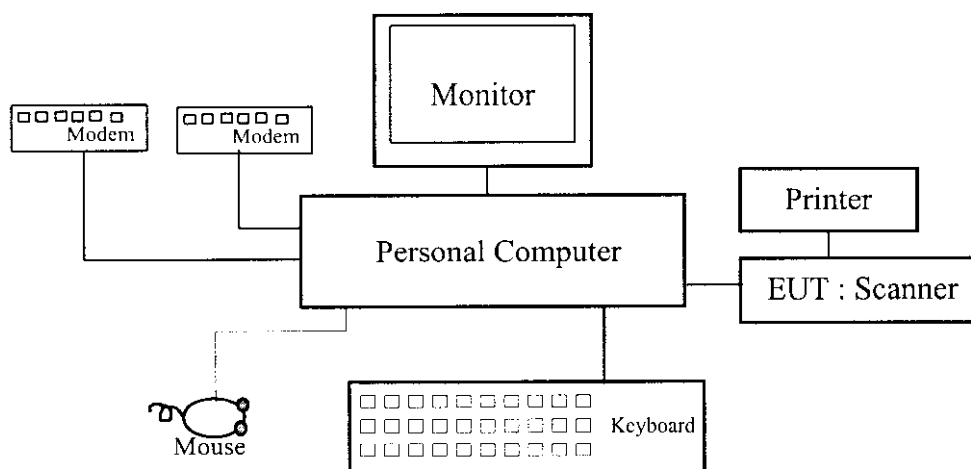
Radiated test was performed on : ☒ Site #1 ☐ Site #2

Instrument	Manufacturer	Type /Serial No.	Last Calibration	Site #1	Site #2
Test Receiver	Rohde & Schwarz	ESVS 30/829007/014	Sep. 1997	✓	
Spectrum Analyzer	Anristu	MA2601B/MT16442	Aug. 1997	✓	
Pre-Amplifier	HP	7447F/3113A04998	Jul. 1997	✓	
Test Receiver	Rohde & Schwarz	ESVS 10/8421122/001	Nov. 1997		✓
Spectrum Analyzer	HP	8568B/4315B05847	Aug. 1997		✓
Pre Amplifier	HP	8447D/3113A04487	Jul. 1997		✓
Antenna 30Mhz-2Ghz	Chase	CBL 6112/2039	Jul. 1997	✓	
Bilog Antenna	Chase	CBL6111/1380	Jul. 1997		✓
Dipole Antenna	Schwarzbeck	VHAP/719,UHAP/736	Jun. 1997		

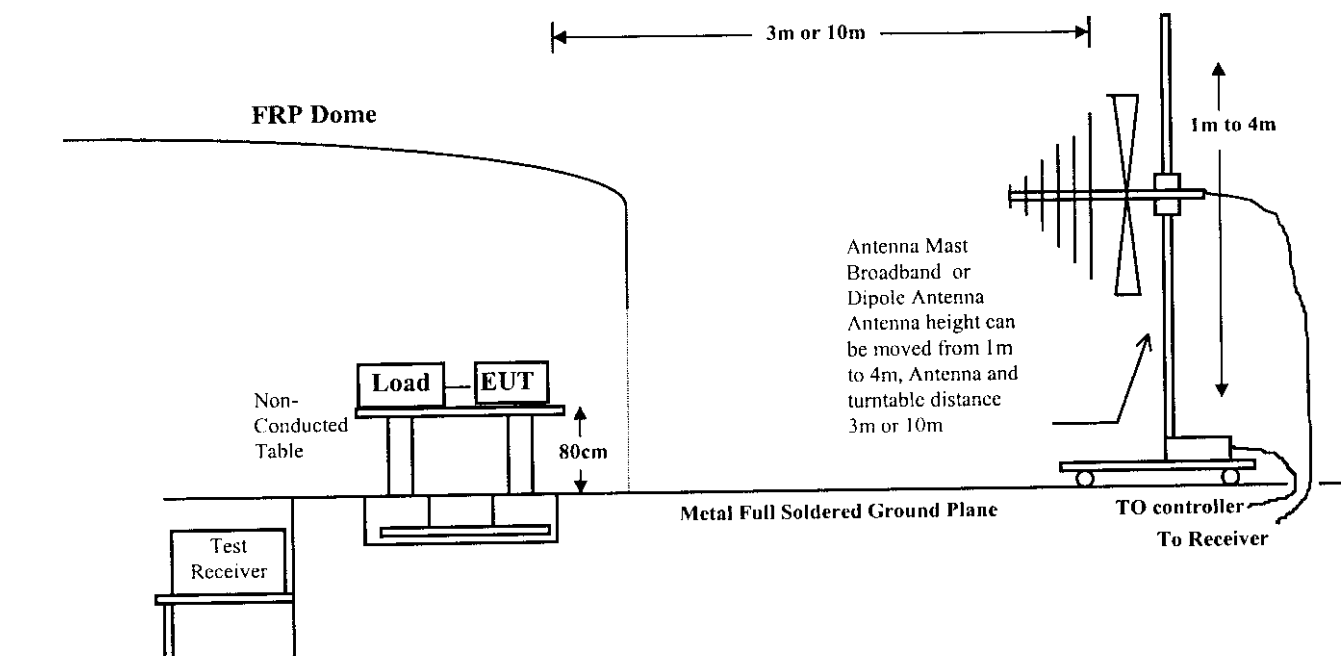
Note: All equipment upon which need to calibrated are with calibration period of 1 year.

4.2 Test Setup

4.2.1 Block Diagram of Connections between EUT and simulators



4.2.2 Open Test Site Setup Diagram



4.3 Radiated Emission Limit

4.3.1 FCC Class B Limits at 3m

Frequency	Distance	Field Strength	
MHz	Meter	$\mu\text{V/M}$	$\text{dB}\mu\text{V/M}$
30 - 88	3	100	40.0
88 - 216	3	150	43.5
216 - 960	3	200	46.0
960 - 2000	3	500	54.0

4.3.2 CISPR Class B Limits at 10m

Frequency	Distance	Field Strength
MHz	Meter	$\text{dB}(\mu\text{V/M})$
30 - 230	10	30
230 - 1000	10	37

- Remark :
1. The tighter limit shall apply at the edge between two frequency bands.
 2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

4.4 EUT Configuration

The equipments which is listed 4.2.1 are installed on Radiated Emission Test to meet the Commission requirement and operating in a manner which tends to maximize its emission characteristics in a normal application.

4.5 Operating Condition of EUT

Same as Conducted Power Line Test which is listed in 3.5.

4.6 Radiated Emission Data

The measurement range of radiated emission which is from **30 MHz to 1 GHz** was investigated. All readings are quasi-peak values with a resolution Bandwidth of 120 KHz. The initial step in collecting radiated emission data is a spectrum analyzer peak scan of the measurement range for all the test modes. Then the worst modes were reported the following data pages.

The total uncertainty for this test is as follows:

- Uncertainty in the field strength measured (3m antenna distance): $< \pm 4$ dB
- Uncertainty in the field strength measured (10m antenna distance): $< \pm 4$ dB

The uncertainty is calculated in accordance with NAMAS document NIS 81, and is given as 2 standard deviations.

Radiated Emission Data

Date of Test :04-01,1998

Temperature :27 deg/C

EUT :SCANNER

Humidity :50 %RH

Test Mode :Mode 1

Display Pattern:Video Figure

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB)	Reading Level Horizontal (dBuV/m)	Emission Level Horizontal (dBuV/m)	Limits (dBuV/m)
48.006	1.31	9.21	11.03	21.55	30.00
58.006	1.53	6.81	11.63	19.97	30.00
70.008	1.80	6.41	9.48	17.69	30.00
128.006	2.62	11.92	12.27	26.81	30.00
*160.008	2.77	10.40	13.71	26.88	30.00
186.010	2.88	9.45	13.45	25.78	30.00
224.011	3.05	11.09	11.83	25.97	30.00
228.016	3.07	11.38	10.46	24.91	30.00
233.870	3.09	11.81	15.25	30.16	37.00

- Remarks:
1. All Readings below 1GHz are Quasi-Peak, above are average value.
 2. “ * ”, means this data is worse case emission level.
 3. Emission Level = Reading Level + Antenna Factor + Cable loss
 4. Deviations from the specifications: None.

Radiated Emission Data

Date of Test :04-01,1998

Temperature :27 deg/C

EUT :SCANNER

Humidity :50 %RH

Test Mode :Mode 1

Display Pattern:Video Figure

Frequency	Cable	Antenna	Reading Level	Emission Level	Limits
	Loss	Factor	Vertical	Vertical	
(MHz)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)
70.006	1.80	6.41	16.78	24.99	30.00
128.010	2.62	11.92	11.69	26.23	30.00
182.010	2.86	9.49	10.66	23.01	30.00
198.008	2.93	9.34	11.10	23.37	30.00
*200.461	2.94	9.32	15.09	27.35	30.00
224.011	3.05	11.09	12.05	26.19	30.00
233.872	3.09	11.81	17.43	32.34	37.00
256.012	3.20	13.03	13.66	29.88	37.00

Remarks: 1. All Readings below 1GHz are Quasi-Peak, above are average value.

2. “ * ”, means this data is worse case emission level.

3. Emission Level = Reading Level + Antenna Factor + Cable loss

4. Deviations from the specifications: None.

Radiated Emission Data

Date of Test :04-01,1998

Temperature :27 deg/C

EUT :SCANNER

Humidity :50 %RH

Test Mode :Mode 2

Display Pattern:Video Figure

Frequency	Cable	Antenna	Reading Level	Emission Level	Limits
(MHz)	Loss	Factor	Horizontal	Horizontal	
(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)
48.005	1.31	9.21	6.38	16.90	30.00
66.822	1.71	6.45	10.15	18.31	30.00
84.006	2.12	7.49	11.84	21.45	30.00
108.005	2.53	11.21	12.85	26.59	30.00
*122.006	2.59	12.50	11.89	26.98	30.00
128.006	2.62	11.92	9.91	24.45	30.00
160.008	2.77	10.40	13.06	26.23	30.00
186.008	2.88	9.45	11.77	24.10	30.00
200.462	2.94	9.32	10.63	22.89	30.00
208.006	2.98	9.87	11.77	24.62	30.00

Remarks: 1. All Readings below 1GHz are Quasi-Peak, above are average value.

2. “ * ”, means this data is worse case emission level.

3. Emission Level = Reading Level + Antenna Factor + Cable loss

4. Deviations from the specifications: None.

Radiated Emission Data

Date of Test :04-01,1998 Temperature :27 deg/C
 EUT :SCANNER Humidity :50 %RH
 Test Mode :Mode 1 Display Pattern:Video Figure

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB)	Reading Level Vertical (dBuV/m)	Emission Level Vertical (dBuV/m)	Limits (dBuV/m)
32.002	0.95	16.71	7.03	24.69	30.00
*35.507	0.99	16.32	9.19	26.50	30.00
38.504	1.08	14.30	10.09	25.47	30.00
45.505	1.22	11.37	13.33	25.92	30.00
84.007	2.12	7.49	15.84	25.45	30.00
116.009	2.56	12.03	10.56	25.15	30.00
132.011	2.64	11.63	11.19	25.46	30.00
140.010	2.68	11.00	9.72	23.40	30.00
158.012	2.76	10.48	7.82	21.05	30.00
169.010	2.80	10.05	10.80	23.65	30.00
186.010	2.88	9.45	11.95	24.28	30.00

- Remarks:
1. All Readings below 1GHz are Quasi-Peak, above are average value.
 2. “ * ”, means this data is worse case emission level.
 3. Emission Level = Reading Level + Antenna Factor + Cable loss
 4. Deviations from the specifications: None.