

EXHIBIT 4

Test Report

Test Report

TTEMC-F98085

APPLICATION FOR CERTIFICATION
On Behalf of
Microtek International Inc.
Image Scanner

Model : DuoScan T2500

FCC ID : EF9DUOSCANT2500

Prepared for : Microtek International Inc.
No. 6 Industry East Road 3
Science-Based Industrial Park,
Hsinchu, Taiwan, R.O.C.

Prepared By : Taiwan Tokin EMC Eng. Corp.
No. 53-11, Tin-Fu Tsun, Lin-Kou,
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File Number : ATM-G98261
Report Number : TTEMC-F98085
Date of Test : May 3 / 5, 1998
Date of Report : May 19, 1998

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70672-F2987

TEST REPORT CERTIFICATION

Applicant : Microtek International Inc.
Manufacturer : Microtek International Inc.
FCC ID : EF9DUOSCANT2500
EUT Description : Image Scanner
(A) MODEL NO. : DuoScan T2500
(B) SERIAL NO. : N/A
(C) POWER SUPPLY : AC 120V/60Hz

Measurement Procedure Used:

FCC RULES AND REGULATIONS PART 15 SUBPART B CLASS B OCTOBER 1996
AND FCC / ANSI C63.4-1992

The device described above was tested by TAIWAN TOKIN EMC ENG. CORP. to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the FCC Part 15B Class B limits both radiated and conducted emissions.

The measurement results are contained in this test report and TAIWAN TOKIN EMC ENG. CORP. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the FCC official limits. TAIWAN TOKIN EMC ENG. CORP. recommends that this data was submitted for FCC certification purposes if a 6dB margin below FCC limits is obtained. This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Taiwan Tokin EMC Eng. corp.

Date of Test : May 3 / 5, 1998

Prepared by : Monica Chang
(MONICA CHANG)

Test Engineer : Allen Wang
(ALLEN WANG)

Approve & Authorized Signer : Jackie Deng
(JACKIE DENG)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description	:	Image Scanner
Model Number	:	DuoScan T2500
FCC ID	:	EF9DUOSCANT2500
Applicant	:	Microtek International Inc. No. 6 Industry East Road 3 Science-Based Industrial Park, Hsinchu, Taiwan, R.O.C.
Manufacturer	:	Microtek International Inc. No. 6 Industry East Road 3 Science-Based Industrial Park, Hsinchu, Taiwan, R.O.C.
Switching Power Supply	:	Kentex, M/N KTX-3326-3
Data Cable	:	Shielded, Detachable, 1.5m Bonded a ferrite core
Power Cord	:	Nonshielded, Detachable, 1.8m
Date of Test	:	May 3 / 5, 1998

1.2. Details of Support Equipments

1.2.1. PERSONAL COMPUTER

Model Number	:	D3498A
Serial Number	:	SG54300543
FCC ID	:	HCJVECTRAVE4
Manufacturer	:	Hewlett Packard
VGA Card	:	Within Mother Board
Scanner Driver Card	:	Adaptec. M/N AVA-1505Ae FCC ID By FCC DoC
Power Cord	:	Nonshielded, Detachable, 1.8m

1.2.2. MONITOR

Model Number	:	PM36A
Serial Number	:	W70205200A
FCC ID	:	LLW9ZB1564
Manufacturer	:	Funai Electric Company of Taiwan
Data Cable	:	Shielded, Undetachable, 1.2m
Power Cord	:	Nonshielded, Detachable, 1.5m

1.2.3. PRINTER

Model Number	:	2225C
Serial Number	:	2526S40437
FCC ID	:	BS46XU2225C
Manufacturer	:	Hewlett Packard
Power Cord	:	Nonshielded, Undetachable, 1.8m
Data Cable	:	Shielded, Detachable, 1.2m

1.2.4. KEYBOARD

Model Number	:	E03633QLTWQ
Serial Number	:	N/A
FCC ID	:	CIGE03614
Manufacturer	:	Hewlett Packard
Data Cable	:	Shielded, Undetachable, 1.8m Bonded a ferrite core

1.2.5. MODEM #1

Model Number	:	1414
Serial Number	:	950110299
FCC ID	:	IFAXDM1414
Manufacturer	:	Aceex
Data Cable	:	Shielded, Detachable, 1.2m
Power Adapter	:	Amigo, Model AM-91000A Nonshielded, Undetachable, 1.8m

1.2.6. MODEM #2

Model Number	:	1414
Serial Number	:	950098201
FCC ID	:	IFAXDM1414
Manufacturer	:	Aceex
Data Cable	:	Shielded, Detachable, 1.2m
Power Adapter	:	Amigo, Model AM-91000A Nonshielded, Undetachable, 1.8m

1.2.7. MOUSE

Model Number	:	M-S34
Serial Number	:	LCA53202204
FCC ID	:	DZL210582
Manufacturer	:	Hewlett Packard
Data Cable	:	Shielded, Undetachable, 1.8m

1.2.8. SCAN MAKER

Model Number	:	PTS-1800
Serial Number	:	N/A
FCC ID	:	EF9PTS-1800
Manufacturer	:	Microtek International Inc.
SCSI Interface Cable	:	Shielded, Detachable, 2.0m Bonded a ferrite core <i>not on front</i>
Power Cord	:	Nonshielded, Detachable, 1.8m

1.3. Description of Test Facility

Site Description (No. 2 Open Site)	:	Jul. 15, 1996 Re-file on Federal Communication Commission FCC Engineering Laboratory 7435 Oakland Mills Road Columbia, MD 21046, U.S.A.
Name of Firm	:	Taiwan Tokin EMC Eng. Corp.
Site Location	:	No. 53-11, Tin-Fu Tsun, Lin-Kou, Taipei Hsien, Taiwan, R.O.C.
NVLAP Lab Code	:	200077-0

72K 76-F024-7

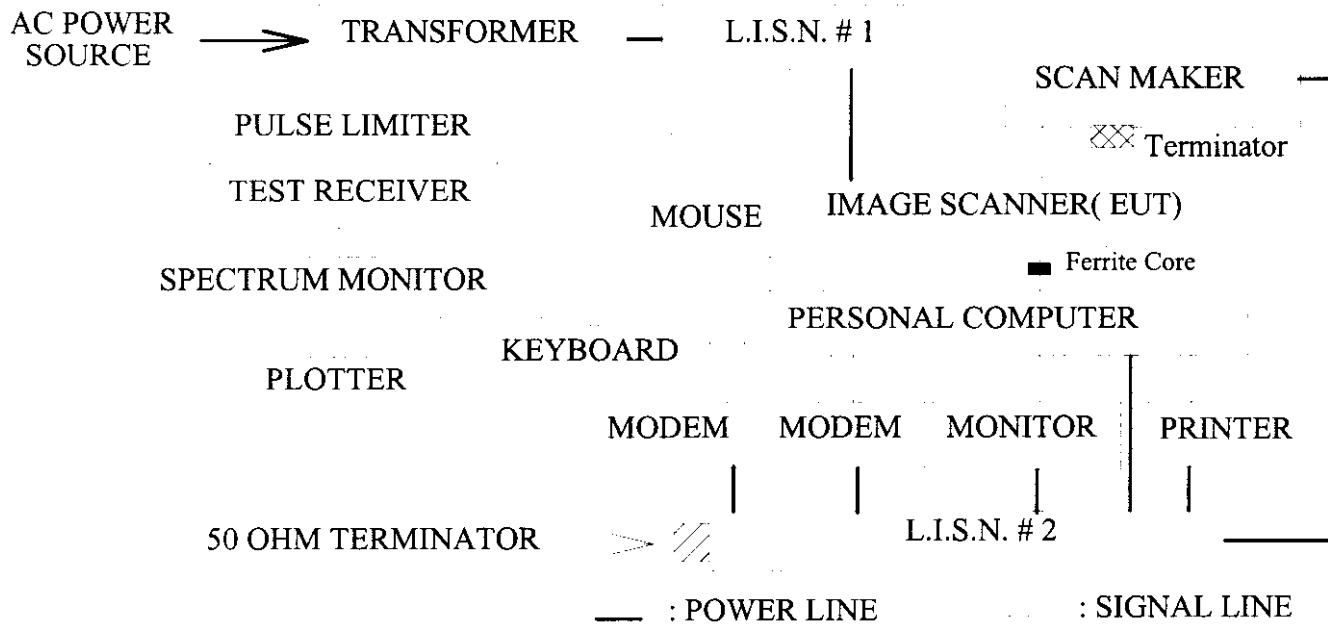
2. POWERLINE CONDUCTED TEST

2.1. Test Equipment

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

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESH3	893044/015	Aug.01, 97'	1 Year
2.	L.I.S.N. # 1	Kyoritsu	KNW-407	8-855-9	Apr.14, 98'	1 Year
3.	L.I.S.N. # 2	Kyoritsu	KNW-407	8-881-13	Apr.14, 98'	1 Year

2.2. Block Diagram of Test Setup



2.3. Conducted Powerline Emission Limit (CLASS B)

Frequency	Maximum RF Line Voltage	
	uV	dBuV
0.45MHz ~ 30MHz	250	48

REMARKS : RF LINE VOLTAGE (dBuV) = $20 \log_{10}$ RF LINE VOLTAGE (uV)

2.4. EUT Configuration on Measurement

The following equipments were installed on RF LINE VOLTAGE measurement to meet the Commission requirement and operating in a manner which tended to maximize its emission characteristics in a normal application.

2.4.1. Image Scanner (EUT)

Model Number	:	DuoScan T2500
Serial Number	:	N/A
FCC ID	:	EF9DUOSCANT2500
Manufacturer	:	Microtek International Inc.
Switching Power Supply	:	KENTEX, M/N KTX-3326-3
Data Cable	:	Shielded, Detachable, 1.5m Bonded a ferrite core
Power Cord	:	Nonshielded, Detachable, 1.8m

2.4.2. Support Simulators : As in section 1.2.

2.5. Operating Condition of EUT

- 2.5.1. Setup the EUT and simulators as shown on 2.2.
- 2.5.2. Turned on the power of all equipments.
- 2.5.3. Setup the personal computer to drive the EUT through the Microtek's scanner driver card and software driver.
- 2.5.4. Data was communicated between host personal computer and Image Scanner (EUT) through scanner driver card.
- 2.5.5. Personal Computer displayed the test software image by windows to monitor.
- 2.5.6. The other peripheral devices were driven and operated in turn during all testing.

2.6. Test Procedure

The EUT was connected to the power mains through a line impedance stabilization network (L.I.S.N. #1) and the other peripheral devices power cord were connected to the power mains through a line impedance stabilization network (L.I.S.N. #2). This provided a 50 ohm coupling impedance for the measuring equipment. (Please refer to the block diagram of the test setup and photographs.)

Both sides of A.C. line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions simulators of the interface cables should be manipulated according to FCC ANSI C63.4-1992 during conducted measurement.

The bandwidth of the field strength meter (R & S Test Receiver ESH3) was set at 10KHz.

The frequency range from 450KHz to 30MHz was checked.

All the test results are listed in section 2.7.

2.7. Line Conducted RF Voltage Measurement Results

The frequency range from 450KHz to 30 MHz was investigated.

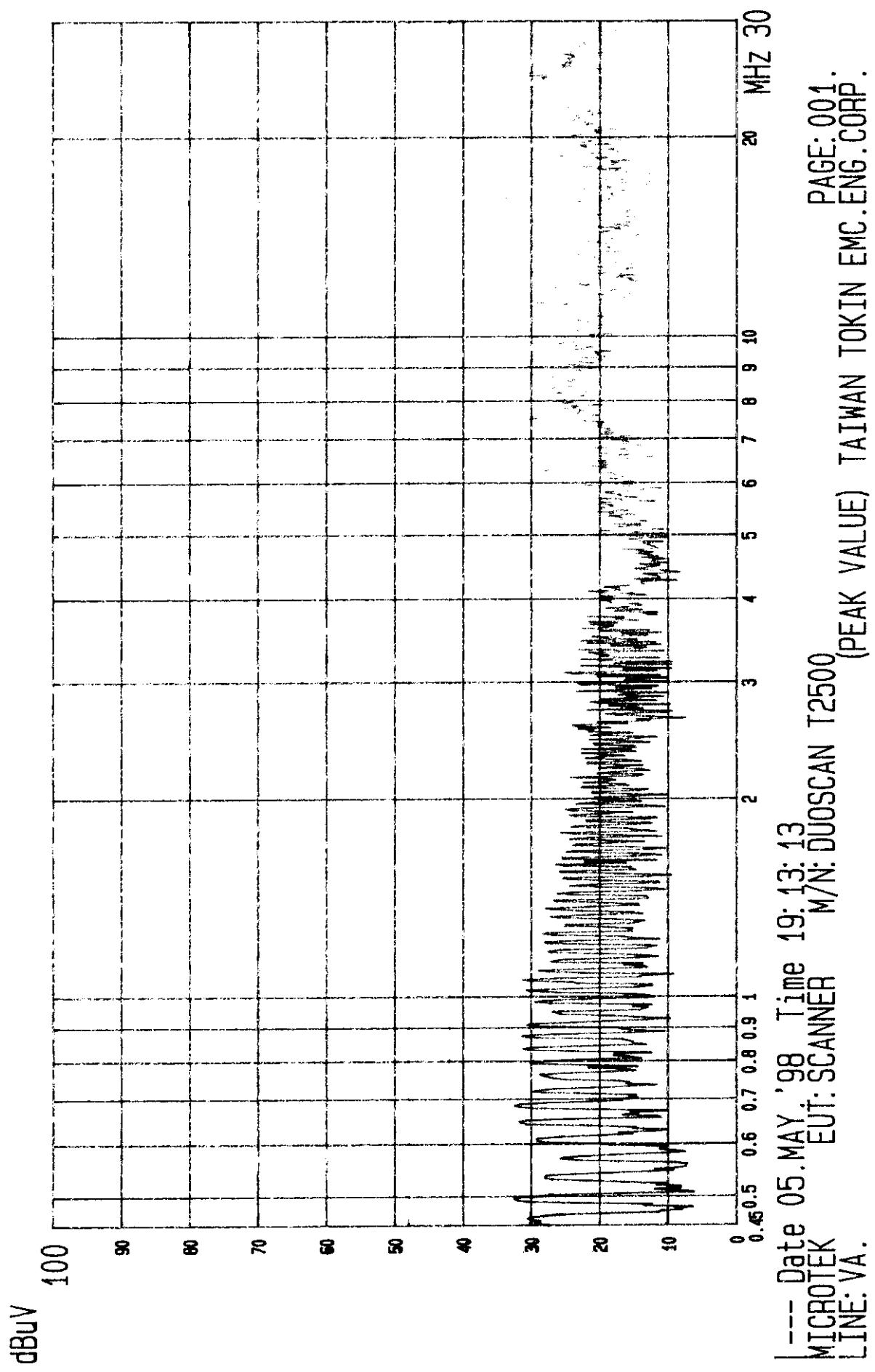
All emissions not reported below are too low against the prescribed limits.

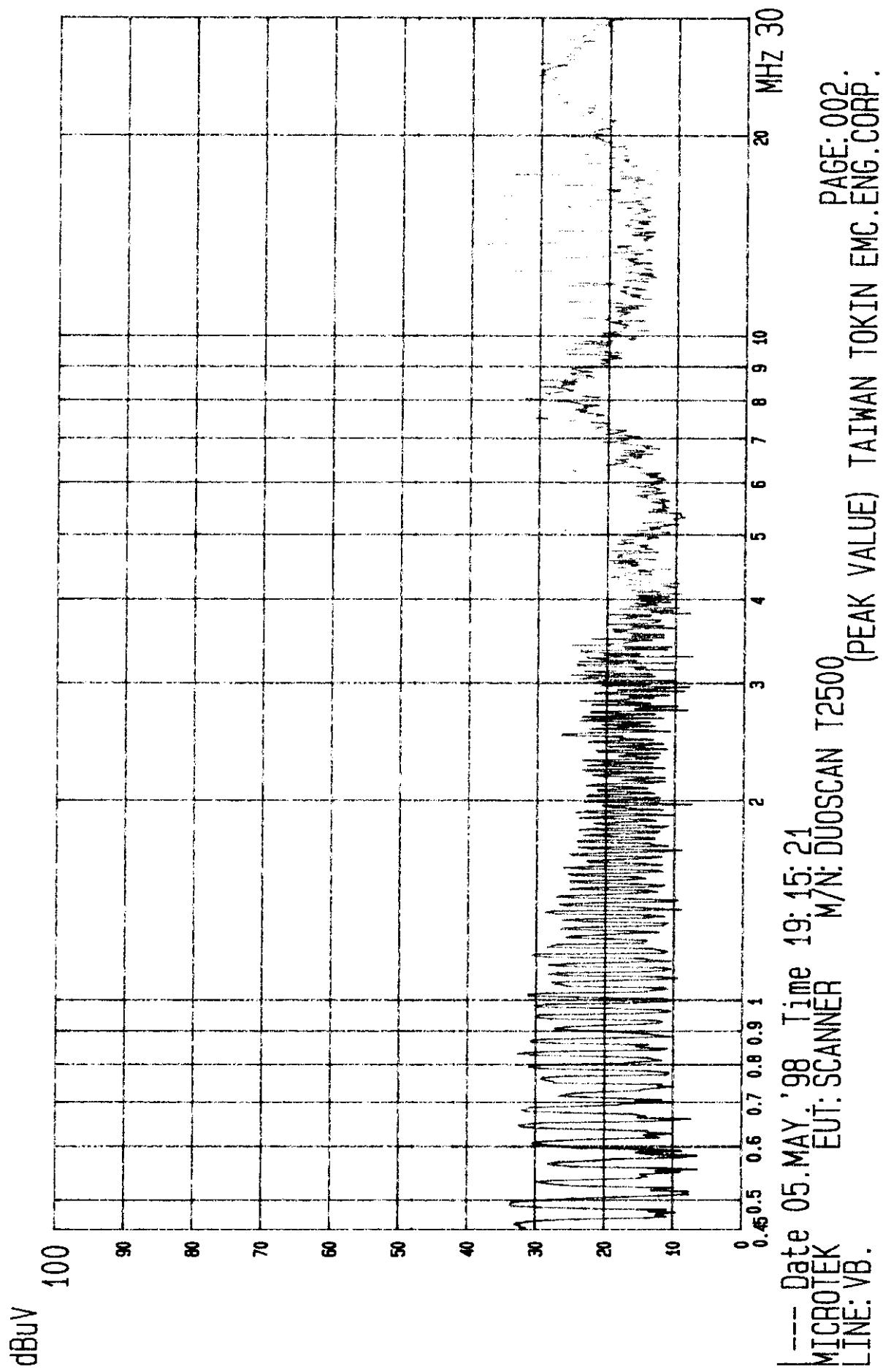
Date of Test : May 05, 1998 Temperature : 24 °C

EUT : Image Scanner Humidity : 62 %

Frequency (MHz)	Factor dB	Measurement (dBuV)		Reading (dBuV)		Limits (dBuV)	Margin (dBuV)	
		VA	VB	VA	VB		VA	VB
0.4910	0.2	30.0	30.6	30.2	30.8	48.0	17.8	17.2
0.8254	0.2	*	28.0	*	28.2	48.0	*	19.8
0.8680	0.2	30.5	*	30.7	*	48.0	17.3	*
1.0182	0.2	*	31.2	*	31.4	48.0	*	16.6
1.5789	0.2	24.2	*	24.4	*	48.0	23.6	*
2.5060	0.2	*	24.5	*	24.7	48.0	*	23.3
6.2540	0.3	26.2	*	26.5	*	48.0	21.5	*
8.0090	0.3	*	30.0	*	30.3	48.0	*	17.7
13.6980	0.6	*	36.2	*	36.8	48.0	*	11.2
14.9680	0.6	34.2	*	34.8	*	48.0	13.2	*
22.5680	1.1	35.0	*	36.1	*	48.0	11.9	*

Remark : 1. All readings are Quasi-Peak values.
 2. Factor = Insertion Loss + Cable Loss
 3. The worst emission was detected at 13.6980MHz with corrected signal level of 36.8dBuV (limit is 48dBuV) when the VB side of the EUT was connected to L.I.S.N.





3. RADIATED EMISSION TEST

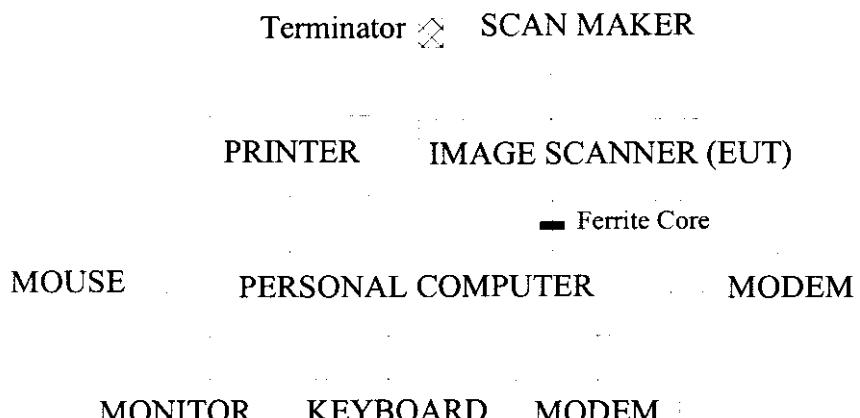
3.1. Test Equipment

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

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde&Schwarz	ESVP	893202/001	Aug.04, 97'	1 Year
2.	Broadband Antenna	Chase	VBA6106A	1240	Jan. 14, 98'	1 Year
3.	Broadband Antenna	Schwarzbeck	UHALP 9108-A	0139	Jan. 14, 98'	1 Year

3.2. Block Diagram of Test Setup

3.2.1. Block Diagram of connection between EUT and simulators



3.2.2. Open Field Test Site Setup Diagram

ANTENNA TOWER

ANTENNA ELEVATION VARIES FROM 1METER TO 4 METER

3 METERS

EUT

0.8
METER

TURN TABLE

GROUND PLANE

3.3. Radiation Limit (CLASS B)

FREQUENCY		FIELD STRENGTHS LIMITS	
MHz	Meters	uV/M	dBuV/M
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0

Remark : (1) Emission level (dBuV/M) = 20 log Emission level (uV/M)
 (2) The tighter limit applies at the edge between two frequency bands.
 (3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

3.4. EUT Configuration on Measurement

The configuration of EUT and its simulators are same as those used in conducted measurement. Please refer to 2.4.

3.5. Operating Condition of EUT

Same as conducted measurement which is listed in 2.5.

3.6. Test Procedure

The EUT and its simulators were placed on a turn table which was 0.8 meter above ground. The turn table rotated 360 degrees to determine the position of the maximum emission level. EUT was set 3 meters away from the receiving antenna which was mounted on a antenna tower. The antenna moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated biconical and log periodical antenna) and dipole antenna were used as receiving antenna. Both horizontal and vertical polarization of the antenna were set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4-1992 during radiated measurement.

The bandwidth setting on the field strength meter (R&S TEST RECEIVER ESVP) was 120KHz.

The frequency range from 30MHz to 1000MHz was checked.

All the test results are listed in section 3.7.

3.7. Radiated Emission Noise Measurement Results

The frequency spectrum from 30 MHz to 1000 MHz was investigated. All the emissions not reported below are too low against the FCC CLASS B limit..

Date of Test : May 3, 1998 Temperature : 28 °C

EUT : Image Scanner Humidity : 65 %

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading dBuV	Emission Level Horizontal dBuV/m	Limits dBuV/m	Margin dBuV/m
36.242	21.89	1.67	0.00	23.56	40.00	16.44
56.249	13.57	2.21	4.00	19.78	40.00	20.22
127.693	19.87	3.12	0.00	22.99	43.50	20.51
* 136.248	20.51	3.26	10.00	33.77	43.50	9.73
156.248	21.13	3.52	8.00	32.65	43.50	10.85
162.498	21.27	3.64	6.00	30.91	43.50	12.59
198.748	22.33	4.03	3.00	29.36	43.50	14.14
208.747	22.36	4.15	0.00	26.51	43.50	16.99
226.247	22.34	4.30	7.00	33.64	46.00	12.36
229.990	22.67	4.34	3.00	30.01	46.00	15.99
259.996	23.91	4.73	1.00	29.64	46.00	16.36
299.995	25.74	5.01	-1.00	29.75	46.00	16.25
319.996	13.63	5.36	1.80	20.79	46.00	25.21
383.745	16.89	5.87	0.00	22.76	46.00	23.24
404.995	17.10	6.08	1.80	24.98	46.00	21.02
489.994	17.34	7.03	3.00	27.37	46.00	18.63
519.993	18.04	7.33	4.00	29.37	46.00	16.63
569.993	18.77	7.83	8.00	34.60	46.00	11.40

Remark : 1. All readings are Quasi-Peak values.
 2. The worst emission was detected at 136.248MHz with corrected signal level of 33.77dBuV/m (limit is 43.5dBuV/m) when the antenna was at horizontal polarization and was at 1m high and the turn table was at 270° .
 3. 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

Date of Test : May 3, 1998 Temperature : 28 °CEUT : Image Scanner Humidity : 65 %

Frequency MHz	Antenna Factor	Cable Loss	Meter Reading	Emission Level		
	dB/m	dB	Vertical dBuV	Vertical dBuV/m	Limits dBuV/m	Margin dBuV/m
36.250	21.29	1.67	0.00	22.96	40.00	17.04
47.490	16.09	1.94	1.10	19.13	40.00	20.87
62.500	12.67	2.15	10.00	24.82	40.00	15.18
67.499	12.60	2.29	10.00	24.89	40.00	15.11
78.726	15.19	2.43	10.00	27.62	40.00	12.38
136.248	18.81	3.26	5.00	27.07	43.50	16.43
147.497	20.10	3.41	7.51	31.02	43.50	12.48
175.000	21.94	3.78	4.70	30.42	43.50	13.08
199.968	20.98	3.98	3.20	28.16	43.50	15.34
229.999	21.75	4.34	2.00	28.09	46.00	17.91
249.995	23.17	4.64	0.50	28.31	46.00	17.69
359.996	14.68	5.76	5.50	25.94	46.00	20.06
373.314	15.09	5.85	5.50	26.44	46.00	19.56
465.349	16.75	6.85	0.00	23.60	46.00	22.40
529.993	19.28	7.46	3.00	29.74	46.00	16.26
* 569.993	18.93	7.83	8.30	35.06	46.00	10.94
629.992	20.44	8.04	0.00	28.48	46.00	17.52
659.991	19.97	8.30	0.00	28.27	46.00	17.73

Remark : 1. All readings are Quasi-Peak values.

2. The worst emission was detected at 569.993MHz with corrected signal level of 35.06dBuV/m (limit is 46dBuV/m) when the antenna was at vertical polarization and was at 1m high and the turn table was at 160°.

3. 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

【 NONE 】

4. DEVIATION TO TEST SPECIFICATIONS