

EXHIBIT 4

Test Report

Test Report

TTEMC-F98050

APPLICATION FOR CERTIFICATION
On Behalf of
Mustek Systems Inc.
Scanner

Model No. : 600 CP
Project Name : S3E10

FCC ID : HWFA4CIS

Prepared for : Mustek Systems Inc.
No. 25, R&D Road II, Science-
Based Industrial Park Hsin-Chu,
Taiwan, R.O.C.

Prepared By : Taiwan Tokin EMC Eng. Corp.
No. 53-11, Tin-Fu Tsun, Lin-Kou,
Taipei Hsien, Taiwan, R.O.C.

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File Number : ATM-G98205
Report Number : TTEMC-F98050
Date of Test : Mar. 31 / Apr. 01, 1998
Date of Report : Apr. 13, 1998

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TEST REPORT CERTIFICATION

Applicant : Mustek Systems Inc.
 Manufacturer : Mustek Systems Inc.
 FCC ID : HWFA4CIS
 EUT Description : Scanner
 (A) MODEL NO. : 600 CP
 (B) PROJECT NAME : S3E10
 (C) SERIAL NO. : N/A
 (D) POWER SUPPLY : AC 120V/60Hz

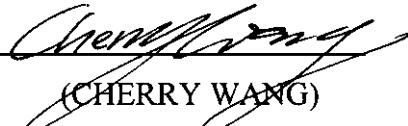
Measurement Procedure Used:

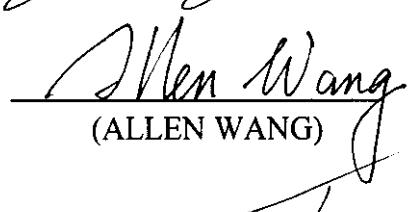
FCC RULES AND REGULATIONS PART 15 SUBPART B CLASS B OCTOBER 1996
AND FCC / ANSI C63.4-1992

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 can be 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 : Mar. 31 / Apr. 01, 1998

Prepared by : 
(CHERRY WANG)

Test Engineer : 
(ALLEN WANG)

Approve & Authorized Signer : 
(JACKIE DENG)

1. GENERAL INFORMATION

1.1. Description of Equipment Under Test (EUT)

Description	:	Scanner
Model Number	:	600 CP
Project Name	:	S3E10
FCC ID	:	HWFA4CIS
Applicant	:	Mustek Systems Inc.
No. 25, R&D Road II, Science-Based Industrial Park, Hsin-Chu, Taiwan, R.O.C.		
Manufacturer	:	Mustek Systems Inc.
No. 25, R&D Road II, Science-Based Industrial Park, Hsin-Chu, Taiwan, R.O.C.		
Interface Data Cable (Connected to Printer Port of PC)	:	Shielded, Detachable, 1.5m Bonded two ferrite cores
Power Adapter	:	HiTRON Electronics Corp. M/N HES10B-12010-0-S Power Cord: Unshielded, Undetachable, 1.9m Input: 100-120Vac, 0.27-0.23A, 60/50Hz Output: 12Vdc, 1A, Max 12W
Date of Test	:	Mar. 31 / Apr. 01, 1998

1.2. Details of Support Simulator

1.2.1. PERSONAL COMPUTER

Model Number	:	D3136A
Serial Number	:	3414S00120
FCC ID	:	HCJVECTRA486-XX
Manufacturer	:	SCI Systems Inc.
Brand	:	Hewlett Packard
Switching Power Supply	:	Delta Electronics, Inc.
Floppy Driver	:	Model DPS-100TB-1 S/N 3572-066321 Hewlett Packard, M/N D2035-600011 S/N B460217330
Hard Disk Driver	:	Quantum, M/N MV54A011
Disk Ctrl Card	:	Within Mother Board
Video Card	:	Within Mother Board
Serial/Parallel Card	:	Within Mother Board
Power Cord	:	Nonshielded, Detachable, 2.3m

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. KEYBOARD

Model Number	:	RT101
Serial Number	:	32240070
FCC ID	:	AQ6-MTN4XZ15
Manufacturer	:	DIGITAL
Data Cable	:	Shielded, Undetachable, 1.9m

1.2.4. PRINTER

Model Number	:	2225C
Serial Number	:	3123S97227
FCC ID	:	DSI6XU2225
Manufacturer	:	Hewlett Packard
Power Adapter	:	Regulated, Model AD-09
Power Cord	:	Nonshielded, Detachable, 2.0m
Data Cable	:	Shielded, Detachable, 1.2m

1.2.5. MODEM # 1

Model Number	:	1414
Serial Number	:	950110300
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	:	LZA65200685
FCC ID	:	DZL210472
Manufacturer	:	Logitech
Data Cable	:	Nonshielded, Undetachable, 1.9m

1.3. Description of Test Facility

Site Description	:	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. 9F., No. 38, Fushing N. Rd., Taipei, Taiwan, R.O.C.
Site Location	:	No. 53-11, Tin-Fu Tsun, Lin-Kou, Taipei Hsien, Taiwan, R.O.C.
NVLAP Code	:	200077-0

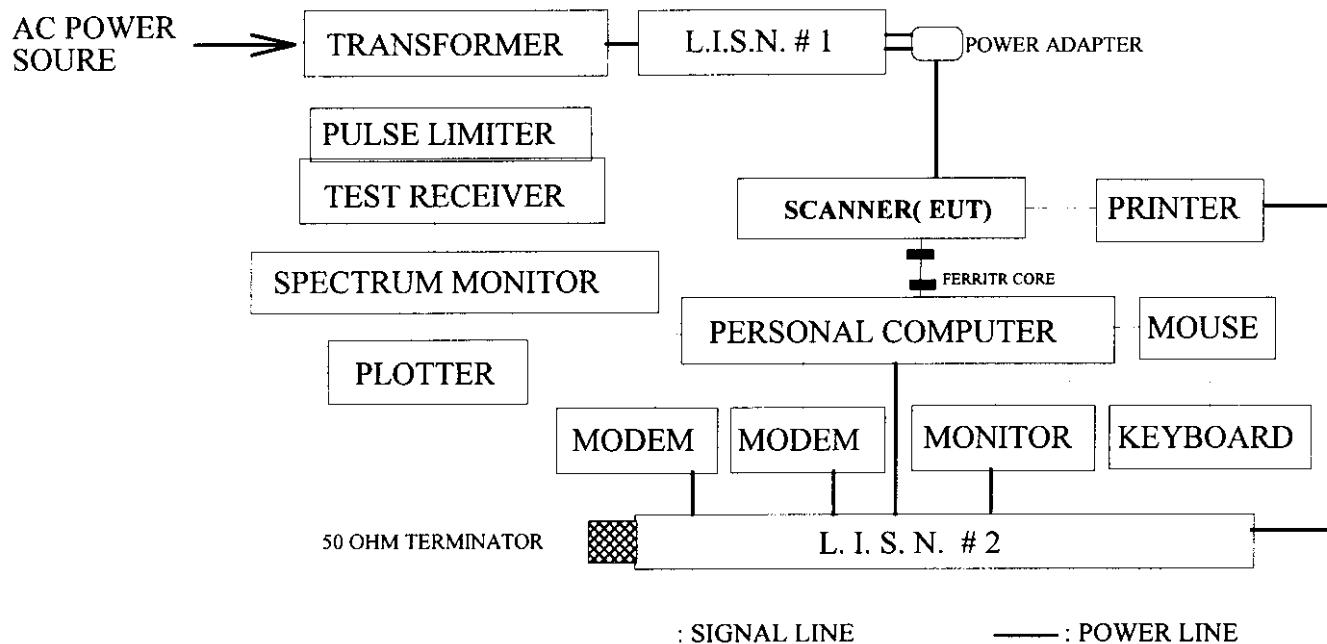
2. POWERLINE CONDUCTED TEST

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	KMW-407	8-855-9	May.01, 97'	1 Year
3.	L.I.S.N. # 2	Kyoritsu	KMW-407	8-881-13	May.01, 97'	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 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. Scanner (EUT)

Model Number	:	600 CP
Serial Number	:	N/A
Project Name	:	S3E10
FCC ID	:	HWFA4CIS
Manufacturer	:	Mustek Systems Inc.
Interface Data Cable	:	Shielded, Detachable, 1.5m Bonded two ferrite cores
Power Adapter	:	HiTRON Electronics Corp. M/N HES10B-12010-0-S Power Cord: Unshielded, Undetachable, 1.9m Input: 100-120Vac, 0.27-0.23A, 60/50Hz Output: 12Vdc, 1A, Max 12W

2.4.2. Support Simulator : As in Section 1.2

2.5. Operating Condition of EUT

- 2.5.1. Setup the EUT and simulator as shown on 2.2.
- 2.5.2. Turn on the power of all equipments.
- 2.5.3. Setup the personal computer to drive the EUT through the Mustek's scanner software driver.
- 2.5.4. Data was communicated between host personal computer and Scanner (EUT) through printer port.
- 2.5.5. Personal computer displayed the test software image by windows to monitor.
- 2.5.6. The other peripheral devices were drove 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 on 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

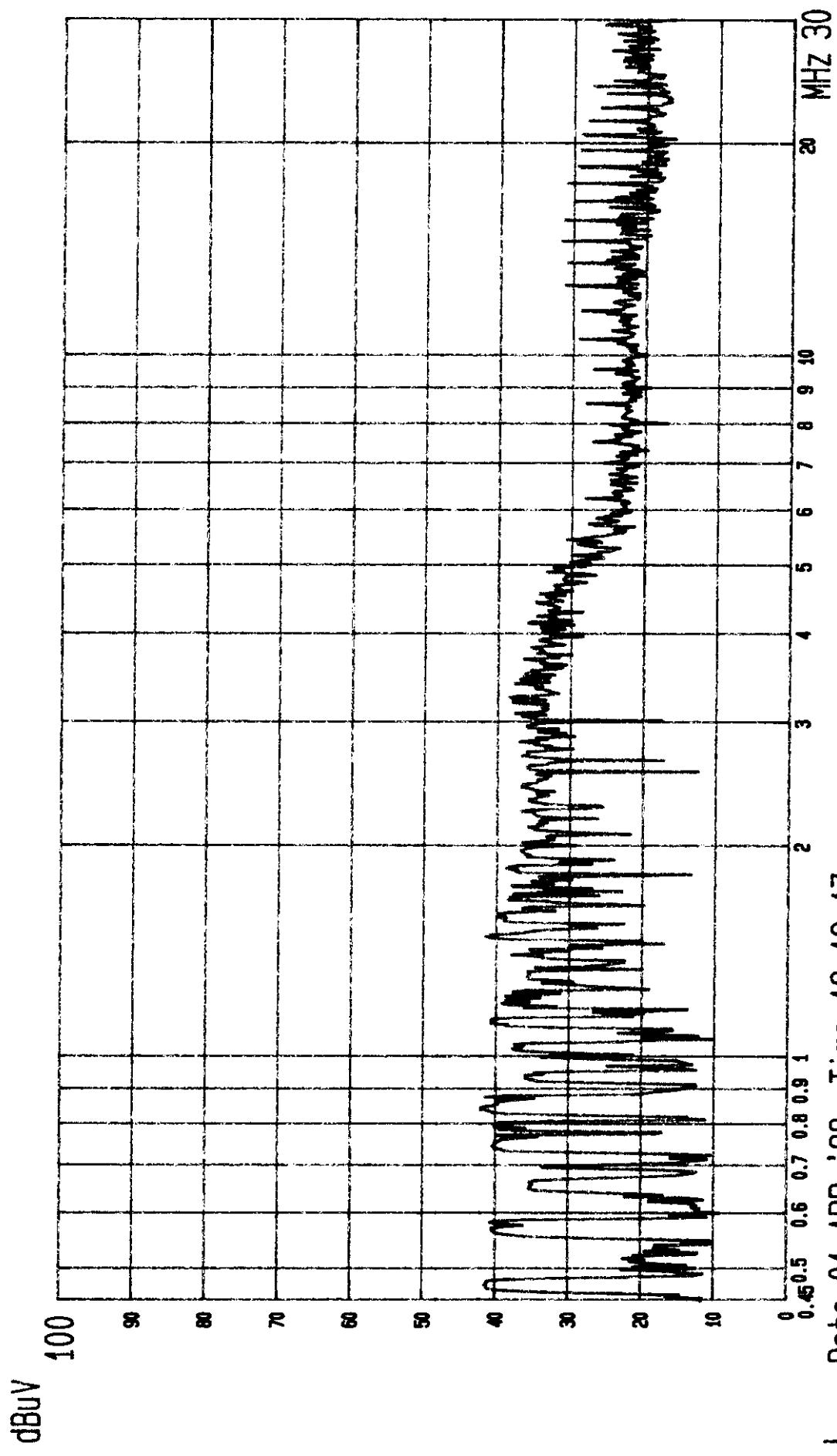
The frequency range from 450KHz to 30 MHz was investigated.

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

Date of Test : Apr. 01, 1998 Temperature : 24 °C
 EUT : Scanner Humidity : 54 %

Frequency (MHz)	Factor dB	Measurement (dBuV)		Reading (dBuV)		Limits (dBuV)	Margin (dBuV)	
		VA	VB	VA	VB		VA	VB
0.4671	0.2	*	38.5	*	38.7	48.0	*	9.3
0.4759	0.2	41.0	*	41.2	*	48.0	6.8	*
0.8370	0.2	*	37.8	*	38	48.0	*	10
0.8409	0.2	41.6	*	41.8	*	48.0	6.2	*
1.1178	0.2	40.1	*	40.3	*	48.0	7.7	*
1.4790	0.2	41.2	*	41.4	*	48.0	6.6	*
1.4859	0.2	*	37.5	*	37.7	48.0	*	10.3
3.2392	0.2	38.1	*	38.3	*	48.0	9.7	*
3.5231	0.2	*	37.2	*	37.4	48.0	*	10.6
4.9530	0.3	*	36.0	*	36.3	48.0	*	11.7
14.4870	0.6	31.6	32.0	32.2	32.6	48.0	15.8	15.4

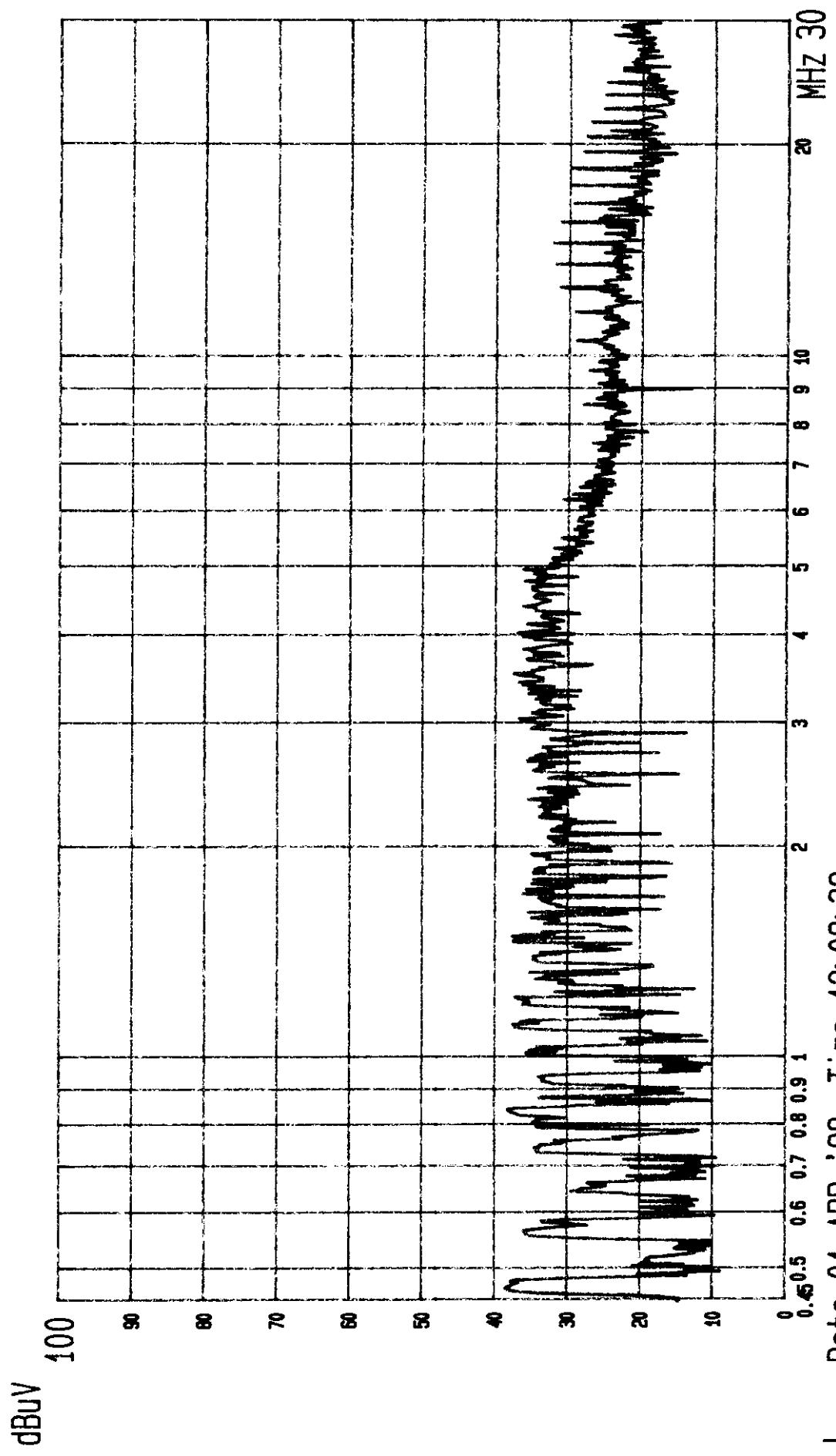
Remark : 1. All readings are Quasi-Peak values.
 2. Factor = Insertion Loss + Cable Loss
 3. The worst emission was detected at 0.8409MHz with corrected signal level of 41.8dBuV (limit is 48dBuV) when the VA side of the EUT was connected to L.I.S.N.



--- Date 01.APR.'98 Time 12:12:17
EUT: SCANNER
MUSTEK
LINE: VA.

M/N: 600CP
(PEAK VALUE)

PAGE: 002.
TAIWAN TOKIN ENC. ENG. CORP.



--- Date 01.APR.'98 Time 12:09:32
EUT: SCANNER
MUSTEK
LINE: VB.

M/N: 600CP
(PEAK VALUE) TAIWAN TOKIN ENC. ENG. CORP.
PAGE: 001.

3. RADIATED EMISSION TEST

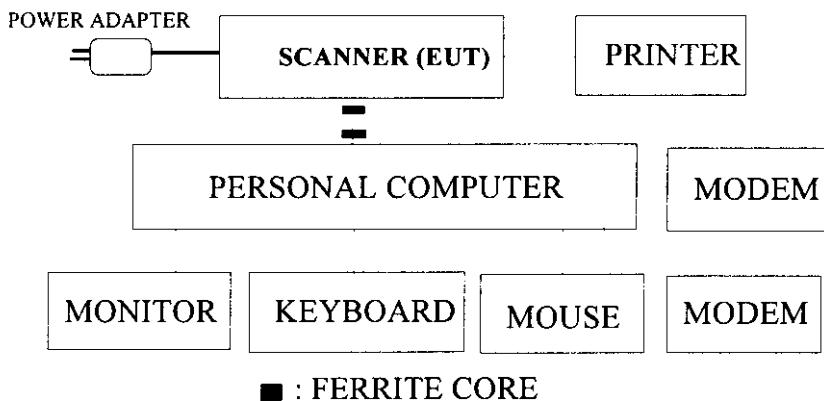
3.1. Test Equipment

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



■ : FERRITE CORE

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 were the same as those used in conducted measurement. Please refer to 2.4.

3.5. Operating Condition of EUT

Same as conducted measurement which was listed in 2.5.

3.6. Test Procedure

The EUT and its simulators were placed on a turn table which is 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 is 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 are set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4-1992 on 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 is investigated. All the emissions not reported below are too low against the FCC CLASS B limit.

Date of Test :	Mar. 31, 1998	Temperature :	27 °C
EUT :	Scanner	Humidity :	58 %

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Horizontal dBuV	Emission Level Horizontal dBuV/m	Limits dBuV/m	Margin dBuV/m
32.026	23.61	1.56	- 1.10	24.07	40.00	15.93
48.009	17.06	1.94	2.80	21.80	40.00	18.20
72.016	12.10	2.35	0.20	14.65	40.00	25.35
95.794	17.02	2.67	- 0.70	18.99	43.50	24.51
*120.012	19.40	3.05	5.30	27.75	43.50	15.75
163.995	21.36	3.66	- 1.70	23.32	43.50	20.18
184.046	21.78	3.87	- 0.30	25.35	43.50	18.15
200.090	22.19	3.98	- 1.30	24.87	43.50	18.63
248.063	23.02	4.58	- 2.50	25.10	46.00	20.90
264.007	24.15	4.82	- 0.20	28.77	46.00	17.23
304.073	13.61	5.19	- 0.30	18.50	46.00	27.50
324.564	13.76	5.42	- 4.80	14.38	46.00	31.62
331.999	13.98	5.43	6.00	25.41	46.00	20.59
344.063	14.57	5.64	1.90	22.11	46.00	23.89
408.106	17.10	6.18	- 3.00	20.28	46.00	25.72
464.081	17.36	6.91	0.70	24.97	46.00	21.03
480.103	17.38	6.95	- 2.90	21.43	46.00	24.57
528.099	18.25	7.42	0.70	26.37	46.00	19.63
576.104	18.80	7.68	- 1.90	24.58	46.00	21.42
600.106	19.17	7.79	- 3.10	23.86	46.00	22.14

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

2. The worst emission was detected at 120.012MHz with corrected signal level of 27.75dBuV/m (limit is 43.5dBuV/m) when the antenna was at horizontal polarization and was at 2m high and the turn table was at 175°.

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

Date of Test : Mar. 31, 1998 Temperature : 27 °C
 EUT : Scanner Humidity : 58 %

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Vertical dBuV	Emission Level Vertical dBuV/m	Limits dBuV/m	Margin dBuV/m
32.019	22.85	1.56	- 1.90	22.51	40.00	17.49
36.030	21.21	1.67	0.70	23.58	40.00	16.42
48.008	15.71	1.94	6.30	23.95	40.00	16.05
60.000	13.44	2.22	1.50	17.16	40.00	22.84
96.026	17.89	2.67	3.30	23.86	43.50	19.64
*120.019	18.56	3.05	8.30	29.91	43.50	13.59
152.527	20.72	3.49	5.60	29.81	43.50	13.69
168.037	21.03	3.67	3.50	28.20	43.50	15.30
224.020	22.69	4.28	- 1.00	25.97	46.00	20.03
256.035	24.13	4.64	- 0.70	28.07	46.00	17.93
337.023	14.53	5.57	7.50	27.60	46.00	18.40
349.082	14.97	5.73	3.20	23.90	46.00	22.10
393.381	15.91	6.06	- 1.10	20.87	46.00	25.13
432.087	16.15	6.43	- 1.90	20.68	46.00	25.32
456.101	16.53	6.77	- 3.20	20.10	46.00	25.90
464.082	16.66	6.91	0.50	24.07	46.00	21.93
528.092	19.30	7.42	0.60	27.32	46.00	18.68
540.107	19.23	7.70	- 3.80	23.13	46.00	22.87
584.103	18.64	7.69	- 4.10	22.23	46.00	23.77

Remark : 1. All readings are Quasi-Peak values.
 2. The worst emission was detected at 120.019MHz with corrected signal level of 29.91dBuV/m (limit is 43.5dBuV/m) when the antenna was at vertical polarization and was at 1m high and the turn table was at 85 ° .
 3. 0 ° was the table front facing the antenna. Degree is calculated from 0 ° clockwise facing the antenna.

4. DEVIATIONS TO TEST SPECIFICATIONS

【 NONE 】