

EXHIBIT 4

Test Report

Test Report

TTEMC-F98089

APPLICATION FOR CERTIFICATION
On Behalf of
Mustek Systems Inc.
Scanner

Model : (1)600 USB (2)4800 USB
Project Name : C3U10

FCC ID : HWFA4USB

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

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TEST REPORT VERIFICATION

Applicant : Mustek Systems Inc.
Manufacturer : Mustek Systems Inc.
FCC ID : HWFA4USB
EUT Description : Scanner
(A) MODEL NO. : (1)600 USB (2)4800 USB
(B) PROJECT NAME : C3U10
(C) SERIAL NO. : N/A
(D) POWER SUPPLY : AC 120V/60Hz

Measurement Procedure Used :

FCC RULES AND CISPR 22 (DOCKET NO. 92-152, SEP. 1993) 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 CISPR 22 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 3dB margin below CISPR 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 20/22, 1998

Prepared by : Julie Hsu
(JULIE HSU)

Test Engineer : Allen Wang
(ALLEN WANG)

Approve & Authorized Signer : Jackie Deng 6/3/98
(JACKIE DENG)

1. GENERAL INFORMATION

1.1. Description of Equipment Under Test (EUT)

Description	:	Scanner (USB Interface)
Model Number	:	(1)600 USB (2)4800 USB
		Above models are identical, except for sale area and packing style difference.
Project Name	:	C3U10
FCC ID	:	HWFA4USB
Applicant	:	Mustek Systems Inc. No. 25, R&D Road II, Science-Based Industrial Park, Hsinchu, Taiwan, R.O.C.
Manufacturer	:	Mustek Systems Inc. No. 25, R&D Road II, Science-Based Industrial Park, Hsinchu, Taiwan, R.O.C.
USB Cable	:	Shielded, Detachable, 1.2m Bonded two ferrite cores
Power Adapter	:	YHI, M/N YC-1015-15 Input: 100V-120V~, 60Hz, 0.4A Output: +15VDC/1A Cable: Nonshielded, Undetachable, 1.5m Bonded a ferrite core
Date of Test	:	May 20/22, 1998

1.2. Details of Support Simulator

1.2.1. PERSONAL COMPUTER

Model Number	:	5/200MMX Series4DT
Serial Number	:	SG88802624
FCC ID	:	by DoC
Manufacturer	:	Hewlett Packard
VGA Card	:	Within Mother Board
Power Cord	:	Nonshielded, Detachable, 2.5m

1.2.2. MONITOR

Model Number : D2825
 Serial Number : MY72375970
 FCC ID : JVP7154E
 Manufacturer : Hewlett Packard
 Data Cable : Shielded, Undetachable, 1.2m
 Power Cord : Nonshielded, Detachable, 1.5m

1.2.3. KEYBOARD

Model Number : RT101
 Serial Number : A2543343
 FCC ID : AQ6-MTN4XZ15
 Manufacturer : DIGITAL
 Data Cable : Shielded, Undetachable, 1.9m

1.2.4. PRINTER

Model Number : 2225C+
 Serial Number : 3121S96627
 FCC ID : DSI6XU2225
 Manufacturer : Hewlett Packard
 Power Adapter : Hewlett Packard, M/N 82241A
 Power Cord : Nonshielded, Undetachable, 2.0m
 Data Cable : Shielded, Detachable, 1.2m

1.2.5. MODEM

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. MOUSE

Model Number : M-S34
 Serial Number : LZA65201997
 FCC ID : DZL210472
 Manufacturer : Logitech
 Data Cable : Nonshielded, Undetachable, 1.9m

1.2.7. USB GAMEPAD

Model Number : INT-002
 Serial Number : N/A
 FCC ID : CETEAK032
 Manufacturer : Alps
 Data Cable : Shielded, Undetachable, 2.3m
 Bonded a ferrite core

1.3. Description of Test Facility

Site Description (No. 5 Open Site)	:	Feb. 13, 1998 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 Code	:	200077-0

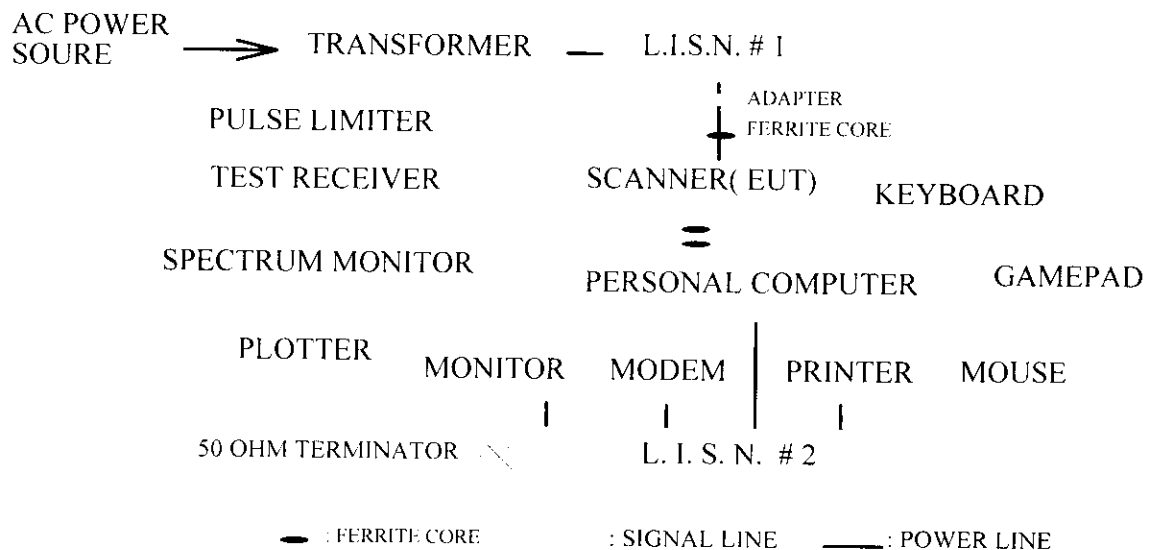
2. POWERLINE CONDUCTED TEST

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	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 (CISPR 22 Class B)

FREQUENCY	MAXIMUM RF LINE VOLTAGE	
	QUASI-PEAK LEVEL	AVERAGE LEVEL
150KHz ~ 500KHz	66 ~ 56 dB	56 ~ 46 dB
500KHz ~ 5MHz	56 dB	46 dB
5MHz ~ 30MHz	60 dB	50dB

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	:	(1)600 USB (2)4800 USB
Project Name	:	C3U10
FCC ID	:	HWFA4USB
Manufacturer	:	Mustek Systems Inc.
USB Cable	:	Shielded, Detachable, 1.2m Bonded two ferrite cores
Power Adapter	:	YHI, M/N YC-1015-15 Input : 100V-120V~, 60Hz, 0.4A Output : +15VDC/1A Cable : Nonshielded, Undetachable, 1.5m Bonded a ferrite core

2.4.2. Support Simulators : 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 USB port.

2.5.5. Personal computer displayed the test software and scanning 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 150KHz 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 150KHz to 30 MHz was investigated.

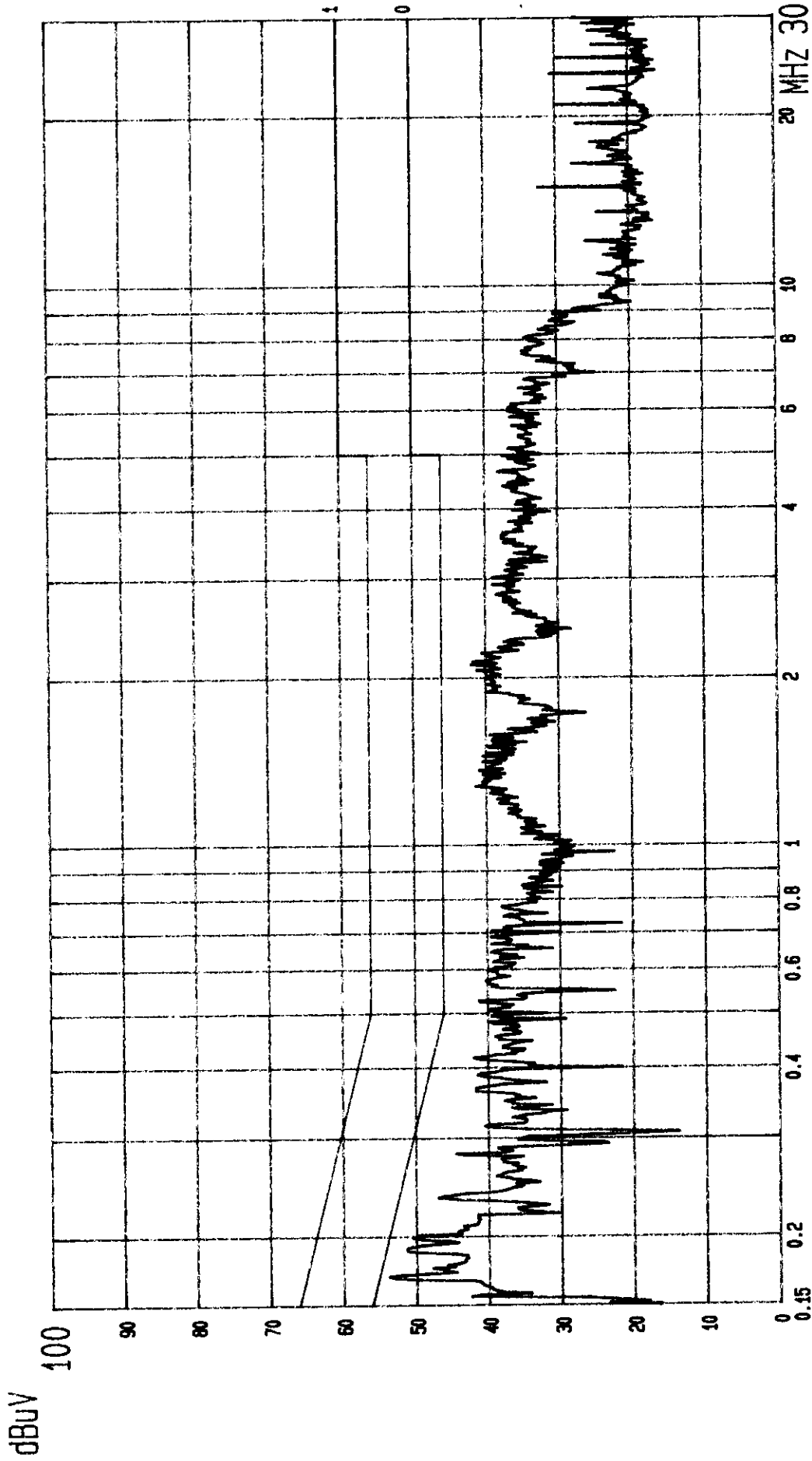
All emissions not reported below are too low against the prescribed limits.

Date of Test : May 20, 1998 Temperature : 26 °C

EUT : Scanner Humidity : 60 %

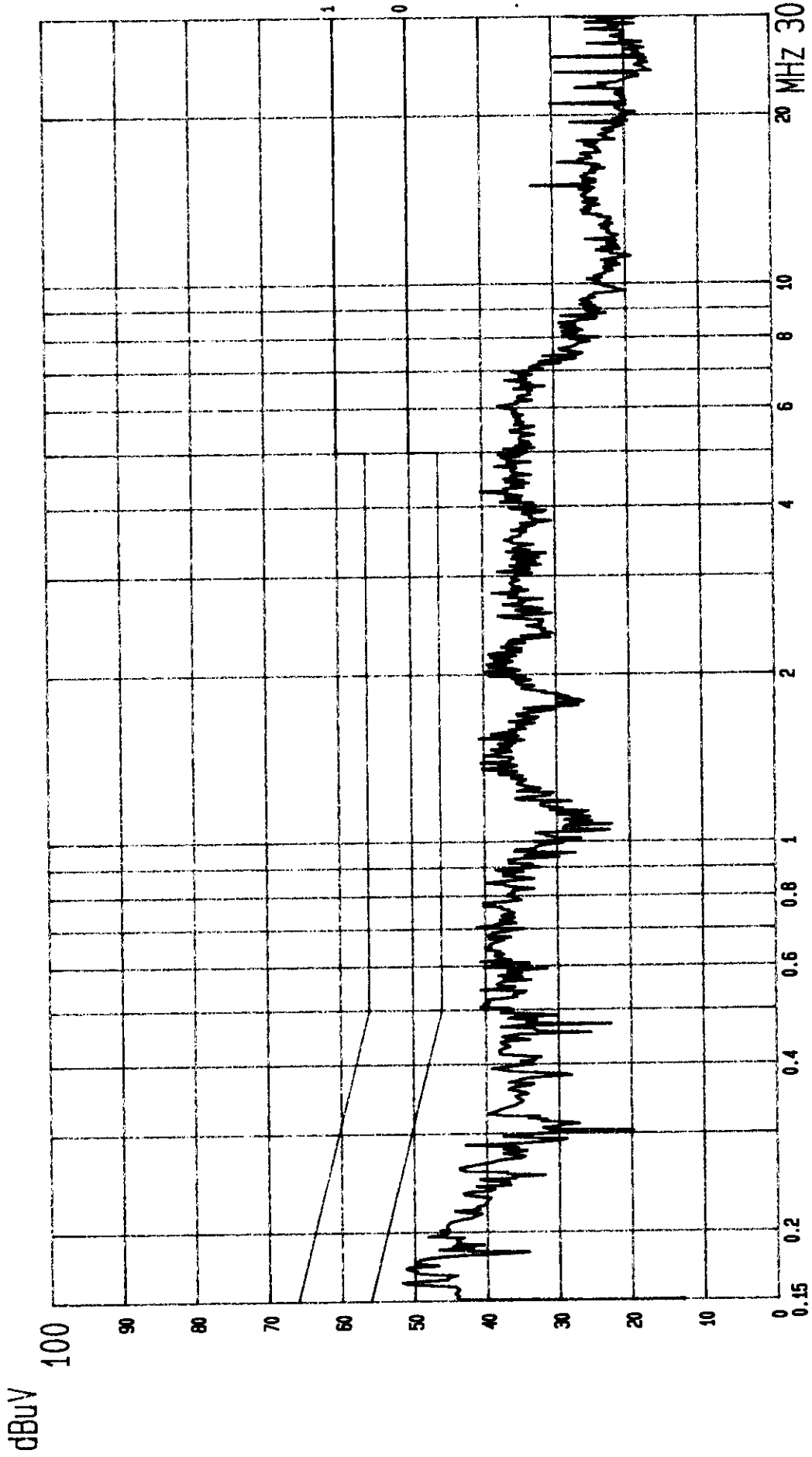
Frequency MHz	Factor dB	Measurement (dBuV)				Reading (dBuV)				Limits (dBuV)	
		Phase A Neutral		Phase B Line		Phase A Neutral		Phase B Line		Q.P.	Average
		Q.P.	Average	Q.P.	Average	Q.P.	Average	Q.P.	Average		
0.1604	0.4	*	*	50.2	43.8	*	*	50.6	44.2	65.5	55.5
0.1668	0.4	51.3	44.7	*	*	51.7	45.1	*	*	65.1	55.1
0.1702	0.4	*	*	48.3	35.8	*	*	48.7	36.2	64.9	54.9
0.1850	0.3	48.6	34.3	*	*	48.9	34.6	*	*	64.2	54.2
0.4155	0.2	39.2	32.3	*	*	39.4	32.5	*	*	57.5	47.5
0.5200	0.2	*	*	39.8	37.0	*	*	40.0	37.2	56.0	46.0
1.2828	0.2	40.0	35.0	*	*	40.2	35.2	*	*	56.0	46.0
1.3823	0.2	*	*	40.1	33.4	*	*	40.3	33.6	56.0	46.0
2.0890	0.2	40.6	35.1	*	*	40.8	35.3	*	*	56.0	46.0
4.2669	0.3	*	*	38.3	32.2	*	*	38.6	32.5	56.0	46.0
14.9810	0.6	30.4	30.2	31.2	30.5	31.0	30.8	31.8	31.1	60.0	50.0

- Remark :
1. All readings are Quasi-Peak and Average values.
 2. Factor = Insertion Loss + Cable Loss
 3. "*" means the emission level undetectable.



--- Date 20.MAY '98 Time 11:25:18
 MUSTEK
 LINE: VA.

M/N: 600 USB
 (PEAK VALUE) TAIWAN TOKIN EMC.ENG.CORP.



--- Date 20.MAY '98 Time 11:31:08
MUSTEK
EUT: SCANNER
LINE: VB.

M/N: 600 USB
(PEAK VALUE) TAIWAN TOKIN EMC.ENG.CORP.
PAGE:002.

3. RADIATED EMISSION TEST

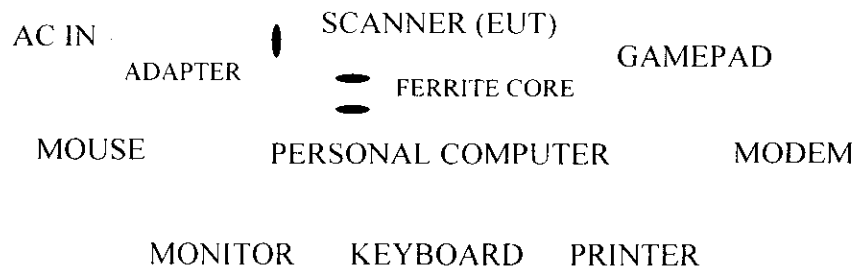
3.1. Test Equipment

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

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	HP	8568B	3001A05001	Feb.10, 98'	1 Year
2.	O.P. Adapter	HP	85650A	2811A01395	Feb.10, 98'	1 Year
3.	Biconical Antenna	Chase	VBA6106A	1245	Aug.04, 97'	1 Year
4.	Log Periodic Antenna	Chase	UPA6109	1035	Aug.04, 97'	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

10 METERS

EUT

0.8
METER

TURN TABLE

GROUND PLANE

3.3. Radiation Limit (CISPR 22 CLASS B)

FREQUENCY	DISTANCE	FIELD STRENGTHS LIMITS
MHz	Meters	dBuV/m
30 ~ 230	10	30
230 ~ 1000	10	37

Remark : (1) The tighter limit applies 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.

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 10 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 (HP Spectrum Analyzer 8568B) 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 CISPR 22 CLASS B limit..

Date of Test : May 22, 1998 Temperature : 32 °C
 EUT : Scanner Humidity : 48 %

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading		Emission Level		Margin dBuV/m
			Horizontal dBuV	Horizontal dBuV/m	Limits dBuV/m		
37.675	20.31	1.25	0.27	21.83	30.00	8.17	
72.316	12.38	1.78	8.19	22.35	30.00	7.65	
84.363	14.76	1.91	6.52	23.19	30.00	6.81	
108.456	18.31	2.17	4.32	24.80	30.00	5.20	
141.569	19.64	2.52	1.25	23.41	30.00	6.59	
159.687	21.14	2.72	1.87	25.73	30.00	4.27	
183.764	20.79	2.94	2.23	25.96	30.00	4.04	
195.804	21.47	3.06	1.86	26.39	30.00	3.61	
207.869	21.37	3.14	0.98	25.49	30.00	4.51	
* 224.422	21.97	3.33	1.69	26.99	30.00	3.01	
253.040	23.02	3.61	1.79	28.42	37.00	8.58	
308.636	15.50	3.99	11.82	31.31	37.00	5.69	
329.715	15.66	4.17	9.02	28.85	37.00	8.15	
358.340	16.27	4.38	7.24	27.89	37.00	9.11	
402.029	16.88	4.68	4.88	26.44	37.00	10.56	
471.330	17.84	5.14	0.23	23.21	37.00	13.79	
542.112	19.51	5.60	- 0.70	24.41	37.00	12.59	
597.828	20.22	5.96	- 4.65	21.53	37.00	15.47	

- Remark :
1. All readings are Quasi-Peak values.
 2. The worst emission was detected at 224.422MHz with corrected signal level of 26.99dBuV/m (limit is 30dBuV/m) when the antenna was at horizontal polarization and was at 3.8m high and the turn table was at 155 °.
 3. 0 ° was the table front facing the antenna. Degree is calculated from 0 ° clockwise facing the antenna.

Date of Test : May 22, 1998 Temperature : 32 °C
 EUT : Scanner Humidity : 48 %

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading		Emission Level		Margin dBuV/m
			Vertical dBuV	Vertical dBuV/m	Limits dBuV/m		
36.139	19.99	1.22	1.79	23.00	30.00	7.00	
46.682	16.95	1.41	1.44	19.80	30.00	10.20	
63.258	13.16	1.70	10.04	24.90	30.00	5.10	
85.895	15.13	1.91	7.08	24.12	30.00	5.88	
109.947	18.53	2.17	- 1.15	19.55	30.00	10.45	
140.061	20.36	2.53	1.77	24.66	30.00	5.34	
159.641	20.31	2.72	2.35	25.38	30.00	4.62	
183.739	21.27	2.94	1.30	25.51	30.00	4.49	
* 191.268	21.31	3.02	2.82	27.15	30.00	2.85	
212.353	20.99	3.22	2.37	26.58	30.00	3.42	
224.404	21.68	3.33	1.44	26.45	30.00	3.55	
265.079	22.91	3.68	- 0.59	26.00	37.00	11.00	
308.712	14.12	3.99	8.31	26.42	37.00	10.58	
320.760	14.42	4.09	8.64	27.15	37.00	9.85	
353.903	15.68	4.36	6.64	26.68	37.00	10.32	
427.695	16.64	4.87	2.64	24.15	37.00	12.85	
534.558	18.90	5.57	- 1.63	22.84	37.00	14.16	
601.399	19.90	5.97	- 2.21	23.66	37.00	13.34	

- Remark : 1. All readings are Quasi-Peak values.
 2. The worst emission was detected at 191.268MHz with corrected signal level of 27.15dBuV/m (limit is 30dBuV/m) when the antenna was at vertical polarization and was at 1.1m high and the turn table was at 102 ° .
 3. 0 ° was the table front facing the antenna. Degree is calculated from 0 ° clockwise facing the antenna..

4. DEVIATIONS TO TEST SPECIFICATIONS

【 NONE 】