PEP Testing Laboratory

RFI / EMI TEST REPORT

APPLICANT	:	INFORTREND TECHNOLOGY INC.
E. U. T.	:	Disk Array Controller
TRADE NAME	:	N/A
FCC ID	:	LC82101U2
REGULATION	:	CFR 47 , Part 15 Subpart B , **Class B**
TEST SITE	:	PEP Testing Laboratory
TEST ENGINEER	:	
TEST DATE	:	7 / 6 / 1999
ISSUED DATE	:	JULY / 13 / 1999
REPORT No.	:	990334

FEDERAL COMMUNICATIONS COMMISSION
Laboratory Division
7435 Oakland Mills Road
Columbia, MD. 21046

May 25, 1999

Registration Number: 90868

PEP Testing Laboratory
12-3 Fl., No. 27-1, Lane 169
Kang-Ning St., Hsi-chi Town
Taipei Hsien
Taiwan, R.O.C.
Attention: M. Tsui

Re: Measurement facility located at Hsi-chi
3 & 10 meter site
Date of Listing: May 25, 1999

Gentlemen:

Your submission of the description of the subject measurement facility has been reviewed and found to be in compliance with the requirements of Section 2.948 of the FCC Rules. The description has, therefore, been placed on file and the name of your organization added to the Commission's list of facilities whose measurement data will be accepted in conjunction with applications for Certification under Parts 15 or 18 of the Commission's Rules. Please note that this filing must be updated for any changes made to the facility, and at least every three years from the date of listing the data on file must be certified as current.

If requested, the above mentioned facility has been added to our list of those who perform these measurement services for the public on a fee basis. An up-to-date list of such public test facilities is available on the Internet on the FCC Website at WWW.FCC.GOV, Electronic Filing, OET Equipment Authorization Electronic Filing.

Sincerely,

Thomas W. Phillips

Thomas W Phillips
Electronics Engineer

PEP Testing Laboratory

REPORT NO. : 990334

VERIFICATION

WE HEREBY VERIFY THAT:

The E. U. T. listed below has completed RFI testing by PEP Testing Laboratory and the interference emissions can pass **FCC Class B** limitations .

The tested configurations and the facility complies with the radiated and AC line conducted test site criteria in ANSI C63 . 4 - 1992 .

Any data in this RFI report is " **reference** " only .

APPLICANT : **INFORTREND TECHNOLOGY INC. ***
PRODUCT : **Disk Array Controller ***
FCC ID : **LC82101U2 ***
MODEL : **IFT-2101U2***

M. Y. Tsui

M. Y. TSUI / Manager

PEP Testing Laboratory
12-3FL., NO. 27-1, Lane 169, Kang-Ning St.,
Hsi-Chih, Taipei Hsien, Taiwan, R. O. C.
TEL : 886-2-26922097 FAX : 886-2-26956236

PEP Testing Laboratory

REPORT NO. : 990334

TABLE OF CONTENTS

1. GENERAL

1.1 GENERAL INFORMATION:

APPLICANT : INFORTREND TECHNOLOGY INC.

10F, NO. 33, SAN-MIN RD., SEC. 2,
PAN-CHIAO CITY, TAIPEI HSIEN, TAIWAN,
R. O. C.

MANUFACTURER : INFORTREND TECHNOLOGY INC.

10F, NO. 33, SAN-MIN RD., SEC. 2,
PAN-CHIAO CITY, TAIPEI HSIEN, TAIWAN,
R. O. C.

MEASUREMENT PROCEDURE : ANSI C63 , 4 - 1992

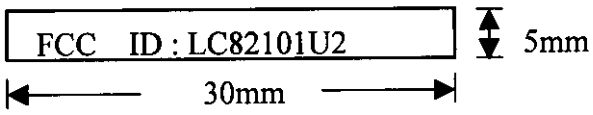
TESTED FOR COMPLIANCE WITH : Title 47 of CFR
Part 15 , Subpart B , Class B

1.2 PLACE OF MEASUREMENT

PEP Testing Laboratory

1.3 LABELING REQUIREMENT

A FCC ID label shall be permanently attached and conspicuously located on the equipment :



1.4 INFORMATION TO THE USER

The following FCC statement should be declared in a conspicuous location in the user's manual.

Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio / TV technician for help.

Warning : A shielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord be used.

Use only shielded cables to connect I/O devices to this equipment.

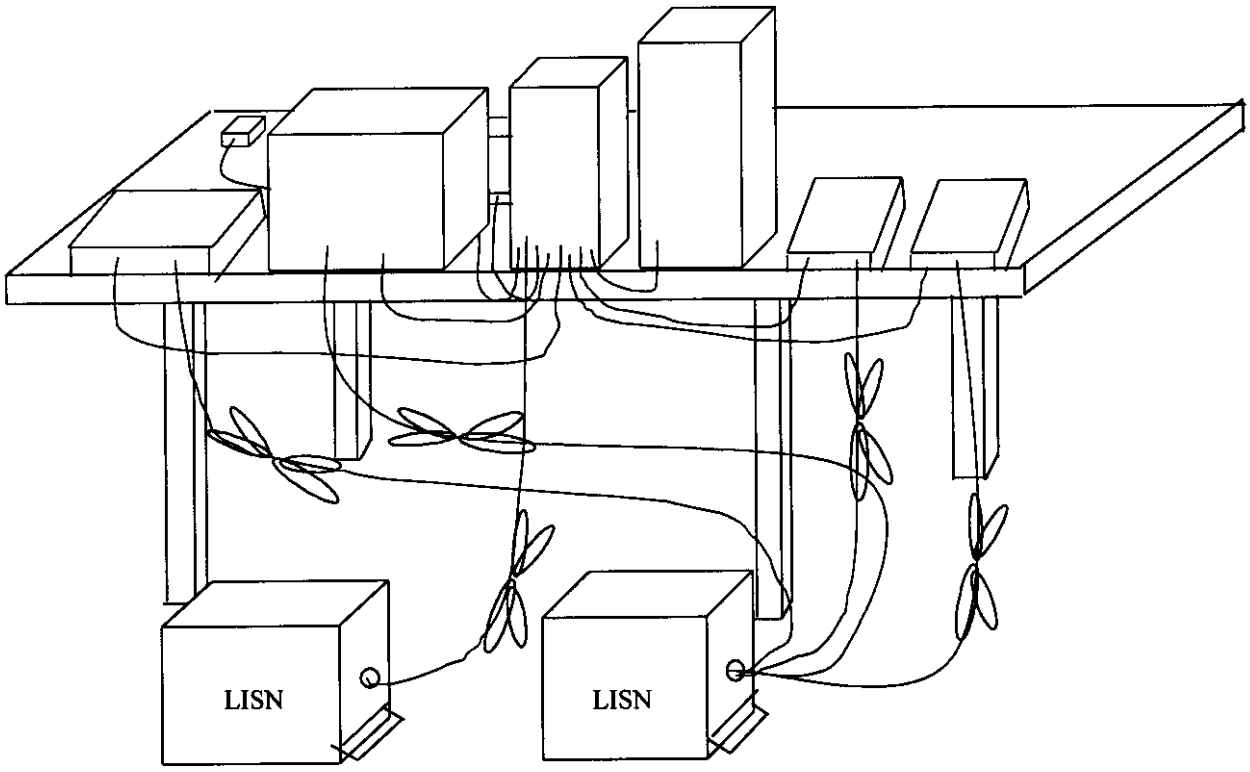
You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

For equipment **FCC ID : LC82101U2**

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions : (1) This device may not cause harmful interference , and (2) this device must accept any interference received , including interference that may cause undesired operation .

2. CONDUCTION EMISSIONS TEST

2.1 GENERAL SETUP OF THE TEST FACILITIES



2.2 TEST PROCEDURES

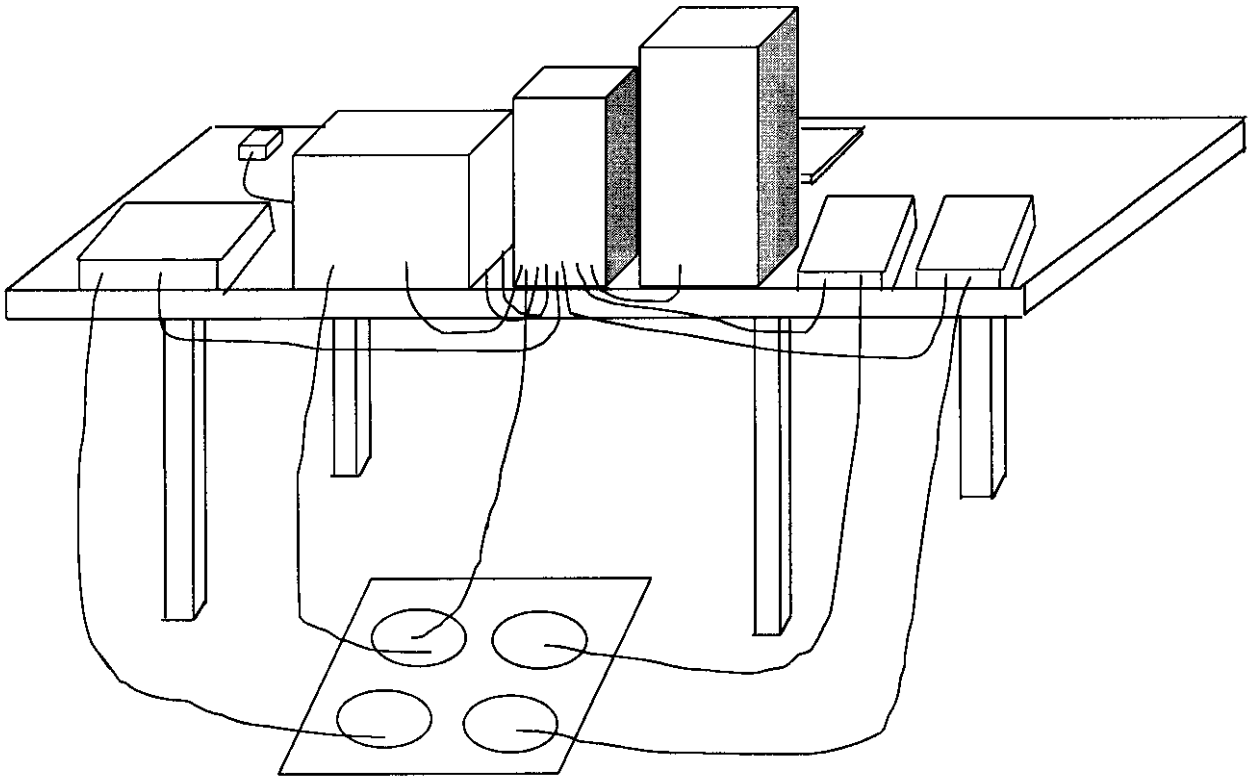
The system was setup as described above, with the EMI diagnostic software.
Both the line of power cord, hot and neutral, were run with the EMI tests software.

To get the maximum power line conducted emission, we changed the configuration by varying the monitor power cord fed from floor outlet and from the outlet on the power supply of this computer.

The highest emissions were recorded in the RFI test report.

3. RADIATED EMISSIONS TEST

3.1 GENERAL SETUP OF THE FACILITIES



3.2 TEST PROCEDURES

Radiated emissions test was carried out by **PEP Testing Laboratory** at the open field test site authorized by FCC.

The EUT and supporting equipments were setup with the EMI diagnostic software.

a. setting up the EUT under normally position, and scanning it from 30 MHz to 1000 MHz, then recording those narrow band noises which cannot be 6 dBuV below lower bound. Both horizontal and vertical antenna are measured from 1 meter height to 4.0 meter height, and turntable rotate 360 degrees.

b. fixing the EUT rear face to antenna and antenna 1.0 meter height. We adjusted I/O cables to find the highest coupling noise and moved the height of antenna from 1 to 4 meters, then rotated the turntable simultaneously.

c. checking following step b. all points which were recorded in step a.

d. changing the peripherals position, and routine steps a. b. c.

The highest emissions were recorded in the RFI test report.

4. DESCRIPTION FOR EUT TESTING CONFIGURATION

** **TEST PROCESURE** ----

(A) The equipment under test (EUT) is disk array controller FCC ID: LC82101U2 with two SCSI output channels , for more detail information about EUT , please refer the user's manual .

(B) Test method : the EUT was inserted into a PC system and the SCSI output connected to a disk array system with eight HDDs inside , EUT was enabled by data exchanging between HDD inside PC and HDD inside disk arry system . We provided the worst case data in this report to reference .

(C) After the EUT was set up , we did the conducted emission test in the shielded room and the worst case placement finding as the ANSI C63.4 requirement ; similarly , the radiated emission test was done at the open field site .

(D) If the peak value of the noise can't under Non-consumer equipment limit 3 dBuV more , we'll change Biconical antenna or Log-periodic antenna for Dipole antenna and record its Quasi-Peak value , making sure it can under 6 dBuV at least .

5. SUPPORTING DEVICES TO TEST

SUPPORT UNIT 1. ---- PERSONAL COMPUTER

Manufacturer : ASUS
Model Number : P2L97
Power Supply Type : Switching
Power Cord : Shielded, Detachable, 1.2m
Data Cable : Shielded, Detachable, 1.2m
FCC ID : Declaration of Conformity (DoC)

SUPPORT UNIT 2. ---- KEYBOARD

Manufacturer : SOLID YEAR CO., LTD.
Model Number : ACK-210
Power Supply Type : N/A
Power Cord : N/A
Data Cable : Shielded, Undetachable, 1.2m
FCC ID : L2BACKEY210

SUPPORT UNIT 3. ---- MONITOR

Manufacturer : ACER
Model Number : 1455
Power Supply Type : Switching
Power Cord : Shielded, Detachable, 1.2m
Data Cable : Shielded, Undetachable, 1m.
FCC ID : JVP7234E

SUPPORT UNIT 4. ---- PRINTER

Manufacturer : Hewlett-Packard Singapore Pte Ltd.

Model Number : HP400

Power Supply Type : Switching

Power Cord : Shielded, Detachable, 1.2m

Data Cable : Shielded, Detachable, 1m

FCC ID : B94C2642X

SUPPORT UNIT 5. ---- Modem x 2

Manufacturer : ACEEX

Model Number : 1414

Power Supply Type : Linear

Power Cord : Non-Shielded, Detachable, 1.2m

Data Cable : Shielded, Detachable, 1m

FCC ID : IFAXDM1414

SUPPORT UNIT 6. ---- MOUSE

Manufacturer : Genius

Model Number : Easy Mouse Serial

Power Supply Type : N/A

Power Cord : N/A

Data Cable : Shielded, Undetachable, 1m

FCC ID : FSUGMZE3

SUPPORT UNIT 7. ---- DISK ARRAY

Manufacturer : DATAWORLD INTERNATIONAL CORP

DoC Number : DA3500RW

Power Supply Type : Switching

Power Cord : Non-Shielded, Detachable, 1.2m

Data Cable : Shielded, Detachable, 1m

FCC ID : OBX983500

EQUIPMENT UNDER TEST ----DISK ARRAY CONTROLLER

Manufacturer : INFORTREND TECHNOLOGY INC.

Model Number : IFT-2101U2

Data Cable : Shielded, Detachable, 20m

24AWG 9PR STP EIA/TIA 568 CAT5

FCC ID : LC82101U2

6. TEST CONFIGURATION

Radiated emission detector function :

(1) 30MHZ~1GHZ : Quasi-Peak Value
Resolution BW : 120KHZ Video BW : 300KHZ

(2) above 1GHZ : Quasi-Peak value and Average Value
Resolution BW : 1MHZ Video BW : 1MHZ
*** either Q. P. or average value will be recorded in the report**

Conducted emission detector function :

(1) 450KHZ~30MHZ : Quasi-Peak Value
Resolution BW : 9KHZ Video BW : 30KHZ

The else descriptions : N/A

PEP Testing Laboratory

REPORT NO. : 990334

CONDUCTED EMISSIONS TEST DATA

Model No. : **IFT-2101U2**
Frequency range : **150KHz to 30MHz**
Detector : **Quasi-peak Value**
Temperature : **28** ℃
Humidity : **60 %**

Test Data : # 677 # 180 < LINE >
682 # 168 < NEUTRAL >

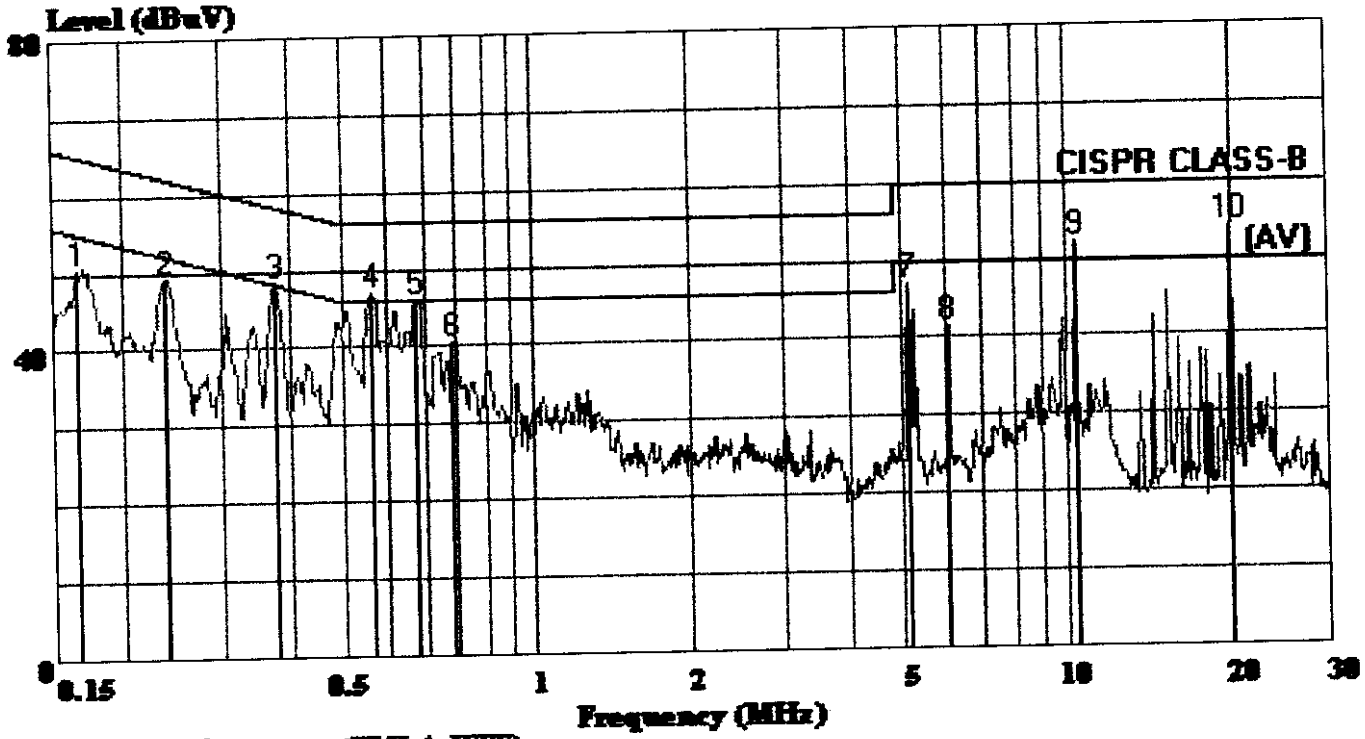
※ Note 1. Level = Meter read + Cable Loss + LISN Factor
2. Margin = Level – Limit
3. LISN = AMN

PEP

PEP Testing Laboratory

12-3FL.,NO.27-1,LANE 169,KANG NING,ST.,
HSI-CHI,TAIPEI HSIEN,TAIWAN,R.O.C.
TEL:886-2-6922097 FAX:886-2-6956236

Data#: 677 File#: cispr22b.EMI Date: 1999-06-17 Time: 10:56:35



PEP Testing Laboratory (EMI 4:JEFF)

Trace: 676 Ref Trace:
Condition: CISPR CLASS-B LISN.L LINE
EUT : IFT-2101U2
Power: AC 115V/60Hz
Memo : Quasi Peak Value

PEP Testing Laboratory

Date of test: 6/17/1999 Data # : 677

EUT Model No: IFT-2101U2 Phase : LINE

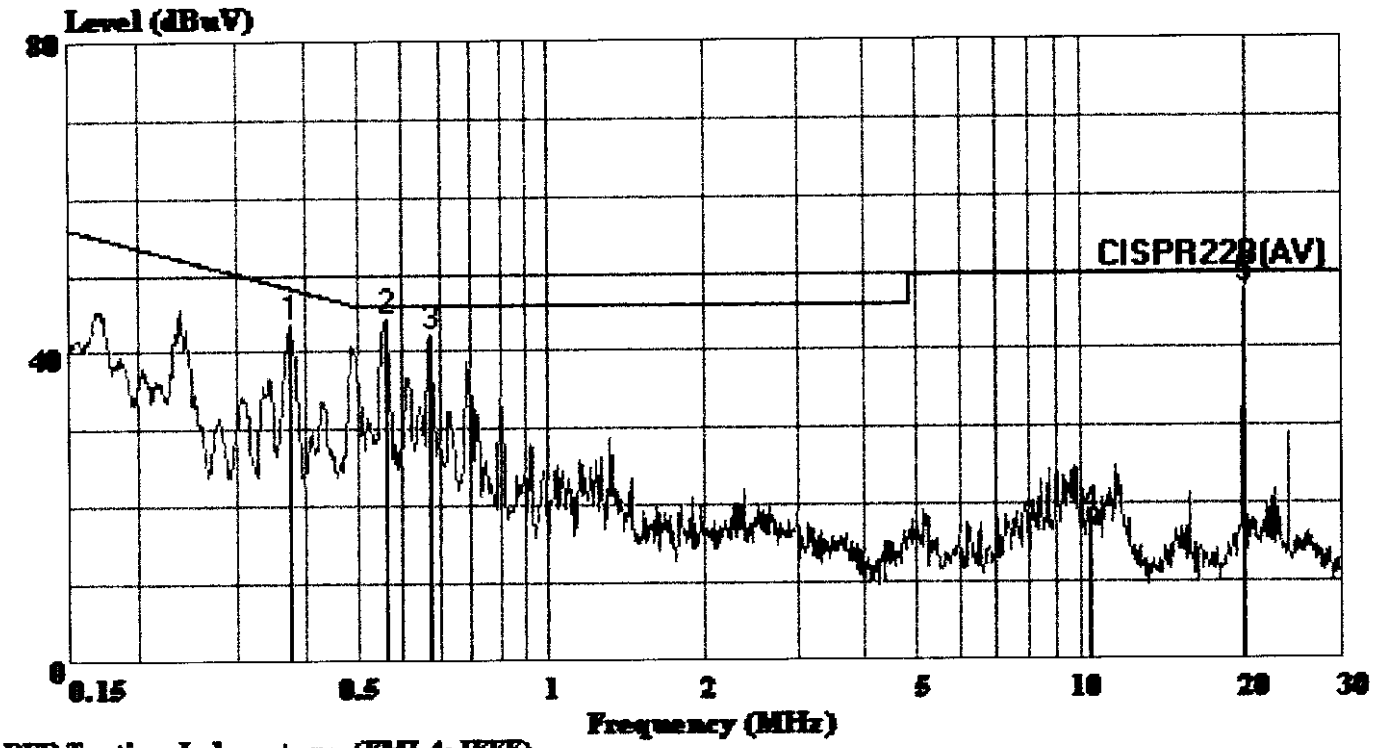
Detector : Q.P.

Frequency (MHz)	LISN Factor (dB)	Cable Loss (dB)	Meter read (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dBuV)
0.167	0.73	0.74	49.00	50.47	65.12	-14.65
0.239	0.73	0.80	47.80	49.33	62.13	-12.80
0.377	0.73	0.90	47.00	48.63	58.34	-9.71
0.564	0.73	0.90	45.40	47.03	56.00	-8.97
0.679	0.72	0.90	44.40	46.02	56.00	-9.98
0.792	0.72	0.90	38.80	40.42	56.00	-15.58
5.249	0.68	1.00	45.40	47.08	60.00	-12.92
6.219	0.67	1.00	39.80	41.47	60.00	-18.53
10.564	0.65	0.80	50.80	52.25	60.00	-7.75
20.162	0.62	0.86	52.40	53.88	60.00	-6.12

PEP
PEP Testing Laboratory

12-3FL.,NO.27-1,LANE 169,KANG NING,ST.,
HSI-CHI,TAIPEI HSIEN,TAIWAN,R.O.C.
TEL:886-2-6922097 FAX:886-2-6956236

Data#: 180 File#: cispr22b.AV.EMI Date: 1999-06-21 Time: 09:56:05



PEP Testing Laboratory (EMI 4:JEFF)

Trace: 162 Ref Trace:
Condition: CISPR22B(AV) LISN.L LINE
EUT Model: IFT-2101U2
Power : AC 115V/60Hz
Memo : Average Value

PEP Testing Laboratory

Date of test: 6/17/1999 Data # : 180
EUT Model : IFT-2101U2 Phase : LINE
Detector : A.V.

Frequency (MHz)	LISN Factor (dB)	Cable Loss (dB)	Meter read (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dBuV)
0.377	0.73	0.90	42.00	43.63	48.34	-4.71
0.564	0.73	0.90	42.60	44.23	46.00	-1.77
0.679	0.72	0.90	40.60	42.22	46.00	-3.78
10.564	0.65	0.80	17.00	18.45	50.00	-31.55
20.056	0.62	0.86	46.40	47.88	50.00	-2.12

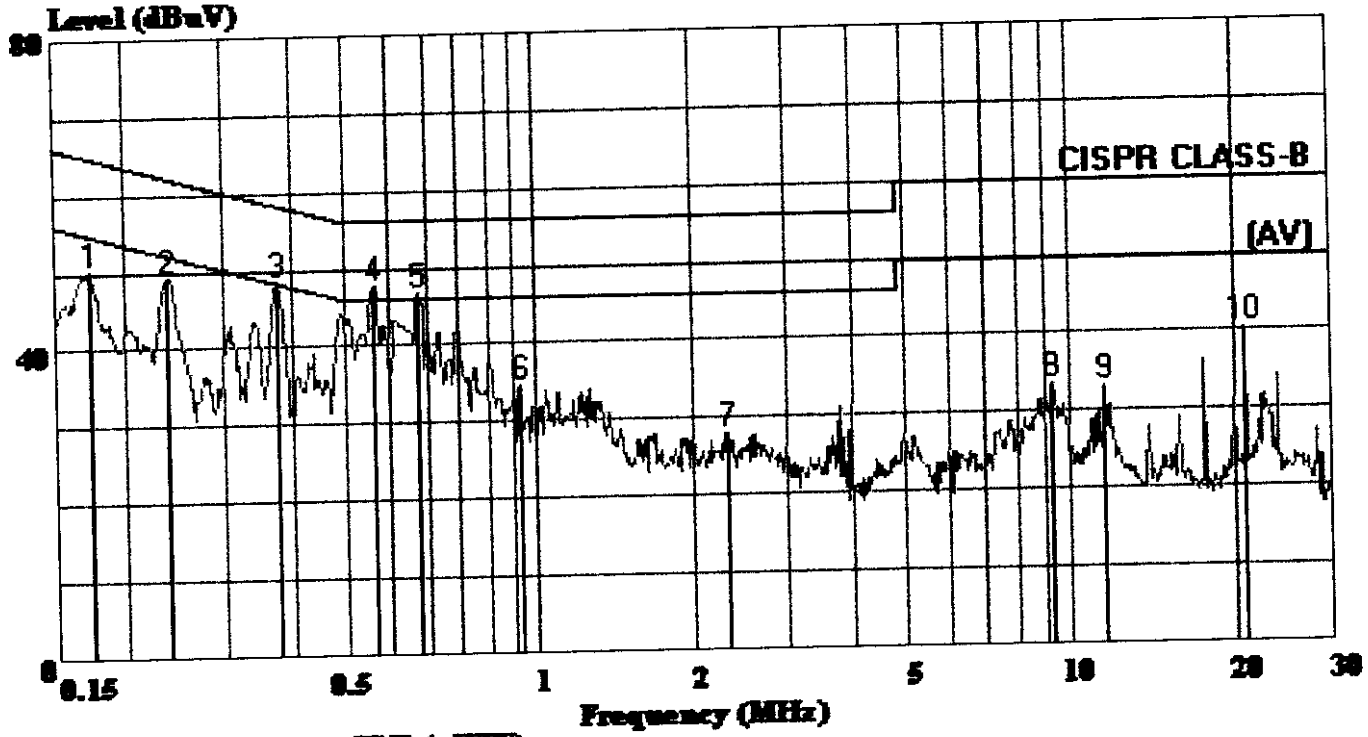
Note: LISN Factor means LISN insertion loss .

PEP

PEP Testing Laboratory

12-3FL.,NO.27-1,LANE 169,KANG NING,ST.,
HSI-CHI,TAIPEI HSIEN,TAIWAN,R.O.C.
TEL:886-2-6922097 FAX:886-2-6956236

Data#: 682 File#: cispr22b.EMI Date: 1999-06-17 Time: 11:09:35



PEP Testing Laboratory (EMI 4:JEFF)

Ref Trace:

Trace: 681
Condition: CISPR CLASS-B LISN.N NEUTRAL
EUT : IFT-2101U2
Power: AC 115V/60Hz
Memo : Quasi Peak Value

PEP Testing Laboratory

Date of test: 6/17/1999 Data # : 682

EUT Model No: IFT-2101U2 Phase : NEUTRAL

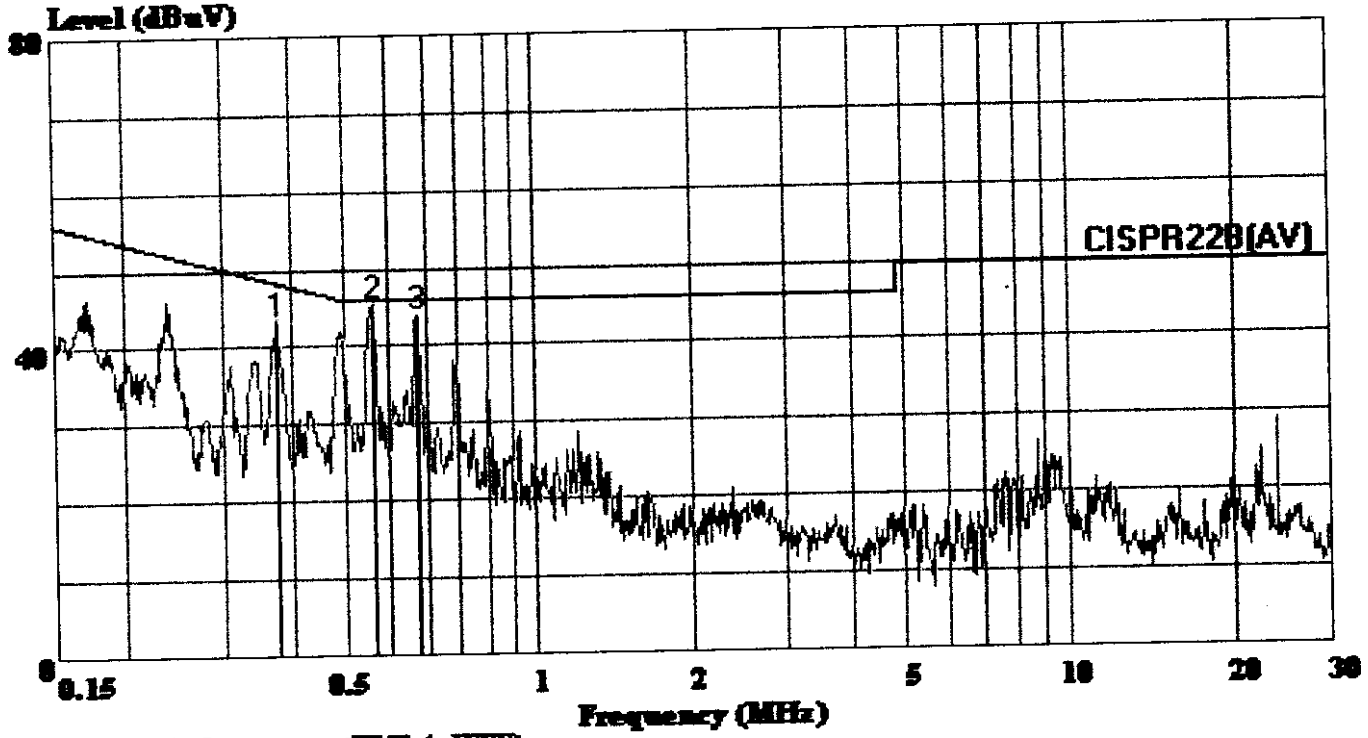
Detector : Q.P.

Frequency (MHz)	LISN Factor (dB)	Cable Loss (dB)	Meter read (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dBuV)
0.174	0.73	0.75	48.60	50.08	64.77	-14.69
0.239	0.73	0.80	47.60	49.13	62.13	-13.00
0.377	0.73	0.90	46.80	48.43	58.34	-9.91
0.564	0.73	0.90	46.00	47.63	56.00	-8.37
0.679	0.72	0.90	45.20	46.82	56.00	-9.18
1.037	0.72	0.90	33.01	34.63	56.00	-21.37
2.448	0.69	1.00	26.40	28.09	56.00	-27.91
9.451	0.63	0.86	32.00	33.49	60.00	-26.51
11.745	0.62	0.80	31.80	33.22	60.00	-26.78
21.147	0.62	0.90	39.00	40.52	60.00	-19.48

PEP
PEP Testing Laboratory

12-3FL.,NO.27-1,LANE 169,KANG NING,ST.,
HSI-CHI,TAIPEI HSIEN,TAIWAN,R.O.C.
TEL:886-2-6922097 FAX:886-2-6956236

Data#: 168 File#: cispr22b.AV.EMI Date: 1999-06-17 Time: 11:26:27



PEP Testing Laboratory (EMI 4:JEFF)

Ref Trace:

Trace: 167
Condition: CISPR22B(AV) LISN.N NEUTRAL
EUT Model: IFT-2101U2
Power : AC 115V/60Hz
Memo : Average Value

PEP Testing Laboratory

Date of test: 6/17/1999 Data # : 168

EUT Model No: IFT-2101U2 Phase :NEUTRAL

Detector : AV

Frequency (MHz)	LISN Factor (dB)	Cable Loss (dB)	Meter read (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dBuV)
0.377	0.73	0.90	41.50	43.13	48.34	-5.21
0.564	0.73	0.90	43.60	45.23	46.00	-0.77
0.679	0.72	0.90	42.40	44.02	46.00	-1.98

PEP Testing Laboratory

REPORT NO. : 990334

RADIATED EMISSIONS TEST DATA

Antenna polarization : HORIZONTAL ; Test distance : 10 m ;

Freq. (MHz)	Level (dB)	Over Limit (dB)	Limit Line (dB)	Read Level (dB)	Probe Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)
33.00	23.04	- 6.96	30.00	29.22	13.08	0.74	20.00
85.47	22.37	- 7.63	30.00	32.01	8.96	1.40	20.00
132.00	25.10	- 4.90	30.00	31.53	11.88	1.69	20.00
160.00	24.79	- 5.21	30.00	30.09	12.60	2.10	20.00
168.02	23.11	- 6.89	30.00	28.03	12.92	2.15	20.00
220.01	23.57	- 6.43	30.00	25.61	15.50	2.46	20.00
239.99	31.43	- 5.57	37.00	32.51	16.30	2.62	20.00
260.01	22.95	-14.05	37.00	22.79	17.36	2.80	20.00
399.99	28.84	- 8.16	37.00	29.06	16.38	3.40	20.00
439.99	27.79	- 9.21	37.00	27.18	17.05	3.56	20.00

Note :

1. Level = Read Level + Probe Factor + Cable Loss – Preamp Factor
2. Over Limit = Level – Limit Line

REPORT NO. : 990334

RADIATED EMISSIONS TEST DATA

Antenna polarization : VERTICAL ; Test distance : 10 m ;

Freq. (MHz)	Level (dB)	Over Limit (dB)	Limit Line (dB)	Read Level (dB)	Probe Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)
33.00	29.86	- 0.14	30.00	36.04	13.08	0.74	20.00
132.01	25.72	- 4.28	30.00	32.15	11.88	1.69	20.00
160.00	26.38	- 3.62	30.00	31.68	12.60	2.10	20.00
168.02	27.31	- 2.69	30.00	32.23	12.92	2.15	20.00
239.99	26.39	-10.61	37.00	27.47	16.30	2.62	20.00
320.00	24.51	-12.49	37.00	27.35	13.92	3.24	20.00
439.99	24.65	-12.35	37.00	24.04	17.05	3.56	20.00
528.01	25.26	-11.74	37.00	23.86	17.54	3.85	20.00
594.01	28.11	- 8.89	37.00	25.62	18.50	3.99	20.00
599.99	26.58	-10.42	37.00	23.99	18.59	4.00	20.00

Note :

1. Level = Read Level + Probe Factor + Cable Loss – Preamp Factor
2. Over Limit = Level – Limit Line

PEP Testing Laboratory

REPORT NO. : 990334

List of Test Equipment

Instrument	**Model No.**	**Cal. Due Date**	**S/N**
R&S Receiver	ESVS30(30M~1GHZ)	Apr. 15, 2000	863342/012
R&S Receiver	ESBI (20~5GHZ)	Apr. 15, 2000	845658/003
Spectrum Analyzer	R3261A (9K~2.6GHZ)	Apr. 15, 2000	91720076
R & S L. I. S. N	ESH 3-Z5 (9K~30MHz)	Jul. 07, 2000	844982/039
MEB L. I. S. N	NNB-4/63T1(10K~30MHz)	Feb. 12, 2000	98008
Anritsu Pre-Amp	3825/2 (10K~30MHZ)	Sep. 20, 1999	M40076
R & S Pre-Amp	ESMI-Z7(100K~1.4GHZ)	Feb. 12, 2000	6/2278/011
COM-Power Horn Antenna	AH-118 (1G~18GHZ)	Feb. 20, 2001	10056
EMCO Biconical Antenna	3110B (30M~300M)	Mar. 10, 2000	N/A
EMCO Log-Periodic Antenna	3146A (300M~1GHZ)	Apr. 14, 2000	1384