

PEP Testing Laboratory

REPORT NO. : 990186

RFI / EMI TEST REPORT

APPLICANT : SYSGRATION CO., LTD.
E. U. T. : UPS
TRADE NAME : N/A
FCC ID : HQXPC98317-03
REGULATION : CFR 47 , Part 15 Subpart B , Class B
TEST SITE : PEP Testing Laboratory
TEST ENGINEER : *Jerry Wang*
TEST DATE : 6 / 15 / 1999
ISSUED DATE : JUL. / 09 / 1999
REPORT No. : 990186

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

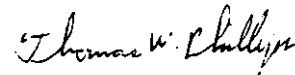
Re: Measurement facility located at Hsi-chi
3 & 10 meter site
Date of Listing: May 25, 1999

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
Electronics Engineer

PEP Testing Laboratory

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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 : SYSGRATION CO., LTD. *
PRODUCT : UPS *
FCC ID : HQXPC98317-03 *
MODEL : MBK 320, MBK 520, MBK 680 *

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

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1. GENERAL

1.1 GENERAL INFORMATION:

APPLICANT : SYSGRATION CO., LTD.

8FL., NO. 542-7, CHUNG CHEN RD.,
HSIN TIEN, TAIPEI, TAIWAN R. O. C.

MANUFACTURER : SYSGRATION CO., LTD.(TAIWAN)
SYSGRATION(SHENZHEN) LTD.(CHINA)

NO. 26, INDUSTRIAL N RD., NAN-KANG
INDUSTRIAL PARK, NAN-TOU CITY
TAIWAN R. O. C.

VILLAGE E GONG-LING, PING-HU TOWN,
LONG-GONG DISTRICT, SHENZHEN CITY,
GUANGDONG, PCOPLE REPUBLIC OF CHINA

MEASUREMENT PROCEDURE : ANSI C63 , 4 - 1992

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

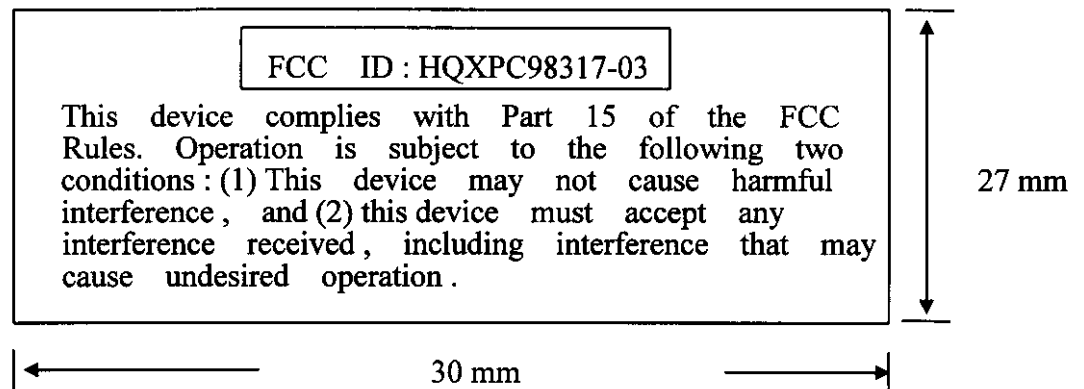
1.2 PLACE OF MEASUREMENT PEP Testing Laboratory

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1.3 LABELING REQUIREMENT

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



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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.

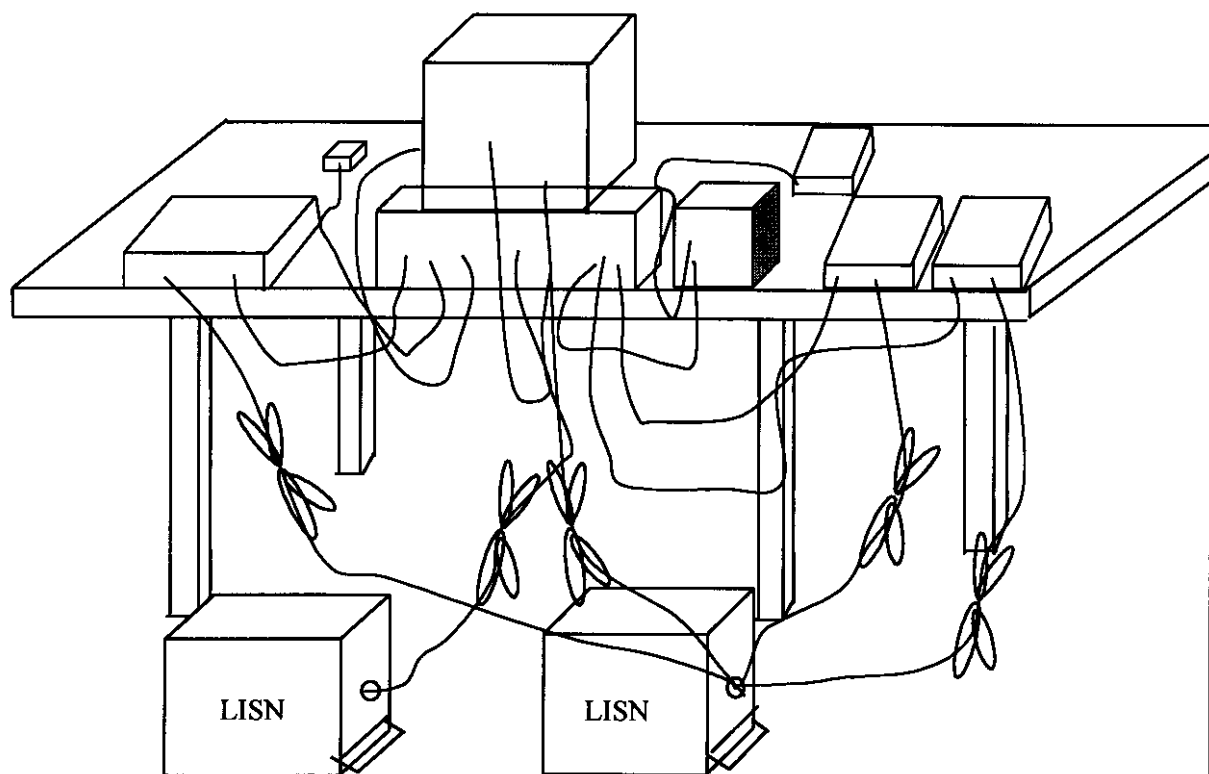
Warning : A shielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord be used.

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.

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.

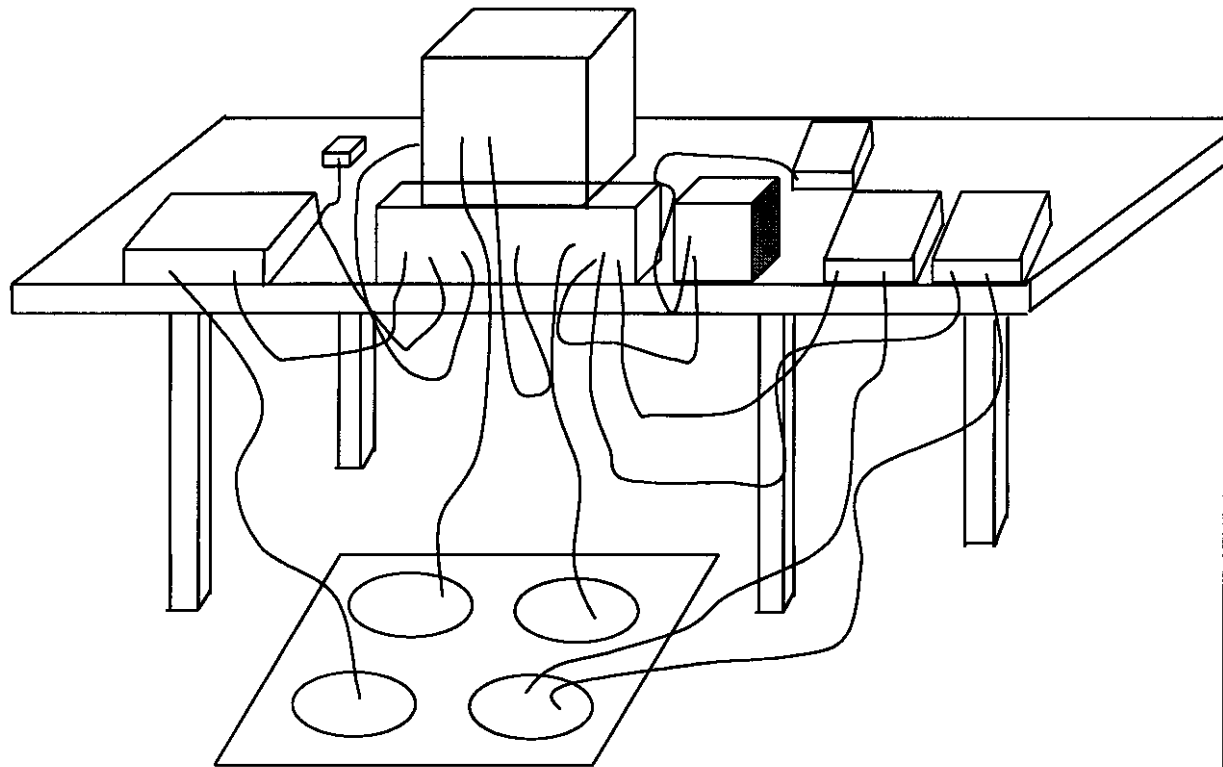
Both the line of power cord, hot and neutral, were run with the EMI tests software.

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



PEP Testing Laboratory

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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.

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4. DESCRIPTION FOR EUT TESTING CONFIGURATION

**** TEST PROCEDURE ----**

- (A) The equipment under test (EUT) is UPS , FCC ID : HQXPC98317-03 , bearing model No. (1) MBK320 with four auxiliary power output connectors and two RJ45 jacks (2)MBK520 with four auxiliary power output connectors , two RJ45 jacks and one RS 232 connector (3) MBK680 with four auxiliary power output connectors, two RJ45 jacks and one RS 232 connector , for more detail information about the EUT , please refer the user's manual .
- (B) Test method : All of models were tested with PC system as ANSI C63.4 requirement , the monitor and PC power derived from the EUT ; the rest of power outlet on EUT would be terminated by free-ended power cord ; Line in jacks was terminated by 680 Ohms terminator and Line out jack connected to a telephone set ; surge protect outlet terminated by free-ended cable ; the RS232 connector , if provided , connected to PC's RS232 port . Because the EUT provided the power timing too short to perform radiated emission test , we performed (1) radiated emission test --- normal AC power source ; (2) conducted emission test --- normal AC power source and abnormal AC power . The worst case testing result for three models[radiated emission test --- normal AC power source and conducted emission test --- abnormal AC power source] provided in this report .
- (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 .
- (E) In the RFI test report , we provided the worst conducted emission testing data and radiated emission test data.

5. SUPPORTING DEVICES TO TEST

SUPPORT UNIT 1. ---- PERSONAL COMPUTER

Manufacturer : HEWLETT PACKARD
Model Number : D3496A
Power Supply Type : Switching
Power Cord : Shielded, Detachable, 1.2m
Data Cable : Shielded, Detachable, 1.2m
FCC ID : BCJVECTRAVE4

SUPPORT UNIT 2. ---- MONITOR

Manufacturer : MICROSCAN
Model Number : LM-1564
Power Supply Type : Switching
Power Cord : Shielded, Detachable, 1.2m
Data Cable : Shielded, Undetachable, 1m
FCC ID : BR8LM-1564

SUPPORT UNIT 3. ---- - KEYBOARD

Manufacturer : HEWLETT PACKARD
Model Number : N/A
Power Supply Type : N/A
Power Cord : N/A
Data Cable : Shielded, Undetachable, 1m
FCC ID : CIGE03633

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SUPPORT UNIT 4. ---- PRINTER

Manufacturer : Hewlett-Packard Singapore Pte Ltd.
Model Number : HP400
Power Supply Type : Linear
Power Cord : Non-Shielded , Detachable, 1.2m
Data Cable : Shielded , Detachable, 1m. 2464
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 : SYSGRATION CO., LTD.
Model Number : AGM5430X
Power Supply Type : N/A
Power Cord : N/A
Data Cable : Shielded , Undetachable, 1m
FCC ID : Declaration of Conformity (DoC)

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SUPPORT UNIT 7. ---- TELEPHONE

Manufacturer : KINGTEL CO., LTD.
Model Number : KT882T/PM
Power Supply Type : N/A
Power Cord : N/A
Data Cable : Non-Shielded , Detachable, 1.2m
FCC ID : N/A

EQUIPMENT UNDER TEST ---- UPS

Manufacturer : SYSGRATION CO., LTD.
Model Number : MBK 320, MBK 520, MBK 680
Data Cable : Shielded, Detachable, 1.2m
FCC ID : HQXPC98317-03

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

Conducted Emission Test Photo. : Page 16, 17, 18

Test Data : Hot 20, 21, 25, 26, 30, 31
Neutral 22, 23, 27, 28, 32, 33

Radiated Emission Test Photo. : Page 34, 35, 36

Test Data : Horizontal 37, 39, 41
Vertical 38, 40, 42

CONDUCTED EMISSIONS TEST DATA

Model No. : MBK 320
Frequency range : 150KHz to 30MHz
Detector : Quasi-peak Value
Temperature : 29 °C
Humidity : 62 %

Test Data : # 1271 < LINE >
 # 1276 < NEUTRAL >

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

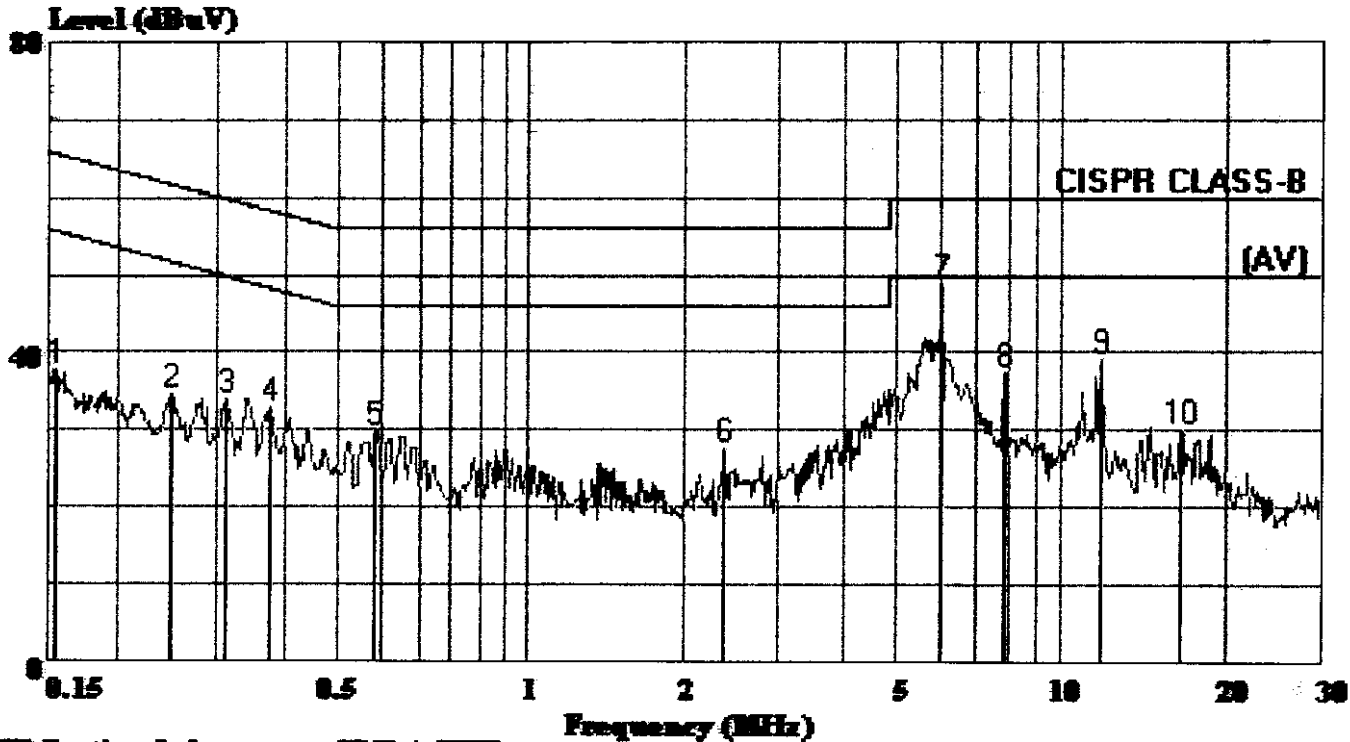


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HSI-CHI, TAIPEI HSIEN, TAIWAN, R.O.C.
TEL:886-2-6922097 FAX:886-2-6956236

Data#: 1271 File#: cispr22b.EMI

Date: 1999-07-01 Time: 17:43:48



PEP Testing Laboratory (EMI 4:JEFF)

Trace: 1270

Ref Trace:

Condition: CISPR CLASS-B LISN.L LINE

EUT : MBK 320

Power: AC 115V/60Hz

Memo: Quasi Peak Value

PEP Testing Laboratory

Date of test: 7/1/1999

Data # : 1271

EUT Model No: MBK 320

Phase : LINE

Detector : Q.P.

Frequency (MHz)	LISN Factor (dB)	Cable Loss (dB)	Meter read (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dBuV)
-----	-----	-----	-----	-----	-----	-----
0.155	0.73	0.71	36.21	37.65	65.74	-28.09
0.251	0.73	0.80	33.00	34.53	61.73	-27.20
0.315	0.73	0.90	32.40	34.03	59.84	-25.81
0.377	0.73	0.90	31.40	33.03	58.34	-25.31
0.589	0.73	0.90	28.20	29.83	56.00	-26.17
2.513	0.70	1.00	26.00	27.70	56.00	-28.30
6.186	0.67	1.00	47.00	48.67	60.00	-11.33
8.020	0.66	1.00	35.80	37.46	60.00	-22.54
11.996	0.65	0.80	37.60	39.05	60.00	-20.95
16.661	0.64	0.80	28.80	30.24	60.00	-29.76

Note: LISN Factor means LISN insertion loss .

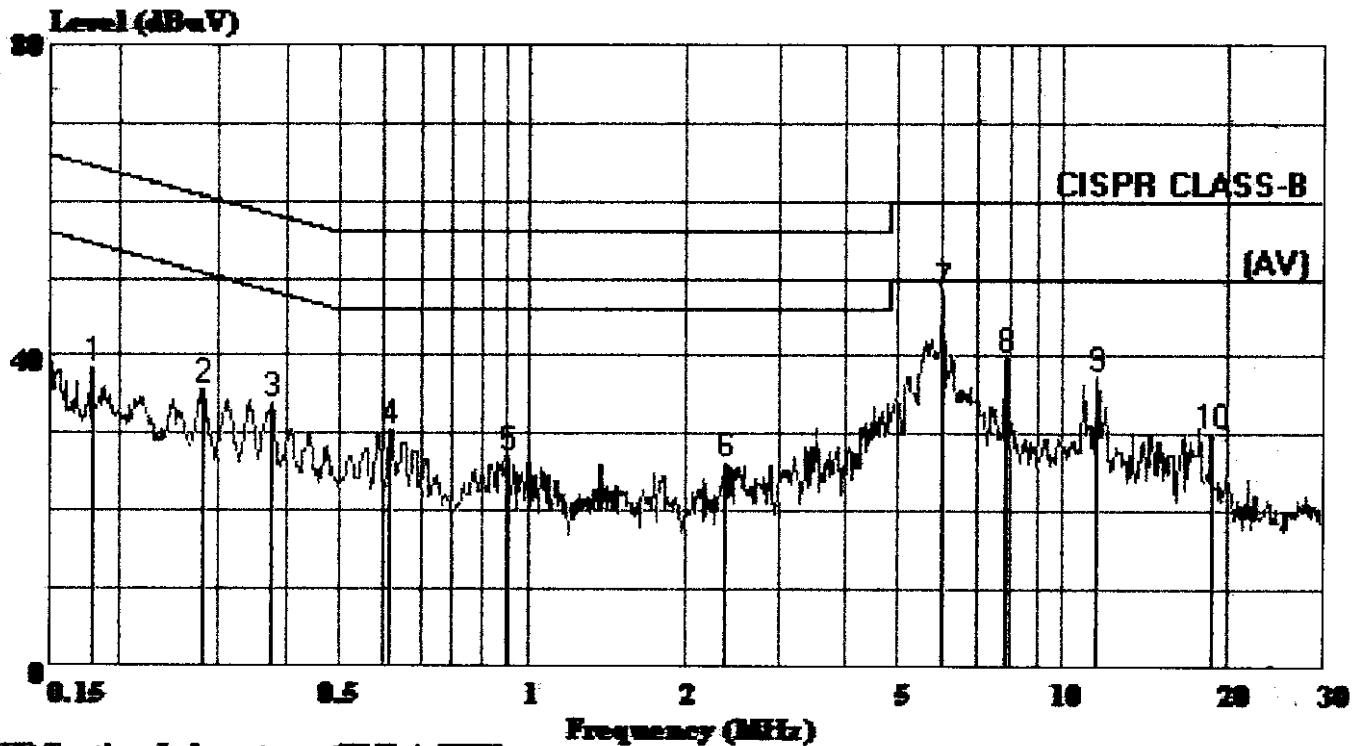


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TEL:886-2-6922097 FAX:886-2-6956236

Data#: 1276 File#: cispr22b.EMI

Date: 1999-07-01 Time: 17:47:21



PEP Testing Laboratory (EMI 4:JEFF)

Trace: 1275

Ref Trace:

Condition: CISPR CLASS-B LISN.N NEUTRAL

EUT : MBK 320

Power: AC 115V/60Hz

Memo: Quasi Peak Value

PEP Testing Laboratory

Date of test: 7/1/1999

Data # : 1276

EUT Model No: MBK 320

Phase : NEUTRAL

Detector : Q.P.

Frequency (MHz)	LISN Factor (dB)	Cable Loss (dB)	Meter read (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dBuV)
-----	-----	-----	-----	-----	-----	-----
0.180	0.73	0.76	37.00	38.49	64.50	-26.01
0.283	0.73	0.87	34.00	35.60	60.72	-25.12
0.379	0.73	0.90	32.40	34.03	58.30	-24.27
0.621	0.73	0.90	28.80	30.43	56.00	-25.57
1.010	0.72	0.90	25.40	27.02	56.00	-28.98
2.513	0.69	1.00	24.60	26.29	56.00	-29.71
6.186	0.66	1.00	46.40	48.06	60.00	-11.94
8.020	0.64	1.00	38.20	39.84	60.00	-20.16
11.745	0.62	0.80	36.00	37.42	60.00	-22.58
18.920	0.62	0.80	28.60	30.02	60.00	-29.98

Note: LISN Factor means LISN insertion loss .

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CONDUCTED EMISSIONS TEST DATA

Model No. : MBK 520
Frequency range : 150KHz to 30MHz
Detector : Quasi-peak Value
Temperature : 29 °C
Humidity : 62 %

Test Data : # 825 < LINE >
 # 830 < NEUTRAL >

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



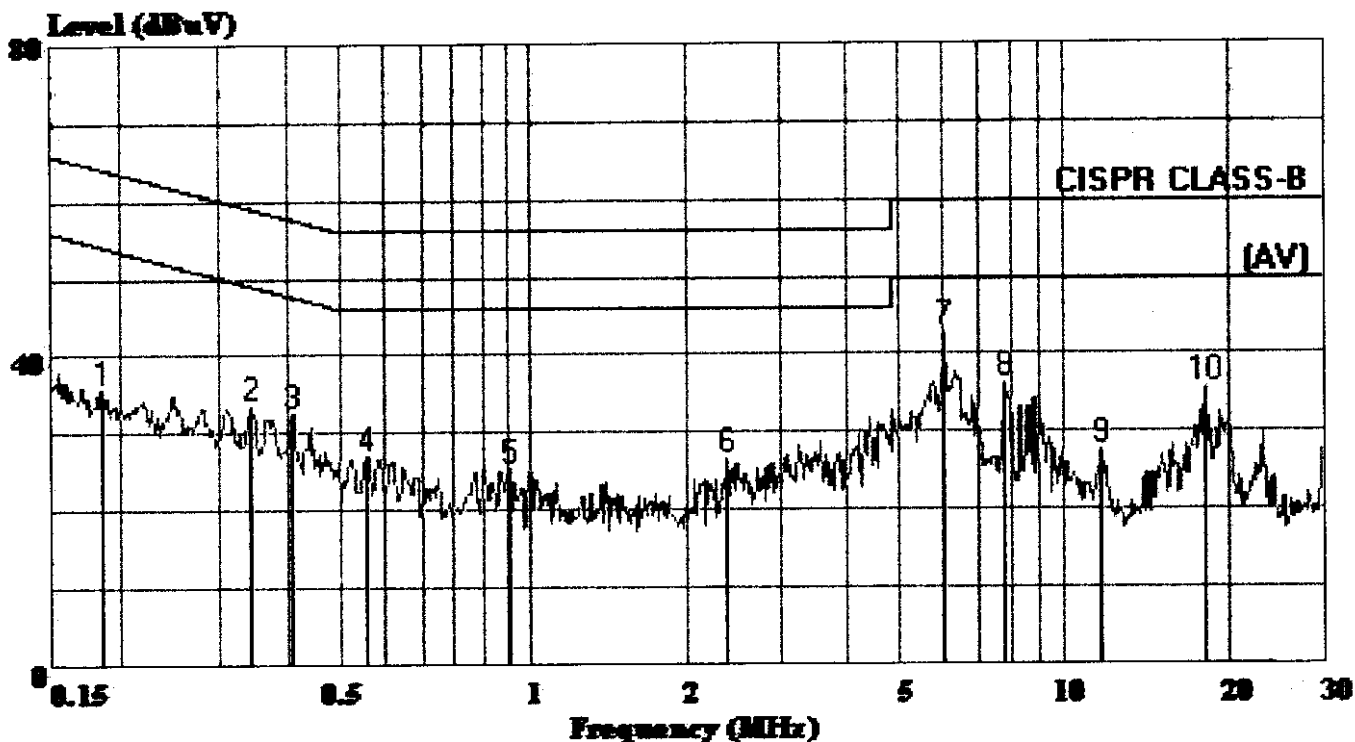
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HSI-CHI, TAIPEI HSIEN, TAIWAN, R.O.C.
TEL:886-2-6922097 FAX:886-2-6956236

Data#: 825 File#: cispr22b.EMI

Date: 1999-06-23 Time: 13:12:55



PEP Testing Laboratory (EMI 4:JEFF)

Trace: 824

Ref Trace:

Condition: CISPR CLASS-B LISN.L LINE

EUT : MBK 520

Power: AC 115V/60Hz

Memo : Quasi Peak Value

PEP Testing Laboratory

Date of test: 6/23/1999

Data # : 825

EUT Model No: MBK 520

Phase : LINE

Detector : Q.P.

Frequency (MHz)	LISN Factor (dB)	Cable Loss (dB)	Meter read (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dBuV)
-----	-----	-----	-----	-----	-----	-----
0.186	0.73	0.78	34.20	35.71	64.20	-28.49
0.346	0.73	0.90	31.80	33.43	59.05	-25.62
0.413	0.73	0.90	30.80	32.43	57.59	-25.16
0.558	0.73	0.90	25.40	27.03	56.00	-28.97
1.010	0.72	0.90	23.60	25.22	56.00	-30.78
2.513	0.70	1.00	24.80	26.50	56.00	-29.50
6.186	0.67	1.00	41.20	42.87	60.00	-17.13
7.935	0.66	1.00	34.60	36.26	60.00	-23.74
11.870	0.65	0.80	26.20	27.65	60.00	-32.35
18.328	0.63	0.80	34.40	35.83	60.00	-24.17

Note: LISN Factor means LISN insertion loss .

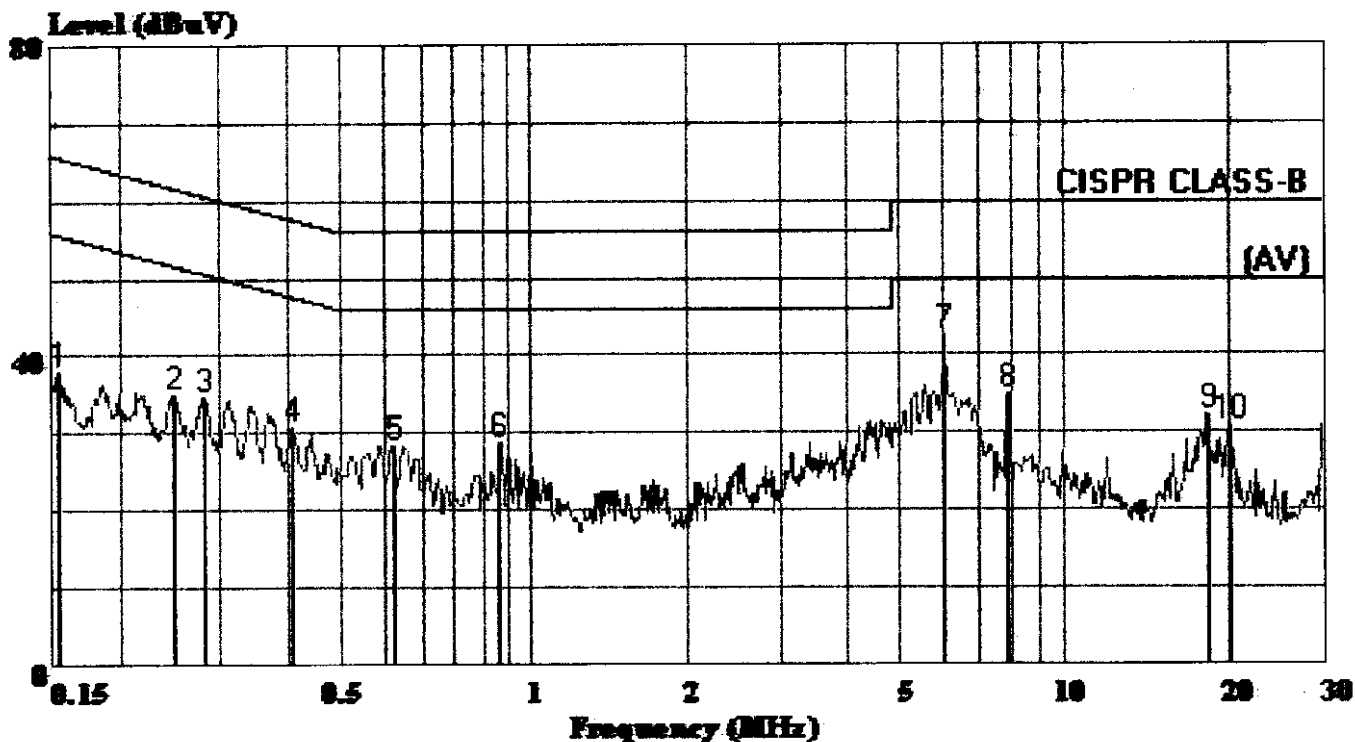


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Data#: 830 File#: cispr22b.EMI

Date: 1999-06-23 Time: 13:17:25



PEP Testing Laboratory (EMI 4:JEFF)

Trace: 829

Ref Trace:

Condition: CISPR CLASS-B LISN.N NEUTRAL

EUT : MBK 520

Power: AC 115V/60Hz

Memo: Quasi Peak Value

PEP Testing Laboratory

Date of test: 6/23/1999

Data # : 830

EUT Model No: MBK 520

Phase : NEUTRAL

Detector : Q.P.

Frequency (MHz)	LISN Factor (dB)	Cable Loss (dB)	Meter read (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dBuV)
-----	-----	-----	-----	-----	-----	-----
0.155	0.73	0.71	36.80	38.24	65.74	-27.50
0.251	0.73	0.80	33.40	34.93	61.73	-26.80
0.285	0.73	0.87	33.20	34.80	60.68	-25.88
0.413	0.73	0.90	29.20	30.83	57.59	-26.76
0.627	0.73	0.90	26.80	28.43	56.00	-27.57
0.974	0.72	0.90	27.00	28.62	56.00	-27.38
6.186	0.66	1.00	40.80	42.46	60.00	-17.54
8.020	0.64	1.00	33.20	34.84	60.00	-25.16
18.524	0.62	0.80	30.80	32.22	60.00	-27.78
20.377	0.62	0.88	29.19	30.69	60.00	-29.31

Note: LISN Factor means LISN insertion loss .

PEP Testing Laboratory

REPORT NO. : 990186

CONDUCTED EMISSIONS TEST DATA

Model No. : MBK 680
Frequency range : 150KHz to 30MHz
Detector : Quasi-peak Value
Temperature : 29 °C
Humidity : 62 %

Test Data : # 835 < LINE >
 # 840 < NEUTRAL >

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

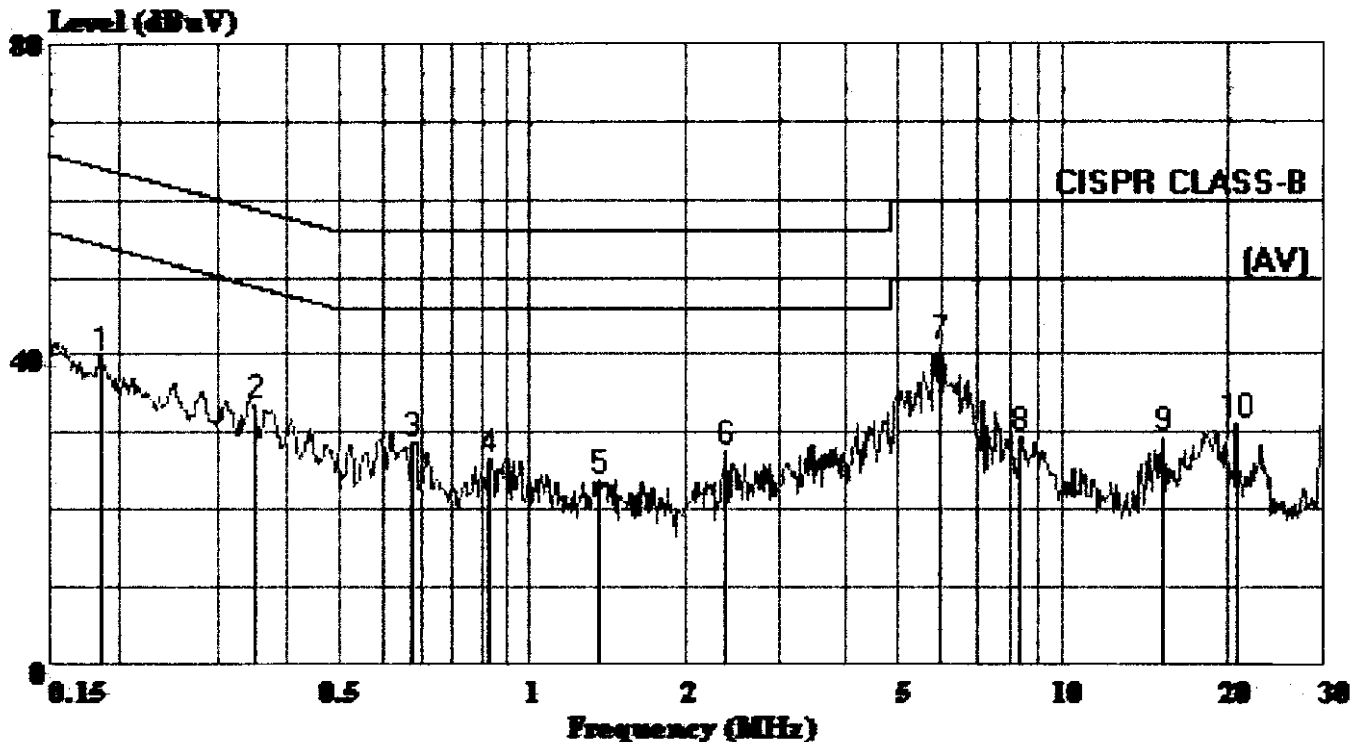


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TEL:886-2-6922097 FAX:886-2-6956236

Data#: 835 File#: cispr22b.EMI

Date: 1999-06-23 Time: 13:45:21



PEP Testing Laboratory (EMI 4:JEFF)

Trace: 834

Ref Trace:

Condition: CISPR CLASS-B LISN.L LINE

EUT : MBK 680

Power: AC 115V/60Hz

Memo : Quasi Peak Value

PEP Testing Laboratory

Date of test: 6/23/1999

Data # : 835

EUT Model No: MBK 680

Phase : LINE

Detector : Q.P.

Frequency (MHz)	LISN Factor (dB)	Cable Loss (dB)	Meter read (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dBuV)
-----	-----	-----	-----	-----	-----	-----
0.185	0.73	0.78	38.20	39.71	64.24	-24.53
0.354	0.73	0.90	31.80	33.43	58.87	-25.44
0.683	0.72	0.90	27.00	28.62	56.00	-27.38
0.938	0.72	0.90	25.20	26.82	56.00	-29.18
1.480	0.71	0.96	22.40	24.07	56.00	-31.93
2.513	0.70	1.00	26.00	27.70	56.00	-28.30
6.089	0.67	1.00	39.40	41.07	60.00	-18.93
8.546	0.66	0.95	27.79	29.40	60.00	-30.60
15.388	0.65	0.80	28.00	29.45	60.00	-30.55
20.924	0.62	0.90	29.80	31.32	60.00	-28.68

Note: LISN Factor means LISN insertion loss .



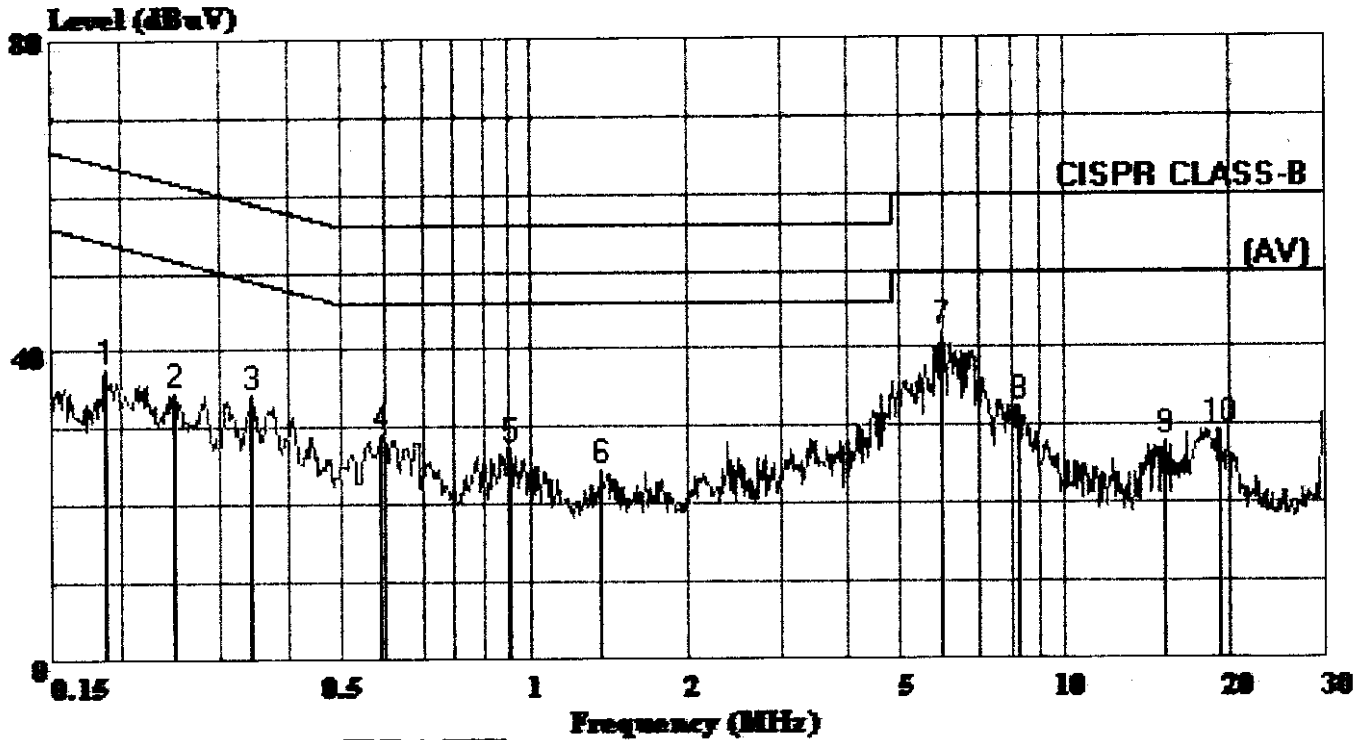
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TEL:886-2-6922097 FAX:886-2-6956236

Data#: 840 File#: cispr22b.EMI

Date: 1999-06-23 Time: 13:48:47



PEP Testing Laboratory (EMI 4:JEFF)

Trace: 839

Ref Trace:

Condition: CISPR CLASS-B LISN.N NEUTRAL

EUT : MBK 680

Power: AC 115V/60Hz

Memo : Quasi Peak Value

PEP Testing Laboratory

Date of test: 6/23/1999

Data # : 840

EUT Model No: MBK 680

Phase : NEUTRAL

Detector : Q.P.

Frequency (MHz)	LISN Factor (dB)	Cable Loss (dB)	Meter read (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dBuV)
-----	-----	-----	-----	-----	-----	-----
0.188	0.73	0.78	36.40	37.91	64.11	-26.20
0.251	0.73	0.80	33.20	34.73	61.73	-27.00
0.346	0.73	0.90	32.80	34.43	59.05	-24.62
0.595	0.73	0.90	27.60	29.23	56.00	-26.77
1.010	0.72	0.90	25.60	27.22	56.00	-28.78
1.480	0.71	0.96	23.00	24.67	56.00	-31.33
6.089	0.66	1.00	40.60	42.26	60.00	-17.74
8.412	0.64	0.96	30.80	32.40	60.00	-27.60
15.388	0.61	0.80	26.60	28.01	60.00	-31.99
19.326	0.62	0.82	28.00	29.44	60.00	-30.56

Note: LISN Factor means LISN insertion loss .

PEP Testing Laboratory

REPORT NO. : 990186

RADIATED EMISSIONS TEST DATA

Antenna polarization : HORIZONTAL ; Test distance : 10 m ;

MODEL NO. : MBK 320

Freq. (MHz)	Level (dB)	Over Limit (dB)	Limit Line (dB)	Read Level (dB)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Azimuth (° angle)	Antenna High(m)
31.00	22.57	- 7.43	30.00	28.05	13.73	0.78	20.00	142.2	4.0
149.55	23.08	- 6.92	30.00	28.80	12.39	1.89	20.00	72.8	4.0
155.10	16.89	-13.11	30.00	22.39	12.50	2.00	20.00	168.3	3.9
182.55	15.88	-14.12	30.00	19.92	13.75	2.21	20.00	245.9	3.8
193.55	21.98	- 8.02	30.00	25.35	14.36	2.27	20.00	158.4	3.9
232.45	24.86	-12.14	37.00	26.31	15.99	2.56	20.00	347.2	3.9
270.99	20.99	-16.01	37.00	20.01	18.08	2.91	20.00	268.9	3.8
616.01	19.32	-17.68	37.00	16.79	18.91	3.62	20.00	57.2	4.0
752.87	20.14	-16.86	37.00	15.12	20.95	4.07	20.00	241.1	3.7
882.39	22.87	-14.13	37.00	14.24	24.23	4.40	20.00	184.3	3.6

Note :

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

PEP Testing Laboratory

REPORT NO. : 990186

RADIATED EMISSIONS TEST DATA

Antenna polarization : VERTICAL; Test distance : 10 m;

MODEL NO. : MBK 320

Freq. (MHz)	Level (dB)	Over Limit (dB)	Limit Line (dB)	Read Level (dB)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Azimuth (° angle)	Antenna High(m)
31.00	21.63	- 8.37	30.00	27.11	13.73	0.78	20.00	155.9	1.1
149.55	17.65	-12.35	30.00	23.37	12.39	1.89	20.00	261.1	1.0
155.10	19.65	-10.35	30.00	25.15	12.50	2.00	20.00	184.3	1.1
193.55	22.03	- 7.97	30.00	25.40	14.36	2.27	20.00	254.9	1.1
232.45	18.95	-18.05	37.00	20.40	15.99	2.56	20.00	161.1	1.1
270.99	17.32	-19.68	37.00	16.34	18.08	2.91	20.00	241.5	1.0
494.43	19.32	-17.68	37.00	18.97	17.18	3.18	20.00	172.9	1.1
671.96	20.84	-16.16	37.00	16.96	20.21	3.67	20.00	65.7	1.0
819.18	23.10	-13.90	37.00	16.14	22.56	4.40	20.00	24.5	1.0
958.38	24.45	-12.55	37.00	15.00	24.70	4.75	20.00	189.3	1.2

Note :

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

PEP Testing Laboratory

REPORT NO. : 990186

RADIATED EMISSIONS TEST DATA

Antenna polarization : HORIZONTAL ; Test distance : 10 m ;

MODEL NO. : MBK 520

Freq. (MHz)	Level (dB)	Over Limit (dB)	Limit Line (dB)	Read Level (dB)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Azimuth (° angle)	Antenna High(m)
31.00	23.54	- 6.46	30.00	29.02	13.73	0.78	20.00	188.9	4.0
149.55	19.69	-10.31	30.00	25.41	12.39	1.89	20.00	261.5	4.0
155.10	20.97	- 9.03	30.00	26.47	12.50	2.00	20.00	72.8	3.9
182.55	18.67	-11.33	30.00	22.71	13.75	2.21	20.00	114.3	3.8
193.55	23.58	- 6.42	30.00	26.95	14.36	2.27	20.00	314.9	3.9
232.45	22.84	-14.16	37.00	24.29	15.99	2.56	20.00	26.7	4.0
270.99	22.68	-14.32	37.00	21.70	18.08	2.91	20.00	155.2	3.8
616.01	20.13	-16.87	37.00	17.60	18.91	3.62	20.00	261.1	3.7
752.87	22.14	-14.86	37.00	17.12	20.95	4.07	20.00	193.1	3.7
882.39	24.09	-12.91	37.00	15.46	24.23	4.40	20.00	158.7	3.6

Note :

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

PEP Testing Laboratory

REPORT NO. : 990186

RADIATED EMISSIONS TEST DATA

Antenna polarization : VERTICAL ; Test distance : 10 m ;

MODEL NO. : MBK 520

Freq. (MHz)	Level (dB)	Over Limit (dB)	Limit Line (dB)	Read Level (dB)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Azimuth (° angle)	Antenna High(m)
31.00	22.03	- 7.97	30.00	27.51	13.73	0.78	20.00	115.7	1.0
149.55	18.62	-11.38	30.00	24.34	12.39	1.89	20.00	241.2	1.1
155.10	22.14	- 7.86	30.00	27.64	12.50	2.00	20.00	168.9	1.2
193.55	22.98	- 7.02	30.00	26.35	14.36	2.27	20.00	261.1	1.0
232.45	16.58	-20.42	37.00	18.03	15.99	2.56	20.00	157.3	1.1
270.99	20.36	-16.64	37.00	19.38	18.08	2.91	20.00	248.9	1.2
494.43	20.13	-16.87	37.00	19.78	17.18	3.18	20.00	161.4	1.1
671.96	22.31	-14.69	37.00	18.43	20.21	3.67	20.00	241.1	1.0
819.18	24.13	-12.87	37.00	17.17	22.56	4.40	20.00	169.3	1.1
958.38	25.34	-11.66	37.00	15.89	24.70	4.75	20.00	58.4	1.0

Note :

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

PEP Testing Laboratory

REPORT NO. : 990186

RADIATED EMISSIONS TEST DATA

Antenna polarization : HORIZONTAL; Test distance : 10 m;

MODEL NO. : MBK 680

Freq. (MHz)	Level (dB)	Over Limit (dB)	Limit Line (dB)	Read Level (dB)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Azimuth (° angle)	Antenna High(m)
31.00	23.96	- 6.04	30.00	29.44	13.73	0.78	20.00	48.3	4.0
149.55	22.45	- 7.55	30.00	28.17	12.39	1.89	20.00	181.5	3.9
155.10	19.98	-10.02	30.00	25.48	12.50	2.00	20.00	161.1	3.9
182.55	21.88	- 8.12	30.00	25.92	13.75	2.21	20.00	124.5	3.9
193.55	24.32	- 5.68	30.00	27.69	14.36	2.27	20.00	347.3	4.0
232.45	28.90	- 8.10	37.00	30.35	15.99	2.56	20.00	261.5	3.8
270.99	25.36	-11.64	37.00	24.38	18.08	2.91	20.00	197.3	3.7
616.01	22.53	-14.47	37.00	20.00	18.91	3.62	20.00	154.2	3.8
752.87	24.02	-12.98	37.00	19.00	20.95	4.07	20.00	241.1	3.6
882.39	24.63	-12.37	37.00	16.00	24.23	4.40	20.00	111.3	3.5

Note :

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

PEP Testing Laboratory

REPORT NO. : 990186

RADIATED EMISSIONS TEST DATA

Antenna polarization : VERTICAL ; Test distance : 10 m ;

MODEL NO. : MBK 680

Freq. (MHz)	Level (dB)	Over Limit (dB)	Limit Line (dB)	Read Level (dB)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Azimuth (° angle)	Antenna High(m)
31.00	23.85	- 6.15	30.00	29.33	13.73	0.78	20.00	111.2	1.0
149.55	19.94	-10.06	30.00	25.66	12.39	1.89	20.00	261.5	1.1
155.10	24.13	- 5.87	30.00	29.63	12.50	2.00	20.00	172.8	1.2
193.55	23.54	- 6.46	30.00	26.91	14.36	2.27	20.00	111.4	1.0
232.45	24.95	-12.05	37.00	26.40	15.99	2.56	20.00	116.9	1.1
270.99	19.63	-17.37	37.00	18.65	18.08	2.91	20.00	172.5	1.2
494.43	22.20	-14.80	37.00	21.85	17.18	3.18	20.00	28.7	1.0
671.96	24.14	-12.86	37.00	20.26	20.21	3.67	20.00	165.4	1.0
819.18	25.96	-11.04	37.00	19.00	22.56	4.40	20.00	244.3	1.0
958.38	26.10	-10.90	37.00	19.65	24.70	4.75	20.00	190.1	1.2

Note :

1. Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
2. Over Limit = Level - Limit Line

PEP Testing Laboratory

REPORT NO. : 990186

APPENDIX B. 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	HP8591A(9K~1.8GHZ)	Apr. 15, 2000	3225A03039
Spectrum Analyzer	R3261A (9K~2.6GHZ)	Apr. 15, 2000	91720076
EMCO L.I.S.N.	3825/2 (10K~30MHZ)	Apr. 15, 2000	9311-2150
Anritsu Pre-Amp.	MH648A(100K~1.4GHZ)	Sep. 20, 1999	M40076
COM-Power Horn	AH-118 (1G~18GHZ) Antenna		10056
EMCO Dipole	3121C (20M~1GHZ) Antenna	May. 22, 2000	9611-1230
EMCO Biconical	3110B (30M~300M) Antenna	Mar. 10, 2000	2932
EMCO Log-Periodic	3146A (300M~1GHZ) Antenna	Apr. 14, 2000	1384