PEP Testing Laboratory

RFI / EMI TEST REPORT

APPLICANT	:	ULTIMA ELECTRONICS CORP.
E. U. T.	:	MOUSE
TRADE NAME	:	N/A
FCC ID	:	ITEUECUM990P
REGULATION	:	CFR 47 , Part 15 Subpart B , **Class B**
TEST SITE	:	PEP Testing Laboratory
TEST ENGINEER	:	Jason Gong
TEST DATE	:	8 / 3 / 1998
ISSUED DATE	:	AUG. / 13 / 1998
REPORT No.	:	980424

FEDERAL COMMUNICATIONS COMMISSION

7435 Oakland Mills Road
Columbia, MD 21046
Telephone: 301-725-1585 (ext-218)
Facsimile: 301-344-2050

November 25, 1996

IN REPLY REFER TO
31040/SIT
1300F2

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. Y. Tsui

Re: Measurement facility located at above address
(3 meter site)

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 or notification under Parts 15 or 18 of the Commission's Rules. Our list will also indicate that the facility complies with the radiated and AC line conducted test site criteria in ANSI C63.4-1992. Please note that this filing must be updated for any changes made to the facility, and at least every three years the data on file must be certified as current.

Per your request, the above mentioned facility has been also added to our list of those who perform these measurement services for the public on a fee basis. This list is published periodically and is also available on the Laboratory's Public Access Link as described in the enclosed Public Notice.

Sincerely,

Thomas W. Phillips
Electronics Engineer
Customer Service Branch

Enclosure:
PAL PN

PEP Testing Laboratory

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 : **ULTIMA ELECTRONICS CORP. ***
PRODUCT : **MOUSE ***
FCC ID : **ITEUECUM990P ***
MODEL : **UM990P ***

M. Y. TSUI
Manager

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

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1. GENERAL

1.1 GENERAL INFORMATION:

APPLICANT : ULTIMA ELECTRONICS CORP.

7F, NO. 100, LI DE CHUNG HO CITY,
TAIPEI HSIEN, TAIWAN R. O. C.

MANUFACTURER : ULTIMA ELECTRONICS CORP.

7F, NO. 100, LI DE CHUNG HO CITY,
TAIPEI HSIEN, TAIWAN R. O. C.

MEASUREMENT PROCEDURE : ANSI C63 , 4 - 1992

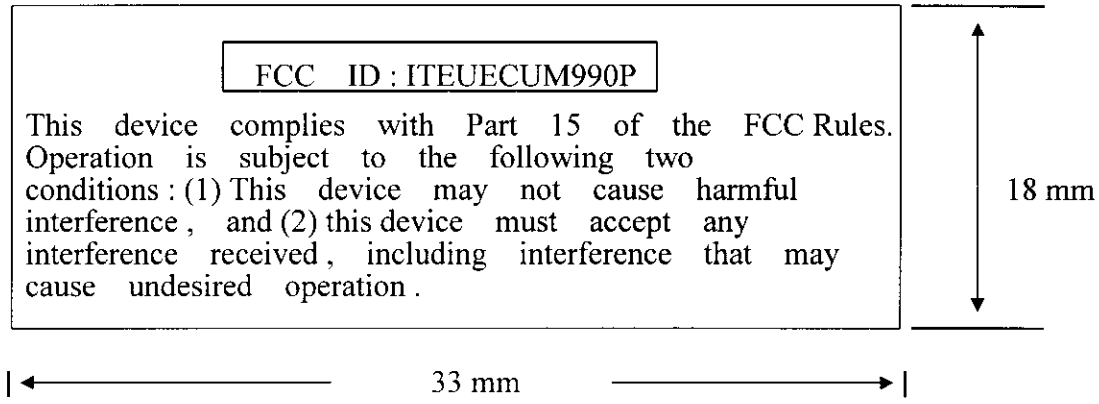
TESTED FOR COMPLIANCE WITH : Title 47 of CFR
Part 15 , Subpart B , Class B

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.

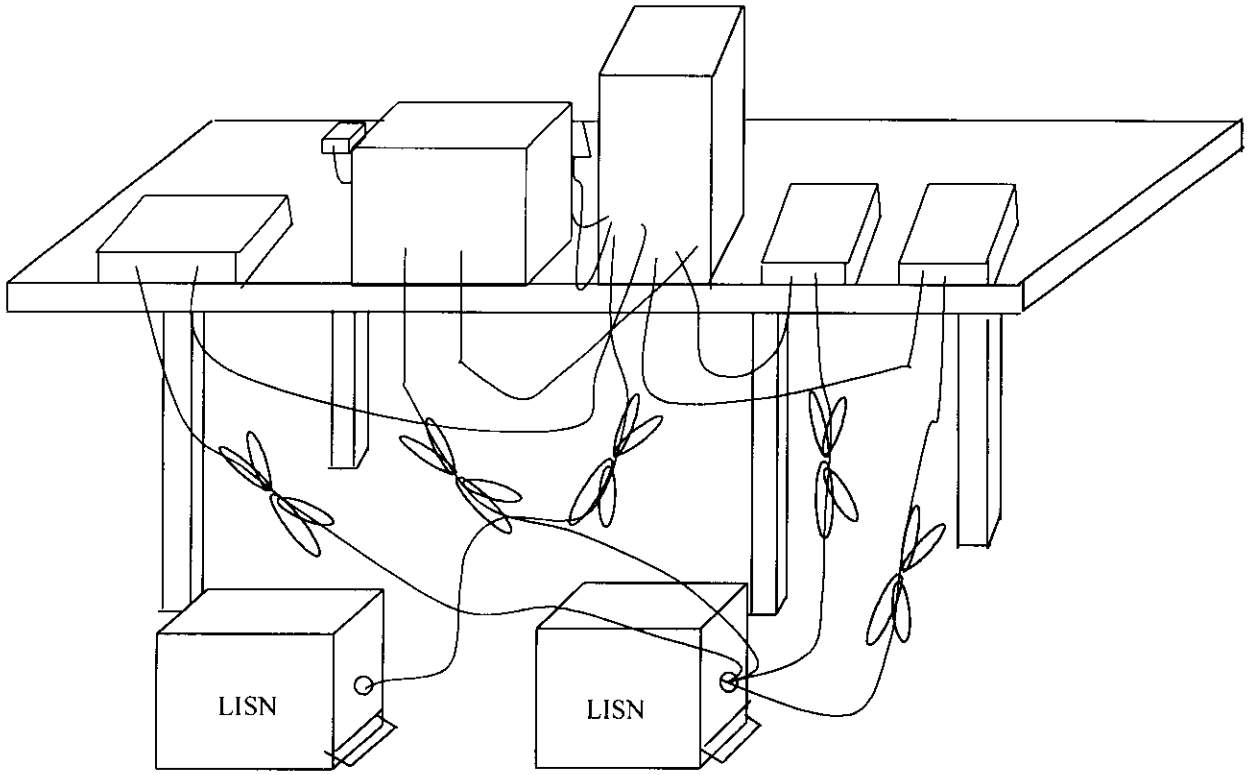
Warning : A shielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord be used.

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.

2. CONDUCTION EMISSIONS TEST

2.1 GENERAL SETUP OF THE TEST FACILITIES



2.2 TEST PROCEDURES

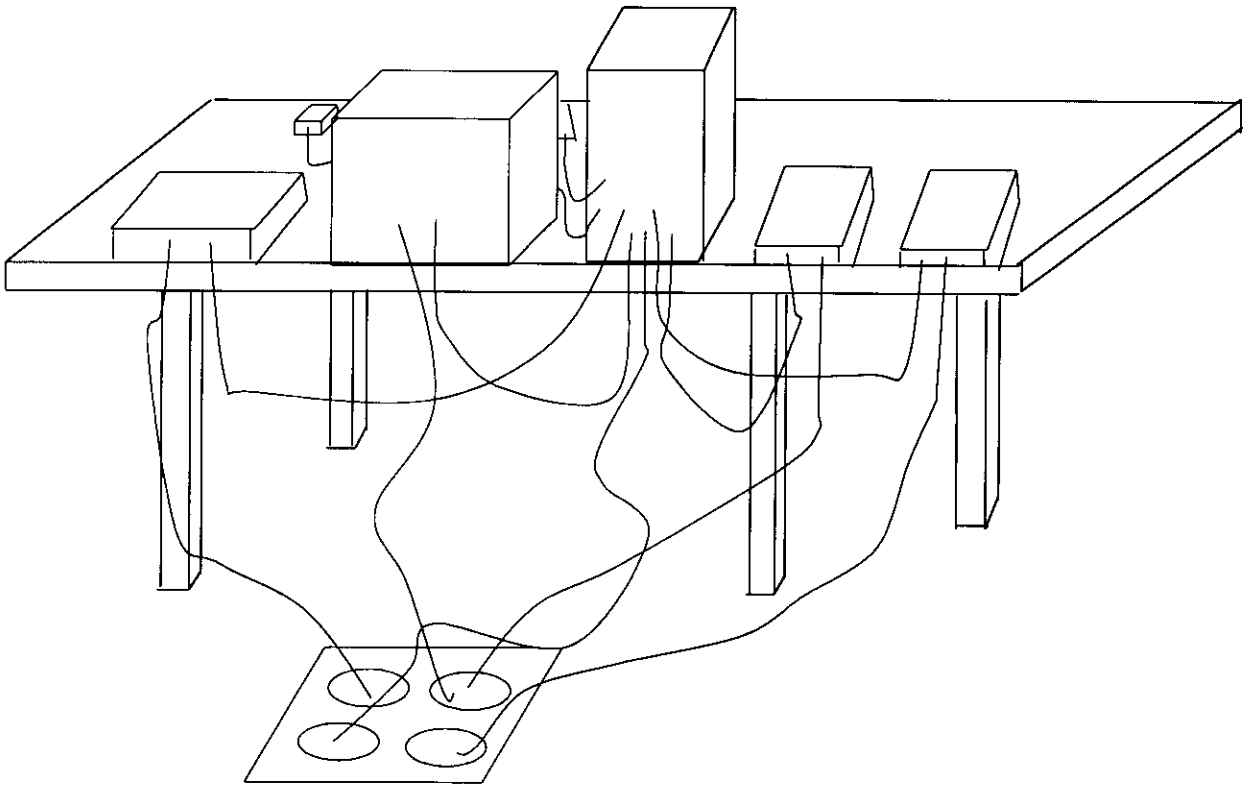
The system was setup as described above, with the EMI diagnostic software.
Both the line of power cord, hot and neutral, were run with the EMI tests software.

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 EUT was two keys PC mouse with PS/2 connector , for more detail information about the EUT , please refer user's manual .

(B) One PC systems was set up , the EUT was inserted into mouse port on the PC and designated as COM.1 , we enabled all the peripheral devices and kept the EUT data cable as close as PC chassis possible during the test .

(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 in page C-1.*
For the radiated emission test , the worst data recorded in the page R-1.*

** **I / O DATA CABLES INFORMATIONS** - - -

Please refer the page 9 .

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 : N/A

SUPPORT UNIT 2. ---- MONITOR

Manufacturer : Acer Peripherals Inc.
Model Number : 7134T
Power Supply Type : Switching
Power Cord : Shielded, Detachable, 1.2m
Data Cable : Shielded, Undetachable, 1m
FCC ID : JVP7134T

SUPPORT UNIT 3. ---- PRINTER

Manufacturer : Hewlett-Packard Singapore Pte Ltd.
Model Number : HP 2225C+
Power Supply Type : Linear
Power Cord : Non-Shielded, Detachable, 1.2m
Data Cable : Shielded, Detachable, 1m. 2464
FCC ID : DSI6XU2225

SUPPORT UNIT 4. ---- 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 5. ---- KEYBOARD

Manufacturer : Acer Peripherals Inc.
Model Number : 6311-KW
Power Supply Type : N/A
Power Cord : N/A
Data Cable : Shielded, Undetachable, 1.2m
FCC ID : JVPKBS-WIN

EQUIPMENT UNDER TEST ---- MOUSE

Manufacturer : ULTIMA ELECTRONICS CORP.
Model Number : UM990P
Data Cable : Shielded
FCC ID : ITEUECUM990P

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

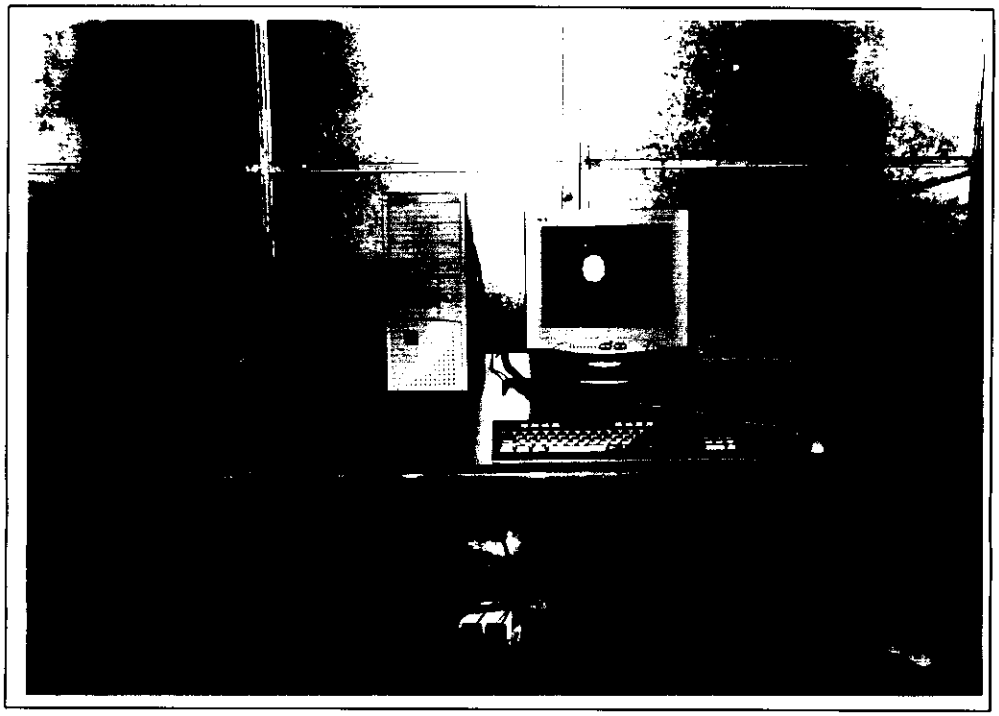
The else descriptions : N/A

Conducted Emission Test Photo. : **Page C-1**
Test Data : Hot C-1.1
Neutral C-1.2

Radiated Emission Test Photo. : **Page R-1**
Test Data : Horizontal R-1.1
Vertical R-1.2

CONDUCTED TEST CONFIGURATION PHOTO.

< FRONT VIEW >



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CONDUCTED EMISSIONS TEST DATA

Note : HOT LINE TEST

Freq. (MHz)	Level (dB)	Over Limit (dB)	Limit Line (dB)	Read Level (dB)	Probe Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)
0.480	33.44	-14.56	48.00	21.41	0.30	1.73	-10.00
6.981	34.95	-13.05	48.00	22.00	1.10	1.85	-10.00
10.438	34.56	-13.44	48.00	21.80	0.94	1.81	-10.00
11.295	33.86	-14.14	48.00	21.01	1.02	1.83	-10.00
12.772	35.59	-12.41	48.00	22.60	1.14	1.84	-10.00
13.452	34.46	-13.54	48.00	21.40	1.20	1.86	-10.00
14.870	35.39	-12.61	48.00	22.20	1.90	1.86	-10.00
16.023	34.03	-13.97	48.00	20.80	1.32	1.90	-10.00
22.819	32.36	-15.64	48.00	19.00	1.28	2.08	-10.00
27.134	32.51	-15.49	48.00	19.00	1.31	2.20	-10.00

Note :

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

CONDUCTED EMISSIONS TEST DATA

Note : NEUTRAL LINE TEST

Freq. (MHz)	Level. (dB)	Over Limit (dB)	Limit Line (dB)	Read Level (dB)	Probe Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)
1.780	34.89	-13.11	48.00	22.21	0.91	1.77	-10.00
9.817	36.90	-11.10	48.00	24.20	0.88	1.82	-10.00
11.797	37.10	-10.90	48.00	24.20	1.07	1.83	-10.00
13.097	36.62	-11.38	48.00	23.60	1.17	1.85	-10.00
14.338	38.55	- 9.45	48.00	25.40	1.26	1.89	-10.00
15.225	37.81	-10.19	48.00	24.60	1.31	1.90	-10.00
17.205	35.28	-12.72	48.00	22.00	1.35	1.94	-10.00
18.180	33.32	-14.68	48.00	20.00	1.37	1.95	-10.00
24.120	33.35	-14.65	48.00	20.00	1.23	2.12	-10.00
25.154	35.16	-12.84	48.00	21.80	1.21	2.16	-10.00

Note :

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

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RADIATED EMISSIONS TEST DATA

Antenna polarization : HORIZONTAL ; Test distance : 3 m ;

Freq. (MHz)	Level (dB)	Over Limit (dB)	Limit Line (dB)	Read Level (dB)	Probe Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)
67.230	20.53	-19.47	40.00	42.17	-3.02	1.37	20.00
100.380	19.65	-23.85	43.50	37.82	0.13	1.70	20.00
108.030	18.22	-25.28	43.50	34.54	1.88	1.80	20.00
134.380	17.85	-25.65	43.50	34.90	0.81	2.13	20.00
168.040	27.94	-15.56	43.50	42.44	3.10	2.40	20.00
287.200	21.78	-24.22	46.00	35.44	2.86	3.48	20.00
301.600	21.52	-24.48	46.00	34.98	2.94	3.61	20.00
335.200	20.02	-25.98	46.00	33.10	3.21	3.72	20.00
371.200	21.78	-24.22	46.00	33.99	3.97	3.82	20.00
466.400	19.23	-26.77	46.00	28.96	5.96	4.31	20.00

Note :

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

PEP Testing Laboratory

RADIATED EMISSIONS TEST DATA

Antenna polarization : VERTICAL ; Test distance : 3 m ;

Freq. (MHz)	Level (dB)	Over Limit (dB)	Limit Line (dB)	Read Level (dB)	Probe Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)
48.190	33.96	- 6.04	40.00	53.05	-0.15	1.06	20.00
102.080	26.69	-16.81	43.50	44.58	0.38	1.73	20.00
108.030	32.24	-11.26	43.50	48.56	1.88	1.80	20.00
168.040	29.15	-14.35	43.50	43.65	3.10	2.40	20.00
186.740	28.10	-15.40	43.50	41.15	4.44	2.50	20.00
269.600	18.06	-27.94	46.00	29.01	5.74	3.31	20.00
287.200	20.41	-25.59	46.00	31.13	5.80	3.48	20.00
303.200	19.53	-26.47	46.00	30.04	5.88	3.61	20.00
337.600	19.28	-26.72	46.00	29.33	6.23	3.72	20.00
505.600	21.99	-24.01	46.00	27.83	9.63	4.53	20.00

Note :

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

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Measuring Instruments Listing :

Instrument	Manufacturer & Model	Serial Number	Band Width	Next Cal. Date	Cal. Interval
Receiver	ROHDE & SCHWARZ ESVS 30	8633421012	20 MHz to 1 GHz	Nov. 2 1998	1 year
Spectrum * Analyzer	Advantest 3261A	91720076	9 MHz to 2.6 GHz	Dec. 03 1998	1 year
Spectrum * Analyzer	HP 8591A	3225A03039	9 MHz to 1.8 GHz	Jan. 04 1999	1 year
Bi-Log Antenna	CHASE Electr. CBL 6111B	1968	20 MHz to 1 GHz	Aug. 23 1998	1 year
Horn Antenna	COM-Power AH-118	10056	1 GHz to 18 GHz	Jun. 16 1999	1 year
LISN	EMCO 3825/2	93112150	9 KHz to 100 MHz	Oct. 31 1998	1 year
LISN	Kokuyo KNW-242	8-837-7	9 KHz to 30 MHz	Jan. 03 1999	1 year

* The Model 3261A has build-in the detector function of the average and additional Q. P. adapter inside the spectrum analyzer.
* The Model 8591A has build-in the detector function of the Q. P. adapter.