RFI / EMI TEST REPORT

APPLICANT	:	MAXTRONIC INTERNATION CO., LTD.
E. U. T.	:	Disk Array System
TRADE NAME	:	N/A
FCC ID	:	NKF-INDY2600
REGULATION	:	CFR 47 , Part 15 Subpart B , **Class B**
TEST SITE	:	PEP Testing Laboratory
TEST ENGINEER	:	
TEST DATE	:	JUL. 04, 2002
ISSUED DATE	:	JUL. / 25 / 2002
REPORT No.	:	E910365

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 : MAXTRONIC INTERNATION CO., LTD.*
PRODUCT : Disk Array System*
FCC ID : NKF-INDY2600 *
MODEL : INDY-2600 *

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

TABLE OF CONTENTS

1. GENERAL

1.1 GENERAL INFORMATION:

APPLICANT : MAXTRONIC INTERNATION CO., LTD.

4FL., NO. 529, CHUNG CHENG RD., HSIN TIEN CITY, TAIPEI HSIEN, TAIWAN, R. O. C.

MANUFACTURER : MAXTRONIC INTERNATION CO., LTD.

4FL., NO. 529, CHUNG CHENG RD., HSIN TIEN CITY, TAIPEI HSIEN, TAIWAN, R. O. C.

MEASUREMENT PROCEDURE : ANSI C63 , 4 - 1992

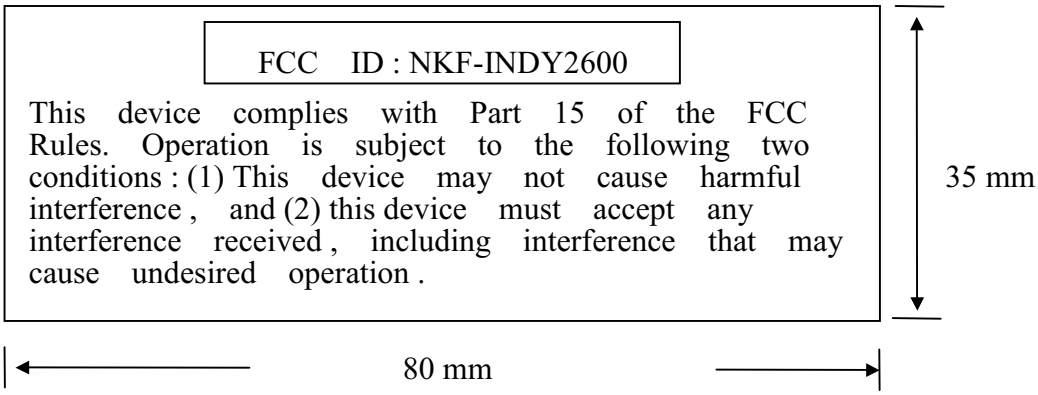
TESTED FOR COMPLIANCE WITH : Title 47 of CFR Part 15 , Subpart B , Class B

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 .

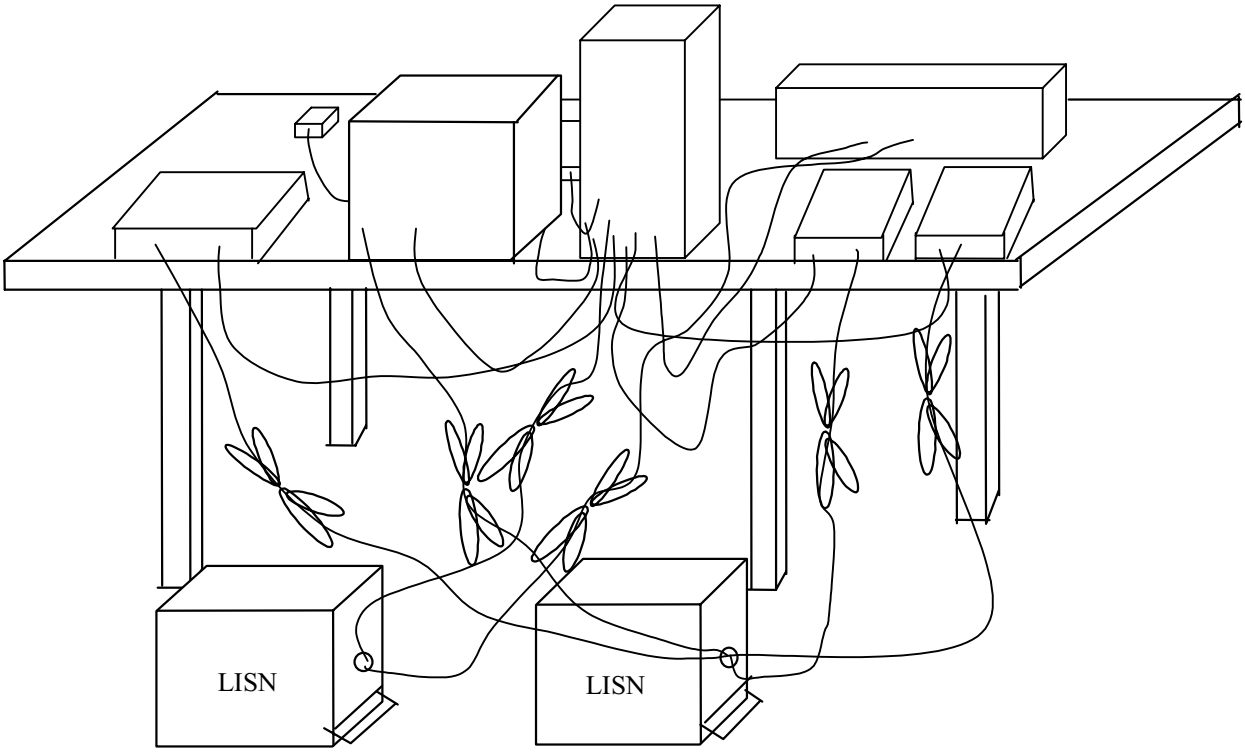
Warning : A shielded- type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception . It is essential that only the supplied power cord be used .

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. CONDUCTED EMISSION TEST

2.1 GENERAL SETUP OF THE TEST FACILITIES



2.2 TEST PROCEDURES

Conducted Emission Test Procedures

The EUT is placed in the center of a non-conducting table which size is 1m by 1.5m and 80cm (or may be enlarged , if necessary) above the ground plane , it's rear shall be flush with the rear of the table and a 10cm separation spaces between the other peripheral devices .

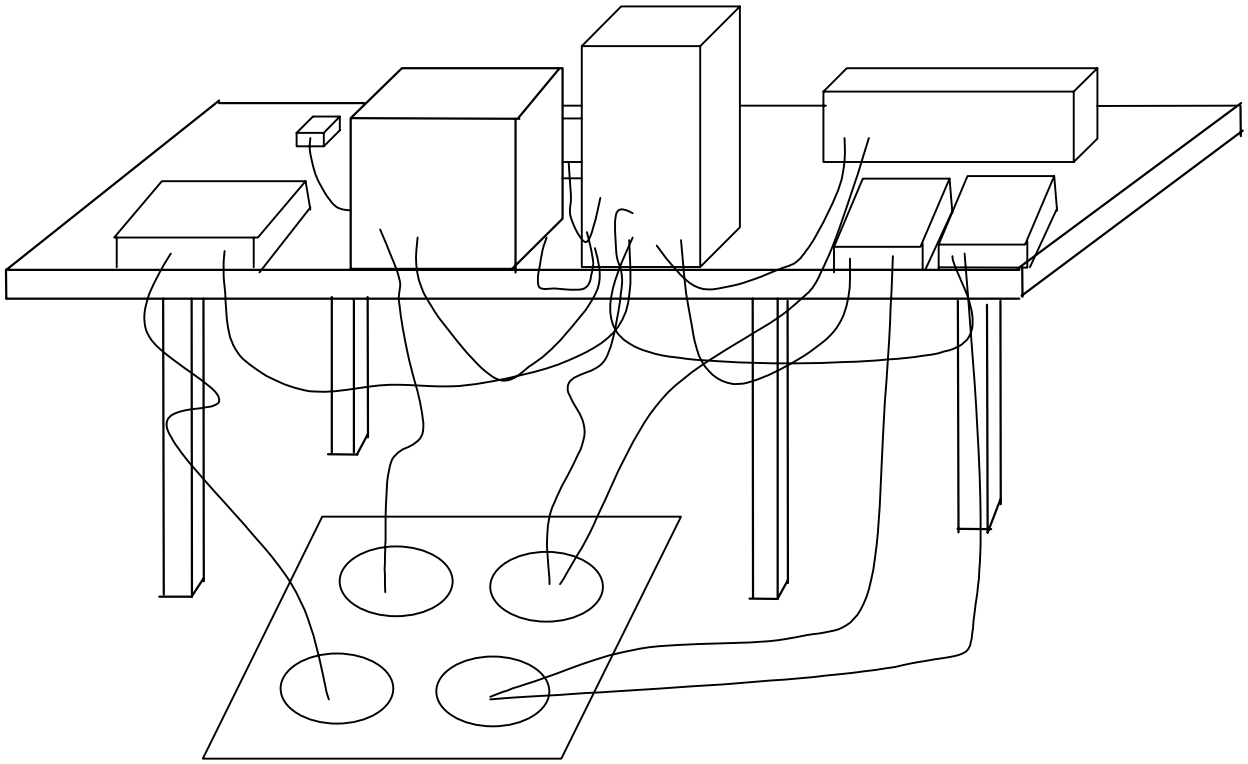
The preliminary tests as specified in ANSI C63.4 (section 7.2.3) should be carried out while varying cable positions in order to determine the maximum or near-maximum emission level .

For the Final tests , based on the preliminary tests of the EUT , the one EUT and cable configuration and mode of operation that produced the emission with the highest amplitude relative to the limit is selected . On all current-carrying conductors of the power cords that comprise the EUT is then performed without variation of the EUT configuration , cable positions , or EUT mode of operation .

The highest emissions data were recorded in this RFI test report .

3. RADIATED EMISSION TEST

3.1 GENERAL SETUP OF THE FACILITIES



3.2 TEST PROCEDURES

Radiated Emission Test Procedures

The EUT is placed in the center of a non-conducting table which size is 1m by 1.5m and 80cm (or may be enlarged , if necessary) above the ground plane , it's rear shall be flush with the rear of the table and a 10cm separation spaces between the other peripheral devices .

The preliminary tests is performed in 3m standard anechonic chamber and as specified in ANSI C63.4 (section 8.3.1.1) should be carried out while varying cable positions in order to determine the maximum or near-maximum emission level . Method of maximization follow ANSI C63.4 Appendix D .

For the final test , the EUT is relocated from chamber to open field site ; then , based on the preliminary tests record , the highest emission shall be re-maximized before final radiated emissions measurements are performed . However , antenna height (1m to 4m) and polarity (Horizontal and Vertical) and EUT azimuth (0 degree to 360 degree) are to be varied .

The highest emissions data were recorded in this RFI test report .

4. DESCRIPTION FOR EUT TESTING CONFIGURATION

** **Operational description - - - -**

The EUT is Disk Array System, FCC ID: NKF-INDY2600, model INDY-2600. The EUT that consists of 16 HDD trays is based on the idea of combining multiple disk drives into an array of disk drives and it appears to the host computer as a single logical storage unit for data security, large storage capacity and high system performance purpose. Setup configuration can be performed in terminal emulation mode by connecting EUT RS232 port to host computer COM port. The LCD status panel displays comprehensive readout of operating status and the HDD LED indicators on each HDD tray display the individual HDD LED status. Four SCSI channel ports are available for the use of data transmitting from host computer to EUT. Three power supply units can provide full range AC electricity input from AC 90V to 260V. For more detail information about the EUT, please refer to the user's manual.

Test method:

(A) The EUT configuration was setup by the following steps for test.

1. Insert one HDD into the tray.
2. With two of four SCSI channel ports were sealed off, we connected one SCSI channel port to PC and the other was connected to a loop.
3. Terminate EUT RS232 port by RS232 data cable.

After PC was setup to identify and drive peripherals and EUT, we enabled EUT by files read/write between EUT and PC, and this could be performed by running batch program provided by applicant.

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

(C) 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.

(D) In the RFI test report, we provided the worst conducted emission testing data and radiated emission test data.

MaxTronic

Date: JUL. 23, 2002

Dear Madam / Sir:

We declare that all of EMI suppression parts added on the EUT, FCC ID: NKF-INDY2600, will be put on mass production product.

(A) Mount three suppression cores to SCSI interface cable and RS232 interface cable which will be sold along with EUT shown as photo2.
(B) Mount one suppression core to power cord of power supply unit inside EUT shown as photo 3.

Sincerely,

Jack Tung

JACK TUNG / TECHNICAL ENGINEER

5. SUPPORTING DEVICES TO TEST

SUPPORT UNIT 1. - - - - PERSONAL COMPUTER

Manufacturer : LEMEL
Model Number : LMIH1A2
Power Supply Type : Switching
Power Cord : Non-Shielded, Detachable, 1.8m
Data Cable : N/A
FCC ID : Declaration of Conformity(DoC)

SUPPORT UNIT 2. - - - - MONITOR

Manufacturer : SAMSUNG
Model Number : 550S
Power Supply Type : Switching
Power Cord : Non-Shielded, Detachable, 1.8m
Data Cable : Shielded, Non-detachable, 1.2m
FCC ID : Declaration of Conformity(DoC)

SUPPORT UNIT 3. - - - - PRINTER

Manufacturer : Hewlett-Packard Singapore Pte Ltd.
Model Number : C2642E
Power Supply Type : Linear, 30Vdc O/P
Power Cord : Non-Shielded, Detachable, 1.8m
Data Cable : Shielded, Detachable, 1.2m
FCC ID : Declaration of Conformity(DoC)

SUPPORT UNIT 4. - - - - MODEM

Manufacturer : ACEEX

Model Number : 1414

Power Supply Type : Linear

Power Cord : Non-Shielded, Detachable, 1.7m

Data Cable : Shielded, Detachable, 1m

FCC ID : IFAXDM1414

SUPPORT UNIT 5. - - - - KEYBOARD

Manufacturer : BTC

Model Number : 5121W

Power Supply Type : N/A

Power Cord : N/A

Data Cable : Shielded, Non-detachable, 1.6m

FCC ID : E5XKB5121WTH0110

SUPPORT UNIT 6. - - - - MOUSE

Manufacturer : LOGITECH

Model Number : M-S43

Power Supply Type : +5Vdc from PS2 of PC

Power Cord : N/A

Data Cable : Shielded, Non-detachable, 1.8m

FCC ID : DZL211106

SUPPORT UNIT 7. - - - - SCSI CARD

Manufacturer : MAXTRONIC

Model Number : N/A

Power Supply Type : N/A

Power Cord : N/A

Data Cable : N/A

FCC ID : Declaration of Conformity(DoC)

EQUIPMENT UNDER TEST - - - -

Manufacturer : MAXTRONIC INTERNATION CO., LTD.

Model Number : INDY-2600

Data Cable : N/A

FCC ID : NKF-INDY2600

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 TEST CONFIGURATION PHOTO.

< FRONT VIEW >

CONDUCTED EMISSIONS TEST DATA

ALL POWER ARE ON

Note : HOT LINE TEST

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Read Level (dBuV)	Probe Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)
1.178	26.40	-21.60	48.00	26.00	0.10	0.30	-10.00
2.513	24.89	-23.11	48.00	24.41	0.13	0.35	-10.00
4.501	21.83	-26.17	48.00	21.20	0.23	0.40	-10.00
7.687	20.34	-27.66	48.00	19.60	0.34	0.40	-10.00
11.021	24.15	-23.85	48.00	23.20	0.45	0.50	-10.00
14.213	22.30	-25.70	48.00	21.40	0.58	0.32	-10.00
17.944	26.16	-21.84	48.00	25.00	0.66	0.50	-10.00
21.373	21.56	-26.44	48.00	20.20	0.76	0.60	-10.00
25.456	24.69	-23.31	48.00	23.20	0.89	0.60	-10.00
29.527	23.09	-24.91	48.00	21.59	0.81	0.69	-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 (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Read Level (dBuV)	Probe Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)
1.184	26.40	-21.60	48.00	26.00	0.10	0.30	-10.00
2.513	24.66	-23.34	48.00	24.21	0.10	0.35	-10.00
4.407	21.52	-26.48	48.00	21.00	0.12	0.40	-10.00
10.508	24.41	-23.59	48.00	23.60	0.31	0.50	-10.00
14.063	22.10	-25.90	48.00	21.41	0.38	0.31	-10.00
17.475	25.55	-22.45	48.00	24.59	0.46	0.50	-10.00
20.056	21.86	-26.14	48.00	20.80	0.50	0.56	-10.00
22.775	21.56	-26.44	48.00	20.40	0.56	0.60	-10.00
26.699	23.76	-24.24	48.00	22.60	0.56	0.60	-10.00
28.908	22.79	-25.21	48.00	21.60	0.52	0.67	-10.00

Note :

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

CONDUCTED EMISSIONS TEST DATA

The first and second power are off, the third is on

Note : HOT LINE TEST

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Read Level (dBuV)	Probe Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)
0.474	35.60	–12.40	48.00	35.40	0.10	0.10	-10.00
1.178	28.60	-19.40	48.00	28.20	0.10	0.30	-10.00
2.513	24.89	-23.11	48.00	24.41	0.13	0.35	-10.00
4.478	21.63	-26.37	48.00	21.01	0.22	0.40	-10.00
9.757	23.69	-24.31	48.00	22.80	0.39	0.50	-10.00
14.517	21.34	-26.66	48.00	20.39	0.59	0.36	-10.00
17.661	27.56	-20.44	48.00	26.40	0.66	0.50	-10.00
21.830	22.18	-25.82	48.00	20.80	0.78	0.60	-10.00
26.841	24.06	-23.94	48.00	22.60	0.86	0.60	-10.00
28.452	23.48	-24.52	48.00	22.00	0.83	0.65	-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 (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Read Level (dBuV)	Probe Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)
1.184	27.40	-20.60	48.00	27.00	0.10	0.30	-10.00
2.513	24.66	-23.34	48.00	24.21	0.10	0.35	-10.00
4.384	20.92	-27.08	48.00	20.40	0.12	0.40	-10.00
7.526	19.64	-28.36	48.00	19.00	0.24	0.40	-10.00
9.861	24.40	-23.60	48.00	23.60	0.30	0.50	-10.00
14.750	19.77	-28.23	48.00	19.00	0.40	0.37	-10.00
17.383	24.55	-23.45	48.00	23.60	0.45	0.50	-10.00
20.814	21.52	-26.48	48.00	20.41	0.52	0.59	-10.00
23.018	21.77	-26.23	48.00	20.61	0.56	0.60	-10.00
26.139	23.17	-24.83	48.00	22.00	0.57	0.60	-10.00
28.603	23.38	-24.62	48.00	22.20	0.52	0.66	-10.00

Note :

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

RADIATED TEST CONFIGURATION PHOTO.

< FRONT VIEW >

< REAR VIEW >

RADIATED EMISSIONS TEST DATA

Antenna polarization : HORIZONTAL ; Test distance : 3 m ;

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dB)	Probe Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)
119.980	30.98	-12.52	43.50	38.78	12.10	0.20	20.10
150.000	31.24	-12.26	43.50	41.14	9.70	0.40	20.00
200.258	32.37	-11.13	43.50	42.47	9.20	0.70	20.00
240.022	39.50	-6.50	46.00	47.05	11.33	0.92	19.80
249.999	40.53	-5.47	46.00	46.63	12.70	1.00	19.80
598.221	41.05	-4.95	46.00	39.91	18.14	2.49	19.49
649.591	41.60	-4.40	46.00	39.34	19.20	2.86	19.80
674.779	43.52	-2.48	46.00	41.77	18.81	3.03	20.09
748.996	38.32	-7.68	46.00	33.68	20.37	3.20	18.93

Note :

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

RADIATED EMISSIONS TEST DATA

Antenna polarization : VERTICAL ; Test distance : 3 m ;

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dB)	Probe Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)
72.012	35.13	-4.87	40.00	49.68	5.51	0.10	20.16
120.016	31.59	-11.91	43.50	39.39	12.10	0.20	20.10
240.021	29.25	-16.75	46.00	36.80	11.33	0.92	19.80
249.998	31.99	-14.01	46.00	38.09	12.70	1.00	19.80
450.588	41.72	-4.28	46.00	43.11	16.40	2.11	19.90
624.060	36.40	-9.60	46.00	34.56	19.04	2.68	19.88
825.402	41.25	-4.75	46.00	37.03	20.39	3.12	19.29

Note :

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

APPENDIX A.
PHOTOS OF EUT APPEARANCE
< EUT FRONT VIEW >

< EUT REAR VIEW >

APPENDIX B.
List of Test Equipment

Test Mode	Instrument	Model No.	Serial No.	Next Cal. Date	Cal. Interval
Conduction (No.1)	R & S Receiver	ESHS10	830223/008	May 22, 2003	1Year
	Rolf Heine LISN	NNB-4/63TL	98008	Apr. 29, 2003	1Year
	R & S LISN	ESH3-Z5	844982/039	Jul. 25, 2002	1Year
	Spectrum Analyzer	R3261A	91720076	May 03, 2003	1Year
	RF Cable	Rg400	N/A	Jul. 08, 2003	1Year
	Schaffner ISN	T411	N/A	Jul. 01, 2003	1Year
Radiation (OP No.1)	R & S Receiver	ESVS30	863342/012	May 20,2003	1Year
	Anritsu Pre-Amp.	MH648A	M15080	Apr. 10, 2003	1Year
	R & S Pre-Amp.	ESMI-Z7	612278/011	Aug. 02, 2002	1Year
	Schaffner Antenna	CBL6112B (30MHz~2GHz)	2655	Jul. 27, 2003	1Year
	COM-Power Horn Ant.	AH-118 (1GHz~18GHz)	10095	May 21, 2003	1Year
	EMCO RF Cable	175series	NO. 1	Apr. 10, 2003	1Year
	Schwarzbeck Precision Dipole Ant	VHAP (30MHz~1GHz)	970 + 971 953 + 954	Jun. 27, 2003	3Year
	R &S Signal Generator	SMY01	841104/037	Apr. 29, 2003	1Year
	RF Cable	No. 1	N/A	Jul. 26, 2003	1Year
	EMCO Antenna	3142B (26MHz~2GHz)	9904-1307	Jul. 01, 2003	1Year