

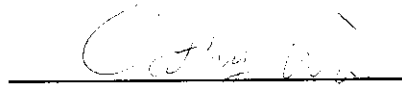


## CERTIFICATION

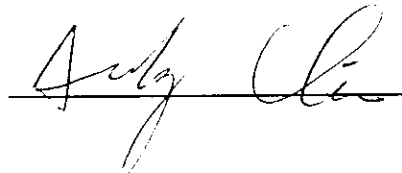
**We hereby certify that:**

The test data , data evaluation , test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (1992) and the energy emitted by the sample EUT tested as described in this report is in compliance with CLASS B conducted and radiated emission limits of FCC Rules Part 15 , Subpart B.

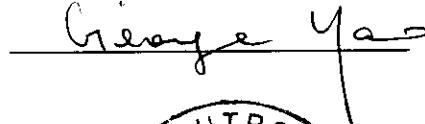
Prepared by : Cathy Wu



Reviewed by : Andy Chiu

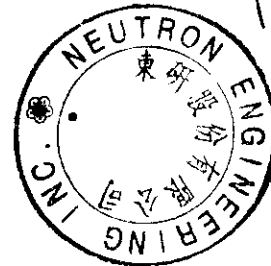


Approved by : George Yao



Issued Date : June 23, 1998

Report No. : NEI-FCCB-98097



Company Stamp :



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## **1. GENERAL INFORMATION**

### **1-1. Product Description**

The National Datacomm Corporation Model: NFE100TA, SFA110A (referred to as the EUT in this report ) are a Fast Ethernet Card, supports 10/100 Mbps, 32 bits PCI Slot based Local Bus. It complies with the IEEE 802.3 100 Base-TX and 10 Base-T standard, and supports ODI driver for Netware 3.X, 4.X; NDIS driver for LAN manager Microsoft Windows 95, Windows NT; Pocket driver for TCP/IP.

The EUT provides a RJ-45 connector for connection with a 10 Base-T/100 Base-TX Hub Via UTP cable.

A more detailed and/or technical description of EUT is attached in **User's Manual**.

### **1-2. Related Submittal(s) / Grant (s)**

#### **1-2-1. Models Covered**

Models covering in this test report is :  
NDC Brand : NFE100TA, SFA110A

#### **1-2-2. Models Difference**

The model SFA110A is identical to model NFE100TA except the model No designation.

**1-3. Tested System Details**

The FCC IDs for all equipments, plus descriptions of all cables used in the tested system (including inserted cards, which have grants) are:

Model No.	FCC ID	Equipment	Cable
NFE100TA <sup>(1)</sup>	IOUSFA11ØSØ1	LAN Card	Add-On Card , Cableless
Vectra VL5/57Series3	K4UVECTRAVL5	PC	Un-Shielded Power Cord.
NE64	KFBNE64	Monitor	Shielded Data Cable <sup>(2)</sup> Un-Shielded Power Cord
SERIES.2-7S	DZL6QBS2	Mouse	Shielded Data Cable
HP2225C+	DSI6XU2225	Printer	Shielded Serial Data Cable Un-Shielded Power Cord
AT-1200CK	E2O5OV1200CK	Modem	Shielded Parallel Data Cable Un-Shielded Power Cord
FDA-102A	F4Z4K3FDA-102A	Keyboard	Shielded Data Cable

Notes:

(1) EUT submitted for grant.

(2) Monitor's attached video cable without ferrite core.

**1-4. Test Methodology**

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (1992). Radiated testing was performed at an antenna to EUT distance 3 meters.

**1-5. Test Facility**

The open area test site and conducted measurement facility used to collect the radiated data is located on the address of No. 5, All 2, Lane 220, Kang Lo St., Nei Hwu, Taipei, Taiwan, R.O.C. of NEUTRON ENGINEERING INC. This site has been fully described in report dated Feb.4,1998 Submitted to your office, and accepted in a letter dated March 28, 1998 (31040/SIT-1300F2).

### 3. System Test Configuration

#### 3-1. Justification

The system was configured for testing in a typical fashion (as a customer would normally use it). The Lan Card was inserted to support equipment-personal computer. Peripherals of PC, such as monitor, modem, mouse, keyboard, and printer were contained in this system in order to comply with the ANSI C63.4 Rules requirement. The PC operated in the default 640X480/31.5Khz VGA Graphic mode. Further, an UTP cable was connected between the RJ-45 connector on EUT and a LAN server PC at remote station (faraway site). This operating Condition was tested and used to collect the included data.

#### 3-2. EUT Exercise Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The software, contained on a 3-1/2 inch disk, was inserted into driver A and is auto-starting on power-up. Once loaded, the program sequentially exercises each system component in turn. The sequence used is:

1. Read(write) from(to) mass storage device(Disk).
2. Read(write) from(to) remote station by EUT(Lan Card).
3. Send "H" pattern to video port device( Monitor).
4. Send " H " pattern to parallel port device(Printer).
5. Send " H " pattern to serial port device (Modem).
6. Repeated from 2 to 5 continuously.

As the Keyboard and mouse are strictly input devices, no data is transmitted to (from) them during test. They are, however, continuously scanned for data input activity.

**3-3. Special Accessories**

No any other special accessory used for compliance testing.

**3-4. Equipment Modifications**

No any other special accessory used for compliance testing.

Applicant Signature :

C. T. Wu

Date :

June 23, 1998

Type/Printed Name :

CHIN-TU WU

Position :

Managing Director



### 3.5 Configuration of Tested System

The configuration of tested system is described as the block diagram shown in next page Figure 3.1 and details information of I/O cable an power cord connection are tabulated as Table A and B. The monitor is powered from a floor mounted receptacle ( referred to as the wall outlet in the previous described )was tested.

**TABLE A - Test Equipment**

Item	Equipment	Mfr.	Model/Type No.	I/O Port	FCC ID	Remark
E-1	LAN Card	NDC	NFE100TA	Add-On Slot	IOUSFA11ØSØ1	EUT
E-2	PC	HP	Vectra VL5/57Series3		K4UVECTRAVL5	
E-3	Monitor	Chern-Yih	NE64	VGA Port	KFBNE64	
E-4	Mouse	Logitech	SERIES.2-7S	P/S 2 Port	DZL6QBS2	
E-5	Printer	HP	HP2225C+	Print Port	DSI6XU2225	
E-6	Modem x2	Datatronics	AT-1200CK	COM Port	E2O5OV1200CK	
E-7	Keyboard	Forward	FDA-102A	KB DIN Port	F4Z4K3FDA-102A	

**Remark:**

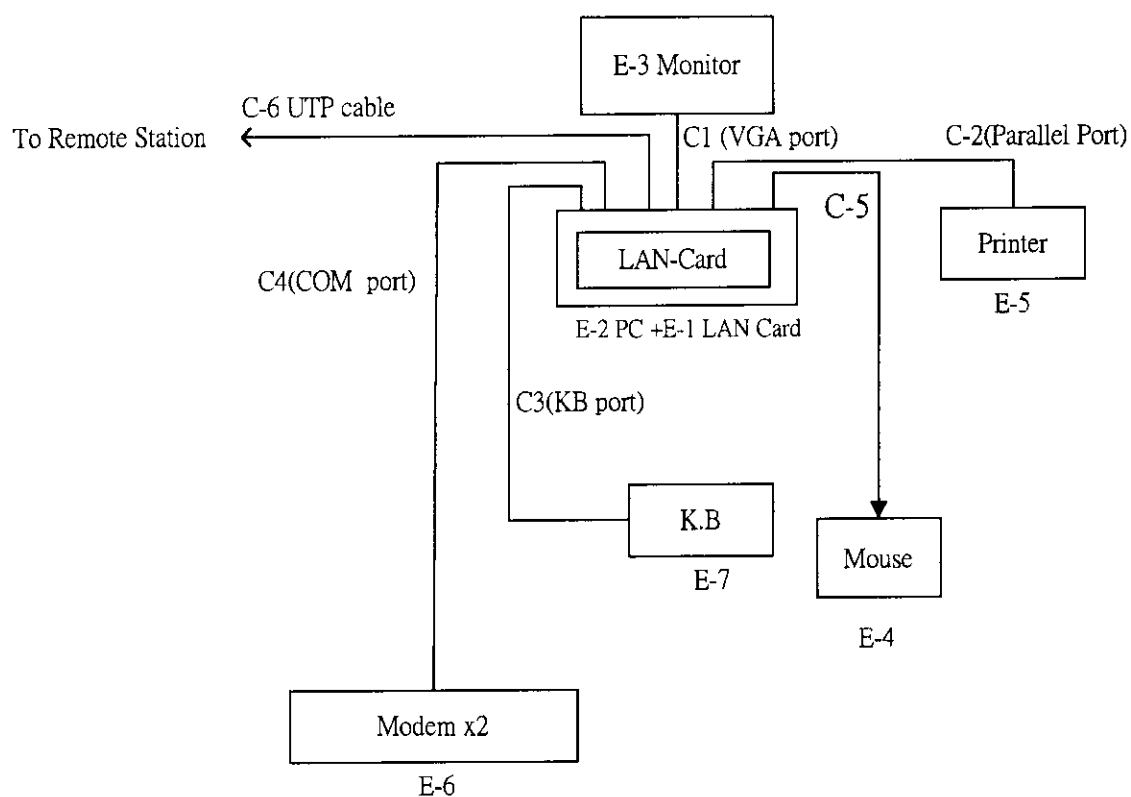
- (1) Unless otherwise denoted as EUT in 「Remark」 column , device(s) used in tested system is a support equipment.
- (2) Unless otherwise marked as ※ in 「Remark」 column, Neutron consigns the supporting equipment(s) to the tested system.

**Table B. - Informations Cable Information**

Item	I/O Cable	Device Connected	Shielded	Ferrite Core	Detachable/Permanently	Note
C-1	Video Cable	PC-Monitor	Yes	No	Permanently attached	
C-2	Centronics Cable	PC-Printer	Yes	No	Detachable type	
C-3	Keyboard Cable	PC-Keyboard	Yes	No	Permanently attached	
C-4	RS-232 Cable	PC-Modem	Yes	No	Detachable type	
C-5	Mouse Cable	PC-Mouse	Yes	No	Permanently attached	
C-6	UTP Cable	PC-Remote Station	Yes	No	Detachable type.	※

Note:

- (1) Unless otherwise marked as ※ in 「Remark」 column, Neutron consigns the supporting equipment(s) to the tested system.

**Figure 3.1 Configuration of Tested System****Fig. 3-1 Configuration of Tested System**

#### **4. Block Diagram(s)**

Figure 4.1 Block diagram of system, Page 13.A, 13.B, 13.C, 13.D

	Y1	D4	R16	R17	R18	R30	R61	R66	C22	C23	C36	C46	C47
MC68836	Use	Use	Use	Use	Use	Use	X	X	Use	Use	Use	Use	Use
MX98704	X	X	X	X	X	X	Use	Use	X	X	X	X	X

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Date:	December 10, 1986	Sheet of

## 6. Conducted Emission Datas

- 6.1 The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

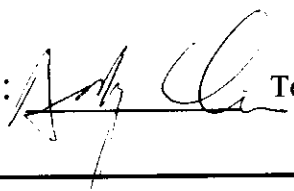
Judgement: Passed by **-3.02** dB in mode of Line terminal **7.57** MHz

Freq. (MHz)	Terminal L/N	Measured (dBuV)	Factor (dBuV)	Limits (dBuV)	Margin (dBuV)	Note (QP)
1.75	Line	41.80	0.10	48.00	-6.10	
2.34	Line	40.60	0.10	48.00	-7.30	
7.57	Line	44.70	0.28	48.00	-3.02	
7.99	Line	42.00	0.30	48.00	-5.70	
14.46	Line	35.80	0.58	48.00	-11.62	
1.75	Neutral	41.30	0.10	48.00	-6.60	
7.57	Neutral	44.60	0.28	48.00	-3.12	
12.18	Neutral	39.60	0.49	48.00	-7.91	
21.73	Neutral	35.30	0.83	48.00	-11.87	
23.35	Neutral	35.60	0.87	48.00	-11.53	

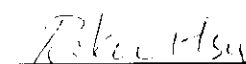
### Remark :

- (1) Test Receiver or Spectrum Analyzer measurement condition setting are Res. BW=100KHz, Video BW =100KHz , Sweep. Time = 0.3 sec./MHz
- (2) All readings are Peak unless otherwise stated QP in colum of 『Note』 .
- (3) Measuring frequency range from 0.45MHz to 30MHz.
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table.
- (5) If the peak scan value lower limit less than 20dB, then this signal data will be listed. But if these signal datas more than 10 frequencies, then only the Top 10 be listed.

Review :



Test Personnel :



Date: JUN. 25, 1997

## 7. Radiated Emission Datas

- 7.1 The following data lists the significant emission frequencise, measured levels, correction factor (includes cable and antenna corrections ), the corrected reading, as well as the limit. Explanation of the Correction Factor is given in paragraph 7.2.

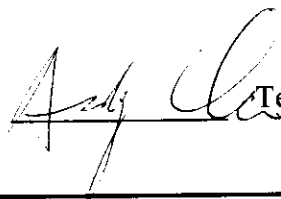
Judgement: Passed by -6.16 dB in polarity of Vertical 173.70 MHz

Freq. (MHz)	Polar. H/V	Reading(RA) (dBuV/m)	Corr.Factor. (dBuV/m)	Corrected FS (dBuV/m)	Limits (QP) (dBuV/m)	Margins (dBuV/m)	Note (QP)
50.70	V	22.20	11.43	33.63	40.00	- 6.37	
52.10	H	21.90	11.29	33.19	40.00	- 6.81	
149.20	H	23.60	13.31	36.91	43.50	- 6.59	
150.40	V	23.40	13.32	36.72	43.50	- 6.78	
173.70	V	21.00	16.34	37.34	43.50	- 6.16	
176.00	H	19.60	16.68	36.28	43.50	- 7.22	
208.00	H	22.40	13.67	36.07	43.50	- 7.43	
233.60	V	17.00	13.81	30.81	46.00	- 15.19	
247.20	H	22.10	14.47	36.57	46.00	- 9.43	
251.20	V	16.30	14.65	30.95	46.00	- 15.05	
261.60	H	23.90	15.06	38.96	46.00	- 7.04	
274.40	V	16.70	15.58	32.28	46.00	- 13.72	

### Remark :

- (1) Test Receiver or Spectrum Analyzer measurement condition setting are Res. BW=1 MHz , Video BW =1MHz , Sweep. Time = 0.2 sec./MHz
- (2) All readings are Peak unless otherwise stated QP in colum of 『Note』
- (3) Measuring frequency range from 30MHz to 1000MHz.
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table.
- (5) If the peak scan value lower limit less than 20dB, then this signal data will be listed. But if these signal datas more than 10 frequencies, then only the Top 10 be listed.

Review :



Test Personnel. :

Rick, 1/3/97

Date: JUN. 24, 1997

## 7-2. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where **FS = Field Strength**

**RA = Receiver Amplitude**

**AF = Antenna Factor (1)**

**CL = Cable Attenuation Factor (1)**

**AG = Amplifier Gain (1) (2)**

### Remark :

(1) The Correction Factor =  $AF + CL - AG$ , as shown in the data tables' Correction Factor column.

(2) AG is not available for Neutron's Open Site Facility

### Example of Calculation:

Assume a Receiver Reading of 23.7 dBuV is obtained with an Antenna Factor of 7.2 dB and a Cable Factor of 1.1 dB. Then:

1. The Correction Factor will be calculated by

$$\text{Correction Factor} = AF + CL - AG = 7.2 + 1.1 - 0 = 8.3 \text{ (dB)}$$

as shown in the data tables' Correction Factor column.

2. The Field Strength will be calculated by

$$FS = RA + \text{Correction Factor} = 23.7 + 8.3 = 32 \text{ (dBuV/m)}.$$

FS is the value shown in the data tables' Corrected Reading column and RA is the value shown in the data tables' Receiver Reading column. The 32 dBuV/m value was mathematically converted to its corresponding level in uV/m as:

$$\text{Log}^{-1} \left[ (32.0 \text{ dBuV/m}) / 20 \right] = 39.8 \text{ (uV/m)}$$



**7-3. Correction Factor VS Frequency**

<b>Frequency (MHz)</b>	<b>Antenna Factor (dB)</b>	<b>Cable Loss (dB)</b>
30.00	11.60	0.10
35.00	10.80	0.20
40.00	11.20	0.20
45.00	11.30	0.20
50.00	11.10	0.40
55.00	10.50	0.50
60.00	9.90	0.60
65.00	8.70	0.60
70.00	7.70	0.60
75.00	6.60	0.60
80.00	6.30	0.60
85.00	7.20	0.70
90.00	8.60	0.70
95.00	10.10	0.70
100.00	11.40	0.70
110.00	12.90	0.90
120.00	13.40	1.00
130.00	13.20	1.00
140.00	12.50	1.00
150.00	12.20	1.10
160.00	13.00	1.10
170.00	14.50	1.10
180.00	15.90	1.10
190.00	17.00	1.10
200.00	17.50	1.20
225.00	12.20	1.20
250.00	13.30	1.30
275.00	14.20	1.40
300.00	15.90	1.30
325.00	14.80	1.40
350.00	15.90	1.50
375.00	20.80	1.60
400.00	17.10	1.60
450.00	18.10	1.70
500.00	19.40	1.60
550.00	19.70	2.00
600.00	20.10	2.10
650.00	21.00	2.00
700.00	22.30	2.30
750.00	22.20	2.40
800.00	22.20	2.50
850.00	23.50	2.50
900.00	24.30	2.70
950.00	24.60	2.60
1000.00	25.70	2.80

**8. Photos of Tested EUT:**

1. Photo # 1. Front View
2. Photo # 2. Rear View
3. Photo # 3. Side View