

**MEASUREMENT/TECHNICAL REPORT****APPLICANT:** NERONIX, INC.**MODEL NO.:** EA-1215C**FCC ID:** NOI9900-11215-001

This report concerns ( check one ) :      **Original Grant** ☒   
    **Class II Change** ☐

**Equipment type:**      LAN Card

Deferred grant requested per 47CFR 0.457(d)(1)(ii)?

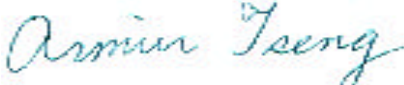
Yes ☐      No ☒      If yes, defer until: \_\_\_\_\_ (date)

We, the undersigned, agree to notify the Commission by (date) \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_  
of the  
intended date of announce ment of the product so that the grant can be issued on that date.

Transiyion Rules Request per 15.37?    Yes ☐  
No ☒

If no, assumed Part 15, Subpart B for unintentional radiator the new 47 CFR (10-1-90 Edition)  
provision.

**Report Prepared****by Testing House :** Neutron Engineering Inc.**for Company Name:** NETRONIX, INC.**Address:**      3F-1, No. 31, Hsin-Tai Road, Chupei City, Hsinchu Hsin, Taiwan, R.O.C.

**Applicant Signature :**   
Armin Tseng/R&D Dept.

## 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)/ CISPR22(1996) 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/ CISPR22(1996).

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**Reviewed by :** Andy Chiu

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**Approved by :** George Yao

George Yao

**Issued Date :** May 10, 2000

**Report No. :** NEI-FCCB-00051

**Company Stamp:**



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## 1. GENERAL INFORMATION

### 1-1. Product Description

The NETRONIX INC. Model: [EA-1215C](#) (referred to as the EUT in this report) is a new 10/100 NWay Fast Ethernet PCI adapter. This document describes the installation of network adapter. This adapter supports 10BASE-T/100BASE-TX Fast Ethernet and complies with the electrical and protocol requirements of the PCI Local Bus Specification, Revision 2.2. The Wake-On-Lan feature is optional for the adapter.

Other features are as follows:

- IEEE 802.3 standards 10BASE-T and 100BASE-TX standards
- 32-bit bus master for high throughput and low CPU utilization
- Wake-On-LAN feature is optional for different hardware version
- Full-duplex operation at both 10Mbps and 100Mbps
- Support 10/100Mbps auto-sensing capability
- Rich diagnostic LED mounted on bracket for easily viewing and troubleshooting
- Single shield RJ-45 connector for using at either Speed(Category 3,4, or 5 UTP cable for 10Mbps Operation, and Category 5 UTP cable for 100Mbps Operation)
- Plug and Play Installation.
- Test program(Include Wake-On-Lan events)
- Network drivers on the diskette for Windows 95,98, 2000, NT, Netware, SCO Unix and Packet driver.

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 : EA-1215C

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

N/A

### 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
EA-1215C	NOI9900 -11215-001	LAN Card	Add-On Card , Shielded Data Cable
CM753ET	N/A (3)	Monitor	Shielded Data Cable <sup>(2)</sup> Un-Shielded Power Cord
444	N/A (3)	PC	Un-Shielded Power Cord.
DPU-414	N/A (3)	Printer	Shielded Serial Data Cable Un-Shielded Power Cord
DM-1414V	N/A (3)	Modem	Shielded Parallel Data Cable Un-Shielded Power Cord
FDA-104GA	F42FDA-104G	Keyboard	Shielded Data Cable
M-S34	DZL211029	Mouse	Shielded Data Cable

Notes:

(1) EUT submitted for grant.

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

(3) The support equipment was authorized by Declaration of Conformity.

**1-4. Test Methodology**

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (1992)/CISPR 22(1996). Radiated testing was performed at an antenna to EUT distance 10 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. 132-1, Lane 329, Sec. 2, Palain Road, Shijr 221, Taipei, Taiwan, R.O.C. of NEUTRON ENGINEERING INC. This site has been fully described in report dated Jun. 25, 1999 Submitted to your office, and accepted in a letter dated Sep. 02, 1999 (Reg. No. 95335).

### 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, keyboard, modem and printer were contained in this system in order to comply with the ANSI C63.4/CISPR22(1996) Rules requirement. A second PC workstation located at faraway side from test site was used as a support equipment to exercise the EUT to simulate data transmitting during the test. Both PC workstations operated in the default 640X480/31.5Khz VGA Graphic mode. This operating Condition was tested and used to collect the included data.

The RJ45 port (100Base-TX,category 5 UTP) was tested as the Rules requirement. The final qualification testing data were included in Table 5-1 and Table 5-2 shown.

#### 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

As shown in Figure 3-1, all interface cables used for compliance testing are shielded type except the power cord which marked as shielded. All cable connectors are integrated by metal hoods for shielding. This equipment is required to use a shielded video interface cable without a ferrite attached in order to comply with FCC requirements.

### 3-4. Equipment Modifications

In order to achieve in compliance with Class B levels, the following change(s) were made by NEUTRON test house during the compliance testing:

Please refer to the next page as the modifications described and cross reference of photos of tested EUT.

The above modifications will be implemented in all product models of this equipment.

Applicant Signature :



Date :

Apr. 20, 2000

Type/Printed Name :

Armin Tseng

Position :

R&D/ Dept.



### 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 and 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	NETRONIX	EA-1215C	PCI Slot	NOI9900-11215-001	EUT
E-2	Monitor	Hitachi	CM753ET	VGA Port	N/A (3)	
E-3	PC	IBM	444		N/A (3)	
E-4	Printer	SII	DPU-414	Print Port	N/A (3)	
E-5	Modem	ACEEX	DM-1414V	COM Port	N/A (3)	
E-6	Keyboard	Forward	FDA-104GA	KB DIN Port	F42FDA-104G	
E-7	Mouse	HP	M-S34	P/S 2 Port	DZL211029	

**Remark:**

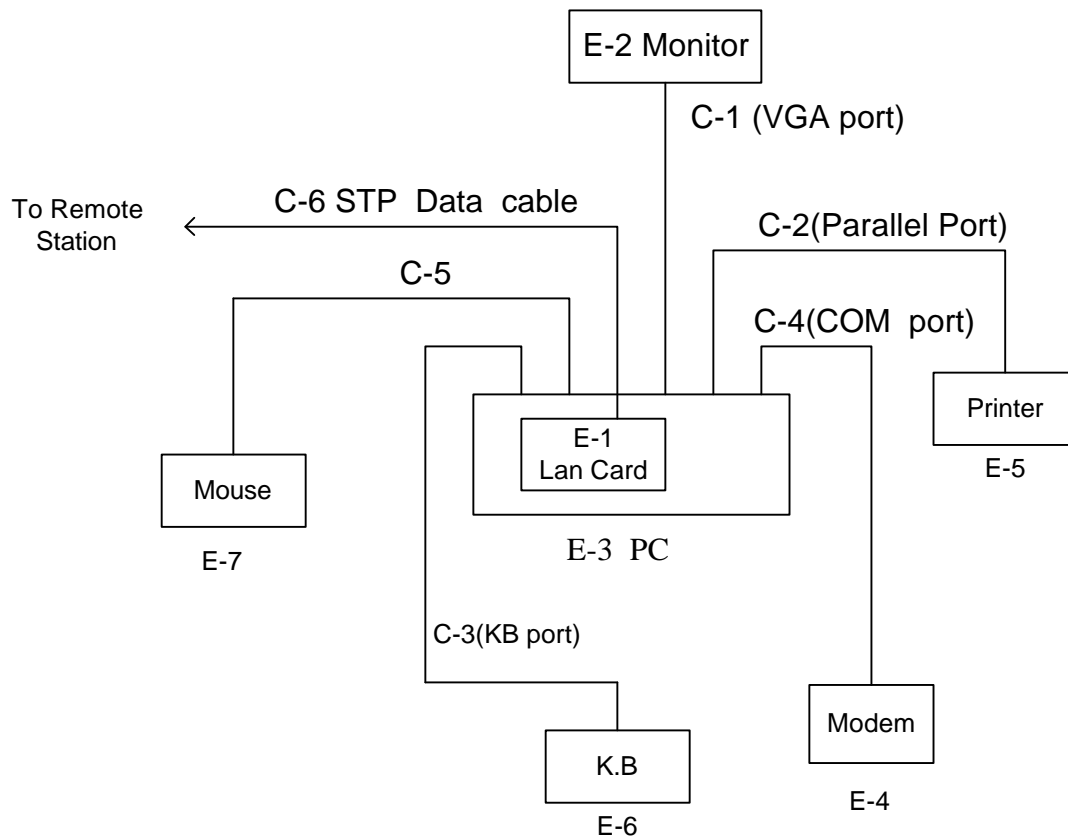
- (1) Unless otherwise denoted as EUT in (Remark) column, device(s) used in tested system is a support equipment.
- (2) Unless otherwise marked as \* in (Remark) column, Neutron consigns the supporting equipment(s) to the tested system.
- (3) The support equipment was authorized by Declaration of Conformity.

**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	STP DataCable	EUT-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.

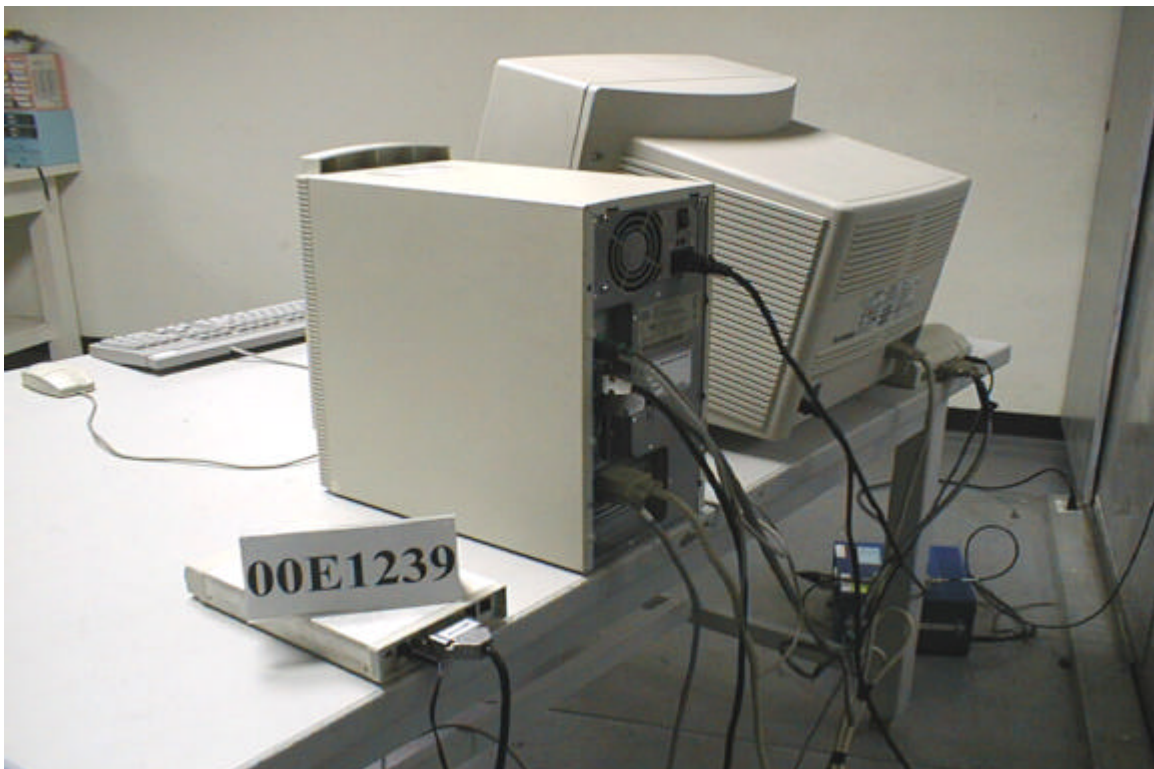
**Figure 3.1 Configuration of Tested System****Fig. 3-1 Configuration of Tested System**

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

Figure 4.1 Block diagram of system, Page 13.A

## 5. Conducted and Radiated Measurement Photos

### 5-1. Conducted Measurement Photos



5-2. Radiated Measurement Photos





## 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 **-5.44 dB** in mode of **Line** terminal **2.87 MHz**

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Safe Margins	
		QP-Mode	AV-Mode	QP-Mode	AV-Mode	(dBuV)	Note
0.20	Line	38.81	*	63.82	53.82	-25.01	(QP)
0.51	Line	38.41	*	56.00	46.00	-17.59	(QP)
1.32	Line	39.76	*	56.00	46.00	-16.24	(QP)
2.87	Line	45.36	40.56	56.00	46.00	-5.44	(AV)
14.67	Line	41.46	*	60.00	50.00	-18.54	(QP)
0.30	Neutral	45.61	*	60.35	50.35	-14.74	(QP)
0.80	Neutral	40.21	*	56.00	46.00	-15.79	(QP)
1.73	Neutral	41.09	*	56.00	46.00	-14.91	(QP)
2.88	Neutral	45.76	39.60	56.00	46.00	-6.40	(AV)
4.55	Neutral	40.36	*	56.00	46.00	-15.64	(QP)

### Remark; G

- (1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz ; SPA setting in RBW=100KHz,VBW =100KHz, Swp. Time = 0.3 sec./MHz. Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz,VBW=10Hz, Swp. Time =0.3 sec./MHz.
- (2) All readings are QP Mode value unless otherwise stated AVG in column of (Note). If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform. In this case, a " \* " marked in AVG Mode column of Interference Voltage Measured.
- (3) Measuring frequency range from 150KHz to 30MHz.

Review :



Test Personnel. :



Date:

Apr. 20, 2000

## 7. Radiated Emission Datas

**7.1** The following data lists the significant emission frequencies, 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 **-2.16 dB** in polarity of **Vertical** **62.36 MHz**

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Safe Margins (dBuV/m)	Note
60.00	V	42.84	- 15.34	27.50	30.00	- 2.50	
62.13	H	42.30	- 15.76	26.54	30.00	- 3.46	
62.36	V	43.60	- 15.76	27.84	30.00	- 2.16	
64.17	H	43.20	- 16.19	27.01	30.00	- 2.99	
64.43	V	43.30	- 16.19	27.11	30.00	- 2.89	
66.38	H	43.40	- 16.51	26.89	30.00	- 3.11	
200.00	H	40.20	- 15.07	25.13	30.00	- 4.87	
200.80	V	40.20	- 15.07	25.13	30.00	- 4.87	
214.40	V	39.54	- 14.98	24.56	30.00	- 5.44	
224.80	H	36.90	- 14.52	22.38	30.00	- 7.62	
248.80	H	39.30	- 13.73	25.57	37.00	- 11.43	
308.00	V	36.60	- 10.73	25.87	37.00	- 11.13	

### 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 column 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.:



Date:

Apr. 21, 2000



## 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:

$$\text{Log}^{-1}\{(32.0\text{dBuV/m})/20\} \times 39.8 \text{ (uV/m)}$$

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

Loss (dB)	Frequency (MHz)	Antenna Factor (dB)	Cable
	30.00	11.10	0.90
	35.00	10.80	0.50
	40.00	11.20	1.00
	45.00	11.50	0.80
	50.00	11.30	1.00
	55.00	10.50	1.30
	60.00	9.90	1.00
	65.00	8.70	1.50
	70.00	7.60	1.20
	75.00	6.40	1.40
	80.00	6.10	1.30
	85.00	7.00	1.40
	90.00	8.00	1.70
	95.00	10.00	1.50
	100.00	11.20	1.90
	110.00	12.60	2.00
	120.00	13.00	1.80
	130.00	12.50	1.80
	140.00	12.00	2.00
	150.00	12.00	2.20
	160.00	13.20	2.40
	170.00	14.80	2.50
	180.00	16.30	2.50
	190.00	17.00	2.50
	200.00	17.30	2.40
	225.00	10.50	2.70
	250.00	11.70	3.10
	275.00	12.80	3.70
	300.00	14.50	4.00
	325.00	14.00	4.50
	350.00	14.20	4.50
	375.00	14.60	4.60
	400.00	15.10	4.80
	450.00	16.20	5.40
	500.00	17.60	6.50
	550.00	17.80	7.00
	600.00	18.40	7.10
	650.00	19.50	7.10
	700.00	20.80	7.20
	750.00	20.50	7.50
	800.00	21.10	8.00
	850.00	22.40	8.60
	900.00	23.50	8.90
	950.00	24.00	9.70
	1000.00	24.80	10.30

**8. Photos of Tested EUT:**

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

## **Attachment**

### **User's Manual**