

EXHIBIT 4
RFI/EMI TEST REPORT



EMC TEST REPORT

REPORT NO. : F88041361
MODEL NO. : EA-1215, NB-1215
DATE OF TEST : May 26, 1999

PREPARED FOR : NETRONIX, INC.

ADDRESS : 5F-5, DONG-KUWANG ROAD,
HSINCHU, TAIWAN, R.O.C.

PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION



Accredited Laboratory

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1.

CERTIFICATION

Issue Date: June 16, 1999

Product : PCI 10/100 LAN CARD
Trade Name : NETRONIX
Model No. : EA-1215, NB-1215
Applicant : NETRONIX, INC
Standard : FCC Part 15, Subpart B, Class B
ANSI C63.4-1992
CISPR 22:1993+A1: 1995+A2: 1996

We hereby certify that one sample of the designation has been tested in our facility on May 26, 1999. The test record, data evaluation and Equipment Under Test (EUT) configurations represent herein are true and accurate representation of the measurements of the sample's EMC characteristics under the conditions herein specified.

The test results show that the EUT as described in this report is in compliance with the Class B limits of conducted and radiated emission of applicable standards

TESTED BY : Rico Teng , DATE: 6/16/99
(Rico Teng)

CHECKED BY : Rita Yi , DATE: 6/16/99
(Rita Yi)

APPROVED BY : Stephen W.F. Chen , DATE: 6/16/99
(Stephen W.F. Chen)

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2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product	:	PCI 10/100 LAN CARD
Model No.	:	EA-1215
Power Supply	:	DC 5V
Data Cable	:	NA

Note: The EUT is a cost effective, high-performance network interface card. It operates in 10BASE-T and 100BASE-TX modes and integrates easily with Fast Ethernet hub and switch.

The EUT have two mode names which are identical to each other in all aspects except for their model names

- Model: EA-1215, Brand: NETRONIX
- Model: NB-1215, Brand: NETRONIX

From the above models, model: EA-1215 was selected as representative model for the test and its data is recorded in this report.

The EUT was pretested under 10Mbps and 100Mbps speed mode. The worst emission was found in 10Mbps speed mode and only its test data was recorded in this report.

For more detailed features, please refer to and User's Manual.



2.2 DESCRIPTION OF SUPPORT UNITS

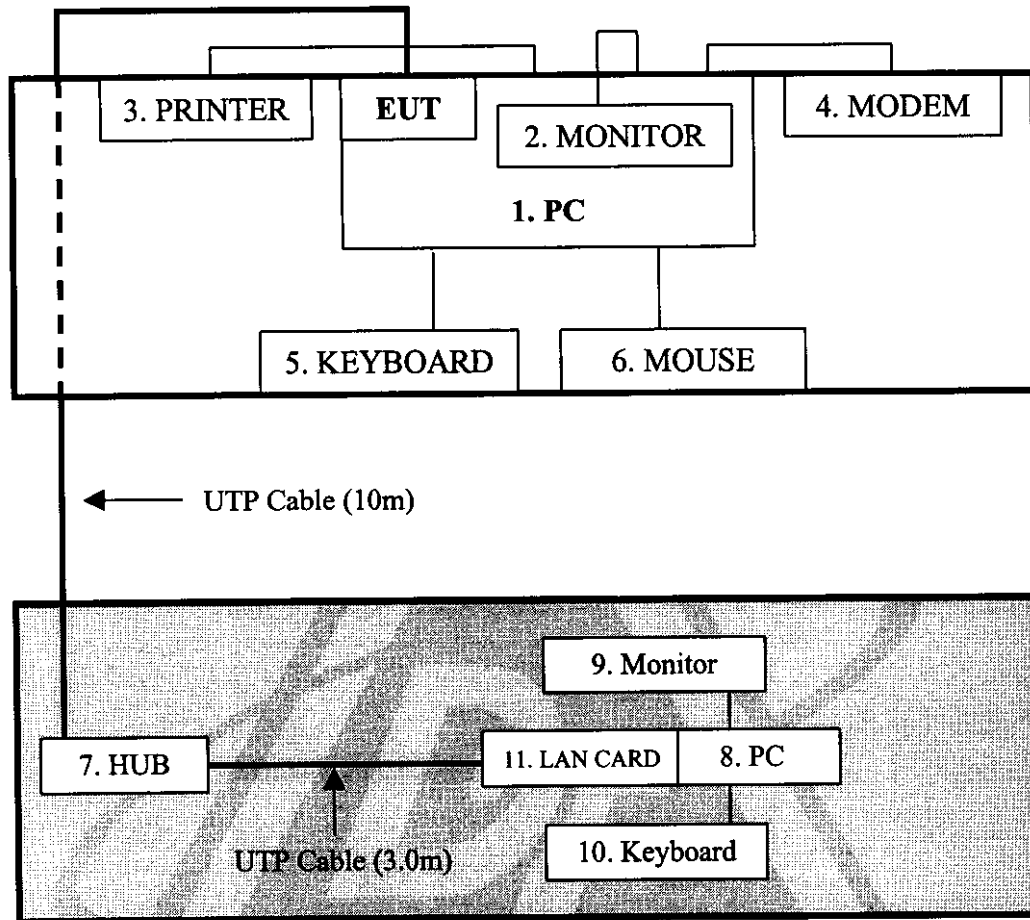
The EUT had been tested as component installed into a system and tested together with necessary accessories or support units. The following support units or accessories are used to form representative test configuration during the tests.

No	Product	Brand	Model No.	FCC ID	I/O Cable
1	PERSONAL COMPUTER	IBM	2156-D1N	FCC DoC	Nonshielded Power (1.8m)
2	COLOR MONITOR	ADI	937G	BR8937G	Shielded Signal (1.2m) Nonshielded Power (1.8m)
3	PRINTER	HP	C2642A	B94C2642X	Shielded Signal (1.1m) Nonshielded Power (1.8m)
4	MODEM	ACEEX	1414	IFAXDM1414	Shielded Signal (1.2m) Nonshielded Power (1.8m)
5	KEYBOARD	IBM	KB-7953	FCC DoC	Shielded Signal (1.8m)
6	MOUSE	LOGITECH	M-S34	DZL211029	Shielded Signal (1.8m)
7	HUB	HP	ADVANCE STACK HUB-8E	FCC DoC	Nonshielded Power (1.8m)
8	PERSONAL COMPUTER	NTI	PII-233T	FCC DoC	Nonshielded Power (1.8m)
9	COLOR MONITOR	COMPAQ	631	BR8SM-994	Shielded Signal (1.2m) Nonshielded Power (1.8m)
10	KEYBOARD	FORWARD	FDA-104GA	F4ZDA-104G	Shielded Signal (1.4m)
11	LAN CARD	NETRONIX	EA-1216	FCC DoC	NA

Note: Support unit 1-6 acted as CLIENT PC and communicated with support unit 7-11 which acted as SERVER PC and systems of communication partner. They communicated with each other at 10Mbps speed with a UTP (Unshielded Twisted Pair) cable (10m). The SERVER PC was kept in the control room during the test.



2.3 TEST METHODOLOGY AND CONFIGURATION



(Support units 7-11 were kept in the control during the test.)

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 of 10 m on an open area test site. Please refer to the photos of test configuration in Item 5.



3. TEST INSTRUMENTS

3.1 TEST INSTRUMENTS (EMISSION)

RADIATED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
HP Spectrum Analyzer	8594E	3710A04861	Sept. 14, 1999
CHASE RF Pre Amplifier	CPA9232	1001	Jan. 31, 2000
ROHDE & SCHWARZ Test Receiver	ESVS 10	846285/012	Dec. 15, 1999
CHASE Broadband Antenna	CBL6112A	2342	June 24, 1999
ROHDE & SCHWARZ Precision Dipole	HZ-12 (30~300MHz)	846932/0003	June 06, 2000
ROHDE & SCHWARZ Precision Dipole	HZ-13 (300~1000MHz)	846556/0007	June 17, 2000
EMCO Antenna Tower	2075-2	9712-2124	N/A
EMCO Turn Table	2081-1.53	9712-2030	N/A
CORCOM AC Filter	MRI2030	107/108	N/A
Open Field Test Site	Site A	ADT-RA	July 08, 1999

Note: 1. The measurement uncertainty is less than +/- 3dB, which is calculated as per NAMAS document NIS81.

2. The calibration interval of the above test instruments is 12 months.

And the calibrations are traceable to NML/ROC and NIST/USA.

CONDUCTED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ Test Receiver	ESCS 30	847124/029	Nov. 13, 1999
ROHDE & SCHWARZ LISN	ESHS-Z5	848773/004	Nov. 11, 1999
KYORITSU LISN	KNW-407	8/1395/12	July 15, 1999
Shielded Room	Con A	ADT-CA	N/A

Note: 1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per NAMAS document NIS81.

2. The calibration interval of the above test instruments is 12 months.

And the calibrations are traceable to NML/ROC and NIST/USA.



3.2 LIMITS OF CONDUCTED AND RADIATED EMISSION

LIMIT OF RADIATED EMISSION OF CISPR 22

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 10m)
	dBuV/m	dBuV/m
30 - 230	40	30
230 - 1000	47	37

LIMIT OF RADIATED EMISSION OF FCC PART 15, SUBPART B FOR FREQUENCY ABOVE 1000 MHz

FREQUENCY (MHz)	Class A (at 10m)		Class B (at 3m)	
	uV/m	dBuV/m	uV/m	dBuV/m
Above 1000	300	49.5	500	54.0

- Note: (1) The lower limit shall apply at the transition frequencies.
 (2) Emission level (dBuV/m) = 20 log Emission level (uV/m).
 (3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

LIMIT OF CONDUCTED EMISSION OF CISPR 22

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

- Note: (1) The lower limit shall apply at the transition frequencies.
 (2) The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz
 (3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.



4. TEST RESULTS (EMISSION)

4.1 RADIO DISTURBANCE

Frequency Range : 0.15 - 30 MHz (Conducted Emission)
30 - 1000 MHz (Radiated Emission)

Input Voltage : DC 5V

Temperature : 28 °C

Humidity : 50 %

Atmospheric Pressure : 979 mbar

TEST RESULT	Remarks
	Minimum passing margin of conducted emission:-13.4 dB at 10.007 MHz
	Minimum passing margin of radiated emission: -2.5 dB at 222.50 MHz

4.2 EUT OPERATION CONDITION

1. Turn on the power of all equipment.
2. SERVER PC and CLIENT PC run a test program to enable all functions of EUT.
3. SERVER PC transmitted messages to and received messages from the CLIENT PC via EUT in specified speed.



4.3 TEST DATA OF CONDUCTED EMISSION

EUT: PCI 10/100 LAN CARD

MODEL: EA-1215

TEST MODE: 10Mbps Speed

6 dB Bandwidth: 9 kHz

PHASE: LINE (L)

Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
		[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.224	0.2	46.6	-	46.8	-	62.7	52.7	-15.9	-
0.337	0.2	36.1	-	36.3	-	59.3	49.3	-23.0	-
4.375	0.4	38.6	-	39.0	-	56.0	46.0	-17.0	-
8.738	0.6	40.4	-	41.0	-	60.0	50.0	-19.0	-
10.007	0.7	45.7	-	46.4	-	60.0	50.0	-13.6	-
11.242	0.7	45.8	-	46.5	-	60.0	50.0	-13.5	-

- Remarks:
1. "*": Undetectable
 2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 3. "-": The Quasi-peak emission level also meets average limit and measurement with the average detector is unnecessary.
 4. The emission levels of other frequencies were very low against the limit.
 5. Margin value = Emission level - Limit value
 6. Emission Level = Correction Factor + Reading Value.

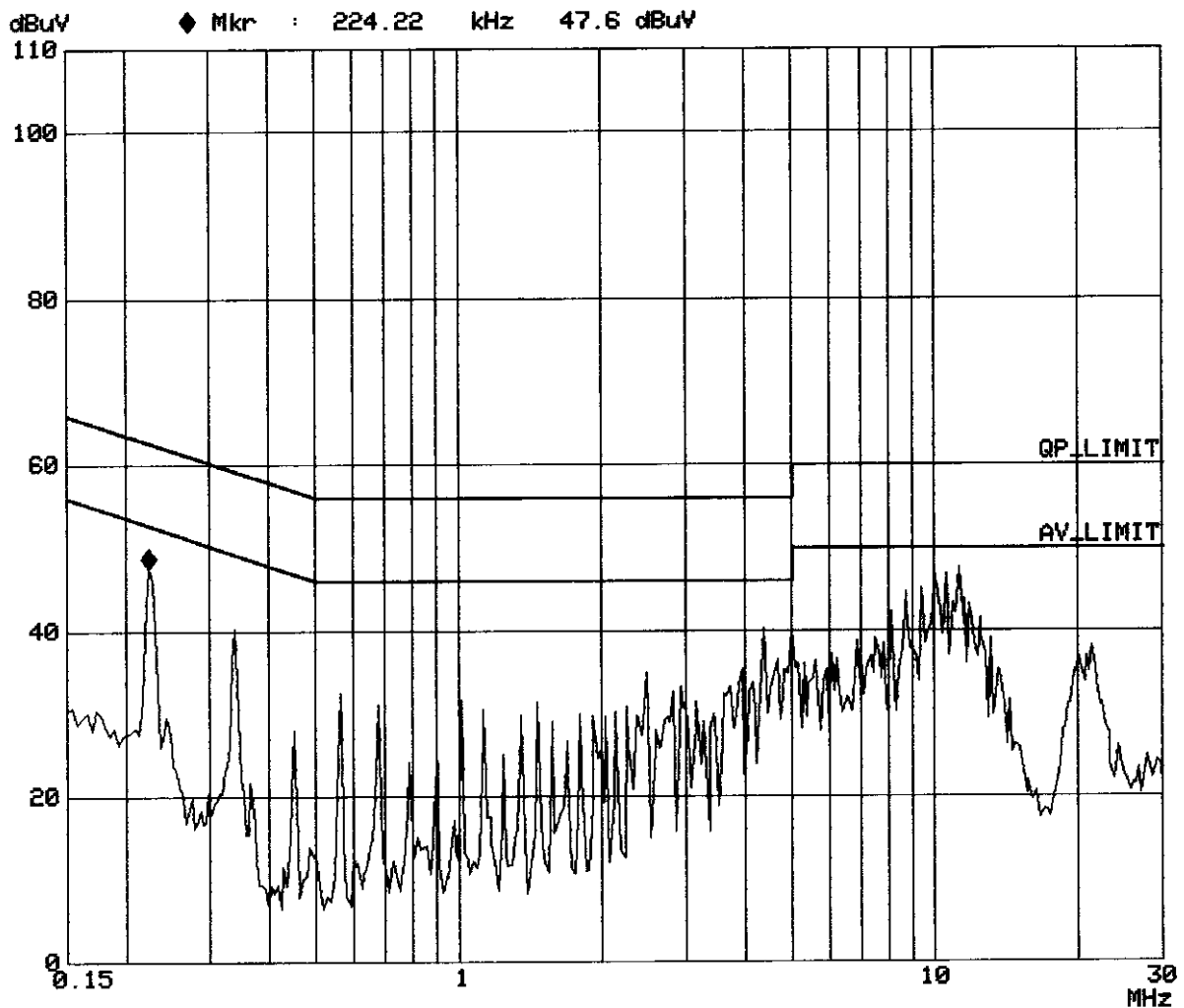
**ADT CORP. SHIELDED ROOM A
CISPR 22 CLASS B**

EUT: EA-1215
 Op Cond: 10Mbps
 Operator: RICO
 Test Spec: LISN :L
 Comment: 120V AC / 60Hz
 Date: 27. May 99 09:57

Report No.: F88041361
 Page: 10-1
 Test By: Rico Teng

Overview Scan Settings (3 Ranges)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	3M	3.90625k	9k	PK	10ms	10dBLN	OFF
3M	10M	3.90625k	9k	PK	0.05ms	10dBLN	OFF
10M	30M	3.90625k	9k	PK	0.05ms	10dBLN	OFF





TEST DATA OF CONDUCTED EMISSION

EUT: PCI 10/100 LAN CARD

MODEL: EA-1215

TEST MODE: 10Mbps Speed

6 dB Bandwidth: 9 kHz

PHASE: NEUTRAL (N)

Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
		[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.224	0.2	43.0	-	43.2	-	62.7	52.7	-19.5	-
0.337	0.2	30.0	-	30.2	-	59.3	49.3	-29.1	-
4.375	0.5	39.0	-	39.5	-	56.0	46.0	-16.5	-
8.738	0.5	40.8	-	41.3	-	60.0	50.0	-18.7	-
10.007	0.6	46.0	-	46.6	-	60.0	50.0	-13.4	-
11.242	0.6	45.9	-	46.5	-	60.0	50.0	-13.5	-

- Remarks:
1. "***": Undetectable
 2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 3. "-": The Quasi-peak emission level also meets average limit and measurement with the average detector is unnecessary.
 4. The emission levels of other frequencies were very low against the limit.
 5. Margin value = Emission level - Limit value
 6. Emission Level = Correction Factor + Reading Value.

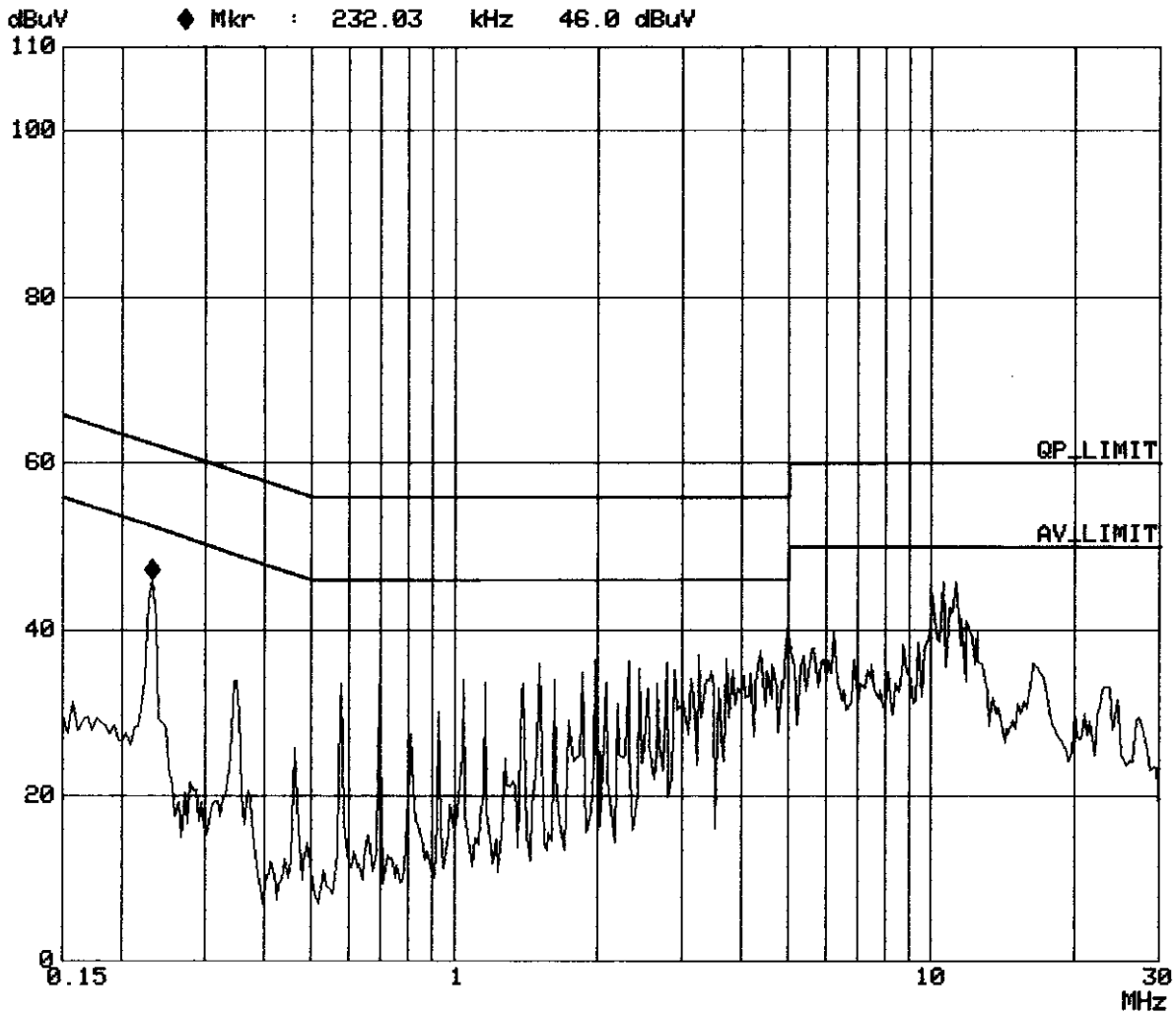
ADT CORP. SHIELDED ROOM A
 CISPR 22 CLASS B

EUT: EA-1215
 Op Cond: 10Mbps
 Operator: RICO
 Test Spec: LISN :N
 Comment: 120V AC / 60Hz
 File name: CISPR22B.SPC
 Date: 26. May 99 15:49

Report No.: F88041361
 Page: 11-1
 Test By: Rico Teng

Overview Scan Settings (3 Ranges)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	3M	3.90625k	9k	PK	10ms	10dBLN	OFF
3M	10M	3.90625k	9k	PK	0.05ms	10dBLN	OFF
10M	30M	3.90625k	9k	PK	0.05ms	10dBLN	OFF





4.4 TEST DATA OF RADIATED EMISSION

EUT: PCI 10/100 LAN CARD

MODEL: EA-1215

TEST MODE: 10Mbps Speed

ANT. POLARITY: Horizontal

DETECTOR FUNCTION: Quasi-peak

6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz

MEASURED DISTANCE: 10 M

Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height	Table Angle
81.10	9.3	10.0	19.3	30.0	-10.7	400	244
120.00	14.6	4.6	19.2	30.0	-10.8	400	128
143.91	12.7	11.9	24.6	30.0	-5.4	400	21
185.20	12.0	8.0	20.0	30.0	-10.0	336	13
192.49	12.0	9.5	21.5	30.0	-8.5	400	99
193.40	12.0	10.0	22.0	30.0	-8.0	400	125
312.50	17.6	11.5	29.1	37.0	-7.9	100	0

- REMARKS:
1. Emission level (dBuV/m) = Correction Factor (dB)
+ Reading Value (dBuV).
 2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level - Limit value



TEST DATA OF RADIATED EMISSION

EUT: PCI 10/100 LAN CARD

MODEL: EA-1215

TEST MODE: 10Mbps Speed

ANT. POLARITY: Vertical

DETECTOR FUNCTION: Quasi-peak

6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz

MEASURED DISTANCE: 10 M

Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height	Table Angle
50.01	9.2	14.5	23.7	30.0	-6.3	100	0
120.01	14.0	12.8	26.8	30.0	-3.2	100	319
195.01	13.1	9.5	22.6	30.0	-7.4	100	154
222.50	13.1	14.4	27.5	30.0	-2.5	100	204
250.00	15.2	12.4	27.6	37.0	-9.4	100	186
312.50	17.6	11.5	29.1	37.0	-7.9	100	0
350.00	18.7	14.2	32.9	37.0	-4.1	100	344

- REMARKS:
1. Emission level (dBuV/m) = Correction Factor (dB) + Reading Value (dBuV).
 2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level - Limit value