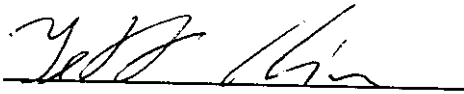



***EXHIBIT B***

***Test Report***

Report No.	N1315267	
Specifications	FCC Part 15.109(g), Class B	
Test Method	ANSI C63.4 1992	
Applicant address	2F, NO. 28, INDUSTRY EAST 9 <sup>TH</sup> RD., SCIENCE PARK, HSIN-CHU, TAIWAN	
Applicant Items tested	NATIONAL DATACOMM CORPORATION	
Model No.	8 PORT SOHOWARE 10/100 FAST HUB	
Results	NDH308, DH308 (Sample # N13267)	
Sample received data	<b>Compliance</b> (As detailed within this report)	
Prepared by		project engineer
Authorized by		Vice General Manager (Jacob Lin)
Issue date	June 4, 1999	(month / day / year)
Modifications	None	
Tested by	Training Research Co., Ltd.	
Office and Open site at	No. 15, Lane 530, Pa-Lian RD., Sec. 1, Hsi-Chih Town, Taipei Hsien, Taiwan, R.O.C.	

**Conditions of issue:**

- (1) **This test report shall not be reproduced except in full, without written approval of TRC. And the test result contained within this report only relate to the sample submitted for testing.**
- (2) **This report must not be used by the client to claim product endorsement by NVLAP or any agency of U.S. Government.**

**FCC ID : IOUNDH308S01**

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## ***Chapter 1 Introduction***

### ***Description of EUT:***

HUB is a data transmission / receiver facility. It was connected to Lan card installed in the PC or compatible computer and makes your data equipment available to transmit / receive data via the EUT. During testing the EUT was operated at Tx or Rx mode for each emission measured. This was done in order to insure that maximum emission levels were attained.

### ***Connections of EUT:***

- (1) The power jack of EUT was connected with the AC power source via a power adapter.
- (2) UTP port 1 and UTP port 8 were each connected with a Lan card installed in a PC located remotely.
- (3) The other UTP ports were terminated.

### ***Test method:***

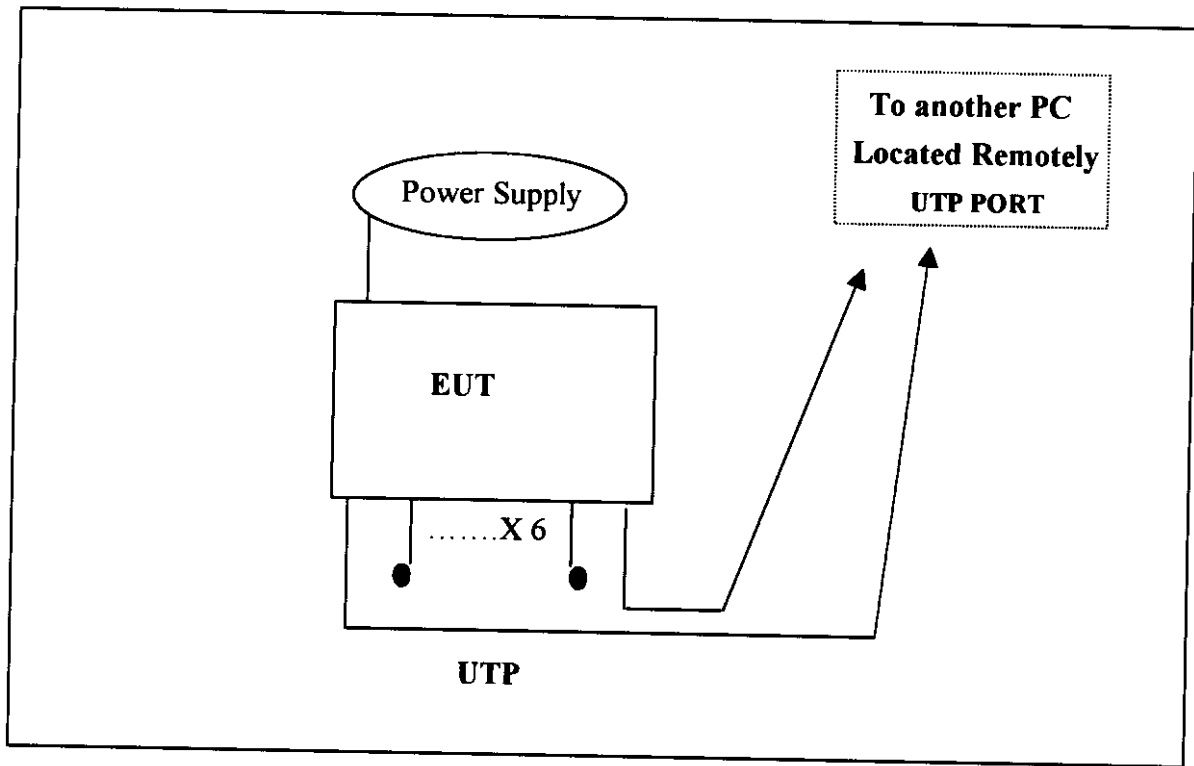
Pretest was found that the emission of operating mode is worse than standby mode. So, The final test is made at the operating mode.

During pretest, there were three modes testing: 10 x 10MHz, 10 x 100MHz, 100 x 100MHz.

During testing, the EUT was operated at "transmitting" and "receiving" mode simultaneously.

The test placement as the photographs showed is the worst case emission placed. (If the emission is close to the ambient, the resolution BW and view resolution will be reduced and the data will be recorded by detection of maximum hold peak mode.)

***The testing configuration of test setup is showing in the next page.***

**Configuration of test setup****Connections:****EUT:**

- \*RJ45 Cable  $\times 2$  --- 30M, Non-Shielded, Plastic Hood, No Ferrite bead.
- \*RJ45 Cable  $\times 6$  --- 3M, Non-Shielded, Plastic Hood, No Ferrite bead.
- \*Power cable --- non-shielded, 1.8 M

***List of support equipment***

**Conducted (Radiated) test:**

**PC** : **HP**  
Model : Vectra VE 5/166 SERIES 3  
Serial No. : SG72450161, SG72450174  
FCC ID : B94VECTRAVE53  
Power type : 110~120 / 220~240 VAC, Switching  
Power cord : non-Shielded, 1.7m long, Plastic, no ferrite core

**Monitor** : **HP**  
Model No. : D2821  
Serial No. : TW73107071, TW73512262  
FCC ID : A3KM064  
Power type : 110~120 / 220~240 VAC, Switching  
Power cord : Non-Shielded, 3m long, no ferrite core  
Data cable : Shielded, 1.8m long, with ferrite core

**Keyboard** : **Digital**  
Model No. : KB-5923  
Serial No. : 9S74904768, 9S74904741  
FCC ID : E8HKB-5923  
Power type : By PC  
Data cable : Shielded, 1.8m long, with ferrite core

**Lan Card** : **DELTA**  
Model No. : AEF380-TX  
Serial No. : N/A  
Power Type : Powered by PC  
Data Cable : UTP, 7', Plastic RJ-45 hoods, No ferrite bead.

## **Chapter 2 Conducted emission test**

### ***Test condition and setup:***

All the equipment is placed and setup according to the CISPR 22. The EUT is assembled on a wooden table that is 80 cm high, is placed 40 cm from the back-wall that is a vertical conducting plane. One LISN is for EUT, the other LISN is for support equipment. They are all placed on the conductive ground. The EUT's LISN connect a line switch box for selecting L1 or L2, then connect to a preamplifier and spectrum.

The spectrum scans from 150KHz to 30MHz. Conducted emission levels are detected at max. peak mode. But if the max. peak mode failed, it will be measured by CISPR's quasi-peak detection mode.

While testing, there is the worst-emission plot printed at peak detection mode, and there are more than 6 highest emissions relative to limit recorded. The plot is kept as the original data, not included in test report.

### ***List of test Instrument:***

<u>Instrument Name</u>	<u>Model No.</u>	<u>Brand</u>	<u>Serial No.</u>	<u>Calibration Date</u>	
				<u>Last time</u>	<u>Next time</u>
Spectrum analyzer	8594EM	HP	3710A00279	01/07/99	01/07/00
LISN (EUT)	3825/2	EMCO	9411-2284	05/15/98	05/15/99
LISN (Support E.)	AC3-001	TRC	-----	05/15/98	05/15/99
Preamplifier	AC3-002	TRC	-----	05/15/98	05/15/99
Line switch box	AC3-003	TRC	-----	05/15/98	05/15/99

The level of confidence of 95%, the uncertainty of measurement of conducted emission is  $\pm 2.4$  dB.

***Test Result: Pass (Appendix A)***

### Chapter 3 Radiated emission test

#### Test condition and setup:

**Pretest:** Prior to the final test (OATS test), the EUT is placed in a anechoic chamber and scan from 30MHz to 1GHz. This is done to ensure the radiation exactly emits form the EUT.

**Final test:** Final radiation measurements are made on a **10 - meter, open-field** test site. The EUT is placed on a nonconductive table that is 0.8m height, the top surface is 1.0 x 1.5 meter. The placement is according to CISPR 22.

The spectrum is examined from 30 MHz to 1000 MHz measured by HP spectrum.

The EMCO whole range Antenna is used to measure frequency from 30 MHz to 1GHz. The final test is used the spectrum HP 8594EM.

Measure more than six top marked frequencies generated form pretest by computer step by step at each frequency. The EUT is rotated 360 degrees, and antenna is raised and lowered from 1 to 4 meters to find the maximum emission levels. The antenna is used with both horizontal and vertical polarization.

Appropriated preamplifier which is made by TRC is used for improving sensitivity and precautions is taken to avoid overloading. The spectrum analyzer's 6dB bandwidth is set to 120 KHz, and the EUT is measured at quasi-peak mode.

If the emission is close to the frequency band of ambient, the data will be rechecked by the tester and the corrected data will be written in the test data sheet. If the emission is just within the ambient, the data from anechoic chamber will be taken as the final data.

#### List of test Instrument:

Instrument Name	Model No.	Brand	Serial No.	Calibration Date	
				Last	Next
Spectrum analyzer	8594EM	HP	3619A00198	11/17/98	11/17/99
RF Pre-selector	AC4-001	TRC	-----	05/15/98	05/15/99
Antenna (30M-2G Hz)	3141	EMCO	9711-1076	12/17/98	12/17/99
Open test side (Antenna, Amplify, cable calibrated together)				05/15/98	05/15/99

The level of confidence of 95%, the uncertainty of measurement of radiated emission is ± 4.96 dB.

**Test Result: Pass (Appendix B)**



**Appendix A**

**Conducted Emission Test Result: ( 10 X 10 MHz )**

Testing room: Temperature : 24 ° C Humidity : 57 % RH

**Line 1**

FREQUENCY ( KHz )	READING AMPLITUDE			LIMIT		MARGIN ( dB )
	Peak (dBμV/m)	Quasi-peak (dBμV/m)	Average (dBμV/m)	Quasi-Peak (dBμV/m)	Average (dBμV/m)	
400	34.77	*** **	*** **	58.86	48.86	-14.09
449	33.44	*** **	*** **	57.46	47.46	-14.02
597	30.56	*** **	*** **	56.00	46.00	-15.44
701	34.51	*** **	*** **	56.00	46.00	-11.49
754	35.45	*** **	*** **	56.00	46.00	-10.55
798	36.13	*** **	*** **	56.00	46.00	-9.87
851	35.52	*** **	*** **	56.00	46.00	-10.48
904	34.05	*** **	*** **	56.00	46.00	-11.95
960	32.44	*** **	*** **	56.00	46.00	-13.56
1003	32.34	*** **	*** **	56.00	46.00	-13.66

**Line 2**

FREQUENCY ( KHz )	READING AMPLITUDE			LIMIT		MARGIN ( dB )
	Peak (dBμV/m)	Quasi-peak (dBμV/m)	Average (dBμV/m)	Quasi-Peak (dBμV/m)	Average (dBμV/m)	
449	32.45	*** **	*** **	57.46	47.46	-15.01
601	32.14	*** **	*** **	56.00	46.00	-13.86
645	31.20	*** **	*** **	56.00	46.00	-14.80
705	33.67	*** **	*** **	56.00	46.00	-12.33
744	34.46	*** **	*** **	56.00	46.00	-11.54
798	33.14	*** **	*** **	56.00	46.00	-12.86
851	34.55	*** **	*** **	56.00	46.00	-11.45
904	33.63	*** **	*** **	56.00	46.00	-12.37
954	30.55	*** **	*** **	56.00	46.00	-15.45
1106	29.55	*** **	*** **	56.00	46.00	-16.45

\* The reading amplitudes are all under average limit.

**Conducted Emission Test Result: ( 10 X 100 MHz )**

Testing room: Temperature : 24 ° C Humidity : 57 % RH

**Line 1**

FREQUENCY ( KHz )	READING AMPLITUDE			LIMIT		MARGIN ( dB )
	Peak (dBμV/m)	Quasi-peak (dBμV/m)	Average (dBμV/m)	Quasi-Peak (dBμV/m)	Average (dBμV/m)	
397	35.10	**** **	**** **	58.94	48.94	-13.84
645	31.63	**** **	**** **	56.00	46.00	-14.37
754	29.82	**** **	**** **	56.00	46.00	-16.18
803	34.78	**** **	**** **	56.00	46.00	-11.22
851	34.17	**** **	**** **	56.00	46.00	-11.83
904	31.26	**** **	**** **	56.00	46.00	-14.74
947	32.60	**** **	**** **	56.00	46.00	-13.40
1003	31.03	**** **	**** **	56.00	46.00	-14.97
1091	34.31	**** **	**** **	56.00	46.00	-11.69
1192	31.23	**** **	**** **	56.00	46.00	-14.77

**Line 2**

FREQUENCY ( KHz )	READING AMPLITUDE			LIMIT		MARGIN ( dB )
	Peak (dBμV/m)	Quasi-peak (dBμV/m)	Average (dBμV/m)	Quasi-Peak (dBμV/m)	Average (dBμV/m)	
400	35.14	**** **	**** **	58.86	48.86	-13.72
499	34.26	**** **	**** **	56.03	46.03	-11.77
645	32.58	**** **	**** **	56.00	46.00	-13.42
749	30.43	**** **	**** **	56.00	46.00	-15.57
793	34.74	**** **	**** **	56.00	46.00	-11.26
845	36.06	**** **	**** **	56.00	46.00	-9.94
898	32.90	**** **	**** **	56.00	46.00	-13.10
1015	30.45	**** **	**** **	56.00	46.00	-15.55
1070	32.06	**** **	**** **	56.00	46.00	-13.94
1156	32.27	**** **	**** **	56.00	46.00	-13.73

\* The reading amplitudes are all under average limit.

**Conducted Emission Test Result: ( 100 X 100 MHz )**

Testing room: Temperature : 24 ° C Humidity : 57 % RH

**Line 1**

FREQUENCY ( KHz )	READING AMPLITUDE			LIMIT		MARGIN ( dB )
	Peak (dBμV/m)	Quasi-peak (dBμV/m)	Average (dBμV/m)	Quasi-Peak (dBμV/m)	Average (dBμV/m)	
394	33.12	*** **	*** **	59.03	49.03	-15.91
489	30.85	*** **	*** **	56.31	46.31	-15.46
697	31.59	*** **	*** **	56.00	46.00	-14.41
798	30.73	*** **	*** **	56.00	46.00	-15.27
851	34.20	*** **	*** **	56.00	46.00	-11.80
904	35.38	*** **	*** **	56.00	46.00	-10.62
947	34.91	*** **	*** **	56.00	46.00	-11.09
997	36.61	*** **	*** **	56.00	46.00	-9.39
1048	32.16	*** **	*** **	56.00	46.00	-13.84
1106	30.33	*** **	*** **	56.00	46.00	-15.67

**Line 2**

FREQUENCY ( KHz )	READING AMPLITUDE			LIMIT		MARGIN ( dB )
	Peak (dBμV/m)	Quasi-peak (dBμV/m)	Average (dBμV/m)	Quasi-Peak (dBμV/m)	Average (dBμV/m)	
397	36.41	*** **	*** **	58.94	48.94	-12.53
499	32.91	*** **	*** **	56.03	46.03	-13.12
641	31.93	*** **	*** **	56.00	46.00	-14.07
803	32.36	*** **	*** **	56.00	46.00	-13.64
851	33.90	*** **	*** **	56.00	46.00	-12.10
904	31.92	*** **	*** **	56.00	46.00	-14.08
947	29.48	*** **	*** **	56.00	46.00	-16.52
1015	31.49	*** **	*** **	56.00	46.00	-14.51
1048	37.52	*** **	*** **	56.00	46.00	-8.48
1142	29.94	*** **	*** **	56.00	46.00	-16.06

\* The reading amplitudes are all under average limit.

**Appendix B**

**Radiated Emission Test Result: (Horizontal) ( 100 X 100 MHz )**

Test Conditions:

Testing room : Temperature : 21 ° C      Humidity : 45 % RH  
 Testing site : Temperature : 21 ° C      Humidity : 49 % RH

Frequency	Reading Amplitude	Ant. Height	Table	Correction Factors	Corrected Amplitude	Class B limit	Margin
MHz	dBμV	m	degree	dB/m	dBμV/m	dBμV/m	dB

124.990	45.39	0.99	77	-21.89	23.50	30.00	-6.50
600.020	45.12	2.52	94	-16.67	28.45	37.00	-8.55
650.010	50.28	0.99	252	-18.75	31.53	37.00	-5.47
749.990	47.11	0.99	105	-18.07	29.04	37.00	-7.96
***							

Note:

1. Margin = Amplitude - limit, if margin is minus means under limit.
  2. Corrected Amplitude = Reading Amplitude + Correction Factors
  3. Correction factor = Antenna factor + ( Cable Loss - Amplitude gain)
- (For example: 30MHz correction factor = 15.5 + (-15.26) = 0.24 dB/m)

**Radiated Emission Test Result: (Vertical) ( 10 X 10 MHz)**

Frequency	Reading Amplitude	Ant. Height	Table	Correction Factors	Corrected Amplitude	Class B limit	Margin
MHz	dB $\mu$ V	m	degree	dB/m	dB $\mu$ V/m	dB $\mu$ V/m	dB

37.500	43.51	2.51	94	-22.74	20.77	30.00	-9.23
69.980	52.71	0.99	283	-24.14	28.57	30.00	-1.43
169.990	42.53	0.99	342	-22.06	20.47	30.00	-9.53
190.000	43.60	0.99	328	-24.19	19.41	30.00	-10.59
200.020	43.60	4.01	226	-24.56	19.04	30.00	-10.96
375.000	46.55	0.99	337	-18.73	27.82	37.00	-9.18
***							

**Final statement:**

**This test report, measurements made by TRC are traceable to the NIST.**