

RFI / EMI TEST REPORT

APPLICANT : NATIONAL DATA COMM CORPORATION

E. U. T. : SOHWARE SuperFlex 10/100 Hub

TRADE NAME : N/A

FCC ID : IOUNDS108S01

REGULATION : CFR 47 , Part 15 Subpart B , Class B

TEST SITE : PEP Testing Laboratory

TEST ENGINEER : *Tommy Wang*

TEST DATE : *Jan 18 1999*

ISSUED DATE : JAN. / 22 / 1999

REPORT No. : 990002

7435 Oakland Mills Road
Columbia, MD 21046
Telephone: 301-725-1585 (ext-218)
Facsimile: 301-344-2050

November 25, 1996

IN REPLY REFER TO
31040/SIT
1300F2

PEP Testing Laboratory
12-3 Fl., No. 27-1, Lane 169
Kang-Ning St., Hsi-chi Town
Taipei Hsien, Taiwan, R.O.C.

Attention: M. Y. Tsui

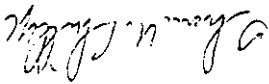
Re: Measurement facility located at above address
(3 meter site)

Gentlemen:

Your submission of the description of the subject measurement facility has been reviewed and found to be in compliance with the requirements of Section 2.948 of the FCC Rules. The description has, therefore, been placed on file and the name of your organization added to the Commission's list of facilities whose measurement data will be accepted in conjunction with applications for certification or notification under Parts 15 or 18 of the Commission's Rules. Our list will also indicate that the facility complies with the radiated and AC line conducted test site criteria in ANSI C63.4-1992. Please note that this filing must be updated for any changes made to the facility, and at least every three years the data on file must be certified as current.

Per your request, the above mentioned facility has been also added to our list of those who perform these measurement services for the public on a fee basis. This list is published periodically and is also available on the Laboratory's Public Access Link as described in the enclosed Public Notice.

Sincerely,



Thomas W. Phillips
Electronics Engineer
Customer Service Branch

Enclosure:
PAL PN

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 : NATIONAL DATACOMM CORPORATION *
 PRODUCT : SOHWARE Superflex 10/100 Hub *
 FCC ID : JOUNDS108S01 *
 MODEL : NDS108_DS108 *

M. Y. Tsui

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

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1. GENERAL

1.1 GENERAL INFORMATION:

APPLICANT : NATIONAL DATACOMM CORPORATION

2F, NO. 28, INDUSTRY EAST 9TH RD.,
SCIENCE PARK, HSIN-CHU, TAIWAN,
R. O. C.

MANUFACTURER : NATIONAL DATACOMM CORPORATION

2F, NO. 28, INDUSTRY EAST 9TH RD.,
SCIENCE PARK, HSIN-CHU, TAIWAN,
R. O. C.

MEASUREMENT PROCEDURE : ANSI C63, 4 - 1992

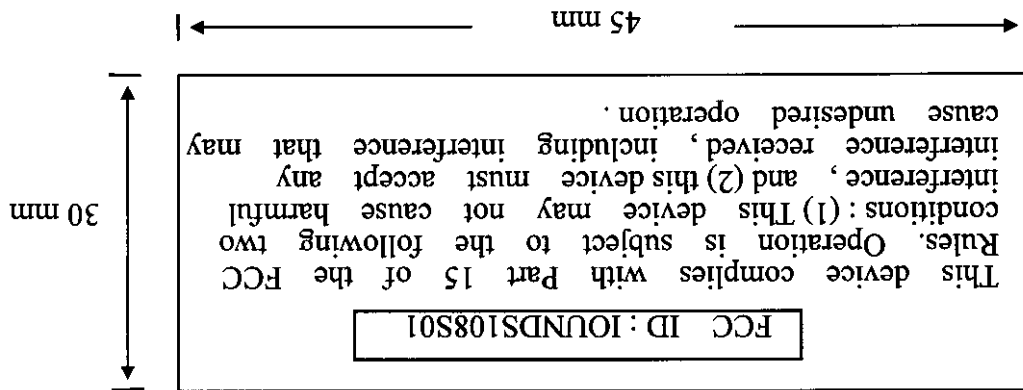
TESTED FOR COMPLIANCE WITH : Title 47 of CFR

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

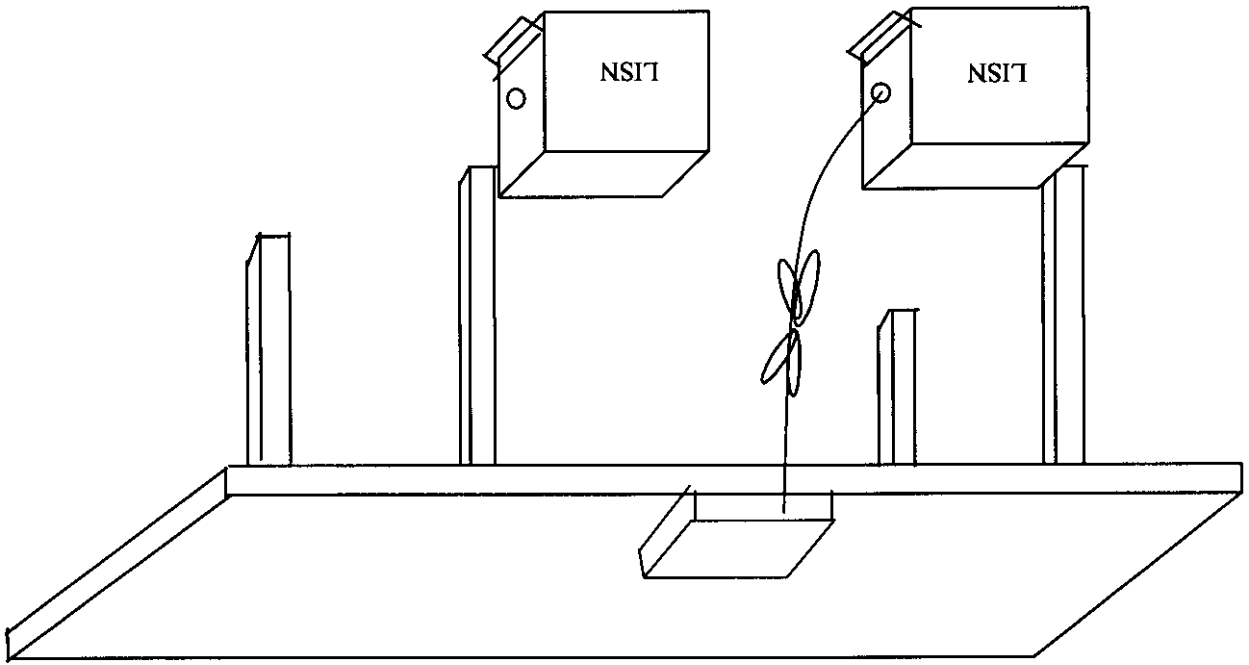
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate 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.



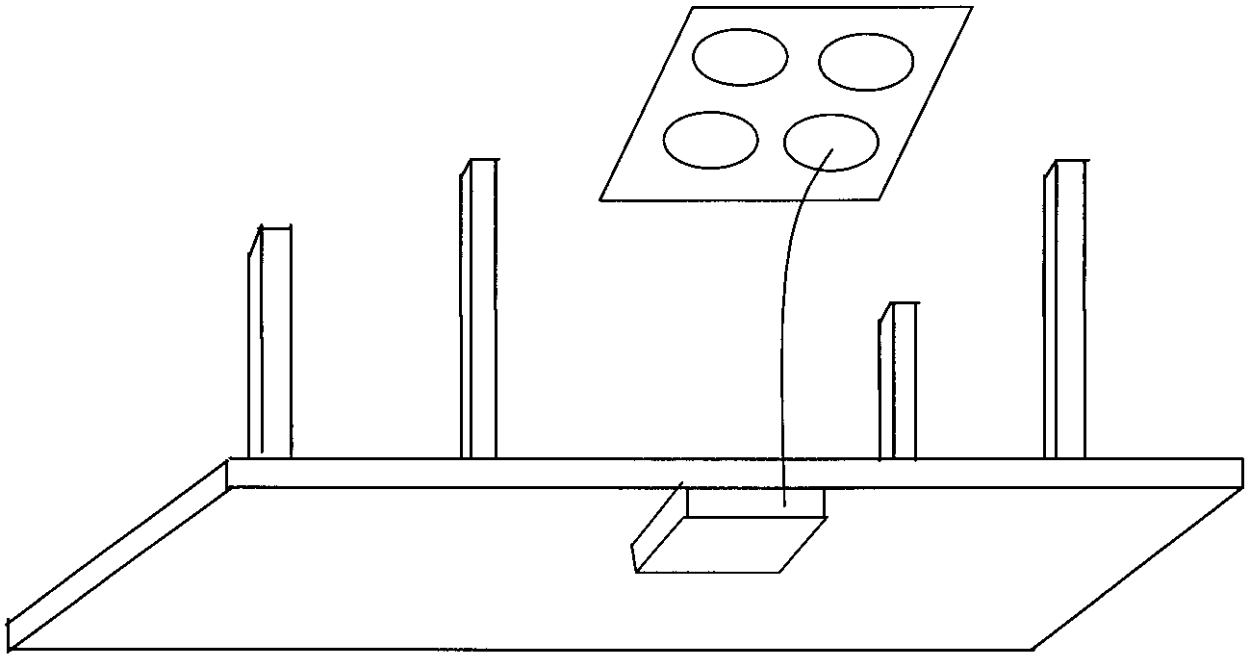
2.1 GENERAL SETUP OF THE TEST FACILITIES

2. CONDUCTION EMISSIONS TEST

2.2 TEST PROCEDURES

The system was setup as described above, with the EMI diagnostic software. Both the line of power cord, hot and neutral, were run with the EMI tests software.

To get the maximum power line conducted emission, we changed the configuration by varying the monitor power cord fed from floor outlet and from the outlet on the power supply of this computer. The highest emissions were recorded in the RFI test report.



3.1 GENERAL SETUP OF THE FACILITIES

3. RADIATED EMISSIONS TEST

3.2 TEST PROCEDURES

Radiated emissions test was carried out by PEP Testing Laboratory at the open field test site authorized by FCC.

The EUT and supporting equipments were setup with the EMI diagnostic software.

a. setting up the EUT under normally position, and scanning it from 30 MHz to 1000 MHz, then recording those narrow band noises which cannot be 6 dBuV below lower bound. Both horizontal and vertical antenna are measured from 1 meter height to 4.0 meter height, and turntable rotate 360 degrees.

b. fixing the EUT rear face to antenna and antenna 1.0 meter height. We adjusted I/O cables to find the highest coupling noise and moved the height of antenna from 1 to 4 meters, then rotated the turntable simultaneously.

c. checking following step b. all points which were recorded in step a.

d. changing the peripherals position, and routine steps a. b. c. The highest emissions were recorded in the RFI test report.

4. DESCRIPTION FOR EUT TESTING CONFIGURATION

**** TEST PROCEDURE ----**

(A) The EUT is 10/100 BASE switching HUB , FCC ID: IOUNDS108S01 , with eight TP output ports , for more detail information about the EUT , please refer user's manual .

(B) Test method : put EUT on turn table and two PCs systems with Ethernet card set away from the EUT about 30 meters , EUT was enabled by data transmitted between both PCs .

When pre-scan , not only all of TP output ports were tested by single , but the rest of seven ports which were not connected to PC were terminated by free-ended data cables during the test . Both speeds (10 / 100 BASE) were tested. This report provided the worst case data (port 1 & port 8 connected to PC and 100 BASE) to reference .

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

(D) 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 .

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

5. SUPPORTING DEVICES TO TEST

SUPPORT UNIT 1. ----PERSONAL COMPUTER × 2
 Manufacturer : ASUS Inc.
 Model Number : P2L97
 Power Supply Type : Switching
 Power Cord : Shielded, Detachable, 1.2m
 Data Cable : Shielded, Detachable, 1.2m
 FCC ID : N/A

SUPPORT UNIT 2. ----MONITOR × 2
 Manufacturer : Acer Peripherals Inc.
 Model Number : 7134T
 Power Supply Type : Switching
 Power Cord : Shielded, Detachable, 1.2m
 Data Cable : Shielded, Detachable, 1m
 FCC ID : JVP7134T

SUPPORT UNIT 3. ----KEYBOARD × 2
 Manufacturer : Acer Peripherals Inc.
 Model Number : 6311-KW
 Power Supply Type : N/A
 Power Cord : N/A
 Data Cable : Shielded, Detachable, 1.2m
 FCC ID : JVPKBS-WIN

EQUIPMENT UNDER TEST ----SOHWARE SuperFlex 10/100 Hub
 Manufacturer : NATIONAL DATA COMM CORPORATION
 Model Number : NDS108, DS108
 Data Cable : Shielded, Detachable, 1.2m
 FCC ID : IOUNDS108S01

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 Emission Test Photo. : Page 14
 Test Data : Hot 15
 Neutral 16

Radiated Emission Test Photo. : Page 17
 Test Data : Horizontal 18
 Vertical 19

CONDUCTED EMISSIONS TEST DATA

Note : HOT LINE TEST

Freq. (MHZ)	Level (dB)	Over Limit (dB)	Limit Line (dB)	Read Level (dB)	Probe Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)
0.716	44.88	- 3.12	48.00	23.00	0.10	1.78	-20.00
1.277	45.06	- 2.94	48.00	23.20	0.10	1.76	-20.00
4.942	43.92	- 4.08	48.00	21.80	0.27	1.85	-20.00
6.242	46.40	- 1.60	48.00	24.20	0.35	1.85	-20.00
9.995	43.50	- 4.50	48.00	21.20	0.50	1.80	-20.00
11.206	44.39	- 3.61	48.00	22.00	0.56	1.83	-20.00
11.827	43.61	- 4.39	48.00	21.20	0.58	1.83	-20.00
12.506	44.45	- 3.55	48.00	22.00	0.61	1.84	-20.00
13.156	45.09	- 2.91	48.00	22.60	0.64	1.85	-20.00
13.747	43.73	- 4.27	48.00	21.20	0.66	1.87	-20.00

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

Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor
(dB)	(dB)	(dB)	(dB)	(dB)	(dB)
- 0.75	48.00	25.40	0.10	1.75	-20.00
- 3.68	48.00	22.20	0.27	1.85	-20.00
- 3.04	48.00	22.80	0.31	1.85	-20.00
- 3.30	48.00	22.40	0.50	1.81	-20.00
- 0.75	48.00	24.80	0.61	1.84	-20.00
- 2.51	48.00	23.00	0.64	1.85	-20.00
- 6.75	48.00	18.60	0.74	1.92	-20.00
- 7.64	48.00	17.60	0.78	1.98	-20.00
- 7.40	48.00	17.81	0.79	2.00	-20.00
- 7.88	48.00	17.20	0.85	2.07	-20.00
47.25	40.12	48.64			
44.32	44.96	4.942			
44.70	44.96	5.562			
47.25	47.25	9.936			
45.49	45.49	12.506			
41.25	41.25	13.127			
40.36	40.36	16.555			
40.60	40.60	18.948			
40.12	40.12	19.569			
		22.317			

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 ;

125.002	150.002	175.002	225.002	250.001	350.003	375.004	400.004	425.004	450.004
27.94	28.76	29.13	27.55	34.83	31.09	24.80	25.76	27.79	24.48
-15.56	-14.74	-14.37	-18.45	-11.17	-14.91	-21.20	-20.24	-18.21	-21.52
43.50	43.50	43.50	46.00	46.00	46.00	46.00	46.00	46.00	46.00
34.75	34.46	34.18	28.39	33.86	33.04	25.92	26.17	27.28	24.17
11.99	12.90	13.36	17.15	18.77	15.30	16.10	16.79	17.60	17.31
1.20	1.40	1.60	2.01	2.20	2.75	2.78	2.80	2.91	3.01
20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Over Limit (dB)	Level (dB)	Level (dB)	Over Limit (dB)	Level (dB)	Level (dB)	Level (dB)	Level (dB)	Level (dB)	Level (dB)
Line (dB)	Read Level (dB)	Probe Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)					

Note :

1. Level = Read Level + Probe Factor + Cable Loss - Preamplifier Factor
2. Over Limit = Level - Limit Line

Instrument	Model No.	Cal. Due Date	S/N
R&S Receiver	ESVS30(30M~1GHZ)	Apr. 21, 1999	863342/012
R&S Receiver	ESBI (20~5GHZ)	Feb. 12, 1999	845658/003
Spectrum Analyzer	HP8591A(9K~1.8GHZ)	Apr. 15, 1999	3225A03039
Spectrum Analyzer	R3261A (9K~2.6GHZ)	Dec. 03 1999	91720076
EMCO L.I.S.N.	3825/2 (10K~30MHZ)	Apr. 15, 1999	9311-2150
L.I.S.N.	KNW-242(10K~30MHZ)	Jan. 31, 1999	8-837-7
R & S L.I.S.N.	ESH3-Z5(9K~30MHZ)	Jul. 09, 1999	844982/039
Anritsu Pre-Amp.	MH648A(100K~1.4GHZ)	Sep. 20, 1999	M40076
R & S Pre-Amp.	ESMI-Z7(20M~7GHZ)	Feb. 12, 1999	6/2278/011
COM-Power Horn Antenna	AH-118 (1G~18GHZ)		10056
EMCO Dipole Antenna	3121C (20M~1GHZ)	May. 22, 1999	9611-1230
EMCO Biconical Antenna	3110B (30M~300M)	Mar. 10, 1999	2932
EMCO Log-Periodic Antenna	3146A (300M~1GHZ)	Apr. 14, 1999	1384

List of Test Equipment