

Exhibit C - Measurement Report



ELECTROMAGNETIC INTERFERENCE TEST REPORT

Company : ALFA, INC.
Address : 11-1 Industry East Road IV Science Based Industrial Park
Hsinchu, Taiwan, R.O.C.
Sample Name : 10/100 NIC
Model : GFC2206
Data Applies To : NS GFC2206
Date Received : JUL. 08, 1998
Date Tested : JUL. 08, 1998

MEASUREMENT PROCEDURE USED :

CISPR 22, CLASS B, 1996
FCC RULE PART 15, 1996

WE HEREBY CERTIFY THAT: The measurements shown in the attachment were made in accordance with the procedures indicated, and the energy emitted by the equipment was found to be within the limits applicable. We assume full responsibility for the accuracy and completeness of these measurements and vouch for the qualifications of all persons taking them.

	Name	Signature	Date
Testing Engineer	C.F.Wu/NVLAP	C.F. Wu	Jul. 10, 1998
Approving Manager	Paul Y. Liao/NVLAP	Paul Y. Liao	Jul. 12, 1998

Notes :

1. This report will be invalid if duplicated or photocopied in part.
2. This report refers only to the specimen(s) submitted to test, and is invalid as separately used.
3. This report is invalid without examination stamp and signature of this institute.
4. The tested specimen(s) will be preserved for thirty days from the date issued.
5. This is a NIST/NVLAP accredited report but not constituted and endorsed by US government.



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1. GENERAL INFORMATION

1.1 DESCRIPTION OF EUT & POWER

MANUFACTURER : ALFA, Inc.

SAMPLE NAME : 10/100 NIC

MODEL NUMBER : GFC2206

POWER SUPPLY : DC5V(from PC)



1.2 DESCRIPTION OF PERIPHERALS

(1) PC

MODEL NUMBER : D5495B
SERIAL NUMBER : SG74600486
MANUFACTURER : HP CORP.
F.C.C. ID : B94VECTRAVE53
POWER CORD : Unshielded , Detachable , 1.8m

(2) MONITOR

MODEL NUMBER : D2621
SERIAL NUMBER : CN73811590
MANUFACTURER : HP CORP
F.C.C. ID : A3KM064
POWER CORD : Unshielded , Detachable , 1.8m

(3) KEYBOARD

MODEL NUMBER : 3722
SERIAL NUMBER : C3758A
MANUFACTURER : HP CORP.
F.C.C. ID : CIGE03633

(4) PC

MODEL NUMBER : D5495B
SERIAL NUMBER : SG74600488
MANUFACTURER : HP CORP.
F.C.C. ID : B94VECTRAVE53
POWER CORD : Unshielded , Detachable , 1.8m

(5) MONITOR

MODEL NUMBER : D2621
SERIAL NUMBER : CN73811580
MANUFACTURER : HP CORP.
F.C.C. ID : A3KM064
POWER CORD : Unshielded , Detachable , 1.8m



(6) KEYBOARD

MODEL NUMBER : 6311
PRODUCT NUMBER : 311273755
MANUFACTURER : Acer CORP.
F.C.C. ID : Q86311-K

(7) 10/100 Network Interface Card

MODEL NUMBER : GFC2206
PRODUCT NUMBER : -----
MANUFACTURER : ALFA, INC.

(8) PRINTER

MODEL NUMBER : 5152-002
PRODUCT NUMBER : 0754365
MANUFACTURER : IBM CORP.
F.C.C. ID : BKM9A85152002

(9) MODEM

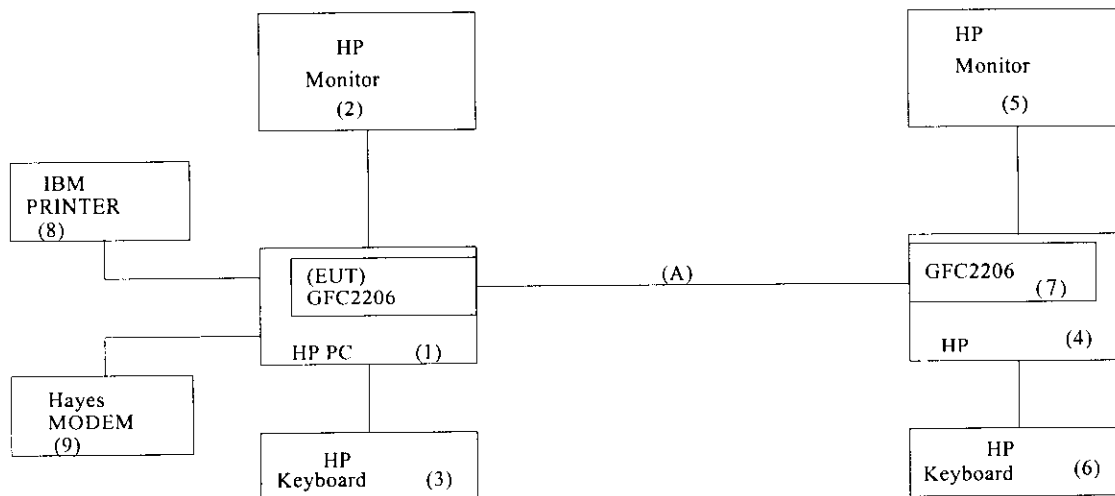
MODEL NUMBER : 5240AM
PRODUCT NUMBER : A0095240K270
MANUFACTURER : Hayes CORP.
F.C.C. ID : BFJ55201AM

(10) Cables

	Type	Connector	Shielded	length
(A)	Cross-over twisted-pair	RJ-45, plastic	No	50ft



1.3 EUT & PERIPHERALS SETUP DIAGRAM



The indicated numbers (1)(2)(A)-----please refer to item 1.2.



1.4 EUT OPERATING CONDITION

1. Powered on all equipment.
2. PC(1) RSET8139 , enter
Select 10Mbps or 100Mbps
3. PC(4) RSET8139 , enter
Select 10Mbps or 100Mbps
4. Run Network Diagnostics.

1.5 DESCRIPTION OF TEST SITE

SITE DESCRIPTION	: FCC certificate NO. :31040/SIT VCCI certificate NO. :R-706 , C-650 DNV certificate NO. : 510-96-1016 TUV certificate NO. :I9664582-9610 Lloyd's certificate NO. :LA003 BCIQ certificate NO. :SL2-IN-E-02 NVLAP Lab code : 200118-0 CNLA certificate NO. :CNLA-ZL97018
NAME OF SITE	: Electronics Research & Service Organization Industrial Technology Research Institute
SITE LOCATION	: K500, 195-4 , sec. 4, Chung Hsing Rd., Chu-Tung Chen. Hsin-Chu, Taiwan 31015 R.O.C.



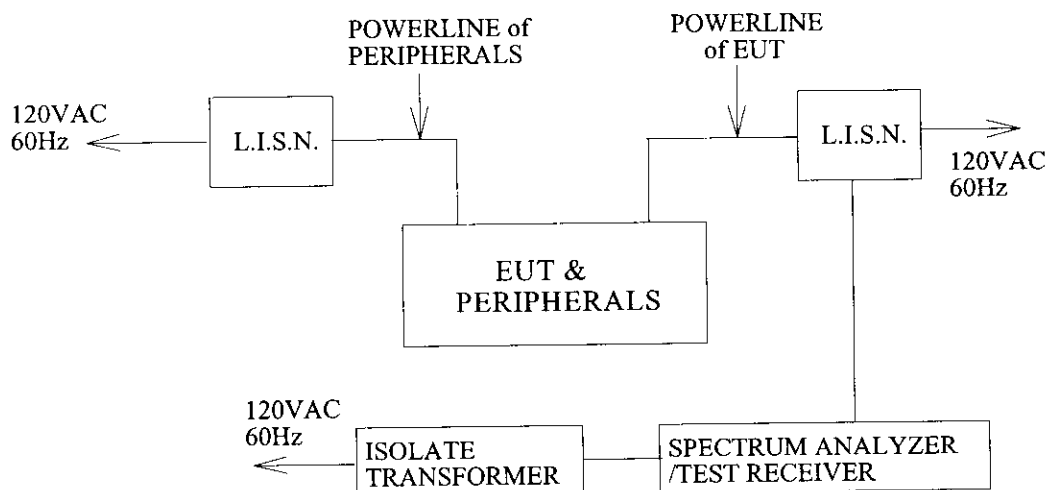
2. CONDUCTED POWERLINE TEST

2.1 TEST EQUIPMENTS

The following test equipments are used during the conducted powerline tests :

MANUFACTURER OR TYPE	MODEL No	SERIAL NO.	DATE OF CALIBRATION
SPECTRUM ANALYZER & DISPLAY	HP 8568A	2235A02320	MAR. 05, 1998
QUASI-PEAK ADAPTER	HP 85650 A	2341A00672	MAR. 05, 1998
ISOLATION TRANSFORMER	SOLAR 7032-1	N/A	N/A
L.I.S.N.	EMCO 3850/2	9311-1025 9401-1028	MAR. 24, 1998
TEST RECEIVER	R/S ESH3	8720791118	MAR. 13, 1998
SHIELDED ROOM	KEENE 5983	N/A	N/A

2.2 TEST SETUP





2.3 CONDUCTED POWER LINE EMISSION LIMIT

FREQUENCY (MHz)	MAXIMUM RF LINE VOLTAGE (dB μ V)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56	56-46
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

2.4 TEST PROCEDURE

The test procedure is performed in a 12ft $\times$ 12ft $\times$ 8ft(L $\times$ W $\times$ H) shielded room. the EUT along with its peripherals were placed on a 1.0m(W) $\times$ 1.5m(L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane. The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chasis ground was bounded to the horizontal ground plane of shielded room. All peripherals were connected to the second LISN and the chasis ground also bounded to the horizontal ground plane of shielded room. The excess power cable between the EUT and the LISN was bundled. The power cables of peripherals were unbundled. All connecting cables of EUT and peripherals were moved to find the maximum emission.

2.5 UNCERTAINTY OF CONDUCTED EMISSION

The uncertainty of conducted emission is ± 1.36 dB.



2.6 LINE CONDUCTED RF VOLTAGE MEASUREMENT

The frequency spectrum from 0.15 MHz to 30 MHz was investigated. All emissions not reported below are more than 20 dB below the prescribed limits.

All readings are Quasi-peak values.

Temperature : 23 °C

Humidity : 55 % RH

FREQUENCY (MHz)	READING(dB μ V)				LIMITS (dB μ V)	
	ONE END & GRD'D		THE OTHER END & GRD'D			
	Q.P.	Ave.	Q.P.	Ave.	Q.P.	Ave.
0.150	*	*	*	*	66.00	56.00
0.152	43.54	*	*	*	65.91	55.91
0.160	*	*	43.34	*	65.47	55.47
0.194	40.55	*	*	*	63.84	53.84
0.226	40.56	*	*	*	62.61	52.61
0.345	40.18	*	44.98	*	59.09	49.09
1.236	*	*	37.14	*	56.00	46.00
1.480	*	*	38.25	*	56.00	46.00
1.698	*	*	38.06	*	56.00	46.00
1.707	36.86	*	*	*	56.00	46.00
2.993	*	*	37.19	*	56.00	46.00
3.107	36.86	*	*	*	56.00	46.00
3.328	37.09	*	37.69	*	56.00	46.00
7.526	40.13	*	40.23	*	60.00	50.00
10.019	39.45	*	*	*	60.00	50.00
10.072	*	*	39.55	*	60.00	50.00
13.841	45.46	*	45.56	*	60.00	50.00
15.226	46.77	*	*	*	60.00	50.00
15.307	*	*	48.67	*	60.00	50.00
20.924	*	*	43.08	*	60.00	50.00
21.260	42.88	*	*	*	60.00	50.00
30.000	*	*	*	*	60.00	50.00

REMARKS : 1. * Undetectable or the Q.P.values is lower than the limits of Ave
2. For 10Mbps



2.6 LINE CONDUCTED RF VOLTAGE MEASUREMENT

The frequency spectrum from 0.15 MHz to 30 MHz was investigated. All emissions not reported below are more than 20 dB below the prescribed limits.

All readings are Quasi-peak values.

Temperature : 23 °C

Humidity : 55 % RH

FREQUENCY (MHz)	READING(dB μ V)				LIMITS (dB μ V)	
	ONE END & GRD'D		THE OTHER END & GRD'D			
	Q.P.	Ave.	Q.P.	Ave.	Q.P.	Ave.
0.150	*	*	*	*	66.00	56.00
0.167	42.46	*	*	*	65.12	55.12
0.227	40.76	*	*	*	62.57	52.57
0.346	39.88	*	44.78	*	59.05	49.05
0.576	*	*	35.91	*	56.00	46.00
1.242	34.84	*	37.44	*	56.00	46.00
1.359	35.35	*	*	*	56.00	46.00
1.480	36.15	*	38.25	*	56.00	46.00
1.707	36.86	*	38.26	*	56.00	46.00
1.939	36.27	*	*	*	56.00	46.00
2.993	36.59	*	*	*	56.00	46.00
3.107	36.97	*	38.89	*	56.00	46.00
3.328	37.49	*	*	*	56.00	46.00
15.066	46.47	*	46.57	*	60.00	50.00
15.552	45.77	*	46.27	*	60.00	50.00
20.594	*	*	41.88	*	60.00	50.00
20.924	42.98	*	*	*	60.00	50.00
21.147	*	*	42.08	*	60.00	50.00
21.600	42.78	*	*	*	60.00	50.00
30.000	*	*	*	*	60.00	50.00

REMARKS : 1. * Undetectable or the Q.P.values is lower than the limits of Ave
2. For 100Mbps



3. RADIATED EMISSION TEST

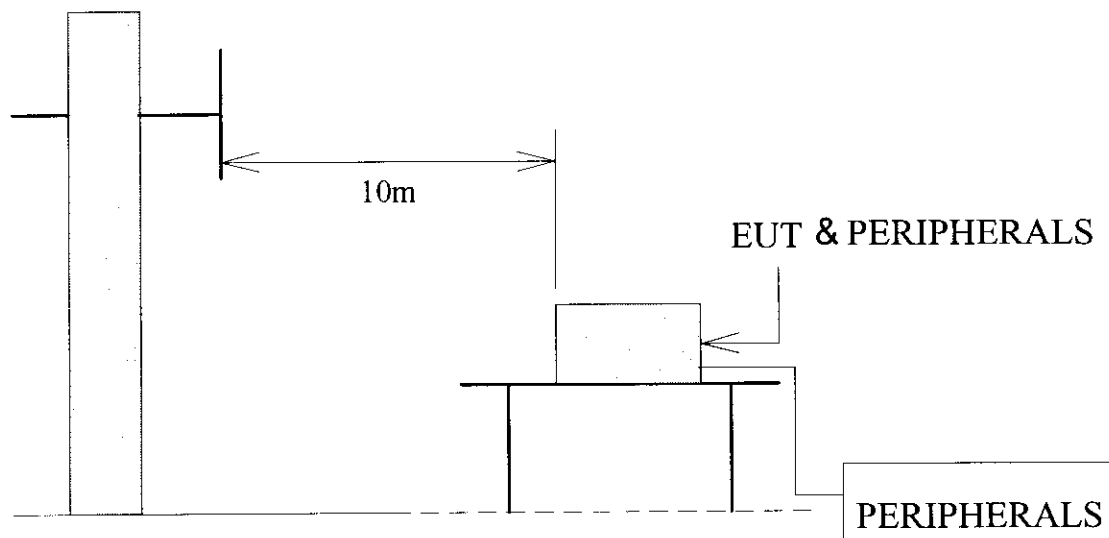
3.1 TEST EQUIPMENTS

The following test equipments are utilized in making the measurements contained in this report.

MANUFACTURER OR TYPE	MODEL No.	SERIAL No.	DATE OF CALIBRATION
CHASE BI-LOG ANTENNA	CBL6111A	1546	MAY.23, 1998
R/S TEST RECEIVER	ESMI	842088/005 841978/008	MAY.29, 1998
OPEN SITE	-----	No.2	AUG. 23, 1997

3.2 TEST SETUP

The diagram below shows the test setup which is utilized to make these measurements.



Antenna Elevation Variable



3.3 RADIATION LIMIT

All emanation from a class B computing device or system , including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below :

FREQUENCY (MHz)	DISTANCE (METERS)	FIELD STRENGTHS(dB μ V/M)	
		CLASS A	CLASS B
30 – 230	10	40	30
230 – 1000	10	47	37

Note : (1)The tighter limit shall apply at the edge between two frequency bands.

(2)Distance refers to the distance in meters between the measuring instrument antenna and the closest point of any part of the device or system.

3.4 TEST PROCEDURE

The devices under test were placed on a rotatable table top 0.8 meter above ground. The table was rotated 360 degrees to determine the position of the highest radiation. EUT is set 10 meters from the interference receiving antenna which is mounted on the top of a variable height mast. The antenna height is varied between one meter and four meters above ground to find the maximum value of the field strength Both horizontal polarization and vertical polarization of the antenna are set to make the measurement.

The bandwidth setting on the E.M.I. meter (R/S TEST RECEIVER ESMI) is 120 KHz.

The levels are quasi peak value readings. The frequency spectrum from 30MHz to 1000MHz was investigated.

3.5 UNCERTAINTY OF RADIATED EMISSION

The uncertainty of radiated emission is ± 2.72 dB.



3.6 RADIATED RF NOISE MEASUREMENT

The frequency spectrum from 30 MHz to 1000 MHz was investigated. All emissions not reported below are more than 20 dB below the prescribed limits.

All readings are quasi-peak values.

Temperature : 27°C

Humidity : 70 % RH

FREQ- UENCY (MHz)	ANTENNA FACTOR (dB)	CABLE LOSS (dB)	METER READING AT10m(dB μ V/M)		LIMITS (dB μ V/M)	EMISSION LEVEL AT10m(dB μ V/M)	
			HORIZON- TAL	VERTICAL		HORIZON- TAL	VERTICAL
30.00	*	*	*	*	30.00	*	*
120.00	11.38	2.60	6.04	10.24	30.00	20.02	24.22
229.09	10.81	3.63	9.12	9.40	30.00	23.56	23.84
240.00	11.42	3.72	5.20	4.64	37.00	20.34	19.78
331.58	14.08	4.39	9.68	16.12	37.00	28.15	34.59
364.73	14.87	4.59	13.88	15.56	37.00	33.34	35.02
397.89	15.66	4.79	11.92	*	37.00	32.37	*
596.84	19.36	5.89	3.24	6.04	37.00	28.49	31.29
1000.00	*	*	*	*	37.00	*	*

REMARKS : 1. * Undetectable

2. Emission level (dB μ V/M) = Antenna Factor (dB) + Cable loss (dB)
+ Meter Reading (dB μ V/M).

3. The test data marked in gray background means the EUT emission data is located in the margin uncertainty range of emission limits.

4. For 10Mbps



3.6 RADIATED RF NOISE MEASUREMENT

The frequency spectrum from 30 MHz to 1000 MHz was investigated. All emissions not reported below are more than 20 dB below the prescribed limits.

All readings are quasi-peak values.

Temperature : 27°C

Humidity : 70 % RH

FREQ- UENCY (MHz)	ANTENNA FACTOR (dB)	CABLE LOSS (dB)	METER READING AT10m(dB μ V/M)		LIMITS (dB μ V/M)	EMISSION LEVEL AT10m(dB μ V/M)	
			HORIZON- TAL	VERTICAL		HORIZON- TAL	VERTICAL
30.00	*	*	*	*	30.00	*	*
198.95	9.19	3.39	*	10.52	30.00	*	23.10
229.09	10.81	3.63	9.12	8.56	30.00	23.56	23.00
250.00	11.97	3.80	11.64	8.84	37.00	27.41	24.61
265.26	12.37	3.92	8.28	8.00	37.00	24.57	24.29
298.42	13.26	4.18	13.88	12.48	37.00	31.32	29.92
331.58	14.08	4.39	10.24	16.40	37.00	28.71	34.87
364.73	14.87	4.59	10.24	15.28	37.00	29.70	34.74
397.89	15.66	4.79	9.40	13.04	37.00	29.85	33.49
596.84	19.36	5.89	3.52	5.76	37.00	28.77	31.01
1000.00	*	*	*	*	37.00	*	*

REMARKS : 1. * Undetectable

2. Emission level (dB μ V/M) = Antenna Factor (dB) + Cable loss (dB)
+ Meter Reading (dB μ V/M).

3. The test data marked in gray background means the EUT emission data is located in the margin uncertainty range of emission limits.

4. For 100Mbps