

Exhibit C - Measurement Report



1. GENERAL INFORMATION

1.1 DESCRIPTION OF EUT

MANUFACTURER : ZyXEL COMMUNICATIONS CORPORATION.

SAMPLE NAME : WAN Bridge/Router

MODEL NUMBER : Prestige 153

SERIAL NO. : -----

POWER SUPPLY : 18VAC(From Power Adapter)



ELECTROMAGNETIC INTERFERENCE TEST REPORT

Company : ZyxEL COMMUNICATIONS CORPORATION.
Address : NO.6, Innovation Rd. II, Science- Based
Industrial Park, Hsin-Chu, Taiwan , R.O.C
Sample Name : WAN Bridge/Router
Model : Prestige153
Date Received : APR. 13, 1998
Date Tested : APR. 22, 1998

MEASUREMENT PORCEDURE USED :

**FCC RULES AND REGULATION PART 15 SUBPART B
CLASS B OCTOBER 1996 AND ANSI C63.4 MAY 1992**

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	MAY. 20, 1998
Approving Manager	Paul Y. Liao/NVLAP	Paul Y. Liao	May. 20, 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 testing, and be invalid as seperately used.
3. This report is invalid with out 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 eudorsed by U.S. government.



TABLE OF CONTENTS

TITLE

TEST REPORT CERTIFICATION

PAGE NO.

1. GENERAL INFORMATION.....	3
1.1 DESCRIPTION OF EUT.....	3
1.2 DESCRIPTION OF PERIPHERALS.....	4
1.3 EUT & PERIPHERALS SETUP DIAGRAM.....	6
1.4 EUT OPERATING CONDITION.....	7
1.5 DESCRIPTION OF TEST SITE.....	7
2. CONDUCTED POWERLINE TEST.....	8
2.1 TEST EQUIPMENTS.....	8
2.2 TEST SETUP.....	8
2.3 CONDUCTED POWER LINE EMISSION LIMIT.....	9
2.4 TEST PROCEDURE.....	9
2.5 UNCERTAINTY OF CONDUCTED EMISSION.....	9
2.6 LINE CONDUCTED RF VOLTAGE MEASUREMENT.....	10
2.7 PHOTOS OF CONDUCTION TEST.....	11
3. RADIATED EMISSION TEST.....	12
3.1 TEST EQUIPMENTS.....	12
3.2 TEST SETUP.....	12
3.3 RADIATION LIMIT.....	13
3.4 TEST PROCEDURE.....	13
3.5 UNCERTAINTY OF RADIATED EMISSION.....	13
3.6 RADIATED RF NOISE MEASUREMENT.....	14
3.7 PHOTOS OF OPEN SITE.....	15-16



3. RADIATED EMISSION TEST

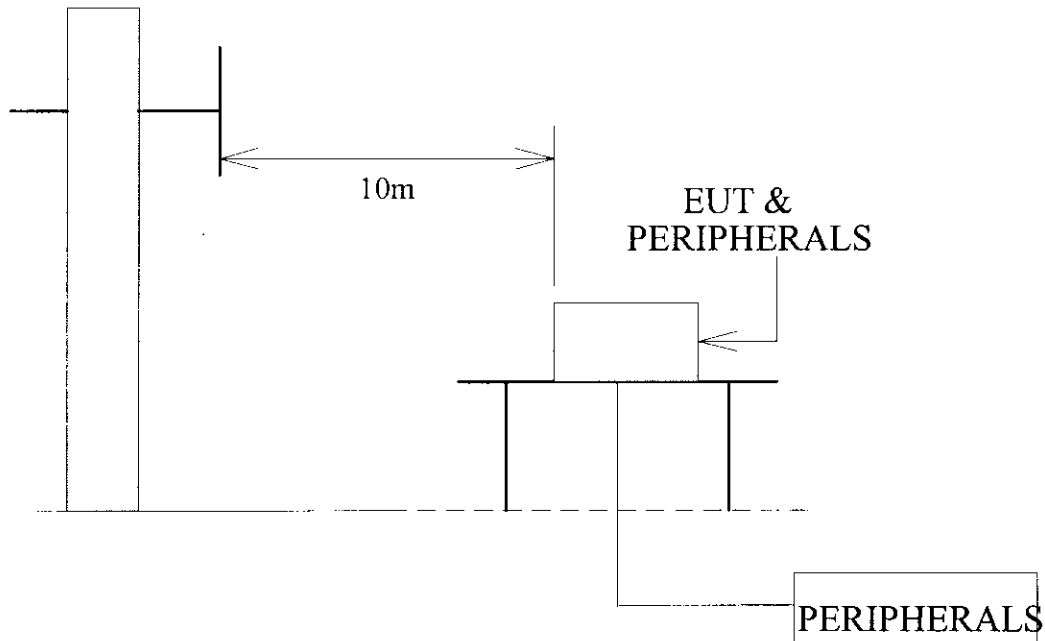
3.1 TEST EQUIPMENTS

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.26, 1997
R/S TEST RECEIVER	ESMI	842088/005 841978/008	MAY.22, 1997
ANECHOIC/SHIELDED ROOM	KEENE 5981	N/A	N/A

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)	FIELD STRENGTHS(dB μ V/M)	
	CLASS A(10m)	CLASS B(3m)
30—88	39.0	40.0
88—216	43.5	43.5
216-960	46.4	46.0
960-1000	49.5	54.0

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 : 71% RH

FREQ- UENCY (MHz)	ANTENNA FACTOR (dB)	CABLE LOSS (dB)	METER READING AT 10m (dB μ V/M)		LIMITS (dB μ V/M)	EMISSION LEVEL AT 3m (dB μ V/M)	
			HORIZON- TAL	VERTICAL		HORIZON- TAL	VERTICAL
30.00	19.71	1.20	*	*	40.00	*	*
80.00	8.73	1.90	*	16.34	40.00	*	36.97
138.25	11.93	2.39	6.54	8.78	43.50	30.86	33.10
150.00	11.15	2.50	6.54	*	43.50	30.19	*
184.02	9.13	2.72	*	2.90	43.50	*	24.75
184.33	9.13	2.72	7.10	11.02	43.50	28.95	32.87
200.00	8.95	2.80	8.78	12.14	43.50	30.53	33.89
215.05	9.99	2.89	5.42	4.58	46.00	28.30	27.16
225.00	10.69	2.95	4.86	8.22	46.00	28.50	31.86
245.77	12.15	3.08	14.94	11.30	46.00	40.17	36.53
368.66	15.01	3.64	15.78	13.54	46.00	44.43	42.19
400.00	15.79	3.80	9.06	*	46.00	38.65	*
441.68	16.65	3.97	*	4.02	46.00	*	34.64
466.68	17.16	4.07	*	4.3	46.00	*	35.53
491.54	17.68	4.17	*	5.7	46.00	*	37.55
491.68	17.68	4.17	5.42	*	46.00	37.27	*
541.68	18.66	4.33	*	5.14	46.00	*	38.13
575.01	19.30	4.42	3.46	3.18	46.00	37.18	36.90
1000.00	24.69	5.70	*	*	54.00	*	*

REMARKS :

1. * Undetectable
2. Emission level at 3m (dB μ V/M) = Antenna Factor (dB) + Cable loss (dB)
+ Meter Reading at 10 m (dB μ V/M) + transferred factor 10(dB).
3. 10m measured data are transferred to 3m by the formula
 $L2 = L1(d1/d20) \mu$ V/ M from CISPR 22
 $20\text{Log}L2 = 20\text{Log}L1 + 20\text{Log} (d1/d2) \text{ dB } \mu$ V/M



(6) Cable

NO.	TYPE	Connector	Shielded	Length
A	D Type	RS232, metal	No	1.5m
B	WAN cable	RJ-45, plastic	No	10m
C	LAN cable	RJ-45, plastic	No	10m



The diagram illustrates the system configuration for the Terminal Prestige 153. The main unit, labeled "Terminal Prestige 153 (5)", features four ports: LAN, WAN #3, WAN #2, and WAN #1. The LAN port is connected to a "Prestige 153 (EUT)" unit. The WAN #3 port is connected to the "LAN" port of the "Prestige 153 (EUT)". The WAN #2 port is connected to the "WAN #3" port of the "Prestige 153 (EUT)". The WAN #1 port is connected to the "WAN #2" port of the "Prestige 153 (EUT)". The "Prestige 153 (EUT)" unit also includes a "console" port and an "AC18V" power input. A "120VAC/60Hz" power source is connected to the "AC18V" input. The "Prestige 153 (EUT)" is connected to a "NEC PC (1)" via a cable labeled (A). The "NEC PC (1)" is connected to a "NEC K/B (3)" and a "NEC (2) MONITOR". The "NEC (2) MONITOR" is connected to an "IBM PRINTER (4)".

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



1.4 EUT OPERATING CONDITION

1. Turn on EUT's power.
2. EUT will send/receive pockets to/from Terminal via WAN#1 cable.
3. EUT will send/receive pockets to/from Terminal via WAN#2 cable.
4. EUT will send/receive pockets to/from Terminal via WAN#3 cable.
5. EUT will send/receive pockets to/from Terminal via LAN cable.
6. EUT will show statistics message to PC via RS-232 cable.
7. Repeat step 1~6.

1.5 DESCRIPTION OF TEST SITE

SITE DESCRIPTION	: FCC certificate NO. :31040/SIT 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 VCCI certificate NO. : R-629, C-650
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.



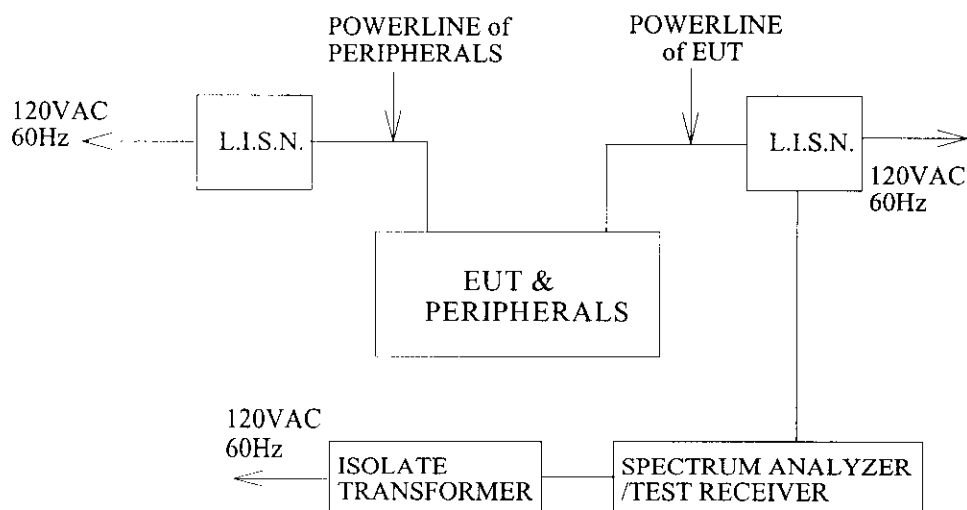
2. CONDUCTED POWERLINE TEST

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
0.45 - 1.705	60	48
1.705 - 30.0	69.5	48

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 0.45 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 : 54 % R.H.

FREQUENCY (MHz)	READING(dB μ V)		LIMITS (dB μ V)
	ONE END & GRD'D	THE OTHER END & GRD'D	
	Q.P.	Q.P.	
0.450	*	*	48.00
2.174	38.77	37.17	48.00
4.590	*	39.41	48.00
4.740	27.90	*	48.00
4.951	*	40.71	48.00
5.185	27.90	*	48.00
5.295	*	40.32	48.00
5.407	41.32	*	48.00
5.522	*	38.72	48.00
6.107	38.22	37.12	48.00
7.278	36.33	*	48.00
7.409	*	35.13	48.00
8.024	37.94	36.14	48.00
22.833	37.49	*	48.00
23.813	41.59	39.69	48.00
28.646	*	35.60	48.00
30.000	*	*	48.00

REMARKS : * Undetectable