



# EMC

## TEST REPORT

REPORT NO. : F88122501

MODEL NO. : TC 3000 Series, T8000 Series

DATE OF TEST : Dec. 29, 1999

PREPARED FOR: VXL INSTRUMENTS LIMITED CO.

ADDRESS : 168, 7TH MAIN, 1ST BLOCK, KORAMANGALA,  
BANGALORE 560034, INDIA

PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION



Accredited Laboratory

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# 1. CERTIFICATION

Issue Date: Jan. 3, 1999

Product : THINCLIENT  
 Trade Name : VXL, ESPRIT  
 Model No. : TC 3000 Series, T8000 Series  
 Applicant : VXL INSTRUMENTS LIMITED  
 Standard : FCC Part 15, Subpart B, Class B  
 ANSI C63.4-1992  
 CISPR 22: 1993+A1: 1995+A2: 1996, Class B

We hereby certify that one sample of the designation has been tested in our facility on Dec. 29, 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 : Jone Lin , DATE: 1/3/2000  
 ( Jone Lin )

CHECKED BY : Yemmy Soong , DATE: 1/3/2000  
 ( Yemmy Soong )

APPROVED BY : Mike Su , DATE: 1/3/2000  
 ( Mike Su )

**ADVANCE DATA TECHNOLOGY CORPORATION**

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## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

Product	:	THINCLIENT
Model No.	:	TC 3000 Series, T8000 Series
Power Supply Type	:	Switching
Power Cord	:	Nonshielded (1.8m)

Note: The EUT is a client for the Citrix Winframe Server & Windows-NT. It works on ICA3 protocol. TC 3000 Series consists of the following :

- 1) Power Supply
- 2) Media-GX Logic Card
- 3) Disk On Chip (Flash Disk)

The EUT has two model names, which are identical to each other in all aspects except for their brand and model names:

- Model: TC 3000 Series, brand: VXL
- Model: T8000 Series, brand: ESPRIT

From the above models, Model: TC 3000 Series was selected as the representative for the test, and its data is recorded in this report.

For more detailed features description, please refer to Manufacturer's Specification or User's Manual.



## 2.2 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other 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	MONITOR	HITACHI	CM814U	FCC Doc Approved	Shielded Signal (1.5m) Nonshielded Power (1.8m)
2	LCD MONITOR	MAG	LT530F	FCC Doc Approved	Nonshielded Power AC (1.8m) Nonshielded Power DC (1.5m) Shielded Signal( 1.2m)
3	KEYBOARD	IBM	52619700	0260267	Shielded Signal (1.4m)
4	USB KEYBOARD	BTC	7932	E5XKBUCP10410	Shielded Signal (1.4m)
5	MODEM X2	ACEEX	1414	IFAXDM1414	Shielded Signal (1.2m) Nonshielded Power (1.2m)
6	MOUSE	LOGITECH	M-S34	DZL211029	Shielded Signal (1.5m)
7	USB MOUSE	DEXIN	A2U800A	NIYA2P800A	Shielded Signal (1.5m)
8	PRINTER	HP	2225C+	DSI6XU2225	Shielded Signal (1.2m) Nonshielded Power (1.2m)
9	MICROPHONE	CAROL	MUD-329	NA	Nonshielded Signal (3.0m)
10	SPEAKER	AUDIO-TECNHICA	AT-SP25	NA	Nonshielded Power DC (2.2m) Nonshielded Signal (1.0m)
11	TELEVISION	SONY	PVM-1351Q	VERIFICATION	Nonshielded Power (1.0m)
12	PERSONAL COMPUTER	IBM	6560-T7T	AN06260F	Nonshielded Power (1.8m)
13	MONITOR	ADI	SM-5514A	BR8SM-5514AC	Shielded Signal (1.2m) Nonshielded Power (1.8m)
14	KEYBOARD	FORWARD	FDA-104GA	F4ZDA-104G	Shielded Signal (1.4m)
15	MOUSE	DEXIN	A2P800A	NIYA2P800A	Shielded Signal (1.4m)
16	LAN CARD	INTEL	S82555	EJMNPDSD035	NA

Note: 1. The EUT acted as SERVER PC and communicated with support units 13-16 which acted as WORKSTATION and partners of communication system via a UTP cable (10m).

## 2.3 TEST METHODOLOGY AND CONFIGURATION

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 3/10 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)

##### CONDUCTED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ Test Receiver	ESHS30	828765/002	Aug. 2, 2000
ROHDE & SCHWARZ Artificial Mains Network	ESH2-Z5	828075/003	July 21, 2000
EMCO-L.I.S.N.	3825/2	90031627	July 21, 2000
Shielded Room	Site 5	ADT-C05	NA

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.

##### RADIATED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
HP Spectrum Analyzer	8590L	3544A01176	April 22, 2000
HP Preamplifier	8447D	2944A08485	May 1, 2000
HP Preamplifier	8347A	3307A01088	Aug. 30, 2000
ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Aug. 30, 2000
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 23, 2000
CHASE BILOG Antenna	CBL6112A	2221	Aug. 4, 2000
EMCO Turn Table	1060	1115	NA
SHOSHIN Tower	AP-4701	A6Y005	NA
Open Field Test Site	Site 5	ADT-R05	July 30, 2000

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.



### 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

\* Detector Function: Quasi-Peak

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

FREQUENCY (MHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	Peak	Average	Peak	Average
Above 1000	80.0	60.0	74.0	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 - 2000 MHz (Radiated Emission)
Input Voltage	:	120 Vac, 60 Hz
Temperature	:	24 degree C
Humidity	:	60 %
Atmospheric Pressure	:	1005 mbar

TEST RESULT	Remarks
<b>PASS</b>	Minimum passing margin of conducted emission: -20.0 dB at 17.486 MHz Minimum passing margin of radiated emission: -2.1 dB at 167.06 MHz

### 4.2 EUT OPERATING CONDITION

1. Turn on the power of all equipment.
2. EUT runs a test program to enable all functions.
3. EUT reads and writes messages from HDD.
4. EUT sends and receives messages from WORKSTATION via a UTP cable.
5. EUT sends "H" messages to LCD monitor, external monitor and television.  
Then, LCD monitor, external monitor and television display "H" patterns on their screens simultaneously.
6. EUT sends "H" messages to modems.
7. EUT sends "H" messages to printer, and then printer prints them on paper.
8. EUT sends audio messages to the external speaker.
9. Repeat steps 3-9.



### 4.3 TEST DATA OF CONDUCTED EMISSION

EUT: **THINCLIENT**

MODEL: **TC 3000 Series**

6 dB Bandwidth: 10 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.
0.165	0.2	41.5	-	41.7	-	65.2	55.2	-23.5	-
0.252	0.2	28.4	-	28.6	-	61.7	51.7	-33.1	-
0.744	0.3	30.7	-	31.0	-	56.0	46.0	-25.0	-
1.908	0.3	29.8	-	30.1	-	56.0	46.0	-25.9	-
6.179	0.8	35.1	-	35.9	-	60.0	50.0	-24.1	-
17.486	1.3	38.7	-	40.0	-	60.0	50.0	-20.0	-

- 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.



## TEST DATA OF CONDUCTED EMISSION

EUT: THINCLIENTMODEL: TC 3000 Series6 dB Bandwidth: 10 kHzPHASE: 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.
0.165	0.2	39.5	-	39.7	-	65.2	55.2	-25.5	-
0.252	0.2	34.2	-	34.4	-	61.7	51.7	-27.3	-
0.744	0.3	28.4	-	28.7	-	56.0	46.0	-27.3	-
1.908	0.3	29.6	-	29.9	-	56.0	46.0	-26.1	-
6.179	0.7	35.9	-	36.6	-	60.0	50.0	-23.4	-
17.486	1.1	37.8	-	38.9	-	60.0	50.0	-21.1	-

- 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.



#### 4.4 TEST DATA OF RADIATED EMISSION

EUT: **THINCLIENT**

MODEL: **TC 3000 Series**

ANT. POLARITY: Horizontal

DETECTOR FUNCTION AND BANDWIDTH: Quasi peak, 120 kHz (30-1000 MHz)  
Peak, 1 MHz (1000 MHz-2000 MHz)

FREQUENCY RANGE: 30-1000 MHz

MEASURED DISTANCE: 10 M

FREQUENCY RANGE: 1000-2000 MHz

MEASURED DISTANCE: 3 M

Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
72.00	7.0	15.2	22.2	30.0	-7.8	400	7
112.45	12.4	9.3	21.7	30.0	-8.3	400	111
126.77	12.8	9.8	22.6	30.0	-7.4	400	198
129.17	12.8	9.8	22.6	30.0	-7.4	400	174
143.49	12.5	12.9	25.4	30.0	-4.6	400	219
167.07	11.3	14.3	25.6	30.0	-4.4	400	312
174.58	11.0	14.3	25.3	30.0	-4.7	400	359
181.77	10.7	13.1	23.8	30.0	-6.2	400	258
191.32	10.4	14.8	25.2	30.0	-4.8	400	0
198.49	10.2	15.1	25.3	30.0	-4.7	400	339
224.81	11.9	13.4	25.3	30.0	-4.7	400	10
229.61	12.2	13.3	25.5	30.0	-4.5	400	266
233.88	12.6	19.1	31.7	37.0	-5.3	400	200
440.07	18.5	13.1	31.6	37.0	-5.4	254	157
444.86	18.6	15.0	33.6	37.0	-3.4	196	326
468.78	19.1	13.4	32.5	37.0	-4.5	205	135
478.34	19.3	12.9	32.2	37.0	-4.8	184	358
557.25	20.9	9.9	30.8	37.0	-6.2	120	358
1001.04	27.2	21.1	48.3	74.0	-25.7	99	244
1195.75	28.5	25.0	53.5	74.0	-20.5	205	294

- 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: THINCLIENTMODEL: TC 3000 SeriesANT. POLARITY: VerticalDETECTOR FUNCTION AND BANDWIDTH: Quasi peak, 120 kHz (30-1000 MHz)  
Peak, 1 MHz (1000 MHz-2000 MHz)FREQUENCY RANGE: 30-1000 MHzMEASURED DISTANCE: 10 MFREQUENCY RANGE: 1000-2000 MHzMEASURED DISTANCE: 3 M

Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
47.85	9.2	17.1	26.3	30.0	-3.7	100	23
78.91	8.7	17.8	26.5	30.0	-3.5	173	356
108.80	12.2	11.4	23.6	30.0	-6.4	100	296
129.15	12.8	10.7	23.5	30.0	-6.5	100	2
133.93	12.7	9.4	22.1	30.0	-7.9	100	91
143.51	12.5	14.6	27.1	30.0	-2.9	100	5
153.07	12.0	12.8	24.8	30.0	-5.2	100	5
157.86	11.8	12.4	24.2	30.0	-5.8	100	181
167.06	11.3	16.6	27.9	30.0	-2.1	100	58
184.17	10.6	12.9	23.5	30.0	-6.5	100	357
191.35	10.4	15.8	26.2	30.0	-3.8	100	357
198.53	10.2	14.4	24.6	30.0	-5.4	100	3
229.70	12.3	13.4	25.7	30.0	-4.3	100	1
287.01	14.8	15.5	30.3	37.0	-6.7	100	351
437.66	18.5	11.7	30.2	37.0	-6.8	319	8
468.78	19.1	10.7	29.8	37.0	-7.2	264	9
509.41	20.0	10.4	30.4	37.0	-6.6	294	5
1004.51	27.2	20.8	48.0	74.0	-26.0	180	367
1030.00	27.4	25.9	53.3	74.0	-20.7	99	349
1195.74	28.5	25.3	53.8	74.0	-20.2	191	64

- 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



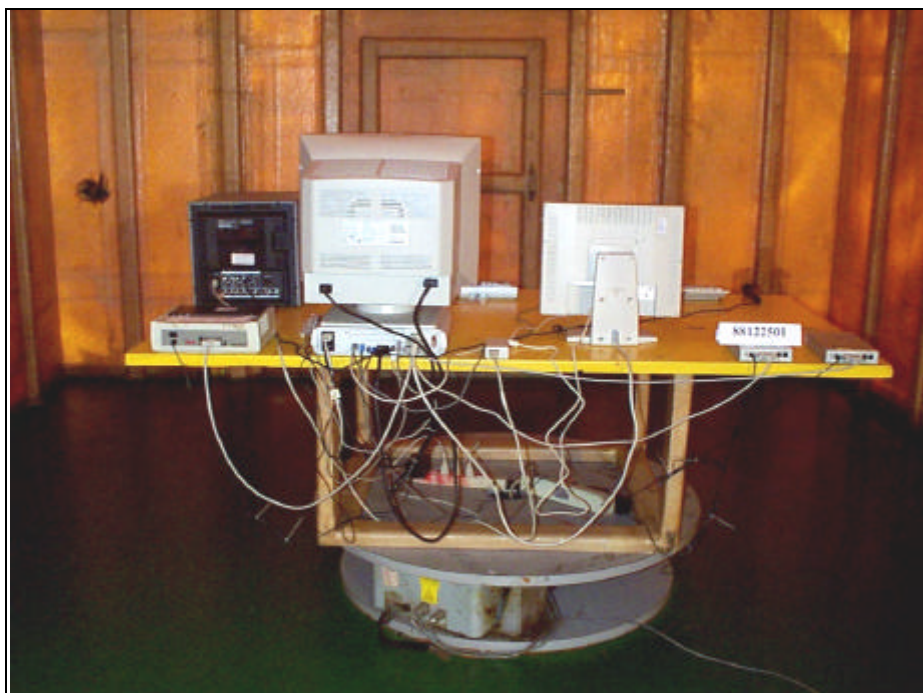
## 5. PHOTOGRAPHS OF THE TEST CONFIGURATION WITH MINIMUM MARGIN

### CONDUCTED EMISSION TEST





### RADIATED EMISSION TEST





## 6. APPENDIX - INFORMATION OF THE TESTING LABORATORY

### Information of the testing laboratory

We, ADT Corp., are founded in 1988, to provide our best service in EMC and Safety consultation. Our laboratory is accredited by the following approval agencies according to ISO/IEC Guide 25 or EN 45001:

- |               |                                      |
|---------------|--------------------------------------|
| ● USA         | FCC, UL, NVLAP                       |
| ● Germany     | TUV Rheinland<br>TUV Product Service |
| ● Japan       | VCCI                                 |
| ● New Zealand | RFS                                  |
| ● Norway      | NEMKO, DNV                           |
| ● U.K.        | INCHCAPE                             |
| ● R.O.C.      | BSMI                                 |

Enclosed please find some certificates of our laboratory obtained from approval agencies. If you have any comments, please feel free to contact us with the following:

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