



EMC

TEST REPORT

REPORT NO. : F88072607MODEL NO. : TC 2000 SeriesDATE OF TEST : Oct. 16, 1999PREPARED FOR: VXL INSTRUMENTS LIMITEDADDRESS : 168, 7TH MAIN, 1ST BLOCK, KORAMANGALA,
BANGALORE 560034, INDIAPREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION

Accredited Laboratory

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1.

CERTIFICATION

Issue Date: Oct. 29, 1999

Product : THINCLIENT
Trade Name : VXL
Model No. : TC 2000 Series
Applicant : VXL INSTRUMENTS LIMITED
Standard : FCC Part 15, Subpart B, Class B
ANSI C63.4-1992
CISPR 22: 1993+A1: 1995+A2: 1996

We hereby certify that one sample of the designation has been tested in our facility on Oct. 16, 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 : Leo Hong , DATE: 10/29/99
(Leo Hong)

CHECKED BY : Yemmy Soong , DATE: 10/29/99
(Yemmy Soong)

APPROVED BY : Harris W. Lai , DATE: 10/29/99
(Harris W. Lai)

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2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product	:	THINCLIENT
Model No.	:	TC 2000 Series
Power Supply Type	:	Battery DC12V
Power Cord	:	DC Nonshielded (1.8m)

Note: The EUT is Mobile Thin Client Terminal for Windows. TC 2000 Series consists of the following :

- ◆ Processor: Cyrix Media GX MMX 200MHz.
- ◆ VGA memory: Shared Video Memory up to 2.5MB display RAM.
- ◆ RAM: 64MB

The EUT only employ battery power.

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 (1.8m) Nonshielded Power (1.8m)
2	KEYBOARD	FORWARD	FDA-102D	F4ZDA-104G	Shielded Signal (1.4m)
3	MODEM	ACEEX	1414	IFAXDM1414	Shielded Signal (1.2m) Nonshielded Power (1.1m)
4	MOUSE	LOGITECH	M-S34	DZL211029	Shielded Signal (1.8m)
5	PRINTER	HP	2225C+	DSI6XU2225	Shielded Signal (1.2m) Nonshielded Power (1.1m)
6	MICROPHONE	L	UDM-535	NA	Nonshielded Signal (2.8m)
7	SPEAKER	J-S	J-008	NA	Nonshielded Signal (1.1m)
8	NOTEBOOK PC	USI	UNI-812	FCC Doc Approved	Nonshielded Power (1.8m)
9	LAN CARD	3 COM	3CCFE575BT	FCC Doc Approved	NA

Note: 1. The EUT acted as SERVER PC and communicated with support units 8-9 which acted as WORKSTATION and partners of communication system via a UTP cable (10m).

2.3 TEST METHODOLOGY AND CONFIGURATION

Radiated testing was performed according to the procedures in ANSI C63.4:1992.

Radiated testing was performed at an antenna to EUT distance of 10 m on an open area test site.

Conducted testing , according to 47 CFR Part 15.107(f), are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines.

Please refer to the photos of test configuration in Item 5.



3. TEST INSTRUMENTS

3.1 TEST INSTRUMENTS (EMISSION)

RADIATED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
HP Spectrum Analyzer	8590L	3544A01042	April 15, 2000
HP Preamplifier	8447D	2944A08313	March 9, 2000
HP Preamplifier	8347A	3307A01088	Aug. 30, 2000
ROHDE & SCHWARZ TEST RECEIVER	ESVS 30	841977/008	Oct. 5, 2000
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 25, 1999
EMCO Double Ridged Guide Antenna	3115	9312-4192	April 5, 2000
CHASE BILOG Antenna	CBL6111A	1647	July 3, 2000
EMCO Turn Table	1016	1722	NA
EMCO Tower	1051	1825	NA
Open Field Test Site	Site 4	ADT-R04	June 11, 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

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

FREQUENCY (MHz)	Class A (at 10m)		Class B (at 3m)	
	uV/m	dBuV/m	uV/m	dBuV/m
Above 1000	300	49.5	500	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.



4. TEST RESULTS (EMISSION)

4.1 RADIO DISTURBANCE

Frequency Range : 30 - 2000 MHz (Radiated Emission)
Input Voltage : DC12V
Temperature : 25 degree C
Humidity : 87 %
Atmospheric Pressure : 1000 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of radiated emission: -2.5 dB at 501.21 & 542.12 MHz

4.2 EUT OPERATING CONDITION

1. Turn on power of all equipment.
2. EUT runs a test program to enable all functions.
3. EUT sends and receives messages from WORKSTATION via a UTP cable.
4. EUT sends "H" messages to monitor and monitor displays "H" pattern on screen.
5. EUT sends "H" messages to modem.
6. EUT sends "H" messages to printer, and the printer prints them on paper.
7. EUT sends audio messages to speaker.
8. Repeat steps 3-8.



4.3 TEST DATA OF RADIATED EMISSION

EUT: THINCLIENTMODEL: TC 2000 SeriesANT. POLARITY: HorizontalDETECTOR 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)
150.00	12.6	8.5	21.1	30.0	-8.9	309	176
200.50	10.3	10.4	20.7	30.0	-9.3	161	159
250.60	14.1	16.7	30.8	37.0	-6.2	342	110
367.54	17.3	12.2	29.5	37.0	-7.5	244	285
433.69	19.2	12.9	32.1	37.0	-4.9	303	262
434.37	19.2	14.3	33.5	37.0	-3.5	305	340
501.20	21.0	12.2	33.2	37.0	-3.8	258	311
542.12	23.0	11.5	34.5	37.0	-2.5	161	159
584.74	22.9	8.8	31.7	37.0	-5.3	194	141
634.85	23.2	8.7	31.9	37.0	-5.1	264	307

- 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 2000 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

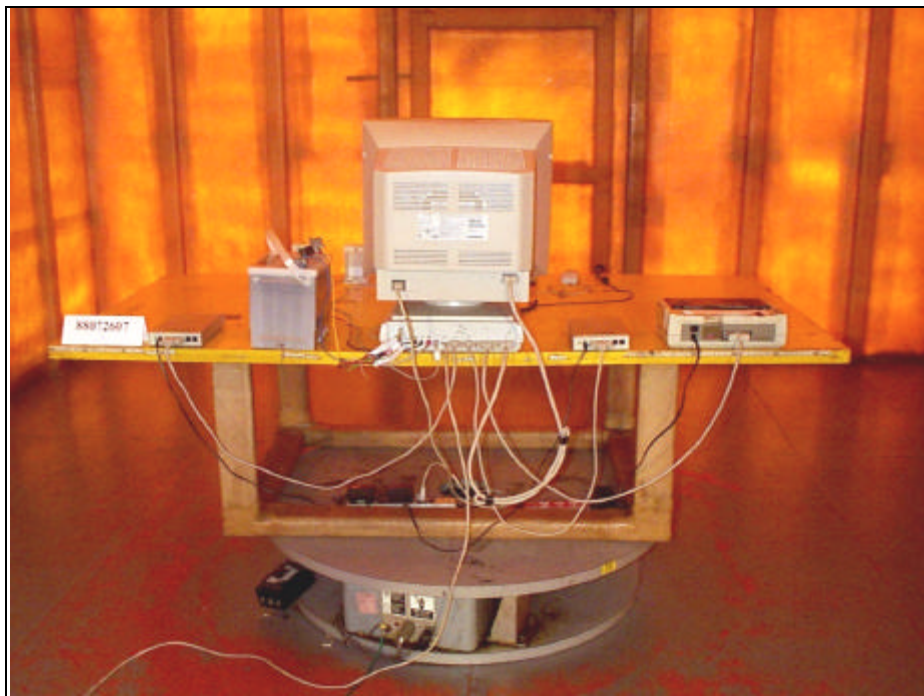
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
50.43	10.2	13.6	23.8	30.0	-6.2	100	254
66.30	6.5	17.1	23.6	30.0	-6.4	285	301
250.61	14.1	17.4	31.5	37.0	-5.5	100	220
267.30	14.7	16.3	31.0	37.0	-6.0	160	219
433.70	19.2	13.9	33.1	37.0	-3.9	106	321
434.37	19.2	15.1	34.3	37.0	-2.7	106	321
467.78	20.0	11.1	31.1	37.0	-5.9	101	264
487.89	20.6	9.9	30.5	37.0	-6.5	100	255
501.21	21.0	13.5	34.5	37.0	-2.5	121	286
542.12	23.0	10.5	33.5	37.0	-3.5	100	140
584.73	22.9	8.7	31.6	37.0	-5.4	394	69
634.85	23.2	7.2	30.4	37.0	-6.6	387	335

- 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

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
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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