May 30, 2001

WYSE Technology EN 55022-B Test Record

for

Window Based Terminal

Model Number: WT8440XL

Tests performed by WYSE Technology

3471 N. First Street, San Jose, CA

Test completed: May 25, 2001

Test Engineer: Harinder Phul

Approved by: Jimmy Nguyen

May 30, 2001

1.0 INTRODUCTION

1.1 Scope

This record is intended to document conformance with **the EMC Directive (89/336/EEC)** and details the results of testing performed on **May 25, 2001** on the model **WT8440XL**.

1.2 Purpose

Testing was performed to evaluate the emissions performance of the **WT8440XL** with respect to **EN 55022** Class **B**.

1.3 Summary

The Windows Terminal **WT8440XL** was found to be compliant to **EN 55022** Class **B** Emission Requirements.

1.4 Testing Requirements

Testing was performed using procedures and criteria contained in **EN 55022**.

2.0 TEST ENVIRONMENT

2.1 Test Sample Description

WT8440XL is designed to communicate with a host system via **Twisted Pair LAN** interface on NT Windows Server.

Test Software

The software used during the test was a continuous loop batch file on Windows NT station. The program creates an entire page of "H"'s and writes the entire page to the screen, and it also prints to the serial and parallel devices as used in the test setup. The cables were moved around to find the maximum emission from the EUT.

2.2 Test Facilities

2.2.1 Emissions Test Site

Radiated emissions testing was performed on a weather protected Open Area Test Site. The description of **OATS** is filed at the WYSE Regulatory Engineering Department. The **OATS** is located at 3471 N. First Street, San Jose, California, USA. Conducted emission testing was performed inside a shielded enclosure (**Screen Room**) in the WYSE RFI laboratory. The description of the screen room is filed at WYSE Regulatory Engineering Department. The Screen Room is located at 3471 N. First Street, San Jose, California, USA.

2.3 Test Equipment

The following are the list of equipment used during the radiation and conducted testing.

Radiated:
HP Receiver model 85460A (RES BW: 30 KHz-100KHz, VBW: 10KHz – 30KHz)

Conducted:
HP 85650A Quasi-Peak Adapter
HP 85680B Spectrum Analyzer (RES BW: 30KHz –100KHz, VBW: 10KHz – 30KHz)

SETUP:

In accordance with WYSE Technology test procedure.

PROCEDURE:

Biconilog antenna was used for frequency range 30MHz - 2 GHz. The frequency range was checked for signals strength. The antenna was then raised and lowered for final maximization. The frequency range was checked with antennas in the horizontal and vertical polarization.

3.0 TEST RESULTS

3.1 Test Description

CISPR Publication 22:1997, limits and methods of measurements of radio interface of information technology equipment, was the guiding document for the test. The product's radiated emissions from 30 MHz to 1000 MHz and its power mains conducted emissions from 150 KHz to 30 MHz were measured.

3.2 Test Configuration

The EUT was configured with a typical mix of available peripherals which fully configured all types of communications ports of the EUT and exercised it in a typical manner.

3.3 Test Procedure

For radiated emissions testing, the equipment is installed on a 0.8 meter high non-conductive turntable 10 meters from the receiving antenna mast. The EUT is fully exercised during the test to maximize emissions. The receiving antenna is scanned over the height range of 1 to 4 meters is both polarities and the turntable is rotated with emissions level observed at each frequency. During the process the equipment configuration is also modified by moving the interconnecting cables to find the typical configuration that maximizes emissions at each frequency.

The frequency range from 30 MHz to 1000 MHz is explored. Measurement data is compared to Class **B** limit.

For conducted emissions testing the equipment is moved to a 0.8 meter high platform and the EUT and Configurations equipment are powered from a different LISNs. Both sides of the AC line are measured and the results compared to the Class **B** limit.

3.4 Test Results

A comparison of the measured data with the Class **B** limit of **CISPR** shows that Windows Terminal **T20** was **4.10 dB** below the limits at the worst case frequency of **100.082976 MHz** in a Horizontal Polarization.

3.5 Product Specification

Model: WT8440XL (Logic Board P/N 961386-01 Rev A)

Clock Circuit:

U13 = IC,W156,CLOCK GEN,SOP-48, 205565-51

Filters:

33 MHZ CLK Line:

R186 = RES,CHIP,1/10W,OHM,22,5%,0603, 370513-09

14 MHZ CLK Line:

R188 = FERRITE BEAD,60 OHM,25%,.4A,0805, 400032-11

48 MHZ CLK Line:

R151 = RES,CHIP,1/10W,OHM,22,5%,0603, 370513-09

U8 = IC,CPU,400MHZ,AMD, 200068-01

Main Power Filters:

L95, L90, L85 = FERRITE BEAD,43MTL,2T,6HOLES,24AWG, 400022-03

EC30, EC25, BC73, EC53, EC1 = CAP,ASE,UF,10,16V,M,4X5MM,DIP, 310071-01

Video Circuit:

U14 = IC,8420,NORTH BRIDGE,SMD,CBI7, 205140-50

Filters:

L25 = BEAD,31R/100MHZ,0805,CB201209-310, 400043-03
C109,C123 = CAP,MC,PF,56,25V,J,0603 LOW,320022-07
L27 = BEAD,31R/100MHZ,0805,CB201209-310, 400043-03
C121, C113 = CAP,MC,PF,56,25V,J,0603 LOW,320022-07
L28 = BEAD,31R/100MHZ,0805,CB201209-310, 400043-03
C126, C101 = CAP,MC,PF,56,25V,J,0603 LOW,320022-07

Termination:

R180, R189, R197 = RES,CHIP,1/10W,OHM,75,5%,0603, 370513-22

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Audio Circuit:

U19 = IC,AK4542,AC-97 AUDIO CODEC,TQFP-48, 205123-54

Filters:

R L73= INDUCTOR,2.7UH,2012,SMD,EASY, 410037-01
C175 = CAP,MC,PF,120,25V,J,0603 LOW, 320022-09
R193 = RES,CHIP,1/10W,KOHM,47,5%,0603, 370513-89
C122 = CAP,MC,UF,0.1,25V,M,0603 LOW, 320024-02

L L74 = INDUCTOR,2.7UH,2012,SMD,EASY, 410037-01
C176 = CAP,MC,PF,120,25V,J,0603 LOW, 320022-09
R194 = RES,CHIP,1/10W,KOHM,47,5%,0603, 370513-89
C125 = CAP,MC,UF,0.1,25V,M,0603 LOW, 320024-02

Network:

U6 = IC,RT-8139BF,250MHZ,LAN CHIP SMD, 205137-50
U1 = XFM,10/100BT,68515,PULSE ONLY,SMD16, 429099-52

Filters:

C23, C27 = CAP,MC,UF,0.1,25V,M,0603 LOW, 320024-02
R57, R74 = RES,CHIP,1/10W,OHM,49.9,1%,0603, 370508-68
U28 = CONN,PHONE-JK,RJ45,8P,LEAN HORN, 563660-06

Radiated Emission Test

10M OATS

WYSE Technology Inc.
3471 North 1st Street
San Jose Ca 95134

Test Description:

EUT: WT8440XL
Serial No. 9CS1A500001
Part No. 902006-20
File No. 052501#1

Test Type:

EN55022 **EN55022**
FCC-A { } FCC-B { } CISPR-A { } CISPR-B {**X**}
PASS: **X** FAIL: Debug:

Frequency MHz	Peak dBuV/m	DelLim-Pk dB	QP dBuV/m	DelLim-QP dB	Angle deg	Hgt cm	Pol
100.082976	25.90	-4.10	--.--	--.--	0	399	Horz

Configuration:

1) Fully configured
2) Video 1280 x 1024 @ 60Hz

Modifications:

1) None

Test Procedure Definition:

Spectrum Analyzer	Model: 8566B (Cal Date: Apr. 24 2001) SN: 2320A02446 (Cal Due Date: Oct. 24 2001)
Quasi Peak Adapter	Model: 85650A (Cal Date: Apr. 24 2001) SN: 2043A00331 (Cal Due Date: Oct. 24 2001)
Emco Biog Ant. (Type2)	Model: 3142 (Cal Date: Sept. 22 2000) SN: 1201 (Cal Due Date: Sept. 22 2001)
Configuration	WYSE 5M Chamber
Frequency Rang	30 - 2000 MHz
Operation to perform	Maximize & Measure
Initial Setting	Table angle: 0 degree to 360 degree Tower Height: 1meter - 4meter (Steps 1M) Antenna Polarity: Vertical and Horizontal

Comment:

1) H Pattern on monitor screen under Window ICA
2) Spread Spectrum On By another UTC (WT3200LE)

Test Engineer: H.S. Phul

EUT:

Description	Part No.	Serial No.
WT8440XL	902006-20	9CS1A500001
Power Supply	FT-8006A	096385451

Supporting Devices:

Description	Model No.	Serial No.	FCC ID:
Server HP Brio Computer	81XX	US74852369	DOC
HP Key Board	SK-2501K	M970814311	GYUR38SK
HP Mouse	M-S34	LZA72737431	DZL211029

Peripherals:

Description	Model No.	Serial No.	FCC ID:
Sony 21" Monitor	CPD-G500	CN9AC1811W	DOC
HP Parallel Printer	C6411B	CN9AC1P11W	DOC
HP Serial Printer	2225D	3208S00972	DS16XU2225
WYSE Key Board	7931M	B92600029	E5XKB10410U
HP Mouse	M-S34	LZC90710752	DZL211029
Microphone	None	None	
Headset	None	None	
Intel Video camera	CS330	20557153	

Final vertical [10/925]

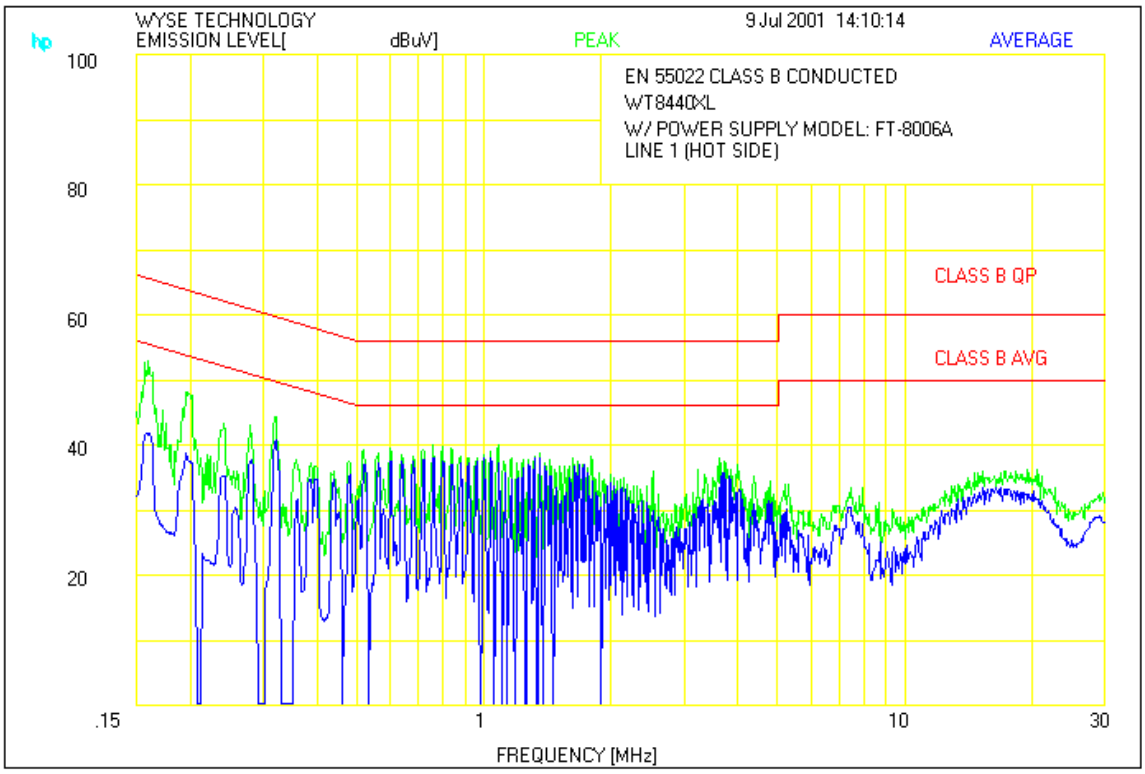
WT8440XL 10Meter Oat Data

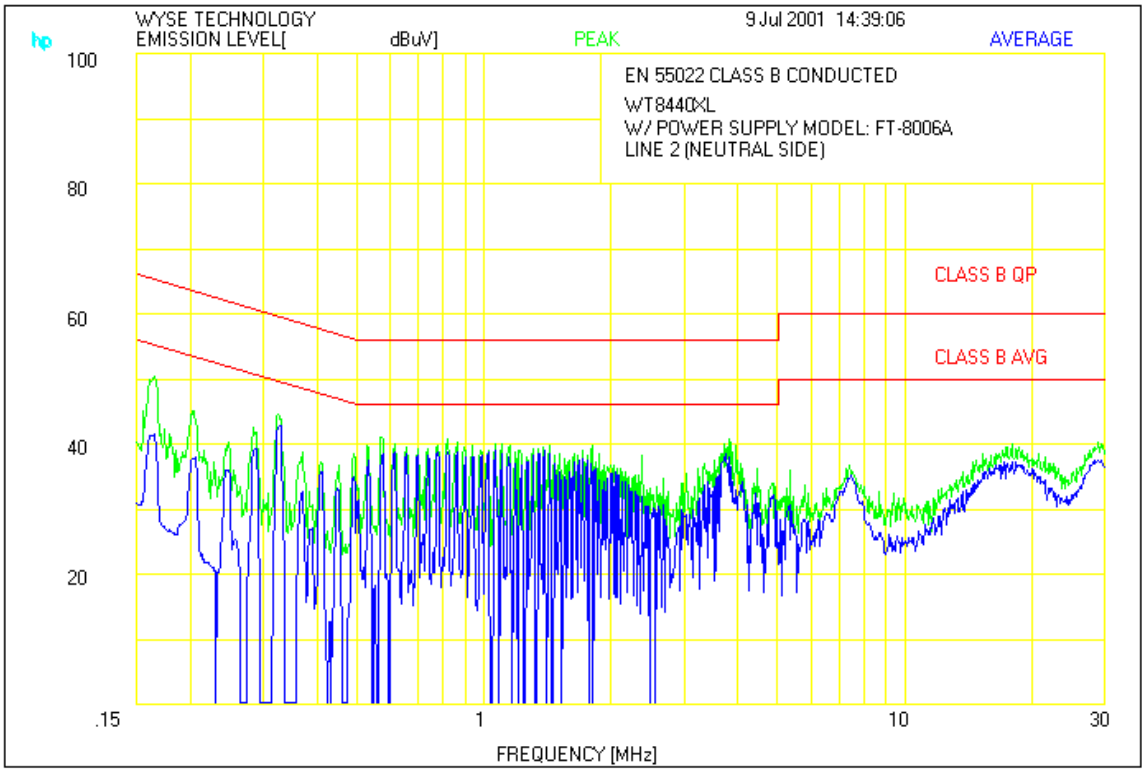
Frequency MHz	Peak dBuV/m	DelLim-Pk dB	QP dBuV/m	DelLim-QP dB	Angle deg	Hgt cm	Pol
108.224136	22.20	-7.80	--.--	--.--	358	102	Vert
170.122256	24.50	-5.50	--.--	--.--	79	102	Vert
200.905392	24.90	-5.10	--.--	--.--	225	102	Vert
217.202336	23.40	-6.60	--.--	--.--	327	99	Vert
300.190976	33.90	-3.10	--.--	--.--	259	103	Vert
300.736768	33.60	-3.40	--.--	--.--	259	103	Vert
301.310944	33.10	-3.90	--.--	--.--	259	103	Vert
400.688741	35.11	-1.89	31.58	-5.42	107	100	Vert
601.600448	26.10	-10.90	--.--	--.--	107	100	Vert
801.468608	23.70	-13.30	--.--	--.--	107	100	Vert

Final Horizontal [12/925]

WT8440XL 10Meter Oat Data

Frequency MHz	Peak dBuV/m	DelLim-Pk dB	QP dBuV/m	DelLim-QP dB	Angle deg	Hgt cm	Pol
100.082976	25.90	-4.10	--.--	--.--	0	399	Horz
108.619402	16.59	-13.41	--.--	--.--	358	296	Horz
170.404069	25.56	-4.44	--.--	--.--	9	398	Horz
200.940240	25.70	-4.30	--.--	--.--	301	401	Horz
217.502816	14.30	-15.70	--.--	--.--	241	403	Horz
400.731534	31.71	-5.29	26.77	-10.23	166	224	Horz
601.779968	28.20	-8.80	--.--	--.--	149	164	Horz
802.482435	30.86	-6.14	--.--	--.--	182	101	Horz


WYSE TECHNOLOGY
EMISSION LEVEL[dBuV]
9 Jul 2001 14:10:14
PEAK
AVERAGE
EN 55022 CLASS B CONDUCTED
WT8440XL
W/ POWER SUPPLY MODEL: FT-8006A
LINE 1 (HOT SIDE)
CLASS B QP
CLASS B AVG
100
80
60
40
20
.15
1
10
30
FREQUENCY [MHz]


WYSE TECHNOLOGY
EMISSION LEVEL[dBuV]
9 Jul 2001 14:39:06
PEAK
AVERAGE
EN 55022 CLASS B CONDUCTED
WT8440XL
W/ POWER SUPPLY MODEL: FT-8006A
LINE 2 (NEUTRAL SIDE)
CLASS B QP
CLASS B AVG
100
80
60
40
20
.15
1
10
30
FREQUENCY [MHz]