**December 17, 1999**

# WYSE Technology EN 55022-B Test Record

**for**

**Window Based Terminal**

**Model Number: WT3360SE**

**Tests performed by WYSE Technology**

**3471 N. First Street, San Jose, CA**

**Test completed: December 17, 1999**

**Test Engineer: Harinder Phul**

**Approved by: Masood Abrishamcar**

# 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 **December 17, 1999** on the model **WT3360SE**.

## 1.2 Purpose

Testing was performed to evaluate the emissions performance of the **WT3360SE** with respect to **EN 55022** Class **B**.

## 1.3 Summary

The Windows Terminal **WT3360SE** 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 550022**.

# 2.0 TEST ENVIRONMENT

## 2.1 Test Sample Description

**WT3360SE** 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 84560A (RES BW: 30 KHz-100KHz, VBW: 10KHz – 30KHz)

Conducted:
HP 85650A Quasi-Peak Adapter
HP 8566B 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 22:1985**, 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 meter 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 **WT3360SE** was **4.31 dB** below the limits at the worst case frequency of **510.20 MHz** in a Vertical Polarization.

## 3.5 Product Specification

Model: **WT3360SE (Logic Board P/N 991355-01 Rev. A)**

**Clock Circuit:**

U21 = MK1492-03, P/N 205565-50

Filters:

33 MHZ CLK Line:

R85 = 33 Ohm, P/N 370513-13; Z61 = 15pF (not loaded)
R86 = 33 Ohm, P/N 370513-13; Z58 = 15pF (not loaded)
R87 = 33 Ohm, P/N 370513-13; Z64 = 15pF (not loaded)
R88 = 33 Ohm, P/N 370513-13; Z59 = 15pF (not loaded)

14.3 MHZ CLK Line:

R27 = 33 Ohm, P/N 370513-13; Z61 = 15pF (not loaded)

24.5 MHZ ( Audio) CLK Line:

R91 = 33 Ohm, P/N 370513-13; Z52 = 15pF, P/N 320310-17

U2 = GXLV166, P/N 200062-52

Power Filter

U1 = CX5530, P/N 205122-50

Filters:

R13 = 47 Ohm, P/N 370513-17; Z6 = 15pF (not loaded)
R12 = 47 Ohm, P/N 370513-17; Z5 = 15pF (not loaded)
L17, L18 = 43MTL, P/N 400021-01
RP 1-7 = 100 Ohm, P/N 371338-11

**Video Circuit:**

U1 = CX5530, P/N 205122-50

Filters:

L1 = 43MTL, P/N 400021-01; C4, C5 = 33pF, P/N 320313-25
L2 = 43MTL, P/N 400021-01; C3, C6 = 33pF, P/N 320313-25
L3 = 43MTL, P/N 400021-01; C2, C7 = 33pF, P/N 320313-25

Termination:

R4, R5, R6 = 75 Ohm, P/N 370508-85

**Audio Circuit:**

U15 = LM4546, P/N 205123-53

Filters:

C524 = 0.1 µF, P/N 320344-37
L16, L15N = 43MTL, P/N 400021-01

Audio Connector:

J1, J2 = 3.5 MM, P/N 563674-01

**Driving Transistor:**

Q3, Q4 = MMBT3904, P/N 270010-50

**Network:**

U24 = DP83815, P/N 205127-50

Filters:

R70, R71 = 49.9 Ohm, P/N 370508-68

U17 = Transformer, Pulse Type '68515,' P/N 429099-51

Filters:

C32, C33 = .1 uF, P/N 320338-24
C34 = .01 uF, P/N 320345-13
R72, R73, R74, R75 = 75 Ohm, P/N 370513-22

**Zero Ohm Jumpers:**

R7, R8, R9, RJA = 0 Ohm, 1/4W, P/N 370457-99
R96, R138, R140, R141, R156, Z53 = 0 Ohm, 1/10W, P/N 370514-99

# Radiated Emission Test

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

## Test Description:

**EUT: WT3360se (Highway)**
**Serial No.** 99M19B00018
**Part No.** 901995-01
**File No.121799#2**

## Test Type: EN55022 EN55022

FCC-A { } FCC-B { } CISPR-A { } CISPR-B {**X**}
PASS: **X** FAIL: Debug:
Frequency {MHz} 1. **510.20** 2. **433.19** 3. **125.19** 4.
Margin {dBuv} 1. **–4.31** 2 **-4.86** 3. **–4.87--** 4.

## Configuration:

1) Fully configured
***2) Video1024 X 768 @ 75Hz (Not DDC 1280 X 1024)***

## Modifications:

None

## Test Procedure Definition:

| | |
|---|---|
| HP EMI Receiver | 85460A 5M (Chamber) |
| Frequency Rang | 30 - 2000 MHz |
| Operation to perform | Maximize & Measure |
| Initial Setting | Table angle: 0 degree to 360 degree |
| | Tower Height: 100 meter - 400 meter (Steps 100M) |
| | Antenna Polarity: Vertical and Horizontal |

## Comment:

1) H Pattern on monitor screen.
2) Blank PCMCI card installed

**Test Engineer:** Harinder S Phul

# Radiated Emission Test

*WYSE Technology Inc.*

**3471 North 1st Street**

San Jose Ca 95134

## EUT:

| Description | Part No. | Serial No. | FCC ID: |
|---|---|---|---|
| **WT3360se (Hiway #1)** | **901995-01** | **99M19B00018** | |

## Supporting Devices:

| Description | Model No. | Serial No. | FCC ID: |
|---|---|---|---|
| Server HP Brio Computer | 81XX | US74852369 | |
| 3 Com Hub | TP400 | 7YPR021705 | |

## Peripherals:

| Description | Model No. | Serial No. | FCC ID: |
|---|---|---|---|
| Sony 21" Monitor | CPD-G500 | 2701749 | DOC |
| HP Serial Printer | 2225D | 3208S00972 | DS16XU2225 |
| HP Parallel Printer | 812C | C6411B | DOC |
| WYSE Key Board | 7931M | B92600029 | E5XKB10410U |
| HP Mouse | M-S34 | LZC90710752 | DZL211029 |
| Gen. Spkr | AMX2000 | None | |
| Gen. Microphone | None | None | |
| Intel Camera | YC76 | 0139882 | EDUYC76 |

## Final Vertical [7/925]

**WT3360se (Hiway #1)**

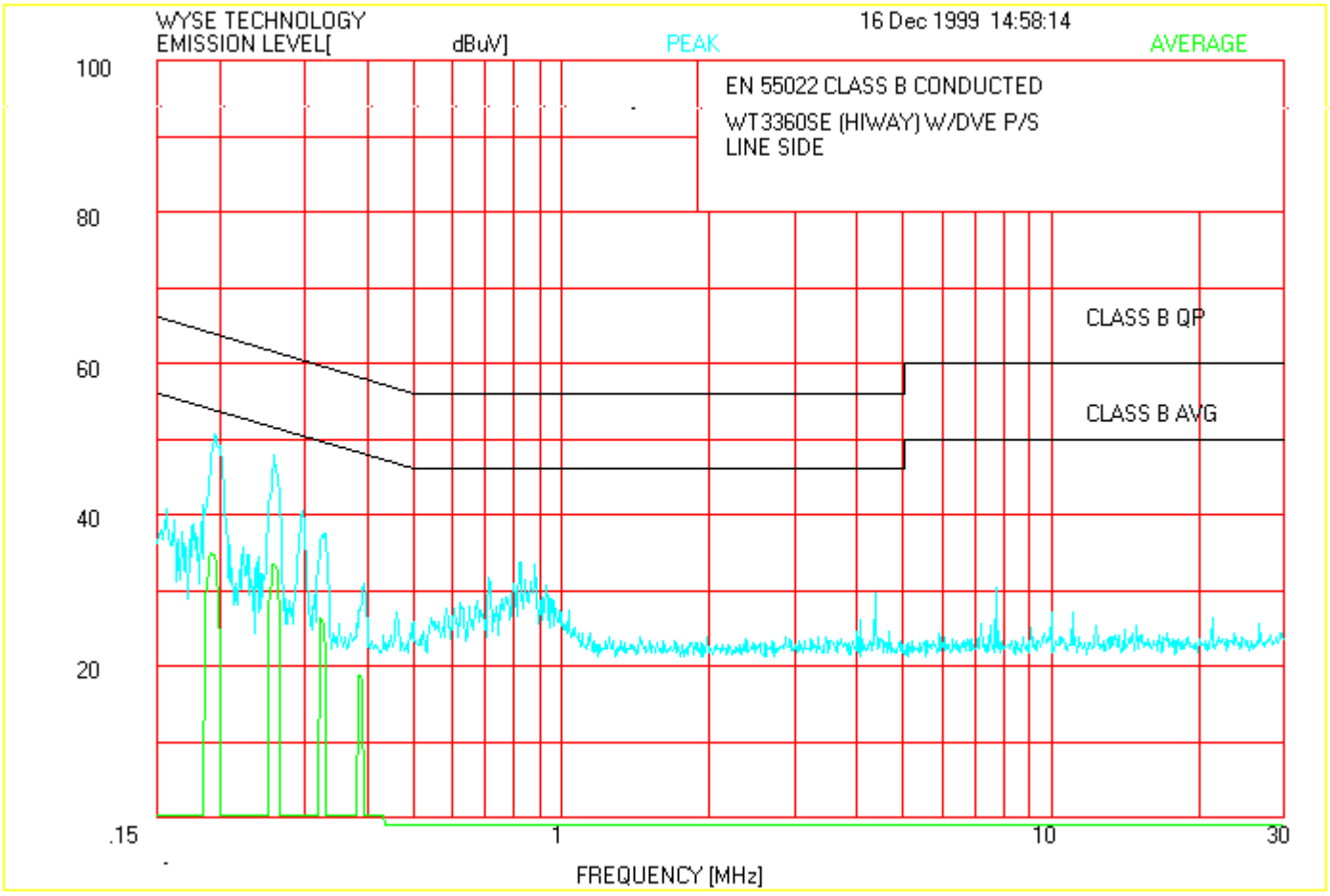
| Frequency MHz | Peak dBuV/m | DelLim-Pk dB | QP dBuV/m | DelLim-QP dB | Angle deg | Hgt cm | Pol |
|---|---|---|---|---|---|---|---|
| **125.196550** | **28.19** | **-1.81** | **25.13*** | **-4.87** | **97** | **383** | **Vert** |
| 216.013477 | 29.81 | -0.19 | 22.20* | -7.80 | 348 | 397 | Vert |
| 369.016000 | 23.97 | -13.03 | --.-- | --.-- | 0 | 295 | Vert |
| **433.192923** | **36.12** | **-0.88** | **32.14*** | **-4.86** | **358** | **399** | **Vert** |
| 479.090000 | 29.80 | -7.20 | --.-- | --.-- | 180 | 399 | Vert |
| **510.204669** | **44.77** | **7.77** | **32.69** | **-4.31** | **358** | **330** | **Vert** |
| 540.888000 | 28.04 | -8.96 | --.-- | --.-- | 267 | 399 | Vert |

## Final Horizontal [7/925]

**WT3360se (Hiway #1)**

| Frequency MHz | Peak dBuV/m | DelLim-Pk dB | QP dBuV/m | DelLim-QP dB | Angle deg | Hgt cm | Pol |
|---|---|---|---|---|---|---|---|
| 125.196550 | 16.62 | -13.38 | --.-- | --.-- | 59 | 399 | Horz |
| 216.010468 | 14.10 | -15.90 | --.-- | --.-- | 96 | 101 | Horz |
| 368.996080 | 22.58 | -14.42 | --.-- | --.-- | 205 | 399 | Horz |
| 433.192923 | 19.68 | -17.32 | --.-- | --.-- | 83 | 101 | Horz |
| 479.093320 | 25.29 | -11.71 | --.-- | --.-- | 239 | 399 | Horz |
| 510.201660 | 26.97 | -10.03 | --.-- | --.-- | 349 | 101 | Horz |
| 540.878040 | 24.56 | -12.44 | --.-- | --.-- | 59 | 399 | Horz |

**Product: WT3360SE**
**Title : EN55022B**
**Line side at 230V input**



**Product: WT3360SE**
**Title : EN55022B**
**Neutral side at 230V input**