

## Radiated Emission Test

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

### Test Description:

**EUT:** WT2715SE

**Serial No.** 19Z19100476

**Part No.** 901975-01

**File No.** 052499#1

**Test Type:** EN55022 EN55022  
FCC-A { } FCC-B { } CISPR-A { } CISPR-B {X}  
PASS: X ; FAIL: \_\_\_\_\_  
Frequency {MHz} 1. 801.79 2. 108.15 3. 112.43 4. 626.51  
Margin {dBuv} 1. -3.85 2. -5.61 3. -5.99 4. -6.03

### Configuration:

1) Fully configured

### Modifications:

1) None

### Test Procedure Definition:

HP EMI Reciver	8546A
Configuration	WYSE 10M OATS
Frequency Rang	30 - 2000 MHz
Operation to perform	Maximize & Measure
Initial Setting	Table angle: 0 degree Tower Height: 100 cms Antenna Polarity: Vertical

**Test Engineer: Harinder S Phul**

**EUT:**

**Description**  
WT2715SE

**Part No.**  
901975-01

**Serial No.**  
19Z19100476

**Supporting Devices:**

**Description**  
Server HP Brio Computer

**FCC ID**  
DOC

**Model**  
81XX

**Serial No.**  
US74852369

**Peripherals:**

**Discription**  
HP Serial Printer  
HP Parallel Printer  
HP Key Board  
HP Mouse  
Yamaha Speaker  
Generic Microphone

<b>FCC ID</b>	<b>Model</b>	<b>Serial No.</b>
DSI6XU2225	2225D	3208S00972
B94C4602X	C5876A	US79S12032
E8HKB-5923	KB-8923	TCAM8303939
DZL211029	M-S34	LZA64804895
	YST-M7	Z0638126X2

## Final Vertical Results [20/849]

Frequency MHz	Peak dBuV/m	DelLim-Pk dB	QP dBuV/m	DelLim-QP dB	Angle deg	Hgt cm	Pol
67.683504	23.40	-6.60	--,--	--,--	11	100	Vert
70.990847	21.24	-8.76	--,--	--,--	133	100	Vert
73.369810	21.07	-8.93	--,--	--,--	296	100	Vert
74.972000	23.33	-6.67	--,--	--,--	205	100	Vert
78.652000	20.97	-9.03	--,--	--,--	225	100	Vert
108.156024	24.39	-6.61	--,--	--,--	152	100	Vert
112.433939	24.01	-5.99	--,--	--,--	115	100	Vert
116.146772	19.81	-10.19	--,--	--,--	82	100	Vert
123.752226	22.72	-7.28	21.39*	-8.61	152	100	Vert
127.995200	16.65	-11.35	--,--	--,--	220	100	Vert
129.588409	21.09	-8.91	--,--	--,--	207	100	Vert
132.669810	21.78	-8.22	--,--	--,--	180	100	Vert
134.976000	24.81	-5.19	--,--	--,--	202	100	Vert
213.732000	23.72	-6.28	--,--	--,--	132	100	Vert
225.024000	26.30	-9.70	--,--	--,--	216	100	Vert
238.739000	28.29	-8.71	--,--	--,--	266	100	Vert
292.475500	29.49	-7.51	--,--	--,--	112	100	Vert
626.514818	30.97	-6.93	--,--	--,--	57	100	Vert
630.029006	30.51	-6.49	--,--	--,--	72	100	Vert
801.868901	35.65	-1.15	32.17*	-4.83	255	100	Vert

## Final Horizontal Results [19/849]

Frequency MHz	Peak dBuV/m	DeiLim-Pk dB	QP dBuV/m	DeiLim-QP dB	Angle deg	Hgt cm	Pol
70.984372	21.03	-8.97	--.--	--.--	133	300	Horz
73.369256	15.04	-14.96	--.--	--.--	214	300	Horz
74.959440	22.80	-7.20	--.--	--.--	352	300	Horz
78.648621	18.67	-11.33	--.--	--.--	288	300	Horz
108.165624	20.44	-9.56	--.--	--.--	251	300	Horz
112.445962	19.81	-10.19	--.--	--.--	67	300	Horz
116.157959	18.74	-11.26	--.--	--.--	25	300	Horz
123.749217	18.59	-11.41	--.--	--.--	60	300	Horz
127.389017	16.02	-13.98	--.--	--.--	296	300	Horz
129.580318	18.16	-11.84	--.--	--.--	246	300	Horz
132.653866	20.55	-9.45	--.--	--.--	83	300	Horz
134.982045	22.13	-7.87	--.--	--.--	354	300	Horz
213.721044	22.41	-7.59	--.--	--.--	137	300	Horz
225.029845	21.11	-8.89	--.--	--.--	0	300	Horz
258.732809	27.37	-9.63	--.--	--.--	141	300	Horz
292.478992	32.38	-4.67	30.09	-6.91	128	300	Horz
626.529218	28.38	-8.65	--.--	--.--	0	300	Horz
630.524128	29.31	-7.99	--.--	--.--	314	300	Horz
601.726198	36.29	1.29	33.15	-6.85	168	300	Horz

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**WYSE Technology EN 55022-B Test Record**

for

**Desk Top Terminal**

**Model Number: WINTERM 2715SE**

**Tests performed by WYSE Technology**

**4399 Lick Mill Blvd. San Jose, CA**

**Tests completed: November 9, 1998**

**Test Engineer: Benton Ng**

**Approved by: Masood Abrishamcar**

December 23, 1998

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## 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 November 9, 1998 on the WYSE WINTERM Model: WINTERM 2715SE.

### 1.2 Purpose

Testing was performed to evaluate the emissions performance of the WINTERM 2715SE with respect to EN 55022 Class B.

### 1.3 Summary

The Desk Top Terminal WINTERM 2715SE were 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

WINTERM 2715SE 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 4399 Lick Mill Blvd. San Jose, California, USA. Conducted emission testing was performed inside a shielded enclosure (**Screen Room**) in the WYSE RFI laboratory. The description of 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

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

HP 8447d Amplifier	Serial #1937A02787
HP 85650A Quasi-Peak Adapter	Serial #2521A00635
HP 8568A Spectrum Analyzer	Serial #2134A02775
HP 85685 RF Preselector	Serial #2510A00103
EMCO Biconilog Antenna	Serial #9706-1201

### SETUP:

In accordance with WYSE Technology test procedure.

### PROCEDURE:

Biconilog antenna was used for frequency range 30MHz - 1 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.

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### 3.4 Test Results

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A comparison of the measured data with the Class **B** limit of **CISPR** shows that Terminal **WINTERM 2715SE** was **2.75 dB** below the limits at the worst case frequency of **67.49 MHz** in a Vertical Polarization

### 3.5 Product Specification

Model: **WINTERM 2715SE**

#### Clock Circuit:

- 1) U1 = CPU, AMD, SC400-66, PC-AT, P/N=202036-50
- 2) Y5 = Crystal, 32.768 KHz, P/N=392013-01

#### PLL CLK filters-

- 3) C27 = 15uF, P/N=320310-17
- 4) C32 = 330uF, P/N=320310-49
- 5) C57 = 33pF, P/N=320310-25
- 6) C68, C28 = 470pF, P/N= 320310-53
- 7) C35 = 22pF, P/N=320310-21
- 8) C20 = 0.01uF, P/N=320333-01
- 9) C107 = 0.22uF, P/N=320316-49
- 10) R111, R101, R110, R102 = 4.7 Kohm, P/N=370461-65

#### CLK IO line-

- 11) Y7 = Crystal, 1.8432 MHz, P/N=390000-01
- 12) R74 = Zero ohm, P/N=370460-91
- 13) R41 = 2.2 Mohm, P/N=370462-33
- 14) C124 = 68uF, P/N=320310-33

#### Video Circuit:

- 1) U2 = Video chip, Cirrus Logic, CL-GD5440, P/N=205114-51
- 2) Y3 = OSC, 14.318 MHz, TTL, P/N=392007-01
- 3) C112 = 10pF, P/N=320310-13
- 4) R79 = 33 ohm, P/N=370456-13

#### VL LCLK line-

- 5) R171, R173 = 33ohm, P/N=370456-13
- 6) C110, C188 = 10pF, P/N=320310-13

#### M CLKVDD line-

- 7) R108 = 33ohm, P/N=370456-13
- 8) C14 = 10uF, P/N=313080-13
- 9) C121 = 0.1uF, P/N 320021-33

#### V CLKVDD line-

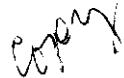
- 10) R109 = 33 ohm, P/N=370456-13
- 11) C15 = 10uF, P/N=313080-13
- 12) C119 = 0.1uF, 320021-33

#### V FILTER line-

- 13) R1 = 127 ohm, P/N=370466-11
- 14) C122 = 0.1uF, P/N=320021-33

#### V RED, V GRN, V BLU lines-

- 15) L1, L4, L5 = 1.6uH, 43MTL, SMD type, P/N=400021-01



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- 16) C21, C22, C23, C24, C25, C26 = 33pF, P/N=320310-25
- 17) R81, R82, R83 = 75 ohm, P/N=370461-22

VSYNC, HSYNC lines-

- 18) C72, C73 = 220uF, P/N=320310-45
- 19) R67, R68 = 22 ohm, P/N=370461-09

**Network Circuit:**

- 1) U3 = Controller, CS8900, P/N=205110-01
- 2) Y4 = Crystal, 20 MHz, P/N=391002-39
- 3) T1 = Transformer, PE65745, 10Base isolation, P/N=429075-50

Filter-

- 4) C45, C47, C48, C49, C53, C54, C55, C56 = 33pF, P/N=320310-25
- 5) C113, C114, C115, C116 = 0.1uF, P/N=320021-33
- 6) R85 = 100 ohm, P/N=370466-01

RXD, TXD lines-

- 7) R7, R8 = 24.3 ohm, P/N=370465-38
- 8) C96 = 68uf, P/N=320310-33

**Flash Memory:** (Loaded to)

- 1) U25, U27 = IC, 4LC1M16ES-7, 1MX16, EDO, P/N=194077-01

### 3.5.1 Modifications

#### PHoM 15" Color

Transformer: P/N= 421553-08

C101: 0.22  $\mu$ f, 250V, P/N=320670-02

C102: 4700 pf, 250V & C103: 4700 pf, 250V, P/N=320050-77

C104: 0.1  $\mu$ f, 250V, P/N=320670-01

C143: 0.01  $\mu$ f, 250V & C144: 0.01  $\mu$ f, 250V, P/N=320050-70  
L101 & L102, P/N=424526-02

#### Modifications:

- 1) **Video Cable:** Shielded type provided with Ferrite Core type 47 at both ends.  
size: 9.5mm (ID) x 17.5mm (OD) x 28.5mm (Height)  
P/N= 941247-05
- 2) **DC Harness:** Provided with two turns on Donut Ferrite Core  
size: 6.34mm (Thickness) x 18.5mm (ID) x 32mm (OD) x 15.9mm (Height)  
P/N=941248-04.  
DC Harness length should be 26". The DC Harness and the Brightness wire are turned twice around the ferrite bead.
- 3) The length of the GND wire from right side of the CRT to AC Socket should be reduced to 10.5"-11.0".
- 4) The length of the GND wire from left side of the CRT to the first screw which connects the AC Socket bracket to Logic Housing (Metal Shield) should be 11".  
Note: The GND wire must be connected to the first screw on the Socket bracket.

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- 5) The length of the GND wire from CRT Shield to AC Socket should be 2.5" to 2.75".
- 6) 22 Ohm resistor should be added in series with Q208 gate.
- 7) Added GND wire at both sides from I/O Panel to CRT Video Board Shield