

July 29, 2003

WYSE Technology FCC 3M Class B Test Record

for

Window Based Terminal

Model Number: WT3125SE

Tests performed by WYSE Technology

3471 N. First Street, San Jose, CA

Test completed: July 27, 2002

Test Engineer: Jimmy Nguyen

July 29, 2002

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 July 27, 2002 on the model WT3125SE.

1.2 Purpose

Testing was performed to evaluate the emissions performance of the WT3125SE with respect to FCC 3m Class B.

1.3 Summary

The Windows Terminal WT3125SE was found to be compliant to FCC 3m Class B Emission Requirements.

1.4 Testing Requirements

Testing was performed using procedures and criteria contained in FCC 3m.

2.0 TEST ENVIRONMENT

2.1 Test Sample Description

WT3125SE 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 in a 3m Semi-Anechoic Chamber. The description of the **3m Chamber** is filed at the WYSE Regulatory Engineering Department. The Chamber 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.

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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 2000 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 3 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 in 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 2000 MHz is explored. Measurement data is compared to Class **B** limit.

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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 **FCC 3m** shows that Windows Terminal **WT3125SE** was **2.79 dB** below the limits at the worst case frequency of **399.93 MHz** in a Horizontal Polarization.

3.5 Product Specification

Model: WT3125SE (Logic Board P/N 961416-00 Rev 6)

Clock Circuit:

U8 = ICS9112-16, P/N 205572-50 (1:5 PLL zero-delay clock buffer)

Filters:

33 MHz CLK Lines:

R82-84 = 33 Ω , P/N 370513-13 (connected lines)

RP9 = 51 Ω , P/N 371338-18 (terminated lines)

U1 = SC2200-266, P/N 200069-51

Filters:

33 MHz CLK Lines:

RP8 = 33 Ω , P/N 371338-02

Power Filters

U1 = SC2200-266, P/N 200069-51

CRT Filter:

L20 = 330 Ω bead, P/N 400044-06

C420 = 22 μ F, P/N 310226-02

C421 = 1 μ F, P/N 320343-25

C422, C423, C424 = 0.1 μ F, P/N 320334-37

PLL3 Filter:

L21, L22 = 330 Ω bead, P/N 400044-06

R58 = 10 Ω , P/N 370513-01

C425 = 10 μ F, P/N 310224-01

C426, C427 = 0.1 μ F, P/N 320334-24

PLL2 Filter:

L23, L24 = 330 Ω bead, P/N 400044-06

R59 = 10 Ω , P/N 370513-01

C428 = 10 μ F, P/N 310224-01

C429, C430 = 0.1 μ F, P/N 320334-24

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Video Circuit:

U1 = SC2200

Filters:

L2 = 0.47 μ H, P/N 410038-02; C4, C7 = 22pF, P/N 320347-21

L3 = 0.47 μ H, P/N 410038-02; C3, C6 = 22pF, P/N 320347-21

L4 = 0.47 μ H, P/N 410038-02; C2, C5 = 22pF, P/N 320347-21

Termination:

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

Audio Circuit:

U11 = LM4546, P/N 205123-53

Power Filters:

C411, C412, C413, C415 = 0.1 μ F, P/N 320347-21

C410, C414 = 10 μ F, P/N 310224-01

L18, L19 = 70 Ohm, P/N 400040-04

Clock Filters:

R30, R31, R45 = 33 Ω , P/N 370513-13

Driving Transistor:

Q7, Q8 = MMBT3904, P/N 270010-50

Network:

U2 = DP83815, P/N 205127-50

Filters:

R11, R12 = 49.9 Ohm, P/N 370508-68

C597 = 0.1 μ F, P/N 320347-21

J4 = RJ45 Connector w/ transformer built in, P/N 563680-01

Filters:

C19, C20 = 0.1 μ F, P/N 320347-21

R9, R10 = 54.9 Ohm, P/N 370508-72

C56, C57 = 15pF, 320347-17

Quiet Ground:

L29 = 2T 6-hole ferrite, P/N 400022-03

Radiated Emission Test
3m Semi Anechoic Chamber
WYSE Technology Inc.
3471 North 1st Street
San Jose Ca 95134

Test Description:

EUT: WT3125SE

Serial No. 9LF1B500060 Unit #2

Part No. 902040-03

File No. 072702#2

Test Type:

FCC-A { }

FCC-B {X }

EN55022

CISPR-A { }

EN55022

CISPR-B { }

PASS: X

FAIL:

Debug:

Frequency MHz	Peak dBuV/m	DelLim-Pk dB	QP dBuV/m	DelLim-QP dB	Angle deg	Hgt cm	Pol	Comment
266.651780	44.53	-1.47	40.08	-5.92	104	288	Vert	
399.939583	44.51	-1.49	43.21	-2.79	102	212	Horz	
533.240334	44.46	-1.54	41.71	-4.29	102	220	Horz	

Configuration:

1) Fully configured 32F/64R

2) Video1024 x 768

Modifications:

None

Test Procedure Definition:

EMI Receiver	Model: 85460A	(Cal. Date: May 9, 2002)
	SN: 3807A11445	(Cal. Due Date: May 9, 2003)
Emco Biog Ant. (Type2)	Model: 3142	(Cal Date: Dec. 11, 2001)
	SN: 1201	(Cal Due Date: Dec. 11, 2002)
Configuration	WYSE 3m Chamber	
Frequency Range	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.
- 2) Installed Bead On 10/100 Base T

EUT:

Description	Part No.	Serial No.	FCC ID:
WT3125SE LP	Unit #2	9LF1B500060	
DVE	DSA0421S-12-3-30	NA	DOC

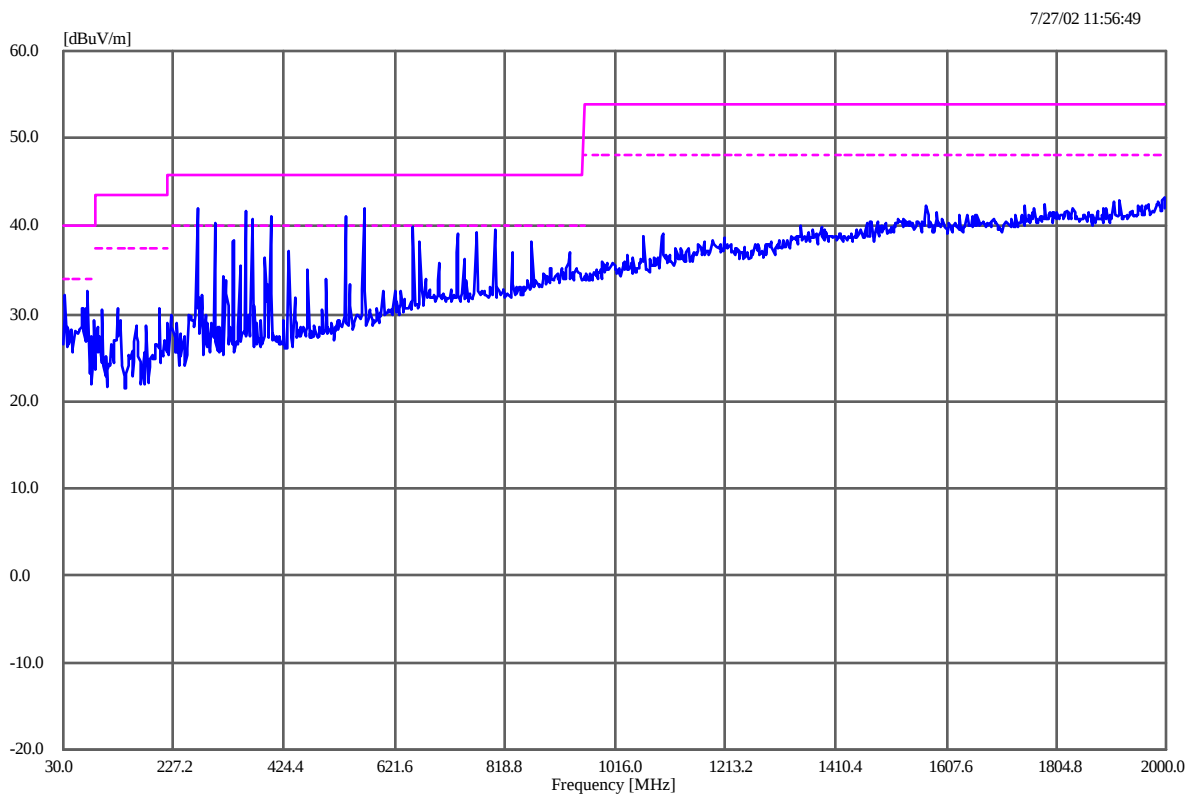
Supporting Devices:

Description	Model No.	Serial No.	FCC ID:
Server HP Brio Computer	81XX	US74852369	
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	2701749	DOC
US Robotics 56K Modem	005686-03	22BBQ9UAHN	DOC
HP Parallel Printer	812C	MX97GW196	DOC
HP Serial Printer	2225D	3208S00972	DS16XU2225
Wyse K/B (PS2)	2971	2F13200045B	DOC
Wyse Wheel Mouse (PS 2)	M-S48a	LZP2240008AW	JNZ2012
CPQ Wheel mouse (USB)	M-U48a	F29690AMSN205MA	JNZ211360
CPQ Wheel mouse (USB)	M-U48a	F29690AMSN205LO	JNZ211360
CPQ Wheel mouse (USB)	M-U48a	F29690A5BJLOJYL	JNZ211360
Headset and Microphone	None	None	

Composite Trace



Final Data [87/849]

Frequency MHz	Peak dBuV/m	DelLim-Pk dB	QP dBuV/m	DelLim-QP dB	Hgt cm	Angle deg	Pol
43.724406	25.56	-14.44	--.---	--.---	98	358	Vert
45.010742	26.44	-13.56	--.---	--.---	126	358	Vert
50.846895	26.08	-13.92	--.---	--.---	98	358	Vert
53.926206	26.35	-13.65	--.---	--.---	102	57	Vert
58.104126	28.33	-11.67	--.---	--.---	189	-2	Vert
58.415911	26.78	-13.22	--.---	--.---	126	-2	Vert
61.876725	28.06	-11.94	--.---	--.---	102	86	Vert
62.157332	29.28	-10.72	--.---	--.---	102	123	Vert
62.531474	28.78	-11.22	--.---	--.---	102	86	Vert
63.466829	29.18	-10.82	--.---	--.---	102	123	Vert
64.028042	29.23	-10.77	--.---	--.---	102	79	Vert
64.345300	27.32	-12.68	--.---	--.---	175	358	Vert
65.024621	26.53	-13.47	--.---	--.---	175	358	Vert
65.981845	25.13	-14.87	--.---	--.---	217	358	Vert
66.692044	25.50	-14.50	--.---	--.---	98	358	Vert
69.903376	27.99	-12.01	--.---	--.---	399	288	Vert
70.829722	25.32	-14.68	--.---	--.---	165	358	Vert
71.447286	24.18	-15.82	--.---	--.---	144	358	Vert
73.824908	30.97	-9.03	--.---	--.---	399	317	Vert
77.601041	28.35	-11.65	--.---	--.---	398	228	Horz
81.567371	22.13	-17.87	--.---	--.---	102	191	Vert
84.715252	26.73	-13.27	--.---	--.---	398	79	Horz
87.705739	24.61	-15.39	--.---	--.---	102	176	Vert
88.706685	21.41	-22.09	--.---	--.---	157	358	Vert
89.276297	25.13	-18.37	--.---	--.---	306	-2	Horz
89.845909	21.78	-21.72	--.---	--.---	328	-2	Horz
90.686765	22.98	-20.52	--.---	--.---	399	130	Vert
93.182209	21.77	-21.73	--.---	--.---	102	72	Horz
96.518509	23.49	-20.01	--.---	--.---	349	-2	Horz
96.762629	20.10	-23.40	--.---	--.---	102	287	Horz
100.225976	31.14	-12.36	--.---	--.---	102	125	Vert
111.306201	19.43	-24.07	--.---	--.---	146	358	Vert
112.386938	19.26	-24.24	--.---	--.---	102	288	Horz
114.177873	18.64	-24.86	--.---	--.---	337	-2	Horz
115.073341	20.38	-23.12	--.---	--.---	102	258	Horz
116.123200	19.61	-23.89	--.---	--.---	102	266	Horz
117.234815	21.03	-22.47	--.---	--.---	102	296	Horz
118.346430	20.49	-23.01	--.---	--.---	337	-2	Horz
121.001956	20.70	-22.80	--.---	--.---	102	280	Horz
122.061142	26.51	-16.99	--.---	--.---	102	251	Vert
123.168728	27.36	-16.14	--.---	--.---	102	266	Vert
126.315279	29.09	-14.41	--.---	--.---	102	65	Vert
128.530451	26.73	-16.77	--.---	--.---	102	347	Vert
129.059072	28.82	-14.68	--.---	--.---	102	310	Vert
129.562520	29.25	-14.25	--.---	--.---	102	310	Vert
145.361261	21.55	-21.95	--.---	--.---	98	358	Vert
150.558672	21.39	-22.11	--.---	--.---	114	358	Vert
155.526266	24.49	-19.01	--.---	--.---	102	289	Vert
157.560088	26.38	-17.12	--.---	--.---	102	274	Vert
159.659517	26.07	-17.43	--.---	--.---	102	214	Vert
160.884184	24.93	-18.57	--.---	--.---	102	252	Vert
160.971660	25.18	-18.32	--.---	--.---	102	259	Vert
161.474648	26.76	-16.74	--.---	--.---	102	252	Vert

166.591308	23.29	-20.21	--.---	--.---	102	143	Horz
172.029783	23.24	-20.26	--.---	--.---	102	203	Horz
177.776270	30.71	-12.79	--.---	--.---	187	358	Horz
199.924310	28.61	-14.89	--.---	--.---	102	242	Horz
200.480107	23.23	-20.27	--.---	--.---	102	302	Horz
216.640573	22.41	-23.59	--.---	--.---	166	358	Horz
221.099099	25.84	-20.16	--.---	--.---	102	88	Vert
226.274731	21.99	-24.01	--.---	--.---	102	191	Vert
233.318994	28.62	-17.38	--.---	--.---	102	192	Horz
266.651780	44.53	-1.47	40.08	-5.92	104	288	Vert
266.697163	44.35	-1.65	39.57*	-6.43	100	295	Vert
270.321694	30.12	-15.88	--.---	--.---	102	348	Vert
277.797906	32.33	-13.67	--.---	--.---	102	172	Horz
300.047010	38.54	-7.46	--.---	--.---	102	98	Vert
314.944505	32.89	-13.11	--.---	--.---	102	189	Horz
319.416055	32.27	-13.73	--.---	--.---	102	218	Horz
333.253754	35.37	-10.63	--.---	--.---	193	1	Vert
343.997964	32.98	-13.02	--.---	--.---	102	305	Horz
355.506113	39.77	-6.23	--.---	--.---	137	358	Horz
366.593795	39.75	-6.25	--.---	--.---	102	202	Horz
388.820193	33.84	-12.16	--.---	--.---	102	202	Vert
393.077408	32.69	-13.31	--.---	--.---	102	195	Vert
399.939583	44.51	-1.49	43.21	-2.79	102	212	Horz
433.309179	37.44	-8.56	--.---	--.---	102	210	Vert
466.670107	33.04	-12.96	--.---	--.---	102	224	Horz
499.990541	31.35	-14.65	--.---	--.---	102	187	Vert
533.240334	44.46	-1.54	41.71	-4.29	102	220	Horz
566.713621	39.92	-6.08	--.---	--.---	135	358	Horz
655.495111	38.97	-7.03	--.---	--.---	102	68	Horz
666.465342	37.71	-8.29	--.---	--.---	102	9	Vert
733.340295	35.64	-10.36	--.---	--.---	98	358	Vert
766.706838	35.25	-10.75	--.---	--.---	102	38	Vert
799.962413	35.11	-10.89	--.---	--.---	208	358	Vert
866.542947	37.92	-8.08	--.---	--.---	102	16	Vert

