

April 16, 2003

WYSE Technology FCC 3M Class B Test Record

for

Window Based Terminal

Model Number: WT9650XE

Tests performed by WYSE Technology

3471 N. First Street, San Jose, CA

Test completed: April 9, 2003

Test Engineer: Jimmy Nguyen

April 16, 2003

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 April 9, 2003 on the model WT9650XE.

1.2 Purpose

Testing was performed to evaluate the emissions performance of the WT9650XE with respect to FCC 3m Class B.

1.3 Summary

The Windows Terminal WT9650XE 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

WT9650XE 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 **WT9650XE** was **1.79 dB** below the limits at the worst case frequency of **75.735 MHz** in a Horizontal Polarization.

3.5 Product Specification

Model: WT9650XE (Logic Board P/N 770428-01)

Clock Circuit:

U16 = ICS C9725-198

Filters:

33 MHZ CLK Line:

R215-217 = 33 ohms

14 MHZ CLK Line:

C164, 173 = 22 pF

48 MHZ CLK Line:

R240 = 22 ohms

U15 = VIA C3 CPU, 533 EBGA

C61, 72, 59, 65 = 47 pF

R117, 106 124, 122 = 27 ohms

C56, 68 = 27 pF

R120, 126, 113, 119 = 15 Kohms

L12, L17 = BLM1IP 300S

Main Power Filters:

U17 = ISL6524

PL1 = 2uH Choke

C188, C169, 168 = 10 uF Aluminum cap

Video Circuit:

U12 = IC,8601,NORTH BRIDGE

Filters:

L19, 20, 24, 25, 35, 32, 31 = BLM11P600S

C119 = 1 uF

C114 = 1000 pF

B38 = 0.1 uF

CT23 = 10 uF 16V

L40, 41 = BLM11A121S

C187, 192 = 1000 pF

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Termination:

R149, 140, 141, 70, 138, 146, 151 = 22.5 ohms
R242, 233 = 47 ohms

Audio Circuit:

U13 = VIA VT1621A AC97 CODEC and Audio

Filters:

L2, 8, 7, 3, 10, 1 = BLM11P600S
B2, 9, 6, 7, 25, 30, C11, 32, 33 = 0.1 uF
B16, B17 = 0.01 uF
C26, 28, 24, 23, 25 = 0.22 uF
C8, 9 = 27 pF
C7, 6, 22 = 22 pF

Network:

U11 = VIA VT6103 LAN

Filters:

C77, 83, 79, 75, 86 = 0.1 uF
C266, 267 = 47 pF
C73, 74 = 22 pF
R171, 175 = 330 ohms
R156, 159 = 49.9 ohms
CN3B = Conn, RJ45, 8P

Radiated Emission Test

3m Chamber

WYSE Technology Inc.

3471 North 1st Street

San Jose Ca 95134

Test Description:

EUT: WT9650XE

Serial No. 9T21C300027

Part No. 902068-03

File No. 040903#1

Test Type:

FCC-A { } FCC-B { X } EN55022 EN55022 CISPR-A { } CISPR-B { }

PASS: X FAIL: Debug:

Frequency MHz	Peak dV/m	DelLim-Pk dB	QP dBuV/m	DelLim-QP dB	Angle deg	Hgt cm	Pol
75.735512	38.21	-1.79	37.12	-2.88	390	357	Horz
100.741264	39.56	-3.94	37.14	-6.36	219	2	Horz

Configuration:

- 1) Fully configured
- 2) Video 1024X768 @ 60Hz

Modifications:

None

Test Procedure Definition:

EMI Receiver	Model: 85460A	(Cal. Date: 09 May 2002)
	SN: 3807A11445	(Cal. Due Date: 09 May 2003)
Emco Biog Ant. (Type2)	Model: 3142	(Cal Date: Aug. 19 2002)
	SN: 1048	(Cal Due Date: Aug. 19 2003)
Configuration	WYSE 3M 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.
- 2) Installed Bead On 10/100 Base T

EUT:

Description	Part No.	Serial No.	FCC ID:
WT9650XE Power adapter	902068-03 0219B1280	9T21C300027 A20305065248	TBA N/A

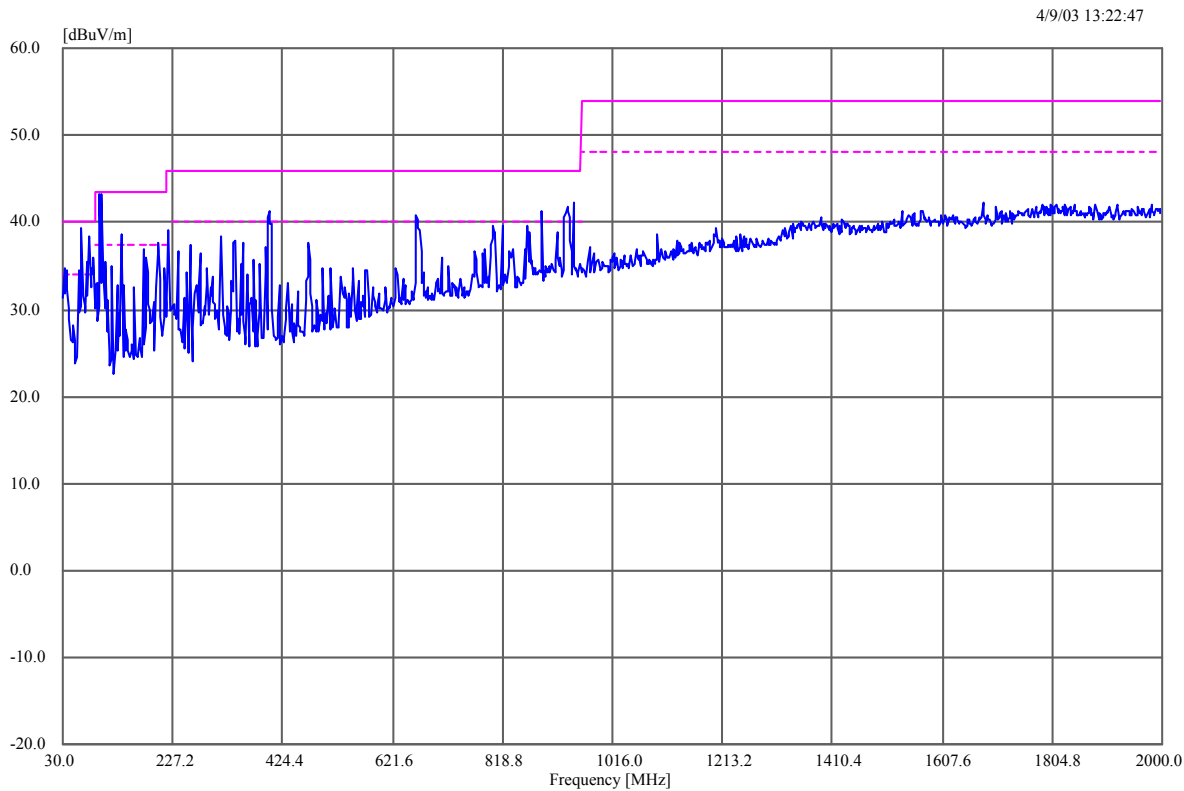
Supporting Devices:

Description	Model No.	Serial No.	FCC ID:
Server HP Brio Computer	81XX	US74852369	DOC
HP Key Board	KB-3923	2J54900264B	E8HKB-5923
HP Mouse	M-S48a	HCA25007892	DZL211029

Peripherals:

Description	Model No.	Serial No.	FCC ID:
HP Parallel Printer	812C	MX97GW196	DOC
US ROBOTICS-Serial port	144000 MODEM	0002680214407879	CJE0265
Wyse Keyboard (PS2)	KU-3923	2J54900264B	E8HKB5923
Wyse mouse (PS2)	M-S69	HCA25007892	JNZ211443
Compaq Mouse (USB Wheel)	M-u48a	F29690AMSN205L0	JNZ211360
Compaq Mouse (USB Wheel)	M-u48a	F29690AMSNA0EK8	JNZ211360
Headset and Microphone	None	None	

Composite Trace



Final Data [153/849]

Frequency MHz	Peak dBuV/m	DelLim-Pk dB	QP dBuV/m	DelLim-QP dB	Hgt cm	Angle deg	Pol
35.343053	36.35	-3.65	32.87	-7.13	101	357	Vert
47.797566	26.67	-13.33	--.--	--.--	104	358	Vert
55.976498	27.43	-12.57	--.--	--.--	398	354	Vert
57.039464	22.13	-17.87	--.--	--.--	98	358	Vert
58.691673	29.74	-10.26	--.--	--.--	398	228	Horz
61.562810	36.03	-3.97	34.27	-5.73	167	2	Vert
63.744461	33.80	-6.20	--.--	--.--	398	43	Horz
66.476492	28.45	-11.55	--.--	--.--	398	258	Horz
67.181532	30.91	-9.09	--.--	--.--	180	1	Vert
67.798442	30.01	-9.99	--.--	--.--	285	1	Vert
71.703098	35.04	-4.96	32.34	-7.66	195	357	Horz
73.784193	25.97	-14.03	--.--	--.--	138	-1	Vert
75.136906	28.65	-11.35	--.--	--.--	148	-1	Vert
75.735512	38.21	-1.79	37.12	-2.88	390	357	Horz
76.595714	28.51	-11.49	--.--	--.--	148	-1	Vert
77.258808	29.62	-10.38	--.--	--.--	168	-1	Vert
78.611521	25.03	-14.97	--.--	--.--	108	-1	Vert
78.770664	32.22	-7.78	--.--	--.--	138	-1	Vert
79.726617	36.48	-3.52	33.44	-6.56	177	-2	Vert
82.035324	26.08	-13.92	--.--	--.--	104	1	Vert
82.904118	26.80	-13.20	--.--	--.--	115	1	Vert
83.710855	33.63	-6.37	--.--	--.--	398	358	Horz
87.620428	31.16	-8.84	--.--	--.--	398	358	Horz
89.575214	31.14	-12.36	--.--	--.--	167	1	Vert
91.716171	27.07	-16.43	--.--	--.--	328	358	Horz
92.387841	24.61	-18.89	--.--	--.--	102	273	Vert
94.376252	30.03	-13.47	--.--	--.--	102	151	Vert
95.153315	39.10	-4.40	--.--	--.--	398	18	Horz
95.792241	32.15	-11.35	--.--	--.--	102	220	Vert
96.334535	32.28	-11.22	--.--	--.--	102	279	Vert
96.635810	31.39	-12.11	--.--	--.--	102	205	Vert
98.383201	33.28	-10.22	--.--	--.--	102	191	Vert
100.741264	39.56	-3.94	37.14	-6.36	219	2	Horz
101.817729	32.82	-10.68	--.--	--.--	102	198	Vert
102.796344	30.22	-13.28	--.--	--.--	102	116	Vert
103.853265	29.64	-13.86	--.--	--.--	102	145	Vert
104.712014	31.03	-12.47	--.--	--.--	102	250	Vert
105.262494	29.24	-14.26	--.--	--.--	102	257	Vert
106.319416	29.06	-14.44	--.--	--.--	174	-1	Horz
108.785567	29.03	-14.47	--.--	--.--	398	349	Horz
117.538452	32.97	-10.53	--.--	--.--	98	-2	Vert
123.210706	20.06	-23.44	--.--	--.--	102	280	Horz
125.033930	32.21	-11.29	--.--	--.--	98	-2	Vert
128.711045	28.50	-15.00	--.--	--.--	102	184	Vert
129.314767	23.24	-20.26	--.--	--.--	102	280	Vert
132.812189	30.54	-12.96	--.--	--.--	102	354	Vert
133.436729	28.98	-14.52	--.--	--.--	102	354	Vert
133.603273	30.20	-13.30	--.--	--.--	102	354	Vert
133.998815	28.46	-15.04	--.--	--.--	102	354	Vert
134.269449	31.09	-12.41	--.--	--.--	102	358	Vert
139.970032	34.00	-9.50	--.--	--.--	102	280	Horz
143.723329	26.48	-17.02	--.--	--.--	102	206	Horz
145.610461	21.88	-21.62	--.--	--.--	102	199	Horz
156.721308	28.97	-14.53	--.--	--.--	102	354	Vert

157.547927	25.37	-18.13	--.--	--.--	108	358	Vert
158.457208	24.99	-18.51	--.--	--.--	102	212	Vert
166.749713	23.26	-20.24	--.--	--.--	102	80	Horz
167.887514	27.14	-16.36	--.--	--.--	102	206	Horz
173.413975	31.46	-12.04	--.--	--.--	102	280	Horz
177.113031	23.38	-20.12	--.--	--.--	168	-2	Horz
178.003340	21.59	-21.91	--.--	--.--	102	131	Vert
179.160743	29.00	-14.50	--.--	--.--	102	338	Vert
180.021375	30.10	-13.40	--.--	--.--	104	-2	Horz
182.543918	22.01	-21.49	--.--	--.--	168	-2	Horz
184.265183	23.57	-19.93	--.--	--.--	102	153	Vert
185.986448	22.31	-21.19	--.--	--.--	102	153	Vert
187.755836	23.01	-20.49	--.--	--.--	102	154	Horz
188.633427	25.19	-18.31	--.--	--.--	102	147	Horz
189.620716	22.19	-21.31	--.--	--.--	102	354	Horz
190.278908	22.78	-20.72	--.--	--.--	98	-2	Vert
192.034089	24.87	-18.63	--.--	--.--	171	358	Horz
195.928395	31.53	-11.97	--.--	--.--	102	265	Horz
199.167422	26.78	-16.72	--.--	--.--	117	-2	Horz
199.448029	27.43	-16.07	--.--	--.--	105	-2	Horz
200.476919	27.52	-15.98	--.--	--.--	128	-2	Horz
200.851062	26.89	-16.61	--.--	--.--	158	-2	Horz
201.131668	25.52	-17.98	--.--	--.--	105	-2	Horz
201.879952	23.38	-20.12	--.--	--.--	102	49	Vert
202.285273	23.70	-19.80	--.--	--.--	102	1	Vert
203.781841	23.38	-20.12	--.--	--.--	102	20	Vert
208.957473	22.25	-21.25	--.--	--.--	102	309	Vert
212.605092	35.70	-7.80	--.--	--.--	102	231	Horz
213.684571	27.90	-15.60	--.--	--.--	102	338	Horz
218.267265	30.34	-15.66	--.--	--.--	219	-2	Vert
223.854403	30.63	-15.37	--.--	--.--	151	358	Vert
225.849676	27.08	-18.92	--.--	--.--	102	346	Vert
228.361582	28.79	-17.21	--.--	--.--	102	20	Vert
235.042387	33.61	-12.39	--.--	--.--	102	295	Horz
240.026035	26.58	-19.42	--.--	--.--	102	169	Horz
246.216362	27.45	-18.55	--.--	--.--	102	48	Vert
249.977908	30.48	-15.52	--.--	--.--	102	358	Vert
251.817345	37.61	-8.39	--.--	--.--	203	358	Vert
257.483238	34.69	-11.31	--.--	--.--	102	139	Horz
258.793123	25.76	-20.24	--.--	--.--	102	87	Horz
266.196822	23.02	-22.98	--.--	--.--	102	116	Horz
267.586057	22.43	-23.57	--.--	--.--	104	-2	Horz
267.893778	20.10	-25.90	--.--	--.--	134	-2	Horz
270.379221	21.90	-24.10	--.--	--.--	98	-2	Horz
272.036183	24.37	-21.63	--.--	--.--	114	-2	Horz
274.213904	36.84	-9.16	--.--	--.--	222	358	Vert
283.900563	31.46	-14.54	--.--	--.--	102	279	Horz
286.351828	29.69	-16.31	--.--	--.--	102	39	Horz
288.267760	30.17	-15.83	--.--	--.--	102	32	Horz
291.085306	31.70	-14.30	--.--	--.--	146	-2	Vert
292.747658	28.23	-17.77	--.--	--.--	102	24	Horz
296.630065	32.01	-13.99	--.--	--.--	182	358	Vert
299.615602	25.58	-20.42	--.--	--.--	115	-2	Horz
300.927717	25.40	-20.60	--.--	--.--	104	-2	Horz
301.479186	24.87	-21.13	--.--	--.--	145	-2	Horz
313.400385	35.72	-10.28	--.--	--.--	102	116	Horz
324.632059	28.49	-17.51	--.--	--.--	150	358	Vert
336.022387	38.08	-7.92	--.--	--.--	102	183	Horz
337.484049	38.74	-7.26	--.--	--.--	102	197	Horz
348.735232	24.57	-21.43	--.--	--.--	398	283	Horz

352.517436	36.74	-9.26	--.--	--.--	129	358	Vert
360.003507	32.51	-13.49	--.--	--.--	102	205	Horz
368.431340	28.21	-17.79	--.--	--.--	102	57	Horz
371.252512	31.70	-14.30	--.--	--.--	102	1	Vert
384.066568	32.51	-13.49	--.--	--.--	102	101	Horz
391.779308	33.97	-12.03	--.--	--.--	147	-2	Vert
393.745904	35.11	-10.89	--.--	--.--	102	79	Horz
397.740741	30.55	-15.45	--.--	--.--	102	213	Vert
398.064015	32.16	-13.84	--.--	--.--	102	168	Vert
398.482371	31.53	-14.47	--.--	--.--	102	168	Vert
398.596468	31.35	-14.65	--.--	--.--	102	191	Vert
399.965631	31.81	-14.19	--.--	--.--	213	358	Vert
400.631197	32.06	-13.94	--.--	--.--	102	191	Vert
401.848231	32.06	-13.94	--.--	--.--	102	339	Vert
402.076425	31.33	-14.67	--.--	--.--	102	213	Vert
402.437732	28.22	-17.78	--.--	--.--	102	146	Vert
416.225047	29.88	-16.12	--.--	--.--	102	94	Horz
432.047627	31.83	-14.17	--.--	--.--	235	358	Vert
469.709677	30.74	-15.26	--.--	--.--	344	-2	Vert
470.598071	28.73	-17.27	--.--	--.--	102	20	Horz
471.230715	28.85	-17.15	--.--	--.--	149	358	Horz
472.442162	28.01	-17.99	--.--	--.--	115	-2	Vert
495.011640	31.20	-14.80	--.--	--.--	102	191	Vert
509.306424	32.53	-13.47	--.--	--.--	99	-2	Vert
528.212225	34.50	-11.50	--.--	--.--	102	354	Vert
551.235145	33.22	-12.78	--.--	--.--	102	309	Horz
572.698201	32.61	-13.39	--.--	--.--	102	154	Vert
573.734901	32.54	-13.46	--.--	--.--	102	154	Vert
662.847508	38.69	-7.31	--.--	--.--	102	34	Horz
663.235742	41.26	-4.74	35.93	-10.07	102	56	Horz
663.710541	39.04	-6.96	--.--	--.--	102	57	Horz
664.170079	38.16	-7.84	--.--	--.--	102	57	Horz
664.338202	38.25	-7.75	--.--	--.--	102	64	Horz
801.649192	39.11	-6.89	--.--	--.--	102	190	Vert
816.090912	37.30	-8.70	--.--	--.--	102	65	Horz
861.937547	37.59	-8.41	--.--	--.--	102	190	Vert
887.649805	32.20	-13.80	--.--	--.--	399	325	Vert
932.828794	38.10	-7.90	--.--	--.--	102	161	Vert
944.988469	35.18	-10.82	--.--	--.--	300	-2	Vert

