

## FCC CLASS B COMPLIANCE REPORT (Certification)

for

Electromagnetic Emissions

of

### **USB 2.0 PCI CARD (4 PORTS)**

<b>FCC ID</b>	:	NUOUT-20NC08
<b>Trade Name</b>	:	N/A
<b>Model Number</b>	:	UT-20NC08
<b>Serial Number</b>	:	N/A
<b>Report Number</b>	:	02E0255-D
<b>Date</b>	:	June 20, 2002

Prepared for :

**UNIXTAR TECHNOLOGY, INC.**  
**3F, NO. 3, LANE 538, CHUNG CHENG RD.,**  
**HSIN TIEN, TAIPEI, TAIWAN, R. O. C.**



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## VERIFICATION OF COMPLIANCE

**Equipment Under Test:** USB 2.0 PCI CARD (4 PORTS)

**Trade Name:** N/A

**Model Number:** UT-20NC08

**Serial Number:** N/A

**Applicant:** **UNIXSTAR TECHNOLOGY, INC.**  
3F, NO. 3, LANE 538, CHUNG CHENG RD.,  
HSIN TIEN, TAIPEI, TAIWAN, R. O. C.

**Manufacturer:** **UNIXSTAR TECHNOLOGY, INC.**  
3F, NO. 3, LANE 538, CHUNG CHENG RD.,  
HSIN TIEN, TAIPEI, TAIWAN, R. O. C.

**Type of Test:** FCC Class B (Certification)

**Measurement Procedure:** ANSI C63.4: 1992 / EN 55022

**File Number:** 02E0255-D

**Date of test:** June 17, 2002

**Deviation:** N/A

**Condition of Test Sample:** Normal

The above equipment was tested by C&C Laboratory, Co., Ltd. For compliance with the requirements set forth in the FCC Rules and Regulations Part 15, Subpart B and the measurement procedure according to ANSI C63.4. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment are within the compliance requirements.

The test results of this report relate only to the tested sample identified in this report.



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**Authorized Signatory**

## **SYSTEM DESCRIPTION**

### **EUT Test Procedure:**

1. Windows XP Boots System.
2. Run Winemc.Exe To Activate All Peripherals And Display “H” Pattern On Monitor Screen.

## PRODUCT INFORMATION

**Housing Type:** N/A

**EUT Power Rating:** 3.3/5/12VDC from Host PC

**AC power during Test:** 120VAC, 60Hz to Host PC Power Supply

**Power Supply Manufacturer:** COMPAQ

**Power Supply Model Number :** DPS-250KB-2B

**AC Power Cable Type:** Unshielded, 1.8m (Detachable)

**OSC/Clock Frequencies:** 30MHz

**I/O Port of EUT:**

I/O PORT TYPES	Q' TY	TESTED WITH
1). USB 2.0	4	3

**Note:** N/A

## SUPPORT EQUIPMENT

No.	Equipment	Model #	Serial #	FCC / BSMI ID	Trade Name	Data Cable	Power Cord
1.	PS/2 Mouse	M-S34	LZE12352345	DZL211029 BSMI ID:4862A011	LOGITECH	Shielded, 1.9m	N/A
2.	Keyboard	6311-TW4C/6	N/A	BSMI ID:4862A064	ACER	Shielded, 1.7m	N/A
3.	CF Card Reader	RW016-D	N/A	DoC	Datafab	Shielded, 0.9m	N/A
4.	Modem	1414	N/A	IFAXDM1414	ACEEX	Shielded, 1.4m	Unshielded, 1.8m
5.	Printer	EPSONSTYLU SC20SX	DW4E126671	BSMI ID:3902E004	EPSON	Shielded, 1.8m	Unshielded, 1.8m
6.	Host PC	5420GC	1D23KMDWM 055	DoC BSMI ID:3892B894	COMPAQ	N/A	Unshielded, 1.8m
7.	Monitor	RB15NS	N/A	DoC BSMI ID:3902B318	SAMSUNG	Shielded, 1.8m with two cores	Unshielded, 1.8m with a core
8.	USB 2.0HDD	USB 2.0 Hard Drive	N/A	DoC	BUSUNK	Shielded, 1.8 m	Unshielded, 1.8 m
9.	USB 2.0HDD	USB 2.0 Hard Drive	N/A	DoC	BUSUNK	Shielded, 1.8 m	Unshielded, 1.8 m
10.	USB 2.0HDD	USB 2.0 Hard Drive	N/A	DoC	BUSUNK	Shielded, 1.8 m	Unshielded, 1.8 m
11.	Server PC	5420GC	1D23KMDWM 084	DoC BSMI ID:3892B894	COMPAQ	Shielded, 10m	Unshielded, 1.8m

**Note:** All the above equipment/cables were placed in worse case positions to maximize emission signals.

**Grounding:** Grounding was in accordance with the manufacturer's requirements and conditions for the intended use.

## MEASUREMENT PROCEDURE (PRELIMINARY LINE CONDUCTED EMISSION TEST)

- 1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- 2) Support equipment, if needed, was placed as per ANSI C63.4.
- 3) All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- 4) The EUT received DC 3.3/5/12V power through Host PC and Line Impedance Stabilization Network (LISN) which supplied power source of 120VAC/ 60Hz and was grounded to the ground plane.
- 5) All support equipment received power from a second LISN supplying power of 110VAC/60Hz, if any.
- 6) The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7) Analyzer / Receiver scanned from 150kHz to 30MHz for emissions in each of the test modes.
- 8) During the above scans, the emissions were maximized by cable manipulation.
- 9) The following test mode(s) were scanned during the preliminary test:

**Mode:**

No.	Mode of operation	Date	Data Report/Plot No.
1	Normal Mode	06/17/2002	0255C#(09, 18)

- 10) After the preliminary scan, we found the following test mode(s) producing the highest emission level.

**Mode: 1.**

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

## MEASUREMENT PROCEDURE (FINAL LINE CONDUCTED EMISSION TEST)

- 1) EUT and support equipment was set up on the test bench as per step 10 of the preliminary test.
- 2) A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less -2dB to the A.V. limit in Q.P. mode, then the emission signal was re-checked using an Average detector.
- 3) The test data of the worst case condition(s) was reported on the Summary Data page.

### Data Sample:

Freq (MHz)	Meter Reading (dBuV)	C.F. (dB)	Corrected Reading (dBuV)	Limits (dBuV)	Margin (dB)	Reading Type (P/Q/A)	Line (L1/L2)
<b>x.xx</b>	<b>x.xx</b>	<b>x.xx</b>	<b>38.38</b>	<b>56.00</b>	<b>-17.62</b>	<b>P</b>	<b>L1</b>

C.F.(Correction Factor)=Insertion Loss + Cable Loss

Corrected Reading = Metering Reading + C.F.

Margin=Corrected Reading - Limits

P=Peak Reading                    L1=Hot

Q=Quasi-peak                    L2=Neutral

A=Average Reading

Comments: N/A

## LINE CONDUCTED EMISSION LIMIT

Frequency	Maximum RF Line Voltage	
	Q.P.	AVERAGE
150kHz-500kHz	66-56dBuV	56-46dBuV
500kHz-5MHz	56dBuV	46dBuV
5MHz-30MHz	60dBuV	50dBuV

**Note:** The lower limit shall apply at the transition frequency.

## MEASUREMENT PROCEDURE (PRELIMINARY RADIATED EMISSION TEST)

- 1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- 2) Support equipment, if needed, was placed as per ANSI C63.4.
- 3) All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- 4) The EUT received DC 3.3/5/12V power source from Host PC Power Supply (120VAC/ 60Hz) and outlet socket under the turntable. All support equipment received 110VAC/60Hz to power from another socket under the turntable, if any.
- 5) The antenna was placed at 10 meter away from the EUT as stated in ANSI C63.4: 1992. The antenna connected to the Analyzer via a cable and at times a pre-amplifier would be used.
- 6) The Analyzer / Receiver quickly scanned from 30MHz to 1000MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- 7) The following test mode(s) were scanned during the preliminary test:

**Mode:**

No.	Mode of operation	Date	Data Report/Plot No.
1	Normal Mode	06/17/2002	0255E#(04, 05)

- 8) After the preliminary scan, we found the following test mode(s) producing the highest emission level.

**Mode:** 1.

Then, the EUT and cable configuration, antenna position, polarization and turntable position of the above highest emission level were recorded for reference of final testing.

## MEASUREMENT PROCEDURE (FINAL RAIDATED EMISSION TEST)

- 1) EUT and support equipment were set up on the turntable as per step 8 of the preliminary test.
- 2) The Analyzer / Receiver scanned from 30MHz to 1000MHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- 3) Recorded at least the six highest emissions. Emission frequency, amplitude, were recorded into a computer ( The antenna position, polarization and turntable position were kept in raw data file ) in which correction factors were used to calculate the emission level and compare reading to the applicable limit.
- 4) The test data of the worst case condition(s) was reported on the Summary Data page.

### Data Sample:

Freq (MHz)	Meter Reading (dBuV)	C.F. (dB/m)	Corrected Reading (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Reading Type P/Q/A	Pol. H/V
<b>x.xx</b>	<b>x.xx</b>	<b>x.xx</b>	<b>30.82</b>	<b>37.00</b>	<b>-6.18</b>	<b>P</b>	<b>V</b>

C.F.(Correction Factor)=Antenna Factor + Cable Loss + Attenuator(3/6 dB) - Amplifier Gain

Corrected Reading = Metering Reading + C.F.

Margin=Corrected Reading – Limits

P=Peak Reading

H=Horizontal Polarization/Antenna

Q=Quasi-peak

V=Vertical Polarization/Antenna

A=Average Reading

Comments: N/A

## RADIATED EMISSION LIMIT

Frequency (MHz)	Distance (m)	Maximum Field Strength Limit (dBu V/m/ Q.P.)
30-230	10	30
230-1000	10	37

**Note:** The lower limit shall apply at the transition frequency.

## SUMMARY DATA (LINE CONDUCTED TEST)

**Model Number:** UT-20NC08

**Location:** Conducted Room

**Tested by:** Stanley Huang

**Test Model:** Mode 1

**Test Results:** Passed

**Temperature:** 24

**Humidity:** 65%RH

(The chart below shows the highest readings taken from the final data)

Frequency Range Investigated				150 kHz TO 30 MHz			
Freq (MHz)	Meter Reading (dBuV)	C.F. (dB)	Corrected Reading (dBuV)	Limits (dBuV)	Margin (dB)	Reading Type (P/Q/A)	Line (L1/L2)
0.544	43.72	0.07	43.79	56.00	-12.21	P	L1
1.088	42.21	0.10	42.31	56.00	-13.69	P	L1
7.486	45.60	0.31	45.91	60.00	-14.09	P	L1
0.544	43.56	0.07	43.63	56.00	-12.37	P	L2
0.871	41.55	0.09	41.64	56.00	-14.36	P	L2
7.407	45.96	0.31	46.27	60.00	-13.73	P	L2

C.F.(Correction Factor)=Insertion Loss + Cable Loss

Corrected Reading = Metering Reading + C.F.

Margin=Corrected Reading - Limits

P=Peak Reading

L1=Hot

Q=Quasi-peak

L2=Neutral

A=Average Reading

Comments: N/A

## SUMMARY DATA (RADIATED EMISSION TEST)

**Model Number:** UN-20NC08

**Location:** Site # E

**Tested by:** David Hung

**Polar:** Vertical / Horizontal- 10m

**Test Mode:** Mode 1

**Test Results:** Passed

**Temperature:** 24

**Humidity:** 64% RH

(The chart below shows the highest readings taken from the final data)

Frequency Range Investigated (30 MHz TO 1000 MHz)							
Freq (MHz)	Meter Reading (dBuV)	C.F. (dB/m)	Corrected Reading (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Reading Type P/Q/A	Pol. H/V
42.127	39.08	-10.09	28.99	30.00	-1.01	Q	V
52.304	37.33	-12.73	24.60	30.00	-5.40	Q	V
61.440	40.70	-14.77	25.93	30.00	-4.07	P	V
71.620	41.90	-15.64	26.26	30.00	-3.74	P	V
120.008	41.00	-14.10	26.90	30.00	-3.10	P	V
184.324	36.50	-10.27	26.23	30.00	-3.77	P	V
184.350	34.60	-10.27	24.33	30.00	-5.67	P	H

C.F.(Correction Factor)=Antenna Factor + Cable Loss - Amplifier Gain (+ Attenuator 3dB)

Corrected Reading = Metering Reading + C.F.

Margin=Corrected Reading - Limits

P=Peak Reading

H=Horizontal Polarization/Antenna

Q=Quasi-peak

V=Vertical Polarization/Antenna

A=Average Reading

Comments: N/A

## TEST FACILITY

<b>Location:</b>	No. 199, Chung Sheng Road, Hsin Tien City, Taipei, Taiwan, R. O. C.
<b>Description:</b>	<p>There are two 3/10m open area test sites and one line conducted lab for final test</p> <p>The Open Area Test Sites and the Line Conducted labs are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 1992 and CISPR 22/EN 55022 requirements.</p>
<b>Site Filing:</b>	<p>A site description is on file with the Federal Communications Commission, 7435 Oakland Mills Road, Columbia, MD 21046.</p> <p>Registration also was made with Voluntary Control Council for Interference (VCCI).</p>
<b>Site Accreditation:</b>	<p>Accredited by A2LA (Certificate #: 824.01) for EMC.</p> <p>Also accredited by BSMI for the product category of Information Technology Equipment.</p>
<b>Instrument Tolerance:</b>	All measuring equipment is in accord with ANSI C63.4 and CISPR 22 requirements that meet industry regulatory agency and accreditation agency requirement.

**Ground Plane:** Two conductive reference ground planes were used during the Line Conducted Emission, one in vertical and the other in horizontal. The dimensions of these ground planes are as below. The vertical ground plane was placed distancing 40 cm to the rear of the wooden test table on where the EUT and the support equipment were placed during test. The horizontal ground plane projected 50 cm beyond the footprint of the EUT system and distanced 80 cm to the wooden test table. For Radiated Emission Test, one horizontal conductive ground plane extended at least 1m beyond the periphery of the EUT and the largest measuring antenna, and covered the entire area between the EUT and the antenna. It has no holes or gaps having longitudinal dimensions larger than one-tenth of a wavelength at the highest frequency of measurement up to 1GHz.

## TEST EQUIPMENT LIST

**Instrumentation:** The following list contains equipment used at C & C Laboratory, Co., Ltd. for testing. The equipment conforms to the CISPR 16-1 / ANSI C63.2-1988 Specifications for Electromagnetic Interference and Field Strength Instrumentation from 10kHz to 1.0GHz or above.

**Equipment used during the tests:**

**Open Area Test Site:** #E

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL. DUE
SPECTRUM ANALYZER	H.P.	8566B	2937A06102	06/07/02	06/06/03
SPECTRUM DISPLAY	H.P.	85662A	2848A18276	06/07/02	06/06/03
QUASI-PEAK DETECTOR	H.P.	85650A	2811A01439	06/07/02	06/06/03
AMPLIFIER	H.P.	8447D A	2727A05764	05/06/02	05/05/03
ANTENNA	EMCO	3142	1310	06/30/02	06/29/03
CABLE	BELDEN	9913	N-TYPE07	01/02/02	01/01/03

**Conducted Emission Test Site:** Conducted Room

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL. DUE
TEST RECEIVER	R&S	ESHS20	840455/006	03/16/02	03/15/03
LISN	SOLAR	8012-50-R-24-BNC	8305114	07/23/01	07/22/02
LISN(EUT)	EMCO	3825/2	01/16/02	01/16/02	01/15/03

The calibrations of the measuring instruments, including any accessories that may effect such calibration, are checked frequently to assure their accuracy. Adjustments are made and correction factors applied in accordance with instructions contained in the manual for the measuring instrument.

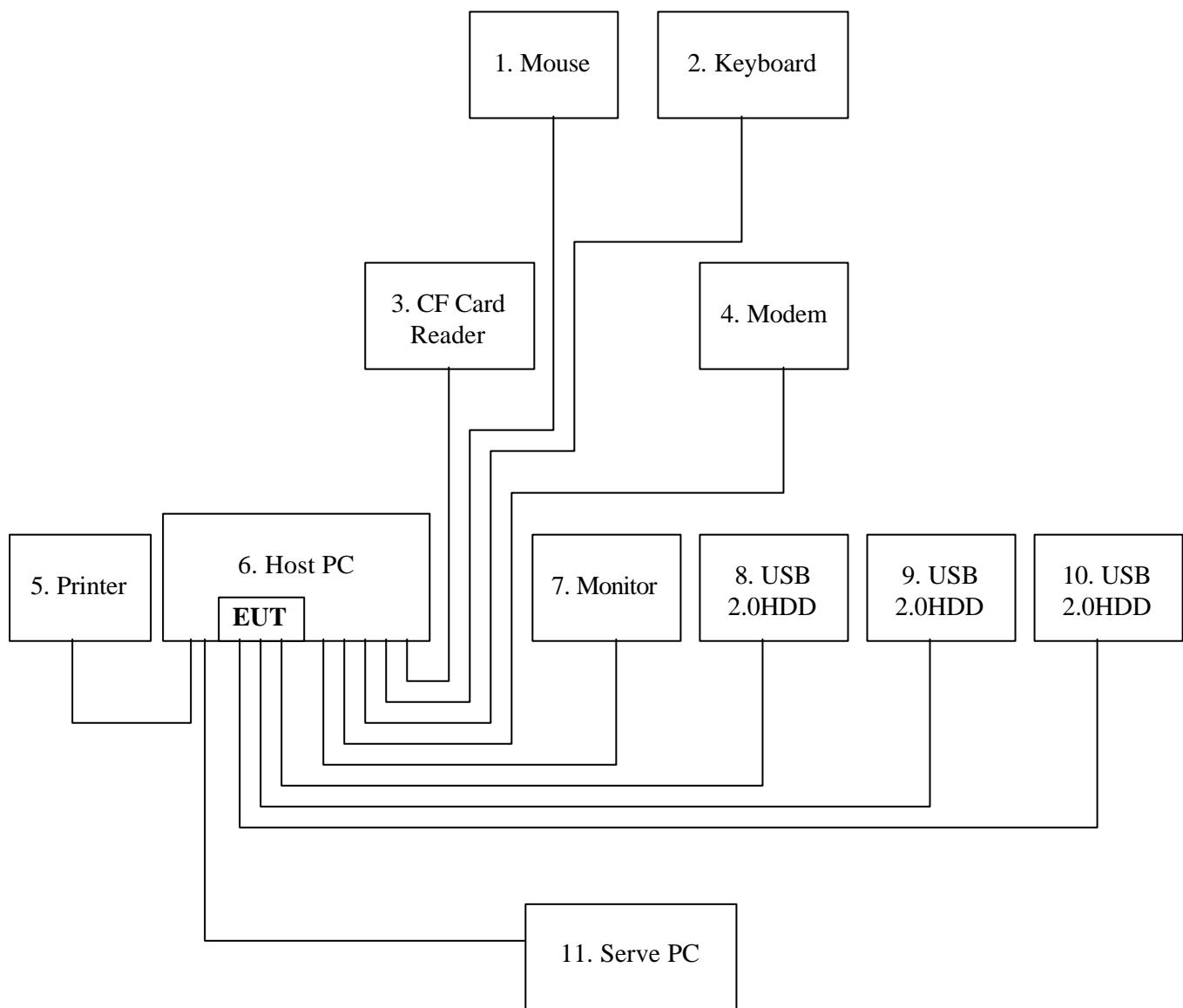
## BLOCK DIAGRAM OF TEST SETUP

System Diagram of Connections between EUT and Simulators

**EUT: USB 2.0 PCI CARD (4 PORTS)**

**Trade Name: N/A**

**Model Number: UT-20NC08**

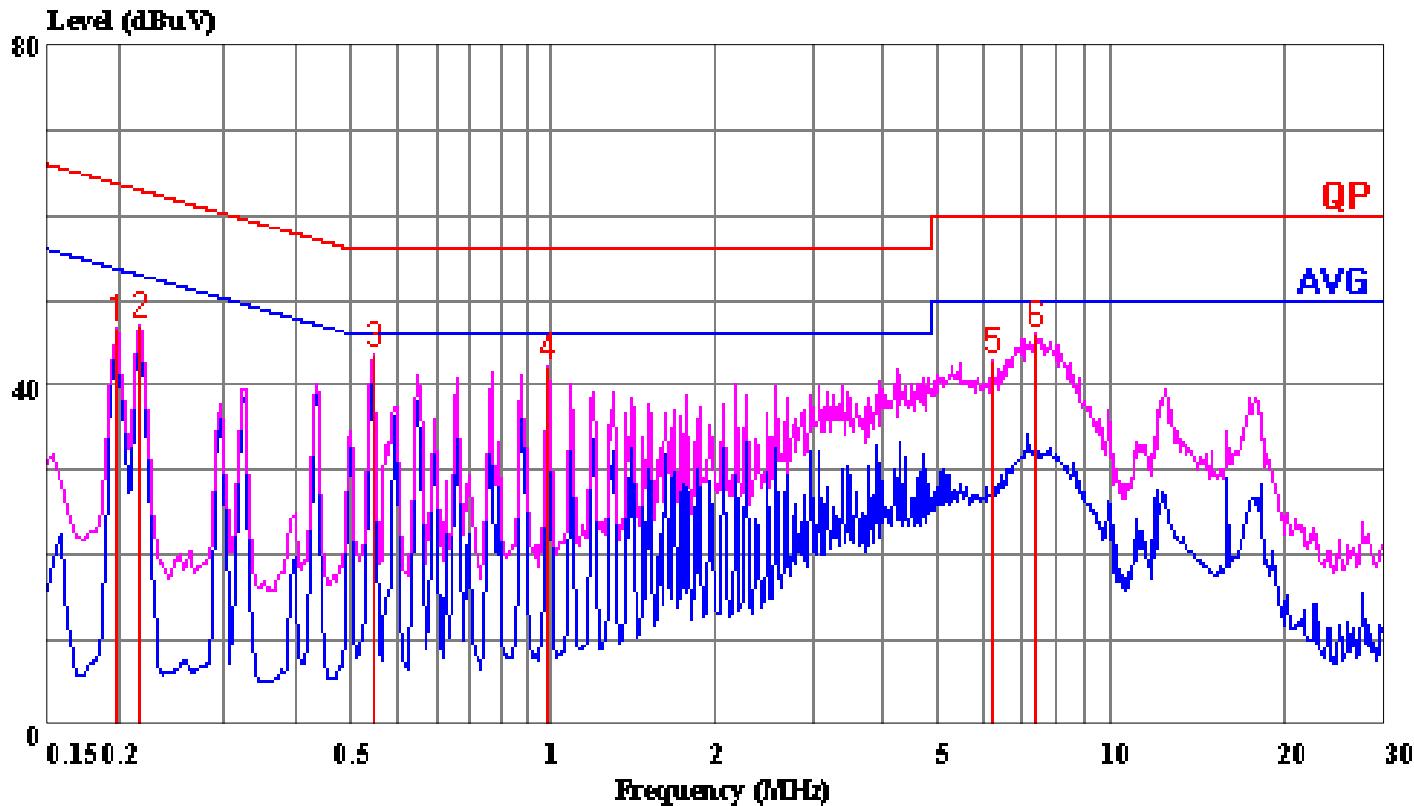


## **APPENDIX 4**

### **CONDUCTED EMISSION PLOT RADIATED EMISSION DATA**

Data#: 9 File#: 0255c.emi

Date: 2002-06-17 Time: 16:40:41



**(Conducted)**

Trace: 7 8

Ref Trace:

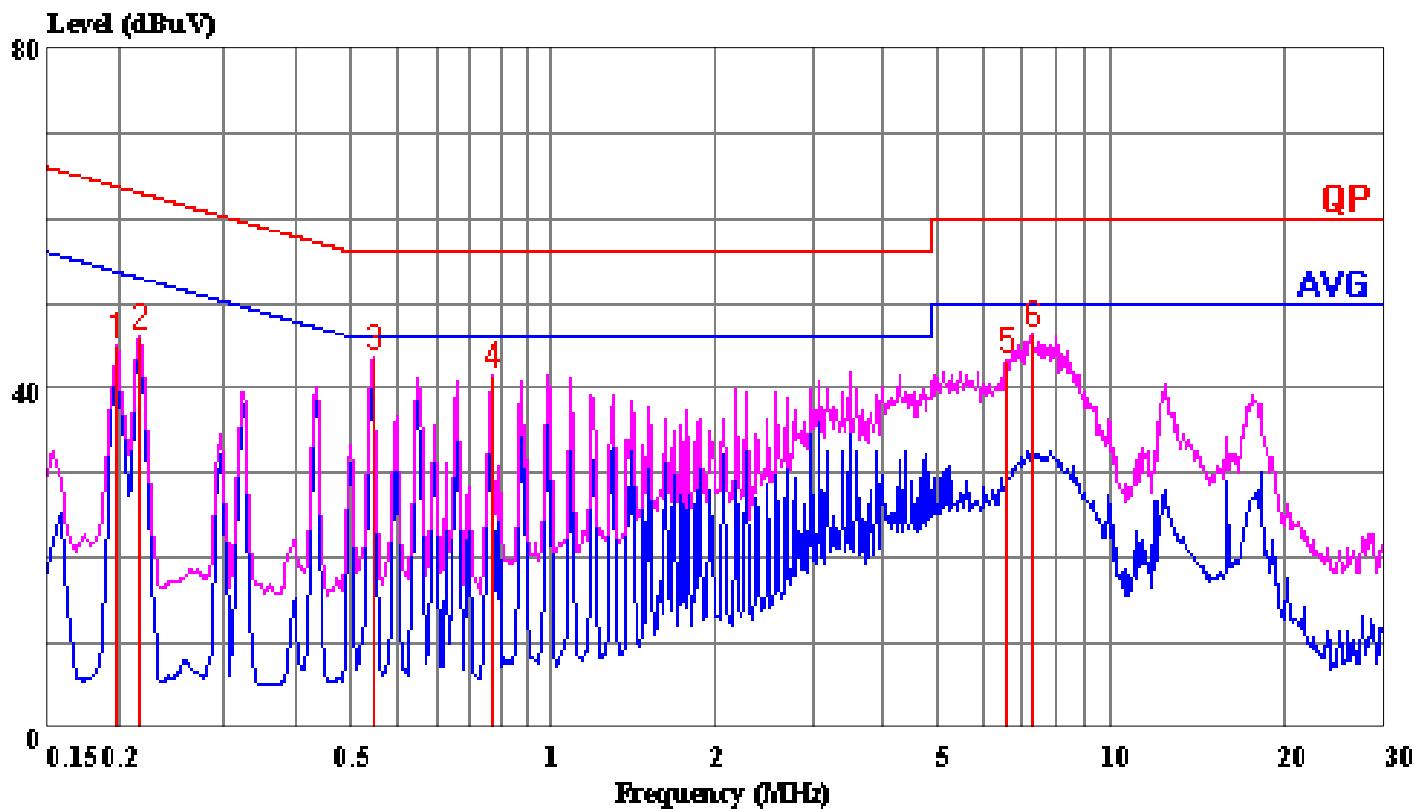
Condition: LINE  
 Report No. : 02E0255  
 Test Engr. : STANLEY HUANG  
 Company : UNIXSTAR TECHNOLOGY, INC.  
 EUT : UT-20NC08  
 Test Config : EUT/ALL PERIPHERALS  
 Type of Test: FCC CLASS B W/ EN 55022 CLASS B LIMIT  
 Mode of Op. : NORMAL MODE

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Freq	Read		Limit	Over	Remark	
	Level	Factor				
	MHz	dBuV	dB	dBuV	dB	
1	0.198	46.72	0.03	46.75	63.71 -16.96	Peak
2	0.217	47.08	0.03	47.12	62.92 -15.80	Peak
3	0.544	43.72	0.07	43.79	56.00 -12.21	Peak
4	1.088	42.21	0.10	42.31	56.00 -13.69	Peak
5	6.319	42.72	0.29	43.01	60.00 -16.99	Peak
6	7.486	45.60	0.31	45.91	60.00 -14.09	Peak

Data#: 18 File#: 0255c.emi

Date: 2002-06-17 Time: 16:49:09



**(Conducted)**

Trace: 16 17

Ref Trace:

Condition: NEUTRAL  
 Report No. : 02E0255  
 Test Engr. : STANLEY HUANG  
 Company : UNIXSTAR TECHNOLOGY, INC.  
 EUT : UT-20NC08  
 Test Config : EUT/ALL PERIPHERALS  
 Type of Test: FCC CLASS B W/ EN 55022 CLASS B LIMIT  
 Mode of Op. : NORMAL MODE

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Freq	Read		Limit	Over	Remark	
	MHz	Level				
	dBuV	dB	dBuV	dBuV	dB	
1	0.198	44.98	0.03	45.01	63.71 -18.70	Peak
2	0.217	45.90	0.03	45.94	62.92 -16.98	Peak
3	0.544	43.56	0.07	43.63	56.00 -12.37	Peak
4	0.871	41.55	0.09	41.64	56.00 -14.36	Peak
5	6.698	43.03	0.29	43.32	60.00 -16.68	Peak
6	7.407	45.96	0.31	46.27	60.00 -13.73	Peak

Data#: **4** File#: 0255e.emi  
E-Site

Date: 2002-06-17 Time: 21:50:56

Condition: VERTICAL / 10m  
Report No. : 02E0255  
Test Engr. : DAVID HUNG  
Company : UNIXSTAR TECHNOLOGY, INC.  
EUT : UT-20NC08  
Test Config : EUT / ALL PERIPHERALS  
Type of Test: FCC CLASS B W/ EN 55022 CLASS B LIMIT  
Mode of Op. : NORMAL MODE

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Freq	Read		Limit		Over		Remark
	Level	Factor	Level	Line	Limit	dB	
	MHz	dBuV	dB	dBuV/m	dBuV/m		
1	42.127	39.08	-10.09	28.99	30.00	-1.01	QP
2	52.304	37.33	-12.73	24.60	30.00	-5.40	QP
3	61.440	40.70	-14.77	25.93	30.00	-4.07	Peak
4	71.620	41.90	-15.64	26.26	30.00	-3.74	Peak
5	111.110	37.00	-13.67	23.33	30.00	-6.67	Peak
6	120.008	41.00	-14.10	26.90	30.00	-3.10	Peak
7	133.970	37.60	-14.14	23.46	30.00	-6.54	Peak
8	167.380	34.30	-11.44	22.86	30.00	-7.14	Peak
9	184.324	36.50	-10.27	26.23	30.00	-3.77	Peak
10	240.022	35.60	-7.77	27.83	37.00	-9.17	Peak
11	276.010	33.00	-6.80	26.20	37.00	-10.80	Peak
12	324.070	30.10	-5.75	24.35	37.00	-12.65	Peak
13	360.021	34.30	-4.77	29.53	37.00	-7.47	Peak

Data#: **5** File#: 0255e.emi  
E-Site

Date: 2002-06-17 Time: 22:51:21

Condition: HORIZONTAL / 10m  
Report No. : 02E0255  
Test Engr. : DAVID HUNG  
Company : UNIXSTAR TECHNOLOGY, INC.  
EUT : UT-20NC08  
Test Config : EUT / ALL PERIPHERALS  
Type of Test: FCC CLASS B W/ EN 55022 CLASS B LIMIT  
Mode of Op. : NORMAL MODE

Page: 1

Freq	Read		Limit		Over		Remark
	Level	Factor	Level	Line	dB	Limit	
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	42.110	31.60	-10.09	21.51	30.00	-8.49	Peak
2	52.160	34.20	-12.73	21.47	30.00	-8.53	Peak
3	71.980	36.80	-15.64	21.16	30.00	-8.84	Peak
4	111.110	35.40	-13.67	21.73	30.00	-8.27	Peak
5	120.010	38.20	-14.10	24.10	30.00	-5.90	Peak
6	133.950	36.50	-14.14	22.36	30.00	-7.64	Peak
7	184.350	34.60	-10.27	24.33	30.00	-5.67	Peak
8	240.040	35.00	-7.77	27.23	37.00	-9.77	Peak
9	360.040	31.80	-4.77	27.03	37.00	-9.97	Peak