

APPLICATION FOR CERTIFICATION

On Behalf of

Delta Electronics, Inc.

19" LCD Monitor

Models : (1)190B4CB/00 (2)190B4CG/00 (3)190B4CS/00

Brand : PHILIPS

FCC ID : H79L19DAR

Prepared for : Delta Electronics, Inc.  
3, Tung Yuan Road, Chungli Industrial Zone,  
Taoyuan Hsien 320, Taiwan, R.O.C.

Prepared by : Audix Corporation.  
Technical Division EMC Department  
No. 53-11, Tin-Fu Tsun, Lin-Kou,  
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File Number : EM-G920370  
Report Number : TTEMC-F92085  
Date of Test : Apr. 28 ~ 30, 2003  
Date of Report : May 06, 2003

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## TEST REPORT CERTIFICATION

Applicant : Delta Electronics, Inc.  
 Manufacturer # 1 : Delta Electronics (Dong Guan) Co., Ltd.  
 Manufacturer # 2 : Delta Electronics (Thailand) Public Company Limited.  
 FCC ID : H79L19DAR  
 EUT Description : 19" LCD Monitor  
 (A) MODEL NO. : (1)190B4CB/00 (2)190B4CG/00  
 (3)190B4CS/00  
 (B) SERIAL NO. : N/A  
 (C) BRAND : PHILIPS  
 (D) POWER SUPPLY : AC 100-240V~, 60-50Hz  
 (Test Voltage: AC 120V/60Hz)

## Measurement Procedure Used:

FCC RULES AND CISPR 22 (DOCKET NO. 92-152, SEP. 1993) AND  
 FCC / ANSI C63.4-1992  
 (FCC CFR 47 Part 15 Subpart B/2002 and CISPR 22/1997+A1/2000)

(NOTE: These results are deemed satisfactory evidence of compliance with ICES-003 of the  
 Canadian Interference-Causing Equipment Regulations.)

The device described above was tested by AUDIX CORPORATION to determine the  
 maximum emission levels emanating from the device. The maximum emission levels were  
 compared to the CISPR 22 Class B limits both radiated and conducted emissions.

The measurement results are contained in this test report and AUDIX CORPORATION is  
 assumed full responsibility for the accuracy and completeness of these measurements. Also,  
 this report shows that the EUT to be technically compliance with the FCC official limits.

This report applies to above tested sample only. This report shall not be reproduced in part  
 without written approval of AUDIX CORPORATION.

Date of Test : Apr. 28 ~ 30, 2003

Prepared By: Kitty Ni May 14, 2003  
 (Kitty Ni/Officer)

Test Engineer: Allen Wang May 14, 2003  
 (Allen Wang/Deputy Manager)

Approve & Authorized Signer: Leon Liu May 15, 2003  
 (Leon Liu/Manager)

# 1. GENERAL INFORMATION

## 1.1. Description of Device (EUT)

Description : 19" LCD Monitor

Model Number : (1)190B4CB/00 (2)190B4CG/00  
(3)190B4CS/00

Above all models have the same PCB circuits & layout, the difference is :

M/N \ Difference	Appearance
(1)190B4CB/00	Black
(2)190B4CG/00	Pearl White
(3)190B4CS/00	Silver

The M/N (1)190B4CB/00 is representative selected in the test and included in this report.

Brand Name : PHILIPS

FCC ID : H79L19DAR

Applicant : Delta Electronics, Inc.  
3, Tung Yuan Road, Chungli Industrial Zone  
Taoyuan Hsien 320, Taiwan, R.O.C.

Manufacturer #1 : Delta Electronics (Dong Guan) Co., Ltd.  
Delta Plant 3, Delta Industrial Estate,  
Shijie Town, Dong Guan City,  
Guangdong Province, P.R.C.

Manufacturer #2 : Delta Electronics (Thailand) Public Company  
Limited.  
714 Soi E5, EPZ, Bangpoo Industrial Estate,  
Sukhumvit Road KM37, Samutprakarn 10280.

LCD Panel : Chi Mei, M/N M190E2-L01

Data Cable : Shielded, Detachable, 1.8m  
Bonded two ferrite cores

Power Cord : Non-Shielded, Detachable, 1.8m

Date of Receipt of Sample : Apr. 04, 2003

Date of Test : Apr. 28 ~ 30, 2003

## 1.2. Tested Supporting System Details

### 1.2.1. PC SYSTEM

Model Number : HP VECTRA XE320  
 Serial Number : SG21101987  
 FCC ID : By DoC  
 BSMI ID : 3912A318  
 Brand : HP  
 Manufacturer : First International Computer, Inc.  
 Power Cord : Non-Shielded, Detachable, 1.8m

### 1.2.2. KEYBOARD

Model Number : SK-2502C  
 Serial Number : M020236402  
 FCC ID : By DoC  
 BSMI ID : 3872F107  
 Manufacturer : Silitek (Brand: HP)  
 Data Cable : Non-Shielded, Undetachable, 1.8m

### 1.2.3. DOT MATRIX PRINTER

Model Number : KX-P2135  
 Serial Number : 8DMCN02139  
 FCC ID : ACJ5Z6KX-P2135  
 BSMI ID : 3872A371  
 Manufacturer : Matsushita (Brand: Panasonic)  
 Data Cable : Shielded, Detachable, 1.5m  
 Power Cord : Non-Shielded, Detachable, 1.8m

### 1.2.4. PS2 MOUSE

Model Number : M-S48a  
 Serial Number : LZE20501538  
 FCC ID : JNZ201213  
 BSMI ID : 4882A001  
 Manufacturer : Logitech (Brand: HP)  
 Data Cable : Non-Shielded, Undetachable, 1.8m

### 1.2.5. MODEM

Model Number : DM-1414  
 Serial Number : 980034392  
 FCC ID : IFAXDM1414  
 Manufacturer : Aceex  
 Data Cable : Shielded, Detachable, 1.2m  
 Power Adapter : Amigo, Model AM-91000A  
 Non-Shielded, Undetachable, 1.8m

## 1.2.6. USB MOUSE

Model Number : CREUBB  
 Serial Number : N/A  
 FCC ID : NHM-CREUBE  
 BSMI ID : 3872F083  
 Manufacturer : CRE Technology Co., Ltd.  
 Data Cable : Shielded, Undetachable, 1.8m

## 1.2.7. MICROPHONE

Model Number : HD-303  
 Serial Number : N/A  
 Manufacturer : Multimedia Microphone System  
 Data Cable : Non-Shielded, Undetachable, 2.2m

## 1.2.8. WALKMAN

Model Number : RQ-P35LT-K  
 Serial Number : HA08562  
 Manufacturer : Panasonic  
 Data Cable : Non-Shielded, Detachable, 1.8m

## 1.2.9. EARPHONE

Model Number : N/A  
 Serial Number : N/A  
 Manufacturer : Panasonic  
 Earphone Cable : Non-Shielded, Undetachable, 1.1m

## 1.3. Description of Test Facility

Name of Firm : Audix Corporation  
 Technical Division EMC Department

Location : No. 53-11, Tin-Fu Tsun, Lin-Kou Hsiang,  
 Taipei Hsien 24443, Taiwan, R.O.C.

Test Facility & Location : No. 4 Shielded Room & No. 4 Open Site  
 (C4/R4) : No. 67-4, Tin-Fu Tsun, Lin-Kou Hsiang,  
 Taipei Hsien 24443, Taiwan, R.O.C.  
 Feb. 10, 2003 Re-File on  
 Federal Communication Commission  
 Registration Number: 90991

NVLAP Lab Code : 200077-0

## 1.4. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty (dB)
Conduction Test	150KHz~30MHz	±2.66dB
Radiation Test (Distance: 10m)	30MHz~300MHz	+4.5dB / -4.5dB
	300MHz~1000MHz	+3.88dB / -3.84dB

Remark : Uncertainty =  $K\mu c(y)$

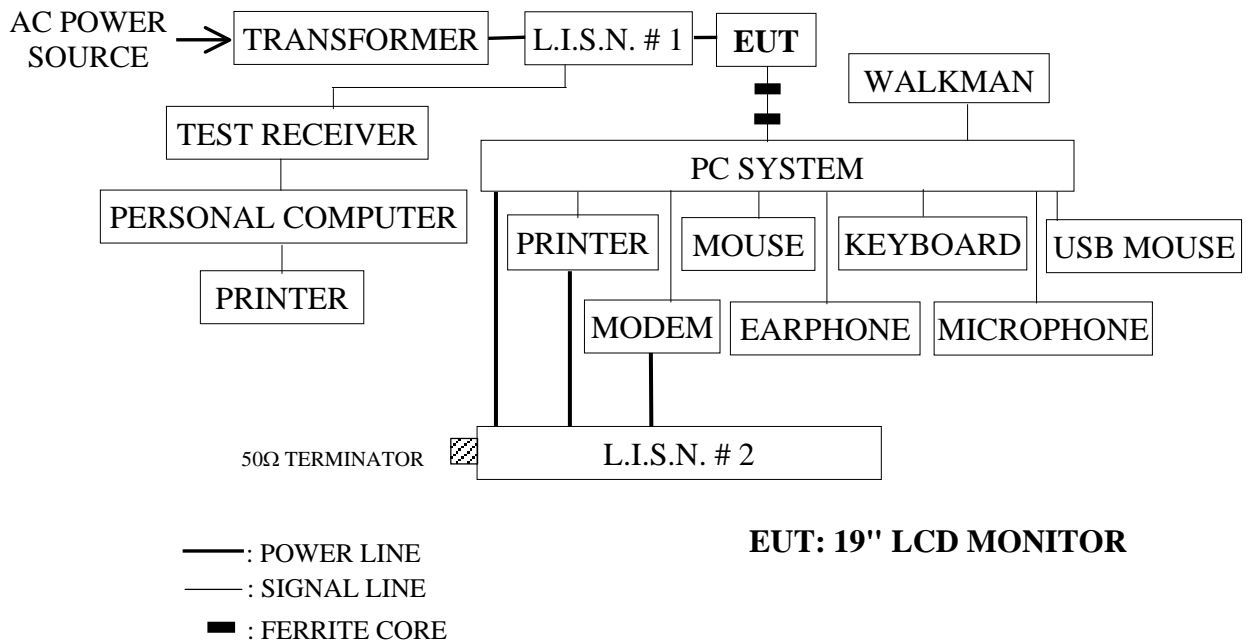
## 2. POWERLINE CONDUCTED TEST

### 2.1. Test Equipment

The following test equipment are used during the power line conducted tests :

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Personal Computer	TOKIN	586PC	N/A	N/A	N/A
2.	Test Receiver	Rohde & Schwarz	ESHS10	844591/015	Mar.05, 03'	1 Year
3.	L.I.S.N. #1	Kyoritsu	KNW-407	8-1430-5	Nov.18, 02'	1 Year
4.	L.I.S.N. #2	Kyoritsu	KNW-407	8-1430-6	Nov.18, 02'	1 Year

### 2.2. Block Diagram of Test Setup



### 2.3. Powerline Conducted Emission Limit (CISPR 22, Class B)

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level	Average Level
150KHz ~ 500KHz	66 ~ 56 dB	56 ~ 46 dB
500KHz ~ 5MHz	56 dB	46 dB
5MHz ~ 30MHz	60 dB	50 dB



## 2.4. EUT's Configuration during Compliance Measurement

The following equipment were installed on RF LINE VOLTAGE measurement to meet the Commission requirement and operating in a manner which tended to maximize its emission characteristics in a normal application.

### 2.4.1. 19" LCD Monitor (EUT)

Model Number	:	190B4CB/00
Serial Number	:	N/A
Brand	:	PHILIPS
FCC ID	:	H79L19DAR
Manufacturer # 1	:	Delta Electronics (Dong Guan) Co., Ltd.
Manufacturer # 2	:	Delta Electronics (Thailand) Public Company Limited.
LCD Panel	:	Chi Mei, M/N M190E2-L01
Data Cable	:	Shielded, Detachable, 1.8m Bonded two ferrite cores
AC Power Cord	:	Non-Shielded, Detachable, 1.8m

2.4.2. Supporting System : As in section 1.2

## 2.5. Operating Condition of EUT

2.5.1. Setup the EUT and simulator as shown on 2.2.

2.5.2. Turned on the power of all equipment.

2.5.3. Personal computer read data from disk.

2.5.4. Personal computer running the EMI self-test program "H V 1.8" by windows and sent "H" character to LCD Monitor (EUT), then the screen of LCD Monitor (EUT) displayed "H" pattern by EUT's resolution.

2.5.5. Personal Computer read data from FDD and then wrote data into FDD, same operation from HDD、 Modem.

2.5.6. The other peripheral devices were drove and operated in turn during all testing.

2.5.7. Repeat above procedure from 2.5.3. to 2.5.6.

## 2.6. Test Procedure

The EUT was connected to the power mains through a line impedance stabilization network (L.I.S.N. #1) and the other peripheral devices power cord were connected to the power mains through a line impedance stabilization network (L.I.S.N. #2) This provided a 50 ohm coupling impedance for the measuring equipment. (Please refer to the block diagram of the test setup and photographs.)

Both sides of A.C. line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables were changed according to FCC ANSI C63.4-1992 on conducted measurement.

The bandwidth of the R&S Test Receiver ESHS10 was set at 10KHz.

The frequency range from 150KHz to 30MHz was checked.

## 2.7. Line Conducted RF Voltage Measurement Results

**PASSED.** Please refer to the following pages.

All emissions not reported below are too low against the prescribed limits.

EUT with following test modes and with AC 120V/60Hz supplying voltage were performed during conducted testing and all the test results are attached in next pages. (EUT's power cord was connected to A.M.N.)

EUT : 19" LCD Monitor M/N : 190B4CB/00

Test Date : Apr. 30, 20023      Temperature : 25      Humidity : 58 %

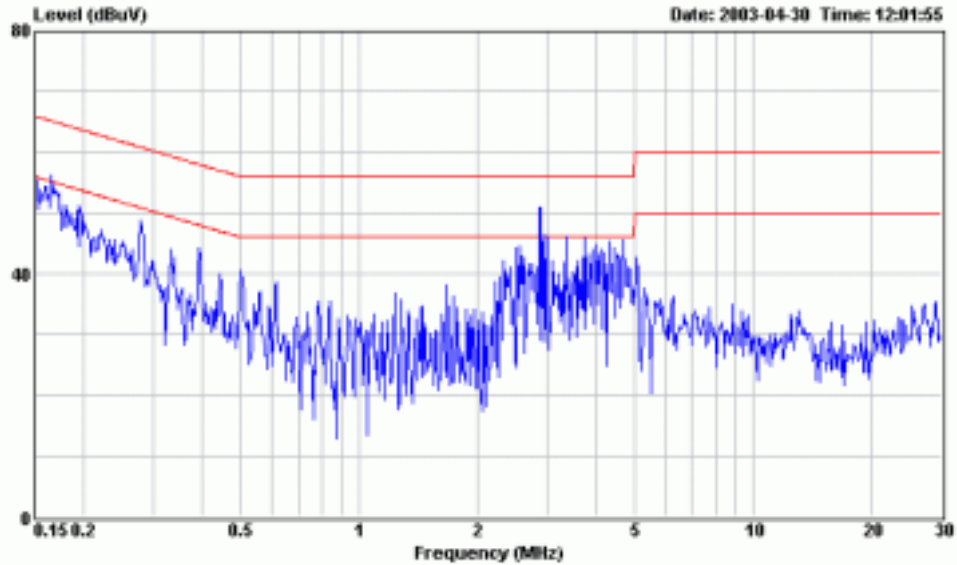
The detail of test modes are as follows :

Mode	Frequency Resolution	Reference Data #
1.	640*480/60Hz, 31kHz	# 67, (68, 69) ; # 70, (71, 72).
2.	1024*768/75Hz, 60kHz	# 64, (65, 66) ; # 61, (62, 63).
3.	1280*1024/75Hz, 80kHz	# 55, (56, 57) ; # 58, (59, 60).



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Data#: 67 File#: D:\Delta-G920370.EMI



Site : No.4 Shielded room  
 Condition : CISPR CLASS-B ENW-407(SR4-021125) NEUTRAL  
 EUT : 19" LCD MONITOR M/N: 190B4CB/00  
 POWER : 120Vac / 60Hz  
 MEMO : 640\*480/60Hz 31KHz  
 Environment : 25°C / 58%

Data#: 68 File#: D:\Delta-G920370.EMI Date: 2003-04-30 Time: 12:02:50

Site : No.4 Shielded room  
 Condition : CISPR CLASS-B ENW-407(SR4-021125) NEUTRAL  
 EUT : 19" LCD MONITOR M/N: 190B4CB/00  
 POWER : 120Vac / 60Hz  
 MEMO : 640\*480/60Hz 31KHz  
 Environment : 25°C / 58%

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.169	52.67	-12.36	65.03	52.32	0.26	0.09	QP
2	0.278	46.51	-14.36	60.87	46.29	0.15	0.07	QP
3	0.501	40.09	-15.91	56.00	39.89	0.10	0.10	QP
4	1.228	34.46	-21.54	56.00	34.26	0.10	0.10	QP
5	2.614	44.76	-11.24	56.00	44.57	0.10	0.09	QP
6	9.371	32.24	-27.76	60.00	31.96	0.10	0.18	QP

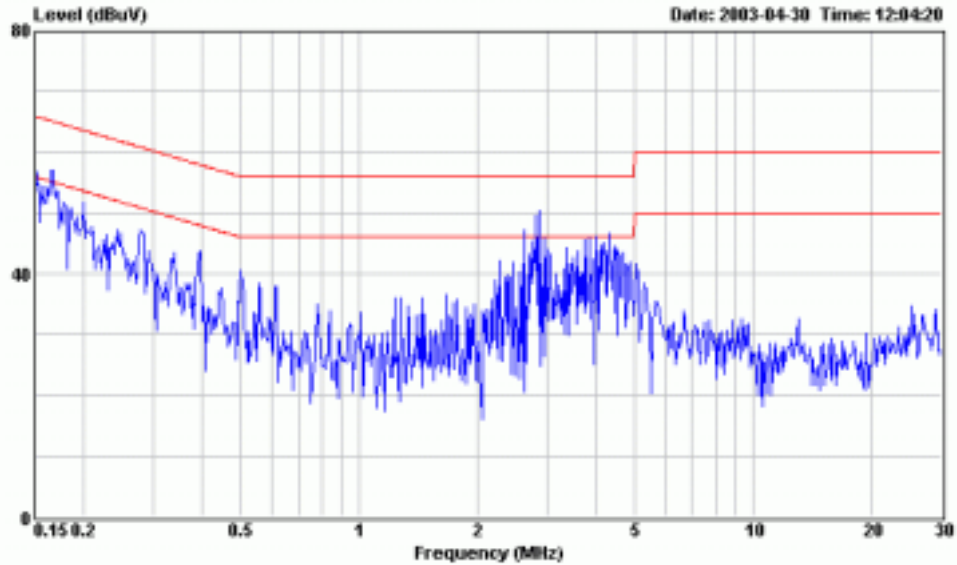
Data#: 69 File#: D:\Delta-G920370.EMI

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.169	51.13	-3.90	55.03	50.78	0.26	0.09	Average
2	0.278	45.92	-4.95	50.87	45.70	0.15	0.07	Average
3	0.501	39.83	-6.17	46.00	39.63	0.10	0.10	Average
4	1.228	32.44	-13.56	46.00	32.24	0.10	0.10	Average
5	2.614	32.24	-13.76	46.00	32.05	0.10	0.09	Average
6	9.371	29.15	-20.85	50.00	28.87	0.10	0.18	Average



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Data#: 70 File#: D:\Delta-G920370.EMI



Site : No.4 Shielded room  
 Condition : CISPR CLASS-B ENW-407(SR4-021125) LINE  
 EUT : 20"LCD MONITOR M/N:190B4  
 POWER : 19" LCD MONITOR M/N: 190B4CB/00  
 MEMO : 640\*480/60Hz 31KHz  
 Environment : 25°C / 58%

Data#: 71 File#: D:\Delta-G920370.EMI

Date: 2003-04-30 Time: 12:05:36

Site : No.4 Shielded room  
 Condition : CISPR CLASS-B ENW-407(SR4-021125) LINE  
 EUT : 19" LCD MONITOR M/N: 190B4CB/00  
 POWER : 120Vac / 60Hz  
 MEMO : 640\*480/60Hz 31KHz  
 Environment : 25°C / 58%

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.170	51.72	-13.24	64.96	51.37	0.26	0.09	QP
2	0.279	46.75	-14.10	60.85	46.53	0.15	0.07	QP
3	0.502	40.43	-15.57	56.00	40.23	0.10	0.10	QP
4	1.227	33.46	-22.54	56.00	33.26	0.10	0.10	QP
5	2.612	44.72	-11.28	56.00	44.53	0.10	0.09	QP
6	9.373	30.79	-29.21	60.00	30.51	0.10	0.18	QP

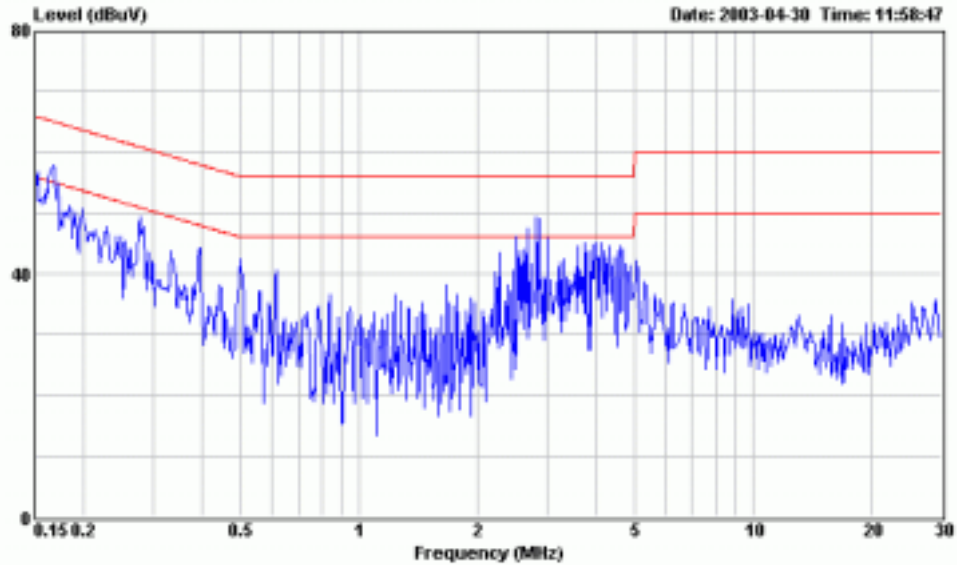
Data#: 72 File#: D:\Delta-G920370.EMI

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.170	50.25	-4.71	54.96	49.90	0.26	0.09	Average
2	0.279	46.15	-4.70	50.85	45.93	0.15	0.07	Average
3	0.502	40.16	-5.84	46.00	39.96	0.10	0.10	Average
4	1.227	32.83	-13.17	46.00	32.63	0.10	0.10	Average
5	2.612	30.49	-15.51	46.00	30.30	0.10	0.09	Average
6	9.373	26.60	-23.40	50.00	26.32	0.10	0.18	Average



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Data#: 64 File#: D:\Delta-G920370.EMI



Site : No.4 Shielded room  
 Condition : CISPR CLASS-B ENW-407(SR4-021125) NEUTRAL  
 EUT : 19" LCD MONITOR M/N: 190B4CB/00  
 POWER : 120Vac / 60Hz  
 MEMO : 1024\*768/75Hz 60KHz  
 Environment : 25°C / 58%

Data#: 65 File#: D:\Delta-G920370.EMI

Date: 2003-04-30 Time: 11:59:56

Site : No.4 Shielded room  
 Condition : CISPR CLASS-B ENW-407(SR4-021125) NEUTRAL  
 EUT : 19" LCD MONITOR M/N: 190B4CB/00  
 POWER : 120Vac / 60Hz  
 MEMO : 1024\*768/75Hz 60KHz  
 Environment : 25°C / 58%

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.168	53.05	-12.02	65.07	52.70	0.26	0.09	QP
2	0.277	46.41	-14.49	60.90	46.19	0.15	0.07	QP
3	0.502	39.87	-16.13	56.00	39.67	0.10	0.10	QP
4	1.230	34.88	-21.12	56.00	34.68	0.10	0.10	QP
5	2.611	44.02	-11.98	56.00	43.83	0.10	0.09	QP
6	9.370	32.04	-27.96	60.00	31.76	0.10	0.18	QP

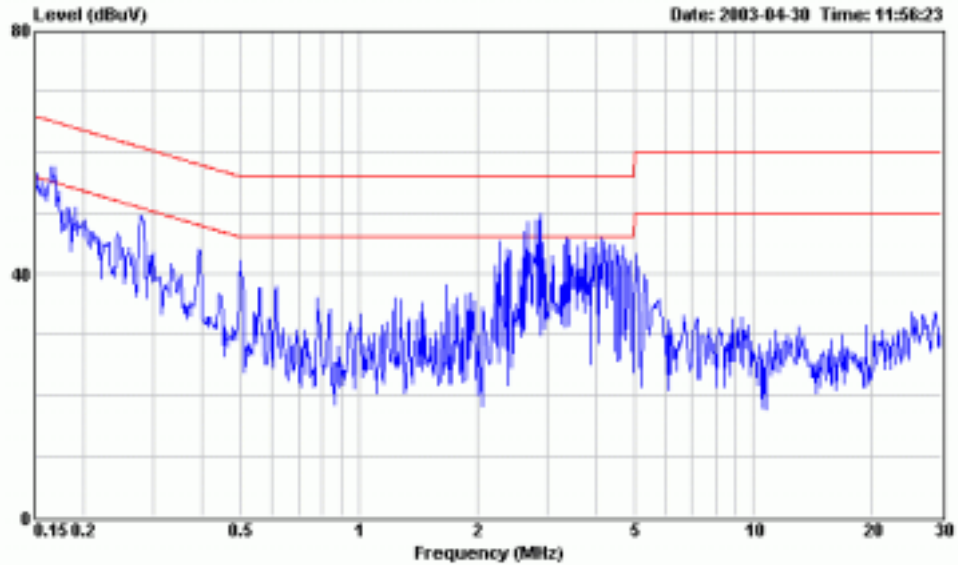
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	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.168	51.62	-3.45	55.07	51.27	0.26	0.09	Average
2	0.277	45.81	-5.09	50.90	45.59	0.15	0.07	Average
3	0.502	39.61	-6.39	46.00	39.41	0.10	0.10	Average
4	1.230	31.91	-14.09	46.00	31.71	0.10	0.10	Average
5	2.611	30.86	-15.14	46.00	30.67	0.10	0.09	Average
6	9.370	28.69	-21.31	50.00	28.41	0.10	0.18	Average



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Data#: 61 File#: D:\Delta-G920370.EMI



Site : No.4 Shielded room  
 Condition : CISPR CLASS-B ENW-407(SR4-021125) LINE  
 EUT : 19" LCD MONITOR M/N: 190B4CB/00  
 POWER : 120Vac / 60Hz  
 MEMO : 1024\*768/75Hz 60KHz  
 Environment : 25°C / 58%

Data#: 62 File#: D:\Delta-G920370.EMI

Date: 2003-04-30 Time: 11:57:37

Site : No.4 Shielded room  
 Condition : CISPR CLASS-B ENW-407(SR4-021125) LINE  
 EUT : 19" LCD MONITOR M/N: 190B4CB/00  
 POWER : 120Vac / 60Hz  
 MEMO : 1024\*768/75Hz 60KHz  
 Environment : 25°C / 58%

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.168	52.93	-12.12	65.05	52.58	0.26	0.09	QP
2	0.278	46.93	-13.96	60.89	46.71	0.15	0.07	QP
3	0.501	40.67	-15.33	56.00	40.47	0.10	0.10	QP
4	1.228	33.44	-22.56	56.00	33.24	0.10	0.10	QP
5	2.616	44.04	-11.96	56.00	43.85	0.10	0.09	QP
6	9.377	29.82	-30.18	60.00	29.54	0.10	0.18	QP

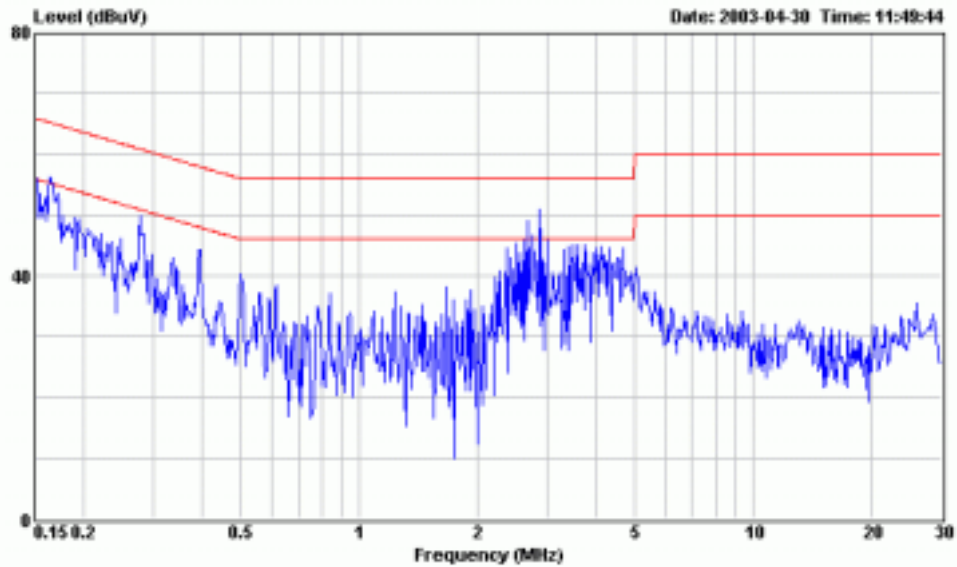
Data#: 63 File#: D:\Delta-G920370.EMI

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.168	51.52	-3.53	55.05	51.17	0.26	0.09	Average
2	0.278	46.37	-4.52	50.89	46.15	0.15	0.07	Average
3	0.501	40.36	-5.64	46.00	40.16	0.10	0.10	Average
4	1.228	32.41	-13.59	46.00	32.21	0.10	0.10	Average
5	2.616	31.34	-14.66	46.00	31.15	0.10	0.09	Average
6	9.377	24.85	-25.15	50.00	24.57	0.10	0.18	Average



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Site : No.4 Shielded room  
 Condition : CISPR CLASS-B ENW-407(SR4-021125) NEUTRAL  
 EUT : 19" LCD MONITOR M/N: 190B4CB/00  
 POWER : 120Vac / 60Hz  
 MEMO : 1280\*1024/75Hz 80KHz  
 Environment : 25°C / 58%

Data#: 56 File#: D:\Delta-G920370.EMI

Date: 2003-04-30 Time: 11:50:40

Site : No.4 Shielded room  
 Condition : CISPR CLASS-B ENW-407(SR4-021125) NEUTRAL  
 EUT : 19" LCD MONITOR M/N: 190B4CB/00  
 POWER : 120Vac / 60Hz  
 MEMO : 1280\*1024/75Hz 80KHz  
 Environment : 25°C / 58%

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.167	53.33	-11.80	65.13	52.98	0.26	0.09	QP
2	0.279	46.21	-14.62	60.83	45.99	0.15	0.07	QP
3	0.501	40.27	-15.73	56.00	40.07	0.10	0.10	QP
4	1.231	34.58	-21.42	56.00	34.38	0.10	0.10	QP
5	3.308	37.55	-18.45	56.00	37.34	0.10	0.11	QP
6	9.372	31.98	-28.02	60.00	31.70	0.10	0.18	QP

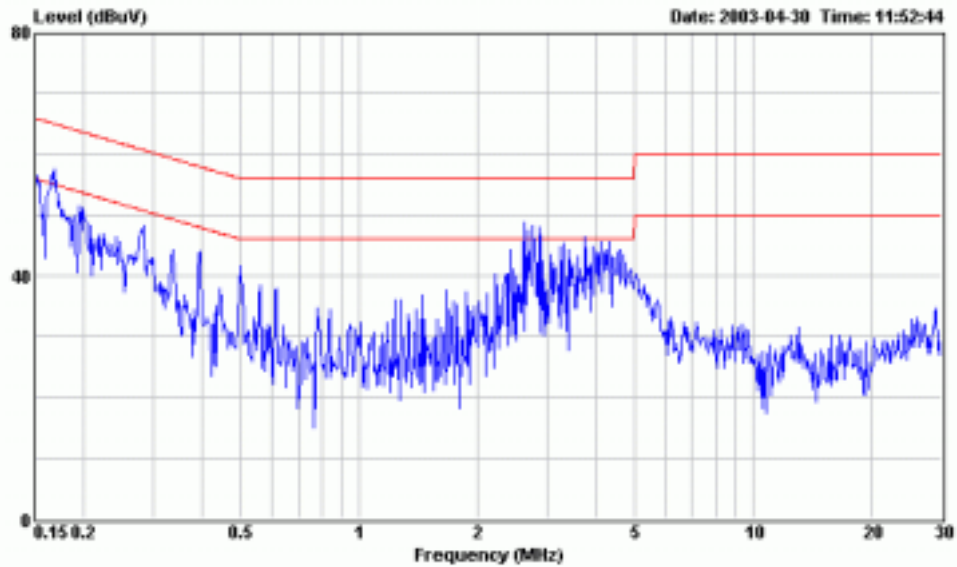
Data#: 57 File#: D:\Delta-G920370.EMI

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.167	51.91	-3.22	55.13	51.56	0.26	0.09	Average
2	0.279	45.60	-5.23	50.83	45.38	0.15	0.07	Average
3	0.501	39.96	-6.04	46.00	39.76	0.10	0.10	Average
4	1.231	30.87	-15.13	46.00	30.67	0.10	0.10	Average
5	3.308	31.38	-14.62	46.00	31.17	0.10	0.11	Average
6	9.372	28.79	-21.21	50.00	28.51	0.10	0.18	Average



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Data#: 58 File#: D:\Delta-G920370.EMI



Site : No.4 Shielded room  
 Condition : CISPR CLASS-B ENW-407(SR4-021125) LINE  
 EUT : 19" LCD MONITOR M/N: 190B4CB/00  
 POWER : 120Vac / 60Hz  
 MEMO : 1280\*1024/75Hz 80KHz  
 Environment : 25°C / 58%

Data#: 59 File#: D:\Delta-G920370.EMI

Date: 2003-04-30 Time: 11:53:45

Site : No.4 Shielded room  
 Condition : CISPR CLASS-B ENW-407(SR4-021125) LINE  
 EUT : 19" LCD MONITOR M/N: 190B4CB/00  
 POWER : 120Vac / 60Hz  
 MEMO : 1280\*1024/75Hz 80KHz  
 Environment : 25°C / 58%

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.167	53.47	-11.65	65.12	53.12	0.26	0.09	QP
2	0.277	46.77	-14.13	60.90	46.55	0.15	0.07	QP
3	0.500	40.65	-15.35	56.00	40.45	0.10	0.10	QP
4	1.227	33.76	-22.24	56.00	33.56	0.10	0.10	QP
5	3.305	38.51	-17.49	56.00	38.30	0.10	0.11	QP
6	9.375	30.15	-29.85	60.00	29.87	0.10	0.18	QP

Data#: 60 File#: D:\Delta-G920370.EMI

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.167	51.98	-3.14	55.12	51.63	0.26	0.09	Average
2	0.277	46.20	-4.70	50.90	45.98	0.15	0.07	Average
3	0.500	40.30	-5.70	46.00	40.10	0.10	0.10	Average
4	1.227	32.86	-13.14	46.00	32.66	0.10	0.10	Average
5	3.305	31.15	-14.85	46.00	30.94	0.10	0.11	Average
6	9.375	26.12	-23.88	50.00	25.84	0.10	0.18	Average



### 3. RADIATED EMISSION TEST

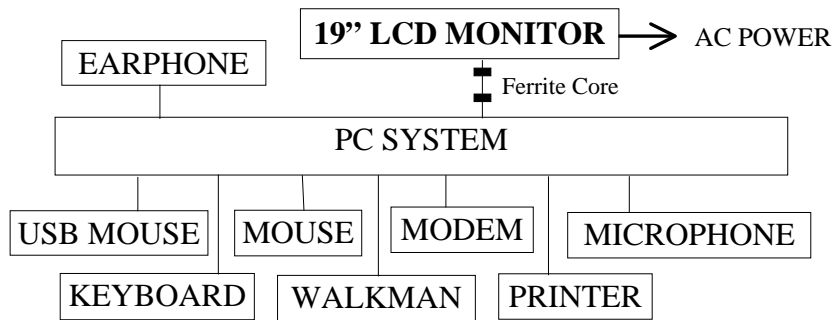
#### 3.1. Test Equipment

The following test equipment are used during the radiated emission tests :

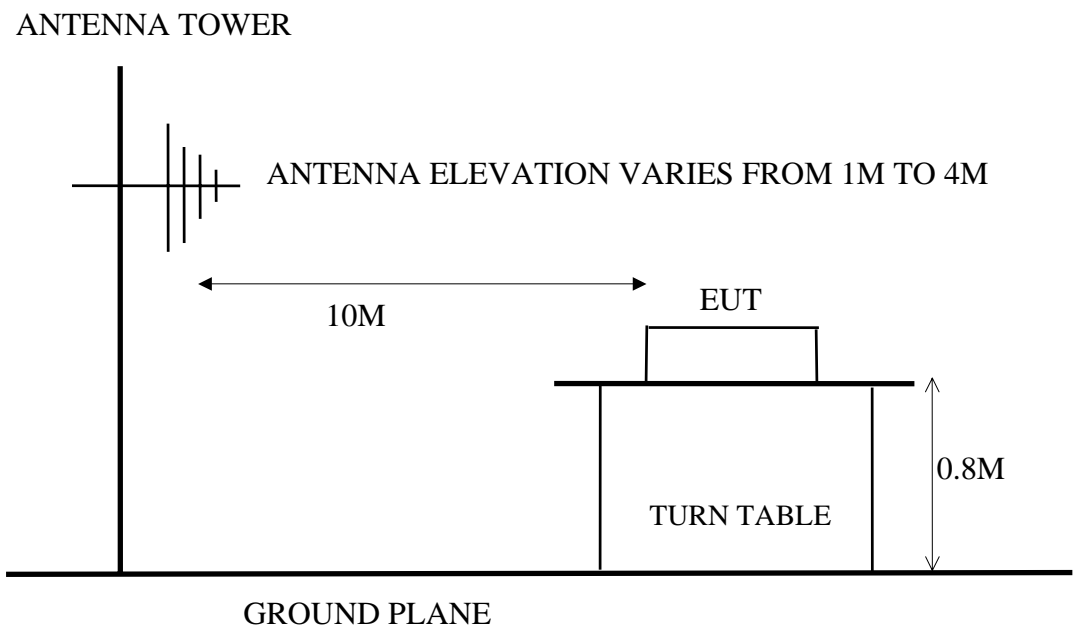
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	HP	8590L	3624A01446	N/A	N/A
2.	Test Receiver	Rohde&Schwarz	ESVS10	845165/018	May 14, 02'	1 Year
3.	Computer	TOKIN	586PC	N/A	N/A	NA
4.	Printer	NEC	P2000	553295372	N/A	N/A
5.	Amplifier	HP	8447D	2727A05737	N/A	N/A
6.	Biconical Antenna	Chase	VBA6106A	1263	Nov.26, 02'	1 Year
7.	Biconical Antenna	Chase	UPA6109	1020	Nov.26, 02'	1 Year

#### 3.2. Block Diagram of Test Setup

##### 3.2.1. Block Diagram of connection between EUT and simulators



##### 3.2.2. Open Field Test Site (10M) Setup Diagram



### 3.3. Radiation Limit (CISPR 22, Class B)

All emanations from a class B computing devices or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMITS (dB $\mu$ V/m)
30 ~ 230	10	30
230 ~ 1000	10	37

Note : (1) The tighter limit applies at the edge between two frequency bands.  
 (2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the E.U.T.

### 3.4. EUT's Configuration during Compliance Measurement

The configuration of EUT and its simulators were same as those used in conducted measurement. Please refer to 2.4.

### 3.5. Operating Condition of EUT

Same as conducted measurement which was listed in 2.5. except the test set up replaced by section 3.2.

### 3.6. Test Procedure

The EUT and its simulators were placed on a turn table which is 0.8 meter above ground. The turn table rotated 360 degrees to determine the position of the maximum emission level. EUT is set 10 meters away from the receiving antenna which was mounted on a antenna tower. The antenna moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated biconical and log periodical antenna) and dipole antenna were used as receiving antenna. Both horizontal and vertical polarization of the antenna were set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4-1992 on radiated measurement.

“According to the requirement of EN 55022/A1:2000 (CISPR 22/A1:2000) clause 10.4, all cables leaving the Table-Top EUT for a connection outside the test side were fitted with ferrite clamps (specified by CISPR 16-1) placed on the turn-table at the point where the cable reaches the turn-table.”

The bandwidth of the R&S Test Receiver ESVS10 was set at 120KHz.

The frequency range from 30MHz to 1000MHz was checked.

EUT with following test modes and with AC 120V/60Hz supplying voltage were done during radiated testing and all the test results are listed in section 3.8. The details of test modes are as follows :

Mode	Frequency Resolution
1.	640*480/60Hz, 31kHz
2.	1024*768/75Hz, 60kHz
3.	1280*1024/75Hz, 80kHz

### 3.7. Test Results

**PASSED.** Please refer to the following pages.

### 3.8. Radiated Emission Measurement Results

**PASSED.** Please refer to the following pages.

All emissions not reported below are too low against the prescribed limits.

Date of Test : Apr. 28, 2003 Temperature : 27

EUT : 19" LCD Monitor Humidity : 52%

Test Mode : 640\*480/60Hz, 31kHz

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading		Emission Level Horizontal dBuV/m	Limits dBuV/m	Margin dB
			Horizontal dBuV				
35.700	19.04	0.60	2.62		22.26	30.00	7.74
60.577	11.84	0.85	3.95		16.64	30.00	13.36
123.962	19.05	1.14	- 1.17		19.02	30.00	10.98
163.200	19.85	1.36	- 1.80		19.41	30.00	10.59
174.670	20.80	1.39	- 2.96		19.23	30.00	10.77
212.701	20.91	1.49	- 1.56		20.84	30.00	9.16
284.706	23.68	1.74	- 4.55		20.87	37.00	16.13
321.261	14.07	1.94	5.13		21.14	37.00	15.86
355.094	14.63	2.11	5.82		22.56	37.00	14.44
443.870	16.75	2.34	2.80		21.89	37.00	15.11
532.648	18.98	2.50	2.91		24.39	37.00	12.61
651.014	20.94	2.90	1.12		24.96	37.00	12.04
739.787	21.91	3.15	1.94		27.00	37.00	10.00

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading		Emission Level Vertical dBuV/m	Limits dBuV/m	Margin dB
			Vertical dBuV				
35.700	20.71	0.60	1.34		22.65	30.00	7.35
129.540	17.40	1.17	0.59		19.16	30.00	10.84
153.560	21.05	1.35	- 4.68		17.72	30.00	12.28
181.700	21.24	1.52	- 3.93		18.83	30.00	11.17
224.711	21.35	1.55	- 2.47		20.43	30.00	9.57
273.546	23.06	1.73	- 0.96		23.83	37.00	13.17
325.502	14.53	1.97	6.80		23.30	37.00	13.70
355.095	15.56	2.11	6.72		24.39	37.00	12.61
443.868	17.23	2.34	3.21		22.78	37.00	14.22
503.055	19.06	2.44	1.21		22.71	37.00	14.29
651.015	20.66	2.90	0.83		24.39	37.00	12.61
710.192	20.96	3.07	0.72		24.75	37.00	12.25

- Remarks :
1. All readings are Quasi-Peak values.
  2. Emission Level= Antenna Factor + Cable Loss + Meter Reading.

Date of Test : Apr. 28, 2003 Temperature : 27  
 EUT : 19" LCD Monitor Humidity : 52%  
 Test Mode : 1024\*768/75Hz, 60kHz

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading		Emission Level Horizontal dBuV/m	Limits dBuV/m	Margin dB
			Horizontal dBuV	Horizontal dBuV/m			
59.000	11.88	0.84	2.28	15.00	30.00	15.00	
84.400	15.36	0.97	2.99	19.32	30.00	10.68	
120.400	18.50	1.11	- 2.91	16.70	30.00	13.30	
152.600	20.05	1.35	- 2.13	19.27	30.00	10.73	
177.721	20.86	1.44	2.63	24.93	30.00	5.07	
236.980	22.08	1.60	- 2.22	21.46	37.00	15.54	
325.826	14.59	1.97	8.53	25.09	37.00	11.91	
400.142	16.57	2.19	4.99	23.75	37.00	13.25	
432.070	16.85	2.30	4.21	23.36	37.00	13.64	
533.178	19.05	2.50	2.56	24.11	37.00	12.89	
624.086	19.95	2.82	1.93	24.70	37.00	12.30	
829.379	23.35	3.35	1.15	27.85	37.00	9.15	

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading		Emission Level Vertical dBuV/m	Limits dBuV/m	Margin dB
			Vertical dBuV	Vertical dBuV/m			
35.880	20.61	0.60	0.99	22.20	30.00	7.80	
68.000	12.30	0.88	6.52	19.70	30.00	10.30	
85.689	14.50	0.98	7.37	22.85	30.00	7.15	
136.500	18.84	1.26	4.81	24.91	30.00	5.09	
* <b>177.720</b>	<b>20.92</b>	<b>1.44</b>	<b>4.60</b>	<b>26.96</b>	<b>30.00</b>	<b>3.04</b>	
236.960	21.03	1.60	1.67	24.30	37.00	12.70	
325.502	14.53	1.97	9.63	26.13	37.00	10.87	
432.070	17.36	2.30	5.16	24.82	37.00	12.18	
528.116	19.15	2.49	4.38	26.02	37.00	10.98	
648.126	19.98	2.89	2.12	24.99	37.00	12.01	
732.133	21.08	3.13	2.13	26.34	37.00	10.66	
829.379	22.66	3.35	1.09	27.10	37.00	9.90	

- Remarks :
1. All readings are Quasi-Peak values.
  2. Emission Level= Antenna Factor + Cable Loss + Meter Reading.
  3. The worst emission was detected at 177.720MHz with corrected signal level of 26.96dBuV/m (limit was 30dBuV/m) when the antenna was at vertical polarization and was at 1m high and the turn table was at 225°.
  4. 0° is the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

Date of Test : Apr. 28, 2003 Temperature : 27

EUT : 19" LCD Monitor Humidity : 52%

Test Mode : 1280\*1024/75Hz, 80kHz

Frequency MHz	Antenna		Cable		Meter Reading	Emission Level		Margin dB
	Factor dB/m	Loss dB	Loss dB	Horizontal dBuV	Horizontal dBuV/m	Limits dBuV/m		
68.060	12.99	0.88		5.07	18.94	30.00	11.06	
142.819	19.92	1.34		- 2.84	18.42	30.00	11.58	
168.263	20.25	1.37		- 2.57	19.05	30.00	10.95	
* 177.544	<b>20.86</b>	<b>1.44</b>		<b>3.24</b>	<b>25.54</b>	<b>30.00</b>	<b>4.46</b>	
236.728	22.08	1.60		- 0.72	22.96	37.00	14.04	
271.596	23.25	1.72		- 2.28	22.69	37.00	14.31	
325.502	14.55	1.97		8.15	24.67	37.00	12.33	
400.142	16.57	2.19		8.38	27.14	37.00	9.86	
432.072	16.85	2.30		3.68	22.83	37.00	14.17	
533.178	19.05	2.50		3.02	24.57	37.00	12.43	
672.550	20.50	2.96		0.33	23.79	37.00	13.21	
828.563	23.42	3.35		5.16	31.93	37.00	5.07	

Frequency MHz	Antenna		Cable		Meter Reading	Emission Level		Margin dB
	Factor dB/m	Loss dB	Loss dB	Vertical dBuV	Vertical dBuV/m	Limits dBuV/m		
35.880	20.61	0.60		2.90	24.11	30.00	5.89	
66.660	12.34	0.87		10.08	23.29	30.00	6.71	
109.460	16.55	1.11		2.78	20.44	30.00	9.56	
142.760	20.27	1.34		3.15	24.76	30.00	5.24	
168.267	19.99	1.37		2.68	24.04	30.00	5.96	
177.559	20.92	1.44		4.37	26.73	30.00	3.27	
236.728	21.03	1.60		0.81	23.44	37.00	13.56	
271.595	23.10	1.72		0.46	25.28	37.00	11.72	
325.503	14.53	1.97		6.90	23.40	37.00	13.60	
400.143	16.72	2.19		7.18	26.09	37.00	10.91	
432.069	17.39	2.30		4.80	24.49	37.00	12.51	
533.179	19.37	2.50		1.87	23.74	37.00	13.26	
665.190	20.32	2.94		0.68	23.94	37.00	13.06	
828.559	22.83	3.35		0.99	27.17	37.00	9.83	

- Remarks :
1. All readings are Quasi-Peak values.
  2. Emission Level= Antenna Factor + Cable Loss + Meter Reading.
  3. The worst emission was detected at 177.544MHz with corrected signal level of 25.54dBuV/m (limit was 30dBuV/m) when the antenna was at horizontal polarization and was at 4m high and the turn table was at 135°.
  4. 0° is the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

#### **4. DEVIATION TO TEST SPECIFICATIONS**

**【NONE】**