

APPLICATION FOR CERTIFICATION

Class II Permissive Change

On Behalf of

Delta Electronics, Inc.

19" LCD Monitor

Models : 190B4XX (where X = 0 ~ 9 or A ~ Z)

Test Model : 190B4CB

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,
Taipei Hsien, Taiwan, R.O.C.

Tel : (02) 2609-9301, 2609-2133

File Number : EM-G920370R2 (G920370)
Report Number : TTEMC-F92156
Date of Test : Jul. 21 ~ 24, 2003
Date of Report : Aug. 01, 2003

TABLE OF CONTENTS

Description	Page
Test Report Certification	3
1. GENERAL INFORMATION	4
1.1. Description of Device (EUT)	4
1.2. Tested Supporting System Details	5
1.3. Description of Test Facility	6
1.4. Measurement Uncertainty	7
2. POWERLINE CONDUCTED TEST	8
2.1. Test Equipment	8
2.2. Block Diagram of Test Setup	8
2.3. Powerline Conducted Emission Limit (CISPR 22, Class B)	8
2.4. EUT's Configuration during Compliance Measurement	9
2.5. Operating Condition of EUT	9
2.6. Test Procedure	10
2.7. Line Conducted RF Voltage Measurement Results	10
3. RADIATED EMISSION TEST	19
3.1. Test Equipment	19
3.2. Block Diagram of Test Setup	19
3.3. Radiation Limit (CISPR 22, Class B)	20
3.4. EUT's Configuration during Compliance Measurement	20
3.5. Operating Condition of EUT	20
3.6. Test Procedure	20
3.7. Test Results	21
3.8. Radiated Emission Measurement Results	22
4. DEVIATION TO TEST SPECIFICATIONS	26
5. PHOTOGRAPHS	27
5.1. Photos of Powerline Conducted Measurement	27
5.2. Photos of Radiated Measurement at Open Field Test Site	28

TEST REPORT CERTIFICATION

(Class II Permissive Change)

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. : 190B4XX
 (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 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 : Jul. 21 ~ 24, 2003

Prepared By: Kitty Ni Aug. 05, 2003
 (Kitty Ni/Officer)

Test Engineer: Allen Wang Aug. 06 2003
 (Allen Wang/Deputy Manager)

Approve & Authorized Signer: Leon Liu Aug. 7 2003
 (Leon Liu/Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description	:	19" LCD Monitor
Model Number	:	190B4XX (where X = 0 ~ 9 or A ~ Z) Test Model : 190B4CB
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
Main Board # 1 (w/D-Sub Only)	:	L19H
D-Sub Data Cable	:	Shielded, Detachable, 1.85m Bonded two ferrite cores
Main Board # 2 (w/D-Sub & DVI Port are available and user selectable)	:	L19J
DVI Data Cable	:	Shielded, Detachable, 1.75m
Power Cord	:	Non-Shielded, Detachable, 2m
Date of Receipt of Sample	:	Jul. 18, 2003
Date of Test	:	Jul. 21 ~ 24, 2003

Remark :

This EUT is a modified version of original FCC ID H79L19DAR, The difference are listed as follows: (please refer to photos of EUT)

- (1) to add a different type of Main Board (L19J, w/D-Sub & DVI Port are available and user selectable).
- (2) to modify the EMI Debug.

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
VGA Card	:	ATI, M/N RADEON VE CARD
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 (C4/R4)	:	No. 4 Shielded Room & No. 4 Open Site 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	$\pm 2.66\text{dB}$
Radiation Test (Distance: 10m)	30MHz~300MHz	+4.5dB / -4.5dB
	300MHz~1000MHz	+3.88dB / -3.84dB

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

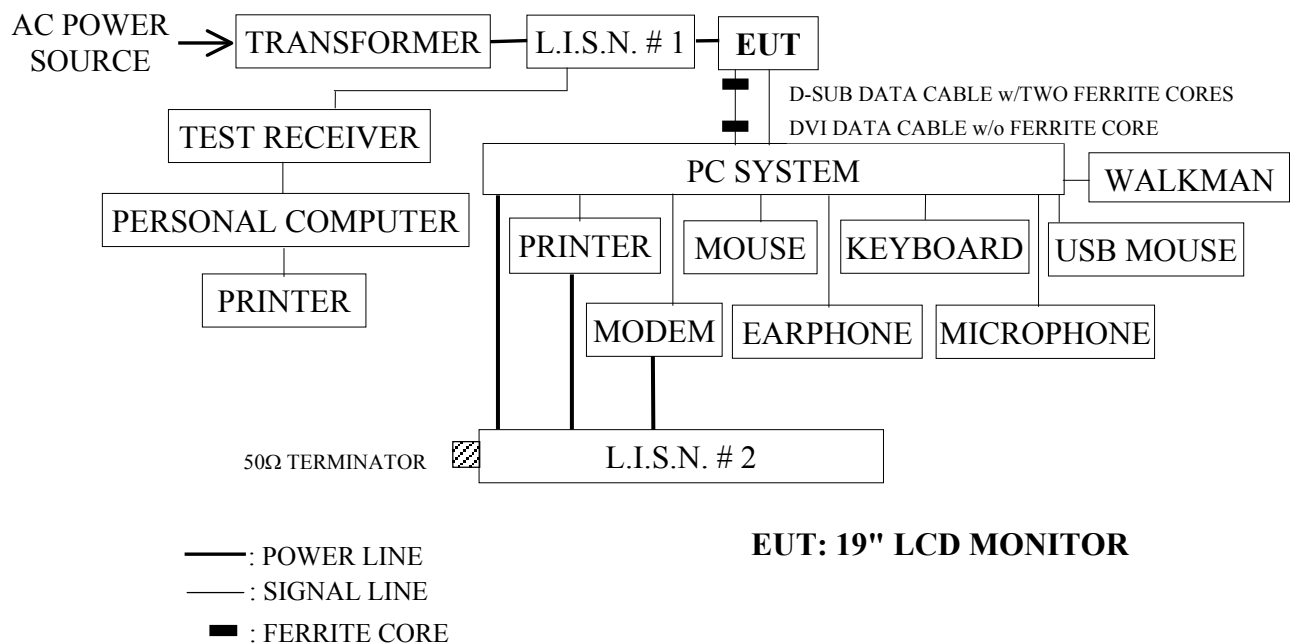
2. POWERLINE CONDUCTED TEST

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.	Next Cal.
1.	Personal Computer	AUDIX	586PC	N/A	N/A	N/A
2.	Test Receiver	R & S	ESHS10	844591/015	Mar.05, 03'	Mar.04, 04'
3.	L.I.S.N. #1	Kyoritsu	KNW-407	8-1430-5	Nov.18, 02'	Nov.17, 03'
4.	L.I.S.N. #2	Kyoritsu	KNW-407	8-1430-6	Nov.18, 02'	Nov.17, 03'

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

Remark: 1. The lower Limit applies at the band edges.

2. The limit of conducted emission was used against §15.107(a).

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	:	190B4XX
Test Model	:	190B4CB
Serial Number	:	N/A
Brand	:	PHILIPS
FCC ID	:	H79L19DAR
Manufacturer	:	Delta Electronics (Thailand) Public Company Limited.
LCD Panel	:	Chi Mei, M/N M190E2-L01
Main Board	:	L19J
(w/D-Sub & DVI Port are available and user selectable)		
D-Sub Data Cable	:	Shielded, Detachable, 1.85m
		Bonded two ferrite cores
DVI Data Cable	:	Shielded, Detachable, 1.75m
AC Power Cord	:	Non-Shielded, Detachable, 2.0m

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 be 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 L.I.S.N.)

EUT : 19" LCD Monitor M/N : 190B4XX

Test Date : Jul. 24, 20023 Temperature : 30°C Humidity : 59 %

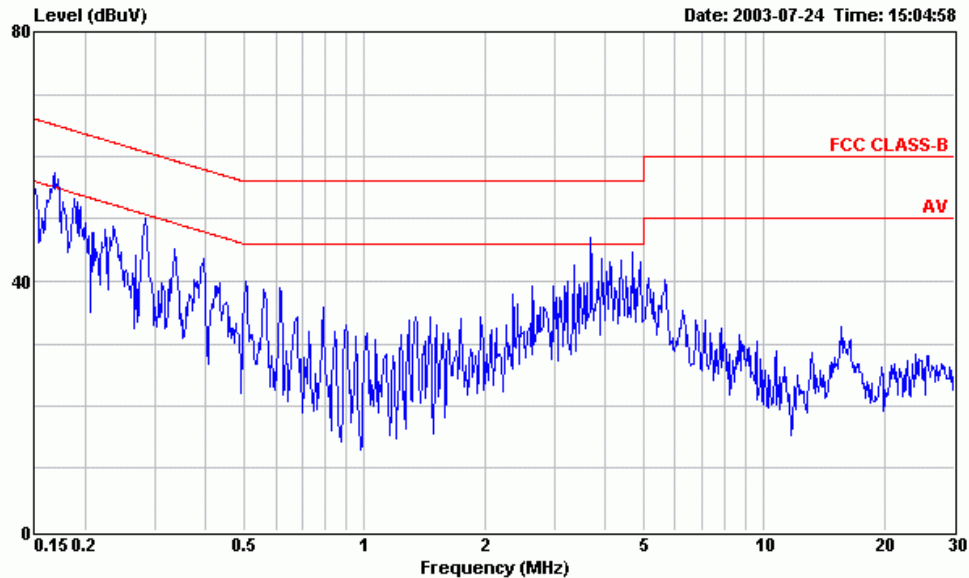
The detail of test modes are as follows :

Mode	Input	Frequency Resolution	Reference Test Data #
1.	DVI	640*480/60Hz, 31kHz	# 37, (38, 39) ; # 40, (41, 42).
2.		1024*768/75Hz, 60kHz	# 34, (35, 36) ; # 31, (32, 33).
3.		1280*1024/75Hz, 80kHz	# 25, (26, 27) ; # 28, (29, 30).
4.	D-Sub	1280*1024/75Hz, 80kHz	# 22, (20, 21) ; # 19, (23, 24).



No.53-11, Tin-fu Tsun, Lin-kou Hsiang,
 Taipei Country, Taiwan, R.O.C.
 Tel:02-26092133 Fax:02-26099303
 Email:ttemc@ttemc.com.tw

Data#: 37 File#: D:\Delta-G920370R2.EMI



Site : No.4 Shielded room
 Condition : FCC CLASS-B KNW-407(SR4-021125) NEUTRAL
 EUT : 19"LCD MONITOR M/N: 190B4CB
 POWER : 120Vac / 60Hz(30°C / 59%)
 MEMO : 640*480 / 60Hz;31KHz(DVI)

Data#: 38 File#: D:\Delta-G920370R2.EMI

Date: 2003-07-24 Time: 15:05:49

Site : No.4 Shielded room
 Condition : FCC CLASS-B KNW-407(SR4-021125) NEUTRAL
 EUT : 19"LCD MONITOR M/N: 190B4CB
 POWER : 120Vac / 60Hz(30°C / 59%)
 MEMO : 640*480 / 60Hz;31KHz(DVI)

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.187	50.69	-13.46	64.15	50.42	0.22	0.05	QP
2	0.236	46.43	-15.82	62.25	46.20	0.18	0.05	QP
3	0.282	47.79	-12.97	60.76	47.59	0.15	0.05	QP
4	0.615	36.84	-19.16	56.00	36.71	0.10	0.03	QP
5	1.347	32.43	-23.57	56.00	32.26	0.10	0.07	QP
6	3.689	42.07	-13.93	56.00	41.87	0.10	0.10	QP

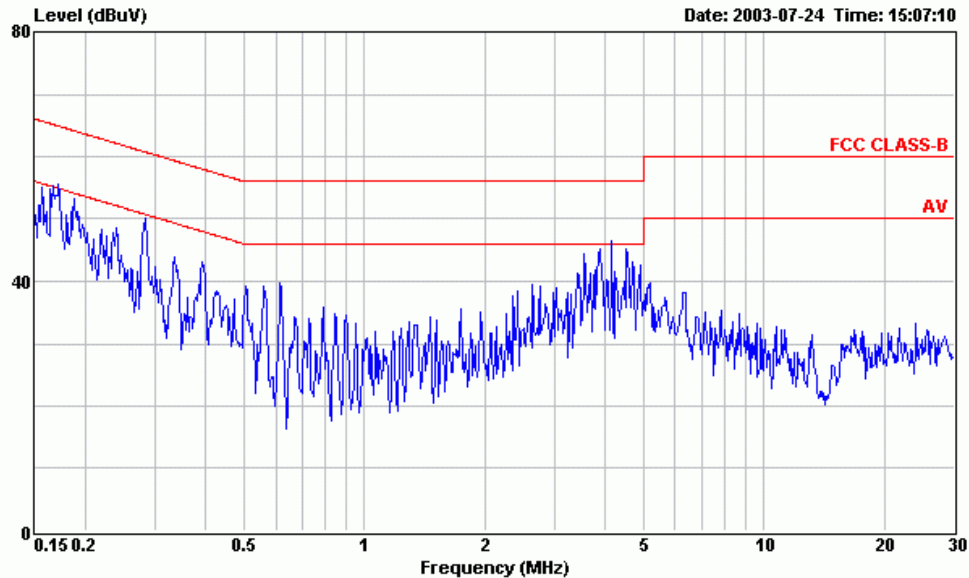
Data#: 39 File#: D:\Delta-G920370R2.EMI

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.187	41.58	-12.57	54.15	41.31	0.22	0.05	Average
2	0.236	38.38	-13.87	52.25	38.15	0.18	0.05	Average
3	0.282	43.69	-7.07	50.76	43.49	0.15	0.05	Average
4	0.615	32.39	-13.61	46.00	32.26	0.10	0.03	Average
5	1.347	28.30	-17.70	46.00	28.13	0.10	0.07	Average
6	4.590	34.04	-11.96	46.00	33.89	0.10	0.05	Average



No.53-11, Tin-fu Tsun, Lin-kou Hsiang,
Taipei Country, Taiwan, R.O.C.
Tel:02-26092133 Fax:02-26099303
Email:ttemc@ttemc.com.tw

Data#: 40 File#: D:\Delta-G920370R2.EMI



Site : No.4 Shielded room
Condition : FCC CLASS-B KMW-407(SR4-021125) LINE
EUT : 19" LCD MONITOR M/N: 190B4CB
POWER : 120Vac / 60Hz(30°C / 59%)
MEMO : 640*480 / 60Hz;31KHz(DVI)

Data#: 41 File#: D:\Delta-G920370R2.EMI

Date: 2003-07-24 Time: 15:07:46

Site : No.4 Shielded room
Condition : FCC CLASS-B KMW-407(SR4-021125) LINE
EUT : 19" LCD MONITOR M/N: 190B4CB
POWER : 120Vac / 60Hz(30°C / 59%)
MEMO : 640*480 / 60Hz;31KHz(DVI)

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.190	49.27	-14.77	64.04	49.00	0.22	0.05	QP
2	0.234	45.34	-16.96	62.30	45.11	0.18	0.05	QP
3	0.281	46.89	-13.90	60.79	46.69	0.15	0.05	QP
4	0.617	38.11	-17.89	56.00	37.98	0.10	0.03	QP
5	1.350	31.94	-24.06	56.00	31.77	0.10	0.07	QP
6	3.688	42.21	-13.79	56.00	42.01	0.10	0.10	QP

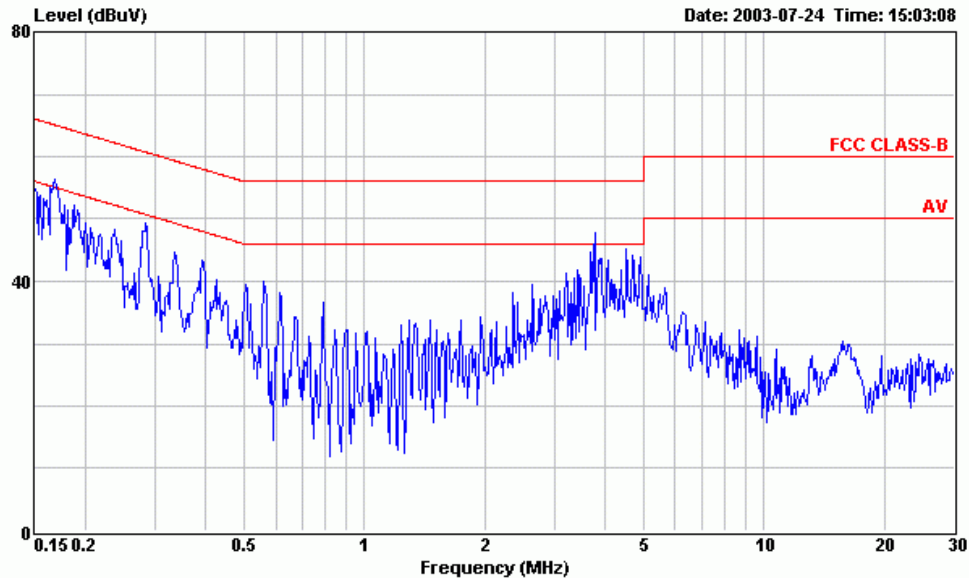
Data#: 42 File#: D:\Delta-G920370R2.EMI

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.190	41.84	-12.20	54.04	41.57	0.22	0.05	Average
2	0.234	38.23	-14.07	52.30	38.00	0.18	0.05	Average
3	0.281	43.76	-7.03	50.79	43.56	0.15	0.05	Average
4	0.617	36.44	-9.56	46.00	36.31	0.10	0.03	Average
5	1.350	29.76	-16.24	46.00	29.59	0.10	0.07	Average
6	3.688	30.14	-15.86	46.00	29.94	0.10	0.10	Average



No.53-11, Tin-fu Tsun, Lin-kou Hsiang,
 Taipei Country, Taiwan, R.O.C.
 Tel:02-26092133 Fax:02-26099303
 Email:ttemc@ttemc.com.tw

Data#: 34 File#: D:\Delta-G920370R2.EMI



Site : No.4 Shielded room
 Condition : FCC CLASS-B KNW-407(SR4-021125) NEUTRAL
 EUT : 19" LCD MONITOR M/N: 190B4CB
 POWER : 120Vac / 60Hz(30°C / 59%)
 MEMO : 1024*768 / 75Hz;60KHz(DVI)

Data#: 35 File#: D:\Delta-G920370R2.EMI

Date: 2003-07-24 Time: 15:03:35

Site : No.4 Shielded room
 Condition : FCC CLASS-B KNW-407(SR4-021125) NEUTRAL
 EUT : 19" LCD MONITOR M/N: 190B4CB
 POWER : 120Vac / 60Hz(30°C / 59%)
 MEMO : 1024*768 / 75Hz;60KHz(DVI)

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.189	50.67	-13.39	64.06	50.40	0.22	0.05	QP
2	0.236	46.59	-15.65	62.24	46.36	0.18	0.05	QP
3	0.281	47.39	-13.41	60.80	47.19	0.15	0.05	QP
4	0.616	37.18	-18.82	56.00	37.05	0.10	0.03	QP
5	1.345	32.61	-23.39	56.00	32.44	0.10	0.07	QP
6	3.689	42.41	-13.59	56.00	42.21	0.10	0.10	QP

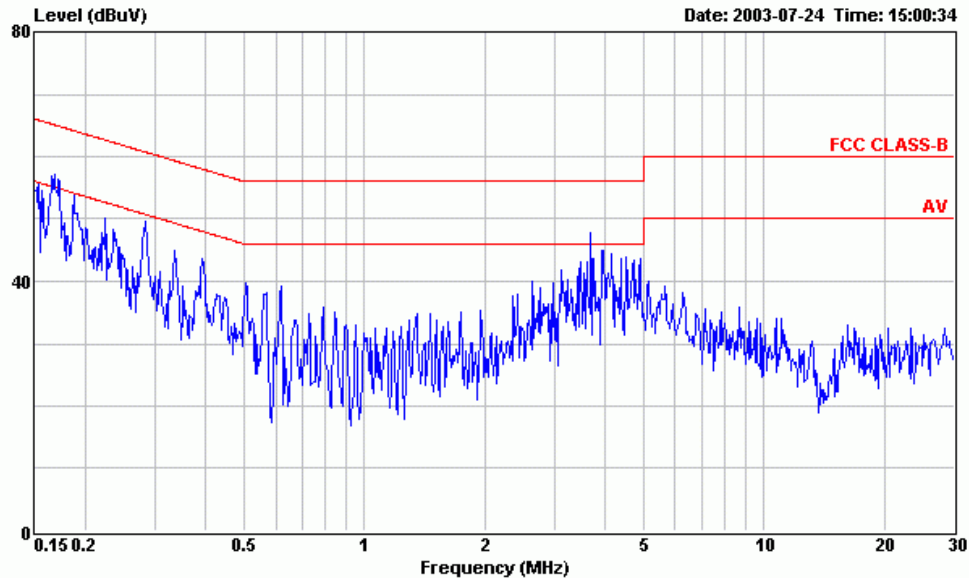
Data#: 36 File#: D:\Delta-G920370R2.EMI

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.189	41.76	-12.30	54.06	41.49	0.22	0.05	Average
2	0.236	38.38	-13.86	52.24	38.15	0.18	0.05	Average
3	0.281	44.26	-6.54	50.80	44.06	0.15	0.05	Average
4	0.616	34.46	-11.54	46.00	34.33	0.10	0.03	Average
5	1.345	25.80	-20.20	46.00	25.63	0.10	0.07	Average
6	3.689	31.40	-14.60	46.00	31.20	0.10	0.10	Average



No.53-11, Tin-fu Tsun, Lin-kou Hsiang,
Taipei Country, Taiwan, R.O.C.
Tel:02-26092133 Fax:02-26099303
Email:ttemc@ttemc.com.tw

Data#: 31 File#: D:\Delta-G920370R2.EMI



Site : No.4 Shielded room
Condition : FCC CLASS-B KMW-407(SR4-021125) LINE
EUT : 19" LCD MONITOR M/N: 190B4CB
POWER : 120Vac / 60Hz(30°C / 59%)
MEMO : 1024*768 / 75Hz;60KHz(DVI)

Data#: 32 File#: D:\Delta-G920370R2.EMI

Date: 2003-07-24 Time: 15:01:58

Site : No.4 Shielded room
Condition : FCC CLASS-B KMW-407(SR4-021125) LINE
EUT : 19" LCD MONITOR M/N: 190B4CB
POWER : 120Vac / 60Hz(30°C / 59%)
MEMO : 1024*768 / 75Hz;60KHz(DVI)

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.189	49.78	-14.28	64.06	49.51	0.22	0.05	QP
2	0.235	46.14	-16.13	62.27	45.91	0.18	0.05	QP
3	0.281	47.31	-13.47	60.78	47.11	0.15	0.05	QP
4	0.617	38.09	-17.91	56.00	37.96	0.10	0.03	QP
5	1.344	31.96	-24.04	56.00	31.79	0.10	0.07	QP
6	3.688	42.52	-13.48	56.00	42.32	0.10	0.10	QP

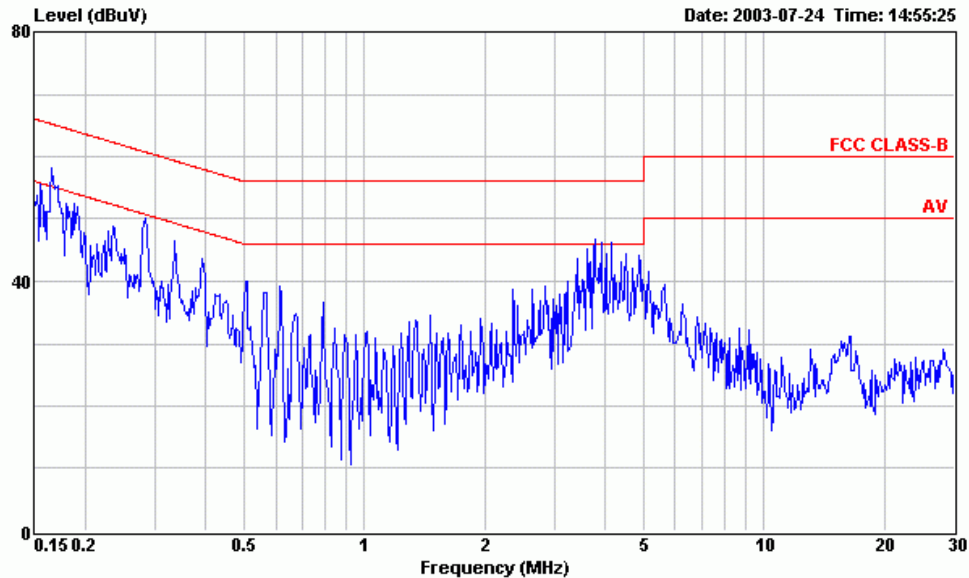
Data#: 33 File#: D:\Delta-G920370R2.EMI

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.189	41.88	-12.18	54.06	41.61	0.22	0.05	Average
2	0.235	38.53	-13.74	52.27	38.30	0.18	0.05	Average
3	0.281	43.64	-7.14	50.78	43.44	0.15	0.05	Average
4	0.617	36.17	-9.83	46.00	36.04	0.10	0.03	Average
5	1.344	23.86	-22.14	46.00	23.69	0.10	0.07	Average
6	3.688	30.36	-15.64	46.00	30.16	0.10	0.10	Average



No.53-11, Tin-fu Tsun, Lin-kou Hsiang,
Taipei Country, Taiwan, R.O.C.
Tel:02-26092133 Fax:02-26099303
Email:ttemc@ttemc.com.tw

Data#: 25 File#: D:\Delta-G920370R2.EMI



Site : No.4 Shielded room
Condition : FCC CLASS-B KNW-407(SR4-021125) NEUTRAL
EUT : 19" LCD MONITOR M/N: 190B4CB
POWER : 120Vac / 60Hz(30°C / 59%)
MEMO : 1280*1024 / 75Hz;80KHz(DVI)

Data#: 26 File#: D:\Delta-G920370R2.EMI

Date: 2003-07-24 Time: 14:57:20

Site : No.4 Shielded room
Condition : FCC CLASS-B KNW-407(SR4-021125) NEUTRAL
EUT : 19" LCD MONITOR M/N: 190B4CB
POWER : 120Vac / 60Hz(30°C / 59%)
MEMO : 1280*1024 / 75Hz;80KHz(DVI)

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.188	51.51	-12.61	64.12	51.24	0.22	0.05	QP
2	0.234	46.49	-15.80	62.29	46.26	0.18	0.05	QP
3	0.284	47.41	-13.30	60.71	47.21	0.15	0.05	QP
4	0.617	36.92	-19.08	56.00	36.79	0.10	0.03	QP
5	1.346	32.39	-23.61	56.00	32.22	0.10	0.07	QP
6	4.590	43.03	-12.97	56.00	42.88	0.10	0.05	QP

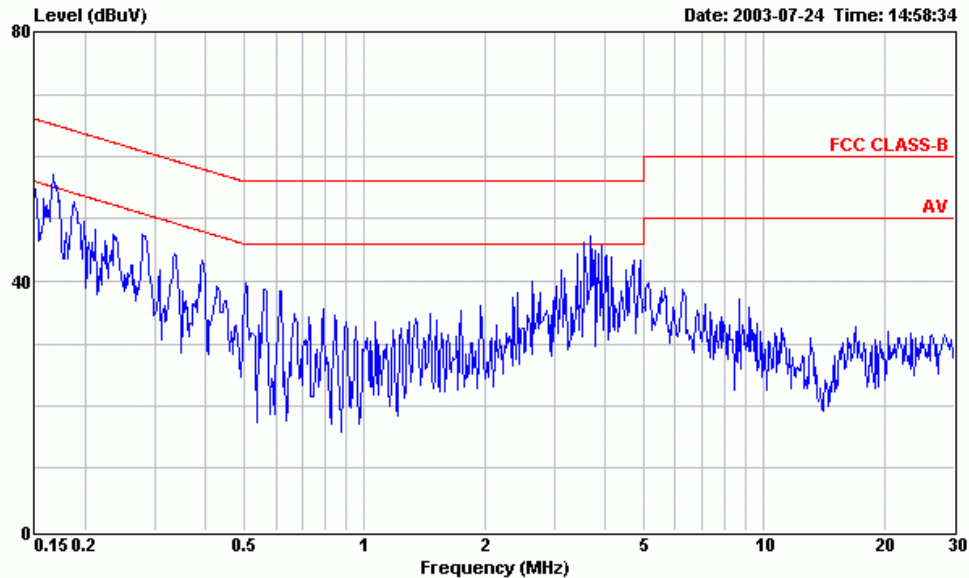
Data#: 27 File#: D:\Delta-G920370R2.EMI

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.188	42.43	-11.69	54.12	42.16	0.22	0.05	Average
2	0.234	37.99	-14.30	52.29	37.76	0.18	0.05	Average
3	0.284	42.86	-7.85	50.71	42.66	0.15	0.05	Average
4	0.617	34.45	-11.55	46.00	34.32	0.10	0.03	Average
5	1.346	24.87	-21.13	46.00	24.70	0.10	0.07	Average
6	4.590	34.86	-11.14	46.00	34.71	0.10	0.05	Average



No.53-11, Tin-fu Tsun, Lin-kou Hsiang,
Taipei Country, Taiwan, R.O.C.
Tel:02-26092133 Fax:02-26099303
Email:ttemc@ttemc.com.tw

Data#: 28 File#: D:\Delta-G920370R2.EMI



Site : No.4 Shielded room
Condition : FCC CLASS-B KMW-407(SR4-021125) LINE
EUT : 19" LCD MONITOR M/N: 190B4CB
POWER : 120Vac / 60Hz(30°C / 59%)
MEMO : 1280*1024 / 75Hz;80KHz(DVI)

Data#: 29 File#: D:\Delta-G920370R2.EMI

Date: 2003-07-24 Time: 14:59:08

Site : No.4 Shielded room
Condition : FCC CLASS-B KMW-407(SR4-021125) LINE
EUT : 19" LCD MONITOR M/N: 190B4CB
POWER : 120Vac / 60Hz(30°C / 59%)
MEMO : 1280*1024 / 75Hz;80KHz(DVI)

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.188	50.22	-13.90	64.12	49.95	0.22	0.05	QP
2	0.236	46.41	-15.84	62.25	46.18	0.18	0.05	QP
3	0.281	47.27	-13.51	60.78	47.07	0.15	0.05	QP
4	0.616	37.87	-18.13	56.00	37.74	0.10	0.03	QP
5	1.346	32.08	-23.92	56.00	31.91	0.10	0.07	QP
6	3.691	43.06	-12.94	56.00	42.86	0.10	0.10	QP

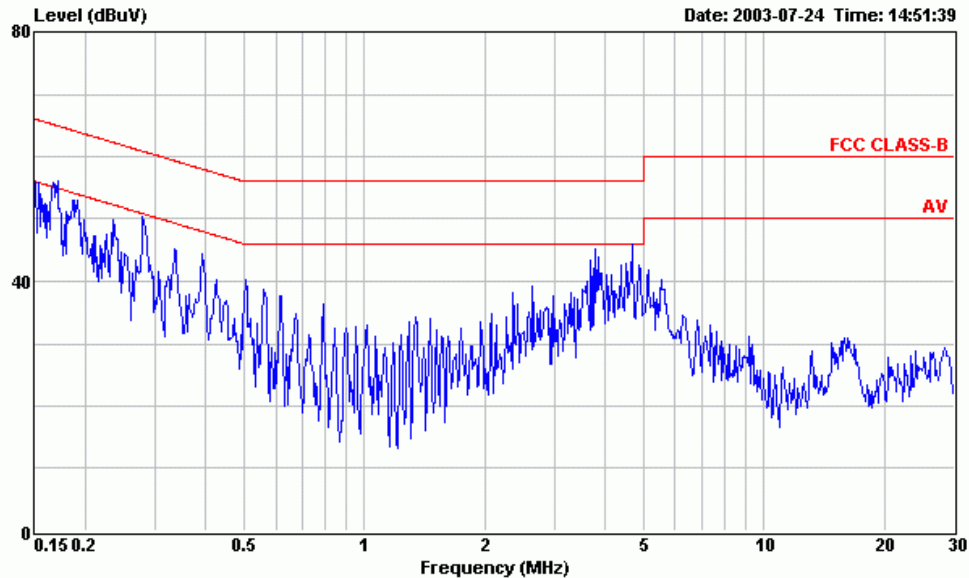
Data#: 30 File#: D:\Delta-G920370R2.EMI

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.188	42.42	-11.70	54.12	42.15	0.22	0.05	Average
2	0.236	38.90	-13.35	52.25	38.67	0.18	0.05	Average
3	0.281	43.72	-7.06	50.78	43.52	0.15	0.05	Average
4	0.616	35.68	-10.32	46.00	35.55	0.10	0.03	Average
5	1.346	26.86	-19.14	46.00	26.69	0.10	0.07	Average
6	3.691	32.34	-13.66	46.00	32.14	0.10	0.10	Average



No.53-11, Tin-fu Tsun, Lin-kou Hsiang,
Taipei Country, Taiwan, R.O.C.
Tel:02-26092133 Fax:02-26099303
Email:ttemc@ttemc.com.tw

Data#: 22 File#: D:\Delta-G920370R2.EMI



Site : No.4 Shielded room
Condition : FCC CLASS-B KNW-407(SR4-021125) NEUTRAL
EUT : 19" LCD MONITOR M/N: 190B4CB
POWER : 120Vac / 60Hz(30°C / 59%)
MEMO : 1280*1024 / 75Hz;80KHz(D-SUB)

Data#: 20 File#: D:\Delta-G920370R2.EMI

Date: 2003-07-24 Time: 14:49:48

Site : No.4 Shielded room
Condition : FCC CLASS-B KNW-407(SR4-021125) LINE
EUT : 19" LCD MONITOR M/N: 190B4CB
POWER : 120Vac / 60Hz(30°C / 59%)
MEMO : 1280*1024 / 75Hz;80KHz(D-SUB)

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.189	51.39	-12.71	64.10	51.12	0.22	0.05	QP
2	0.235	47.25	-15.03	62.28	47.02	0.18	0.05	QP
3	0.281	47.69	-13.09	60.78	47.49	0.15	0.05	QP
4	0.616	37.73	-18.27	56.00	37.60	0.10	0.03	QP
5	1.346	32.12	-23.88	56.00	31.95	0.10	0.07	QP
6	3.690	41.33	-14.67	56.00	41.13	0.10	0.10	QP

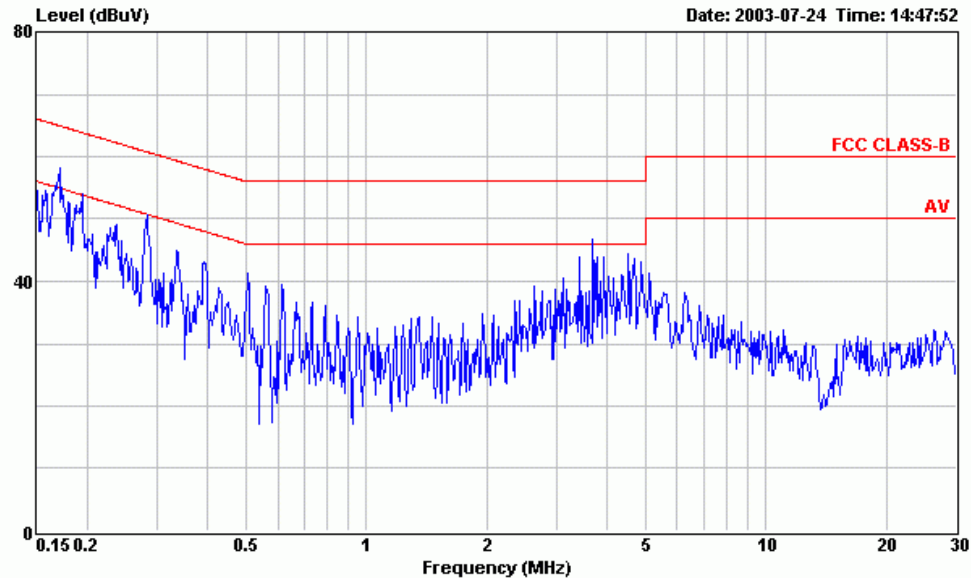
Data#: 21 File#: D:\Delta-G920370R2.EMI

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.189	42.74	-11.36	54.10	42.47	0.22	0.05	Average
2	0.235	38.55	-13.73	52.28	38.32	0.18	0.05	Average
3	0.281	44.30	-6.48	50.78	44.10	0.15	0.05	Average
4	0.616	34.01	-11.99	46.00	33.88	0.10	0.03	Average
5	1.346	23.69	-22.31	46.00	23.52	0.10	0.07	Average
6	3.690	30.98	-15.02	46.00	30.78	0.10	0.10	Average



No.53-11, Tin-fu Tsun, Lin-kou Hsiang,
 Taipei Country, Taiwan, R.O.C.
 Tel:02-26092133 Fax:02-26099303
 Email:ttemc@ttemc.com.tw

Data#: 19 File#: D:\Delta-G920370R2.EMI



Site : No.4 Shielded room
 Condition : FCC CLASS-B KMW-407(SR4-021125) LINE
 EUT : 19"LCD MONITOR M/N: 190B4CB
 POWER : 120Vac / 60Hz(30°C / 59%)
 MEMO : 1280*1024 / 75Hz;80KHz(D-SUB)

Data#: 23 File#: D:\Delta-G920370R2.EMI

Date: 2003-07-24 Time: 14:54:22

Site : No.4 Shielded room
 Condition : FCC CLASS-B KMW-407(SR4-021125) NEUTRAL
 EUT : 19"LCD MONITOR M/N: 190B4CB
 POWER : 120Vac / 60Hz(30°C / 59%)
 MEMO : 1280*1024 / 75Hz;80KHz(D-SUB)

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.190	51.38	-12.68	64.06	51.11	0.22	0.05	QP
2	0.236	47.27	-14.98	62.25	47.04	0.18	0.05	QP
3	0.281	47.81	-12.97	60.78	47.61	0.15	0.05	QP
4	0.616	36.84	-19.16	56.00	36.71	0.10	0.03	QP
5	1.344	31.92	-24.08	56.00	31.75	0.10	0.07	QP
6	4.591	42.71	-13.29	56.00	42.56	0.10	0.05	QP

Data#: 24 File#: D:\Delta-G920370R2.EMI

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.190	42.31	-11.75	54.06	42.04	0.22	0.05	Average
2	0.236	39.01	-13.24	52.25	38.78	0.18	0.05	Average
3	0.281	44.22	-6.56	50.78	44.02	0.15	0.05	Average
4	0.616	34.22	-11.78	46.00	34.09	0.10	0.03	Average
5	1.344	21.23	-24.77	46.00	21.06	0.10	0.07	Average
6	4.591	34.87	-11.13	46.00	34.72	0.10	0.05	Average

3. RADIATED EMISSION TEST

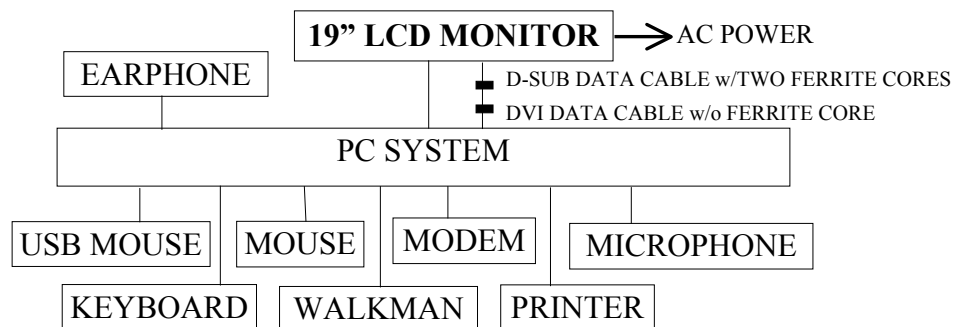
3.1. Test Equipment

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

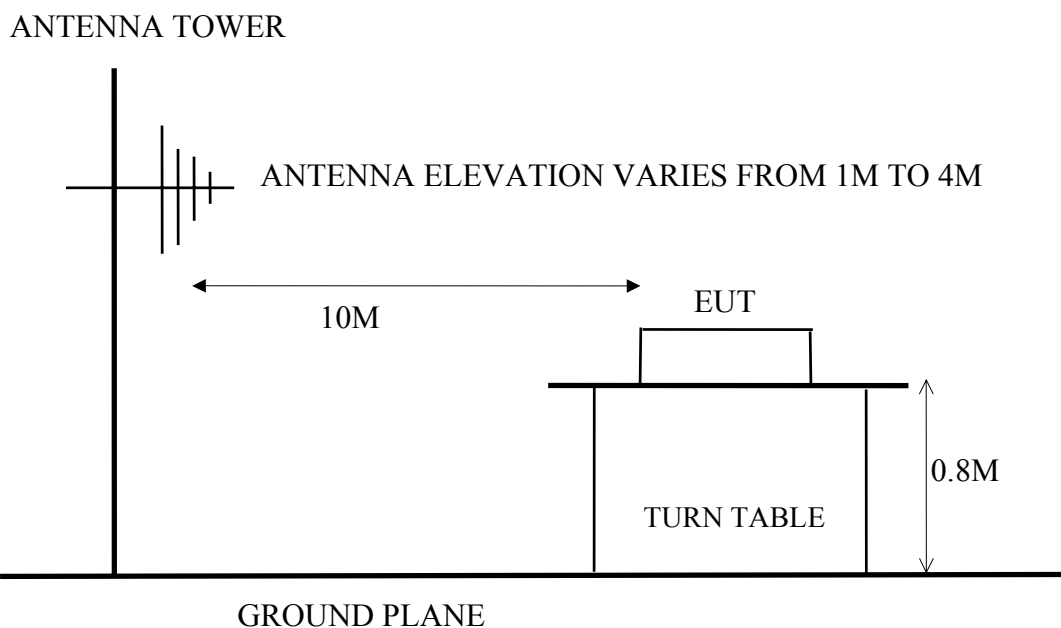
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	HP	8590L	3624A01446	N/A	N/A
2.	Test Receiver	R&S	ESVS10	845165/018	May 16, 03'	May 15, 04'
3.	Computer	TOKIN	586PC	N/A	N/A	NA
4.	Printer	NEC	P2000	553295372	N/A	N/A
5.	Amplifier	HP	8447D	2727A05737	N/A	N/A
6.	Biconical Antenna	Chase	VBA6106A	1263	Nov.26, 02'	Nov.25, 03'
7.	Biconical Antenna	Chase	UPA6109	1020	Nov.26, 02'	Nov.25, 03'
8.	Ferrite Clamp	R&S	EZ-24	100011	N/A	N/A

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 μ 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	Input	Frequency Resolution
1.	DVI	640*480/60Hz, 31kHz
2.		1024*768/75Hz, 60kHz
3.		1280*1024/75Hz, 80kHz
4.	D-Sub	1280*1024/75Hz, 80kHz ※

(The ※ is worst mode)

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 be reported below are too low against the prescribed limits.

Date of Test : Jul. 24, 2003 Temperature : 32°C

EUT : 19" LCD Monitor Humidity : 50%

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

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Horizontal dBuV	Emission Level Horizontal dBuV/m	Limits dBuV/m	Margin dB
78.426	13.60	0.93	3.45	17.98	30.00	12.02
110.040	18.17	1.11	2.70	21.98	30.00	8.02
163.232	19.85	1.36	- 1.60	19.61	30.00	10.39
216.894	21.38	1.51	- 2.19	20.70	30.00	9.30
268.558	23.12	1.72	0.14	24.98	37.00	12.02
323.312	14.10	1.94	4.60	20.64	37.00	16.36
431.312	16.94	2.30	- 0.41	18.83	37.00	18.17
539.312	18.88	2.51	- 0.82	20.57	37.00	16.43
647.814	20.87	2.89	- 1.29	22.47	37.00	14.53
754.846	22.42	3.19	- 1.27	24.34	37.00	12.66
864.764	24.15	3.37	- 1.78	25.74	37.00	11.26
917.576	23.13	3.39	- 2.38	24.14	37.00	12.86

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Vertical dBuV	Emission Level Vertical dBuV/m	Limits dBuV/m	Margin dB
68.300	12.29	0.88	6.49	19.66	30.00	10.34
79.320	13.70	0.94	8.50	23.14	30.00	6.86
110.120	16.55	1.11	1.29	18.95	30.00	11.05
152.600	21.05	1.35	3.40	25.80	30.00	4.20
215.840	22.34	1.50	- 0.19	23.65	30.00	6.35
269.840	23.00	1.72	- 1.30	23.42	37.00	13.58
374.844	15.88	2.12	- 5.38	12.62	37.00	24.38
431.280	17.43	2.30	- 3.54	16.19	37.00	20.81
538.764	19.09	2.51	- 4.72	16.88	37.00	20.12
647.522	20.38	2.89	- 2.36	20.91	37.00	16.09
703.166	21.53	3.04	- 4.69	19.88	37.00	17.12
810.126	22.32	3.30	- 3.57	22.05	37.00	14.95
918.988	23.09	3.39	- 4.15	22.33	37.00	14.67

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

Date of Test : Jul. 24, 2003 Temperature : 32°C

EUT : 19" LCD Monitor Humidity : 50%

Test Mode : 1024*768/75Hz, 60kHz Input : DVI

Frequency MHz	Antenna	Cable	Meter Reading	Emission Level		Margin dB
	Factor dB/m	Loss dB	Horizontal dBuV	Horizontal dBuV/m	Limits dBuV/m	
54.436	13.46	0.79	4.98	19.23	30.00	10.77
108.994	18.19	1.11	3.72	23.02	30.00	6.98
162.994	19.85	1.36	- 0.53	20.68	30.00	9.32
216.994	21.36	1.51	- 0.89	21.98	30.00	8.02
270.994	23.32	1.72	- 0.11	24.93	37.00	12.07
373.993	15.44	2.12	2.50	20.06	37.00	16.94
432.922	16.79	2.30	- 1.36	17.73	37.00	19.27
540.922	19.16	2.52	- 1.01	20.67	37.00	16.33
647.314	20.39	2.89	- 1.13	22.15	37.00	14.85
755.846	22.65	3.20	- 2.52	23.33	37.00	13.67
863.314	24.11	3.37	- 2.17	25.31	37.00	11.69

Frequency MHz	Antenna	Cable	Meter Reading	Emission Level		Margin dB
	Factor dB/m	Loss dB	Vertical dBuV	Vertical dBuV/m	Limits dBuV/m	
70.070	12.09	0.88	7.81	20.78	30.00	9.22
78.970	13.68	0.94	8.49	23.11	30.00	6.89
110.500	16.54	1.11	7.00	24.65	30.00	5.35
152.300	21.05	1.35	3.10	25.50	30.00	4.50
162.001	19.83	1.36	0.20	21.39	30.00	8.61
215.700	22.41	1.50	- 0.29	23.62	30.00	6.38
269.560	23.05	1.72	- 1.10	23.67	37.00	13.33
373.998	15.88	2.12	7.30	25.30	37.00	11.70
486.894	18.50	2.43	1.94	22.87	37.00	14.13
540.894	18.95	2.52	0.03	21.50	37.00	15.50
647.806	19.98	2.89	- 0.19	22.68	37.00	14.32
755.806	22.56	3.20	- 0.85	24.91	37.00	12.09
811.568	22.59	3.31	- 0.96	24.94	37.00	12.06

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

Date of Test : Jul. 21, 2003 Temperature : 31°C

EUT : 19" LCD Monitor Humidity : 58%

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

Frequency MHz	Antenna	Cable	Meter Reading	Emission Level		Margin dB
	Factor dB/m	Loss dB	Horizontal dBuV	Horizontal dBuV/m	Limits dBuV/m	
53.972	13.63	0.78	6.13	20.54	30.00	9.46
83.070	15.11	0.96	5.20	21.27	30.00	8.73
108.560	18.21	1.11	2.60	21.92	30.00	8.08
161.918	19.98	1.36	0.11	21.45	30.00	8.55
214.644	21.12	1.50	- 1.29	21.33	30.00	8.67
269.228	23.12	1.72	0.88	25.72	37.00	11.28
324.086	14.44	1.96	7.40	23.80	37.00	13.20
432.310	16.85	2.30	1.94	21.09	37.00	15.91
540.310	19.02	2.52	0.56	22.10	37.00	14.90
647.988	20.39	2.89	1.35	24.63	37.00	12.37
701.988	21.45	3.05	- 0.26	24.24	37.00	12.76
809.988	22.57	3.31	- 0.20	25.68	37.00	11.32
971.988	24.41	3.50	- 2.84	25.07	37.00	11.93

Frequency MHz	Antenna	Cable	Meter Reading	Emission Level		Margin dB
	Factor dB/m	Loss dB	Vertical dBuV	Vertical dBuV/m	Limits dBuV/m	
40.090	19.57	0.67	- 0.80	19.44	30.00	10.56
66.350	12.33	0.87	6.20	19.40	30.00	10.60
83.550	14.09	0.97	10.80	25.86	30.00	4.14
108.720	16.54	1.11	4.79	22.44	30.00	7.56
144.600	20.63	1.35	3.60	25.58	30.00	4.42
213.900	22.18	1.50	- 0.20	23.48	30.00	6.52
270.620	23.05	1.72	1.30	26.07	37.00	10.93
323.986	14.38	1.96	9.20	25.54	37.00	11.46
377.986	15.91	2.12	4.01	22.04	37.00	14.96
485.986	18.86	2.42	3.01	24.29	37.00	12.71
539.986	18.95	2.52	0.71	22.18	37.00	14.82
647.986	19.98	2.89	2.05	24.92	37.00	12.08
755.986	22.56	3.20	- 2.72	23.04	37.00	13.96
863.986	24.16	3.37	- 1.56	25.97	37.00	11.03

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

Date of Test : Jul. 21, 2003 Temperature : 31°C

EUT : 19" LCD Monitor Humidity : 58%

Test Mode : 1280*1024/75Hz, 80kHz Input : D-Sub

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading		Emission Level		Margin dB
			Horizontal dBuV		Horizontal dBuV/m	Limits dBuV/m	
66.876	12.73	0.87	1.21		14.81	30.00	15.19
107.898	18.17	1.11	0.50		19.78	30.00	10.22
* 144.036	19.98	1.35	4.64		25.97	30.00	4.03
161.293	20.00	1.36	0.20		21.56	30.00	8.44
215.988	21.33	1.51	1.40		24.24	30.00	5.76
269.955	23.38	1.72	0.10		25.20	37.00	11.80
324.301	14.44	1.96	7.65		24.05	37.00	12.95
432.221	16.85	2.30	4.20		23.35	37.00	13.65
541.966	19.30	2.53	2.35		24.18	37.00	12.82
649.433	20.40	2.90	4.19		27.49	37.00	9.51
705.145	21.33	3.05	1.37		25.75	37.00	11.25
813.155	22.48	3.32	2.34		28.14	37.00	8.86

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading		Emission Level		Margin dB
			Vertical dBuV		Vertical dBuV/m	Limits dBuV/m	
54.263	14.71	0.78	0.31		15.80	30.00	14.20
108.046	16.53	1.11	0.20		17.84	30.00	12.16
* 155.060	21.03	1.35	3.36		25.74	30.00	4.26
161.832	19.95	1.36	2.69		24.00	30.00	6.00
268.416	23.04	1.72	1.10		25.86	37.00	11.14
377.543	15.93	2.12	7.09		25.14	37.00	11.86
431.486	17.43	2.30	2.04		21.77	37.00	15.23
593.488	19.73	2.70	0.63		23.06	37.00	13.94
643.150	20.30	2.88	1.65		24.83	37.00	12.17
752.858	22.28	3.19	0.79		26.26	37.00	10.74
810.387	22.59	3.31	0.72		26.62	37.00	10.38
971.400	24.88	3.49	- 0.63		27.74	37.00	9.26

- Remarks :
1. All readings are Quasi-Peak values.
 2. Emission Level= Antenna Factor + Cable Loss + Meter Reading.
 3. The worst emission was detected at 144.036MHz with corrected signal level of 25.97dBuV/m (limit was 30dBuV/m) when the antenna was at horizontal polarization and was at 4m high and the turn table was at 155° .
 4. The worst emission was detected at 155.060MHz with corrected signal level of 25.74dBuV/m (limit was 30dBuV/m) when the antenna was at vertical polarization and was at 1m high and the turn table was at 285° .
 5. 0° is the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

4. DEVIATION TO TEST SPECIFICATIONS

【NONE】