

APPLICATION FOR CERTIFICATION

On Behalf of

Voza Technology Co., Ltd.

TFT LCD Monitor

Model : E-5

FCC ID : QPT02040001

Prepared for : Voza Technology Co., Ltd.
3F, No. 661, Wen Hsin S. Road,
Taichung 402, Taiwan, R.O.C.

Prepared By : Taiwan Tokin EMC Eng. Corp.
No. 53-11, Tin-Fu Tsun, Lin-Kou,
Taipei Hsien, Taiwan, R.O.C.

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

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Date of Test : Oct. 16 ~ 18, 2002
Date of Report : Oct. 29, 2002

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TEST REPORT CERTIFICATION

Applicant : Voza Technology Co., Ltd.
 Manufacturer : Voza Technology Co., Ltd.
 FCC ID : QPT02040001
 EUT Description : TFT LCD Monitor
 (A) MODEL NO. : E-5
 (B) SERIAL NO. : N/A
 (C) POWER SUPPLY : DC 12V, 3A
 (Test Voltage: AC 120V/60Hz Via AC Adapter)

Measurement Procedure Used:

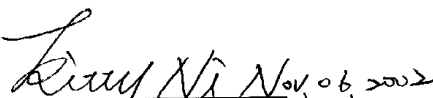
FCC RULES AND CISPR 22 (DOCKET NO. 92-152, SEP. 1993) AND
FCC / ANSI C63.4-1992

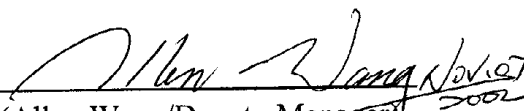
The device described above was tested by TAIWAN TOKIN EMC ENG. CORP. to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the CISPR 22 Class B limits both radiated and conducted emissions.

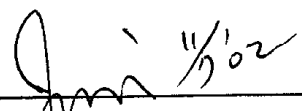
The measurement results are contained in this test report and TAIWAN TOKIN EMC ENG. CORP. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliance with the FCC official limits.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Taiwan Tokin EMC Eng. corp.

Date of Test : Oct. 16 ~ 18, 2002

Prepared By: 
 (Kitty Ni/Officer)

Test Engineer: 
 (Allen Wang/Deputy Manager)

Approve & Authorized Signer: 
 (Jackie Deng/Assistant General Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description	:	TFT LCD Monitor
Model Number	:	E-5
FCC ID	:	QPT02040001
Applicant	:	Voza Technology Co., Ltd. 3F, No. 661, Wen Hsin S. Road, Taichung 402, Taiwan, R.O.C.
Manufacturer	:	Voza Technology Co., Ltd. 3F, No. 661, Wen Hsin S. Road, Taichung 402, Taiwan, R.O.C.
LCD Panel	:	Chung Hwa, M/N CLAA150XA03
Data Cable (D-Sub)	:	Shielded, Undetachable, 1.5m Bonded two ferrite cores
AC Adapter	:	EDAC, M/N EA1050F-120 I/P: AC 100-240V~ 1.8A, 50-60Hz O/P: DC 12V, 3.0A Cable: Shielded, Undetachable, 1.6m Bonded a ferrite core
AC Power Cord	:	Non-Shielded, Detachable, 1.2m
Date of Receipt of Sample	:	Oct. 02, 2002
Date of Test	:	Oct. 16 ~ 18, 2002

1.2. Tested Supporting System Details

1.2.1. PERSONAL COMPUTER

Model Number	:	HP VECTRA XE320
Serial Number	:	SG21102000
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	:	M020235970
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
Brand	:	Panasonic
Manufacturer	:	Matsushita
Data Cable	:	Shielded, Detachable, 1.2m
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 #1

Model Number	:	DM-1414
Serial Number	:	980034395
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. MODEM #2

Model Number	:	DM-1414
Serial Number	:	980034383
FCC ID	:	IFAXDM1414
Manufacturer	:	Aceex
Data Cable	:	Shielded, Detachable, 1.2m
Power Adapter	:	Amigo, Model AM-91000A
		Non-Shielded, Undetachable, 1.8m

1.2.7. USB MOUSE #1

Model Number	:	CREUBB
Serial Number	:	N/A
FCC ID	:	NHM-CREUBE
BSMI ID No.	:	3872F083
Manufacturer	:	CRE Technology Co., Ltd.
Data Cable	:	Shielded, Undetachable, 1.8m

1.2.8. USB MOUSE #2

Model Number	:	CREUBB
Serial Number	:	N/A
FCC ID	:	NHM-CREUBE
BSMI ID No.	:	3872F083
Manufacturer	:	CRE Technology Co., Ltd.
Data Cable	:	Shielded, Undetachable, 1.8m

1.2.9. MICROPHONE

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

1.2.10. SPEAKER

Model Number	:	J-008
Serial Number	:	J80547833
Manufacturer	:	(J-S) JAZZ HIPSTER
Data Cable	:	Non-Shielded, Undetachable, 1m

1.2.11. WALKMAN

Model Number	:	RQ-P35LT-K
Serial Number	:	HA08717
Manufacturer	:	Panasonic
Data Cable	:	Non-Shielded, Detachable, 1.8m

1.2.12. EARPHONE

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

1.2.13. HUB

Model Number : 8222-008
 Serial Number : 23-F4014
 FCC ID : By DoC
 Manufacturer : IBM
 LAN Cable : Non-Shielded, Detachable, 1.5m
 Power Cord : Non-Shielded, Detachable, 1.8m

1.3. Description of Test Facility

Site Description : Jan. 29, 2001 Re-File on
 (No. 5 Open Site) Federal Communication Commission
 Registration Number: 90992

Site Description : May 16, 2000 Re-file on
 (Semi-Anechoic Chamber) Federal Communication Commission
 Registration Number: 90993

Name of Firm : Taiwan Tokin EMC Eng. Corp.

Site Location #1 : No. 53-11, Tin-Fu Tsun, Lin-Kou,
 Taipei Hsien, Taiwan, R.O.C.

Site Location #2 : No. 67-4, Tin-Fu Tsun, Lin-Kou,
 Taipei Hsien, Taiwan, R.O.C.

NVLAP Lab Code : 200077-0

DAR- Registration No. : DAT-P-092/99-00e

1.4. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty (dB)
Conduction Test	150KHz~30MHz	±2.66dB
Radiation Test (Distance: 3m)	30MHz~300MHz	+4.26dB / -4.22dB
	300MHz~1000MHz	+5.28dB / -4.0dB
Radiation Test (Distance: 10m)	30MHz~300MHz	+4.5dB / -4.5dB
	300MHz~1000MHz	+3.88dB / -3.84dB

Remark : Uncertainty = $K_{uc}(y)$

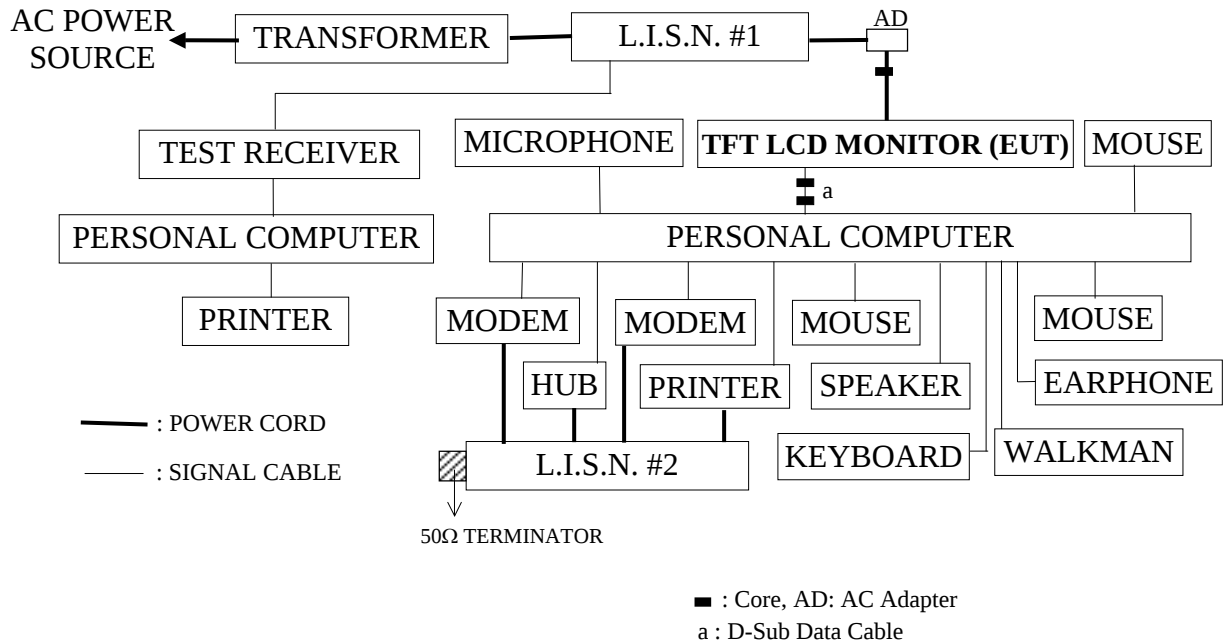
2. POWERLINE CONDUCTED TEST

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	Feb.27, 02'	1 Year
3.	L.I.S.N. #1	Kyoritsu	KNW-407	8-1430-5	Nov.12, 01'	1 Year
4.	L.I.S.N. #2	Kyoritsu	KNW-407	8-1430-6	Nov.12, 01'	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. TFT LCD Monitor (EUT)

Model Number	:	E-5
Serial Number	:	N/A
FCC ID	:	QPT02040001
Manufacturer	:	Voza Technology Co., Ltd.
LCD Panel	:	Chung Hwa, M/N CLAA150XA03
Data Cable (D-Sub)	:	Shielded, Undetachable, 1.5m Bonded two ferrite cores
AC Adapter	:	EDAC, M/N EA1050F-120 I/P: AC 100-240V~ 1.8A, 50-60Hz O/P: DC 12V, 3.0A Cable: Shielded, Undetachable, 1.6m Bonded a ferrite core
AC Power Cord	:	Non-Shielded, Detachable, 1.2m

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 Pattern" by windows and sent "H" character to TFT LCD Monitor (EUT), then the screen of TFT 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 CD-ROM played a Music CD-Disk and sent sound to earphone.
- 2.5.7. The other peripheral devices were driven and operated in turn during all testing.
- 2.5.8. Repeat the above procedures from 2.5.3 to 2.5.7.

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.

The test voltage was AC 120V/60Hz via AC Adapter of EUT.

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 three kinds of working frequency were done on conducted measurement and all the test results are listed in following pages.

EUT : TFT LCD Monitor M/N : E-5

Test Date : Oct. 18, 2002 Temperature : 29°C Humidity : 57%

The detail of test modes are as follows :

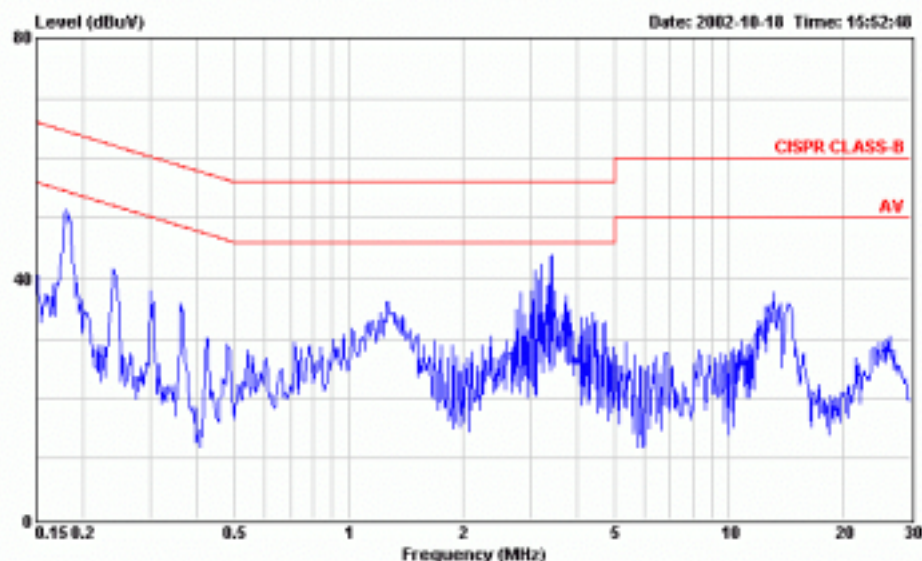
Mode	Frequency / Resolution	Reference Data #
1.	31KHz/640*480, 60Hz	# 16 (# 17, # 18) ; # 13 (# 14, # 15)
2.	48KHz/800*600, 75Hz	# 7 (# 8, # 9) ; # 10 (# 11, # 12)
3.	60KHz/1024*768, 75Hz	# 4 (# 5, # 6) ; # 1 (# 2, # 3)



TAIWAN TOKEN EMC ENG. CORP.
台灣東金科技股份有限公司

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

Data#: 16 File#: D:\Voza.emi



Site : No.4 Shielded room
Condition : CISPR CLASS-B KNW-407 NEUTRAL
EUT : TFT LCD MONITOR M/N:E-5
POWER : 120Vac / 60Hz
MEMO : 640*480/60Hz 31KHz

Data#: 17 File#: D:\Voza.emi

Date: 2002-10-18 Time: 15:53:56

Site : No.4 Shielded room
Condition : CISPR CLASS-B KNW-407 NEUTRAL
EUT : TFT LCD MONITOR M/N:E-5
POWER : 120Vac / 60Hz
MEMO : 640*480/60Hz 31KHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.180	50.54	-13.97	64.51	50.10	0.24	0.20	QP
2	0.241	40.48	-21.60	62.08	40.11	0.17	0.20	QP
3	0.300	36.71	-23.55	60.26	36.37	0.14	0.20	QP
4	1.290	30.94	-25.06	56.00	30.44	0.10	0.40	QP
5	3.559	43.58	-12.42	56.00	43.08	0.10	0.40	QP
6	14.301	33.93	-26.07	60.00	33.03	0.20	0.70	QP

Data#: 18 File#: D:\Voza.emi

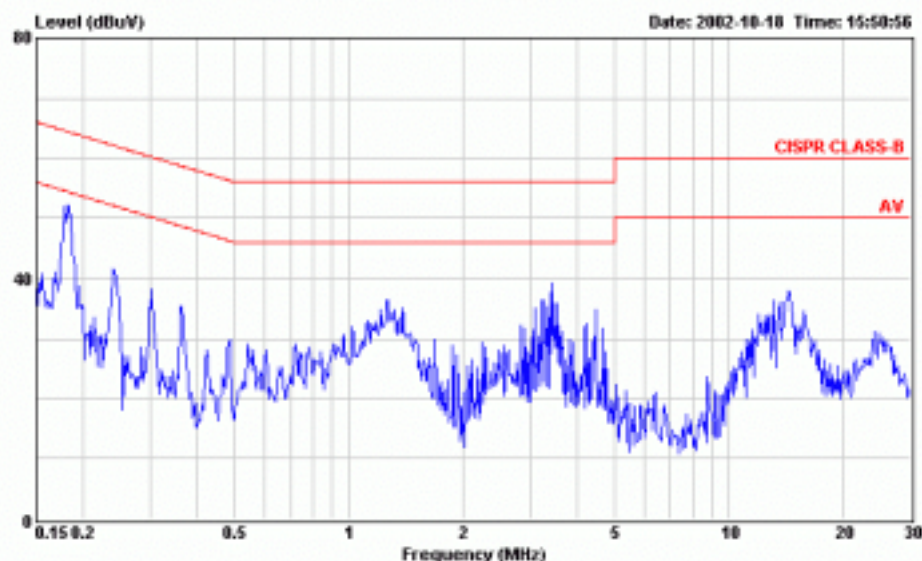
	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.180	39.83	-14.68	54.51	39.39	0.24	0.20	Average
2	0.241	28.87	-23.21	52.08	28.50	0.17	0.20	Average
3	0.300	31.79	-18.47	50.26	31.45	0.14	0.20	Average
4	1.290	24.19	-21.81	46.00	23.69	0.10	0.40	Average
5	3.559	31.64	-14.36	46.00	31.14	0.10	0.40	Average
6	14.301	27.47	-22.53	50.00	26.57	0.20	0.70	Average



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台灣東金科技股份有限公司

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#: 13 File#: D:\Voza.emi



Site : No.4 Shielded room
Condition : CISPR CLASS-B KNW-407 LINE
EUT : TFT LCD MONITOR M/N:E-5
POWER : 120Vac / 60Hz
MEMO : 640*480/60Hz 31KHz

Data#: 14 File#: D:\Voza.emi

Date: 2002-10-18 Time: 15:51:44

Site : No.4 Shielded room
Condition : CISPR CLASS-B KNW-407 LINE
EUT : TFT LCD MONITOR M/N:E-5
POWER : 120Vac / 60Hz
MEMO : 640*480/60Hz 31KHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.181	51.90	-12.55	64.45	51.46	0.24	0.20	QP
2	0.239	40.25	-21.87	62.12	39.88	0.17	0.20	QP
3	0.300	37.07	-23.18	60.25	36.73	0.14	0.20	QP
4	1.287	30.72	-25.28	56.00	30.22	0.10	0.40	QP
5	3.561	37.09	-18.91	56.00	36.59	0.10	0.40	QP
6	14.309	34.77	-25.23	60.00	33.87	0.20	0.70	QP

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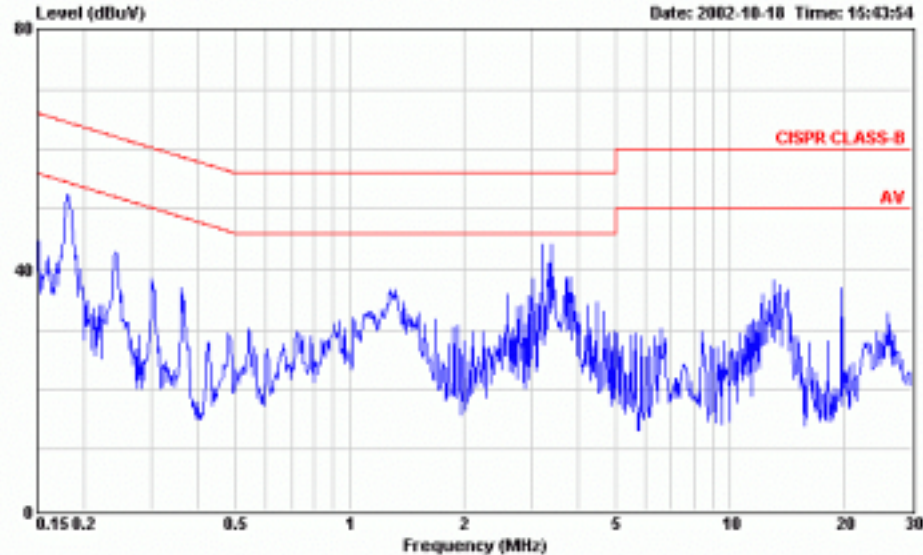
	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.181	39.95	-14.50	54.45	39.51	0.24	0.20	Average
2	0.239	28.57	-23.55	52.12	28.20	0.17	0.20	Average
3	0.300	31.64	-18.61	50.25	31.30	0.14	0.20	Average
4	1.287	23.87	-22.13	46.00	23.37	0.10	0.40	Average
5	3.561	26.12	-19.88	46.00	25.62	0.10	0.40	Average
6	14.309	27.46	-22.54	50.00	26.56	0.20	0.70	Average



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

Data#: 7 File#: D:\Voza.emi



Site : No.4 Shielded room
Condition : CISPR CLASS-B KNW-407 NEUTRAL
EUT : TFT LCD MONITOR M/N:E-5
POWER : 120Vac / 60Hz
MEMO : 800*600/75Hz 48KHz

Data#: 8 File#: D:\Voza.emi

Date: 2002-10-18 Time: 15:45:43

Site : No.4 Shielded room
Condition : CISPR CLASS-B KNW-407 NEUTRAL
EUT : TFT LCD MONITOR M/N:E-5
POWER : 120Vac / 60Hz
MEMO : 800*600/75Hz 48KHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.181	51.47	-12.97	64.44	51.03	0.24	0.20	QP
2	0.243	41.16	-20.83	61.99	40.79	0.17	0.20	QP
3	0.301	37.65	-22.57	60.22	37.31	0.14	0.20	QP
4	1.283	31.92	-24.08	56.00	31.42	0.10	0.40	QP
5	3.564	44.36	-11.64	56.00	43.86	0.10	0.40	QP
6	14.310	34.91	-25.09	60.00	34.01	0.20	0.70	QP

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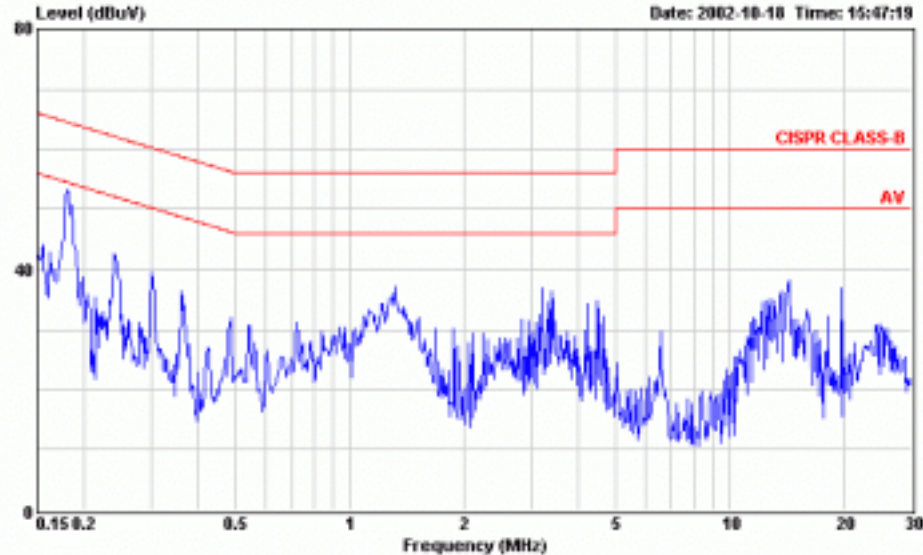
	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.181	40.40	-14.04	54.44	39.96	0.24	0.20	Average
2	0.243	29.47	-22.52	51.99	29.10	0.17	0.20	Average
3	0.301	31.93	-18.29	50.22	31.59	0.14	0.20	Average
4	1.283	26.58	-19.42	46.00	26.08	0.10	0.40	Average
5	3.564	31.21	-14.79	46.00	30.71	0.10	0.40	Average
6	14.310	31.42	-18.58	50.00	30.52	0.20	0.70	Average



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台灣東金科技股份有限公司

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

Data#: 10 File#: D:\Voza.emi



Site : No.4 Shielded room
Condition : CISPR CLASS-B KNW-407 LINE
EUT : TFT LCD MONITOR M/N:E-5
POWER : 120Vac / 60Hz
MEMO : 800*600/75Hz 48KHz

Data#: 11 File#: D:\Voza.emi

Date: 2002-10-18 Time: 15:48:13

Site : No.4 Shielded room
Condition : CISPR CLASS-B KNW-407 LINE
EUT : TFT LCD MONITOR M/N:E-5
POWER : 120Vac / 60Hz
MEMO : 800*600/75Hz 48KHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.181	52.14	-12.30	64.44	51.70	0.24	0.20	QP
2	0.241	41.66	-20.42	62.08	41.29	0.17	0.20	QP
3	0.300	36.99	-23.26	60.25	36.65	0.14	0.20	QP
4	1.288	31.60	-24.40	56.00	31.10	0.10	0.40	QP
5	3.560	37.61	-18.39	56.00	37.11	0.10	0.40	QP
6	14.310	35.84	-24.16	60.00	34.94	0.20	0.70	QP

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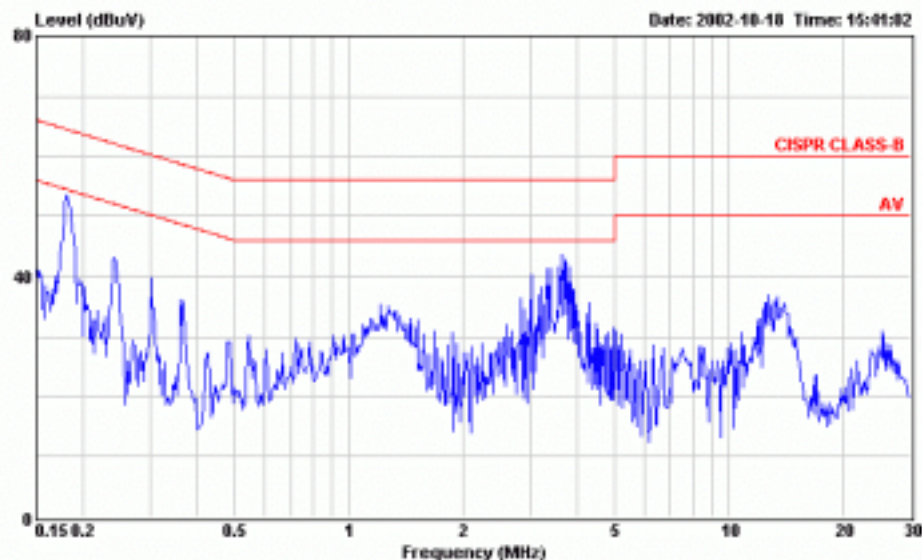
	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.181	39.75	-14.69	54.44	39.31	0.24	0.20	Average
2	0.241	29.87	-22.21	52.08	29.50	0.17	0.20	Average
3	0.300	31.43	-18.82	50.25	31.09	0.14	0.20	Average
4	1.288	25.49	-20.51	46.00	24.99	0.10	0.40	Average
5	3.560	26.98	-19.02	46.00	26.48	0.10	0.40	Average
6	14.310	28.50	-21.50	50.00	27.60	0.20	0.70	Average



TAIWAN TOKIN EMC ENG. CORP.
台灣東金科技股份有限公司

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#: 4 File#: D:\Voza.emi



Site : No.4 Shielded room
Condition : CISPR CLASS-B KNW-407 NEUTRAL
EUT : TFT LCD MONITOR M/N:E-5
POWER : 120Vac / 60Hz
MEMO : 1024*768/75Hz 60KHz

Data#: 5 File#: D:\Voza.emi

Date: 2002-10-18 Time: 15:42:15

Site : No.4 Shielded room
Condition : CISPR CLASS-B KNW-407 NEUTRAL
EUT : TFT LCD MONITOR M/N:E-5
POWER : 120Vac / 60Hz
MEMO : 1024*768/75Hz 60KHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.181	52.28	-12.16	64.44	51.84	0.24	0.20	QP
2	0.241	42.26	-19.81	62.07	41.89	0.17	0.20	QP
3	0.301	38.03	-22.19	60.22	37.69	0.14	0.20	QP
4	1.281	30.34	-25.66	56.00	29.84	0.10	0.40	QP
5	3.566	42.92	-13.08	56.00	42.42	0.10	0.40	QP
6	14.339	30.38	-29.62	60.00	29.48	0.20	0.70	QP

Data#: 6 File#: D:\Voza.emi

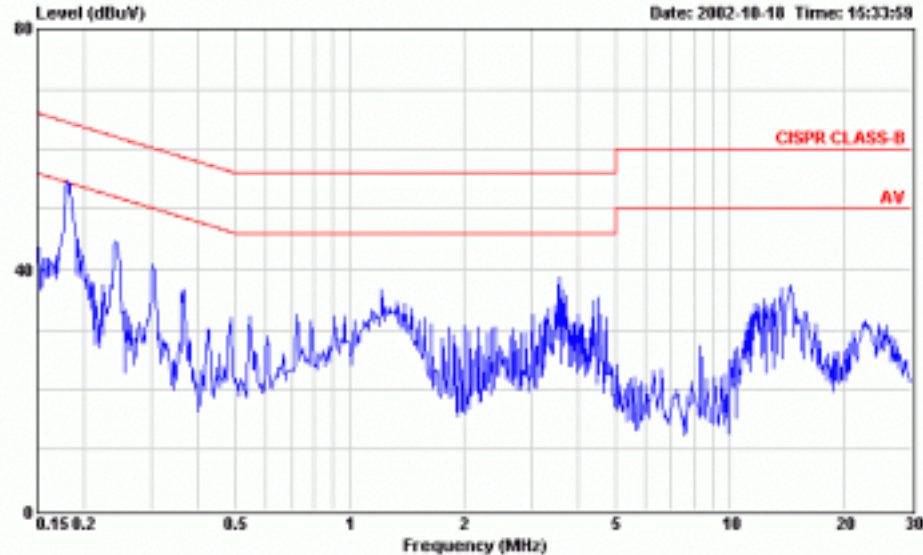
	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.181	41.09	-13.35	54.44	40.65	0.24	0.20	Average
2	0.241	30.59	-21.48	52.07	30.22	0.17	0.20	Average
3	0.301	32.23	-17.99	50.22	31.89	0.14	0.20	Average
4	1.281	24.25	-21.75	46.00	23.75	0.10	0.40	Average
5	3.566	30.57	-15.43	46.00	30.07	0.10	0.40	Average
6	14.339	23.34	-26.66	50.00	22.44	0.20	0.70	Average



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Tel:02-26092133 Fax:02-26099303
Email:ttenc@ttenc.com.tw

Data#: 1 File#: D:\Voza.emi



Site : No.4 Shielded room
Condition : CISPR CLASS-B KNW-407 LINE
EUT : TFT LCD MONITOR M/N:E-5
POWER : 120Vac / 60Hz
MEMO : 1024*768/75Hz 60KHz

Data#: 2 File#: D:\Voza.emi

Date: 2002-10-18 Time: 15:39:36

Site : No.4 Shielded room
Condition : CISPR CLASS-B KNW-407 LINE
EUT : TFT LCD MONITOR M/N:E-5
POWER : 120Vac / 60Hz
MEMO : 1024*768/75Hz 60KHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.181	53.78	-10.66	64.44	53.34	0.24	0.20	QP
2	0.242	42.92	-19.11	62.03	42.55	0.17	0.20	QP
3	0.301	38.59	-21.63	60.22	38.25	0.14	0.20	QP
4	1.287	29.89	-26.11	56.00	29.39	0.10	0.40	QP
5	3.567	35.14	-20.86	56.00	34.64	0.10	0.40	QP
6	14.341	34.95	-25.05	60.00	34.05	0.20	0.70	QP

Data#: 3 File#: D:\Voza.emi

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.181	41.98	-12.46	54.44	41.54	0.24	0.20	Average
2	0.242	31.73	-20.30	52.03	31.36	0.17	0.20	Average
3	0.301	32.24	-17.98	50.22	31.90	0.14	0.20	Average
4	1.287	24.22	-21.78	46.00	23.72	0.10	0.40	Average
5	3.567	25.23	-20.77	46.00	24.73	0.10	0.40	Average
6	14.341	30.34	-19.66	50.00	29.44	0.20	0.70	Average

3. RADIATED EMISSION TEST

3.1. Test Equipment

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

3.1.1. Semi-Anechoic Chamber

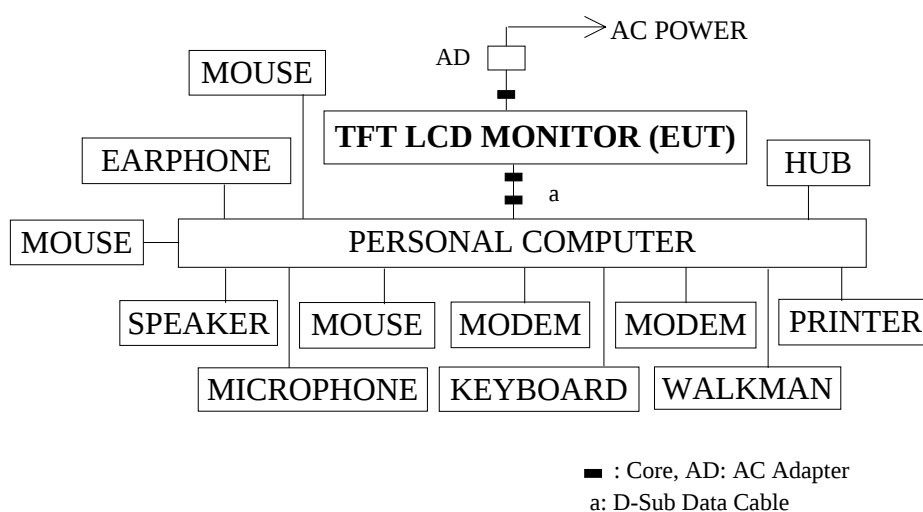
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	HP	8593EM	3826A00272	May 30, 02'	1 Year
2.	Pre-Amplifier	HP	8447D	2944A06305	Mar.05, 02'	1 Year
3.	Computer	--	PC-486	N/A	N/A	NA
4.	Printer	NEC	P5200	603095067	N/A	N/A
5.	Broadband Antenna	Schwarzbeck	BBA 9106	A3L	Jan.08, 02'	1 Year
6.	Broadband Antenna	Schwarzbeck	UHALP9108-A	0139	Jan.08, 02'	1 Year

3.1.2. No. 5 Open Test Site

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	HP	8593EM	3826A00272	May 30, 02'	1 Year
2.	Test Receiver	R&S	ESVS10	849231/017	Dec.20, 01'	1 Year
3.	Computer	TOKIN	586PC	N/A	N/A	NA
4.	Printer	Panasonic	KX-2135	N/A	N/A	N/A
5.	Amplifier	HP	8447D	2944A07185	N/A	N/A
6.	Biconical Antenna	Chase	VBA6106A	1227	Nov.27, 01'	1 Year
7.	Biconical Antenna	Chase	UPA6109	1061	Nov.27, 01'	1 Year

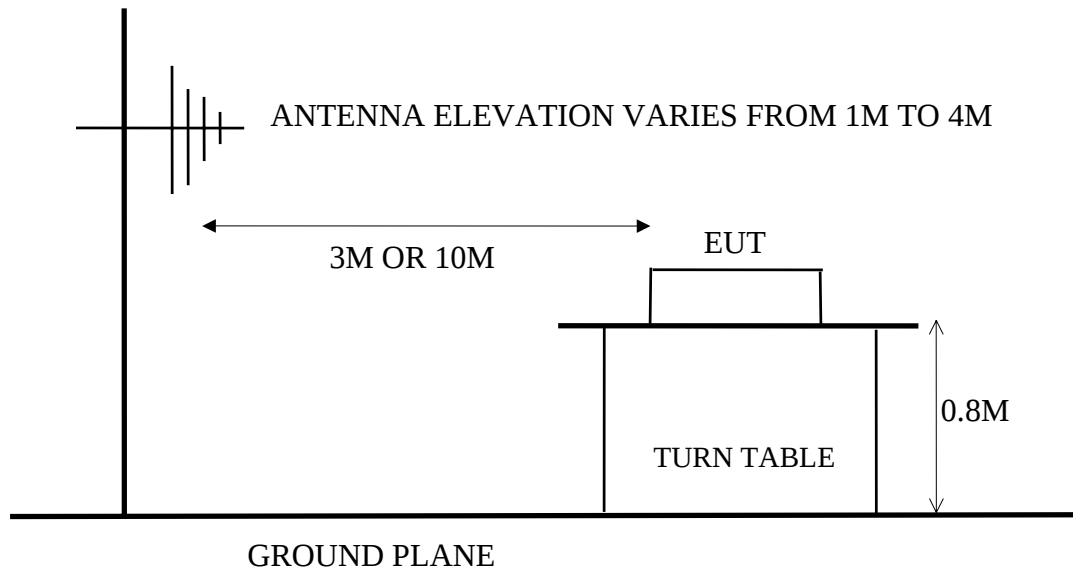
3.2. Block Diagram of Test Setup

3.2.1. Block Diagram of connection between EUT and simulators



3.2.2. Semi-Anechoic Chamber (3M) & Open Field Test Site (10M) Setup Diagram

ANTENNA TOWER



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 (3)	30 (40)
230 ~ 1000	10 (3)	37 (47)

- 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) Inside the () is 3 meters limits.

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 3 or 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.

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

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

The test voltage was AC 120V/60Hz via AC Adapter of EUT.

EUT with three kinds of working frequency were measured within Semi-Anechoic Chamber and all the scanning waveform were attached within Appendix. Which included:

Mode	Resolution
1.	31KHz/640*480, 60Hz
2.	48KHz/800*600, 75Hz
※ 3.	60KHz/1024*768, 75Hz

※ The worst test mode (Mode 3) at No. 5 Open Field Test Site and all the test results are listed in section 3.7.

3.7. Test Results

PASSED. Please refer to the following pages.

3.8. Radiated Emission Measurement Results

The frequency spectrum from 30 MHz to 1000MHz is investigated. All the emissions not report below are too low against the CISPR 22 Class B limits.

Date of Test : Oct. 16, 2002 Temperature : 27°C
 EUT : TFT LCD Monitor Humidity : 61%
 Test Mode : 1024*768/75Hz, 60kHz

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading		Emission Level		Margin dB
			Horizontal dBuV		Horizontal dBuV/m	Limits dBuV/m	
54.624	13.19	0.88	2.68		16.75	30.00	13.25
84.036	14.93	1.03	5.15		21.11	30.00	8.89
113.448	18.68	1.18	2.96		22.82	30.00	7.18
131.268	19.88	1.14	3.17		24.19	30.00	5.81
157.518	20.53	1.42	-1.09		20.86	30.00	9.14
183.768	21.48	1.48	0.43		23.39	30.00	6.61
* 210.019	21.71	1.47	1.93		25.11	30.00	4.89
236.269	22.62	1.67	1.46		25.75	37.00	11.25
262.519	23.03	1.74	0.84		25.61	37.00	11.39
288.769	24.73	1.80	2.03		28.56	37.00	8.44
331.938	15.02	2.01	10.15		27.18	37.00	9.82
399.996	16.96	2.24	12.24		31.44	37.00	5.56
432.082	16.70	2.31	6.61		25.62	37.00	11.38
472.501	18.39	2.37	5.51		26.27	37.00	10.73
551.252	19.84	2.53	2.54		24.91	37.00	12.09
630.002	20.59	2.77	2.33		25.69	37.00	11.31
708.753	21.63	3.05	0.82		25.50	37.00	11.50
787.503	23.72	3.20	1.10		28.02	37.00	8.98
866.254	25.32	3.33	0.71		29.36	37.00	7.64
999.989	25.81	3.53	1.04		30.38	37.00	6.62

- Remark :
1. All reading are Quasi-Peak values.
 2. “*” The worst emission was detected at 210.019MHz with corrected signal level of 25.11dBuV/m (limit was 30dBuV/m) when the antenna was at horizontal polarization and was at 3.8m high and the turn table was at 315°.
 3. 0° is the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

Date of Test : Oct. 16, 2002 Temperature : 27°C

EUT : TFT LCD Monitor Humidity : 61%

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

	Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading		Emission Level	
				Vertical dBuV	Vertical dBuV/m	Limits dBuV/m	Margin dB
	54.625	14.46	0.88	7.79	23.13	30.00	6.87
	84.036	14.58	1.03	8.80	24.41	30.00	5.59
	105.018	16.37	1.13	9.00	26.50	30.00	3.50
*	113.449	17.62	1.18	8.03	26.83	30.00	3.17
	131.268	20.55	1.14	4.09	25.78	30.00	4.22
	157.518	21.62	1.42	- 1.90	21.14	30.00	8.86
	183.768	20.91	1.48	- 0.33	22.06	30.00	7.94
	210.019	22.34	1.47	0.58	24.39	30.00	5.61
	236.269	22.56	1.67	0.63	24.86	37.00	12.14
	262.519	23.79	1.74	0.83	26.36	37.00	10.64
	288.769	24.15	1.80	3.26	29.21	37.00	7.79
	315.138	14.14	1.81	11.84	27.79	37.00	9.21
	323.535	15.17	1.91	10.99	28.07	37.00	8.93
	331.933	15.37	2.01	10.75	28.13	37.00	8.87
	399.996	17.65	2.24	11.99	31.88	37.00	5.12
	432.082	17.35	2.31	5.53	25.19	37.00	11.81
	472.501	19.09	2.37	4.73	26.19	37.00	10.81
	551.252	19.80	2.53	2.22	24.55	37.00	12.45
	630.002	20.94	2.77	1.85	25.56	37.00	11.44
	708.753	21.63	3.05	1.76	26.44	37.00	10.56
	787.503	23.69	3.20	0.96	27.85	37.00	9.15
	866.254	24.49	3.33	0.70	28.52	37.00	8.48
	999.989	25.92	3.53	3.14	32.59	37.00	4.41

- Remark :
1. All reading are Quasi-Peak values.
 2. “*” The worst emission was detected at 113.449MHz with corrected signal level of 26.83dBuV/m (limit was 30dBuV/m) when the antenna was at vertical polarization and was at 1m high and the turn table was at 60° .
 3. 0° is the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

4. MODIFICATIONS TO EUT

1. Added 2pcs ferrite cores on the D-Sub signal cable.
2. Added a ferrite core on the connect wire nearby main board.
3. Added 4pcs ferrite cores on the flexible flat cable.
4. Shielded the flexible flat cable by conductive fabric and pasted aluminum tape.
5. Changed the flexible flat cable from main board below to metal cover below.
6. Changed VGA cable's ground from main board to metal cover.

5. DEVIATION TO TEST SPECIFICATIONS

【NONE】

6. PHOTOGRAPHS

6.1. Photos of Powerline Conducted Measurement



FRONT VIEW OF CONDUCTED TEST

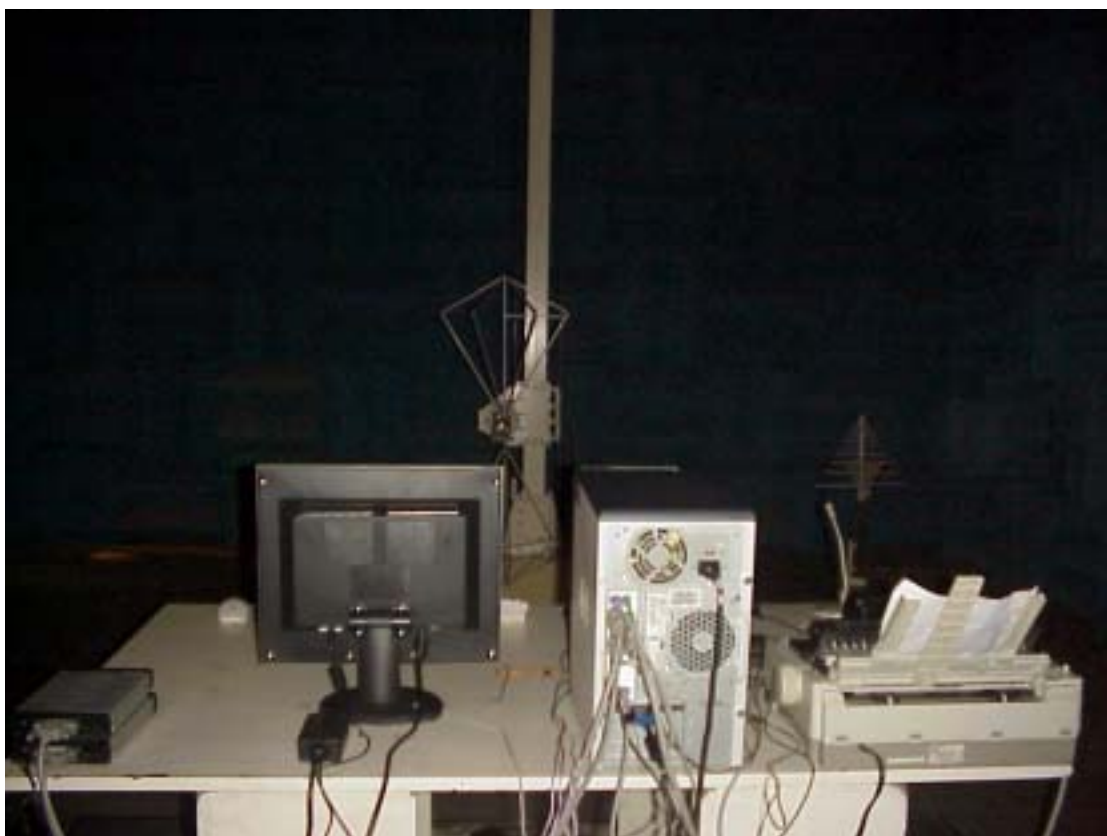


BACK VIEW OF CONDUCTED TEST

6.2. Photos of Radiated Measurement at Semi-Anechoic Chamber



FRONT VIEW OF RADIATED TEST



BACK VIEW OF RADIATED TEST

6.3. Photos of Radiated Measurement at Open Field Test Site

Test Mode : 1024*768/75Hz, 60KHz



FRONT VIEW OF RADIATED TEST



FRONT VIEW OF RADIATED TEST



SETUP WITH MAXIMUM DETECTED EMISSION AT HORIZONTAL POLARIZATION



SETUP WITH MAXIMUM DETECTED EMISSION AT VERTICAL POLARIZATION

APPENDIX

Radiated Test Data at Semi-Anechoic Chamber

(Total Pages: 6 Pages)



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

Data#: 102 File#: D:\Voza.emi



Site : Anechoic Chamber
Condition : CISPR CLASS-B 3m BBA9106(A3L) HORIZONTAL
ENVIRONMENT : 22°C/55%
EUT : TFT LCD MONITOR M/N: B-5
POWER : 120V/60Hz
MEMO : 640*480/60Hz; 31KHz



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Email:ttenc@ttenc.com.tw

Data#: 101 File#: D:\Voza.emi



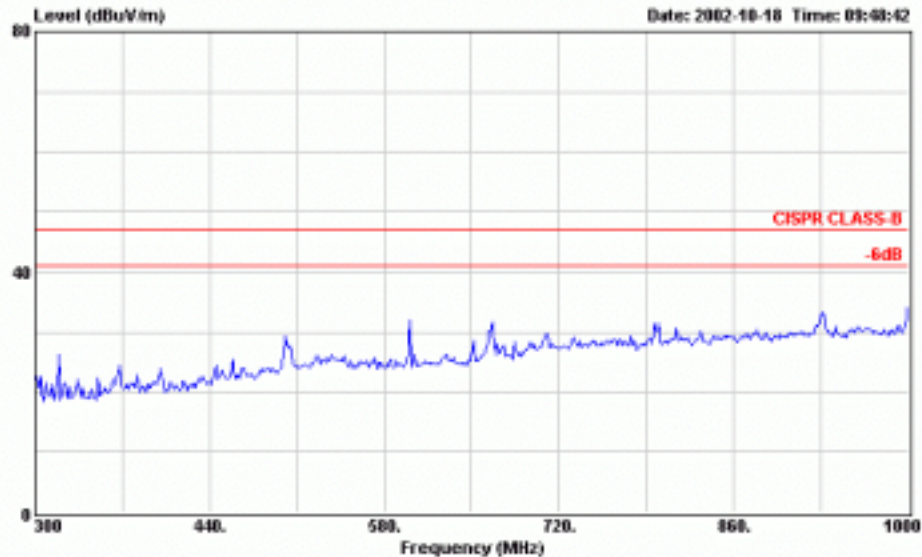
Site : Anechoic Chamber
Condition : CISPR CLASS-B 3m BBA9106(A3L) VERTICAL
ENVIRONMENT : 22°C/55%
EUT : TFT LCD MONITOR M/N: B-5
POWER : 120V/60Hz
MEMO : 640*480/60Hz; 31KHz



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Tel:02-26092133 Fax:02-26099303
Email:ttenc@ttenc.com.tw

Data#: 103 File#: D:\Voza.emi



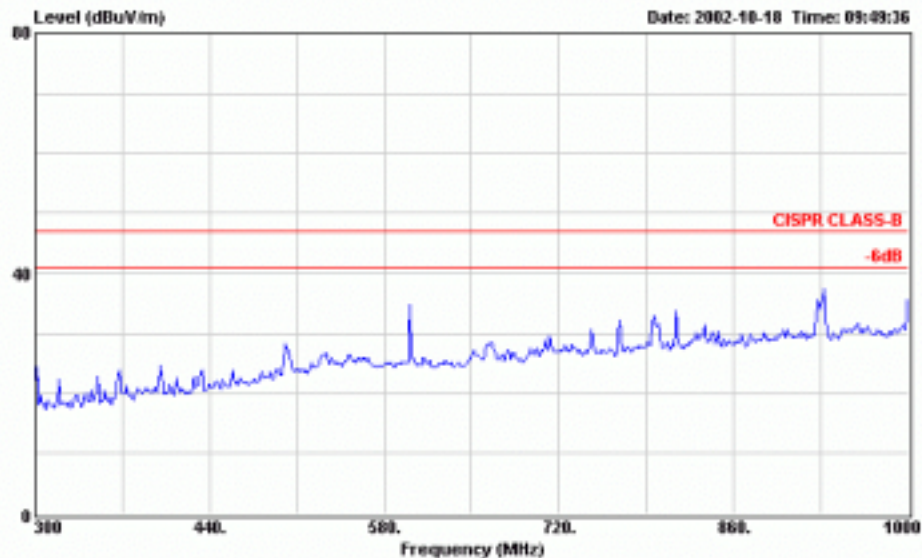
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Condition : CISPR CLASS-B 3m UHALP 9108-A 0138 HORIZONTAL
ENVIRONMENT : 22°C/55%
EUT : TFT LCD MONITOR M/N:E-5
POWER : 120V/60Hz
MEMO : 640*480/60Hz;31KHz



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Data#: 104 File#: D:\Voza.emi



Site : Anechoic Chamber
Condition : CISPR CLASS-B 3m UHALP 9108-A 0138 VERTICAL
ENVIRONMENT : 22°C/55%
EUT : TFT LCD MONITOR M/N:E-5
POWER : 120V/60Hz
MEMO : 640*480/60Hz;31KHz