

APPLICATION FOR CERTIFICATION

On Behalf of  
Colortac Technology Co., Ltd.  
15" LCD Monitor

Model : LM15X

FCC ID : PDU15

Prepared for : Colortac Technology Co., Ltd.  
9F, No. 584, Ray-Guang Road,  
Taipei, Taiwan, R.O.C.

Prepared By : Taiwan Tokin EMC Eng. Corp.  
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File Number : ATM-G01240  
Report Number : TTEMC-F20144  
Date of Test : Dec. 14/16, 2000  
Date of Report : Dec. 22, 2000

# TABLE OF CONTENTS

Description	Page
Test Report Certification .....	3
<b>1.GENERAL INFORMATION .....</b>	<b>4</b>
1.1. Description of Device Under Test (EUT) .....	4
1.2. Details of Support Equipment .....	5
1.3. Description of Test Facility .....	7
<b>2.POWERLINE CONDUCTED TEST .....</b>	<b>8</b>
2.1. Test Equipment .....	8
2.2. Block Diagram of Test Setup .....	8
2.3. Conducted Powerline Emission Limit (CISPR 22, Class B) .....	8
2.4. EUT Configuration on Measurement .....	9
2.5. Operating Condition of EUT .....	9
2.6. Test Procedure .....	10
2.7. Line Conducted RF Voltage Measurement Results .....	10
<b>3.RADIATED EMISSION TEST .....</b>	<b>19</b>
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 Configuration on Measurement .....	20
3.5. Operating Condition of EUT .....	20
3.6. Test Procedure .....	21
3.7. Test Results .....	21
3.8. Radiated Emission Noise Measurement Results .....	22
<b>4.DEVIATION TO TEST SPECIFICATIONS .....</b>	<b>32</b>
<b>5.PHOTOGRAPHS .....</b>	<b>33</b>
5.1. Photos of Powerline Conducted Measurement .....	33
5.2. Photos of Radiated Measurement at Open Field Test Site .....	35
<b>APPENDIX I (CONDUCTED TEST DATA) .....</b>	<b>39</b>

# TEST REPORT CERTIFICATION

Applicant : Colortac Technology Co., Ltd.  
Manufacturer : Colortac Technology Co., Ltd.  
EUT Description : 15" LCD Monitor  
FCC ID : PDU15  
(A) MODEL NO. : LM15X  
(B) SERIAL NO. : N/A  
(C) POWER SUPPLY : AC 120V/60Hz

## Measurement Procedure Used:


FCC RULES AND CISPR 22 (DOCKET NO. 92-152, SEP. 1993) AND  
FCC / ANSI C63.4-1992  
(FCC Part 15/1999 and CISPR 22/1998)

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 compliant 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 : Dec. 14/16, 2000

Prepared by :   
(CHERRY WANG)

Test Engineer :   
(ALLEN WANG)

Approve & Authorized Signer :   
(JACKIE DENG)

# 1. GENERAL INFORMATION

## 1.1. Description of Device Under Test (EUT)

Description	:	15" LCD Monitor
Model Number	:	LM15X (The "X" is alphabet suffix A to Z, which are to separate the color and base of case)
FCC ID	:	PDU15
Applicant	:	Colortac Technology Co., Ltd.  9F, No. 584, Ray-Guang Road, Taipei, Taiwan, R.O.C.
Manufacturer	:	Colortac Technology Co., Ltd.  9F, No. 584, Ray-Guang Road, Taipei, Taiwan, R.O.C.
LCD Panel	:	P/N: EDTCF02 [M] EDTCF05QDF Made in Japan.
D-Sub VGA Data Cable	:	Shielded, Detachable, 1.5m Bonded two ferrite cores
S-Video Data Cable	:	Non-Shielded, Detachable, 1.8m
AV Data Cable	:	Non-Shielded, Detachable, 1.5m
AC Adapter	:	LINEARITY, M/N LAD4212B I/P: 100-240Vac 1.5A 50-60Hz O/P: DC 12V, 3.5A O/P Cord: Non-Shielded, Undetachable, 1.9m Bonded two ferrite cores
Power Cord (AC IN)	:	Non-Shielded, Detachable, 1.8m
Date of Receipt of Sample	:	Nov. 29, 2000
Date of Test	:	Dec. 14/16, 2000

## 1.2. Details of Support Equipment

### 1.2.1. PERSONAL COMPUTER

Mother Board	:	ASUS(Intel 815), M/N CUSL2, S/N 07Z7Y31475, FCC by DoC
CPU	:	Intel Pentium III 667MHz
RAM	:	128MB (PC-133)
Case	:	Enlight, M/N EN-7105A
S.P.S.	:	FSP, M/N FSP250-60PFN S/N S00769632, BSMI ID. 3892B514
Floppy Driver 3.5"	:	Mitsumi, M/N D353M3, S/N 0G04JT1209
Hard Disk Driver	:	Seagate, M/N ST34321A S/N VT193713
CD-ROM	:	A Open, M/N 952E/AKH (52X) S/N 001120WG28-12
VGA Card	:	CP, M/N CM64A, S/N C05E168246 FCC by DoC
Power Cord	:	Non-Shielded, Detachable, 1.8m

### 1.2.2. KEYBOARD

Model Number	:	5121
Serial Number	:	J83300812
FCC ID	:	E5XKBM104M10UC
Manufacturer	:	BTC
Data Cable	:	Shielded, Undetachable, 1m

### 1.2.3. PRINTER

Model Number	:	2225C
Serial Number	:	2526S40437
FCC ID	:	BS46XU2225C
Manufacturer	:	Hewlett Packard
Power Cord	:	Non-Shielded, Undetachable, 1.8m
Data Cable	:	Shielded, Detachable, 1.2m

### 1.2.4. MODEM

Model Number	:	DM-1414
Serial Number	:	980034389
FCC ID	:	IFAXDM1414
Manufacturer	:	Accex
Data Cable	:	Shielded, Detachable, 1.2m
Power Adapter	:	Amigo, M/N AM-91000A Non-Shielded, Undetachable, 1.8m

## 1.2.5. PS2 MOUSE

Model Number	:	M-S35
Serial Number	:	LZA82103154
FCC ID	:	DZL211029
Manufacturer	:	Logitech
BSMI ID	:	4862A011
Data Cable	:	Non-Shielded, Undetachable, 1.8m

## 1.2.6. USB MOUSE #1

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. USB MOUSE #2

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

## 1.2.8. WALKMAN (LINK TO EUT)

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

## 1.2.9. EARPHONE #1 (LINK TO EUT)

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

## 1.2.10. EARPHONE #2

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

## 1.2.11. DVD PLAYER (LINK TO EUT)

Model Number	:	DV-S6D
Serial Number	:	TLKR003935TA
Manufacturer	:	Pioneer
Power Cord	:	Non-Shielded, Detachable, 1.8m

### 1.3. Description of Test Facility

Site Description (No. 6 Open Site)	:	Aug. 10, 2000 File on Federal Communication Commission FCC Engineering Laboratory 7435 Oakland Mills Road Columbia, MD 21046, U.S.A.
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

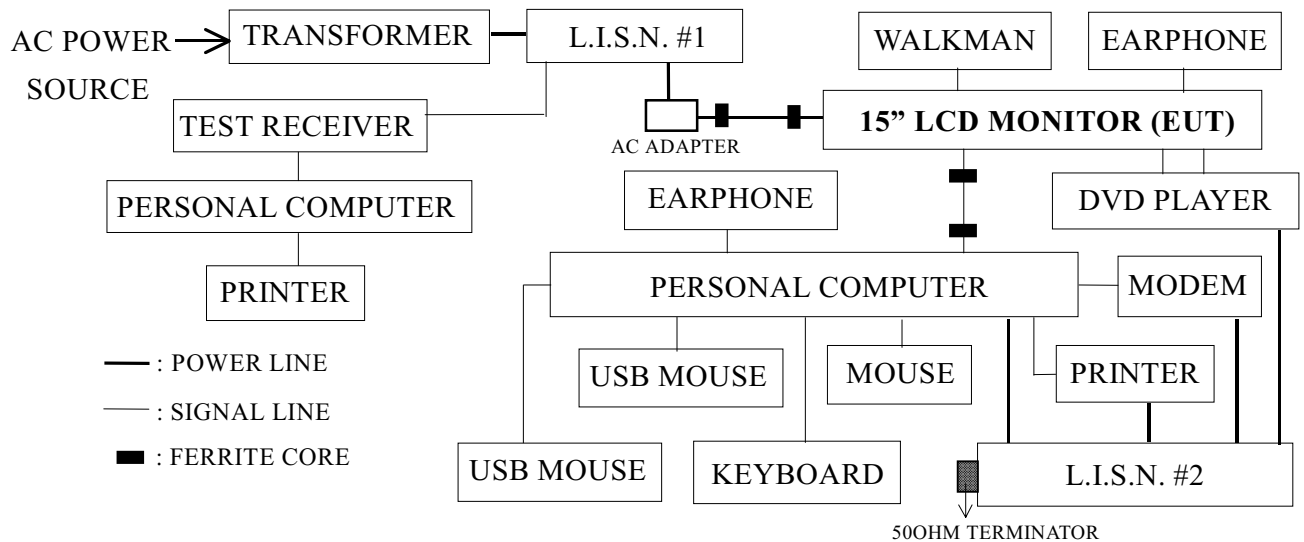
## 2. POWERLINE CONDUCTED TEST

### 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.	Test Receiver	Rohde & Schwarz	ESCS 30	825442/020	Jun. 27, 00'	1 Year
2.	L.I.S.N. #1	Kyoritsu	KNW-407	8-1370-10	May 31, 00'	1 Year
3.	L.I.S.N. #2	Kyoritsu	KNW-407	8-1370-9	May 31, 00'	1 Year

### 2.2. Block Diagram of Test Setup



### 2.3. Conducted Powerline 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 Configuration on 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. 15" LCD Monitor (EUT)

Model Number	:	LM15X
Serial Number	:	N/A
FCC ID	:	PDU15
Manufacturer	:	Colortac Technology Co., Ltd.
LCD Panel	:	P/N: EDTCF02 [M] EDTCF05QDF Made in Japan.
D-Sub VGA Data Cable	:	Shielded, Detachable, 1.5m Bonded two ferrite cores
S-Video Data Cable	:	Non-Shielded, Detachable, 1.8m
AV Data Cable	:	Non-Shielded, Detachable, 1.5m
AC Adapter	:	LINEARITY, M/N LAD4212B I/P: 100-240Vac 1.5A 50-60Hz O/P: DC 12V, 3.5A O/P Cord: Non-Shielded, Undetachable, 1.9m Bonded two ferrite cores
Power Cord (AC IN)	:	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-Win" and sent "H" character to LCD Monitor (EUT) via D-Sub VGA Data Cable, the screen of LCD Monitor (EUT) displayed and filled with "H" pattern by EUT's resolution.
- 2.5.5. The DVD Player played a DVD-Disk and sent the image to LCD Monitor (EUT) via AV or S-Video Data Cable, the screen of LCD Monitor (EUT) displayed image by 15KHz/60Hz working frequency.
- 2.5.6. The other peripheral devices were drove and operated in turn during all testing.
- 2.5.7. Repeat the above procedures 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). The other peripheral devices power cord 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 during conducted measurement.

The bandwidth of the R&S Test Receiver ESCS 30 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.

EUT : 15" LCD Monitor M/N : LM15X

Test Date : Dec. 16, 2000 Temperature : 23°C Humidity : 59%

EUT with five kinds of test modes were investigated during prescanning and report the **two worst test modes (Mode 3 、 5)** in section 2.7., the others test data are attached within Appendix I. The detail of test modes and reference test data # are as follows:

Test Modes		Reference Data #
1.	38KHz, 640*480/75Hz, D-Sub Data Cable	# 45 ; # 46.
2.	47KHz, 800*600/75Hz, D-Sub Data Cable	# 44 ; # 43.
3.	<b>60KHz, 1024*768/75Hz, D-Sub Data Cable</b>	<b># 37, (38, 39) ; # 40, (41, 42).</b>
4.	15KHz, 60Hz, AV Data Cable	# 48 ; # 47.
5.	<b>15KHz, 60Hz, S-Video Data Cable</b>	<b># 49, (50, 51) ; # 52, (53, 54).</b>

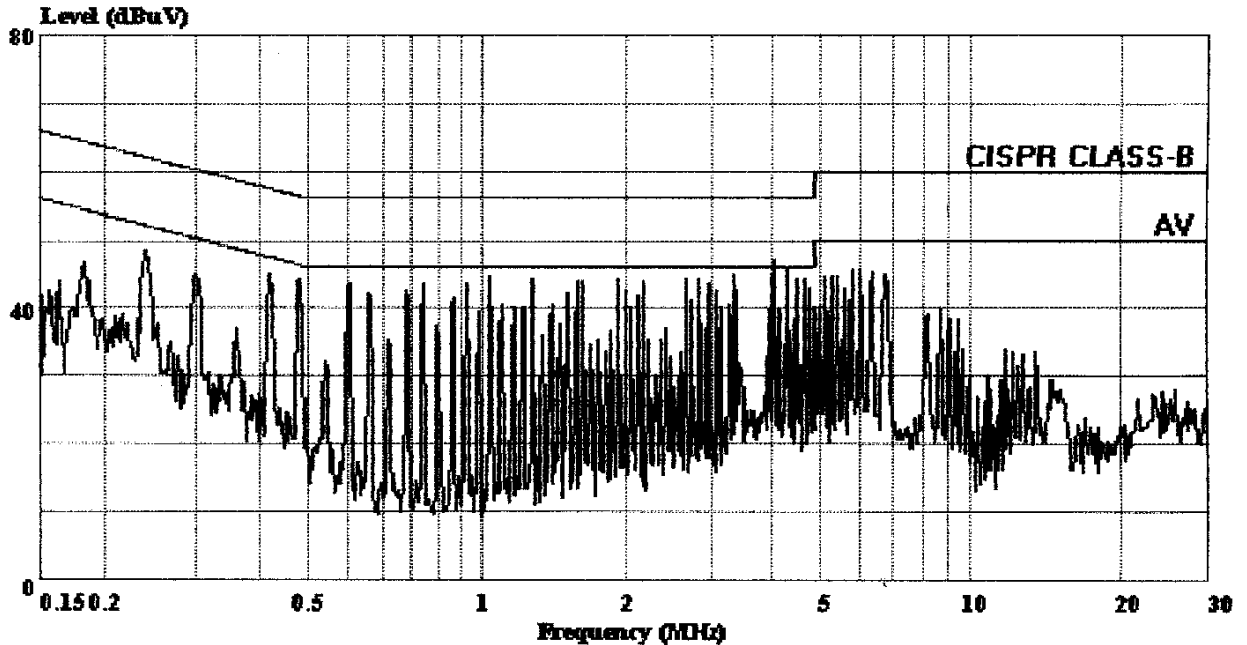
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TAIWAN TOKIN EMC ENG. CORP.

Data#: 37 File#: 彩華.EMI

Date: 2000-12-16 Time: 11:35:34



TAIWAN TOKIN EMC ENG. CORP. (S/R 3)

Trace:

Ref Trace:

Condition: CISPR CLASS-B KRW-407(FCC) LINE

EUT : 15"LCD MONITOR M/N:LM15X

Power: 120Vac/60Hz

Memo : 1024\*768/75Hz;60KHz

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TAIWAN TOKIN EMC ENG. CORP.

Data#: 38 File#: 彩華.EMI  
 S/R 3

Date: 2000-12-16 Time: 11:37:29

Condition: CISPR CLASS-B KNW-407(FCC) LINE  
 EUT : 15"LCD MONITOR M/N:LM15X  
 Power: 120Vac/60Hz  
 Memo : 1024\*768/75Hz;60KHz

Page: 1

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	dB	
1	0.242	47.25	-14.79	62.04	46.75	0.30	0.20	0.00	QP
2	0.481	42.80	-13.52	56.32	42.30	0.30	0.20	0.00	QP
3	1.146	43.82	-12.18	56.00	43.12	0.30	0.40	0.00	QP
4	2.049	43.92	-12.08	56.00	43.22	0.30	0.40	0.00	QP
5	4.160	45.82	-10.18	56.00	44.92	0.30	0.60	0.00	QP
6	5.908	44.13	-15.87	60.00	43.23	0.30	0.60	0.00	QP

Data#: 39 File#: 彩華.EMI  
 S/R 3

Date: 2000-12-16 Time: 11:37:52

Condition: CISPR CLASS-B (AV) KNW-407(FCC) LINE  
 EUT : 15"LCD MONITOR M/N:LM15X  
 Power: 120Vac/60Hz  
 Memo : 1024\*768/75Hz;60KHz

Page: 1

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	dB	
1 !	0.242	45.26	-6.78	52.04	44.76	0.30	0.20	0.00	Average
2 !	0.481	42.17	-4.15	46.32	41.67	0.30	0.20	0.00	Average
3 !	1.146	43.67	-2.33	46.00	42.97	0.30	0.40	0.00	Average
4 !	2.049	43.32	-2.68	46.00	42.62	0.30	0.40	0.00	Average
5 !	4.160	42.48	-3.52	46.00	41.58	0.30	0.60	0.00	Average
6 !	5.908	41.74	-8.26	50.00	40.84	0.30	0.60	0.00	Average

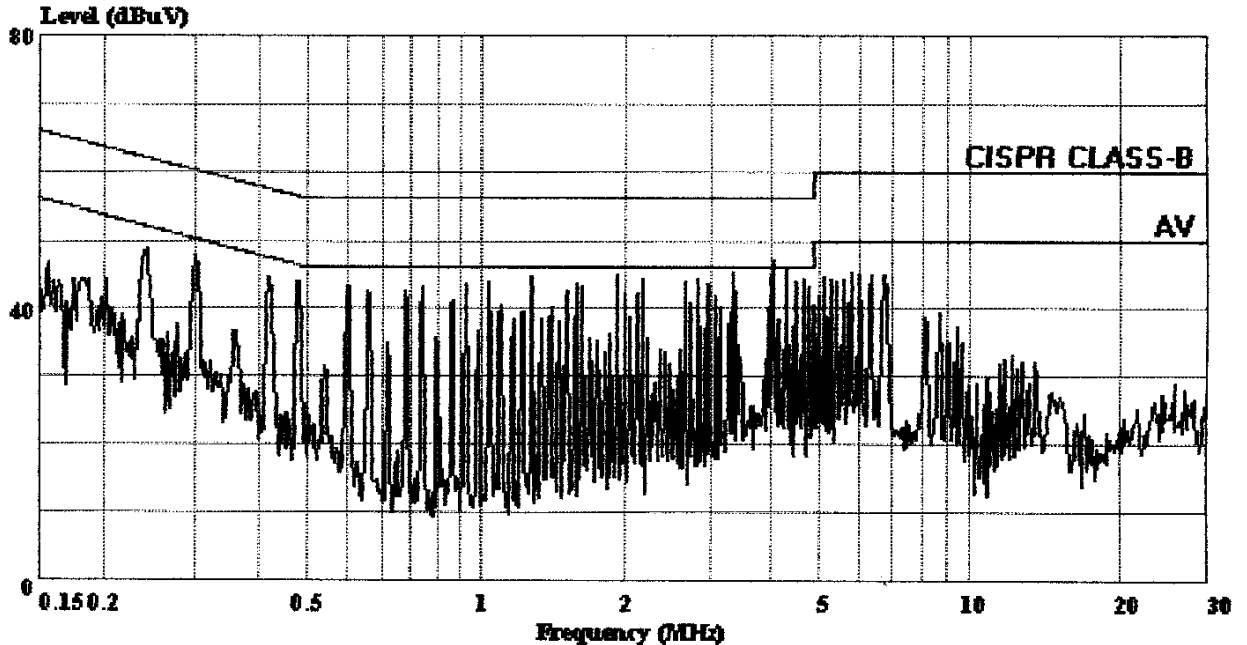
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TAIWAN TOKIN EMC ENG. CORP.

Data#: 40 File#: 彩華.EMI

Date: 2000-12-16 Time: 11:38:50



TAIWAN TOKIN EMC ENG. CORP. (S/R 3)

Trace:

Ref Trace:

Condition: CISPR CLASS-B KNW-407(FCC) NEUTRAL

EUT : 15"LCD MONITOR M/N:LM15X

Power: 120Vac/60Hz

Memo : 1024\*768/75Hz;60KHz

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TAIWAN TOKIN EMC ENG. CORP.

Data#: 41 File#: 彩華.EMI  
 S/R 3

Date: 2000-12-16 Time: 11:40:38

Condition: CISPR CLASS-B KNW-407(FCC) NEUTRAL  
 EUT : 15"LCD MONITOR M/N:LM15X  
 Power: 120Vac/60Hz  
 Memo : 1024\*768/75Hz;60KHz

Page: 1

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	dB	
1	0.242	47.19	-14.84	62.03	46.69	0.30	0.20	0.00	QP
2	0.602	43.16	-12.84	56.00	42.66	0.30	0.20	0.00	QP
3	1.388	43.32	-12.68	56.00	42.62	0.30	0.40	0.00	QP
4	2.050	43.98	-12.02	56.00	43.28	0.30	0.40	0.00	QP
5	4.161	45.25	-10.75	56.00	44.35	0.30	0.60	0.00	QP
6	6.450	43.50	-16.50	60.00	42.60	0.30	0.60	0.00	QP

Data#: 42 File#: 彩華.EMI  
 S/R 3

Date: 2000-12-16 Time: 11:40:59

Condition: CISPR CLASS-B (AV) KNW-407(FCC) NEUTRAL  
 EUT : 15"LCD MONITOR M/N:LM15X  
 Power: 120Vac/60Hz  
 Memo : 1024\*768/75Hz;60KHz

Page: 1

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	dB	
1 !	0.242	45.63	-6.40	52.03	45.13	0.30	0.20	0.00	Average
2 !	0.602	43.27	-2.73	46.00	42.77	0.30	0.20	0.00	Average
3 !	1.388	39.99	-6.01	46.00	39.29	0.30	0.40	0.00	Average
4 !	2.050	43.37	-2.63	46.00	42.67	0.30	0.40	0.00	Average
5 !	4.161	40.99	-5.01	46.00	40.09	0.30	0.60	0.00	Average
6 !	6.450	41.07	-8.93	50.00	40.17	0.30	0.60	0.00	Average

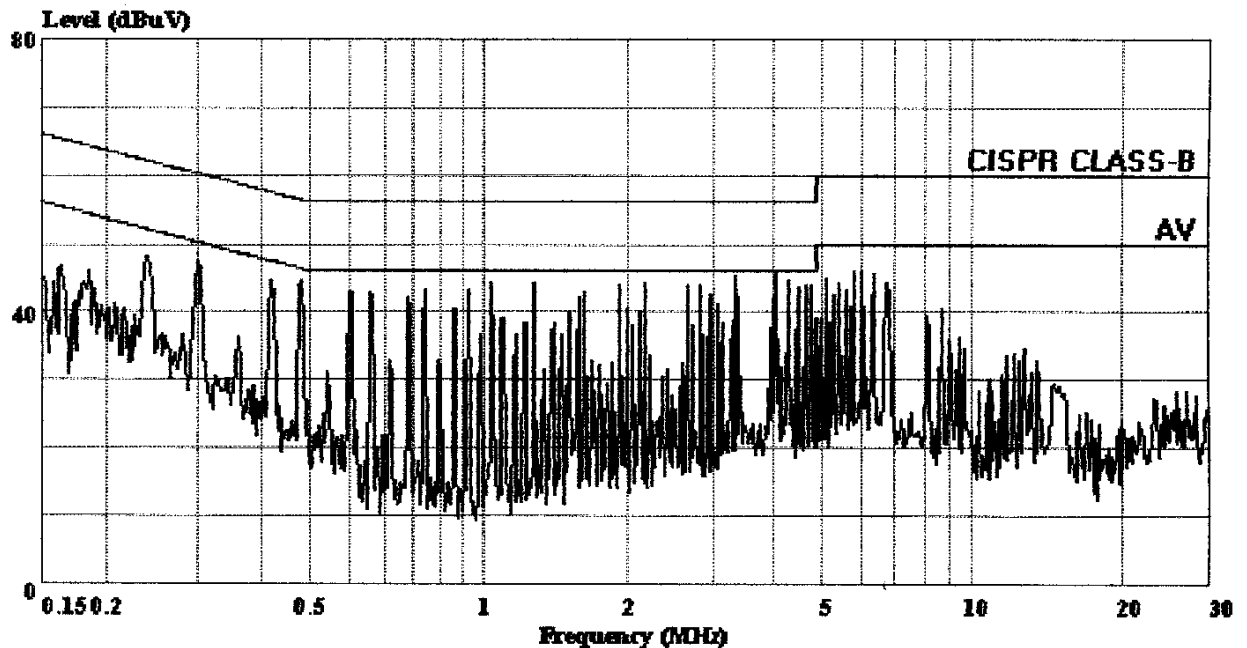
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TAIWAN TOKIN EMC ENG. CORP.

Data#: 49 File#: 彩華.EMI

Date: 2000-12-16 Time: 11:50:06



TAIWAN TOKIN EMC ENG. CORP. (S/R 3)

Trace:

Ref Trace:

Condition: CISPR CLASS-B KRW-407(FCC) LINE

EUT : 15"LCD MONITOR M/N:LM15X

Power: 120Vac/60Hz

Memo : S IN;60Hz/15KHz

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TAIWAN TOKIN EMC ENG. CORP.

Data#: 50 File#: 彩華.EMI  
 S/R 3

Date: 2000-12-16 Time: 11:52:59

Condition: CISPR CLASS-B KNW-407(FCC) LINE  
 EUT : 15"LCD MONITOR M/N:LM15X  
 Power: 120Vac/60Hz  
 Memo : S IN;60Hz/15KHz

Page: 1

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	dB	
1	0.300	45.76	-14.48	60.24	45.26	0.30	0.20	0.00	QP
2	0.481	43.12	-13.20	56.32	42.62	0.30	0.20	0.00	QP
3	1.146	43.44	-12.56	56.00	42.74	0.30	0.40	0.00	QP
4	3.436	44.43	-11.57	56.00	43.73	0.30	0.40	0.00	QP
5	4.159	45.90	-10.10	56.00	45.00	0.30	0.60	0.00	QP
6	5.908	44.88	-15.12	60.00	43.98	0.30	0.60	0.00	QP

Data#: 51 File#: 彩華.EMI Date: 2000-12-16 Time: 11:53:25  
 S/R 3

Condition: CISPR CLASS-B (AV) KNW-407(FCC) LINE  
 EUT : 15"LCD MONITOR M/N:LM15X  
 Power: 120Vac/60Hz  
 Memo : S IN;60Hz/15KHz

Page: 1

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	dB	
1 !	0.300	43.91	-6.33	50.24	43.41	0.30	0.20	0.00	Average
2 !	0.481	42.88	-3.44	46.32	42.38	0.30	0.20	0.00	Average
3 !	1.146	43.49	-2.51	46.00	42.79	0.30	0.40	0.00	Average
4 !	3.436	39.56	-6.44	46.00	38.86	0.30	0.40	0.00	Average
5 !	4.157	41.14	-4.86	46.00	40.24	0.30	0.60	0.00	Average
6 !	5.906	41.68	-8.32	50.00	40.78	0.30	0.60	0.00	Average



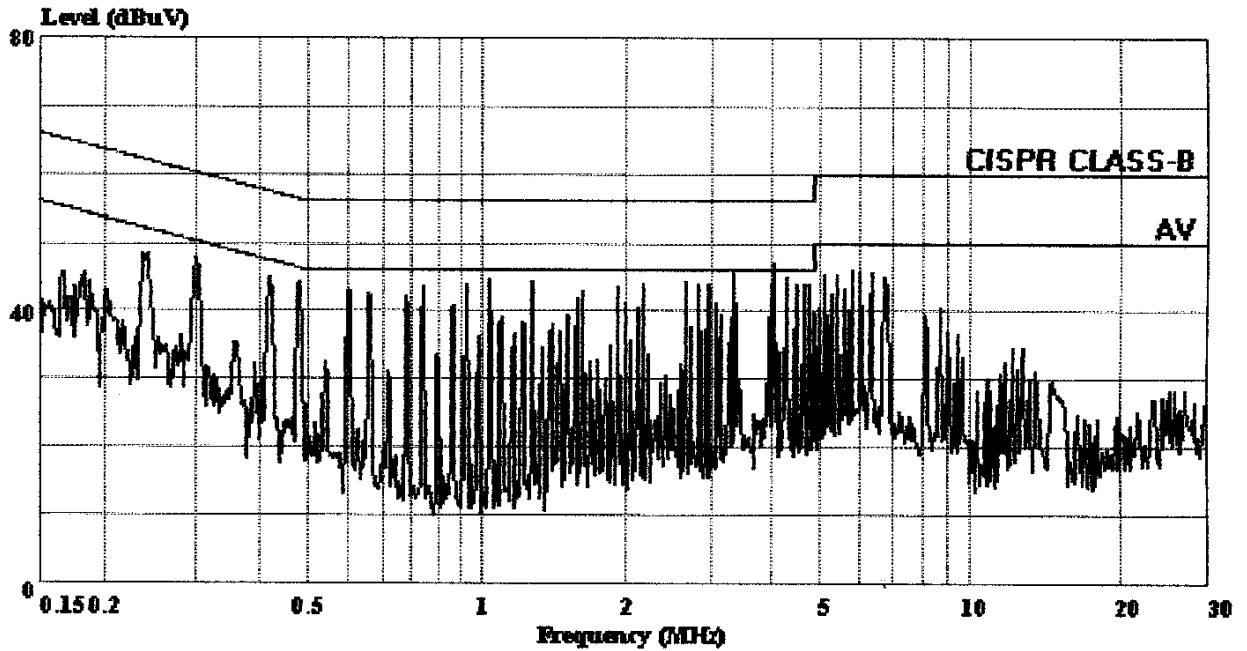
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TAIWAN TOKIN EMC ENG. CORP.

Data#: 52 File#: 彩華.EMI

Date: 2000-12-16 Time: 11:54:47



TAIWAN TOKIN EMC ENG. CORP. (S/R 3)

Trace:

Ref Trace:

Condition: CISPR CLASS-B KRW-407(FCC) NEUTRAL

EUT : 15"LCD MONITOR M/N:LM15X

Power: 120Vac/60Hz

Memo : S IN;60Hz/15KHz

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 Fax:(02)2609-9303

TAIWAN TOKIN EMC ENG. CORP.

Data#: 53 File#: 彩華.EMI  
 S/R 3

Date: 2000-12-16 Time: 11:57:02

Condition: CISPR CLASS-B KNW-407(FCC) NEUTRAL  
 EUT : 15"LCD MONITOR M/N:LM15X  
 Power: 120Vac/60Hz  
 Memo : S IN;60Hz/15KHz

Page: 1

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	dB	
1	0.301	46.18	-14.02	60.20	45.68	0.30	0.20	0.00	QP
2	0.483	43.58	-12.70	56.28	43.08	0.30	0.20	0.00	QP
3	1.146	43.28	-12.72	56.00	42.58	0.30	0.40	0.00	QP
4	3.436	43.96	-12.04	56.00	43.26	0.30	0.40	0.00	QP
5	4.159	45.90	-10.10	56.00	45.00	0.30	0.60	0.00	QP
6	5.908	44.74	-15.26	60.00	43.84	0.30	0.60	0.00	QP

Data#: 54 File#: 彩華.EMI Date: 2000-12-16 Time: 11:57:31  
 S/R 3

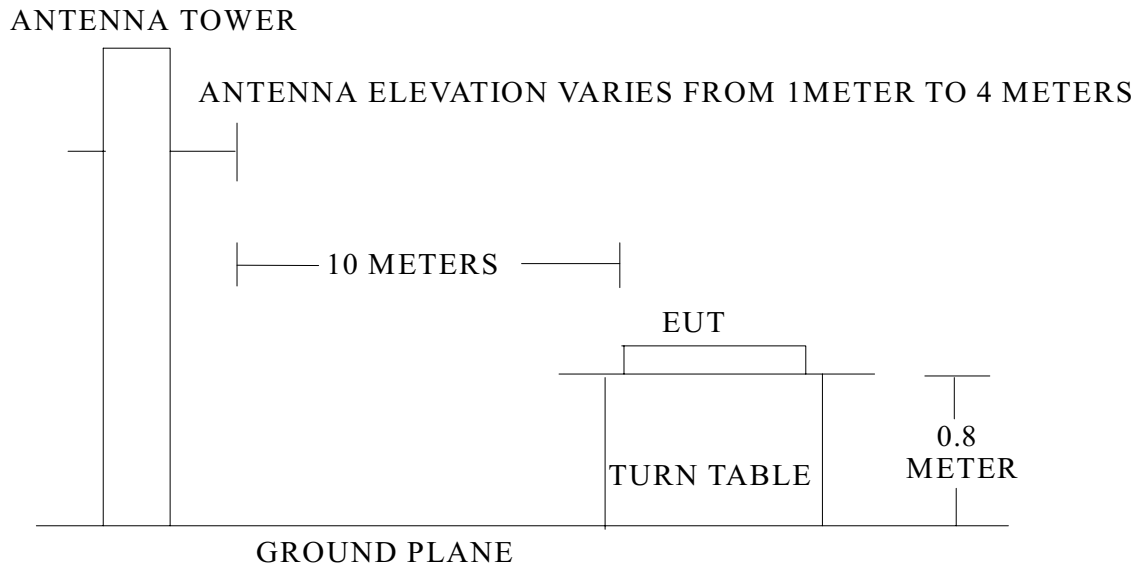
Condition: CISPR CLASS-B (AV) KNW-407(FCC) NEUTRAL  
 EUT : 15"LCD MONITOR M/N:LM15X  
 Power: 120Vac/60Hz  
 Memo : S IN;60Hz/15KHz

Page: 1

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	dB	
1 !	0.301	44.35	-5.85	50.20	43.85	0.30	0.20	0.00	Average
2 !	0.483	43.12	-3.16	46.28	42.62	0.30	0.20	0.00	Average
3 !	1.146	42.88	-3.12	46.00	42.18	0.30	0.40	0.00	Average
4 !	3.436	38.86	-7.14	46.00	38.16	0.30	0.40	0.00	Average
5 !	4.159	42.08	-3.92	46.00	41.18	0.30	0.60	0.00	Average
6 !	5.908	40.69	-9.31	50.00	39.79	0.30	0.60	0.00	Average



### 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 shall apply 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 Configuration on Measurement

The configuration of EUT and its simulators were the 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.

### 3.6. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 10 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can move 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 are used as receiving antenna. Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4-1992 on radiated measurement.

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

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

EUT with five kinds of test modes were done during radiated measurement and all the test results are listed in section 3.8. The details of test modes are as follows:

Test Modes	
1.	38KHz, 640*480/75Hz, D-Sub Data Cable
2.	47KHz, 800*600/75Hz, D-Sub Data Cable
3.	60KHz, 1024*768/75Hz, D-Sub Data Cable
4.	15KHz, 60Hz, AV Data Cable
5.	15KHz, 60Hz, S-Video Data Cable

### 3.7. Test Results

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

### 3.8. Radiated Emission Noise Measurement Results

All the emissions not report below are against the EN55022 (CISPR Pub.22, class B) limit.

Date of Test : Dec. 14, 2000 Temperature : 24.3°C  
 EUT : 15" LCD Monitor Humidity : 67%  
 Test Mode : 38KHz, 640\*480/75Hz, D-Sub Data Cable

Frequency MHz	Antenna	Cable	Meter Reading		Emission Level		Margin dB
	Factor dB/m	Loss dB	Horizontal dBμV	Horizontal dBμV/m	Limits dBμV/m		
36.020	20.32	1.58	- 5.50	16.40	30.00	13.60	
54.153	14.09	1.74	1.80	17.63	30.00	12.37	
72.006	12.69	1.86	4.41	18.96	30.00	11.04	
120.025	19.23	2.01	- 2.90	18.34	30.00	11.66	
143.997	20.46	2.58	1.30	24.34	30.00	5.66	
180.004	20.94	2.75	2.40	26.09	30.00	3.91	
216.004	21.51	3.09	- 0.50	24.10	30.00	5.90	
252.034	22.75	3.50	- 1.30	24.95	37.00	12.05	
324.008	13.80	4.15	9.50	27.45	37.00	9.55	
360.006	14.43	4.48	8.50	27.41	37.00	9.59	
378.047	14.67	4.21	5.69	24.57	37.00	12.43	
441.056	16.31	4.98	3.10	24.39	37.00	12.61	
540.055	17.78	5.47	4.90	28.15	37.00	8.85	
612.045	20.10	6.23	- 1.01	25.32	37.00	11.68	
810.059	22.79	7.13	- 4.49	25.43	37.00	11.57	

Remark : 1. All reading are Quasi-Peak values.

Date of Test : Dec. 14, 2000 Temperature : 24.3°C  
 EUT : 15" LCD Monitor Humidity : 67%  
 Test Mode : 38KHz, 640\*480/75Hz, D-Sub Data Cable

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Vertical dBμV	Emission Level Vertical dBμV/m	Limits dBμV/m	Margin dB
36.007	20.51	1.58	- 0.69	21.40	30.00	8.60
58.486	13.35	1.70	4.30	19.35	30.00	10.65
72.010	12.75	1.86	7.41	22.02	30.00	7.98
126.017	18.80	2.12	- 3.00	17.92	30.00	12.08
144.009	20.41	2.58	4.40	27.39	30.00	2.61
180.010	22.44	2.75	- 0.70	24.49	30.00	5.51
216.013	22.29	3.09	0.50	25.88	30.00	4.12
252.008	22.42	3.50	1.20	27.12	37.00	9.88
324.011	13.84	4.15	6.20	24.19	37.00	12.81
360.399	15.10	4.48	7.30	26.88	37.00	10.12
432.041	16.30	4.80	3.90	25.00	37.00	12.00
468.056	16.95	5.08	3.60	25.63	37.00	11.37
558.056	18.79	5.64	- 2.00	22.43	37.00	14.57
675.058	20.78	6.59	- 4.50	22.87	37.00	14.13
756.056	22.12	6.85	- 3.90	25.07	37.00	11.93

Remark : 1. All reading are Quasi-Peak values.

Date of Test : Dec. 14, 2000 Temperature : 24.3°C

EUT : 15" LCD Monitor Humidity : 67%

Test Mode : 47KHz, 800\*600/75Hz, D-Sub Data Cable

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading		Emission Level		Margin dB
			Horizontal dBμV		Horizontal dBμV/m	Limits dBμV/m	
36.726	20.32	1.59	- 5.80		16.11	30.00	13.89
54.708	13.85	1.74	1.90		17.49	30.00	12.51
72.027	12.69	1.86	4.11		18.66	30.00	11.34
117.072	19.00	1.96	- 3.90		17.06	30.00	12.94
144.069	20.46	2.58	- 3.00		20.04	30.00	9.96
180.080	20.94	2.75	2.10		25.79	30.00	4.21
197.755	21.33	3.05	- 1.80		22.58	30.00	7.42
216.066	21.51	3.09	0.00		24.60	30.00	5.40
252.057	22.75	3.50	- 1.80		24.45	37.00	12.55
311.865	13.45	4.05	10.59		28.09	37.00	8.91
360.131	14.43	4.48	7.10		26.01	37.00	10.99
432.132	16.06	4.77	2.60		23.43	37.00	13.57
522.138	17.46	5.39	- 0.60		22.25	37.00	14.75
576.253	19.19	5.89	1.30		26.38	37.00	10.62
612.256	20.10	6.23	- 1.11		25.22	37.00	11.78
738.203	21.30	6.76	- 3.40		24.66	37.00	12.34

Remark : 1. All readings are Quasi-Peak values.



Date of Test : Dec. 14, 2000 Temperature : 24.3°C  
 EUT : 15" LCD Monitor Humidity : 67%  
 Test Mode : 47KHz, 800\*600/75Hz, D-Sub Data Cable

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Vertical dBμV	Emission Level Vertical dBμV/m	Limits dBμV/m	Margin dB
37.417	19.69	1.59	- 0.70	20.58	30.00	9.42
58.025	13.47	1.70	6.40	21.57	30.00	8.43
72.031	12.75	1.86	6.61	21.22	30.00	8.78
144.079	20.41	2.58	2.20	25.19	30.00	4.81
180.082	22.44	2.75	0.20	25.39	30.00	4.61
197.999	23.24	3.05	- 1.00	25.29	30.00	4.71
216.013	22.29	3.09	0.30	25.68	30.00	4.32
252.087	22.42	3.50	0.40	26.32	37.00	10.68
311.865	13.45	4.05	14.99	32.49	37.00	4.51
360.145	15.09	4.48	12.10	31.67	37.00	5.33
432.146	16.33	4.77	3.80	24.90	37.00	12.10
540.149	18.09	5.47	- 0.10	23.46	37.00	13.54
576.156	19.03	5.89	- 1.50	23.42	37.00	13.58
648.155	20.02	6.43	- 4.80	21.65	37.00	15.35
747.156	21.86	6.78	- 3.20	25.44	37.00	11.56

Remark : 1. All readings are Quasi-Peak values.

Date of Test : Dec. 14, 2000 Temperature : 24.3°C

EUT : 15" LCD Monitor Humidity : 67%

Test Mode : 60KHz, 1024\*768/75Hz, D-Sub Data Cable

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading		Emission Level		Margin dB
			Horizontal dBμV	Horizontal dBμV/m	Limits dBμV/m		
36.019	20.32	1.58	- 3.70	18.20	30.00		11.80
54.021	14.12	1.74	4.50	20.36	30.00		9.64
72.022	12.69	1.86	9.11	23.66	30.00		6.34
126.059	19.93	2.12	3.10	25.15	30.00		4.85
162.056	20.73	2.67	1.40	24.80	30.00		5.20
180.055	20.94	2.75	2.00	25.69	30.00		4.31
* 198.051	<b>21.33</b>	<b>3.05</b>	<b>3.40</b>	<b>27.78</b>	<b>30.00</b>		<b>2.22</b>
216.087	21.51	3.09	2.20	26.80	30.00		3.20
252.029	22.75	3.50	- 3.00	23.25	37.00		13.75
315.039	13.50	4.04	13.30	30.84	37.00		6.16
393.799	15.12	4.15	8.70	27.97	37.00		9.03
472.558	16.65	5.02	7.00	28.67	37.00		8.33
531.632	17.62	5.48	8.80	31.90	37.00		5.10
590.701	19.56	5.95	7.00	32.51	37.00		4.49
787.598	22.06	7.10	2.50	31.66	37.00		5.34
866.362	22.67	7.45	1.70	31.82	37.00		5.18

- Remark :
1. All readings are Quasi-Peak values.
  2. The worst emission was detected at 198.051MHz with corrected signal level of 27.78dBμV/m (limit is 30dBμV/m) when the antenna was at horizontal polarization and was at 4m high and the turn table was at 220° .
  3. 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

Date of Test : Dec. 14, 2000 Temperature : 24.3°C

EUT : 15" LCD Monitor Humidity : 67%

Test Mode : 60KHz, 1024\*768/75Hz, D-Sub Data Cable

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Vertical dBμV	Emission Level Vertical dBμV/m	Limits dBμV/m	Margin dB
36.057	20.51	1.58	0.61	22.70	30.00	7.30
54.062	15.15	1.74	8.90	25.79	30.00	4.21
62.928	12.86	1.78	5.70	20.34	30.00	9.66
126.068	18.80	2.12	4.10	25.02	30.00	4.98
144.049	20.41	2.58	2.50	25.49	30.00	4.51
180.087	22.44	2.75	0.00	25.19	30.00	4.81
* 198.139	<b>23.24</b>	<b>3.05</b>	<b>1.70</b>	<b>27.99</b>	<b>30.00</b>	<b>2.01</b>
216.124	22.29	3.09	1.70	27.08	30.00	2.92
252.137	22.42	3.50	4.00	29.92	37.00	7.08
315.039	13.54	4.04	15.50	33.08	37.00	3.92
360.062	15.09	4.48	10.20	29.77	37.00	7.23
393.799	15.94	4.15	10.50	30.59	37.00	6.41
472.558	17.02	5.02	4.10	26.14	37.00	10.86
590.703	19.19	5.95	4.29	29.43	37.00	7.57
669.466	20.55	6.54	- 3.10	23.99	37.00	13.01
866.358	22.68	7.45	0.50	30.63	37.00	6.37

- Remark :
1. All readings are Quasi-Peak values.
  2. The worst emission was detected at 198.139MHz with corrected signal level of 27.99dBμV/m (limit is 30dBμV/m) when the antenna was at vertical polarization and was at 1m high and the turn table was at 160° .
  3. 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

Date of Test : Dec. 14, 2000 Temperature : 24.3°C

EUT : 15" LCD Monitor Humidity : 67%

Test Mode : 15KHz/60Hz, AV Data Cable

	Antenna	Cable	Meter Reading	Emission Level		Margin	
	Factor	Loss	Horizontal	Horizontal	Limits		
	Frequency						
	MHz	dB/m	dB	Horizontal	Horizontal		
				dBμV	dBμV/m	dBμV/m	
*	41.150	19.16	1.71	- 1.50	19.37	30.00	10.63
	61.590	12.00	1.78	2.39	16.17	30.00	13.83
	82.029	14.33	2.03	0.80	17.16	30.00	12.84
	122.902	19.61	2.07	- 1.60	20.08	30.00	9.92
	153.600	20.50	2.65	- 1.10	22.05	30.00	7.95
	<b>184.326</b>	<b>21.06</b>	<b>2.77</b>	<b>3.10</b>	<b>26.93</b>	<b>30.00</b>	<b>3.07</b>
	214.994	21.45	3.08	0.59	25.12	30.00	4.88
	245.691	22.33	3.41	3.00	28.74	37.00	8.26
	337.823	14.48	4.27	5.01	23.76	37.00	13.24
	368.511	14.46	4.42	3.60	22.48	37.00	14.52
	429.883	15.97	4.69	- 0.39	20.27	37.00	16.73
	491.445	17.02	5.21	1.30	23.53	37.00	13.47
	542.615	17.82	5.64	- 3.20	20.26	37.00	16.74
	624.426	20.34	6.25	- 3.20	23.39	37.00	13.61
	757.364	21.52	6.88	- 3.00	25.40	37.00	11.60

- Remark :
1. All readings are Quasi-Peak values.
  2. The worst emission was detected at 194.326MHz with corrected signal level of 26.93dBμV/m (limit is 30dBμV/m) when the antenna was at horizontal polarization and was at 4m high and the turn table was at 70° .
  3. 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

Date of Test : Dec. 14, 2000 Temperature : 24.3°C

EUT : 15" LCD Monitor Humidity : 67%

Test Mode : 15KHz/60Hz, AV Data Cable

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Vertical dBμV	Emission Level Vertical dBμV/m	Limits dBμV/m	Margin dB
41.130	19.25	1.71	- 2.80	18.16	30.00	11.84
61.599	12.95	1.78	2.30	17.03	30.00	12.97
74.622	13.33	1.93	4.70	19.96	30.00	10.04
122.948	18.78	2.07	- 2.00	18.85	30.00	11.15
153.600	20.18	2.65	-1.40	21.43	30.00	8.57
* 184.292	<b>22.34</b>	<b>2.77</b>	<b>2.20</b>	<b>27.31</b>	<b>30.00</b>	<b>2.69</b>
214.979	22.17	3.08	1.20	26.45	30.00	3.55
245.658	21.96	3.41	2.90	28.27	37.00	8.73
310.501	13.41	4.03	3.69	21.13	37.00	15.87
368.523	15.28	4.42	7.90	27.60	37.00	9.40
429.930	16.24	4.69	0.50	21.43	37.00	15.57
460.638	16.94	4.87	1.60	23.41	37.00	13.59
521.994	17.50	5.39	1.70	24.59	37.00	12.41
624.262	19.74	6.25	- 4.10	21.89	37.00	15.11
746.974	21.86	6.78	- 4.00	24.64	37.00	12.36

- Remark :
1. All readings are Quasi-Peak values.
  2. The worst emission was detected at 184.292MHz with corrected signal level of 27.31dBμV/m (limit is 30dBμV/m) when the antenna was at vertical polarization and was at 1m high and the turn table was at 130° .
  3. 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

Date of Test : Dec. 14, 2000 Temperature : 24.3°C

EUT : 15" LCD Monitor Humidity : 67%

Test Mode : 15KHz/60Hz, S-Video Data Cable

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading		Emission Level		Margin dB
			Horizontal dBμV		Horizontal dBμV/m	Limits dBμV/m	
41.165	19.16	1.71	- 2.10		18.77	30.00	11.23
61.579	12.00	1.78	3.69		17.47	30.00	12.53
82.043	14.33	2.03	3.20		19.56	30.00	10.44
122.928	19.61	2.07	- 1.90		19.78	30.00	10.22
153.583	20.50	2.65	- 0.80		22.35	30.00	7.65
184.333	21.06	2.77	2.40		26.23	30.00	3.77
214.987	21.45	3.08	0.09		24.62	30.00	5.38
245.669	22.33	3.41	1.20		26.94	37.00	10.06
337.842	14.48	4.27	4.61		23.36	37.00	13.64
368.522	14.46	4.42	3.00		21.88	37.00	15.12
429.868	15.97	4.69	- 1.09		19.57	37.00	17.43
491.465	17.02	5.21	0.50		22.73	37.00	14.27
542.632	17.82	5.64	- 2.60		20.86	37.00	16.14
624.443	20.34	6.25	- 3.80		22.79	37.00	14.21
757.356	21.52	6.88	- 3.80		24.60	37.00	12.40

Remark : 1. All readings are Quasi-Peak values.

Date of Test : Dec. 14, 2000 Temperature : 24.3°C  
 EUT : 15" LCD Monitor Humidity : 67%  
 Test Mode : 15KHz/60Hz, S-Video Data Cable

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading		Emission Level		Margin dB
			Vertical dBμV		Vertical dBμV/m	Limits dBμV/m	
41.148	19.25	1.71	- 3.40		17.56	30.00	12.44
61.580	12.95	1.78	1.90		16.63	30.00	13.37
74.635	13.33	1.93	4.60		19.86	30.00	10.14
122.955	18.78	2.07	- 3.30		17.55	30.00	12.45
153.622	20.18	2.65	- 1.10		21.73	30.00	8.27
184.276	22.34	2.77	1.70		26.81	30.00	3.19
214.983	22.17	3.08	- 0.60		24.65	30.00	5.35
245.640	21.96	3.41	2.10		27.47	37.00	9.53
310.510	13.41	4.03	3.09		20.53	37.00	16.47
368.532	15.28	4.42	6.80		26.50	37.00	10.50
429.943	16.24	4.69	2.00		22.93	37.00	14.07
460.624	16.94	4.87	2.80		24.61	37.00	12.39
521.978	17.50	5.39	1.10		23.99	37.00	13.01
624.256	19.74	6.25	- 3.20		22.79	37.00	14.21
746.957	21.86	6.78	- 4.70		23.94	37.00	13.06

Remark : 1. All readings are Quasi-Peak values.

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

[NONE]



# APPENDIX I

## Conducted Test Data

(Total Pages : 6)

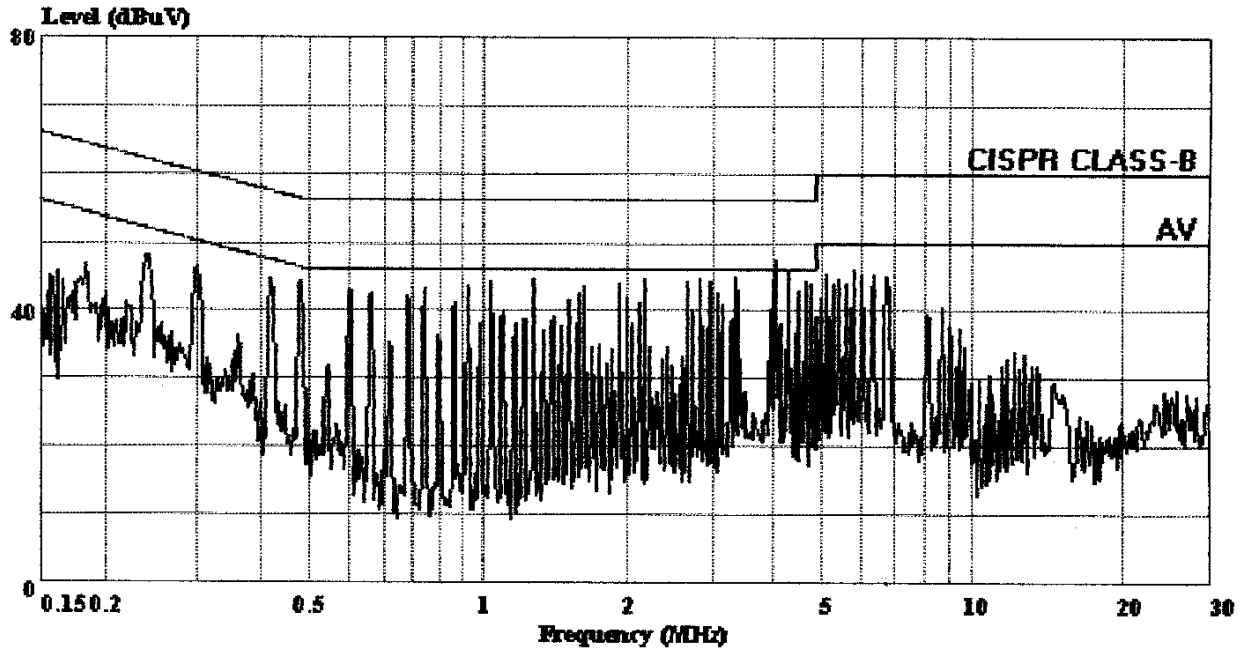
**TOKIN**

No.53-11, Tin-fu Tsun, Lin-kou Hsiang,  
 Taipei Country, Taiwan, R.O.C.  
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TAIWAN TOKIN EMC ENG. CORP.

Data#: 45 File#: 彩華.EMI

Date: 2000-12-16 Time: 11:44:18



TAIWAN TOKIN EMC ENG. CORP. (S/R 3)

Trace:

Ref Trace:

Condition: CISPR CLASS-B KRW-407(FCC) LINE

EUT : 15"LCD MONITOR M/N:LM15X

Power: 120Vac/60Hz

Memo : 640X480/75Hz;38KHz

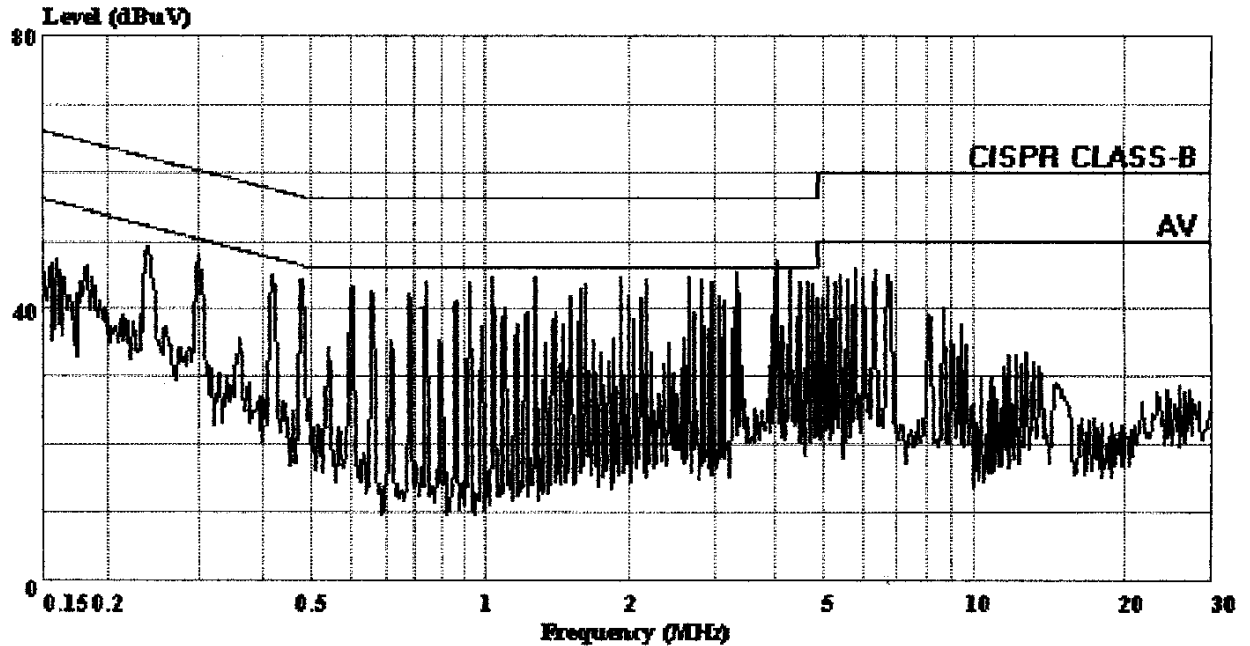
**TOKIN**

No.53-11, Tin-fu Tsun, Lin-kou Hsiang,  
 Taipei Country, Taiwan, R.O.C.  
 Tel: (02) 2609-9301, 2609-2133  
 Fax: (02) 2609-9303

TAIWAN TOKIN EMC ENG. CORP.

Data#: 46 File#: 彩華.EMI

Date: 2000-12-16 Time: 11:45:15



TAIWAN TOKIN EMC ENG. CORP. (S/R 3)

Trace:

Ref Trace:

Condition: CISPR CLASS-B KRW-407(FCC) NEUTRAL

EUT : 15"LCD MONITOR M/N:LM15X

Power: 120Vac/60Hz

Memo : 640X480/75Hz;38KHz

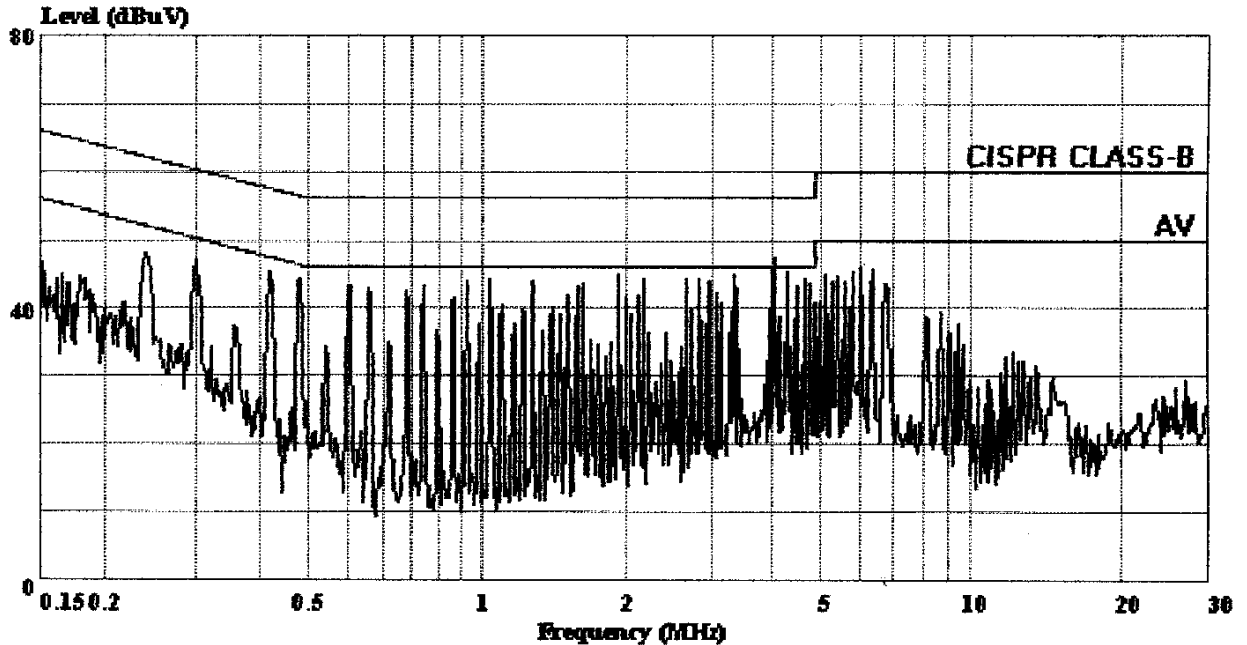
**TOKIN**

No.53-11, Tin-fu Tsun, Lin-kou Hsiang,  
 Taipei Country, Taiwan, R.O.C.  
 Tel: (02)2609-9301, 2609-2133  
 Fax: (02)2609-9303

TAIWAN TOKIN EMC ENG. CORP.

Data#: 44 File#: 彩華.EMI

Date: 2000-12-16 Time: 11:43:21



TAIWAN TOKIN EMC ENG. CORP. (S/R 3)

Trace:

Ref Trace:

Condition: CISPR CLASS-B KRW-407(FCC) LINE

EUT : 15"LCD MONITOR M/N:LM15X

Power: 120Vac/60Hz

Memo : 800\*600/75Hz;47KHz

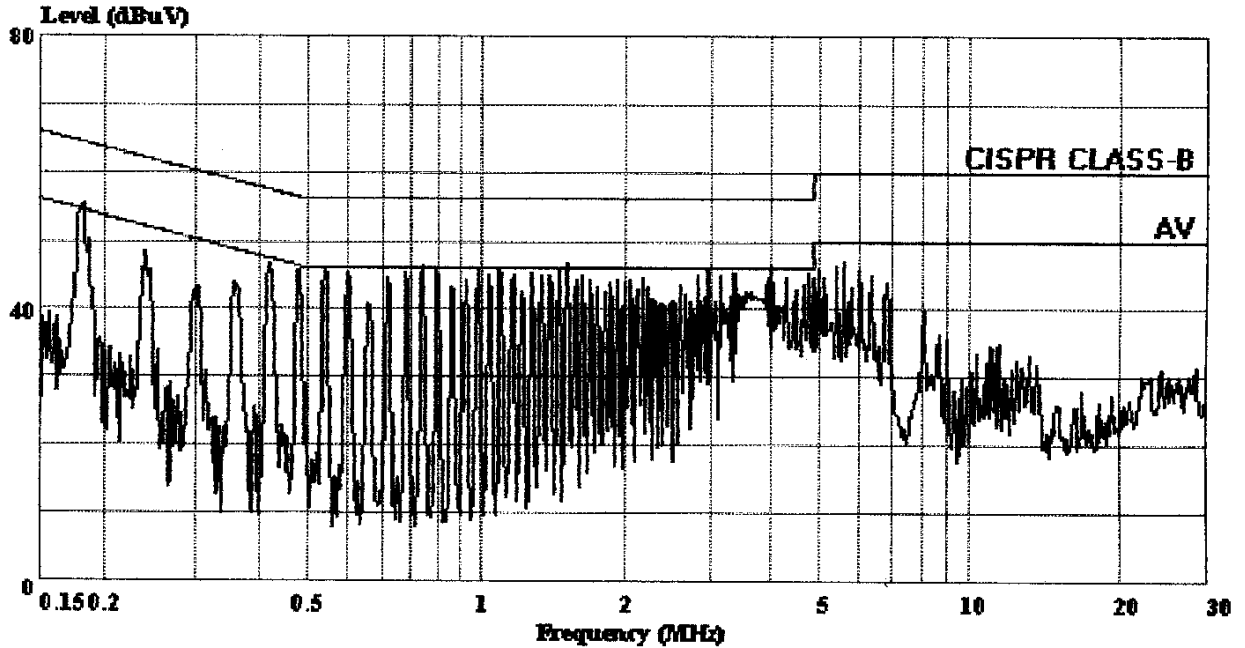
**TOKIN**

No.53-11, Tin-fu Tsun, Lin-kou Hsiang,  
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 Fax: (02) 2609-9303

TAIWAN TOKIN EMC ENG. CORP.

Data#: 30 File#: 彩華.EMI

Date: 2000-12-16 Time: 11:11:08



TAIWAN TOKIN EMC ENG. CORP. (S/R 3)

Trace:

Ref Trace:

Condition: CISPR CLASS-B KNW-244C NEUTRAL

EUT : 15"LCD MONITOR M/N:LM15X

Power: 230Vac/50Hz

Memo : 800\*600/75Hz;47KHz

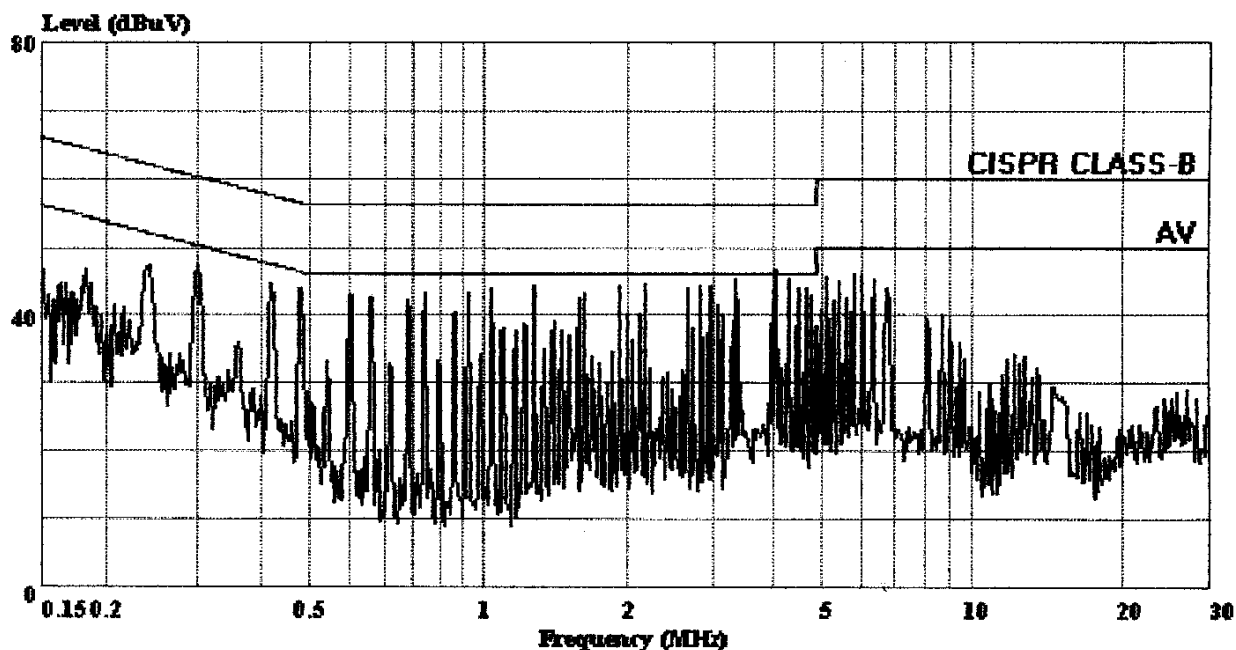
**TOKIN**

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 Tel: (02) 2609-9301, 2609-2133  
 Fax: (02) 2609-9303

TAIWAN TOKIN EMC ENG. CORP.

Data#: 48 File#: 彩華.EMI

Date: 2000-12-16 Time: 11:49:10



TAIWAN TOKIN EMC ENG. CORP. (S/R 3)

Trace:

Ref Trace:

Condition: CISPR CLASS-B KNW-407(FCC) LINE

EUT : 15"LCD MONITOR M/N:LM15X

Power: 120Vac/60Hz

Memo : AV IN;60Hz/15KHz

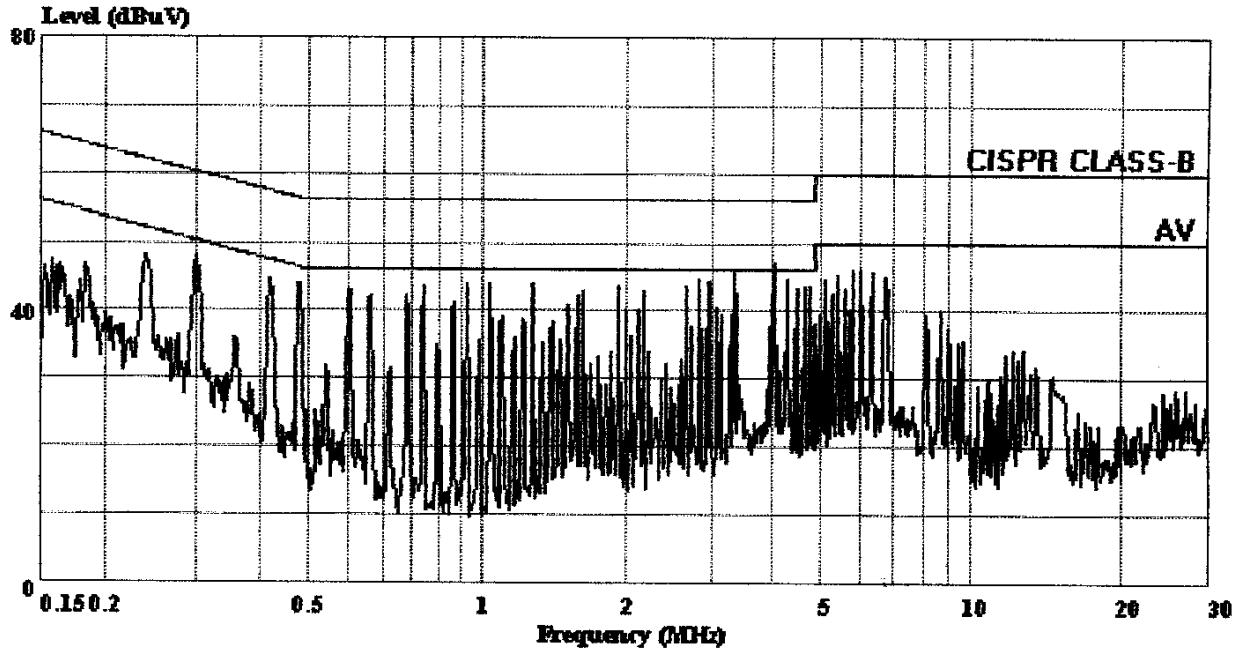
**TOKIN**

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 Fax: (02)2609-9303

TAIWAN TOKIN EMC ENG. CORP.

Data#: 47 File#: 彩華.EMI

Date: 2000-12-16 Time: 11:48:03



TAIWAN TOKIN EMC ENG. CORP. (S/R 3)

Trace:

Ref Trace:

Condition: CISPR CLASS-B KNW-407(FCC) NEUTRAL

EUT : 15"LCD MONITOR M/N:LM15X

Power: 120Vac/60Hz

Memo : AV IN;60Hz/15KHz