



EMC

TEST REPORT

REPORT NO. : F88080308C
MODEL NO. : 7Glr, 7Klr, 7Vlr, 7Vlr+
DATE OF TEST : Sept. 19, 2000
DATE OF RECEIPT : July 21, 2000

PREPARED FOR: TOP VICTORY ELECTRONICS (TAIWAN) CO., LTD.

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PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION



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1. CERTIFICATION

Issue Date: Oct. 11, 2000

Reference No.: 89072106

Product : COLOR MONITOR
 Trade Name : AOC
 Model No. : 7Glr, 7Klr, 7Vlr, 7Vlr+
 Applicant : TOP VICTORY ELECTRONICS (TAIWAN) CO., LTD.
 Standard : FCC Part 15, Subpart B, Class B
 ANSI C63.4-1992
 CISPR 22: 1997, Class B

We hereby certify that one sample of the designation has been tested in our facility on Sept. 19, 2000. The test record, data evaluation and Equipment Under Test (EUT) configurations represent herein are true and accurate representation of the measurements of the sample's EMC characteristics under the conditions herein specified.

The test results show that the EUT as described in this report is in compliance with the Class B limits of conducted and radiated emission of applicable standards.

TESTED BY : John Liao , DATE: 10/11/2000
 (John Liao)

CHECKED BY : Vickie Yu , DATE: 10/11/2000
 (Vickie Yu)

APPROVED BY : Mike Su , DATE: 10/11/2000
 (Mike Su)

ADVANCE DATA TECHNOLOGY CORPORATION



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2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product	:	COLOR MONITOR
Model No.	:	7Glr, 7Klr, 7Vlr, 7Vlr+
Power Supply Type	:	Switching
Power Cord	:	Nonshielded (1.8m)
Data Cable	:	Shielded (1.8m)

Note: This report is a Class II permissive change report. The main changes are as the following:

- ◇ Addition of PFC on main board.
- ◇ Change the place of video board.

The EUT is a 17" Color Monitor with resolution up to 1600x1200.

The EUT has four model names, which are identical to each other in all aspects except for the following:

- ◆ Model: 7Glr - Horizontal frequency up to 95 kHz
- ◆ Model: 7Klr - Horizontal frequency up to 95 kHz
- ◆ Model: 7Vlr - Horizontal frequency up to 69 kHz
- ◆ Model: 7Vlr+ - Horizontal frequency up to 69 kHz, with TCO model

From the above models, model: **7Glr** was selected as representative for the test, and therefore its data is recorded in this report.

There is a ferrite core on the video cable outside monitor.

For more detailed features description, please refer to Manufacturer's Specification or User's Manual.



2.2 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories are used to form representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID
1	PERSONAL COMPUTER	NTI	PI I-450T	P201141	FCC DoC APPROVED
2	VGA CARD	GAINWARD	CD-GX2A44T	GHF19516	ICUVGA-GW710
3	MOUSE	LOGITECH	M-S43	LZE000703165	DZL211106
4	PS/2 KEYBOARD	FORWARD	FDA-104GA	FDKB8110116	F4ZDA-104G
5	MODEM	ACEEX	1414	980020532	IFAXDM1414
6	PRINTER	HP	2225C+	2936S56294	DSI6XU2225

No.	Signal cable description
1	NA
2	NA
3	1.5 m foil shielded wire, terminated with PS2 connector via drain wire, w/o core.
4	1.5 m foil shielded wire, terminated with PS/2 connector via metallic frame, w/o core.
5	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
6	1.2m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core.

Note: All power cords of the above support units are non shielded (1.8m).

2.3 TEST METHODOLOGY AND CONFIGURATION

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4:1992. Radiated testing was performed at an antenna to EUT distance of 3/10 m on an open area test site.

Please refer to the photos of test configuration in Item 5.



3. TEST INSTRUMENTS

3.1 TEST INSTRUMENTS (EMISSION)

CONDUCTED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ Test Receiver	ESCS30	834115/016	Feb. 22, 2001
ROHDE & SCHWARZ Artificial Mains Network	ESH2-Z5	892107/003	July 11, 2001
ROHDE & SCHWARZ 4-wire ISN	ENY41	835154/007	Apr. 26, 2001
EMCO L.I.S.N.	3825/2	9504-2359	July 11, 2001
Shielded Room	Site 3	ADT-C03	NA

Note: 1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per NAMAS document NIS81.

2. The calibration interval of the above test instruments is 12 months.

And the calibrations are traceable to NML/ROC and NIST/USA.

RADIATED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
HP Spectrum Analyzer	8590L	3544A01042	April 6, 2001
HP Preamplifier	8447D	2944A08313	Mar. 20, 2001
HP Preamplifier	8449B	3008A01201	Dec. 14, 2000
ROHDE & SCHWARZ TEST RECEIVER	ESVS 30	841977/008	Oct. 5, 2000
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 23, 2000
ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Aug. 3, 2001
EMCO Double Ridged Guide Antenna	3115	9312-4192	March 29, 2001
CHASE BILOG Antenna	CBL6111A	1647	July 3, 2001
EMCO Turn Table	1016	1722	NA
EMCO Tower	1051	1825	NA
Open Field Test Site	Site 4	ADT-R04	June 9, 2001

Note: 1. The measurement uncertainty is less than +/- 3dB, which is calculated as per NAMAS document NIS81.

2. The calibration interval of the above test instruments is 12 months.

And the calibrations are traceable to NML/ROC and NIST/USA.



3.2 LIMITS OF CONDUCTED AND RADIATED EMISSION

LIMIT OF RADIATED EMISSION OF CISPR 22

FREQUENCY (MHz)	Class A (at 10m) *	Class B (at 10m) *
	dBuV/m	dBuV/m
30 - 230	40	30
230 - 1000	47	37

* Detector Function: Quasi-Peak

LIMIT OF RADIATED EMISSION OF FCC PART 15, SUBPART B FOR FREQUENCY ABOVE 1000 MHz

FREQUENCY (MHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	Peak	Average	Peak	Average
Above 1000	80.0	60.0	74.0	54.0

- Note: (1) The lower limit shall apply at the transition frequencies.
 (2) Emission level (dBuV/m) = 20 log Emission level (uV/m).
 (3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

LIMIT OF CONDUCTED EMISSION OF CISPR 22

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

- Note: (1) The lower limit shall apply at the transition frequencies.
 (2) The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz
 (3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.



4. TEST RESULTS (EMISSION)

4.1 RADIO DISTURBANCE

Frequency Range : 0.15 - 30 MHz (Conducted Emission)
 : 30 - 2000 MHz (Radiated Emission)
 Input Voltage : 120 Vac, 60 Hz
 Temperature : 25 Degree C
 Humidity : 60 %
 Atmospheric Pressure : 989 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: -10.27 dB at 0.185 MHz Minimum passing margin of radiated emission: -2.5 dB at 79.34 MHz

Note: The EUT was pre-tested under the following resolution & horizontal synchronization speed mode:

- ◆ 1600 x 1200 (94 kHz)
- ◆ 1280 x 1024 (91 kHz)
- ◆ 640 x 480 (31.5 kHz)

The worst emission levels were found under 1600 x 1200 (94 kHz) and therefore test data of this mode is recorded.

4.2 EUT OPERATION CONDITION

1. Turn on the power of all equipment.
2. PC reads a test program to enable all functions.
3. PC reads and writes messages from FDD and HDD.
4. PC sends "H" messages to monitor (EUT) and monitor display "H" patterns on screen.
5. PC sends "H" messages to modem.
6. PC sends "H" messages to printer, and the printer prints them on paper.
7. Repeat steps 3-7.



4.3 TEST DATA OF CONDUCTED EMISSION

EUT: COLOR MONITOR

MODEL: 7Glr

MODE: 1600x1200 (94 kHz)

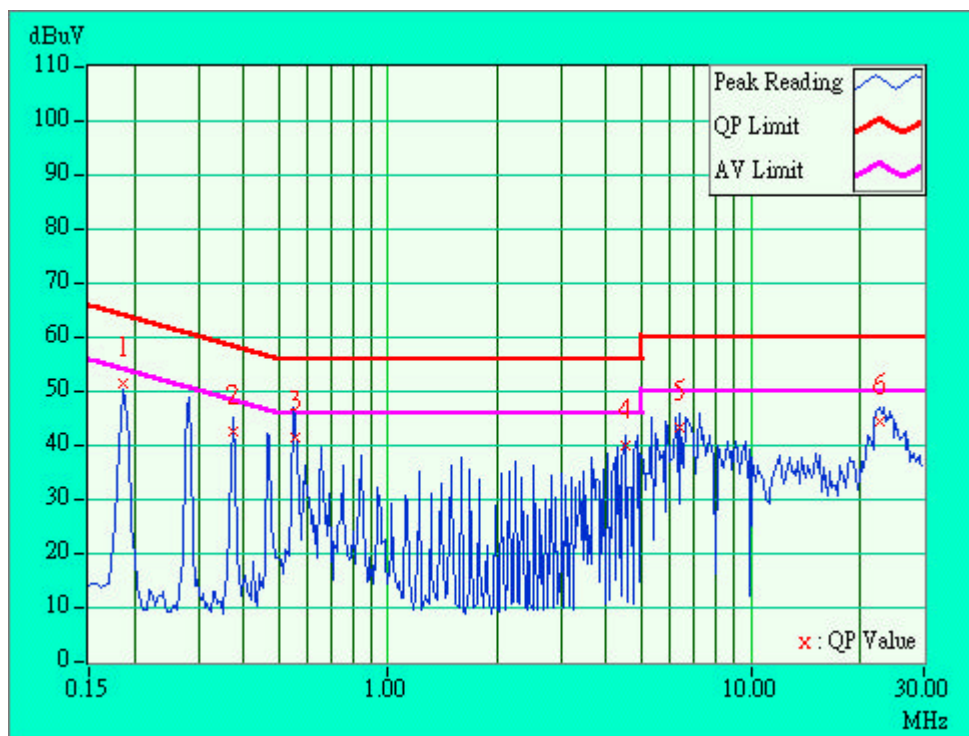
6 dB Bandwidth: 10 kHz

PHASE: LINE (L)

Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.185	0.19	51.37	-	51.56	-	64.25	54.25	-12.70	-
0.373	0.20	42.68	-	42.88	-	58.44	48.44	-15.56	-
0.552	0.23	41.41	-	41.64	-	56.00	46.00	-14.36	-
4.500	0.42	39.99	-	40.41	-	56.00	46.00	-15.59	-
6.375	0.48	43.50	-	43.98	-	60.00	50.00	-16.02	-
22.688	1.11	44.28	-	45.39	-	60.00	50.00	-14.61	-

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Correction Factor + Reading Value.





TEST DATA OF CONDUCTED EMISSION

EUT: COLOR MONITOR

MODEL: 7Glr

MODE: 1600x1200 (94 kHz)

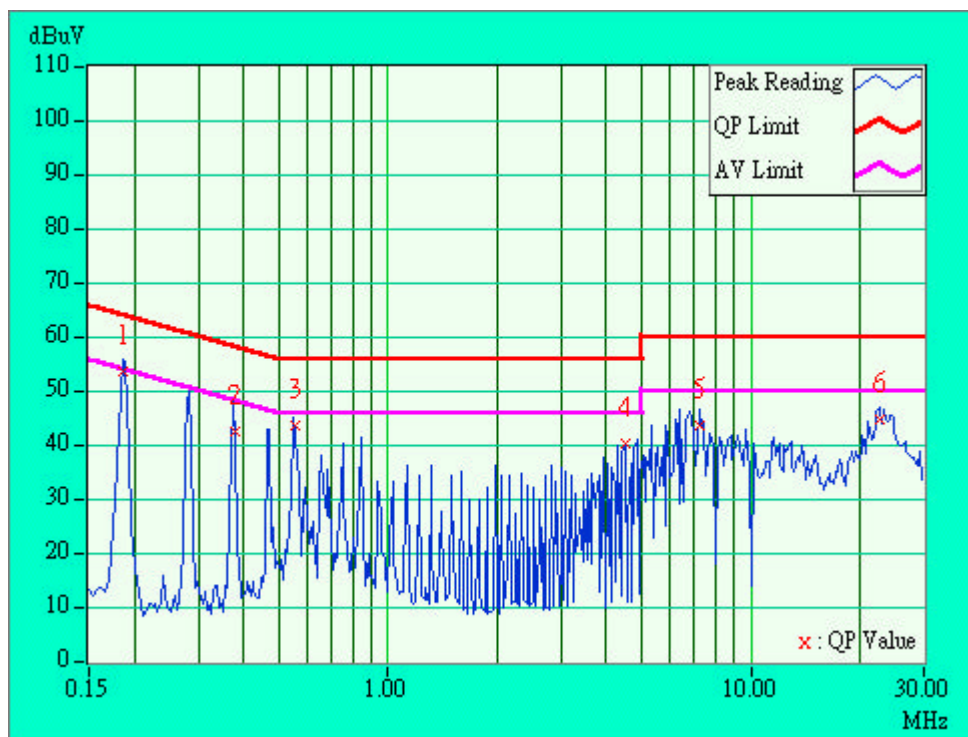
6 dB Bandwidth: 10 kHz

PHASE: NEUTRAL (N)

Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
		[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.185	0.19	53.80	-	53.99	-	64.25	54.25	-10.27	-
0.379	0.20	42.68	-	42.88	-	58.31	48.31	-15.43	-
0.553	0.23	43.73	-	43.96	-	56.00	46.00	-12.04	-
4.500	0.41	40.20	-	40.61	-	56.00	46.00	-15.39	-
7.220	0.45	43.62	-	44.07	-	60.00	50.00	-15.93	-
22.686	0.75	44.82	-	45.57	-	60.00	50.00	-14.43	-

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Correction Factor + Reading Value.





4.4 TEST DATA OF RADIATED EMISSION

EUT: **COLOR MONITOR**

MODEL: **7Glr**

MODE: **1600x1200 (94 kHz)**

ANT. POLARITY: **Horizontal**

DETECTOR FUNCTION AND BANDWIDTH: Quasi peak, 120 kHz (30-1000 MHz)

Peak, 1 MHz (1000 MHz-2000 MHz)

FREQUENCY RANGE: 30-1000 MHz

MEASURED DISTANCE: 10 M

FREQUENCY RANGE: 1000-2000 MHz

MEASURED DISTANCE: 3 M

Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
36.00	16.8	10.3	27.1	30.0	-2.9	400	165
79.47	9.2	13.0	22.2	30.0	-7.8	314	81
112.51	12.6	10.7	23.3	30.0	-6.7	400	103
168.57	11.1	9.9	21.0	30.0	-9.0	400	136
185.44	10.6	12.5	23.1	30.0	-6.9	400	157
202.53	10.6	15.2	25.8	30.0	-4.2	400	295
219.26	11.9	14.9	26.8	30.0	-3.2	400	245
236.16	13.1	16.4	29.5	37.0	-7.5	400	288
253.08	14.0	13.2	27.2	37.0	-9.8	400	321
421.67	19.0	9.1	28.1	37.0	-8.9	244	331

- REMARKS:
1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).
 2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level - Limit value



TEST DATA OF RADIATED EMISSION

EUT: COLOR MONITOR

MODEL: 7Glr

MODE: 1600x1200 (94 kHz)

ANT. POLARITY: Vertical

DETECTOR FUNCTION AND BANDWIDTH: Quasi peak, 120 kHz (30-1000 MHz)

Peak, 1 MHz (1000 MHz-2000 MHz)

FREQUENCY RANGE: 30-1000 MHz

MEASURED DISTANCE: 10 M

FREQUENCY RANGE: 1000-2000 MHz

MEASURED DISTANCE: 3 M

Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
36.09	16.8	10.3	27.1	30.0	-2.9	100	11
79.34	9.1	18.4	27.5	30.0	-2.5	156	67
112.50	12.6	11.9	24.5	30.0	-5.5	100	346
137.73	13.7	13.7	27.4	30.0	-2.6	100	157
168.58	11.1	10.6	21.7	30.0	-8.3	100	23
202.79	10.7	10.1	20.8	30.0	-9.2	100	165
216.04	11.6	11.9	23.5	30.0	-6.5	100	197
219.74	11.9	11.0	22.9	30.0	-7.1	100	199
401.00	18.8	11.3	30.1	37.0	-6.9	148	127
421.78	19.0	9.7	28.7	37.0	-8.3	110	165
472.44	19.9	10.9	30.8	37.0	-6.2	289	237

- REMARKS:
1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).
 2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level - Limit value



5. PHOTOGRAPHS OF THE TEST CONFIGURATION WITH MINIMUM MARGIN

CONDUCTED EMISSION TEST





RADIATED EMISSION TEST





6. APPENDIX - INFORMATION OF THE TESTING LABORATORY

Information of the testing laboratory

We, ADT Corp., are founded in 1988, to provide our best service in EMC and Safety consultation. Our laboratory is accredited by the following approval agencies according to ISO/IEC Guide 25 or EN 45001:

- | | |
|---------------|---------------|
| ● USA | FCC, NVLAP |
| ● Germany | TUV Rheinland |
| ● Japan | VCCI |
| ● New Zealand | RFS |
| ● Norway | NEMKO, DNV |
| ● U.K. | INCHCAPE |
| ● R.O.C. | BSMI |

Copies of accreditation certificates of our laboratory obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml. If you have any comments, please feel free to contact us at the following:

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