



# EMC

## TEST REPORT

REPORT NO. : F87100708  
MODEL NO. : AS5Sv, LR5Sv, Professional 15Mv,  
Advance 15Mv  
DATE OF TEST : Nov. 14, 1998

PREPARED FOR: TAIWAN VIDEO & MONITOR CORP.

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TAIPEI, TAIWAN, R.O.C.

PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION



Accredited Laboratory

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1.

**CERTIFICATION**

Issue Date: Nov.17, 1998

Product : COLOR MONITOR  
Trade Name : TVM, ACANA  
Model No. : AS5Sv, LR5Sv, Professional 15Mv, Advance 15Mv  
Applicant : TAIWAN VIDEO & MONITOR CORP.  
Standard : FCC Part 15, Subpart B, Class B  
ANSI C63.4-1992  
CISPR 22:1993+A1:1995+A2:1997

We hereby certify that one sample of the designation has been tested in our facility on Nov. 14, 1998. 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:

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(Joey Chen)

DATE:

11/17/98

CHECKED BY:

Yemmy Soong  
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DATE:

11/17/98

APPROVED BY:

Mike Su  
(Mike Su)

DATE:

11/17/98**ADVANCE DATA TECHNOLOGY CORPORATION****NVLAP<sup>®</sup>**

Accredited Laboratory



## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

Product	:	COLOR MONITOR
Model No.	:	AS5Sv, LR5Sv, Professional 15Mv Advance 15Mv
Power Supply Type	:	Switching
Power Cord	:	Nonshielded (1.8m)
Data Cable	:	Shielded (1.8m)

Note: The EUT has four model names, as the following:

- Brand name: TVM, Model name: AS5Sv, LR5Sv
- Brand name: ACANA, Model name: Professional 15Mv, Advance 15Mv

The difference between all the models are as the following:

- Model : AS5Sv and Professional 15Mv are using MPR II Low radiation Monitor.
- Model : LR5Sv and Advance 15Mv are using standard color monitor.

From the above models, model: AS5Sv was chosen as the representative model for the test.

The EUT is a 15" color monitor with resolution up to 1024 x 768.

There is a ferrite core on the video cable outside the 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.	FCC ID	I/O Cable
1	PERSONAL COMPUTER	HP	D4579A	FCC DoC Approved	Nonshielded Power (1.8m)
2	KEYBOARD	FORWARD	FDA-104GA	F4ZDA-104G	Shielded Signal (1.4m)
3	PRINTER	HP	2225C+	DSI6XU2225	Shielded Signal (1.4m) Nonshielded Power (1.8m)
4	MODEM	ACEEX	1414	IFAXDM1414	Shielded Signal (1.2m) Nonshielded Power(1.8m)
5	MOUSE	DEXIN	A2P800A	NIYA2P800A	Shielded Signal (1.5m)

## 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 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)

##### RADIATED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
HP Spectrum Analyzer	8590L	3544A01042	April 29, 1999
HP Preamplifier	8447D	2944A08313	March 21, 1999
ROHDE & SCHWARZ TEST RECEIVER	ESVS 30	841977/008	Oct. 1, 1999
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 28, 1998
CHASE BiLOG Antenna	CBL6111A	1647	July 3, 1999
EMCO Turn Table	1016	1722	N/A
EMCO Tower	1051	1825	N/A
Open Field Test Site	Site 4	ADT-R04	June 19, 1999

Note: 1. The measurement uncertainty is less than +/- 3dB, which is calculated as per NAMA's 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.

##### CONDUCTED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ Test Receiver	ESHS30	828109/007	July 22, 1999
ROHDE & SCHWARZ Artificial Mains Network	ESH2-Z5	892107/003	July 20, 1999
EMCO L.I.S.N.	3825/2	9504-2359	July 20, 1999
Shielded Room	Site 3	ADT-C03	N/A

Note: 1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per NAMA's 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

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

FREQUENCY (MHz)	Class A (at 10m)		Class B (at 3m)	
	uV/m	dBuV/m	uV/m	dBuV/m
Above 1000	300	49.5	500	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 - 1000 MHz (Radiated Emission)
Input Voltage	:	120 Vac, 60 Hz
Temperature	:	25 °C
Humidity	:	63 %
Atmospheric Pressure	:	1003 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: -2.1 dB at 8.531 MHz Minimum passing margin of radiated emission: -3.6 dB at 76.58 MHz

Note: The EUT was pretested under the following resolution & horizontal synchronization speed mode:

- \* 1024 x 768 mode (48 kHz),
- \* 800 x 600 mode (54 kHz),
- \* 640 x 480 mode (31.5 kHz)

The worst emission levels were found under 800 x 600 mode (54 kHz) and therefore the test data of only this mode is recorded.

### 4.2 EUT OPERATION CONDITION

1. Turn on the power of all equipments.
2. PC run 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 displays "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: AS5Sv

MODE: 800x600 (54 kHz)

6 dB Band Width: 10 kHz

Freq.	L Level		N Level		Limit		Margin [dB (μV)]			
[MHz]	[dB (μV)]		[dB (μV)]		[dB (μV)]		L		N	
	QP	AV	QP	AV	QP	AV	QP	AV	QP	AV
0.161	45.20	-	46.50	-	65.41	55.41	-20.2	-	-18.9	-
0.268	40.50	-	39.60	-	61.18	51.18	-20.7	-	-21.6	-
0.549	38.30	-	38.70	-	56.00	46.00	-17.7	-	-17.3	-
3.941	43.00	-	37.40	-	56.00	46.00	-13.0	-	-18.6	-
8.531	57.90	46.80	54.00	42.20	60.00	50.00	-2.1	-3.2	-6.0	-7.8
17.008	33.00	-	35.30	-	60.00	50.00	-27.0	-	-24.7	-

- Remarks:
1. "\*\*\*": Undetectable
  2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  3. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  4. The emission level of other frequencies were very low against the limit.

ADT CO. Shielded Room 3  
CISPR 22 CLASS B

14. Nov 98 11:33

EUT: AS5SV  
Op Cond: 800X600 54KHz  
Test Spec: LISN : L  
Comment: 110V AC/ 60 HZ

Report No. F87100708

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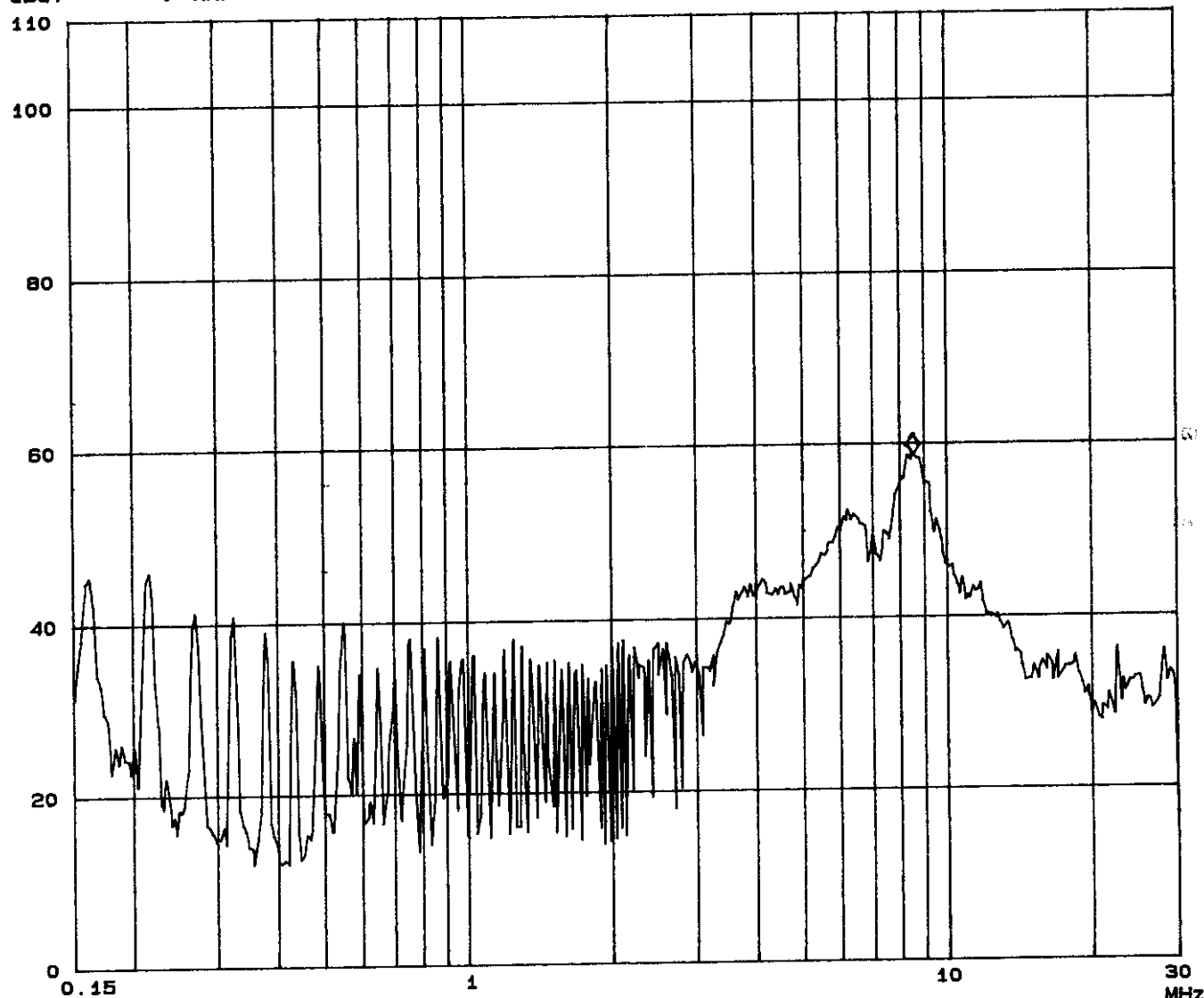
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Tested by *Jay Chen*

Fast Scan Settings (3 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpAgs
150k	450k	3k	10k	PK	1ms	10dB LN	OFF	60dB
450k	5M	3k	10k	PK	1ms	10dB LN	OFF	60dB
5M	30M	3k	10k	PK	1ms	10dB LN	OFF	60dB

dBuV  $\diamond$  Mkr : 8.47700MHz 58.8 dBuV



ADT CO. Shielded Room 3  
CISPR 22 CLASS B

14. Nov 98 11:45

EUT: AS5SV  
Op Cond: 800X600 54KHz  
Test Spec: LISN : N  
Comment: 110V AC/ 60 HZ

Report No. F87100708

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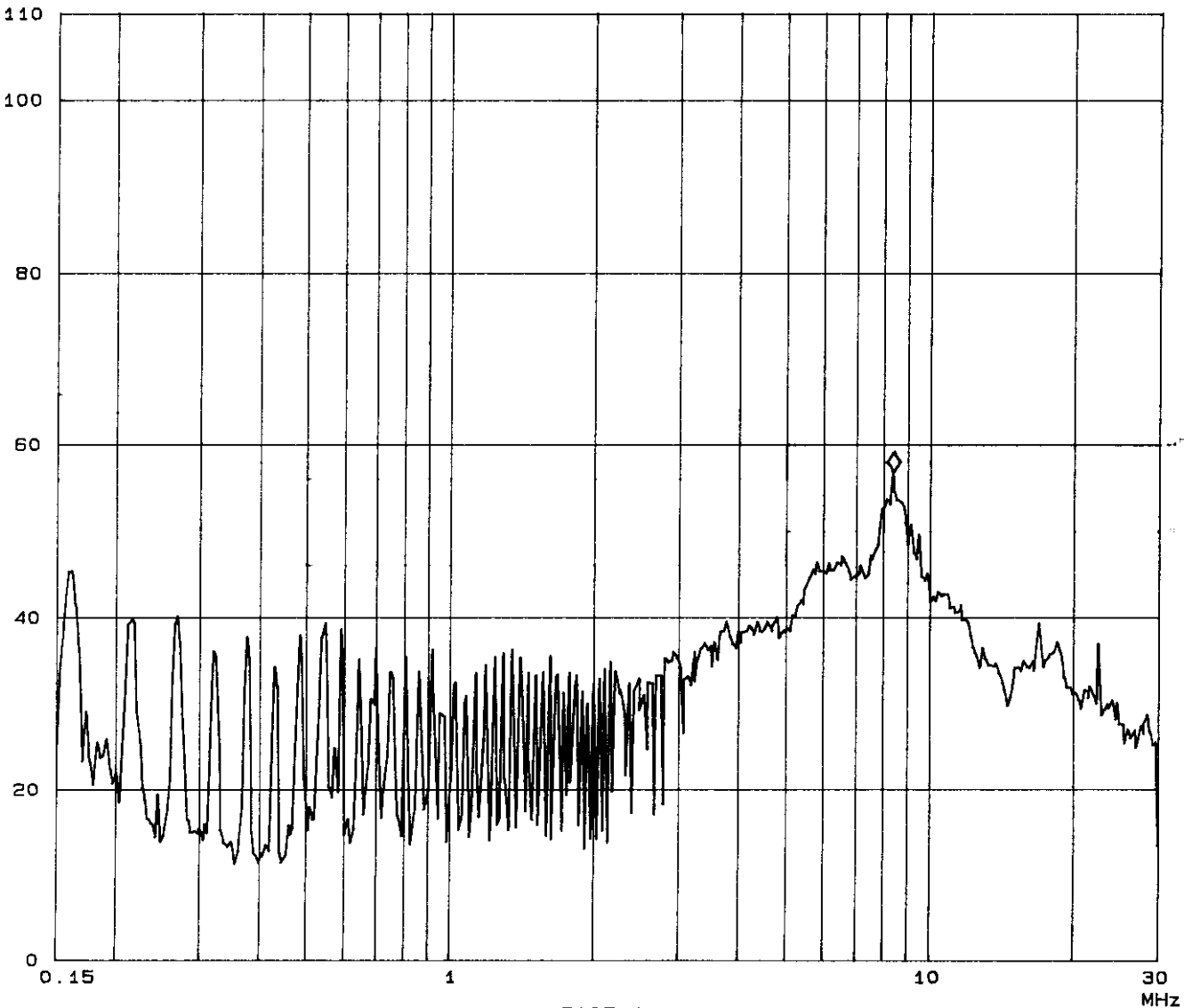
Tested by

*Joey Chen*

Fast Scan Settings (3 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	450k	3k	10k	PK	1ms	10dBLN	OFF	60dB
450k	5M	3k	10k	PK	1ms	10dBLN	OFF	60dB
5M	30M	3k	10k	PK	1ms	10dBLN	OFF	60dB

dBuV     ♦ Mkr :     8.36900MHz     56.9 dBuV





#### 4.4 TEST DATA OF RADIATED EMISSION

EUT: COLOR MONITORMODEL: AS5SvMODE: 800 x 600 (54 kHz)POLARITY: HorizontalDETECTOR FUNCTION: Quasi-peak6 dB BANDWIDTH: 120 kHzFREQUENCY RANGE: 30-1000 MHzMEASURED DISTANCE: 10 M

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
56.60	8.9	12.8	21.7	30.0	-8.3
67.91	8.1	11.6	19.7	30.0	-10.3
73.56	8.8	8.3	17.1	30.0	-12.9
76.56	9.3	11.7	21.0	30.0	-9.0
152.80	12.9	8.8	21.7	30.0	-8.3
158.46	12.2	13.6	25.8	30.0	-4.2
181.10	11.6	10.2	21.8	30.0	-8.2

- REMARKS :
1. Emission level (dBuV/m) = Correction Factor(dB/m) + Meter Reading (dBuV).
  2. Correction Factor(dB/m) = Ant. Factor(dB/m)+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 MONITORMODEL: AS5SvMODE: 800 x 600 ( 54kHz)POLARITY: VerticalDETECTOR FUNCTION: Quasi-peak6 dB BANDWIDTH: 120 kHzFREQUENCY RANGE: 30-1000 MHzMEASURED DISTANCE: 10 M

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
45.27	12.2	11.1	23.3	30.0	-6.7
56.60	8.2	17.6	25.8	30.0	-4.2
62.24	7.7	8.2	15.9	30.0	-14.1
67.91	7.9	12.2	20.1	30.0	-9.9
73.56	7.7	16.1	23.8	30.0	-6.2
76.58	7.4	19.0	26.4	30.0	-3.6
79.23	7.1	18.2	25.3	30.0	-4.7
84.89	8.5	12.8	21.3	30.0	-8.7
110.59	11.7	10.2	21.9	30.0	-8.1
158.46	13.0	10.5	23.5	30.0	-6.5
181.10	11.5	8.0	19.5	30.0	-10.5
186.75	11.7	11.9	23.6	30.0	-6.4
198.06	12.0	9.2	21.2	30.0	-8.8

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