



# EMC

## TEST REPORT

REPORT NO. : F87051502  
MODEL NO. : V5AV01  
DATE OF TEST : May 21, 1998

PREPARED FOR: MAG TECHNOLOGY CO., LTD.

ADDRESS : 9F, 245, SEC. 1, TUNHWA S. RD.,  
TAIPEI, TAIWAN, R.O.C.

PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION



Accredited Laboratory

12F, NO.1, SEC.4, NAN-KING EAST RD.,  
TAIPEI, TAIWAN, R.O.C.

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1.

**CERTIFICATION**

Issue Date: May 27, 1998

Product : MONITOR  
Trade Name : MAG  
Model No. : V5AV01  
Applicant : MAG TECHNOLOGY CO., LTD.  
Standard : FCC Part 15, Subpart B, Class B  
ANSI C63.4-1992  
CISPR 22:1993+A1+A2

We hereby certify that one sample of the designation has been tested in our facility on May 21, 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: Chris Yang, DATE: 5/27/98  
( Chris Yang )

CHECKED BY: Ariel Hsieh, DATE: 5/27/98  
( Ariel Hsieh )

APPROVED BY: Mike Su, DATE: 5/27/98  
( Mike Su )

**ADVANCE DATA TECHNOLOGY CORPORATION**

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## **2. GENERAL INFORMATION**

### **2.1 GENERAL DESCRIPTION OF EUT**

Product	:	MONITOR
Model No.	:	V5AV01
Power Supply Type	:	Switching
Power Cord	:	Nonshielded (1.8 m)
Data Cable	:	Shielded (1.8 m)
Audio Cable	:	Nonshielded (1.5 m)

Note: The EUT is a 15" monitor with resolution up to 1280x1024.

There are two ferrite cores on the video cable outside the monitor.

For more detailed features description, please refer to  
ATTACHMENT I - TECHNICAL DESCRIPTION OF EUT and  
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	DoC Approved	Nonshielded Power (1.8 m)
2	KEYBOARD	FORWARD	FDA-102GA	F4ZDA-104G	Shielded signal (1.4 m)
3	PRINTER	HP	2225C+	DSI6XU2225	Shielded Signal (1.2 m) Nonshielded Power (1.8 m)
4	MODEM	ACEEX	1414	IFAXDM1414	Shielded signal (1.2 m) Nonshielded Power (1.8 m)
5	MOUSE	DEXIN	A2P800A	NIYA2P800A	Shielded signal (1.5 m)
6	VGA CARD	GORDIA	DSV3365	LUT-DSV3365	N/A

## 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	8594A	3144A00308	Sept. 1, 1998
HP Preamplifier	8447D	2944A08119	Aug. 2, 1998
ROHDE & SCHWARZ TEST RECEIVER	ESVP	893496/030	July 17, 1998
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 28, 1998
CHASE Bilog Antenna	CBL6112	2086	Dec. 26, 1998
EMCO Turn Table	1060	1195	N/A
EMCO Tower	1051	1163	N/A
Open Field Test Site	Site 2	ADT-R02	Sept. 26, 1998

##### CONDUCTED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ Test Receiver	ESHS30	828765/002	July 31, 1998
ROHDE & SCHWARZ Artificial Mains Network	ESH2-Z5	828075/003	July 28, 1998
EMCO-L.I.S.N.	3825/2	90031627	July 28, 1998
Shielded Room	Site 5	ADT-C05	N/A

Note: 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 : 29 °C  
Humidity : 45 %  
Atmospheric Pressure : 998 mbar

TEST RESULT	Remarks
<b>PASS</b>	Minimum passing margin of conducted emission: -17.6 dB at 11.693 MHz Minimum passing margin of radiated emission: -5.1 dB at 46.10 MHz

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

- \* 1280x1024 mode (64 kHz),
- \* 1024x768 mode (69 kHz)
- \* 640x480 mode (31.5 kHz)

The worst emission levels were found under 1280x1024 (64 kHz) and therefore the test data of only this mode is recorded.

##### 4.1.1 EUT OPERATION CONDITION

1. Turn on the power of all equipments.
2. PC runs 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. PC sends audio messages to internal speaker.
8. Repeat steps 3-8.





## 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 : 29 °C  
Humidity : 45 %  
Atmospheric Pressure : 998 mbar

TEST RESULT	Remarks
<b>PASS</b>	Minimum passing margin of conducted emission: -17.6 dB at 11.693 MHz Minimum passing margin of radiated emission: -5.1 dB at 46.10 MHz

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2. PC runs 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.



## 4.2 TEST DATA OF CONDUCTED EMISSION

EUT: **MONITOR**MODEL: **V5AV01**MODE: **1280x1024 (64kHz)**

6 dB Bandwidth: 10 kHz

TEST PERSONNEL:

Chris Foley

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
0.192	40.20	-	39.70	-	63.95	53.95	-23.8	-	-24.3	-
0.288	31.80	-	29.10	-	60.58	50.58	-28.8	-	-31.5	-
1.443	30.30	-	31.10	-	56.00	46.00	-25.7	-	-24.9	-
2.166	31.40	-	30.80	-	56.00	46.00	-24.6	-	-25.2	-
11.693	42.40	-	39.60	-	60.00	50.00	-17.6	-	-20.4	-
19.487	40.00	-	37.40	-	60.00	50.00	-20.0	-	-22.6	-

- 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.
  5. Margin value = Emission level - Limit value

ADT CO. SITE 5  
CISPR 22 CLASS B

21. May 98 16:44

EUT: V5AV01  
Test Spec: LISN: L  
Comment: 1280X1024 60Hz 64KHz

**Report No.** F87051502

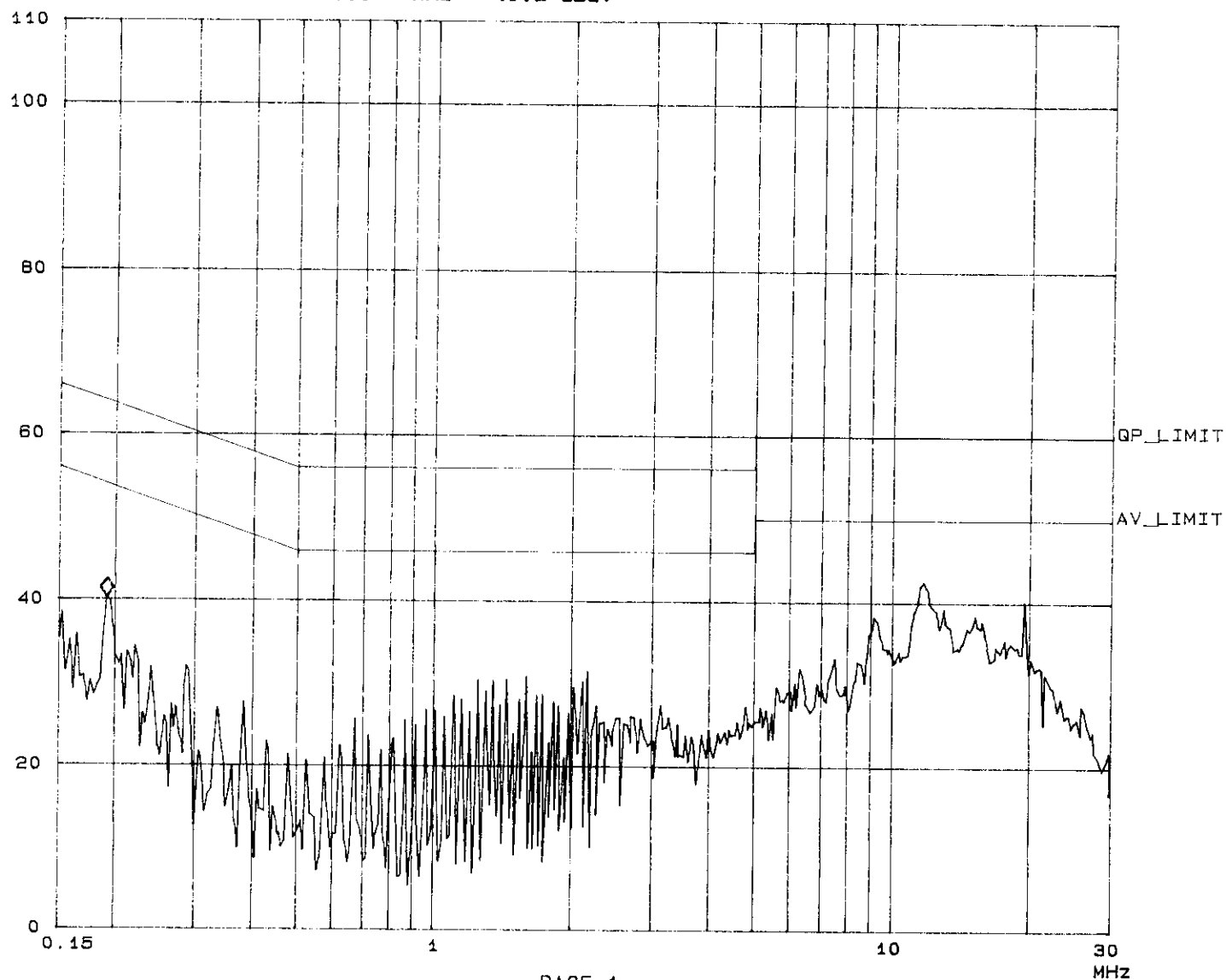
**Page** 9-1

**Tested by** Chris Jany

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 : 182.00 kHz 40.2 dBuV



ADT CO. SITE 5  
CISPR 22 CLASS B

21. May 98 17:06

EUT: V5AV01  
Test Spec: LISN : N  
Comment: 1280X1024 60Hz 64KHz

**Report No. F87051502**

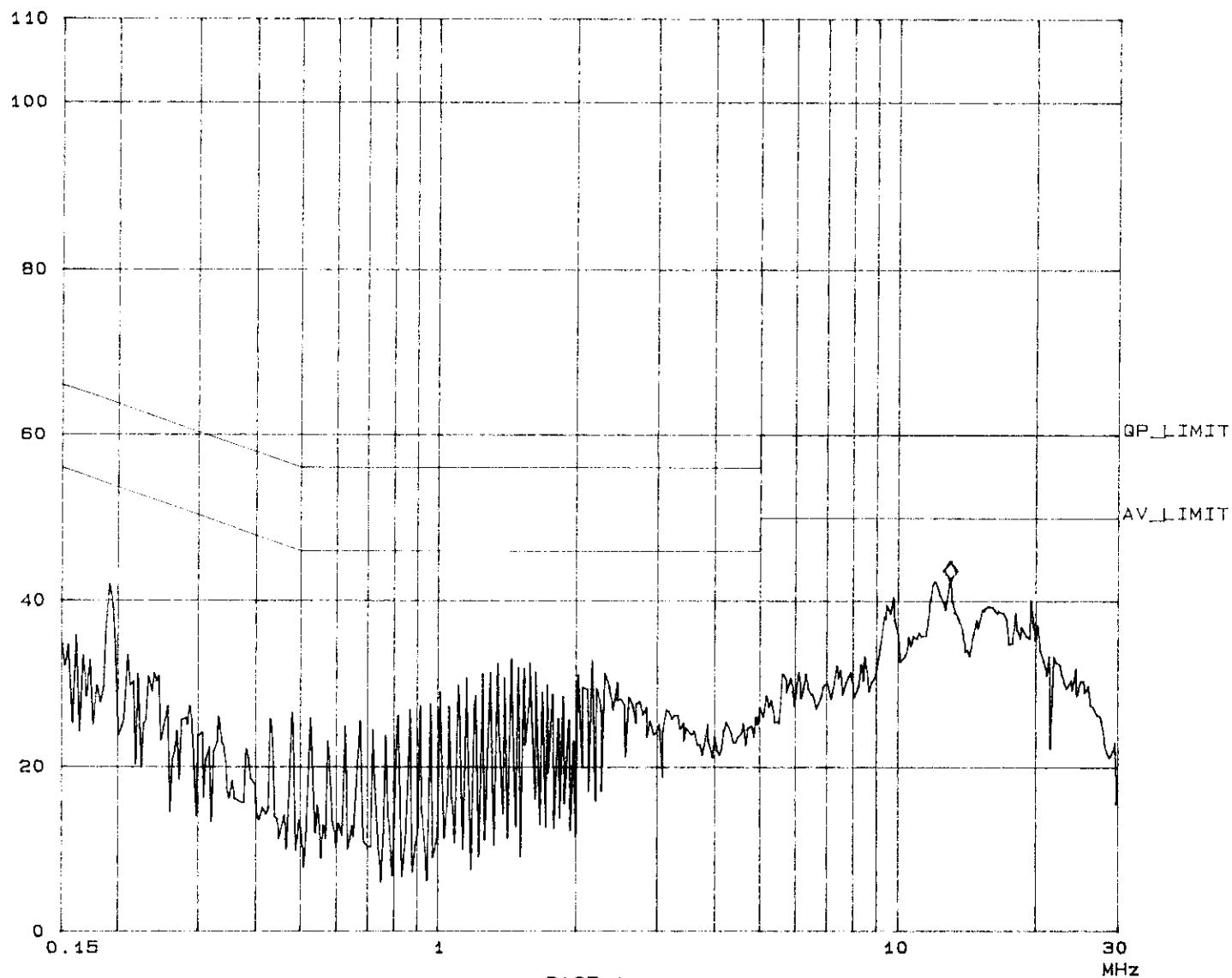
**Page 9-2**

**Tested by Chris Yang**

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	10dB	BLN OFF	60dB	
450k	5M	3k	10k	PK	1ms	10dB	BLN OFF	60dB	
5M	30M	3k	10k	PK	1ms	10dB	BLN OFF	60dB	

dBuV      ♦ Mkr : 12.99200MHz 42.5 dBuV





### 4.3 TEST DATA OF RADIATED EMISSION

EUT: MONITORMODEL: V5AV01MODE: 1280x1024 (64 kHz)ANTENNA: CHASE BILOG CBL6112POLARITY: HorizontalDETECTOR FUNCTION: Quasi-peak6 dB BANDWIDTH: 120 kHzFREQUENCY RANGE: 30-1000 MHzMEASURED DISTANCE: 10 MTEST PERSONNEL: Chris Young

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
30.63	18.7	4.5	23.2	30.0	-6.8
34.50	17.3	5.4	22.7	30.0	-7.3
76.61	8.5	14.0	22.5	30.0	-7.5
201.65	13.4	3.1	16.5	30.0	-13.5
208.15	13.7	7.5	21.2	30.0	-8.8
214.67	14.0	7.5	21.5	30.0	-8.5

- 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: **MONITOR**MODEL: **V5AV01**MODE: **1280x1024 (64 kHz)**

ANTENNA: CHASE BILOG CBL6112

POLARITY: VerticalDETECTOR FUNCTION: Quasi-peak

6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz

MEASURED DISTANCE: 10 M

TEST PERSONNEL: Chris Young

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
46.10	11.4	13.5	24.9	30.0	-5.1
47.72	10.8	13.0	23.8	30.0	-6.2
76.45	7.7	13.5	21.2	30.0	-8.8
78.80	7.9	11.9	19.8	30.0	-10.2
143.10	14.7	6.4	21.1	30.0	-8.9
208.18	13.9	6.5	20.4	30.0	-9.6

- 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



## 6. ATTACHMENT I-TECHNICAL DESCRIPTION OF EUT

### SPECIFICATIONS:

*Picture Tube	15-inch (13.9" viewable) High Contrast flat square tube, Anti-reflective coating and 90 ° deflection.
*Dot Pitch	0.28 mm
*Max. Resolution	1280x1024 (Non-interlaced)
*Display Colors	Unlimited
*Scanning Frequency	
Horizontal	30kHz to 70 kHz
Vertical	50 Hz to 120 Hz
*Display Area W x H	11.8" x 8.9" (300 mm x 225 mm) typical
*Video Bandwidth	100 MHz (-3 db) typical
*Input Signal	
Video	Analog, 0.7Vp-p, 75 ohm
Sync	Separate TTL level
*Audio	Built-in 2W x 2 stereo speakers
*Power Supply	100-240 Vac, 50/60 Hz, Universal
*Power Consumption	Normal: < 90 Watts Suspend: < 15 Watts Active Off: < 8 Watts
Recommended Ambience	
Operating Temperature	32 °F to 104 °F
Operating Humidity	10 to 90 %
Storage Temperature	-4 °F to 140 °F
Dimensions W x H x D	14.2" x 14.6" x 15.9" (360 mm x 370 mm x 405 mm)
Weight	
Net	28.9 lbs. (13.1 kg)
Gross	33.3 lbs. (15.1 kg)