



FCC CFR47 PART 15 DIGITAL DEVICE

TEST REPORT

FOR

Display Monitor

MODEL: AMB-280A/AT

REPORT NUMBER: 01E9606

ISSUE DATE: July 23, 2001

Prepared for

**AAEON Technology Inc.
5F, No. 135, Lane 235, Pao Chiao Rd.,
Hsin-Tien City, Taipei,
Taiwan, R. O. C.**

Prepared by

**COMPLIANCE ENGINEERING SERVICES, INC.
No. 199, CHUNG SHENG ROAD
HSIN TIEN CITY, TAIPEI, TAIWAN R.O.C.
TEL: (02) 2217-0894
FAX: (02) 2217-1254**

NVLAP[®]
LAB CODE: SL2-IN-E-0005



**FCC, VCCI, CISPR, CE
UL, CSA, TÜV, VDE**

**U.S.A. : P.O.BOX 612650, SAN JOSE, CA 95161-2650
TAIPEI : P.O.BOX 17-82, HSIN TIEN, TAIWAN, R.O.C.**

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1. VERIFICATION OF COMPLIANCE



COMPANY NAME: AAEON Technology Inc.
 5F, No. 135, Lane 235, Pao Chiao Rd.,
 Hsin-Tien City, Taipei,
 Taiwan, R. O. C.

CONTACT PERSON: Jack Chao / Deputy Director

TELEPHONE NO: 8919-1234 # 637

MODEL NO/NAME: AMB-280A/AT

SERIAL NO: N/A

DATE TESTED: July 16, 2001 & July 18, 2001

TYPE OF EQUIPMENT:	INFORMATION TECHNOLOGY EQUIPMENT (ITE)
MEASUREMENT DISTANCE:	() 3 METER (x) 10 METER
TECHNICAL LIMIT:	Class A
FCC RULES:	PART 15
MEASUREMENT PROCEDURE	ANSI C63.4:92 / EN55022
EQUIPMENT AUTHORIZATION PROCEDURE	DECLARATION OF CONFORMITY
MODIFICATION MADE ON EUT	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
DEVIATIONS FROM MEASUREMENT PROCEDURE	<input type="checkbox"/> YES (refer to section 21 for comments) <input checked="" type="checkbox"/> NO
RADIATED EMISSION TEST RESULT	-5.03dB @ 801.933 MHz / VERTICAL
CONDUCTED EMISSION TEST RESULT	-23.36dB @ 9.654 MHz / L1

The above equipment was tested by Compliance Engineering Services, Inc. for compliance with the requirements set forth in the FCC CFR 47, PART 15. The results of testing in this report apply to the product/system which was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Approved By

Acknowledged By

Rick Yeo

 RICK YEO / EMC MANAGER
 COMPLIANCE ENGINEERING SERVICES

 Jack Chao / Deputy Director
 AAEON Technology Inc.

SYSTEM DESCRIPTION

EUT Test Procedure:

1. Windows 98 Boots System.
2. Run Winemc.exe and Pen mount to Activate All Peripherals And Display “H” Pattern on Monitor Screen.

PRODU INFORMATION

Housing Type:	N/A
EUT Power Rating:	DC 12V from AC-DC Adaptor
AC power during Test:	110V, 60Hz
AC-DC Adaptor Manufacturer:	CHI
AC-DC Adaptor Model Number:	CH-1205
AC Power Cord Type:	Unshielded, 1.8m (Detachable)
Max. Resolution:	1024 X 768
Max. Hor./Ver. Frequency(kHz/Hz):	80kHz / 75Hz
DC Power Cable Type:	Unshielded, 0.8m W/ One core of EUT end. (Detachable)
OSC/Clock Frequencies :	14.318 MHz; 24.576 MHz

I/O Port of EUT:

I/O PORT TYPES	Q'TY	TESTED WITH
1). Serial Port	1	1
2). VGA Port	1	1
3). S-Video	1	1
4). RCA Jack	3	3
5). DC Plug	1	1

Note: N/A

SUPPORT EQUIPMENT

No	Equipment	Model #	Serial #	FCC ID	Trade Name	Data Cable	Power Cord
1.	Mouse	M-M34	LZE02353706	DZL211029	Logitech	Unshielded, 1.8m	N/A
2.	Printer	2225C+	2927S50444	DSI6XU2225	HP	UnShielded, 1.8m	Unshielded, 1.8m
3.	Notebook	365	TZ30518	DOC	ACER	Serial Port: Shielded, 1.7m VGA Port: Shielded, 1.5m Two Ferrite Core	Unshielded, 1.8m
4.	Monitor	170MP	N/A	DOC	Samsung	Video Out: Un-Shielded, 1.8m	Unshielded, 1.8m
5.	HI-8	SCH985	67CG300364	DOC	Samsung	Video In #2 : Unshielded, 1.5 m S-Video: Unshielded, 1.5m	Unshielded, 1.8m
6.	V.C.R.	SLV-588HF	0135505	AK8SLV688HF	Sony	Video In #1 : Shielded, 1.5m	Unshielded, 1.8m

Note: All the above equipment/cables were placed in worse case positions to maximize emission signals.

Grounding: Grounding was in accordance with the manufacturer's requirements and conditions for the intended use.

MEASUREMENT PROCEDURE (PRELIMINARY LINE CONDUCTED EMISSION TEST)

- 1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- 2) Support equipment, if needed, was placed as per ANSI C63.4.
- 3) All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- 4) The EUT received DC 12V power through AC Adaptor and Line Impedance Stabilization Network (LISN) which supplied power source of 110VAC/ 60Hz and was grounded to the ground plane.
- 5) All support equipment received power from a second LISN supplying power of 110VAC/60Hz, if any.
- 6) The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7) Analyzer / Receiver scanned from 150kHz to 30MHz for emissions in each of the test modes.
- 8) During the above scans, the emissions were maximized by cable manipulation.
- 9) The following test mode(s) were scanned during the preliminary test:

Mode(s):

- 1. RGB & Touch Panel Mode (Data No. : 9606E# 40 ; Date: 07/18/2001)**
- 2. Video 1 & Video 2 Mode (Data No. : 9606E# 32 ; Date: 07/18/2001)**
- 3. S-Video Mode (Data No. : 9606E# 24, 56 ; Date: 07/18/2001)**

- 10) After the preliminary scan, we found the following test mode(s) producing the highest emission level.

Mode(s): 3.

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

MEASUREMENT PROCEDURE (FINAL LINE CONDUCTED EMISSION TEST)

- 1) EUT and support equipment was set up on the test bench as per step 10 of the preliminary test.
- 2) A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less -2dB to the A.V. limit in Q.P. mode, then the emission signal was re-checked using an Average detector.
- 3) The test data of the worst case condition(s) was reported on the Summary Data page.

Data Sample:

Freq (MHz)	Meter Reading (dBuV)	C.F. (dB)	Corrected Reading (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Reading Type (P/Q/A)	Line (L1/L2)
x.xx	x.xx	x.xx	48.38	66.00	-17.62	P	L1

C.F.(Correction Factor)=Insertion Loss + Cable Loss
 Corrected Reading = Metering Reading + C.F.
 Margin=Corrected Reading - Limits

P=Peak Reading L1=Hot
 Q=Quasi-peak L2=Neutral
 A=Average Reading

Comments: N/A

LINE CONDUCTED EMISSION LIMIT

Frequency	Maximum RF Line Voltage	
	Q.P.	AVERAGE
150kHz-500kHz	79dBuV	66dBuV
500kHz-5MHz	73dBuV	60dBuV
5MHz-30MHz	73dBuV	60dBuV

Note: The lower limit shall apply at the transition frequency.

MEASUREMENT PROCEDURE (PRELIMINARY RADIATED EMISSION TEST)

- 1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- 2) Support equipment, if needed, was placed as per ANSI C63.4.
- 3) All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- 4) The EUT received DC 12V power source from AC Adaptor to the outlet socket under the turntable. All support equipment received 110VAC/60Hz power from another socket under the turntable, if any.
- 5) The antenna was placed at 10 meter away from the EUT as stated in ANSI C63.4: 1992. The antenna connected to the Analyzer via a cable and at times a pre-amplifier would be used.
- 6) The Analyzer / Receiver quickly scanned from 30MHz to 1000MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- 7) The following test mode(s) were scanned during the preliminary test:

Mode:

- 1. RGB & Touch Panel Mode (Data No. 9606D# 15, 18 ; Date: 07/16/2001)**
- 2. Video 1 & Video 2 Mode (Data No. 9606D# 12 ; Date: 07/16/2001)**
- 3. S-Video Mode (Data No. 9606D# 11 ; Date: 07/16/2001)**

- 8) After the preliminary scan, we found the following test mode(s) producing the highest emission level.

Mode(s): 1.

Then, the EUT and cable configuration, antenna position, polarization and turntable position of the above highest emission level were recorded for reference of final testing.

MEASUREMENT PROCEDURE (FINAL RAIDATED EMISSION TEST)

- 1) EUT and support equipment were set up on the turntable as per step 8 of the preliminary test.
- 2) The Analyzer / Receiver scanned from 30MHz to 1000MHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- 3) Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and only Peak reading is presented. If EUT emission level was less-2dB to the limit, then the emission signal was re-checked using a Q.P. detector.
- 4) The test data of the worst case condition(s) was reported on the Summary Data page.

Data Sample:

Freq (MHz)	Meter Reading (dBuV)	C.F. (dB/m)	Corrected Reading (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Reading Type P/Q/A	Pol. H/V
x.xx	x.xx	x.xx	40.82	47.00	-6.18	P	V

C.F.(Correction Factor)=Antenna Factor + Cable Loss + Attenuator(3/6 dB) - Amplifier Gain

Corrected Reading = Metering Reading + C.F.

Margin=Corrected Reading – Limits

P=Peak Reading

H=Horizontal Polarization/Antenna

Q=Quasi-peak

V=Vertical Polarization/Antenna

A=Average Reading

Comments: N/A

RADIATED EMISSION LIMIT

Frequency (MHz)	Distance (m)	Maximum Field Strength Limit (dBu V/m/ Q.P.)
30-230	10	40
230-1000	10	47

Note: The lower limit shall apply at the transition frequency.

SUMMARY DATA (LINE CONDUCTED TEST)

Model Number: AMB-280A/AT**Location:** Site # E**Tested by:** Michael Hung**Test Model:** Mode 3**Test Results:** Passed**Temperature:** 24°C**Humidity:** 60%RH

(The chart below shows the highest readings taken from the final data)

Frequency Range Investigated				150 kHz TO 30 MHz			
Freq (MHz)	Meter Reading (dBuV)	C.F. (dB)	Corrected Reading (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Reading Type (P/Q/A)	Line (L1/L2)
4.598	47.09	0.25	47.34	73.00	-25.66	P	L1
5.623	48.18	0.28	48.46	73.00	-24.54	P	L1
9.451	46.65	0.33	46.98	73.00	-26.02	P	L1
9.654	49.30	0.34	49.64	73.00	-23.36	P	L1
9.913	47.53	0.34	47.87	73.00	-25.13	P	L1
5.623	45.82	0.28	46.10	73.00	-26.90	P	L2

C.F.(Correction Factor)=Insertion Loss + Cable Loss

Corrected Reading = Metering Reading + C.F.

Margin=Corrected Reading - Limits

P=Peak Reading

L1=Hot

Q=Quasi-peak

L2=Neutral

A=Average Reading

Comments: N/A

SUMMARY DATA

(RADIATED EMISSION TEST)

Model Number: AMB-280A/AT**Location:** Site # D**Tested by:** Michael Hung**Polar:** Vertical / Horizontal– 10m**Test Mode:** Mode 1**Test Results:** Passed**Temperature:** 25⁰C**Humidity:** 65%RH

(The chart below shows the highest readings taken from the final data)

Frequency Range Investigated				30 MHz TO 1000 MHz			
Freq (MHz)	Meter Reading (dBuV)	C.F. (dB/m)	Corrected Reading (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Reading Type P/Q/A	Pol. H/V
36.008	38.89	-9.88	29.01	40.00	-10.99	P	V
149.786	37.42	-7.11	30.31	40.00	-9.69	P	V
791.667	31.35	4.93	36.28	47.00	-10.72	P	V
801.933	36.86	5.11	41.97	47.00	-5.03	P	V
801.882	33.94	5.11	39.05	47.00	-7.95	P	H
880.518	29.73	6.13	35.86	47.00	-11.14	P	H

C.F.(Correction Factor)=Antenna Factor + Cable Loss + Attenuator (6dB) - Amplifier Gain

Corrected Reading = Metering Reading + C.F.

Margin=Corrected Reading - Limits

P=Peak Reading

H=Horizontal Polarization/Antenna

Q=Quasi-peak

V=Vertical Polarization/Antenna

A=Average Reading

Comments: N/A

TEST EQUIPMENT LIST (EMISSION)

Instrumentation: The following list contains equipment used at Compliance Engineering Services, Inc.. for testing. The equipment conforms to the CISPR 16-1 / ANSI C63.2-1988 Specifications for Electromagnetic Interference and Field Strength Instrumentation from 9kHz to 1.0 / 2.0 GHz.

Equipment used during the tests:

Open Area Test Site: #D

Equipment	Manuf.	Model No.	Serial No.	Cal Date	Due Date
EMI TEST DISPLAY	R&S	DSAI-D 804.8932.52	827832/001	11/05/00	11/05/01
EMI TEST RF UNIT	R&S	ESBI-RF/1005.4300.52	827832/003	11/05/00	11/05/01
AMPLIFIER	HP	8447D A	2727A05764	05/07/01	05/07/02
ANTENNA	SCHWARZBECK	VULB 9160	3104	05/17/01	05/17/02
CABLE	TIME MICROWAVE	LMR-400	N-TYPE02	07/09/01	07/09/02

Open Area Test Site: # E

Equipment	Manuf.	Model No.	Serial No.	Cal Date	Due Date
SPECTRUM ANALYZER	H.P.	8566B	2937A06102	06/06/01	06/06/02
SPECTRUM DISPLAY	H.P.	85662A	2848A18276	06/06/01	06/06/02
QUASI-PEAK DETECTOR	H.P.	85650A	2811A01439	06/07/01	06/07/02
AMPLIFIER	H.P.	8447D B	1644A02328	05/07/01	05/07/02
ANTENNA	EMCO	3142	1310	06/30/01	06/30/02
TEST RECEIVER	R&S	ESHS20	840455/006	03/15/01	03/15/02
LISN	EMCO	3825/2	1842	01/10/01	01/10/02
LISN(EUT)	EMCO	3825/2	1435	01/10/01	01/10/02
CABLE	TIME MICROWAVE	LMR-400	N-TYPE04	07/09/01	07/09/02
ANTENNA (1-18GHz)	EMCO	3115	5761	02/23/01	02/23/02
CABLE (1-18GHz)	JYEBAO	N30-L142-1	N/A	03/02/01	03/02/02
AMPLIFIER (1-26GHz)	MITEQ	NSP2600-44	646455	02/26/01	02/26/02

The calibrations of the measuring instruments, including any accessories that may effect such calibration, are checked frequently to assure their accuracy. Adjustments are made and correction factors applied in accordance with instructions contained in the manual for the measuring instrument.

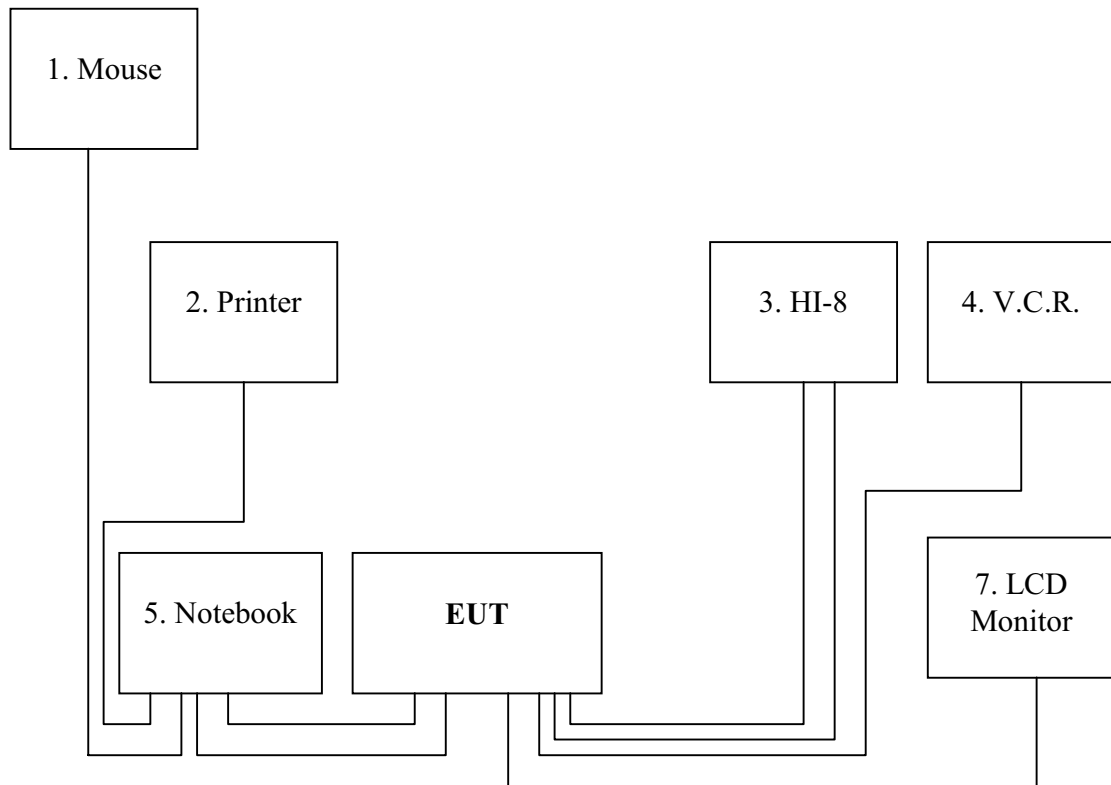
BLOCK DIAGRAM OF TEST SETUP

System Diagram of Connections between EUT and Simulators

EUT: Display Monitor

Trade Name: N/A

Model Number: AMB-280A/AT



APPENDIX 1

PHOTOGRAPHS OF TEST SETUP (TEST SETUP OF LINE CONDUCTED EMISSION)

LINE CONDUCTED EMISSION TEST



APPENDIX 2

PHOTOGRAPHS OF TEST SETUP (TEST SETUP OF LINE RADIATED EMISSION)

RADIATED EMISSION TEST

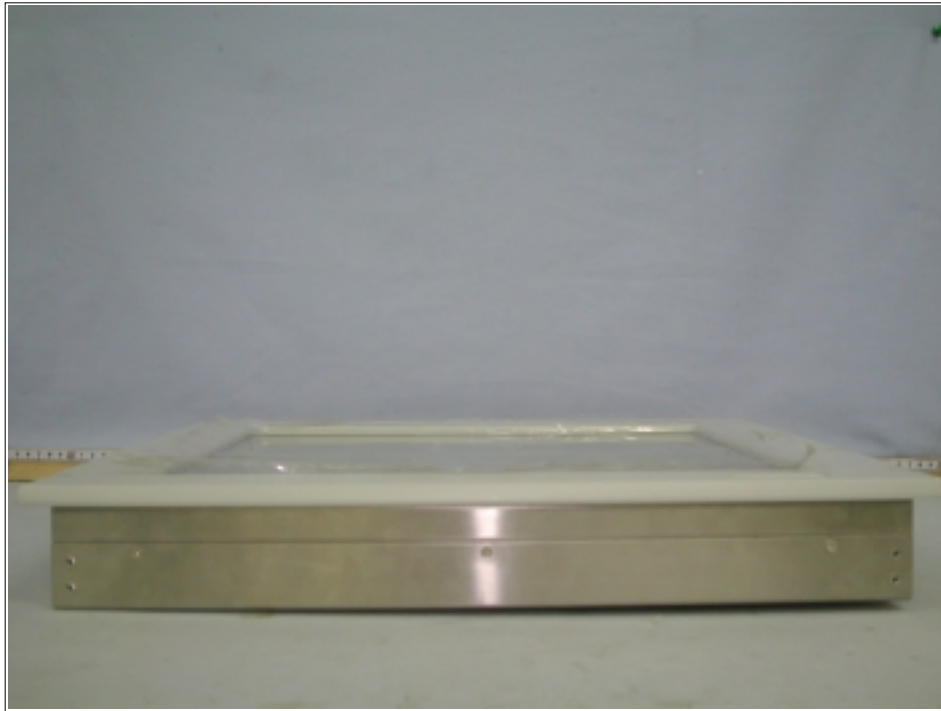


APPENDIX 3

PHOTOGRAPHS OF EUT







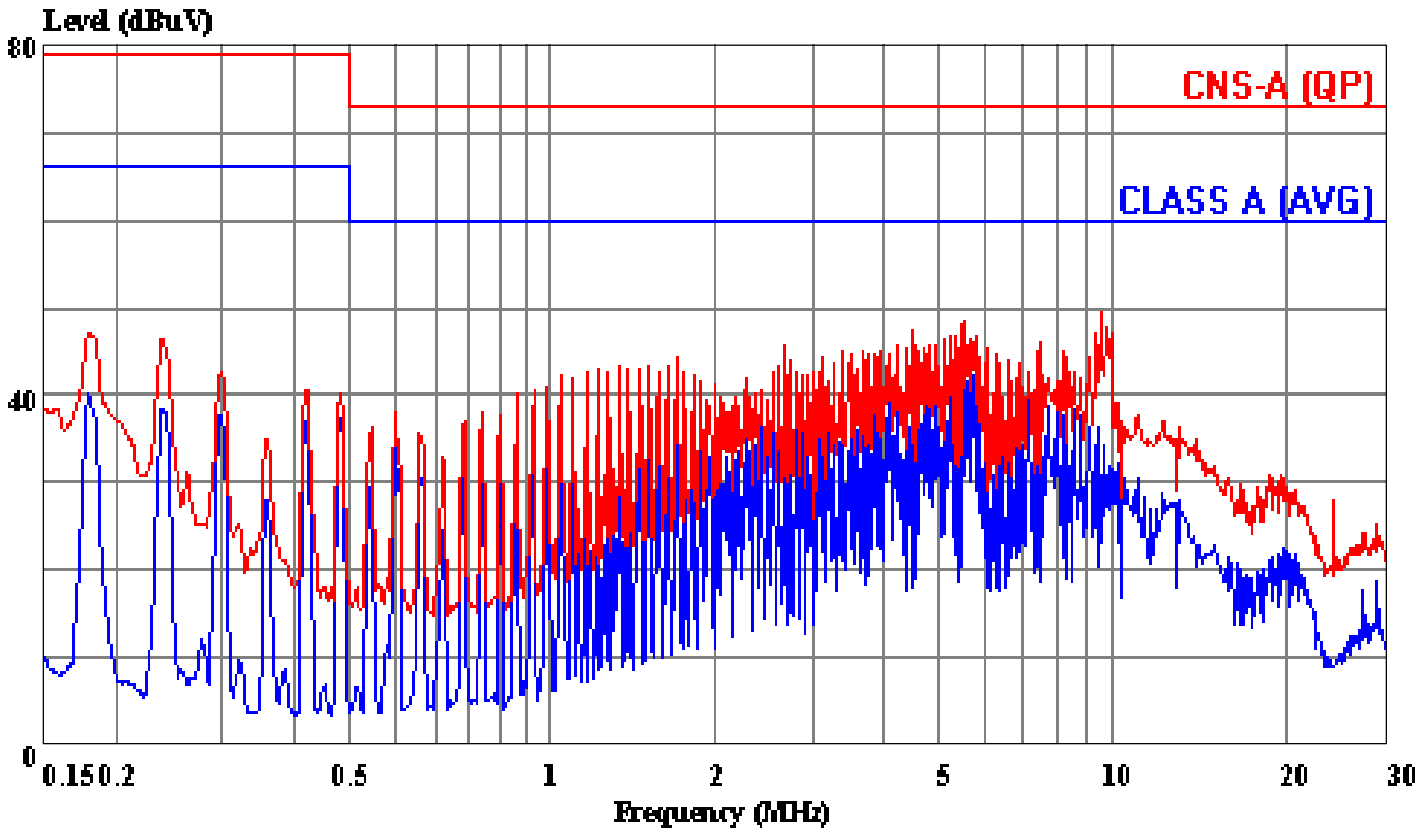


APPENDIX 4

CONDUCTED EMISSION PLOT RADIATED EMISSION DATA

Data#: 24 File#: 9606e.emi

Date: 2001-07-18 Time: 18:25:23



(CES Conducted)

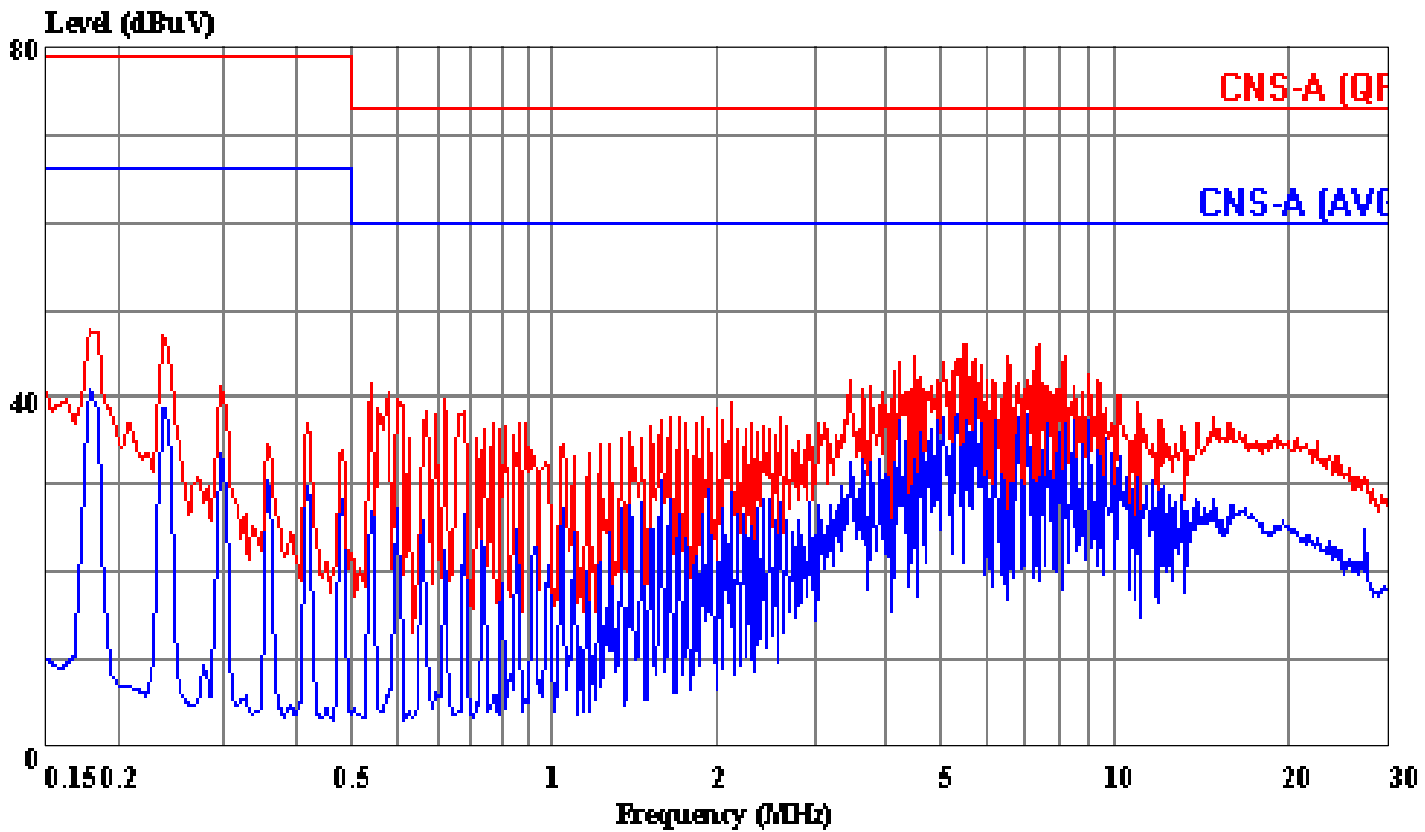
Trace: 23

Ref Trace:

Condition: LINE
 Report No. : 01E9606
 Test Engr. : MICHAEL HUNG
 Company : AAEON Technology Inc.
 EUT : AMB-280A/AT
 Test Config : EUT/ALL PERIPHERALS
 Type of Test : FCC CLASS A W/ EN 55022 CLASS A LIMIT
 Mode of Op. : S-Video MODE

Data#: 56 File#: 9606e.emi

Date: 2001-07-18 Time: 20:34:09



(CES Conducted)

Trace: 55

Ref Trace:

Condition: NEUTRAL
 Report No. : 01E9606
 Test Engr. : MICHAEL HUNG
 Company : AAEON Technology Inc.
 EUT : AMB-280A/AT
 Test Config : EUT/ALL PERIPHERALS
 Type of Test: FCC CLASS A W/EN 55022 CLASS A LIMIT
 Mode of Op. : S-Video MODE

Data#: 15 File#: 9606d.emi
CCS D-Site

Date: 2001-07-16 Time: 20:15:31

Condition: VERTICAL
Report No. : 01E9606
Test Engr. : MICHAEL HUNG
Company : AAEON Technology Inc.
EUT : AMB-280A/AT
Test Config : EUT/ALL PERIPHERALS
Type of Test: FCC CLASS A W/EN 55022 CLASS A LIMIT
Mode of Op. : RGB & TOUCH PANEL MODE

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	Freq	Read		Level	Limit	Over	Remark
		Level	Factor				
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	36.008	38.89	-9.88	29.01	40.00	-10.99	Peak
2	149.786	37.42	-7.11	30.31	40.00	-9.69	Peak
3	168.989	34.80	-7.56	27.24	40.00	-12.76	Peak
4	188.540	35.69	-9.32	26.37	40.00	-13.63	Peak
5	300.733	38.89	-4.89	34.00	47.00	-13.00	Peak
6	400.945	33.66	-2.84	30.82	47.00	-16.18	Peak
7	499.850	35.11	-1.01	34.10	47.00	-12.90	Peak
8	791.667	31.35	4.93	36.28	47.00	-10.72	Peak
9	801.933	36.86	5.11	41.97	47.00	-5.03	Peak

Data#: 18 File#: 9606d.emi
CCS D-Site

Date: 2001-07-16 Time: 22:22:16

Condition: HORIZONTAL
Report No. : 01E9606
Test Engr. : MICHAEL HUNG
Company : AAEON Technology Inc.
EUT : AMB-280A/AT
Test Config : EUT/ALL PERIPHERALS
Type of Test: FCC CLASS A W/EN 55022 CLASS A LIMIT
Mode of Op. : RGB & TOUCH PANEL MODE

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	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	150.344	34.60	-7.10	27.50	40.00	-12.50	Peak
2	169.211	31.07	-7.56	23.51	40.00	-16.49	Peak
3	186.139	35.21	-9.03	26.18	40.00	-13.82	Peak
4	229.056	34.96	-8.18	26.78	40.00	-13.22	Peak
5	399.900	32.14	-2.86	29.28	47.00	-17.72	Peak
6	801.882	33.94	5.11	39.05	47.00	-7.95	Peak
7	880.518	29.73	6.13	35.86	47.00	-11.14	Peak