

1. GENERAL INFORMATION

1-1. Product Description

The TECO Information System Co., Ltd. Model: JC-1579VMA-(TW) (referred to as the EUT in this report) is a VGA, and VESA compatible multi-sync. color monitor featuring a maximum pixel resolution of 1280×1024 (Non-Interlaced).

The EUT provides a permanently attached video interface cable, approx. 1.5 meter, incorporated with a 15-pin, D-shell male, connector in addition to a detachable type power cord.

Following described the summarized feature of EUT:

A more detailed and/or technical descriptions of EUT is attached in **attachment-A**

1-2. Related Submittal(s) / Grant (s)

This submittal is intended for filing a class II permissive change for the certified equipment FCC ID : E80TE572 (date of grant Oct. 16, 1998).

Comparing with current model, the following change are initiated into the modified model:

Comparing with current model, the following changes are made:

1. Electrical Circuitry – Power Supply
Deleting the Power Factor Correction (PFC) circuit for cost down purpose.
2. PWB
Partial printed wiring Board routing (layout), location of L901, C902, R901, R902, FL902, D901 ~ D904, D90, PTH901, NTH901, BD901 and BD903, modified due to the change(s) of PFC circuit.

The charges will be made only in those units produce after the charges is authorized. Also, the product will keep two versions in market.

1-3. Tested System Details

The FCC IDs for all equipments, plus descriptions of all cables used in the tested system (including inserted cards, which have grants) are:

Model No.	FCC ID	Equipment	Cable
JC-1579VMA-(TW) ⁽¹⁾	E8OTE572	MONITOR	Shielded Video Cable. ⁽²⁾ Shielded Power Cord
PRESARIO7222	EJH3326	PC	Shielded Power Cord.
Series.2 -7S	DZL6QBS2	Mouse	Shielded Parallel I/F Cable. Unshielded Power Cord.
HP2225C+	DSI6XU2225	Printer	Shielded Serial I/F Cable. Unshielded Power Cord.
AT-1200CK	E205OV1200CK	Modem	Shielded Data Cable
FDA-102A	F4Z4K3FDA102A	Keyboard	Shielded Data Cable
S3Trio64+	ICUVGA-GW503B	VGA Card	Add-On Card Cableless

Notes:

(1) EUT submitted for grant.

(2) Monitor's attached video cable with ferrite core.

1-4. Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (1992)/CISPR 22 (1996). Radiated testing was performed at an antenna to EUT distance 10 meters.

1-5. Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the address of No. 5, All 2, Lane 220, Kang Lo St., Nei Hwu, Taipei, Taiwan, R.O.C. of NEUTRON ENGINEERING INC. This site has been fully described in report dated Feb.4,1998 Submitted to your office, and accepted in a letter dated March 28, 1998 (31040/SIT-1300F2).

3. System Test Configuration

3-1. Justification

The system was configured for testing in a typical fashion (as a customer would normally use it). The EUT was connected to support equipment-personal computer. Peripherals of PC, such as printer, modem, mouse and keyboard as well as the VGA add-on card were contained in this system in order to comply with the ANSI C63.4 standard requirement. The system was tested in the highest pixel resolution mode of 1280×1024 Hsync. 64KHz, and the highest horizontal sweep rate mode of 1024×768 , Hsync. 69KHz. Both modes were investigated and were used to collect the included data.

The second serial port(COM2) was tested in addition to the first port (COM1) ANSI C63.4, second paragraph. The simultaneous testing of this identical port did not take the system out of compliance. Therefore, the final qualification testing was completed with COM1 port connected by a stand alone modem.

3-2. EUT Exercise Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The software, contained on a 3-1/2 inch disk, was inserted into driver A and is auto-starting on power-up. Once loaded, the program sequentially exercises each system component in turn. The sequence used is:

1. Read(write) from(to)the disk desk driver.
2. Send " H " pattern to the parallel port device (Printer).
3. Send " H " pattern to the video port device (Monitor).
4. Send " H " pattern to the serial port device (Modem).
5. Repeated from 1 to 4 continuously.

As the Keyboard and mouse are strictly input devices, no data is transmitted to (from) them during test. They are, however, continuously scanned for data input activity.

3-3. Special Accessories

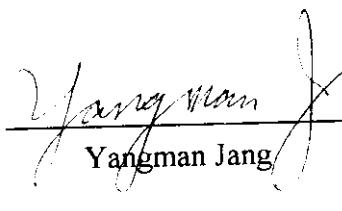
N/A

3-4. Equipment Modifications

In order to achieve in compliance with Class B levels, the following change(s) were made by NEUTRON test house during the compliance testing:

Please refer to the next page as the modification described and cross reference of photos of tested EUT.

The above modifications will be implemented in all product models of this equipment.

Applicant Signature :**Date :**

Nov. 13, 1998

Type/Printed Name :

Yangman Jang

Position :

Project Manager

TECO Image Systems Co., Ltd.

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Modification Report

Company:

Model No.: JC-1579VMA-(TW)

Page 1 of 1

FCC ID: E8OTE572

Date: Nov. 13, 1998

- A. Add a trorid core on the video cable.
- B. Add a trorid core on the video cable to close the video board.
- C. Add a trorid core on the CN502 cable.
- D. Add a trorid core on the CN603 cable.
- E. Add a trorid core on the safety ground line.
- F. Add a trorid core on the video cable to close the middle.

All the above modification will be implemented and relayout in the mass production to meet the FCC Class B requirements.

TECO Information System Co., Ltd.


Yangmian Jang
Project Manager

3.5 Configuration of Tested System

The configuration of tested system is described as the block diagram shown in next page Figure 3.1 and details information of I/O cable and power cord connection are tabulated as Table A and B. The monitor is powered from a floor mounted receptacle (referred to as the wall outlet in the previous described) was tested.

TABLE A - Test Equipment

Item	Equipment	Mfr.	Model/Type No.	I/O Port	FCC ID	Remark
E-1	MONITOR	TECO	JC-1579VMA-(TW)	VGA Port	E8OTE572	EUT
E-2	PC	COMPAQ	PRESARIO7222		EJH3326	
E-3	Mouse	Logitech	Series.2 -7S	Print Port	DZL6QBS2	
E-4	Printer	HP	HP2225C+	Com Port	DSI6XU2225	
E-5	Modem	Datatrionics	AT-1200CK	K/B Port	E2O5OV1200CK	
E-6	Keyboard	Forward	FDA-102A	PS/2 Port	F4Z4K3FDA102A	
E-7	VGA Card	GAINWARD	S3Trio64+	Card Slot	ICUVGA-GW503B	

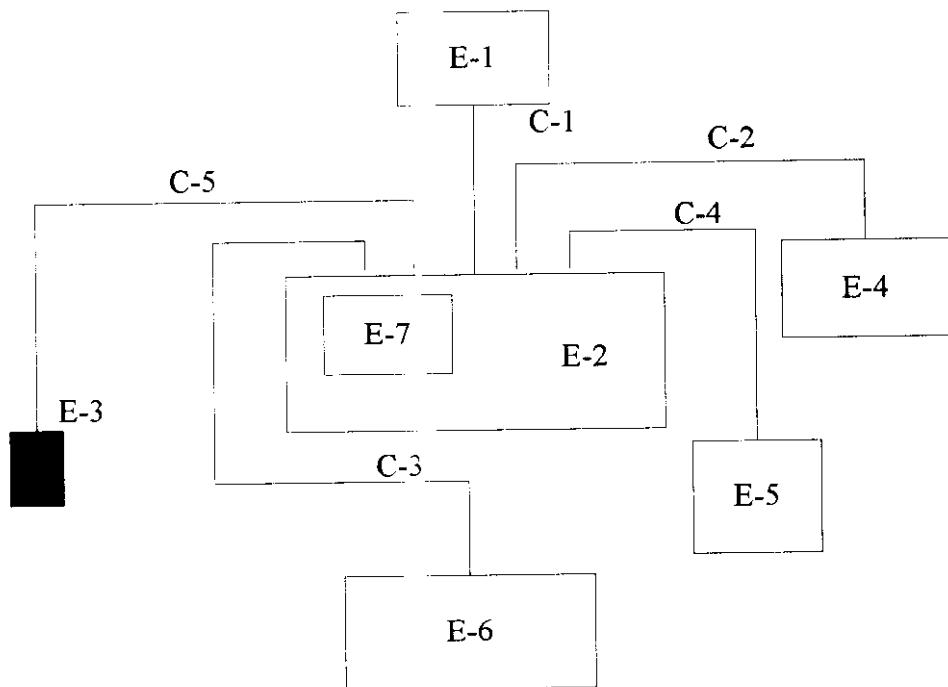
Remark:

- (1) Unless otherwise denoted as EUT in «Remark» column, device(s) used in tested system is a support equipment.
- (2) Unless otherwise marked as * in «Remark» column, Neutron consigns the supporting equipment(s) to the tested system.

Table B. - Informations Cable Information

Note:

(1) Unless otherwise marked as **※** in『Remark』colum, Neutron consigns the supporting equipment(s) to the tested system.

Figure 3.1 Configuration of Tested System

4. Block Diagram(s)

Figure 4.1 Block diagram of system

6.1 The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

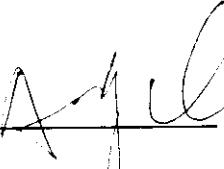
Test Mode : 1280 × 1024/64KHz/60Hz

Judgement: Passed by **-2.80 dB** in mode of **Line terminal 4.98 MHz**

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		(dBuV)	Safe Margins (Note)
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.17	L	45.47	*	65.16	55.16	-19.69	(QP)
0.28	L	38.09	*	60.91	50.91	-22.82	(QP)
2.44	L	38.42	*	56.00	46.00	-17.58	(QP)
4.98	L	45.88	43.20	56.00	46.00	-2.80	(AV)
6.22	L	43.05	*	60.00	50.00	-16.95	(QP)
0.17	N	45.89	*	65.16	55.16	-19.27	(QP)
0.22	N	38.51	*	62.93	52.93	-24.42	(QP)
1.43	N	27.14	*	56.00	46.00	-28.86	(QP)
4.82	N	44.19	41.70	56.00	46.00	-4.30	(AV)
15.80	N	32.34	*	60.00	50.00	-27.66	(QP)

Remark :

- (1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz ; SPA setting in RBW=100KHz,VBW =100KHz, Swp. Time = 0.3 sec./MHz. Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz,VBW=10Hz, Swp. Time =0.3 sec./MHz.
- (2) All readings are QP Mode value unless otherwise stated AVG in colum of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform. In this case, a " * " marked in AVG Mode colum of Interference Voltage Measured.
- (3) Measuring frequency range from 150KHz to 30MHz.

Review :  Test Personnel : Kiley WSG Date: July 31, 1998

6. Conducted Emission Datas

6.1 The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

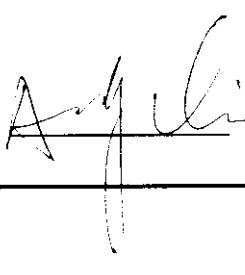
Test Mode : 1024×768/69KHz/85Hz

Judgement: Passed by **-16.04 dB** in mode of **Line terminal 4.95 MHz**

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		(dBuV)	Safe Margins Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.16	L	42.50	*	65.41	55.41	-22.91	(QP)
0.20	L	43.85	*	63.61	53.61	-19.76	(QP)
4.95	L	39.96	*	56.00	46.00	-16.04	(QP)
6.19	L	39.96	*	60.00	50.00	-20.04	(QP)
24.92	L	41.11	*	60.00	50.00	-18.89	(QP)
0.15	N	43.51	*	65.84	55.84	-22.33	(QP)
0.20	N	42.27	*	63.45	53.45	-21.18	(QP)
5.01	N	39.04	*	60.00	50.00	-20.96	(QP)
6.19	N	38.74	*	60.00	50.00	-21.26	(QP)
24.92	N	39.30	*	60.00	50.00	-20.70	(QP)

Remark :

- (1) Reading inwhich marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz ; SPA setting in RBW=100KHz,VBW =100KHz, Swp. Time = 0.3 sec./MHz 。 Reading inwhich marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz,VBW=10Hz, Swp. Time =0.3 sec./MHz 。
- (2) All readings are QP Mode value unless otherwise stated AVG in colum of『Note』。 If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemd to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform 。 In this case, a “*” marked in AVG Mode colum of Interference Voltage Measured 。
- (3) Measuring frequency range from 150KHz to 30MHz 。

Review :  Test Personnel : Ricky Yiu Date: July 31, 1998

7. Radiated Emission Data

7.1 The following data lists the significant emission frequencies, measured levels, correction factor (includes cable and antenna corrections), the corrected reading, as well as the limit. Explanation of the Correction Factor is given in paragraph 7.2.

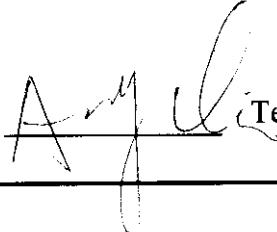
Test Mode : 1280 × 1024/64KHz/60Hz

Judgement: Passed by **-4.80 dB** in polarity of **Vertical 31.00 MHz**

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Safe Margins (dBuV/m)	Note
31.00	V	14.00	11.20	25.20	30.00	-	4.80
32.20	H	12.70	11.08	23.78	30.00	-	6.22
47.30	H	13.20	12.04	25.24	30.00	-	4.76
48.00	V	12.40	12.08	24.48	30.00	-	5.52
141.00	H	11.40	12.26	23.66	30.00	-	6.34
141.90	V	11.80	12.31	24.11	30.00	-	5.89
215.20	V	10.50	11.91	22.41	30.00	-	7.59
220.80	H	11.30	11.73	23.03	30.00	-	6.97
225.60	H	11.50	11.65	23.15	30.00	-	6.85
263.20	V	12.40	14.49	26.89	37.00	-	10.11
314.40	H	10.60	16.32	26.92	37.00	-	10.08
484.00	V	10.00	20.69	30.69	37.00	-	6.31

Remark :

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=1MHz, VBW =1MHz, Swp. Time = 0.3 sec./MHz.
- (2) All readings are Peak unless otherwise stated QP in column of "Note". Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
- (3) Measuring frequency range from 30MHz to 1000MHz.
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table.

Review :  Test Personnel : Riley Hsu Date: July 31, 1998

7. Radiated Emission Data

7.1 The following data lists the significant emission frequencies, measured levels, correction factor (includes cable and antenna corrections), the corrected reading, as well as the limit. Explanation of the Correction Factor is given in paragraph 7.2.

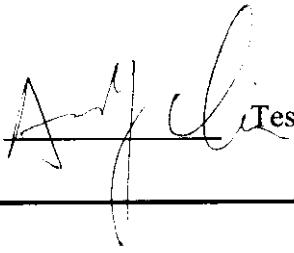
Test Mode : 1280×768/69KHz/85Hz

Judgement: Passed by **-3.53 dB** in polarity of **Horizon 157.3 MHz**

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Safe Margins (dBuV/m)	Note
32.20	H	14.50	11.08	25.58	30.00	-	4.42
122.30	H	12.90	13.49	26.39	30.00	-	3.61
127.80	V	12.10	13.15	25.25	30.00	-	4.75
144.60	V	13.30	12.48	25.78	30.00	-	4.22
157.30	H	12.50	13.97	26.47	30.00	-	3.53
158.90	V	11.80	14.22	26.02	30.00	-	3.98
215.20	V	12.00	11.91	23.91	30.00	-	6.09
378.40	H	11.90	17.54	29.44	37.00	-	7.56
418.40	V	13.40	18.28	31.68	37.00	-	5.32
420.80	H	15.10	18.34	33.44	37.00	-	3.56
438.40	V	12.00	18.96	30.96	37.00	-	6.04
479.20	H	11.00	20.51	31.51	37.00	-	5.49

Remark :

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=1MHz, VBW =1MHz, Swp. Time = 0.3 sec./MHz.
- (2) All readings are Peak unless otherwise stated QP in column of "Note". Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
- (3) Measuring frequency range from 30MHz to 1000MHz.
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table.

Review :  Test Personnel : Kiley Hsu Date: July 28, 1998

7. Radiated Emission Datas

7.1 The following data lists the significant emission frequencies, measured levels, correction factor (includes cable and antenna corrections), the corrected reading, as well as the limit. Explanation of the Correction Factor is given in paragraph 7.2.

Test Mode : 1280 × 768/69KHz/85Hz

Judgement: Passed by **-8.0 dB** in polarity of **Vertical 1316.0 MHz**

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Safe Margins (dBuV/m)	Note
1068.00	V	41.80	- 2.63	39.17	54.00	-14.83	
1178.00	V	43.50	- 1.92	41.58	54.00	-12.42	
1200.00	V	43.00	- 2.30	40.70	54.00	-13.30	
1222.00	H	39.70	- 1.48	38.22	54.00	-15.78	
1244.00	H	39.70	- 0.84	38.86	54.00	-15.14	
1244.00	V	43.30	- 0.84	42.46	54.00	-11.54	
1310.00	H	40.20	- 0.10	40.10	54.00	-13.90	
1316.00	V	46.10	- 0.10	46.00	54.00	- 8.00	
1332.00	H	36.80	0.45	36.35	54.00	-17.65	

Remark :

- (1) Reading inwhich marked as Peak means measurements by using are Peak Mode with instrument setting in RBW=1 MHz ,VBW =1MHz, Swp. Time = 0.3 sec./MHz .
- (2) Reading inwhich marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz,VBW=10Hz, Swp. Time =0.3 sec./MHz .
- (3) Measuring frequency range from 1000MHz to 2000MHz.
- (4) All readings are Peak unless otherwise stated AV in colum of 『Note』 . \times marked denotes that the Peak reading compliance with the Average Limits in FCC 15.109 and then the AV Mode measurement didn't perform.
- (5) If the peak scan value lower limit more than 20dB, then this signal data does not show in table

Review : Andy Liu Test Personnel : Riley Hsu Date: July 28, 1998

7-2. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$\mathbf{FS = RA + AF + CL - AG}$$

Where **FS** = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor (1)

CL = Cable Attenuation Factor (1)

AG = Amplifier Gain (1) (2)

Remark :

(1) The Correction Factor = AF + CL - AG, as shown in the data tables' Correction Factor column.

(2) AG is not available for Neutron's Open Site Facility

Example of Calculation:

Assume a Receiver Reading of 23.7 dBuV is obtained with an Antenna Factor of 7.2 dB and a Cable Factor of 1.1 dB. Then:

1. The Correction Factor will be calculated by

$$\mathbf{Correction\ Factor = AF + CL - AG = 7.2 + 1.1 - 0 = 8.3\ (dB)}$$

as shown in the data tables' Correction Factor column.

2. The Field Strength will be calculated by

$$\mathbf{FS = RA + Correction\ Factor = 23.7 + 8.3 = 32\ (dBuV/m).}$$

FS is the value shown in the data tables' Corrected Reading column and RA is the value shown in the data tables' Receiver Reading column. The 32 dBuV/m value was mathematically converted to its corresponding level in uV/m as:

$$\mathbf{Log^{-1} [(32.0dBuV/m)/20] = 39.8\ (uV/m)}$$

7-3. Correction Factor VS Frequency

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)
30.00	11.10	0.20
35.00	10.80	0.00
40.00	11.20	0.40
45.00	11.50	0.40
50.00	11.30	0.90
55.00	10.50	0.00
60.00	9.90	0.00
65.00	8.70	0.20
70.00	7.60	0.00
75.00	6.40	0.50
80.00	6.10	0.10
85.00	7.00	0.80
90.00	8.00	0.30
95.00	10.00	0.40
100.00	11.20	0.60
110.00	12.60	0.60
120.00	13.00	0.60
130.00	12.50	0.50
140.00	12.00	0.20
150.00	12.00	1.00
160.00	13.20	1.20
170.00	14.80	1.60
180.00	16.30	1.90
190.00	17.00	1.90
200.00	17.30	1.40
225.00	10.50	1.10
250.00	11.70	2.00
275.00	12.80	2.40
300.00	14.50	2.40
325.00	14.00	1.90
350.00	14.20	2.40
375.00	14.60	2.90
400.00	15.10	2.70
450.00	16.20	3.20
500.00	17.60	3.70
550.00	17.80	3.90
600.00	18.40	4.30
650.00	19.50	4.00
700.00	20.80	4.10
750.00	20.50	5.30
800.00	21.10	5.90
850.00	22.40	5.80
900.00	23.50	5.50
950.00	24.00	6.30
1000.00	24.80	5.20

8. Photos of Tested EUT:

The following photos are attached:

Photo # 1. Front View

Photo # 2. Rear View

Photo # 3. Unit Partially Disassembled

Photo # 4. Unit Partially Disassembled

Photo # 5. Unit Partially Disassembled

Photo # 6. Unit Partially Disassembled

Photo # 7. Unit Partially Disassembled

Photo # 8. Unit Partially Disassembled

Photo # 9. Unit Partially Disassembled

Photo # 10. Unit Partially Disassembled