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## **1. Introduction**

This specification describes a 17.0" color TFT LCD monitor which is supported by analog/digital interface solution and support maximum resolution 1280x1024 at 76Hz refresh rate. It has the following features:

**- User controls:**

- (a) "Power on/off" switch.
- (b) "Exit" key(Exit to previous menu ).
- (c) "iKey"(Intelligent key for automatic adjustment function by pressing one button).
- (d) "Enter" key (for enter OSD sub-menu or select items.
- (e) "Right" key (Select left, decreasing adjust and hot key of brightness mode).
- (f) "Left" key (Select right, increasing adjust and hot key of contrast mode).

- OSD window for control and information display with 8 languages selection.

- DPMS (Display Power Management System)

- Power on/off indicator.

- High quality advanced zoom function (Scaling function)

- Attached base with 0~25 degree tilt.

-DDC1/2B function supported.

-audio speakers and SRS sound

-Dual Input

**- A LCD monitor**

**(a)Head part:**

- (1) A LCD module(AU EN05 12ms).
- (2) An AC to DC adapter(60W) and inverter board.
- (3) An Interface board.
- (4) A control board.
- (5) A 15pin D-sub connector and 30 pin DVI connector.
- (6) USB 2.0 480Mb/Sec (3 down stream ports).

**(b) Optional part**

- (1) Web Camera

350K pixel (640 x 480 ) color CMOS Sensor .

- (2) Speaker module

An optional speaker module with SRS and 2Wx2 speakers. Reserve one audio in and earphone out jacket and one volume control.

**(c) Base part:**

- (1)Tilt base. (2) Foldable

- A power cord
- An user menu.
- Setup disk. (including .INF/.ICM/Test pattern) --all INF/ICM/Test pattern are loaded in CD manual + Quick start guide

## **2. Operational Specification**

### **2.1 Environment**

#### **2.1.1 Temperature**

- Operating                      0 to 40
- Storage                        -20 to 60

#### **2.1.2 Humidity**

- Relative Humidity, Operating:    10%~90%, without condensation
- Relative Humidity, Storage:        10%~95%

#### **2.1.3 Altitude**

- Operating (without packing condition)      0 to 3,657m (12,000ft)
- Non-operating(with packing condition)      0 to 12,192m (40,000ft)

### **2.2 Transportation**

#### **2.2.1 Vibration Test (Package, Non-Operating)**

- A) Sine-wave vibration for initial resonance sweeps and dwell  
\* Sine sweep

Frequency (Hz)	Status
5 ~ 26.6	0.6G
26.6 ~ 50	0.016"
50 ~ 500	1.5G

Sweep times: 1 sweep / Per Axis (X,Y, and Z Axis )

\* One major resonance dwell is required for each axis.

Total dwell time at each resonance point shall be 15 minutes.

- B) Random Vibration

Frequency (Hz)	Slope ( dB/Oct.)	Spectrum Level (g <sup>2</sup> /Hz)
5 ~ 100	0	0.015
100 ~ 200	-6	---
200	---	0.0038

Equivalent to 1.47 G rms

\* Duration: 30 Minutes / Per Axis (X,Y, and Z Axis )

Total test time : 90 Minutes

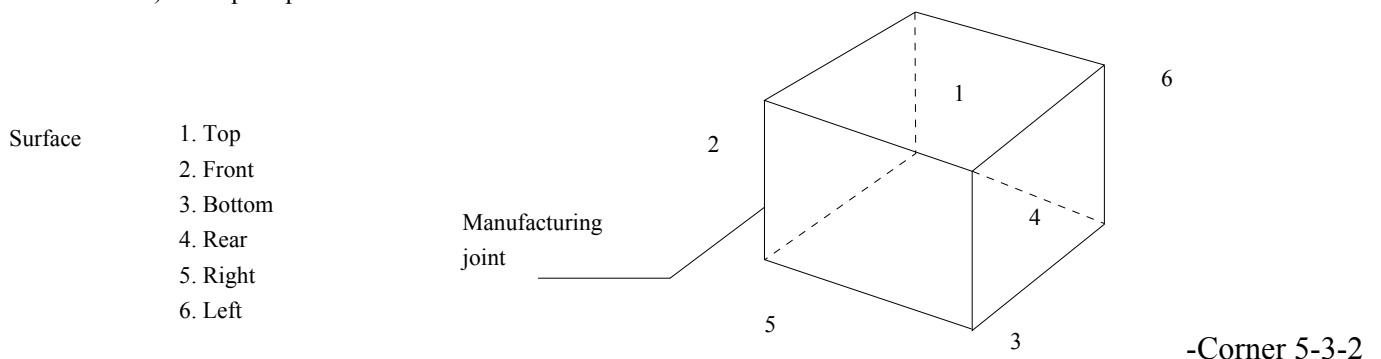
**2.2.2 Drop Test (Package, Non-Operating)**

## A) Drop Height

Weight ( Kg )	ACM Spec. Height (cm)
0 – 9	91
> 9 - 18.2	76
> 18.2 - 27.2	61
> 27.2 - 45.4	46
> 45.4 - 68.1	31
> 68.1 – 113.5	26

Upgrade one level of height before MP.

## B) Drop Sequence



select at weakness side [the low left(or right) corner of the front panel]

- An edge drop with impact on the shortest edge radiating from corner 5-3-2
- An edge drop with impact on the next shortest edge radiating from corner 5-3-2
- An edge drop with impact on the longest edge radiating from corner 5-3-2
- A flat drop with impact on the rear
- A flat drop with impact on the front
- A flat drop with impact on the right
- A flat drop with impact on the left
- A flat drop with impact on the bottom
- A flat drop with impact on the top

After test, there is no electrical and mechanical damage permitted.

**2.2.3 Vibration Test (Unpackaged, Non-Operating)**

5~200Hz at 1.04g rms

FREQUENCY (Hz)	SPECTRUM LEVEL (g <sup>2</sup> /Hz)
2.0	0.0185
4.0	0.0300
8.0	0.0300
40.0	0.0030
55.0	0.0100
70.0	0.0100
200.0	0.0010

- DURATION: 15 MINUTES PER AXIS.

#### **2.2.4 HALF-SINE SHOCK**

Test conditions:

Test unit : 2 sets

Each unit has to withstand 18 shocks.(3 shocks pre face)

No- operation

Half-sine wave

Duration : 3ms

Acceleration(G) : 75G

### **2.3 Packing Configuration**

#### **2.3.1 Container Specification**

**Shipping Container**

Container Type		20'8'8'6" " Steel	40'8'8'6" Steel	40'8'9'6" High Cube Steel
Weight(Kgs)	Gross	24,000	30,480	30,480
	Tare	2,370	4,000	4,200
	Payload	21,630	26,480	26,280
Interior Measurement (mm)	Length	5,898	12,031	12,031
	Width	2,352	2,352	2,352
	Height	2,394	2,394	2,699
Volume(Cubic Meter)		33.2	67.74	76.4
Door opening(mm)	Width	2,340	2,340	2,340

	Height	2,280	2,280	2,585
Useable Interior Dimension (Ducted pallet(130mm & Operating spce 50mm)	Length	5,890	12,000	12,000
	Width	2,330	2,330	2,330
	Height	2,100	2,100	2,405

### 2.3.2 Carton Specification

Product	Net	TBD
Weight(Kgs)	Gross	TBD

Carton Interior Dimension (mm) L*W*H	Carton External Dimension (mm) L*W*H
478*532*179	495*570*186

### 2.3.3 Container Carrying Capacity

#### a, Shipping Container

Stowing Type	Container	Quantity of products (sets)	Quantity of Products (sets)	Quantity of pallet (sets)
		(Every container)	(Every Pallet)	(Every Container)
With pallet	20'	484	Pallet A: 44	Pallet A: 10
			Pallet B: 22	Pallet B: 2
	40'	1056	Pallet A: 44	Pallet A: 24
Without pallet				
	20'		X	X
			X	X
	40'		X	X
			X	X

### 2.4 Electrostatic Discharge Requirements

The subject product must withstand 8 KV for contact discharge and 15 KV for air discharge of Electrostatic Discharge and meet the acceptance criteria as specified IEC 801-2 .

### 2.5 Safety Requirements

The display unit complies with the following safety standards and specifications.

- UL compliance....standard for information-processing and business equipment, UL 1950.
- CSA compliance....standard C22.2 No. 950-M89, data processing equipment.
- TUV compliance...EN60950 safety specification-business equipment.
- ISO13406-2 .Ergonomic Requirements of Visual Display.
- Demko...EN60950.
- Nemko...EN60950.
- Semko...EN60950.

-Fimko...EN60950.

## **2.6 EMI Requirements**

1. This display unit complies with the following EMC rules and regulations.

-FCC compliance...FCC Rule, Part 15, Subpart B, Class B.

-VCCI compliance...VCCI Rule, Class-2.

-CE Mark Compliance... 89/336/EEC.

EN55024, EN61000-4-2/-3/-4/-5/-6/-8/-11

EN55022, Class B.

EN61000-3-2,EN61000-3-3.

-DNSF compliance...EN55022, Class B.

-MPR2 compliance

-TCO99

-C-Tick

-BSMI

-EPA

2. The sample for EMI agency approval should be under 4 dB of the limit.

The production pilot run units should be under 4 dB of the limit.

The mass production units should be under 1 dB of the limit.

## **2.7 Reliability**

1. The prediction MTBF of display unit should be greater than 60,000 hrs.

2. Lamp life time : 30,000 hrs minimum at which brightness of lamp is 50% compare to that of initial value at 7.0mA and 25 °C.

## **2.8 Mechanical Design for TCO 99:**

1) Front Frame Reflectance:

\* diffuse reflectance: > 20%

\* Gloss <= 30% gloss unit

2) Labeling of plastics:

Plastic weight > 25g shall be marked in accordance with ISO11469

3) Variety of Plastic:

All plastic components that weight > 100g shall be made from the same type of plastic.

4) Painting of Plastic:

\*Any plastic components that weight >100g shall not be painted lacquer or vanished, so that the paint, lacquer or vanish in dry matter exceed 1 weight-% of the plastic component.

\* Mould decoration (IMD) is not allowed

\* All paints, lacquers, vanishes or colour additives used shall be declared by the type and mount.

5) Metallization of Plastic Housing:

\* Metallization is not allowed.

6) Plastic components > 25g shall not contain retardants of organically bound chloride or bromide.



## 2.9 Environment Protection Design:

Product is Per ES 715-C49 Environment Design Guide

### 2.10 Acoustical Noise

With the display operating, the issue of sound measured is contained within 40 dB/A in the audible field.

## 3. Input / Output Signal Specification

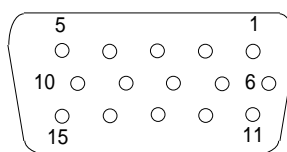
### 3.1 Input Signal Requirements

#### 3.1.1 Signal cable (Directly attached to unit)

##### 3.1.1.1 Video Inputs:

##### (1) DSUB –Analog Signal Inputs

15pin D-sub connector is on the captive signal cable for IBM VGA, compatible graphic adapters. The pin assignment of this connector is described as below:

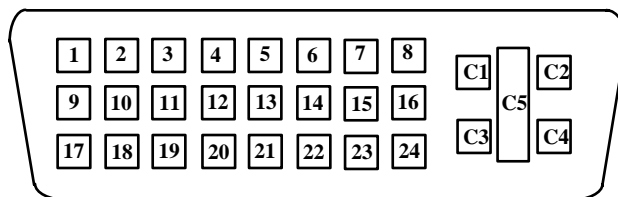


15pin D-sub female

- 1 RED VIDEO
- 2 GREEN VIDEO
- 3 BLUE VIDEO
- 4 GROUND
- 5 GROUND
- 6 RED GROUND
- 7 GREEN GROUND
- 8 BLUE GROUND
- 9 PC5V
- 10 SYNC GROUND
- 11 GROUND
- 12 SDA
- 13 H SYNC (H+V)
- 14 V SYNC
- 15 SCL

##### (2) DVI –digital Signal Inputs

30pins DVI connector is designed to match with DVI-digital signal cable. The pin assignment of this connector is as the following:



\* 30 pins DVI female

Pin	Signal Assignment	Pin	Signal Assignment	Pin	Signal Assignment
1	TMDS RX2-	13	Floating	C1	Floating
2	TMDS RX2+	14	+5V Power	C2	Floating
3	TMDS Ground	15	Ground	C3	Floating
4	Floating	16	Hot Plug Detect	C4	Floating
5	Floating	17	TMDS RX0-	C5	Floating
6	DDC Clock	18	TMDS RX0+		
7	DDC Data	19	TMDS Ground		
8	Floating	20	Floating		
9	TMDS RX1-	21	Floating		
10	TMDS RX1+	22	TMDS Ground		
11	TMDS Ground	23	TMDS Clock+		
12	Floating	24	TMDS Clock-		

**3.1.1.3 Cable length:**

Detachable 1500mm +/- 20mm

**3.1.2 Video signals:**

RGB separate, Analog 0.7Vp-p/75 Ohm

DVI, 600mV for each differential line, 50Ohm TDR scan needed for DVI cable and interface board

**3.1.3 Sync signal:**

- H/V separate, TTL level
- H/V composite, TTL level

## 3.2 Function

### 3.2.1 Support timing

This Interface board is designed to operate in any of the following video mode.

Incoming display mode(Input timing)					Multi-scan operation
Resolution	Horizontal Frequency (KHz)	Vertical Frequency (Hz)	Dot Clock Frequency (MHz)	Remark	Actual display resolution
640x350	31.47(P)	70.08(N)	25.17	DOS	1280x943
720x400	31.47(N)	70.08(P)	28.32	DOS	full screen 1280x1024
640x480	31.47(N)	60.00(N)	25.18	DOS	
640x480	35.00(N)	67.00(N)	30.24	Macintosh	
640x480	37.86(N)	72.80(N)	31.5	VESA	
640x480	37.50(N)	75.00(N)	31.5	VESA	
800x600	37.88(P)	60.32(P)	40.00	VESA	
800x600	48.08(P)	72.19(P)	50.00	VESA	
800x600	46.86(P)	75.00(P)	49.50	VESA	
832X624	49.72(N)	74.55(N)	57.29	Macintosh	
1024x768	48.36(N)	60.00(N)	65.00	VESA	
1024x768	56.48(N)	70.10(N)	75.00	VESA	
1024x768	60.02(P)	75.00(P)	78.75	VESA	
1024X768	60.24(N)	74.93(N)	80.00	Macintosh	
1152x864	67.50(P)	75.00(P)	108.00	VESA	
1152x870	68.68(N)	75.06(N)	100.00	Macintosh	
1152x900	61.80(N)	66.00(N)	94.50	SUN 66	
1152x900	71.81(N)	76.14(N)	108.00	SUN	
1280x1024	64.00(P)	60.00(P)	108.00	VESA	
1280x1024	75.83(N)	71.53(N)	128.00	IBM1	
1280x1024	80.00(P)	75.00(P)	135.00	VESA	
1280x1024	81.18(N)	76.16(N)	135.09	SPARC2	

**Notes :**

- (1) If the incoming display mode is not supported by this I/F board listed above, the picture can show up or doesn't which is unpredictable, even the picture can display but probably isn't good or clear.
- (2) Some signals from graphics board may not function properly.
- (3) "P", "N" stands for "Positive", "Negative" polarity of incoming HSYNC/VSNC(input timing).
- (4) OSD will show "No Signal" message on the screen as below to indicate it while no display mode inputs,

### 3.3 Number of display colors:

16M color numbers (with dithering)

### 3.4 Adjustment function

Brightness

Contrast

Display position (Vertical , Horizontal)

Phase

Pixel clock

Color gain(Red, Green, Blue)

OSD position (Vertical , Horizontal)

Multi-language selection

Miscellaneous( Display Information、 Sharpness、 Input Priority: D-sub, DVI)

OSD time

Recall function(Position Recall、 Color Recall、 Recall All)

### 3.5 Power Supply Requirements

#### 3.5.1 Input Power Requirements

##### (1) Input Voltage Range

The unit shall meet all the operating requirements with an input voltage range of 90~264 Vac .

##### (2) Input Current

Maximum Input Current	Measuring Range
(MAX) 2 Arms	90Vac    264Vac

##### (3) Frequency Range

The unit shall operate within a frequency range of 47Hz to 63Hz.

##### (4) Inrush Current

Power supply inrush current shall be less than the ratings of its critical components(including Power switch, fuse, rectifiers and surge limiting device) for all conditions of line voltage.

##### (5) Regulator Efficiency

75% minimum (measuring at 115Vac and full load)  
Power saving mode < 1 Watts

#### 3.5.2 Power Management

Mode	H/Vsync	Power consumption	LED Color (Status)	Recovery Time
Normal	Both exist	< 60W (with webcam and speaker module)	Green (Normal)	--
off	None or Only one exist	< 1W (only monitor)	Amber	5 sec

### 3.6 Specification of Inverter

#### 3.6.1 General

These specifications are applied to inverter of FP791 for SXGA 17" 4 Lamps panel.

#### 3.6.2 Input Characteristics

Parameter	Symbol	Min	Nom	Max	Unit	Remarks
Input Voltage	Vin	10.8	12	13.2	V	12V $\pm$ 10%
Input Current	Iin	—	1800	2300	mA	Vin=12V Vcon=3.2V, On State
Input Power	Pin	—	21	26	W	Vin=12V Vcon=3.2V, On State
Brightness Control	Vcon	0	—	3.3	V	3.3V:Max Brightness 0V:Min Brightness
Input Current	Icon	0	0.1	0.3	mA	
On/Off Control	ENA	2.7	3.4	5	V	On State
		0	0.25	0.5		Off State
Input Current	I		0.1	0.3	mA	On State
		-	0	-		Off State

#### 3.6.3 Output Characteristics

Parameter	Symbol	Min	Nom	Max	Unit	Remarks
Output Current	IO1/IO2	13	13	15	mA	Vin=12V, Vcon=3.2V Max. Brightness
Output Current	IO1/IO2	6.0	7.0	8.0	mA	Vin=12V, Vcon=0V Min. Brightness
Frequency	FL1/FL2 FL3/FL4	50	60	70	KHZ	Vin=12V, Vcon=3.2V Max. Brightness
Output Open Voltage	Vs1/Vs2 Vs3/Vs4	1700		2000	Vrms	Vin=12V, Von/off=5V RL1=RL2=00

NOTE: 1.All condition are at 25C ambient unless otherwise specified.

2. Load Panel=SXGA 17"

## 3.7 Panel optical Characteristics

Item	Unit	Conditions	Min.	Typ.	Max.
Viewing Angle	[degree]	Horizontal (Right)	60	70	-
		CR = 10 (Left)	60	70	-
		Vertical (Up)	60	70	-
		CR = 10 (Down)	60	70	-
		Horizontal (Right)	70	80	-
		CR = 5 (Left)	70	80	-
		Vertical (Up)	70	80	-
		CR = 5 (Down)	70	80	-
Contrast ratio		Normal Direction	250	450	-
Response Time (Note 1)	[msec]	Raising Time	-	4	5
		Falling Time	-	12	20
		Raising + Falling	-	16	25
Color / Chromaticity Coordinates (CIE)		Red x	0.61	0.64	0.67
		Red y	0.31	0.34	0.37
		Green x	0.26	0.29	0.32
		Green y	0.58	0.61	0.64
		Blue x	0.11	0.14	0.17
		Blue y	0.04	0.07	0.10
Color Coordinates (CIE) White		White x	0.28	0.31	0.34
		White y	0.30	0.33	0.36
White Luminance @ CCFL 7.0mA (center)	[cd/m <sup>2</sup> ]		200	260	-
Luminance Uniformity (Note 2)	[%]		75	80	-
TCO99 1.5.2B luminance uniformity (Note 3)					1.7
Crosstalk (in 75Hz) (Note 4)	[%]				1.5

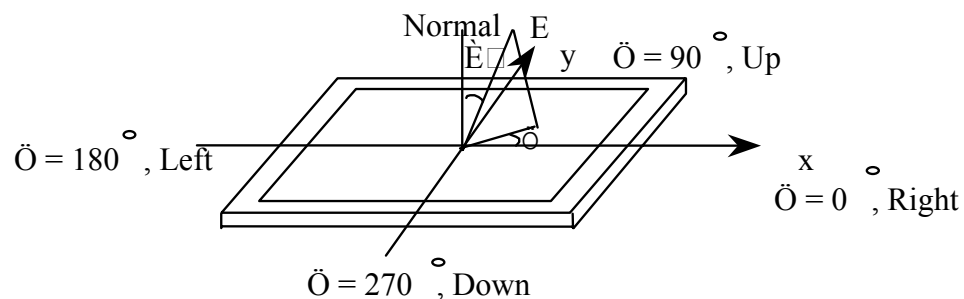
Note :

1. Viewing Angle, Contrast Ratio, Response Time, Reflectance, and Chromaticity are measured at panel center.
2. Viewing Angle ( , )

Measurement is done on position 1.

Viewing angle origine is the axis normal to the flat panel. Left (L) and Right (R) value are the maximum angles for which CR=10. Up (U) and (D) value are the maximum angles for which CR=10.

See figure below



3. Contrast Ratio (CR) is defined mathematically as:

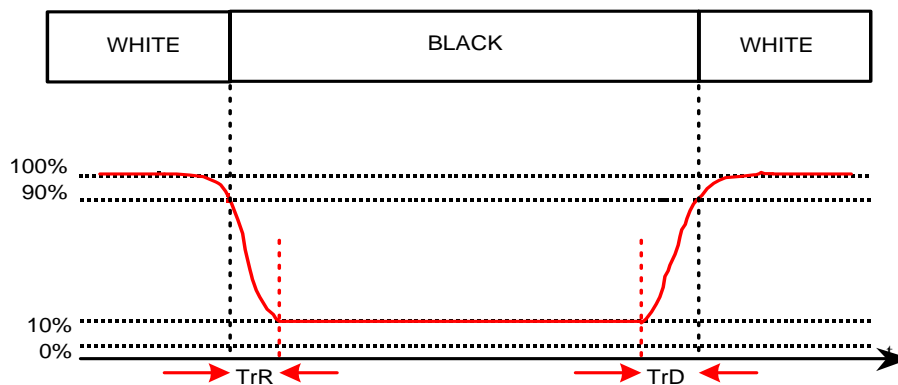
$$\frac{\text{Luminance in White Level (Max.)}}{\text{Luminance in Black Level (Min.)}}$$

(at  $\theta = 0^\circ, \varphi = 0^\circ$ )

#### 4. Response time

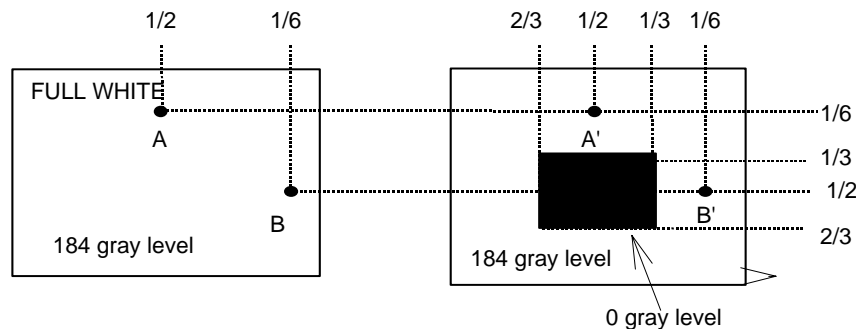
TrR measures the transition time of L1 relative luminance from white to black state, from 90% to 10% (see graph below)

TrD measures the transition time of L1 relative luminance from black to white state, from 10% to 90% (see



graph below)

5. Cross talk shall be measured between two patterns.

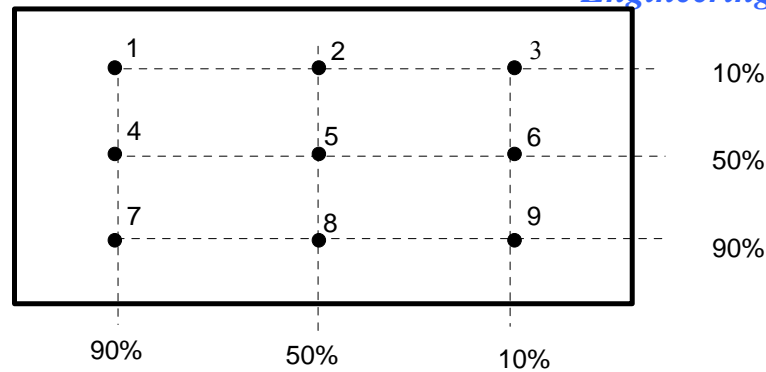


$1 | L_A - L_{A'} | / L_A \times 100\% = 1.2\% \text{ max.}$ ,  $L_A$  and  $L_B$  are brightness at location A and B  
 $1 | L_B - L_{B'} | / L_B \times 100\% = 1.2\% \text{ max.}$ ,  $L_{A'}$  and  $L_{B'}$  are brightness at location A' and B'

$L_A$  : Luminance of measured point in A (cd/m<sup>2</sup>)  
 $L_B$  : Luminance of measured point in B (cd/m<sup>2</sup>)  
 $L_{A'}$  : Luminance of measured point in A' (cd/m<sup>2</sup>)  
 $L_{B'}$  : Luminance of measured point in B' (cd/m<sup>2</sup>)

(at Viewing Angle  $= 0^\circ, = 0^\circ$ )

6. Brightness Uniformity of these 9 points is defined as below:



$$\text{Brightness Uniformity} = \frac{\text{Min. brightness}}{\text{Max. brightness}} \times 100 \% > 70\%$$

### 3.8 BACK-LIGHT UNIT

The backlight system is an edge-lighting type with 4 CCFLs (Cold Cathode Fluorescent Tube).

The characters of dual lamps are shown in the following tables.

Symbol	Parameter	Min	Typ	Max	Units	Condition
(L63)	White Luminance	200	260	-	[cd/m <sup>2</sup> ]	(Ta=25°C)
ISCFL	CCFL standard current	6.5	7.0	7.5	[mA] rms	(Ta=25°C)
IRCFL	CCFL operation range	3.0	7.0	7.5	[mA] rms	(Ta=25°C)
ICFL	CCFL Inrush current	-	26	34	[mA]	Note 1
fCFL	CCFL Frequency	40	50	80	[KHz]	(Ta=25°C) Note 2
ViCFL (0°C)	CCFL Ignition Voltage	1700			[Volt] rms	(Ta=0°C) Note 3
ViCFL (25°C)	CCFL Ignition Voltage	1200			[Volt] rms	(Ta=25°C) Note 3
TCFL	CCFL Dark start time			1.0	sec	(Ta=25°C)
VCFL	CCFL Discharge Voltage (Reference)		700	860	[Volt] rms	(Ta=25°C) Note 4
PCFL	CCFL Power consumption		19.6	25.8	[Watt]	(Ta=25°C) Note 4

Note 1: Duration=50 [msec]

Note 2: CCFL Frequency should be carefully determined to avoid interference between inverter and TFT LCD

Note 3: CCFL inverter should be able to give out a power that has a generating capacity of over 1700 voltage.

Lamp units need 1700 voltage minimum for ignition

Note 4: Calculator value for reference (ICFL×VCFL=PCFL)

Note 5: Lamp soldering method is required to use "Hook Soldering".



## 4. Functional specification

All the tests to verify specifications in this section must be performed under the following standard conditions unless otherwise noted. The standard conditions are:

- Temperature : 0 to 40 degree Celsius
- AC line input voltage : 90 Vac to 264 Vac, 47Hz or 63Hz
- Warm-up time : 30 minutes minimum

### 4.1 Display Quality

#### 4.1.1 Display Data Area (with full white pattern)

- (1) Horizontal: 337.920 mm
- (2) Vertical: 270.336 mm

#### 4.1.2 Video Performance

- (1) Resolution : 1280 X 1024 pixels Maximum
- (2) Contrast ratio : 250(Min.), 450(Typ.)
- (3) Response time : 12 mS(Typ.)
- (4) Viewing angle : Up:70° Down:70° R/L:70°/70° Typ (At contrast ratio = 10)
- (5) CIE Coordinate: White ( 0.31, 0.33 )
- (6) Display color: 18 bits color

#### 4.1.3 Light Output

Brightness rating : 260cd/m<sup>2</sup>(Typ.) @7.0mA

#### 4.1.4 Brightness Adjustment Range

At contrast ratio control set at maximum level, adjusting Brightness control from minimum to maximum position, the light output of WHITE pattern shall be increased more than 40cd/m<sup>2</sup>.

## 4.2 Audio Quality

### 4.2.1 Preamp + Poweramp:

- (1) Output Power : 2 W rms/CH @ 1KHz
- (2) THD (@ 1W) : <1%
- (3) S/N ratio : >40dB

### 4.2.2 Speaker Driver:

- (1) Nominal Impedance: 4 +/- 15% Ohm at 1KHz
- (2) Normal / Maximum Power Rating: 2W / 3W Per CH
- (3) Frequency Response: 150~20KHz Average SPL -10dB
- (4) Mean Sound Pressure Level: 85 +/- 3dB(1W 0.5M) Average at 600,800,1000,1200Hz
- (5) Outer Diameter: 40mm

### 4.2.3 Audio Controls:

- (1) Volume 0 - 5V

## **5. Physical Specifications**

### **5.1 Physical Dimension & Appearance**

**5.1.1 Overall Dimensions:** 401.72mm (W) X 392mm (H) X 182.38mm (D)

**5.1.2 Outer Appearance:** see Fig.1

### **5.2 Construction and Materials on outer surface**

- (1) Materials: Plastic
- (2) Color: To be defined for Model

### **5.3 Base**

- (1)Tilt: 0/+25 °

### **5.4 Marking & Labels**

#### **5.4.1 Reference Label (Rear panel)**

- (1) Reference numbers
- (2) Manufacture data
- (3) Agency Approvals
- (4) Power Ratings

#### **5.4.2 Controls & Connectors**

- (1) AC power cord input: abbreviated labels
- (2) User's Controls: standard print

### **5.5 Packaging**

**5.5.1 Carton Dimension:** 560mm (W) X465mm (D) X 257mm (H) ( LCD monitor )

**5.5.2 Shipping Weight:** 7.2kg ( LCD monitor )

**5.5.3 Shipping Container:** 792sets per 40 feet container with pallet

## **6. Maintainability Specifications**

### **6.1 General & Requirements**

**6.1.1 Installation:** From outside of unit with standard tools and documentation provided to user.

**6.1.2 Periodic Maintenance:** No periodic maintenance is required.

**6.1.3 Repair & Calibration:** Require spare modules or components as specified as followings:

- (1) Interface board ASSY
- (2) DC-DC inverter board ASSY
- (3)Control board ASSY

### **6.2 Mean Time to Repair**

**6.2.1 Module Level:** Less than 10 minutes

**6.2.2 Component Level:** Less than 15 minutes

## **6.3 Accessibility**

### **6.3.1 General:**

All panels, covers, and major assemblies are removable without disruption of permanent mounting or fasteners.

### **6.3.2 Outside Cabinet, access to the following elements**

- Operating Controls
- DC Inlet
- Audio in

### **6.3.3 Cover Removal, Access**

All sub assemblies and internally adjustable components may be accessed by removing the base and the rear cover .

## **6.4 Equipment & Tools Required**

### **6.4.1 Standard Test Equipment**

- (1) Voltmeter
- (2) Dual trace oscilloscope
- (3) Hand tools as required
- (4) Computer with IBM VGA , or compatible graphic adapter

### **6.4.2 Documentation**

A service manual will be available which covers all service requirements. A users manual written in Japanese German, Italian, Spanish, France and English will be available to ship with the product.

## **6.5 Electrical Emission and Energy Saving summary for TCO99**

### **6.5.1 Electrical Field(AC):**

- \*Band I < 10V/m (132cd/m<sup>2</sup>, ”+” pattern)
- \*Band II < 1V/m (132cd/m<sup>2</sup>, ”+” pattern)
- Note: Shielded power cord is not acceptable

### **6.5.2 Magnetic Field(AC):**

- \*Band I < 200nt (132cd/m<sup>2</sup>, ”+” pattern)
- \*Band II < 32nt (132cd/m<sup>2</sup>, ”+” pattern)
- Note: Shielded power cord is not acceptable

### **6.5.3 Energy Saving:**

- \*1<sup>st</sup> stage:<15W(recover time:3 sec)
- 2<sup>nd</sup> stage:<5W
- \*single stage:<5W(recover time: 3sec)

**Fig. 1** Physical Dimension Front View and Side view

