**Toshiba Matsushita Display Technology Co., Ltd**

**PRODUCT INFORMATION**

**39cm COLOUR TFT-LCD MODULE**

**LTD154EZ0S**

**(p-Si TFT)**

**FEATURES**

1. 15.4WIDE-UXGA(1920x1200 pixels) display size for notebook PC
2. LVDS interface system (H-Sync, V-Sync)

**TENTATIVE**

**MECHANICAL SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensional Outline (typ.)</td>
<td>344.5max(W) x 222.5max (H) x 6.5max(D) mm</td>
</tr>
<tr>
<td>Number of Pixels</td>
<td>1920(W) x 1200(H) pixels</td>
</tr>
<tr>
<td>Active Area</td>
<td>331.2 (W) x 207(H) mm</td>
</tr>
<tr>
<td>Pixel Pitch</td>
<td>0.1725(W) x 0.1725(H)</td>
</tr>
<tr>
<td>Weight (approximately)</td>
<td>570 g</td>
</tr>
<tr>
<td>Backlight</td>
<td>Single CCFL, Sidelight type</td>
</tr>
</tbody>
</table>

**ABSOLUTE MAXIMUM RATINGS**

<table>
<thead>
<tr>
<th>Item</th>
<th>Symbol</th>
<th>Min.</th>
<th>Max.</th>
<th>Unit</th>
<th>Checked Terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Voltage</td>
<td>V_{DD}</td>
<td>-0.3</td>
<td>+4.0</td>
<td>V</td>
<td>V_{DD} - GND</td>
</tr>
<tr>
<td>Input Voltage of Signals</td>
<td>V_{IN}</td>
<td>-0.3</td>
<td>V_{DD}+0.3</td>
<td>V</td>
<td>LVDS interface</td>
</tr>
<tr>
<td>Operating Ambient Temperature</td>
<td>T_{OP}</td>
<td>0</td>
<td>50</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>Operating Ambient Humidity</td>
<td>H_{OP}</td>
<td>10</td>
<td>90</td>
<td>% (RH)</td>
<td></td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>T_{STG}</td>
<td>-20</td>
<td>+60</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>Storage Humidity</td>
<td>H_{STG}</td>
<td>10</td>
<td>90</td>
<td>% (RH)</td>
<td></td>
</tr>
<tr>
<td>Operating Temperature for Panel</td>
<td>-</td>
<td>0</td>
<td>+60</td>
<td>°C</td>
<td></td>
</tr>
</tbody>
</table>

**ELECTRICAL SPECIFICATION (T.B.D.)**

<table>
<thead>
<tr>
<th>Item</th>
<th>Symbol</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Voltage</td>
<td>V_{DD}</td>
<td>3.0</td>
<td>3.3</td>
<td>3.6</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td></td>
<td>V_{IL}</td>
<td>---</td>
<td>710</td>
<td>---</td>
<td>V(rms)</td>
<td>k_{IL}=6.0mA(rms)</td>
</tr>
<tr>
<td>FL Start Voltage (Ta=0°C)</td>
<td>V_{BFL}</td>
<td>1550</td>
<td>---</td>
<td>1800</td>
<td>V(rms)</td>
<td></td>
</tr>
<tr>
<td>Differential Input Voltage</td>
<td>V_{ID}</td>
<td>100</td>
<td>-</td>
<td>600</td>
<td>mV</td>
<td></td>
</tr>
<tr>
<td>Common Mode Input Voltage</td>
<td>V_{CM}</td>
<td>1.0</td>
<td>-</td>
<td>2.4 -(V_{DD})/2</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>Current Consumption</td>
<td>I_{DD}</td>
<td>---</td>
<td>515</td>
<td>---</td>
<td>mA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I_{IL}</td>
<td>---</td>
<td>6.0</td>
<td>6.0</td>
<td>mA(rms)</td>
<td></td>
</tr>
<tr>
<td>Power Consumption</td>
<td></td>
<td>---</td>
<td>5.96</td>
<td>---</td>
<td>W</td>
<td>k_{IL}=6.0mA(rms)</td>
</tr>
</tbody>
</table>

*1) The module should be always operated within these ranges. The "Typ." shows the recommendable value.

**OPTICAL SPECIFICATION (Ta=25°C)**

<table>
<thead>
<tr>
<th>Item</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contrast Ratio (CR)</td>
<td>150</td>
<td>350</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Response Time</td>
<td>(t_{ON})</td>
<td>---</td>
<td>---</td>
<td>50</td>
<td>ms</td>
</tr>
<tr>
<td></td>
<td>(t_{OFF})</td>
<td>---</td>
<td>---</td>
<td>50</td>
<td>ms</td>
</tr>
<tr>
<td>Luminance (L)</td>
<td>135</td>
<td>170</td>
<td>---</td>
<td>cd/m²</td>
<td>k_{IL}=6.0mA(rms)</td>
</tr>
</tbody>
</table>

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(1/1) 2005-04-25 (Ver.0.5)
DIMENSIONAL OUTLINE
(Front side)

Unit: mm
Standard tolerance: ±0.5
DIMENSIONAL OUTLINE
(Back side)

Unit: mm
Standard tolerance: ±0.5
BLOCK DIAGRAM

Source driver

Liquid Crystal Panel
1920 x 1200 pixels

Gate driver

Panel Controller
LVDS

DC/DC converter

Gray scale Manipulation Voltage Generation Circuit

Backlight

CN1

Connector

1920 pixels

1, 1  2, 1  X2_{n-1}, 1  X2_{n}, 1  1920, 1
1, 2

1, Y  X2_{n-1}, Y  X2_{n}, Y
1, 1200

1920, 1200

1200 pixels

(4/4)  2005-04-25 (Ver.0.5)
## TIMING SPECIFICATION 1) 2) 3) 4) 5) 6)

<table>
<thead>
<tr>
<th>Item</th>
<th>Symbol</th>
<th>min.</th>
<th>typ.</th>
<th>max.</th>
<th>unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal Scanning Term</td>
<td>T(\text{hp})</td>
<td>-</td>
<td>1024</td>
<td>-</td>
<td>Tc</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>13.50</td>
<td>-</td>
<td>us</td>
</tr>
<tr>
<td>H-sync Pulse Width 6)</td>
<td>HSPW</td>
<td>4</td>
<td>136</td>
<td>-</td>
<td>Tc</td>
</tr>
<tr>
<td>Horizontal Front Porch</td>
<td>thfp</td>
<td>4</td>
<td>136</td>
<td>-</td>
<td>Tc</td>
</tr>
<tr>
<td>Horizontal Back Porch 6)</td>
<td>T(\text{hbp})</td>
<td>16</td>
<td>-</td>
<td>-</td>
<td>Tc</td>
</tr>
<tr>
<td>Horizontal Sync Term</td>
<td>ta</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>Tc</td>
</tr>
<tr>
<td>Horizontal Blanking Term</td>
<td>HBL</td>
<td>-</td>
<td>64</td>
<td>-</td>
<td>Tc</td>
</tr>
<tr>
<td>Horizontal Display Term</td>
<td>HA</td>
<td>960</td>
<td>960</td>
<td>960</td>
<td>Tc</td>
</tr>
<tr>
<td>Frame Period</td>
<td>T(\text{vp})</td>
<td>-</td>
<td>1235</td>
<td>-</td>
<td>T(\text{hp})</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>16.67</td>
<td>16.67</td>
<td>ms</td>
</tr>
<tr>
<td>V-sync Pulse Width</td>
<td>VSPW</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>T(\text{hp})</td>
</tr>
<tr>
<td>V-sync Set Up Time (to H-sync)</td>
<td>T(\text{su})</td>
<td>8</td>
<td>-</td>
<td>-</td>
<td>Tc</td>
</tr>
<tr>
<td>V-sync Hold Time</td>
<td>T(\text{hd})</td>
<td>8</td>
<td>-</td>
<td>-</td>
<td>Tc</td>
</tr>
<tr>
<td>Vertical Front Porch</td>
<td>T(\text{fp})</td>
<td>8</td>
<td>-</td>
<td>-</td>
<td>Tc</td>
</tr>
<tr>
<td>Vertical Back Porch 6)</td>
<td>T(\text{vbp})</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>Tc</td>
</tr>
<tr>
<td>Vertical Blanking Term</td>
<td>VBL</td>
<td>-</td>
<td>35</td>
<td>-</td>
<td>T(\text{hp})</td>
</tr>
<tr>
<td>Vertical Display Term</td>
<td>VA</td>
<td>1200</td>
<td>1200</td>
<td>1200</td>
<td>T(\text{hp})</td>
</tr>
<tr>
<td>DE Pulse Width</td>
<td>HA</td>
<td>960</td>
<td>960</td>
<td>960</td>
<td>Tc</td>
</tr>
<tr>
<td>Clock Period</td>
<td>Tc</td>
<td>13.179</td>
<td>13.179</td>
<td>-</td>
<td>ns</td>
</tr>
</tbody>
</table>

**Note 1)** Refer to "TIA/EIA Timing Chart"

**Note 2)** If ENAB is fixed to "H" or "L" level for certain period while NCLK is supplied, the panel displays black with some flicker.

**Note 3)** If NCLK is fixed to "H" or "L" level for certain period while ENAB is supplied, the panel may be damaged.

**Note 4)** Please adjust LCD operating signal timing and FL driving frequency, to optimize the display quality.

There is a possibility that flicker is observed by the interference of LCD operating signal timing and FL driving condition (especially driving frequency), even if the condition satisfies above timing specifications and recommended operating conditions shown in 3.

**Note 5)** Do not make \(t_v\), \(tvdh\) and \(tvd\) fluctuate.

If \(t_v\), \(tvdh\), and \(tvd\) are fluctuate, the panel displays black.

**Note 6)** In case of using the long frame period, the deterioration of display quality, noise etc. may be occurred.

**Note 7)** NCLK count of each Horizontal Scanning Time should be always the same.

- Vertical blanking period should be \(n\) X "Horizontal Scanning Time", \((n: \text{integer})\)
- Frame period should be always the same.

**Note 8)** Please keep below equations.

\[
\text{VBL} = T\text{vp} + T\text{vbp} \\
\text{HSPW} = HBL - T\text{hp} - ta \\
T\text{hbp} = HSPW + ta
\]
**CONNECTOR PIN ASSIGNMENT FOR INTERFACE**

**CN1 INPUT SIGNAL**

Connector: FI-XB30SR-HF11 (Locking Type) / JAPAN AVIATION ELECTRONICS INDUSTRY, LTD.

Mating Connector:

- Wire Type: FI-X30H (Housing), FI-XC3-A-15000 (Contact)
- FPC Type: FI-X30M or FI-X30M R, Coax Type: FI-X30C or FI-X30C2 (Housing), FI-X30CH-7000 (Shell)

<table>
<thead>
<tr>
<th>Terminal No.</th>
<th>Symbol</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GND</td>
<td>Ground</td>
</tr>
<tr>
<td>2</td>
<td>VDD</td>
<td>Power Supply : +3.3V</td>
</tr>
<tr>
<td>3</td>
<td>VDD</td>
<td>Power Supply : +3.3V</td>
</tr>
<tr>
<td>4</td>
<td>V_EEED</td>
<td>DDC 3.3V Power</td>
</tr>
<tr>
<td>5</td>
<td>NC</td>
<td>Non-Connection</td>
</tr>
<tr>
<td>6</td>
<td>CI_EEED</td>
<td>DDC Clock</td>
</tr>
<tr>
<td>7</td>
<td>DATA_EEED</td>
<td>DDC Data</td>
</tr>
<tr>
<td>8</td>
<td>RxO1N0-</td>
<td>Odd Negative LVDS differential data input (R0-R5, G0)</td>
</tr>
<tr>
<td>9</td>
<td>RxO1N0+</td>
<td>Odd Positive LVDS differential data input (R0-R5, G0)</td>
</tr>
<tr>
<td>10</td>
<td>GND</td>
<td>Ground</td>
</tr>
<tr>
<td>11</td>
<td>RxO1N1-</td>
<td>Odd Negative LVDS differential data input (G1-G5, B0-B1)</td>
</tr>
<tr>
<td>12</td>
<td>RxO1N1+</td>
<td>Odd Positive LVDS differential data input (G1-G5, B0-B1)</td>
</tr>
<tr>
<td>13</td>
<td>GND</td>
<td>Ground</td>
</tr>
<tr>
<td>14</td>
<td>RxO1N2-</td>
<td>Odd Negative LVDS differential data input (B2-B5, HS, VS, DE)</td>
</tr>
<tr>
<td>15</td>
<td>RxO1N2+</td>
<td>Odd Positive LVDS differential data input (B2-B5, HS, VS, DE)</td>
</tr>
<tr>
<td>16</td>
<td>GND</td>
<td>Ground</td>
</tr>
<tr>
<td>17</td>
<td>OCLK-</td>
<td>Odd Clock Signal(-)</td>
</tr>
<tr>
<td>18</td>
<td>OCLK+</td>
<td>Odd Clock Signal(+)</td>
</tr>
<tr>
<td>19</td>
<td>GND</td>
<td>Ground</td>
</tr>
<tr>
<td>20</td>
<td>RxE1N0-</td>
<td>Even Negative LVDS differential data input (R0-R5, G0)</td>
</tr>
<tr>
<td>21</td>
<td>RxE1N0+</td>
<td>Even Positive LVDS differential data input (R0-R5, G0)</td>
</tr>
<tr>
<td>22</td>
<td>GND</td>
<td>Ground</td>
</tr>
<tr>
<td>23</td>
<td>RxE1N1-</td>
<td>Even Negative LVDS differential data input (G1-G5, B0-B1)</td>
</tr>
<tr>
<td>24</td>
<td>RxE1N1+</td>
<td>Even Positive LVDS differential data input (G1-G5, B0-B1)</td>
</tr>
<tr>
<td>25</td>
<td>GND</td>
<td>Ground</td>
</tr>
<tr>
<td>26</td>
<td>RxE1N2-</td>
<td>Even Negative LVDS differential data input (B2-B5, HS, VS, DE)</td>
</tr>
<tr>
<td>27</td>
<td>RxE1N2+</td>
<td>Even Positive LVDS differential data input (B2-B5, HS, VS, DE)</td>
</tr>
<tr>
<td>28</td>
<td>GND</td>
<td>Ground</td>
</tr>
<tr>
<td>29</td>
<td>ECLK-</td>
<td>Even Clock Signal(-)</td>
</tr>
<tr>
<td>30</td>
<td>ECLK+</td>
<td>Even Clock Signal(+)</td>
</tr>
</tbody>
</table>

Note 1) Please connect GND pin to ground. Don't use it as no-connect nor connection with high impedance.

**CN2 CCFL POWER SOURCE**

Connector: BHSR-02VS-1 / JAPAN SOLDERLESS TERMINAL MFG CO., LTD.

Mating Connector: SM02B-BHS-1 / JAPAN SOLDERLESS TERMINAL MFG CO., LTD.

<table>
<thead>
<tr>
<th>Terminal No.</th>
<th>Symbol</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>V_LH</td>
<td>CCFL Power Supply (high voltage)</td>
</tr>
<tr>
<td>2</td>
<td>V_LL</td>
<td>CCFL Power Supply (low voltage)</td>
</tr>
</tbody>
</table>

(7/7) 2005-04-25 (Ver.0.5)
### RECOMMENDED TRANSMITTER (DS90CF365) TO LTM154AX0S INTERFACE ASSIGNMENT

#### Case1: 6bit Transmitter

<table>
<thead>
<tr>
<th>Input Terminal No.</th>
<th>Input Signal (Graphics controller output signal)</th>
<th>Output Signal Symbol</th>
<th>LTM154EZ0S Interface (CN1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symbol</td>
<td>Terminal</td>
<td>Symbol</td>
<td>Function</td>
</tr>
<tr>
<td>TA0</td>
<td>44</td>
<td>R0</td>
<td>Red Pixels Display Data (LSB)</td>
</tr>
<tr>
<td>TA1</td>
<td>45</td>
<td>R1</td>
<td>Red Pixels Display Data</td>
</tr>
<tr>
<td>TA2</td>
<td>47</td>
<td>R2</td>
<td>Red Pixels Display Data</td>
</tr>
<tr>
<td>TA3</td>
<td>48</td>
<td>R3</td>
<td>Red Pixels Display Data</td>
</tr>
<tr>
<td>TA4</td>
<td>1</td>
<td>R4</td>
<td>Red Pixels Display Data</td>
</tr>
<tr>
<td>TA5</td>
<td>3</td>
<td>R5</td>
<td>Red Pixels Display Data (MSB)</td>
</tr>
<tr>
<td>TA6</td>
<td>4</td>
<td>G0</td>
<td>Green Pixels Display Data (LSB)</td>
</tr>
<tr>
<td>TB0</td>
<td>6</td>
<td>G1</td>
<td>Green Pixels Display Data</td>
</tr>
<tr>
<td>TB1</td>
<td>7</td>
<td>G2</td>
<td>Green Pixels Display Data</td>
</tr>
<tr>
<td>TB2</td>
<td>9</td>
<td>G3</td>
<td>Green Pixels Display Data</td>
</tr>
<tr>
<td>TB3</td>
<td>10</td>
<td>G4</td>
<td>Green Pixels Display Data</td>
</tr>
<tr>
<td>TB4</td>
<td>12</td>
<td>G5</td>
<td>Green Pixels Display Data (MSB)</td>
</tr>
<tr>
<td>TB5</td>
<td>13</td>
<td>B0</td>
<td>Blue Pixels Display Data (LSB)</td>
</tr>
<tr>
<td>TB6</td>
<td>15</td>
<td>B1</td>
<td>Blue Pixels Display Data</td>
</tr>
<tr>
<td>TC0</td>
<td>16</td>
<td>B2</td>
<td>Blue Pixels Display Data</td>
</tr>
<tr>
<td>TC1</td>
<td>18</td>
<td>B3</td>
<td>Blue Pixels Display Data</td>
</tr>
<tr>
<td>TC2</td>
<td>19</td>
<td>B4</td>
<td>Blue Pixels Display Data</td>
</tr>
<tr>
<td>TC3</td>
<td>20</td>
<td>B5</td>
<td>Blue Pixels Display Data (MSB)</td>
</tr>
<tr>
<td>TC4</td>
<td>22</td>
<td>HSYNC</td>
<td>Horizontal Synchronization Signal</td>
</tr>
<tr>
<td>TC5</td>
<td>23</td>
<td>VSYNC</td>
<td>Vertical Synchronization Signal</td>
</tr>
<tr>
<td>TC6</td>
<td>25</td>
<td>DE</td>
<td>Compound Synchronization Signal</td>
</tr>
<tr>
<td>CLK IN</td>
<td>26</td>
<td>CLK</td>
<td>Data Sampling Clock</td>
</tr>
<tr>
<td>CLK IN</td>
<td>26</td>
<td>CLK</td>
<td>Data Sampling Clock</td>
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<tr>
<td>CLK IN</td>
<td>26</td>
<td>CLK</td>
<td>Data Sampling Clock</td>
</tr>
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</table>
### 256k (k=1024) COLORS COMBINATION TABLE

<table>
<thead>
<tr>
<th>Display</th>
<th>Basic Color</th>
<th>Gray Scale of Red</th>
<th>Gray Scale of Green</th>
<th>Gray Scale of Blue</th>
<th>Gray Scale of White &amp; Black</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>L L L L L L L L</td>
<td>L L L L L L L L</td>
<td>L L L L L L L L</td>
<td>L L L L L L L L</td>
<td>L L L L L L L L</td>
</tr>
<tr>
<td>Blue</td>
<td>L L L L L L L L</td>
<td>L L L L L L L L</td>
<td>H H H H H H H H</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green</td>
<td>L L L L L L L L</td>
<td>H H H H H H H H</td>
<td>L L L L L L L L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light Blue</td>
<td>L L L L L L L L</td>
<td>H H H H H H H H</td>
<td>L L L L L L L L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red</td>
<td>H H H H H H H H</td>
<td>L L L L L L L L</td>
<td>L L L L L L L L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purple</td>
<td>H H H H H H H H</td>
<td>L L L L L L L L</td>
<td>H H H H H H H H</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yellow</td>
<td>H H H H H H H H</td>
<td>L L L L L L L L</td>
<td>H H H H H H H H</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>H H H H H H H H</td>
<td>H H H H H H H H</td>
<td>H H H H H H H H</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Gray Scale Level
- L 0
- L 1
- L 2
- L 3...
- L 60
- L 61
- L 62
- L 63
- Blue
- White

(9/9) 2005-04-25 (Ver.0.5)
FOR SAFETY

LCD module is generally designed with precise parts to achieve light weighted thin mechanical dimensions. In using our Modules, make certain that you fully understand and put into practice the warnings and safety precautions detailed in Engineering Information No.EE-D-001A."CAUTIONS AND INSTRUCTIONS FOR TOSHIBA LCD MODULES". Refer to individual specifications and TECHNICAL DATA sheets (hereinafter called "TD") for more detailed technical information.

1) SPECIAL PURPOSES

A) Toshiba Matsushita Display Technology's Standard LCD Modules have not been customized for operation in extreme environments or for use in applications where performance failures could be life-threatening or otherwise catastrophic.

B) Since Toshiba Matsushita Display Technology's Standard LCD Modules have not been designed for operation in extreme environments, they must never be used in devices that will be exposed to abnormally high levels of vibration or shock which exceed Toshiba's published specification limits.

C) In addition, since Toshiba Matsushita Display Technology's Standard LCD Modules have not been designed for use in applications where performance failures could be life-threatening or catastrophic, they must never be installed in aircraft navigation control systems (such as, but not limited to Traffic Collision Avoidance System and Air Traffic Indicator), in military defense or weapons systems, in critical industrial process-control systems (e.g., those involved in the production of nuclear energy), or in critical medical device or patient life-support systems.

2) DISASSEMBLING OR MODIFICATION

DO NOT DISASSEMBLE OR MODIFY the module. It may damage sensitive parts inside LCD module, and may cause scratches or dust on the display. Toshiba Matsushita Display Technology does not warrant the module, if customer disassembled or modified it.

3) BREAKAGE OF LCD PANEL

DO NOT INGEST liquid crystal material, DO NOT INHALE this material, and DO NOT CONTACT the material with skin, if LCD panel is broken and liquid crystal material spills out.

If liquid crystal material comes into mouth or eyes, rinse mouth or eyes out with water immediately.

If this material contact with skin or cloths, wash it off immediately with alcohol and rinse thoroughly with water.

4) GLASS OF LCD PANEL

BE CAREFUL WITH CHIPS OF GLASS that may cause injuring fingers or skin, when the glass is broken.

5) ELECTRIC SHOCK

DISCONNECT POWER SUPPLY before handling LCD module.

DO NOT TOUCH the parts inside LCD module and the fluorescent lamp's connector or cables in order to prevent electric shock, because high voltage is supplied to these parts from the inverter unit while power supply is turned on.

6) ABSOLUTE MAXIMUM RATINGS AND POWER PROTECTION CIRCUIT

DO NOT EXCEED the absolute maximum rating values under the worst probable conditions caused by the supply voltage variation, input voltage variation, variation in parts' constants, environmental temperature, etc., otherwise LCD module may be damaged.

Employ protection circuit for power supply, whenever the specification or TD specifies it.

Suitable protection circuit should be applied for each system design.

7) DISPOSAL

When dispose LCD module, obey to the applicable environmental regulations.

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