Handling Guide for LCD module

LS027B4DH01
LS027B7DH01

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# RECORDS OF REVISION

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<table>
<thead>
<tr>
<th>DATE</th>
<th>REVISED</th>
<th>SUMMARY</th>
<th>Check &amp; APPROVAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mar. 8. 11</td>
<td>-</td>
<td>1\textsuperscript{st} Issue</td>
<td></td>
</tr>
</tbody>
</table>

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[For handling]

(1) Do not scratch the surface of the polarizer as it is easily damaged.

(2) If the cleaning of the surface of the LCD module is necessary, wipe it swiftly with cotton or other soft cloth. Do not use organic solvent as it damages polarizer.

(3) Water droplets on polarizer must be wiped off immediately as they may cause color changes, or other defects if remained for a long time.

(4) Since this LCD panel is made of glass, dropping the module or banging it against hard objects may cause cracks or fragmentation.

(5) Certain materials such as epoxy resin (amine’s hardener) or silicone adhesive agent (de-alcohol or de-oxym) emits gas to which polarizer reacts (color change). Check carefully that gas from materials used in system housing or packaging do not harm polarizer.

(6) Liquid crystal material will freeze below specified storage temperature range and it will not get back to normal quality even after temperature comes back within specified temperature range. Liquid crystal material will become isotropic above specified temperature range and may not get back to normal quality. Keep the LCD module always within specified temperature range.

(7) Do not expose LCD module to the direct sunlight or to strong ultraviolet light for long time.

(8) Do not disassemble the LCD module as it may cause permanent damage.

(9) As this LCD module contains components sensitive to electrostatic discharge, be sure to follow the instructions in below.

* Operators
Operators must wear anti-static wears to prevent electrostatic charge up to and discharge from human body.

* Equipment and containers
Process equipment such as conveyer, soldering iron, working bench and containers may possibly generate electrostatic charge up and discharge. Equipment must be grounded through 100MΩ resistance. Use ion blower.

* Floor
Floor is an important part to leak static electricity which is generated from human body or equipment. There is a possibility that the static electricity is charged to them without leakage in case of insulating floor, so the countermeasure (electrostatic earth: 100MΩ) should be made.

* Humidity
Proper humidity of working room may reduce the risk of electrostatic charge up and discharge. Humidity should be kept over 50% all the time.

* Transportation/storage
Storage materials must be anti-static to prevent causing electrostatic discharge.

* Others
Protective film is attached on the surface of LCD module to prevent scratches or other damages. When removing this protective film, remove it slowly under proper anti-ESD control such as ion blower.
(10) Hold LCD module very carefully when placing it into the system housing. Do not apply excessive stress or pressure to LCD module. Do not use chloroprene rubber as it may affect the reliability of the electrical interconnection.

(11) Do not hold or touch LCD panel to flex interconnection area as it may be damaged.

(12) As the binding material between LCD panel and flex connector mentioned in (11) contains an organic material, any type of organic solvents are not allowed to be used. Direct contacts by fingers are also prohibited.

(13) When carrying the LCD module, place it on the tray to protect from mechanical damage. It is recommended to use the conductive trays to protect the CMOS components from electrostatic discharge.

(14) Place a protective cover on the LCD module to protect the glass panel from mechanical damages.

(15) LCD module is susceptible to mechanical stress and even the slightest stress will cause partial non-uniformity due to cell gap unevenness. So make sure the LCD module is placed on flat plane without any continuous twisting, bending or pushing stress.

(16) Protective film is placed onto the surface of LCD module when it is shipped from factory. Make sure to peel it off before assembling the LCD module into the system. Be very careful not to damage LCD module by electrostatic discharge when peeling off this protective film. Ionized air-blower and ground strap are recommended.

(17) Make sure the mechanical design of the system in which the LCD module will be assembled matches specified viewing angle of this LCD module.
[Do’s and Don’ts for holding modules]

a. Do’s
i) Correct way to hold the LCD modules

b. Don’ts
i) Connector FPC and/or Pins and/or components might be damaged.

ii) Risk of LCD module damage.
[Do’s and Don’ts for Peeling off the protection Film]

a. Do’s
i) Correct way to hold the LCD modules

Recommended hold position.

ii) (step1) Hold the LCD module by hand at designated position.

Recommended hold position.

(step2) Slowly peel off the protection film, taking 3 seconds or more.

(+1sec) (+1sec) (+1sec) (Total=3sec)

b. Don’ts
i) Quickly peeling off the protection film might cause ESD damage to the LCD module.
[Do’s and Don’ts for holding modules]

a. Please hold the LCD panel and FPC by the finger in order to insert the FPC to connector.

b. Do not push by holding only LCD module to insert the FPC to connector.

c. Do not bend FPC toward display surface side.
[Handling and Storage method]

a. Handling  
i) LCD module is stored in the packing.  
Use wagon in case of transportation between stations in production line.

b. Storage  
a. Do’s  
i) Correct way to store the LCD module.

b. Don’ts  
ii)
[For operating LCD module]

(1) Do not operate the LCD module under outside of electrical specification. Otherwise LCD module may be damaged.
(2) Do not use the LCD module under outside of specified driving timing chart. Otherwise LCD module may not have proper picture quality.
(3) A still image should be displayed less than two hours, if it is necessary to display still image longer than two hour, display image data must be refreshed in order to avoid sticking image on LCD module.
(4) If LCD module takes a static electricity, as the display image which is written into pixel memory might not be displayed, Data update should be executed frequently.

[Package Storing]

i) Maximum number of carton in a stack : 12 cartons
   Maximum quantity of units in carton : 400 units per carton

ii) Storage condition
   • Temperature : 0 to 40 (°C)
   • Humidity : less than 60%RH (at 40 °C)
     No condensation
   • Gas : No harmful gas, such as acid or alkali, which causes severe corrosion on electronic parts and wiring, are to be detected. (acid, alkaline-gas etc.)
   • Length : About 3 months
   • Opening the package: in order to prevent electrostatic damage to LCD modules, room humidity should be made over 50%RH and take effective measure such as use of earth when opening the package.
[Precautions for Storage]

(1) After opening the package, do not leave the LCD module in direct sun or under strong ultraviolet ray. Store in dark place.

(2) In temperature lower than specified rating, liquid crystal material will coagulate. In temperature higher than specified rating, it isotropically liquefies. In either condition, the liquid crystal may not recover its original condition. Store the LCD module in at or around room temperature as much as possible. Also, storing the LCD module in high humidity will damage the polarizer. Store in normal room temperature as much as possible.

(3) Storing Method

a. Don't keeping under the direct sunlight.  
b. Keeping in the tray under the dark place.

DON'T

DO

i. Do not operate or store the LCD module under outside of specified environmental conditions.
[Other Notice]

(1) Operation outside specified environmental conditions cannot be guaranteed.
(2) As power supply (VDD-GND) impedance is lowered during use, bus controller should be inserted near LCD module as much as possible.
(3) Polarizer film is applied over LCD panel surface. Liquid crystal inside LCD panel deteriorates with ultraviolet ray. The LCD module should not be left in direct sun or under strong ultraviolet ray for prolonged period of time even with the polarizer film.
(4) Disassembling the LCD module will cause permanent damage to the module. Do not disassemble the module.
(5) If LCD module is broken, do not ingest the liquid crystal from the broken module. If hand, leg, or clothes come in contact with liquid crystal, wash off immediately with soap.
(6) ODS (specific chlorofluorocarbon, specific halon, 1-1-1 trichloroethane, carbon tetrachloride) are not used or contained in material or all production processes of this product.
(7) Observe all other precautionary requirements in handling general electronic components.
(8) Handling LCD panel with FPC
   i) FPC bend R should be 0.45mm or more. Do not bend FPC toward display surface side.
   ii) FPC bend area is 0.8mm to 6mm from glass edge. (do not bend FPC by the glass edge.)
   iii) It is possible to raise strength of the joint of FPC and the panel by pasting the PET tape to FPC.

Example of reinforcement of FPC bonding area