

Document No. : EB-10-002	Subject : LCD GENERAL SPECIFICATION
Rev : F	Issued By : Wilson Chan
Page 1 of 6	Audited By :
Eff. Date : 03 NOV, 15	Management :

1. PURPOSE

The LCD general specification provides outgoing inspection provision and its expected quality level based on outgoing inspection of LCD.

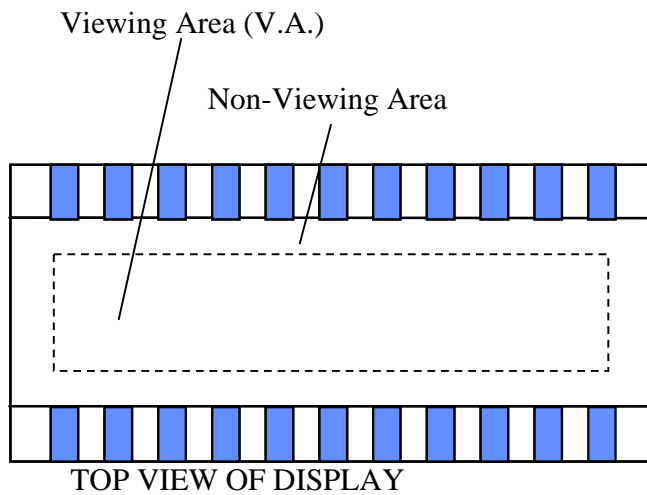
2. APPLICABLE SCOPE

The LCD specification is applicable to the arrangement in regard to outgoing inspection and quality assurance after it.

3. INSPECTION CONDITION

The LCD inspection is under a 40W fluorescent lamps with 400-800 lux condition , with the distance of view at around 30 cm. The inspection temperature & relative humidity are $23 \pm 5^{\circ}\text{C}$ & $60 \pm 20\%$ respectively.

4. VIEWING ZONE[#]



***5. SAMPLING METHOD**

Unless stated otherwise, the sampling method ANSI/ASQ Z1.4 standard is use and the AQL level is 0.65% & 1.5% for major and minor respectively.

[#]Any defect in Non-Viewing area is not guaranteed.

Document No. : EB-10-002	Subject : LCD GENERAL SPECIFICATION
Rev : F	
Eff. Date : 03 NOV, 15	Page 2 of 6

6. GENERAL GUIDELING OF CONNECTION

Caution of Pin Type LCD

It is recommended :

To complete dip soldering within 3 seconds at temperature about 270 °C.

To complete hand soldering within 3 seconds at temperature about 280 °C.

The soldering position is at least 3mm apart from the pin head.

Not to use wave or reflow soldering.

Soldering within 6 months and stored at 25 °C ±10°C & < 65% RH before soldered.

Caution of Zebra Type LCD

House should be designed to ensure uniform pressure acting on LCD; otherwise, adhesion of epoxy sealing will be weakened and eventually liquid crystal leakage will be caused.

7. GENERAL GUIDELINE OF POWER SUPPLY

Any D.C. or high frequency A.C. voltage applied on LCD will shorten life-time and should be avoided. The reference waveform of IC driver is shown in Appendix 1.

8. OPTICAL CHARACTERISTIC

The definition of rising time and falling time are as follows :

T_{on} = Time required for the LCD from 0% rising to 90% brightness (for transmissive type).

T_{off} = Time required for the LCD from 100% falling to 10% brightness (for transmissive type).

Typical waveform is shown in Appendix 2.

9. D.C. RESISTANCE OF LCD

The measuring method of LCD D.C. resistance is shown in Appendix 3.

10. VIEWING CONE

The viewing direction is defined as coordinate geometry. It combines a horizontal direction with a vertical angle which is derived from normal.

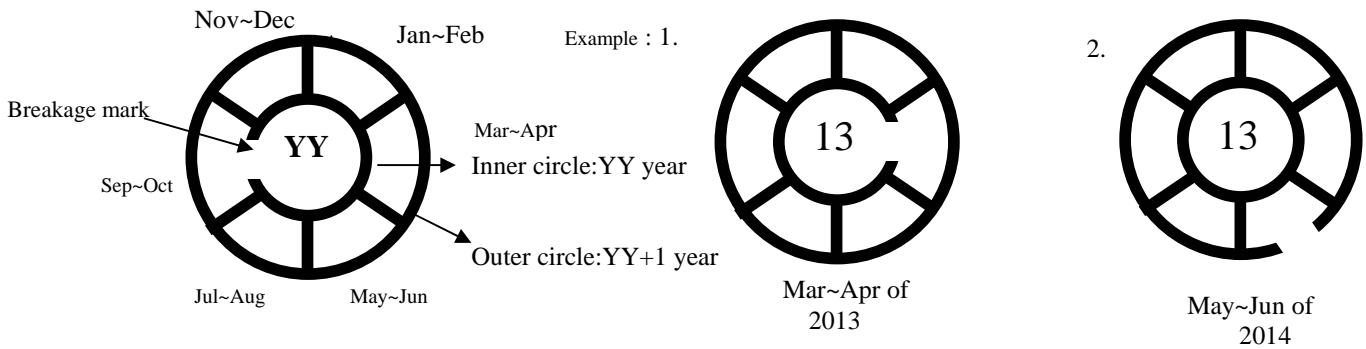
Document No. : EB-10-002	Subject : LCD GENERAL SPECIFICATION
Rev : F	
Eff. Date : 03 NOV, 15	Page 3 of 6

11. CONTRAST RATIO

Contrast ratio is the ratio between brightness of on-segment and off-segment. Because of limitation of LCD, four viewing angles for specified contrast ratio is provided. Out of this viewing cone, cross-talk or poor contrast will be resulted.

12. LOT INDICATION

The pinout area of LCD will be marked as follows:



If not applicable, the end seal color on LCD for lot indication, different color indicate the production period for better traceability.

Period	Even Year	Odd Year
Jan - Feb	Brown	Purple
Mar - Apr	Red	Grey
May - Jun	Orange	White
Jul - Aug	Yellow	Black
Sep - Oct	Green	Gold
Nov - Dec	Blue	Silver

Document No. : EB-10-002	Subject : LCD GENERAL SPECIFICATION
Rev : F	
Eff. Date : 03 NOV, 15	Page 4 of 6

13. HANDLING PRECAUTIONS

(1) CAUTION OF LCD HANDLING & CLEANING

The polarizing plate on the surface of the panel is made from organic substances. Be very careful for chemicals not to touch the plate or it leads the polarizing plate to deteriorate.

If the use of a chemical is unavoidable, wipe the panel lightly with soft materials, such as gauze and absorbent cotton, soaked in a solvent.

Usable solvent: Alcohol (ethanol, IPA and the like)

Appropriate solvent: Ketones, ethyl alcohol

Avoid wiping with a dry cloth or any hard materials, since it could damage the surface of the polarizing plate, screen printed ink on it if any and others.

(2) PACKAGING

Avoid intense shock and falls from a height and do not operate or store them exposed to direct sunshine or high temperature/humidity for long periods.

(3) CAUTION FOR OPERATION

The viewing angle can be adjusted by varying the LCD driving voltage.

Driving voltage should be kept within specified range, excess voltage shortens display life.

Response time increases with decrease in temperature.

Display may turn black or dark Blue at temperature above its operational range; this is however not destructive and the display will return to normal once the temperature falls back to range.

Mechanical disturbance during operation (such as pressing on the viewing area) may cause the segments to appear "fractured". They will recover once the display is turned off.

Condensation at terminals will cause malfunction and possible electrochemical reaction. Relative humidity of the environment should therefore be kept below 60%.

(4) SAFETY

Liquid crystal may leak out of a damaged LCD, it is recommended to wash off the liquid crystal by using solvents such as acetone or ethanol and should be burned up later.

If any liquid leaks out of a damaged glass cell comes in contact with your hands, wash it off with soap and water immediately.

14. LIFE EXPECTANCY

Under typical rating and room temperature condition(25 °C ±10°C & < 65% RH)and without exposure to direct sun light, the expected lifetime is 50,000 hours.

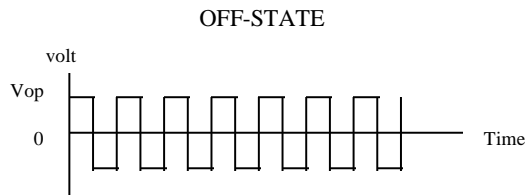
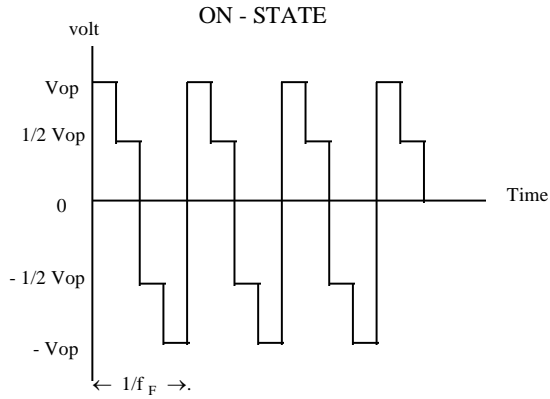
15. WARRANTY

Clover will replace or repair any of her LCD in accordance with her LCD specification for a period of one year from date of shipment. The warranty liability of Clover is limited to repair and / or replacement. Clover will not be responsible for any subsequent or consequential event.

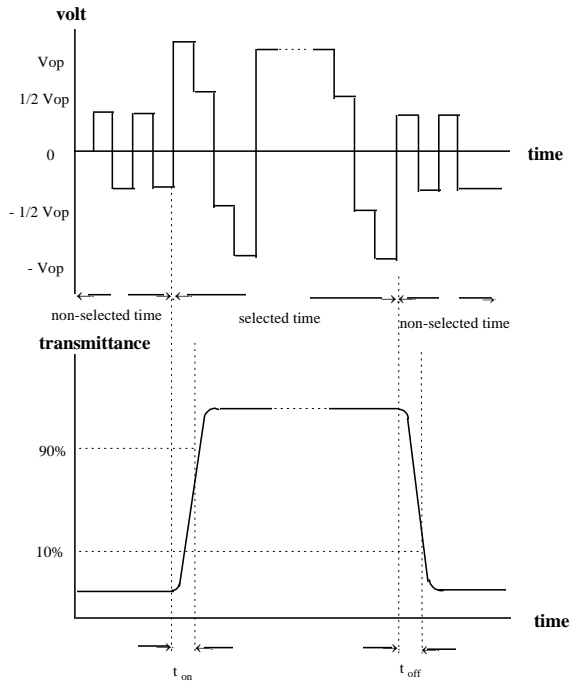
Definition of End of Life : Display cannot see clearly anymore.

Document No. : EB-10-002	Subject : LCD GENERAL SPECIFICATION
Rev : F	
Eff. Date : 03 NOV, 15	Page 5 of 6

APPENDIX 1

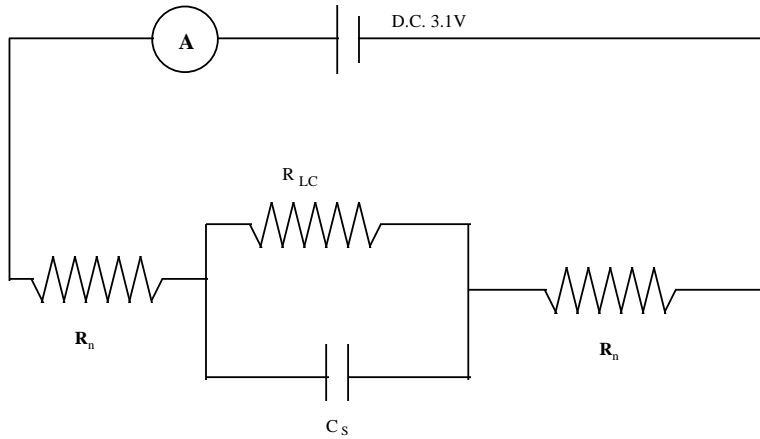


APPENDIX 2



Document No. : EB-10-002	Subject : LCD GENERAL SPECIFICATION
Rev : F	
Eff. Date : 03 NOV, 15	Page 6 of 6

APPENDIX 3



- R_n : ITO ELECTRODE RESISTANCE**
- R_{LC} : LIQUID CRYSTAL RESISTANCE**
- C_s : CAPACITANCE BETWEEN ITO ELECTRODES**

APPENDIX 4

