TFT LCD Approval Specification

MODEL NO.:M190E5-C03

Customer : _____

Approved by : _____

Note :

記錄	工作	審核	角色	投票
2006-12-13 08:59:43 CST	Approve by Dept. Mgr.(QA RA)	tomy_chen(陳永一 /52720/54140/43150)	Department Manager(QA RA)	Accept
2006-12-11 18:53:35 CST	Approve by Director	teren_lin(林添仁 /56910/36064)	Director	Accept

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REVISION HISTORY

Version	Date	Section	Description
Ver 2.0	Oct,23 '06	-	M190E5-C03 Approval Specifications was first issued。
Ver 2.1	Dec.11 '06	9	Modify cell drawing

1.GENERAL DESCRIPTION

1.1 OVERVIEW

The M190E5-C03 is a 19-inch LCD cell with thin film transistors as active elements and contains 1280x1024 pixels. Each pixel is divided into red, green and blue dot, which are arranged in vertical stripe. The cell is normally white mode, and can be applied to the transmission type display. Backlight unit (BLU) and circuit board for the cell are not built in.

1.2 FEATURES

- Wide viewing angle
- High contrast ratio
- Fast response time
- SXGA (1280 x 1024 pixels) resolution

1.3 APPLICATION

- LCD Monitor
- LCD TV

1.4 GENERAL SPECIFICATIONS

Item		Specification	Unit
Max Panel Dimension (TFT)		387.52 X 312.056	mm
Glass thickness(TFT/ CF)		0.7/ 0.7	mm
Active Area		376.32 (H) x 301.056 (V) (19.0” diagonal)	mm
Driver Element		a-si TFT active matrix	-
Pixel Number		1280X R.G.B X 1024	pixel
Pixel Pitch		0.294 (H) X 0.294 (V)	mm
Pixel Arrangement		RGB vertical stripe	-
Transmissive Mode		Normally white	-
Surface Treatment		Hardness (3H), AG (Haze 25%)	-
Polarizer Type		E-Wide View	-
Polarizer Dimension	TFT	380.52 X 304.13	mm
	CF	383.15 X 307.85	mm
Polarizer Thickness	TFT	0.21	mm
	CF	0.21	mm
Weight		470(typ.)	g

2. ABSOLUTE MAXIMUM RATINGS

1. Storage condition : With shipping package.
2. Storage temperature range : 25±5 ℃.
3. Storage humidity range : 50±10% RH.
4. Shelf life : 30 days

3. Suggestive Driving Condition

Item				Min.	Typ.	Max.	Unit
Driving Voltage	V_G	On		23.7	24.5	25.3	V
		Off		-7.0	-6.8	-6.6	V
	V_D	B	Gam1	-	12.105	-	V
			Gam14	-	0.128	-	V
		W	Gam7	-	6.688	-	V
			Gam8	-	6.283	-	V
	V_{COM}	Center		4.81	5.31	5.81	V
	G↓-D offset			2.0	-	-	us
	Charging time			-	9.8	-	us

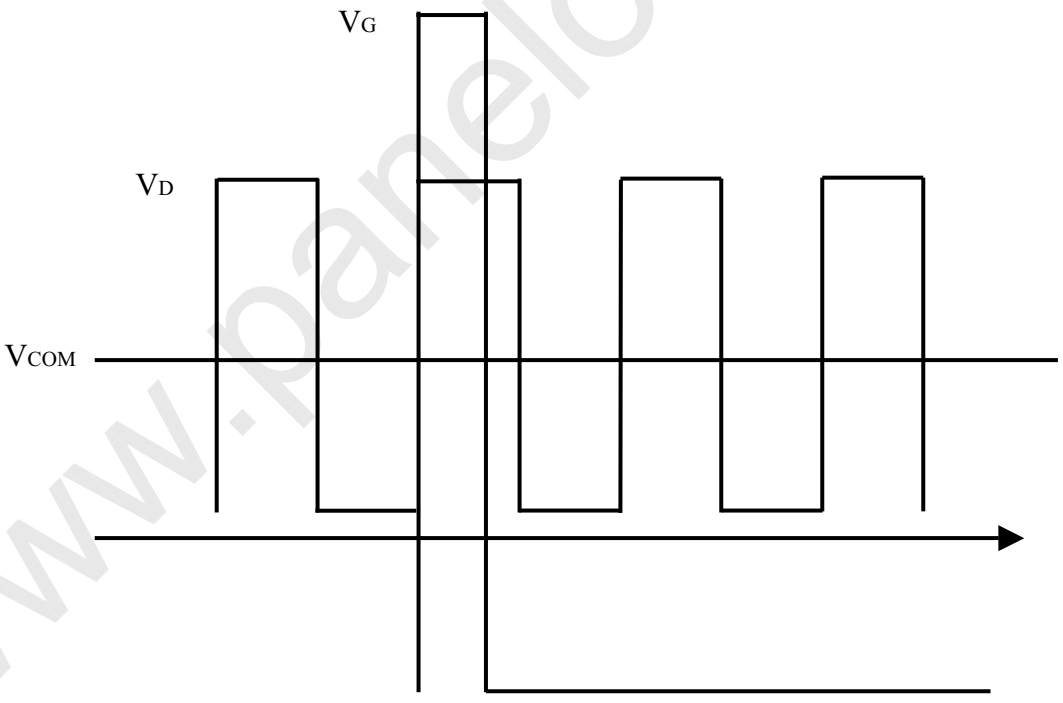
B: Black pattern

W: White pattern

Gamma Voltage : Gam1 > Gam2 > Gam3 > … > Gam10

G↓: gate pulse falling edge

DRIVING TIMING DIAGRAM



4. PANEL PIN DEFINITION

Pin No.	Data driver Pin Define		
	TAB1	TAB2 ~ 9	TAB10
1~2	Test pin*	Test pin*	Test pin*
3	Test pin*	NC	NC
4	NC	NC	NC
5	NC	NC	NC
6	XAO	NC	NC
7	OE	NC	NC
8	CPV	NC	NC
9	STV	NC	NC
10~12	Vss	NC	NC
13~15	Vdd	NC	NC
16~17	Vee	NC	NC
18	NC	NC	NC
19~24	Vgl	NC	NC
25	NC	NC	NC
26~31	Vgh	NC	NC
32	NC	NC	NC
33~34	Vcom	NC	NC
35	Vcom	Vcom	Vcom
36	Test pin*	Test pin*	Test pin*
37	Out1	Out1	Out1
38 ~ 419	out2 ~out 383	out2 ~out 383	out2 ~out 383
420	out384	out384	out384
421	Test pin*	Test pin*	Test pin*
422	NC	NC	Test pin*
423	NC	NC	NC
424~425	NC	NC	GND
426~427	NC	NC	Vgl
428	NC	NC	NC
429~430	NC	NC	Vcom
431	NC	NC	Test pin*
432	NC	NC	NC
433~434	Vcom	Vcom	Vcom
435~436	Test pin*	Test pin*	Test pin*

Note: Recommended Gate IC for the cell is HiMAX's HX8633APD400, 256Ch, or equivalent.

5. OPTICAL CHARACTERISTICS

5.1 TEST CONDITIONS

Item	Symbol	Value	Unit
Ambient Temperature	Ta	25±2	°C
Ambient Humidity	Ha	50±10	%RH
Gamma voltage	-	Refer to Item 3 driving condition	V
Vcom	-	most suitable Vcom	V

5.2 OPTICAL SPECIFICATION

ITEM		Symbol	Condition	MIN.	TYP.	MAX.	UNIT	NOTE
Contrast Ratio		CR	θx=θy=0°	450	800	-	%	4,1
Response Time (Black/White)		Tr	θx=θy=0°	-	1.3	6	ms	5,1
		Tf	θx=θy=0°	-	3.7	8	ms	
Center point Transmittance		T%	θx=θy=0°	5.1	5.7	-	%	7,1
Transmittance uniformity (9pts)		δT%	θx=θy=0°	-	1.25	1.4	-	6,1
Viewing Angle	Horizontal θx (θy=0°)	Right	CR≧10	70	80	-	Deg	2,3,1
		Left		70	80	-	Deg	
	Vertical θy (θx=0°)	Up		70	80	-	Deg	
		Down		70	80	-	Deg	
Color Coordinate at center point	Red	Rcx	θx=θy=0°	Typ. -0.03	0.646	Typ. +0.03	-	2,0
		Rcy	θx=θy=0°		0.326		-	
	Green	Gcx	θx=θy=0°		0.276		-	
		Gcy	θx=θy=0°		0.592		-	
	Blue	Bcx	θx=θy=0°		0.148		-	
		Bcy	θx=θy=0°		0.105		-	
	White	Wcx	θx=θy=0°		0.314		-	
		Wcy	θx=θy=0°		0.350		-	

Note (0)

Light source is the standard light source “C” which is defined by CIE and driving voltages are based on suitable gamma voltages. The calculating method is as following：

1.Measure Module’s and BLU’s spectrums. White is without signal input and R, G, B are with signal input. BLU is supplied by CMO.

2.Calculate cell’s spectrum.

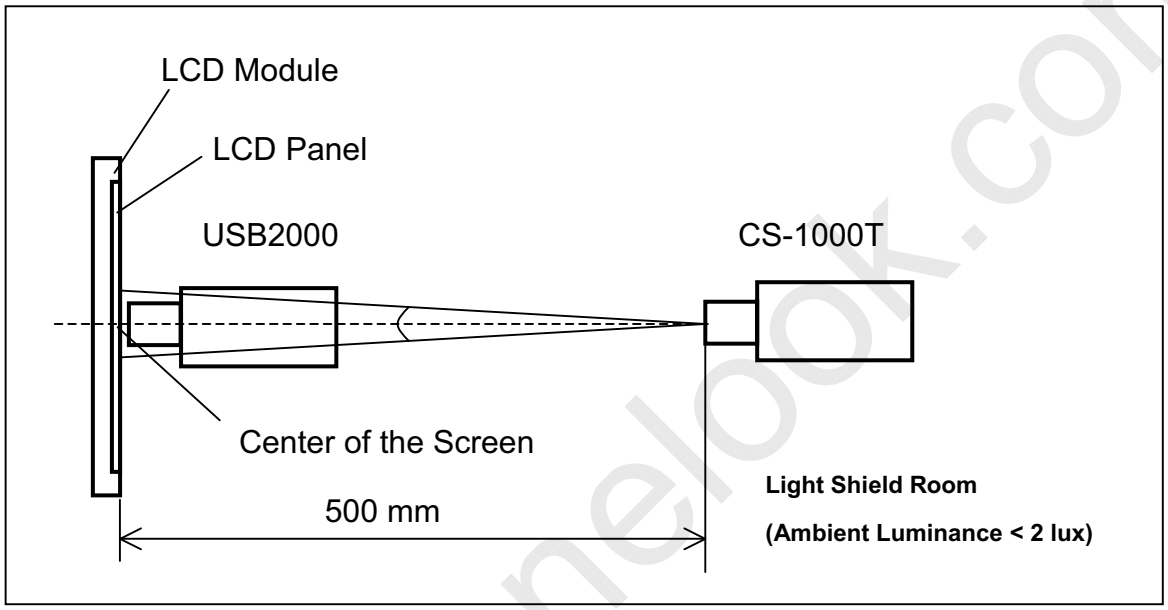
3.Calculate cell’s chromaticity by using the spectrum of standard light source “C”

Note (1)

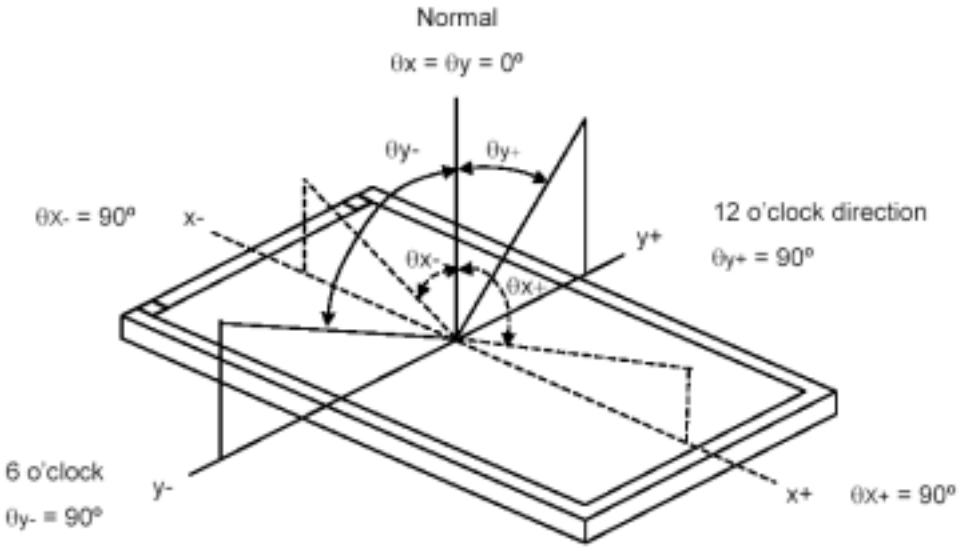
Light source is the BLU which is supplied by CMO and driving voltages are based on suitable gamma voltages. White is without signal input and R, G, B are with signal input. SPEC is judged by CMO's golden sample .

Note (2) : Measurement setup:

The LCD module should be stabilized at given temperature for 20 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting backlight for 20 minutes in a windless room.



Note (3) : Definition of viewing angle (θx ,θy):

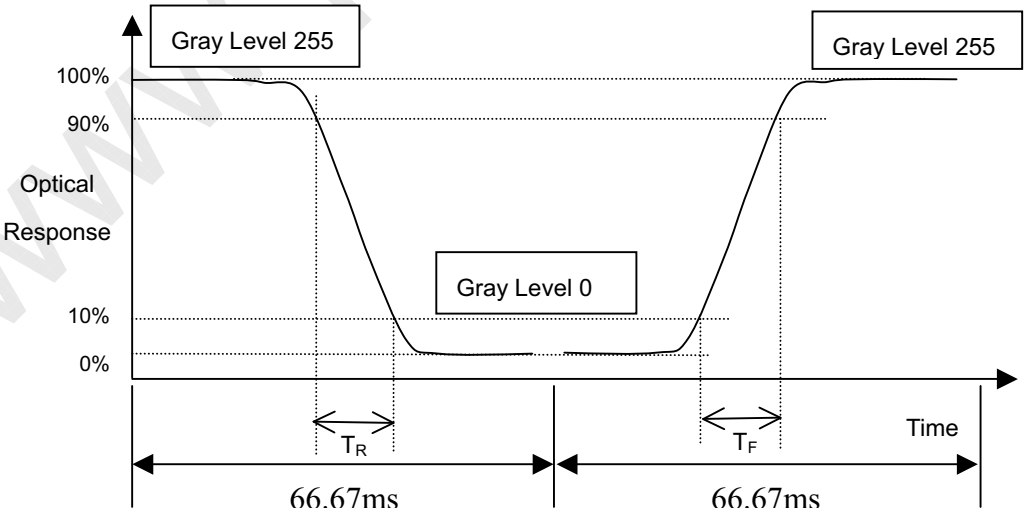


Note (4) : Definition of Contrast Ratio (CR):

Ratio of gray max (Gmax), gray min (Gmin), at the center point of panel.

$$CR = \frac{\text{Luminance with all pixel white (Gmax)}}{\text{Luminance with all pixel Black (Gmin)}}$$

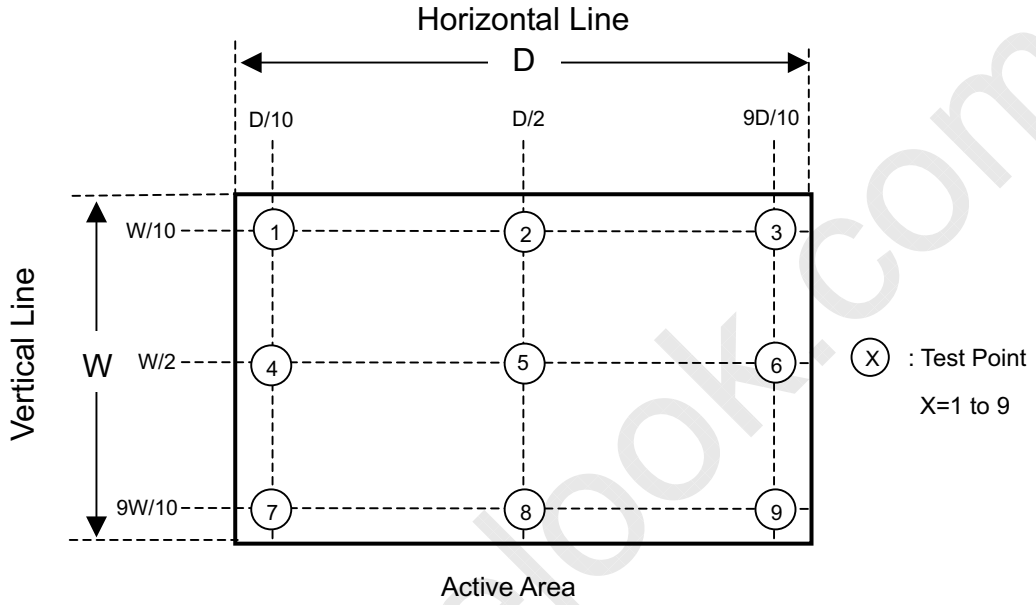
Note (5) : Definition of Response Time (T_R, T_F):



Note (6) : Definition of Transmittance Variation (δT%):

Measure the transmittance at 9 points

$$\delta T\% = \frac{\text{Maximum [T\%(1), T\%(2), … T\%(9)]}}{\text{Minimum [T\%(1), T\%(2), … T\%(9)]}}$$



Note (7) : Definition of Transmittance(T%):

Module is without signal input.

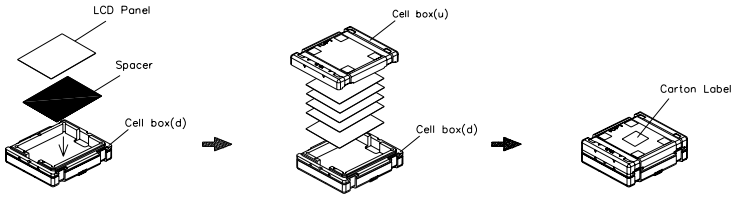
BLU is Supplied by CMO .

$$\text{Transmittance} = \frac{\text{Luminance of LCD module}}{\text{Luminance of backlight}} * 100\%$$

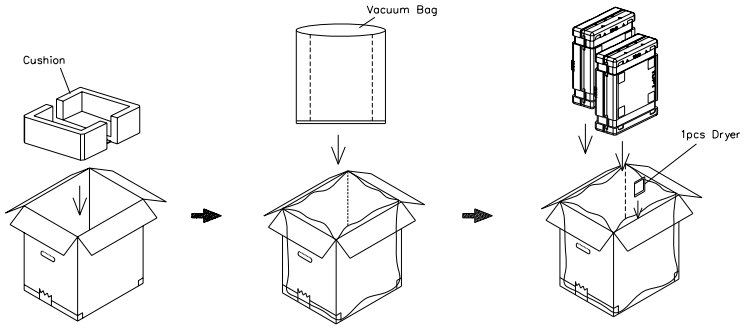
6. PACKAGING

6.1 PACKING METHOD

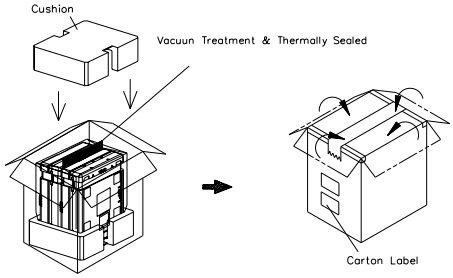
1.



2.



3.



(1) 20 LCD Cells/1 box
(2) Carton dimensions : 524(L)x430(W)x585(H)mm
(3) Weight :approximately 29.4kg(40 Cells per box).

Figure. 6-1 Packing method

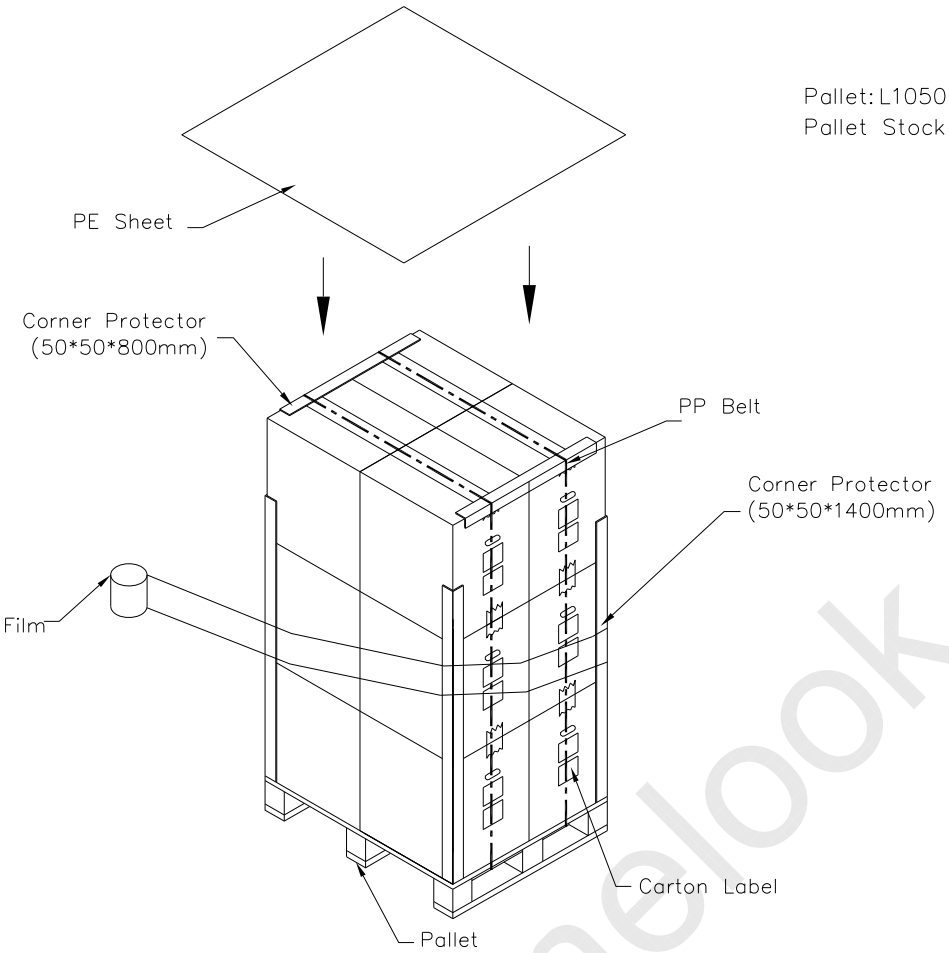


Figure. 6-2 Packing method

7. DEFINITION OF LABEL

1. Mode Name: M190E5- C03
2. Panel Type: version control
3. Quantity: 20pcs / box
4. Case ID: serial number.
5. Note: Notification, if necessary.
6. Barcode: Case ID in code39 format

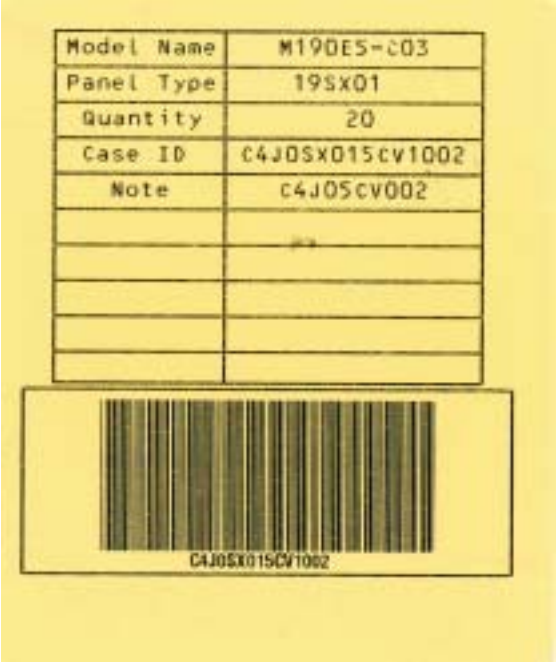


Figure. 7-1 Carton Label

8. PRECAUTIONS

8.1 ASSEMBLY AND HANDLING PRECAUTIONS

1. Do not apply rough force such as bending or twisting to the cell during assembly.
2. To assemble or install cell into customer's module can be only in clean working areas. The dust and oil may cause electrical short or worsen the polarizer.
3. It's not permitted to have pressure or impulse on the module because the LCD panel and Backlight will be damaged.
4. Use a soft dry cloth without chemicals for cleaning, because the surface of polarizer is very soft and easily scratched.
5. It is dangerous that moisture come into or contacted the LCD panel, because moisture may damage TFT circuit .
6. High temperature or humidity may reduce the performance of cell. Please store LCD cell within the specified storage conditions.

8.2 SAFETY PRECAUTIONS

1. If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contact with hands, skin or clothes, it has to be washed away thoroughly with soap.