TFT LCD Approval Specification

MODEL NO.:M170E5-C03

Customer : _____

Approved by : _____

Note :

Liquid Crystal Display Division	
QRA Division.	OA Head Division.
Approval	Approval
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REVISION HISTORY

Version	Date	Section	Description
Ver 1.0	Mar, 01 '05	-	M170E5-C03 Specifications was first issued。
Ver 2.0	Apr, 28 '05	1.4	Add "Weight" item , Weight=400g(typ.)
		5.2	Delete R,G,B,W color coordinate which uses CMO's BLU
			Center point Transmittance : typ. from 5.25%to 5.3%
		9	Add "PANEL DRAWING"

1.GENERAL DESCRIPTION

1.1 OVERVIEW

The M170E5-C03 is a 17-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)		348.3 X 280.9	mm
Glass thickness(TFT/ CF)		0.7/ 0.7	mm
Active Area		337.92 (H) x 270.34 (V) (17.0” diagonal)	mm
Driver Element		a-si TFT active matrix	-
Pixel Number		1280X R.G.B X 1024	pixel
Pixel Pitch		0.264 (H) X 0.264 (V)	mm
Pixel Arrangement		RGB vertical stripe	-
Transmissive Mode		Normally white	-
Surface Treatment		Hard coating (3H), AG (Haze 25%)	-
Polarizer Type		Super Wide View	-
Polarizer Dimension	TFT	344.1 X 276.5	mm
	CF	340.6 X 273.0	mm
Polarizer Thickness	TFT	0.245	mm
	CF	0.245	mm
Weight		400(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		22.3	23	23.7	V
		Off		-7.1	-6.8	-6.6	V
	V_D	B	Gam1	-	9.73	-	V
			Gam10	-	0.14	-	V
		W	Gam5	-	5.56	-	V
			Gam6	-	4.99	-	V
	V_{COM}	Center		3.7	3.9	4.1	V
	G↓ -D offset			2.0	-	-	us
	Charging time			-	9.8	-	us

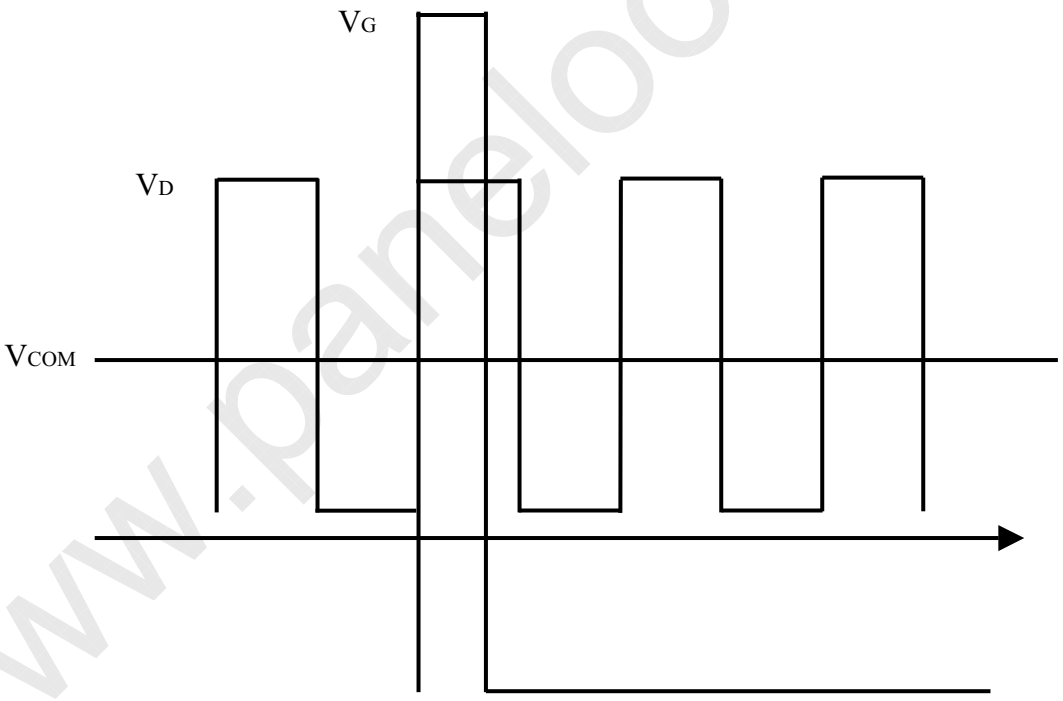
B: Black pattern

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	NC	NC	NC
3	floating is recommend	NC	NC
4	floating is recommend	NC	NC
5	XAO	NC	NC
6	OE	NC	NC
7	CPV	NC	NC
8	STV	NC	NC
9~11	Vss	NC	NC
12~14	Vdd	NC	NC
15~16	Vee	NC	NC
17~18	floating is recommend	NC	NC
19	NC	NC	NC
20~21	floating is recommend	NC	NC
22	NC	NC	NC
23~26	Vgl	NC	NC
27	NC	NC	NC
28~31	Vgh	NC	NC
32	NC	NC	NC
33~34	Vcom	Vcom	Vcom
35	Vcom	Vcom	Vcom
36	floating is recommend	floating is recommend	floating is recommend
37	out1	out1	out1
38 ~ 419	out2 ~ 383	out2 ~383	out2 ~383
420	out384	out384	out384
421	floating is recommend	floating is recommend	floating is recommend
422	NC	NC	floating is recommend
423	NC	NC	NC
424~425	NC	NC	Vcom
426~427	NC	NC	Vgl
428	NC	NC	NC
429	NC	NC	floating is recommend
430	NC	NC	NC
431~434	Vcom	Vcom	Vcom
435~436	NC	NC	NC

Note: Recommended Gate IC for the cell is HiMAX's HX8607APD400, 256/263Ch, 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°	400	500	-	%	4,1
Response Time (Black/White)		Tr	θx=θy=0°	-	2	7	ms	5,1
		Tf	θx=θy=0°	-	6	11	ms	
Center point Transmittance		T%	θx=θy=0°	4.8	5.3	-	%	7,1
Transmittance uniformity (13pts)		δ T%	θx=θy=0°	-	1.25	1.4	-	6,1
Viewing Angle	Horizontal θx (θy=0°)	Right	CR≧10	65	75	-	Deg	2,3,1
		Left		65	75	-	Deg	
	Vertical θy (θx=0°)	Up		60	70	-	Deg	
		Down		50	60	-	Deg	
Color Coordinate at center point	Red	Rcx	θx=θy=0°	Typ -0.03	0.650	Typ +0.03	-	2,0
		Rcy	θx=θy=0°		0.343		-	
	Green	Gcx	θx=θy=0°		0.274		-	
		Gcy	θx=θy=0°		0.600		-	
	Blue	Bcx	θx=θy=0°		0.132		-	
		Bcy	θx=θy=0°		0.112		-	
	White	Wcx	θx=θy=0°		0.318		-	
		Wcy	θx=θy=0°		0.361		-	

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.

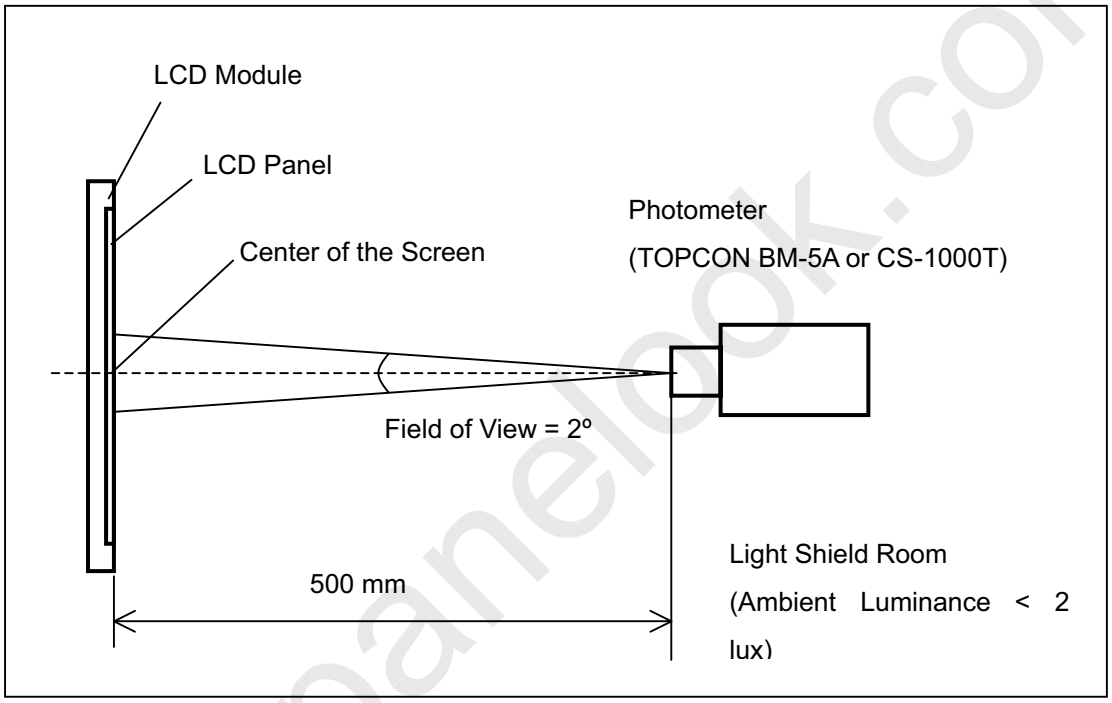
3.Calculate cell’s chromaticity by using the spectrum of standard light source “C”

Note (1)

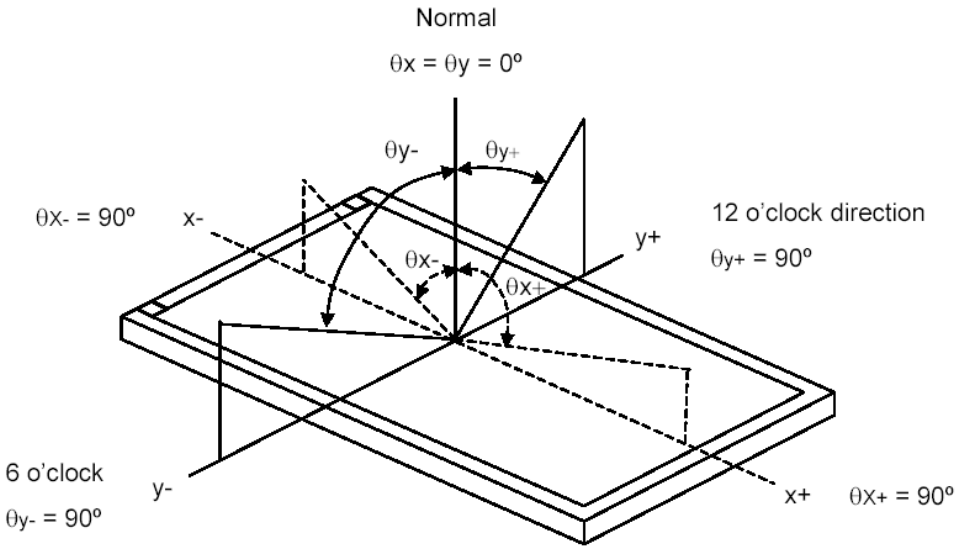
Light source is the BLU which is supplied by CMO and driving voltages are based on suitable gamma voltages. White is without signal input and R, G, B are with signal input. SPEC is judged by CMO's golden sample .

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):

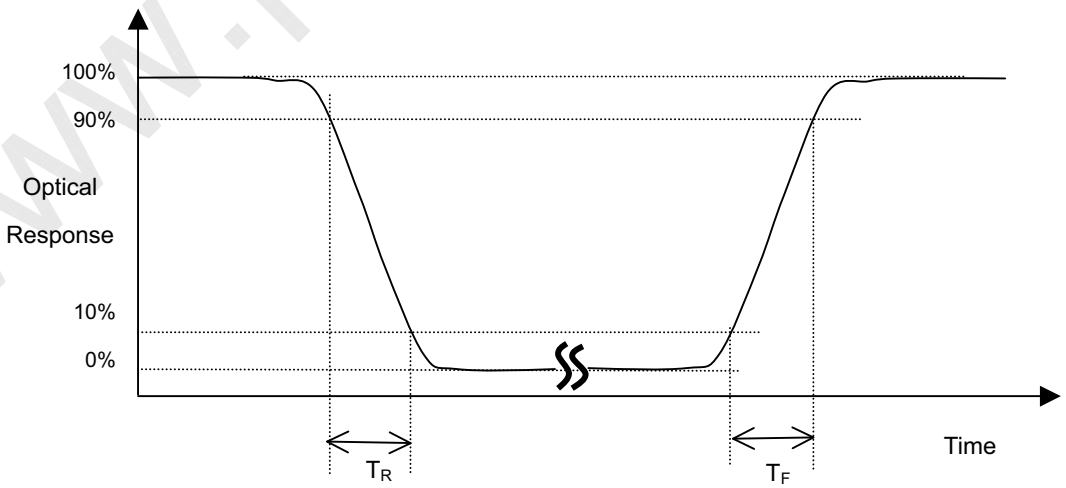


Note (4) : Definition of Contrast Ratio (CR):

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

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

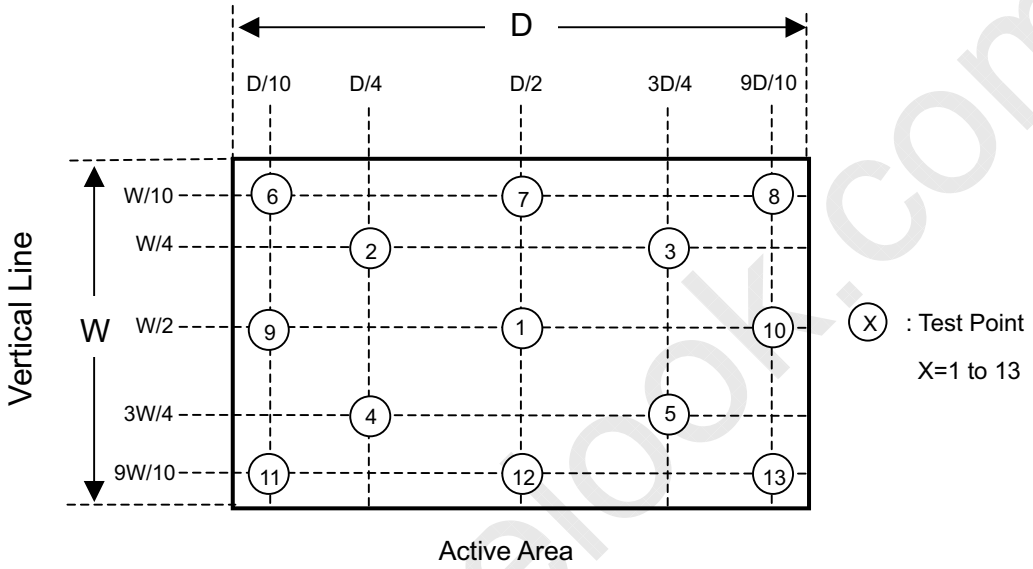
Note (5) : Definition of Response Time (T_R, T_F):



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

Measure the transmittance at 13 points

$$\delta T\% = \frac{\text{Maximum [T\%(1), T\%(2), … T\%(13)]}}{\text{Minimum [T\%(1), T\%(2), … T\%(13)]}}$$



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 SPECIFICATION

1. 15 pcs LCD panel / 1 Box
2. Box Dimension : 391(L) X 333(W) X 474(H) mm
3. Weight : Approximately 7Kg (15 panel per box)

6.2 PACKING METHOD

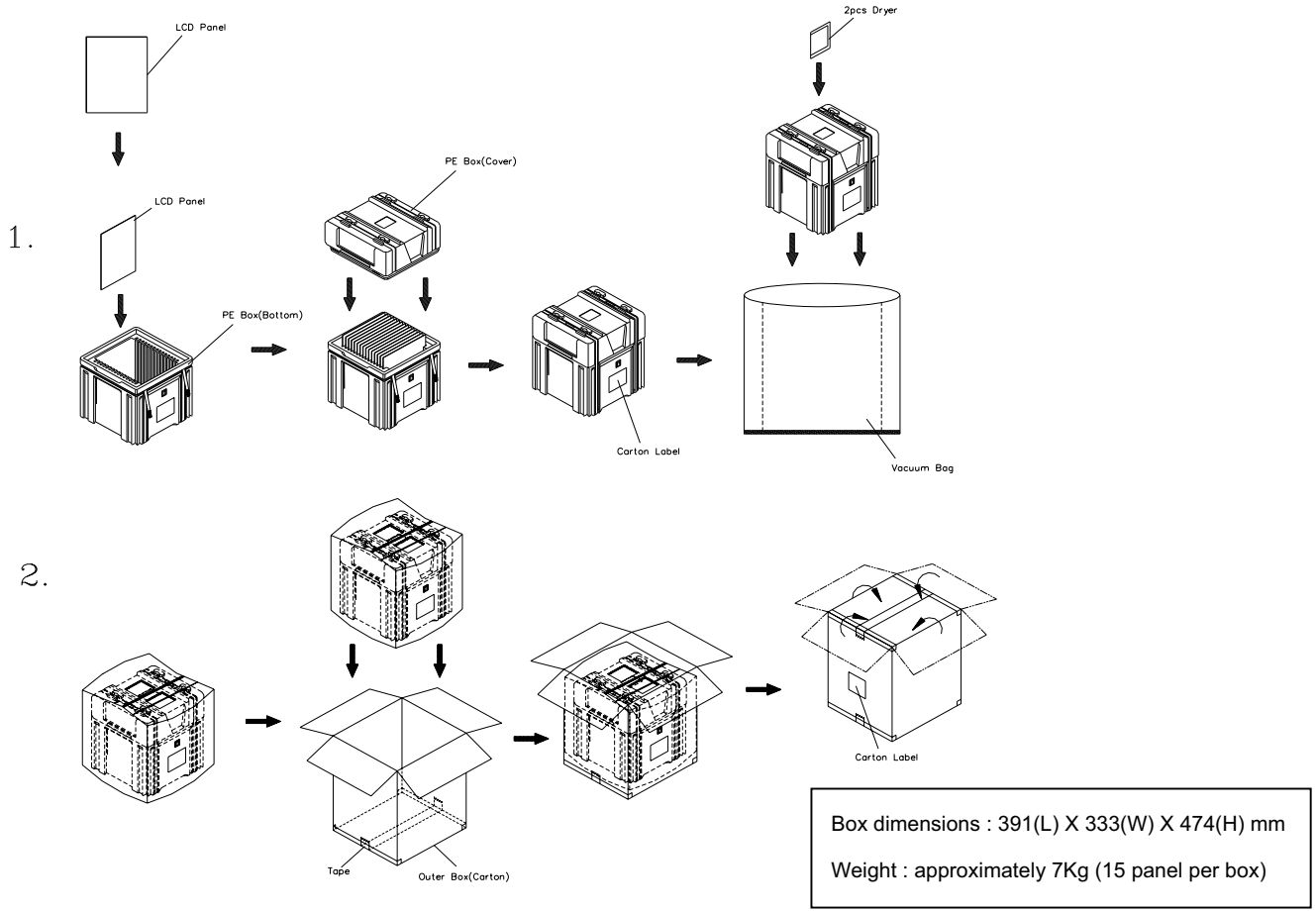


Figure. 6-1 Packing method

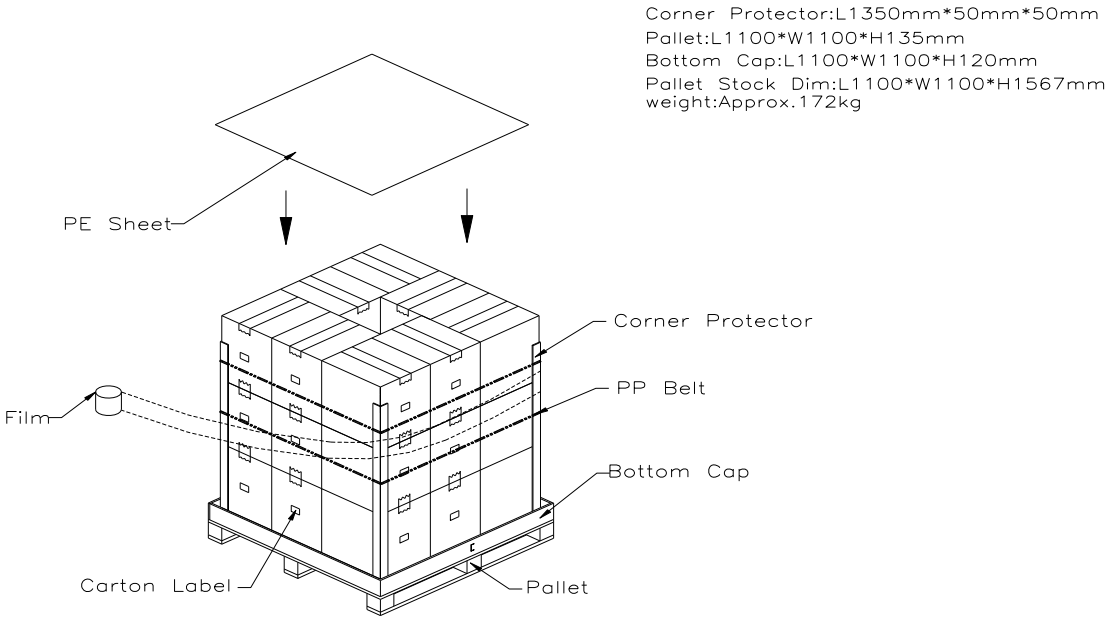


Figure. 6-2 Packing method

7. DEFINITION OF LABEL

1. Mode Name: M170E5- C03
2. Panel Type: version control
3. Quantity: 15pcs / PP box
4. Case ID: serial number.
5. Note: Notification, if necessary.
6. Barcode: Case ID in code39 format

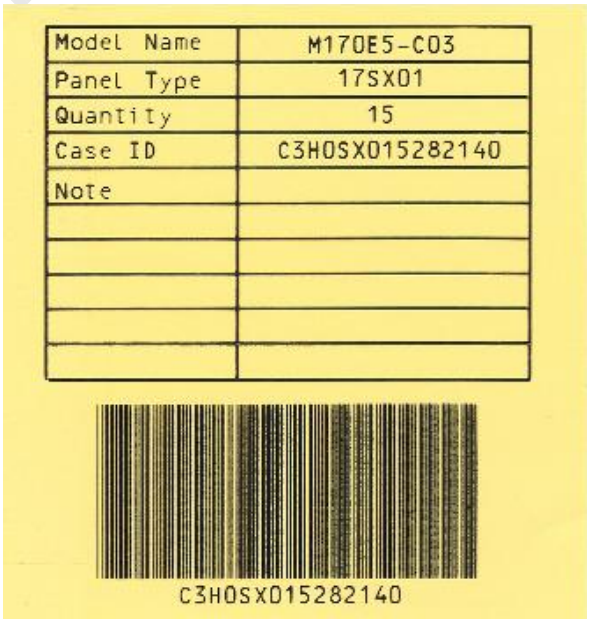


Figure. 7-1 Packing Label

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.