TFT LCD Approval Specification

CMO MODEL NO.: M185B1-CZ1

FUNAI MODEL NO.:TLCD10CME007

Customer: _____

Approved by: _____

Note:

核准時間	部門	審核	角色	投票
2009-06-25 09:05:40	MTR 產品管理處	吳 2009.06.25 柏 勳	Director	Accept

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REVISION HISTORY

Version	Date	Section	Description
Ver. 2.0	June, 04 '09	-	M185B1-CZ1(Funai TLCD10TME007) Approval specifications was first issued。

1. GENERAL DESCRIPTION

1.1 OVERVIEW

The M185B1-CZ1 is a 18.5-inch wide LCD cell with thin film transistors as active elements and contains 1366x768 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
- WXGA (1366 x 768 pixels) resolution

1.3 APPLICATION

- LCD Monitor
- LCD TV

1.4 GENERAL SPECIFICATIONS

Item		Specification	Unit
Max Panel Dimension (TFT)		420.65 X 241.25	mm
Glass thickness(TFT/ CF)		0.7/ 0.7	mm
Active Area		409.8 (H) x 230.4 (V) (18.5” diagonal)	mm
Driver Element		a-si TFT active matrix	-
Pixel Number		1366X R.G.B X 768	pixel
Pixel Pitch		0.3 (H) X 0.3 (V)	mm
Pixel Arrangement		RGB vertical stripe	-
Transmissive Mode		Normally white	-
Surface Treatment		Hard coating (3H), AG (Haze 25%)	-
Polarizer Type		E -Wide View	-
Polarizer Dimension	TFT	417.15 X 237.8	mm
	CF	417.15 X 237.8	mm
Polarizer Thickness	TFT	0.215	mm
	CF	0.215	mm
Weight		400 (Max.)	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

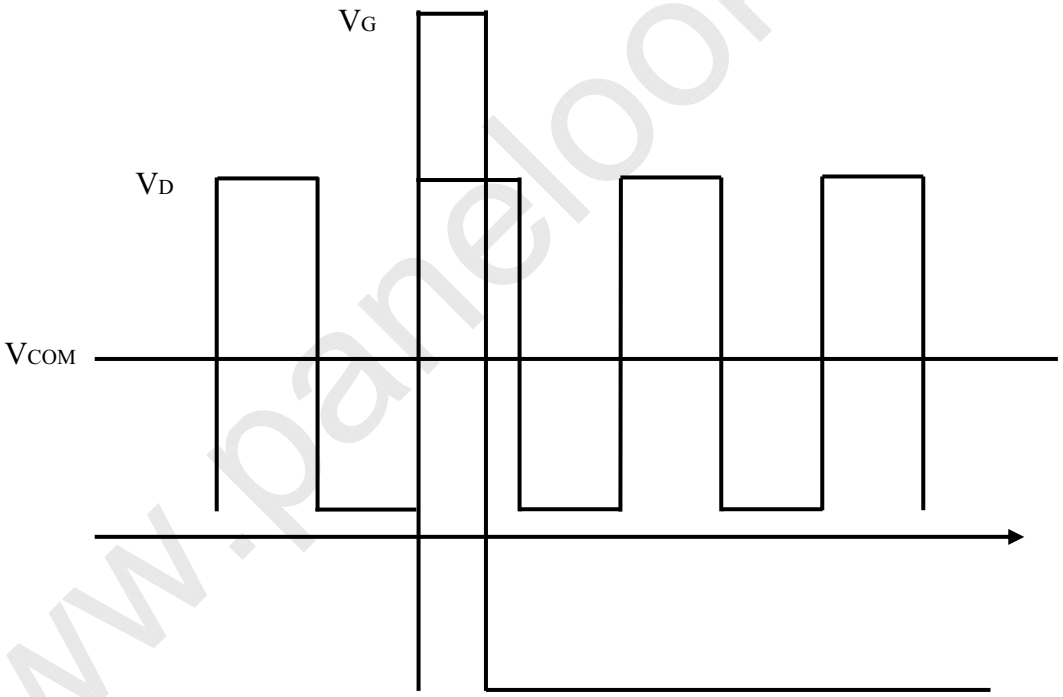
Item				Min.	Typ.	Max.	Unit
Driving Voltage	V_G	On		23.17	24.43	-	V
		Off		-	-6.846	-6.66	V
	V_D	B	Gam1	-	12.242	-	V
			Gam14	-	0.291	-	V
		W	Gam7	-	6.698	-	V
			Gam8	-	5.988	-	V
	V_{COM}	Center		-	5.6	-	V
	G↓-D offset			2	-	-	us
	Charging time			-	9.28	-	us

B: Black pattern

W: White pattern

Gamma Voltage : Gam1 > Gam2 > Gam3 > … > Gam14 G↓: gate pulse falling edge

DRIVING TIMING DIAGRAM



4. PANEL PIN DEFINITION

4.1 DATA PIN DEFINE

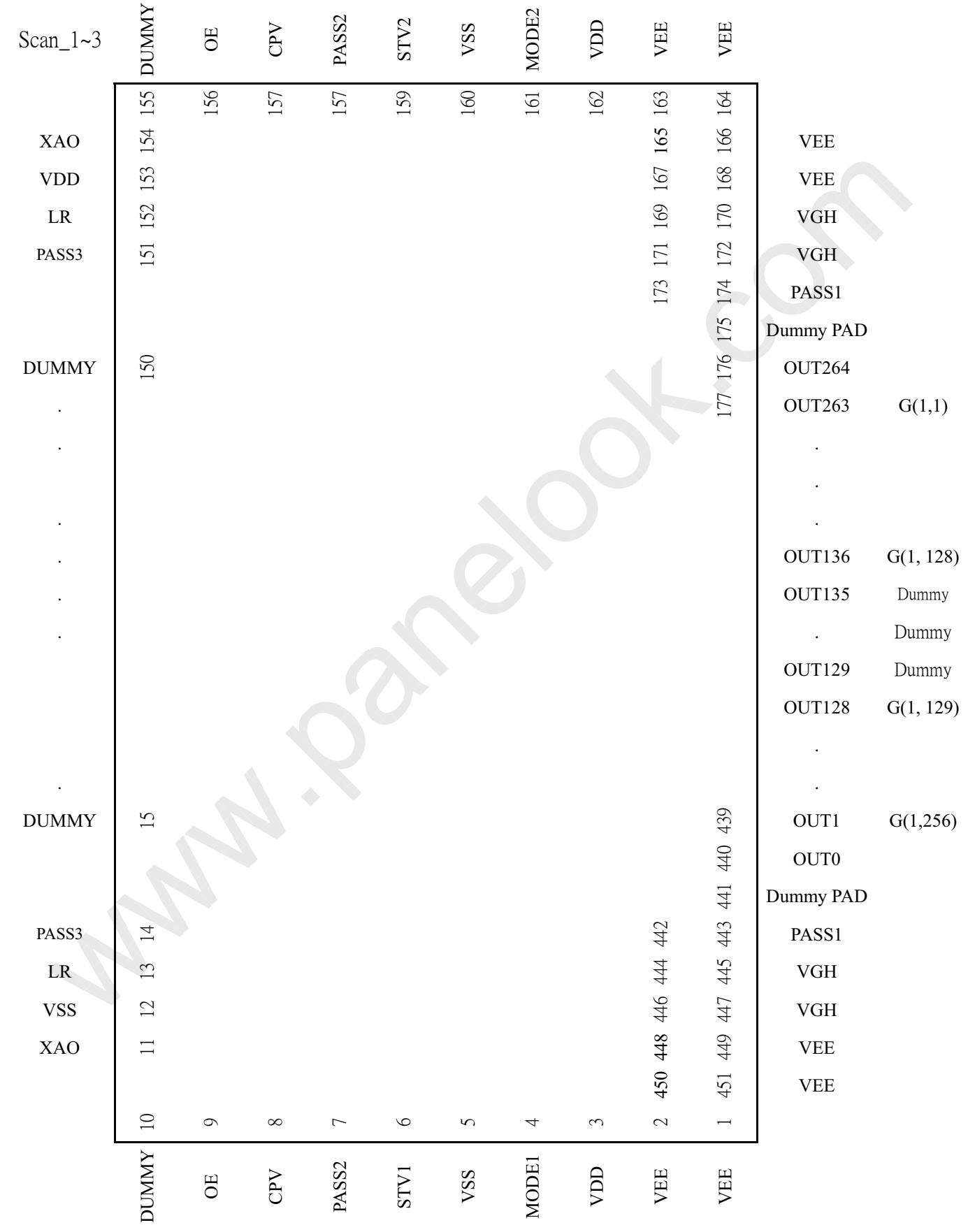
Pin number	TAB_1	TAB_2~5	TAB_6
1	dummy	dummy	dummy
2	dummy	dummy	dummy
3	dummy	dummy	dummy
4	Test	Test	Test
5	Test	Test	Test
6	dummy	dummy	dummy
7	dummy	dummy	dummy
8	LR	dummy	dummy
9	XAO	dummy	dummy
10	OE	dummy	dummy
11	CPV	dummy	dummy
12	STV1	dummy	dummy
13	STV2	dummy	dummy
14	VSS	dummy	dummy
15	VSS	dummy	dummy
16	VDD	dummy	dummy
17	VDD	dummy	dummy
18	Vee	dummy	dummy
19	Vgl	dummy	dummy
20	Vgl	dummy	dummy
21	Vgl	dummy	dummy
22	dummy	dummy	dummy
23	Vgh	dummy	dummy
24	Vgh	dummy	dummy
25	Vgh	dummy	dummy
26	Vcom	Vcom	Vcom
27	Vcom	dummy	dummy
28	Vcom	dummy	dummy
29	Vcom	Vcom	Vcom
30	Test	Test	Test
31	OUT_1	OUT_1	OUT_1
32	OUT_2	OUT_2	OUT_2
33	OUT_3	OUT_3	OUT_3

34	OUT_4	OUT_4	OUT_4
35	OUT_5	OUT_5	OUT_5
36	OUT_6	OUT_6	OUT_6
37	OUT_7	OUT_7	OUT_7
38	OUT_8	OUT_8	OUT_8
39	OUT_9	OUT_9	OUT_9
....	....	....	....
372	OUT_342	OUT_342	OUT_342
373	OUT_343(NC)	OUT_343(NC)	OUT_343(NC)
'…	'----	'----	'----
408	OUT_378(NC)	OUT_378(NC)	OUT_378(NC)
409	OUT_379	OUT_379	OUT_379
....	....	....	....
744	OUT_714	OUT_714	OUT_714
745	OUT_715	OUT_715	OUT_715(NC)
....	----	----	----
750	OUT_720	OUT_720	OUT_720(NC)
751	Test	Test	Test
752	dummy	dummy	Test
753	Vcom	Vcom	Vcom
754	dummy	dummy	Vcom
755	dummy	dummy	Vcom
756	dummy	dummy	Vgl
757	dummy	dummy	Vcom
758	dummy	dummy	Vcom
759	dummy	dummy	dummy
760	dummy	dummy	Test
761	Vcom	Vcom	Vcom
762	Vcom	Vcom	Vcom
763	Test	Test	Test
764	Test	Test	Test
765	dummy	dummy	dummy
766	dummy	dummy	dummy
767	dummy	dummy	dummy

Note: 1. Dummy pin is recommend for floating

2. LR default value is Vss (ground)

4.2 SCAN PIN DEFINE



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

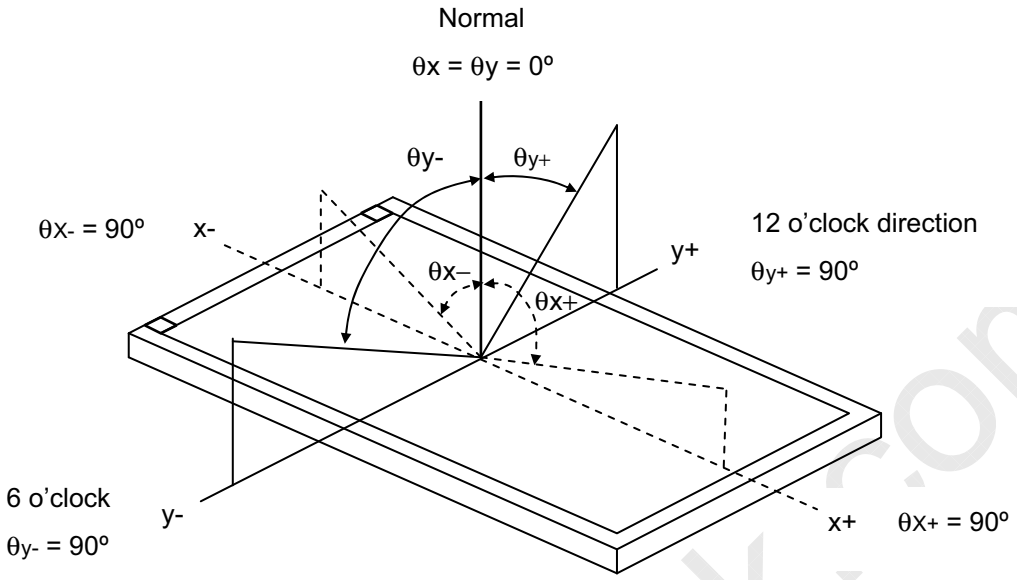
ITEM		Symbol	Condition	MIN.	TYP.	MAX.	UNIT	NOTE
Contrast Ratio		CR	θx=θy=0° CS-1000T	630	1000	-	%	3,1
Response Time (Black/White)		Tr	θx=θy=0°	---	1.5	3.5	ms	4
		Tf	θx=θy=0°	---	3.5	6.5	ms	4
Center point Transmittance		T%	θx=θy=0° CS-1000T	5.4	6.0	-	%	8,1
Transmittance uniformity (9pts)		ΔT%	θx=θy=0°	-	1.3	1.42	-	7,1
Viewing Angle	Horizontal θx (θy=0°)	Right	CR≧10 USB-2000	75	85	-	Deg	2,6,1
		Left		75	85	-	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	0.652	Typ +0.03	-	6,0
		Rcy	θx=θy=0°		0.330		-	
	Green	Gcx	θx=θy=0°		0.275		-	
		Gcy	θx=θy=0°		0.590		-	
	Blue	Bcx	θx=θy=0°		0.148		-	
		Bcy	θx=θy=0°		0.107		-	
	White	Wcx	θx=θy=0°		0.320		-	
		Wcy	θx=θy=0°		0.360		-	

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 (for M185B1-L01) 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) Definition of Viewing Angle (θx, θy):



Note (3) Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

Contrast Ratio (CR) = L255 / L0

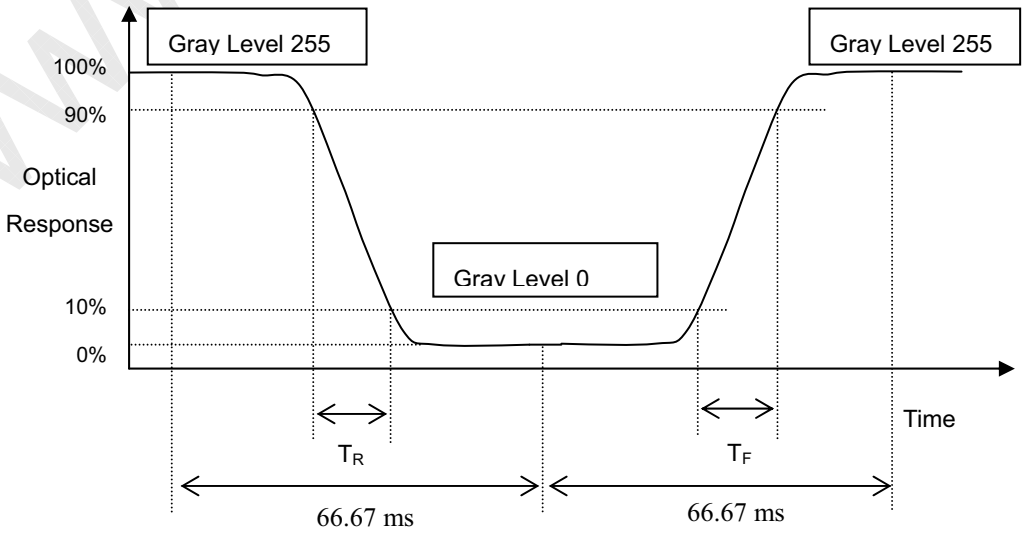
L255: Luminance of gray level 255

L 0: Luminance of gray level 0

CR = CR (5)

CR (X) is corresponding to the Contrast Ratio of the point X at Figure in Note (7).

Note (4) Definition of Response Time (T_R, T_F):



Note (5) Definition of Luminance of White (L_C):

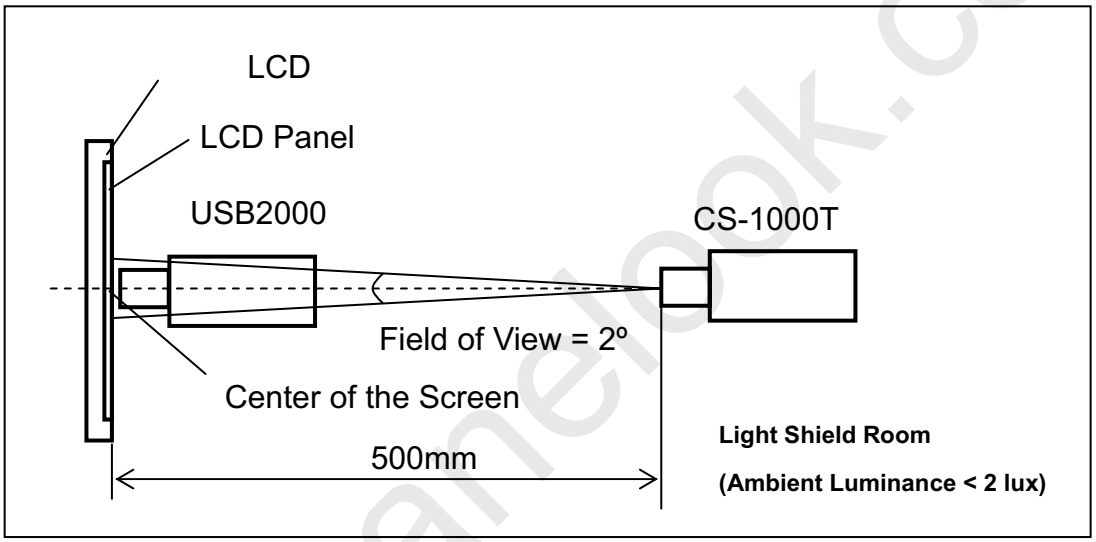
Measure the luminance of gray level 255 at center point

L_C = L (5)

L (x) is corresponding to the luminance of the point X at Figure in Note (7).

Note (6) Measurement Setup:

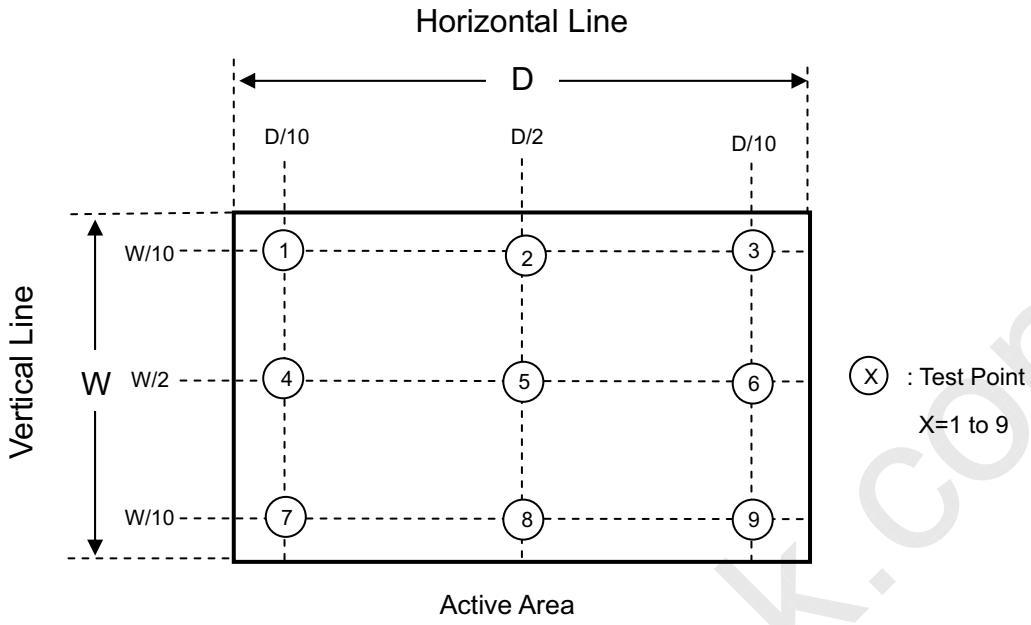
The LCD module should be stabilized at given temperature for 30 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 30 minutes in a windless room.



Note (7) 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 (8) 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. 20 LCD cells / 1 Dense Pack Box
2. Dense box dimension: 587 (L) X 410(W) X 141(H) mm
3. Weight: Approximately 22.5Kg (40 cells per Bag)

6.2 PACKING METHOD

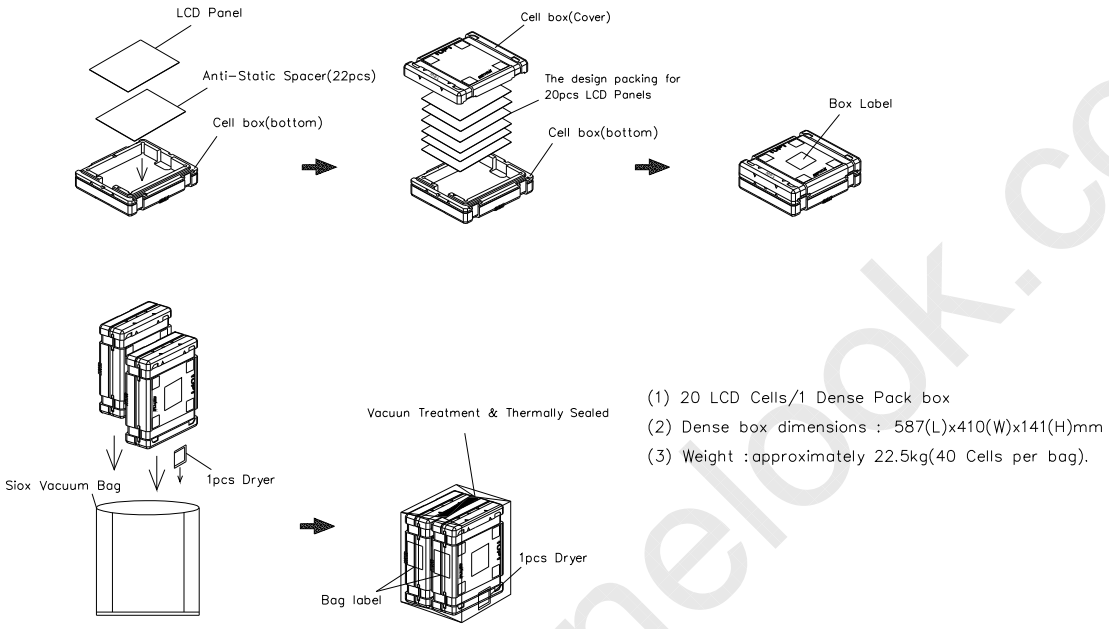


Figure. 6-1 Packing method

Pallet Stack:L1050*W870*H1249mm

Weight: 420 kgs

Total 36 pcs box

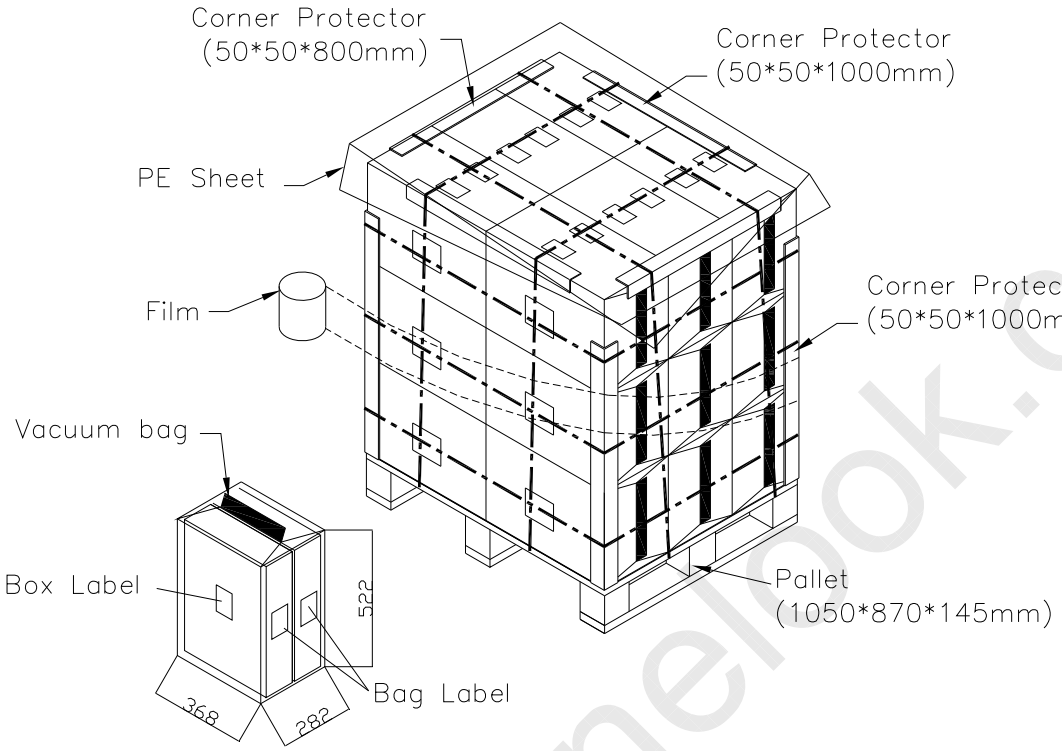


Figure. 6-2 Packing method

7. DEFINITION OF LABEL

1. Mode Name: M185B1-CZ1
2. Panel Type: version control
3. Quantity: 20pcs / Dense Pack Box
4. Case ID: serial number.
5. Note: Notification, if necessary.
6. Barcode: Case ID in code39 format

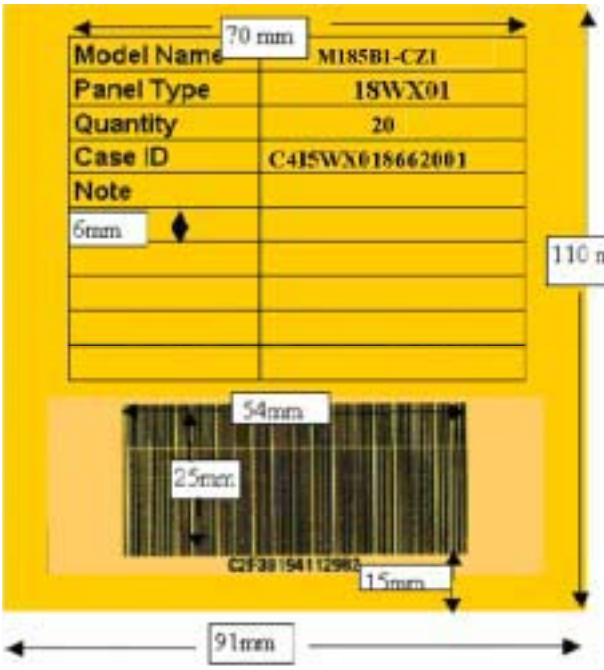


Figure. 7-1 Carton Label

8. PRECAUTIONS

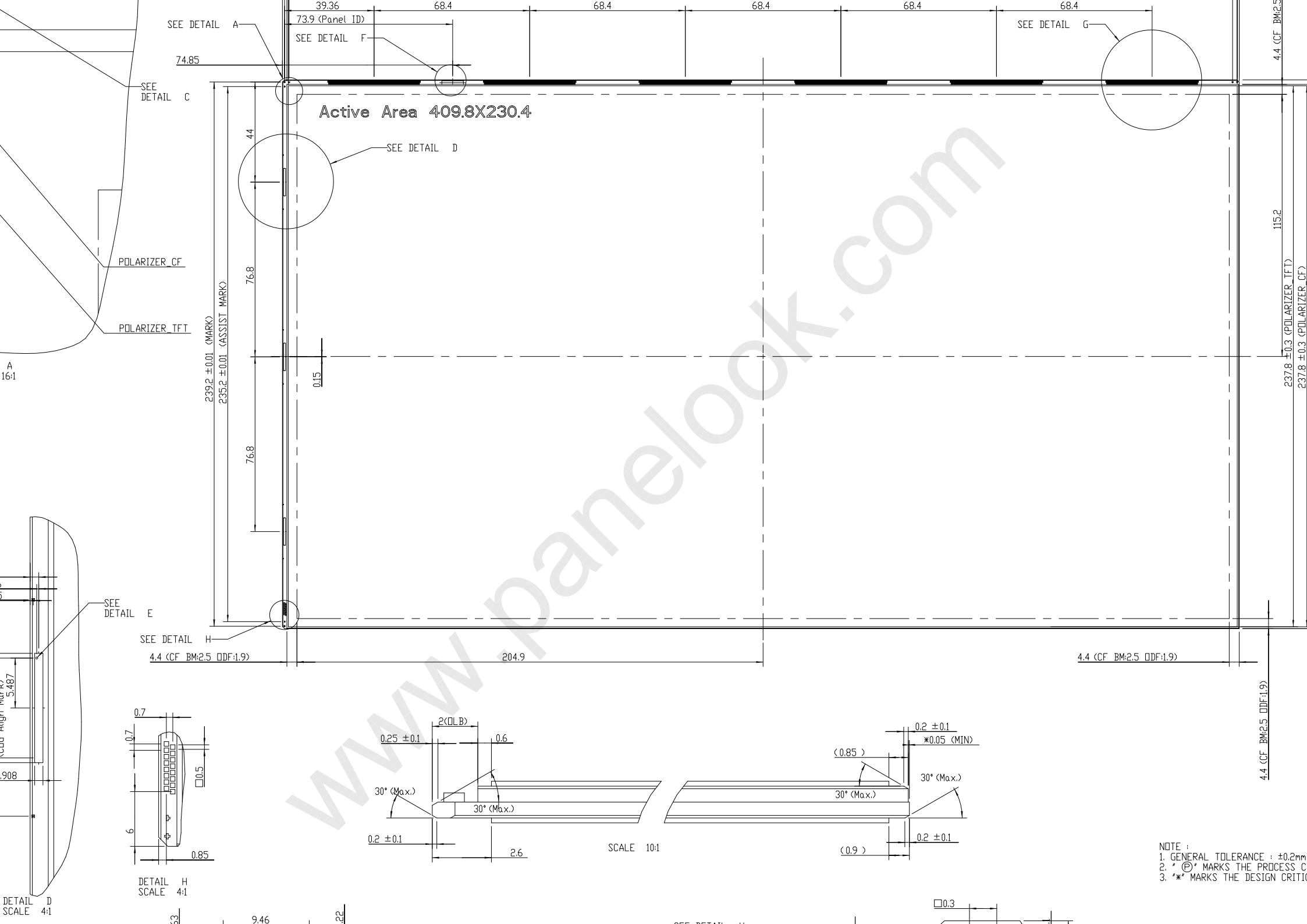
8.1 ASSEMBLY AND HANDLING PRECAUTIONS

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.

9. PANEL DRAWING



NOTE :
1. GENERAL TOLERANCE : ±0.2mm
2. ' Ⓟ' MARKS THE PROCESS C
3. '*' MARKS THE DESIGN CRITI