TFT LCD Approval Specification

MODEL NO.: M220Z1-C03

Customer: _____

Approved by: _____

Note:

記錄	工作	審核	角色	投票
2008-03-04 19:38:59 CST	PMMD Director	cs_lee(李志聖 /56510/44926)	Director	Accept

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REVISION HISTORY

Version	Date	Section	Description
Ver.2.0	Jun, 18 '07	-	M220Z1-C03 Approval specifications was first issued。
		1.4	Weight is changed to 580g(Max)
		5.2	Transmittance uniformity (Max.) 1.5
			Color Coordinate at center point Gcx: 0.275, Gcy: 0.590
		7	Figure 7.1 is changed
2.1	Jan, 18 '08	3	Vcom typical value is provided only. Max. and Min. values are cancelled.
2.2	Feb, 20 '08	3	Deleted Vg-On max value and Vg-Off min value.

1. GENERAL DESCRIPTION

1.1 OVERVIEW

The M220Z1-C03 is a 22-inch wide LCD cell with thin film transistors as active elements and contains 1680x1050 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
- WSXGA+ (1680 x 1050 pixels) resolution

1.3 APPLICATION

- LCD Monitor
- LCD TV

1.4 GENERAL SPECIFICATIONS

Item		Specification	Unit
Max Panel Dimension (TFT)		485.26 X 307.6	mm
Glass thickness(TFT/ CF)		0.7/ 0.7	mm
Active Area		473.76 (H) x 296.1 (V) (22.0” diagonal)	mm
Driver Element		a-si TFT active matrix	-
Pixel Number		1680X R.G.B X 1050	pixel
Pixel Pitch		0.282 (H) X 0.282 (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	478.16 X 300.2	mm
	CF	480.76 X 303.1	mm
Polarizer Thickness	TFT	0.21	mm
	CF	0.21	mm
Weight		580 (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

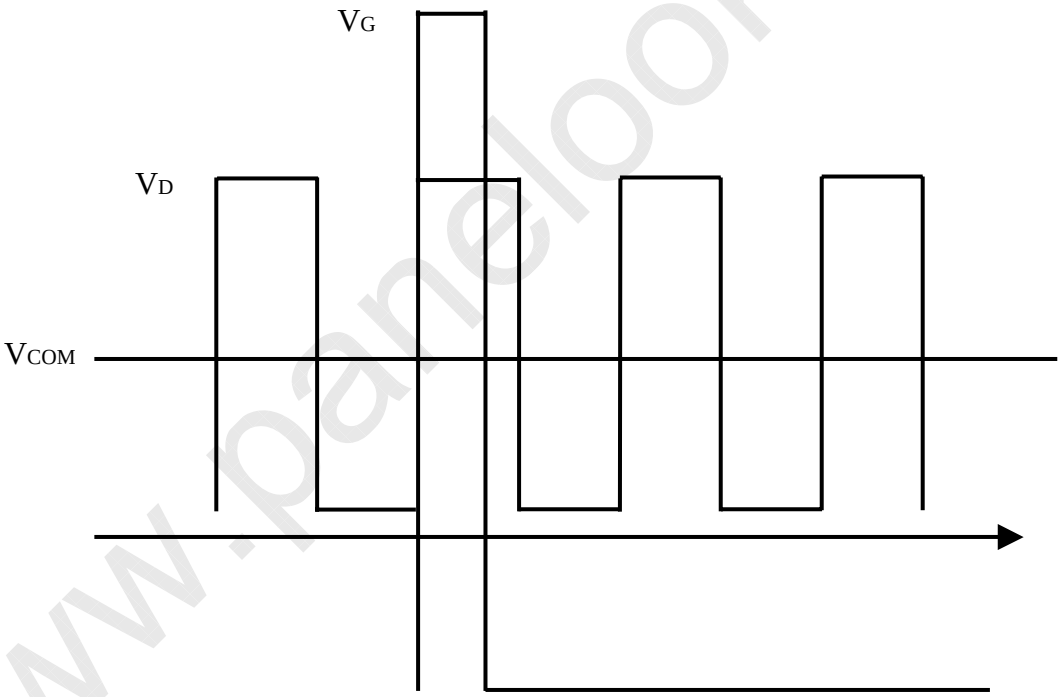
Item				Min.	Typ.	Max.	Unit
Driving Voltage	V_G	On		23.17	24.43	-	V
		Off		-	-6.846	-6.66	V
	V_D	B	Gam1	-	12.242	-	V
			Gam14	-	0.291	-	V
		W	Gam7	-	6.698	-	V
			Gam8	-	5.988	-	V
	V_{COM}	Center		-	5.6	-	V
	G↓-D offset			2	-	-	us
	Charging time			-	9.28	-	us

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

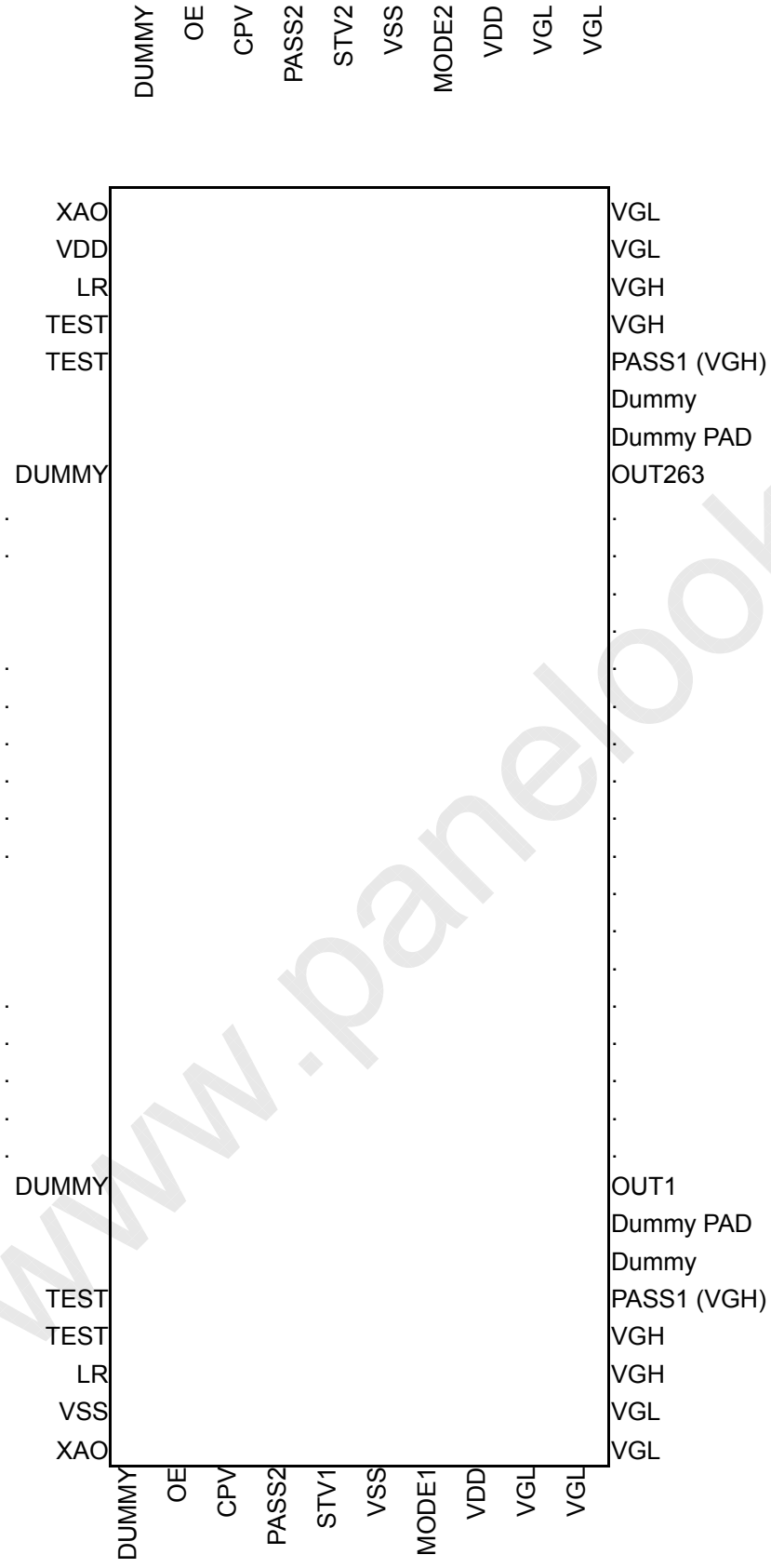
Pin number	TAB1	TAB2~7	TAB8
1	DUMMY	DUMMY	DUMMY
2	DUMMY	DUMMY	DUMMY
3	DUMMY	DUMMY	DUMMY
4	DUMMY	DUMMY	DUMMY
5	Test	DUMMY	DUMMY
6	Test	DUMMY	DUMMY
7	Test	DUMMY	DUMMY
8	Test	DUMMY	DUMMY
9	LR	DUMMY	DUMMY
10	XAO	DUMMY	DUMMY
11	OE	DUMMY	DUMMY
12	CPV	DUMMY	DUMMY
13	Test	DUMMY	DUMMY
14	STV2	DUMMY	DUMMY
15	VSS	DUMMY	DUMMY
16	VSS	DUMMY	DUMMY
17	VDD	DUMMY	DUMMY
18	VDD	DUMMY	DUMMY
19	VEE	DUMMY	DUMMY
20	VEE	DUMMY	DUMMY
21	DUMMY	DUMMY	DUMMY
22	Vgl	DUMMY	DUMMY
23	Vgl	DUMMY	DUMMY
24	Vgl	DUMMY	DUMMY
25	Vgl	DUMMY	DUMMY
26	DUMMY	DUMMY	DUMMY
27	Vgh	DUMMY	DUMMY
28	Vgh	DUMMY	DUMMY
29	Vgh	DUMMY	DUMMY
30	Vgh	DUMMY	DUMMY
31	DUMMY	DUMMY	DUMMY
32	Vst	Vcom	Vcom
33	Vst	Vcom	Vcom
34	Vcom	Vcom	Vcom
35	Test	Test	Test
36	DUMMY	DUMMY	DUMMY
37	DUMMY	DUMMY	DUMMY
38~352	OUT1~315	OUT1~315	OUT1~315
353~364	DUMMY	DUMMY	DUMMY
365~679	OUT316~630	OUT316~630	OUT316~630
680	DUMMY	DUMMY	DUMMY
681	DUMMY	DUMMY	DUMMY
682	Test	Test	Test

683	DUMMY	DUMMY	Test
684	Vcom	Vcom	Vcom
685	Vcom	Vcom	Vst
686	Vcom	Vcom	Vst
687	DUMMY	DUMMY	Vgl
688	DUMMY	DUMMY	DUMMY
689	DUMMY	DUMMY	Vcom
690	DUMMY	DUMMY	Vcom
691	DUMMY	DUMMY	Test
692	DUMMY	DUMMY	Test
693	DUMMY	DUMMY	Vcom
694	DUMMY	DUMMY	Vcom
695	Test	Test	Test
696	Test	Test	Test
697	DUMMY	DUMMY	DUMMY
698	DUMMY	DUMMY	DUMMY
699	DUMMY	DUMMY	DUMMY
700	DUMMY	DUMMY	DUMMY

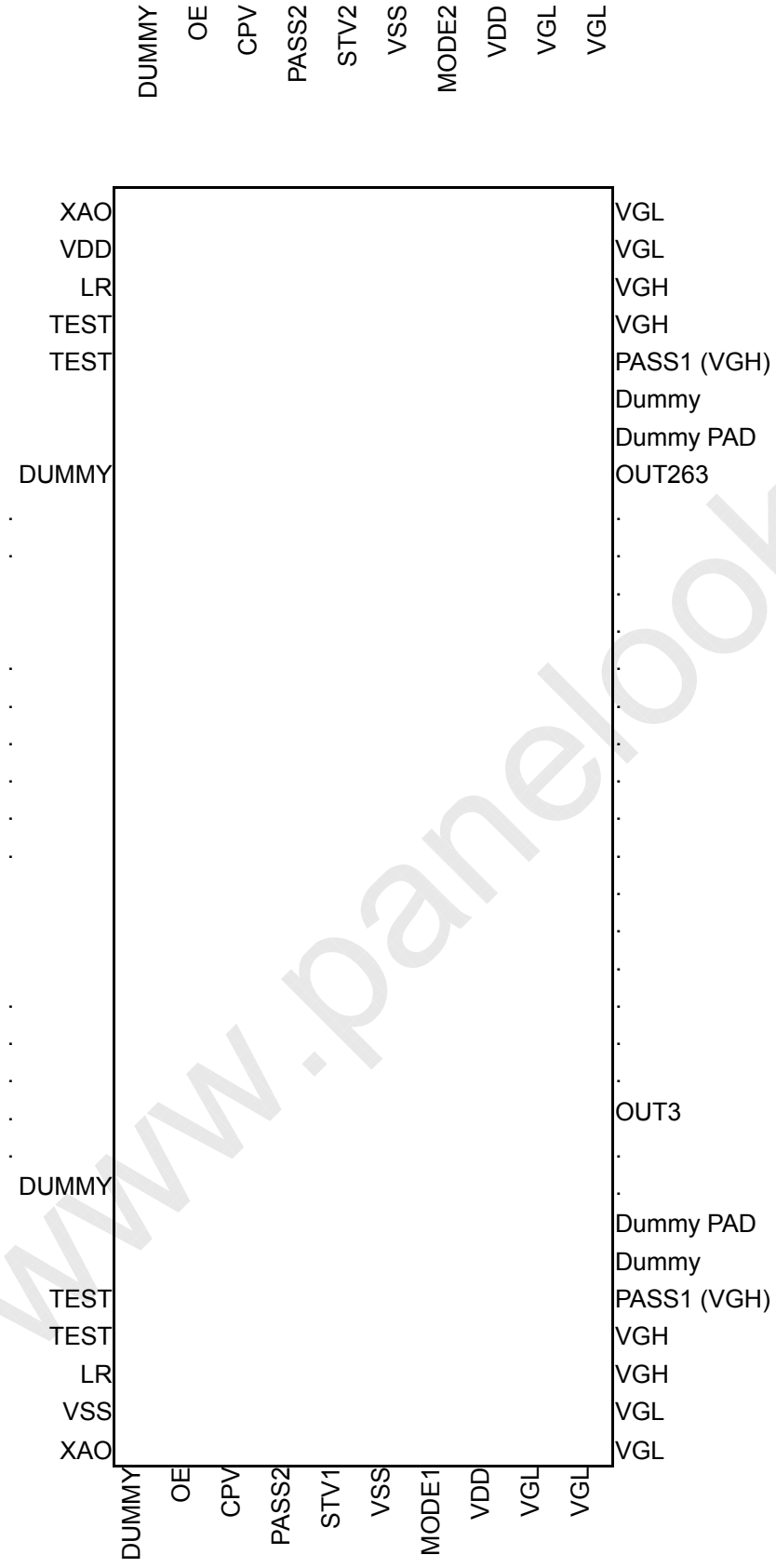
Note: Test pin is recommend for floating

4.2 SCAN PIN DEFINE

Scan 1~3



Scan 4



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

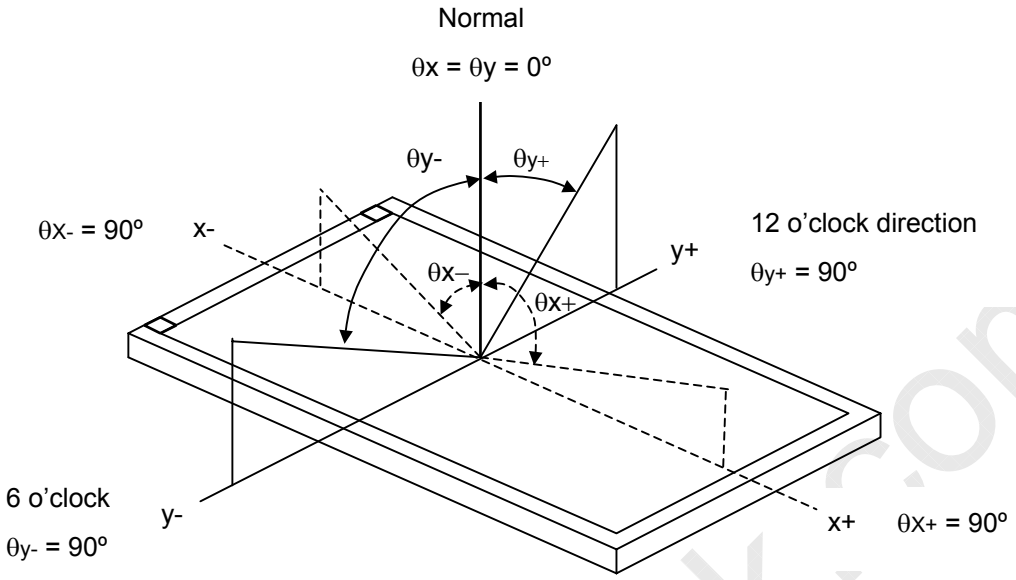
ITEM		Symbol	Condition	MIN.	TYP.	MAX.	UNIT	NOTE
Contrast Ratio		CR	θx=θy=0 ° CS-1000T	700	1000	-	%	3,1
Response Time (Black/White)		Tr	θx=θy=0 °	---	1.3	6.5	ms	4
		Tf	θx=θy=0 °	---	3.7	8.5	ms	4
Center point Transmittance		T%	θx=θy=0 ° CS-1000T	5.2	5.8	-	%	8,1
Transmittance uniformity (13pts)		δT%	θx=θy=0 °	-	1.25	1.5	-	7,1
Viewing Angle	Horizontal θx (θy=0 °)	Right	CR≧10 BM-5A	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	0.650	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 °		0.145		-	
		Bcy	θx=θy=0 °		0.101		-	
	White	Wcx	θx=θy=0 °		0.320		-	
		Wcy	θx=θy=0 °		0.356		-	

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 M220Z1-L03) 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.

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

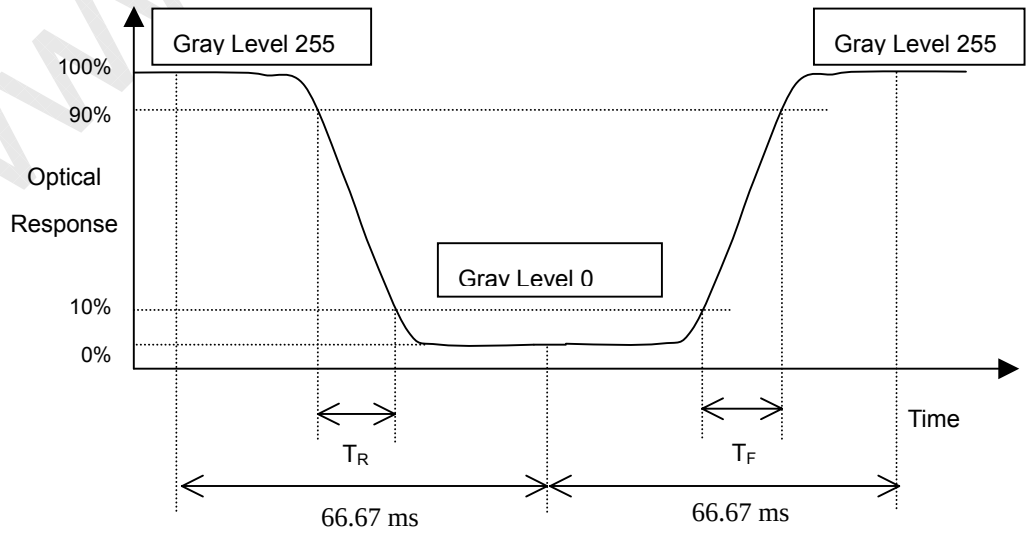
L255: Luminance of gray level 255

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):

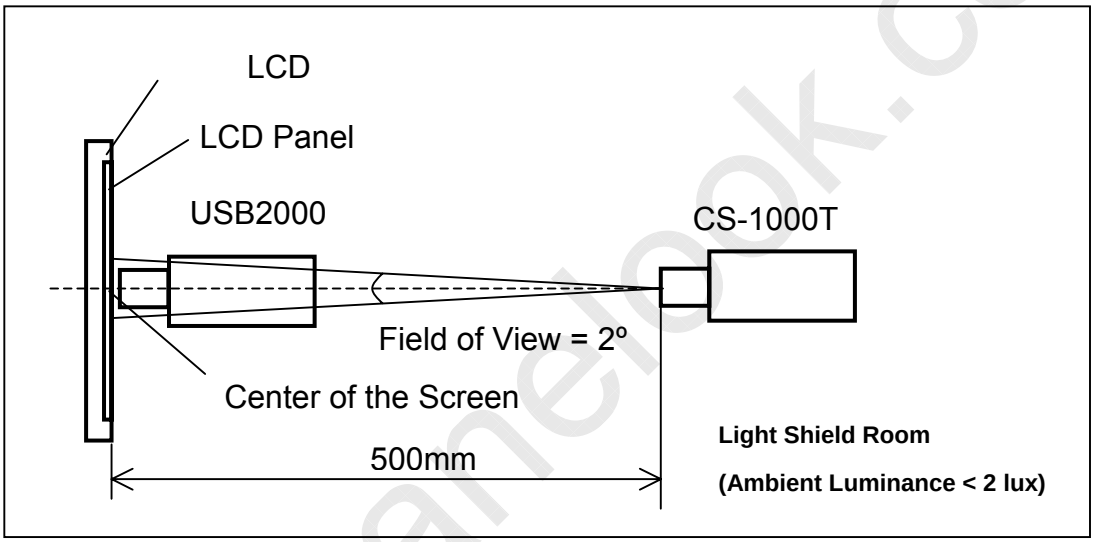
Measure the luminance of gray level 255 at center point

L_C = L (5)

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

Note (6) Measurement Setup:

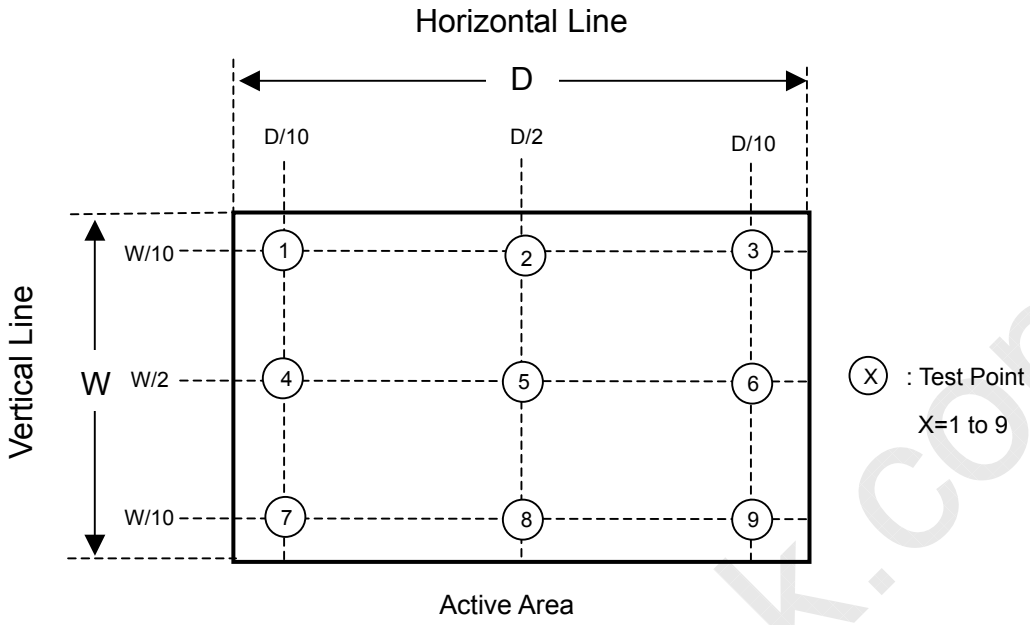
The LCD module should be stabilized at given temperature for 20 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 20 minutes in a windless room.



Note (7) Definition of Transmittance Variation (δT%):

Measure the transmittance at 9 points

$$\delta T\% = \frac{\text{Maximum [L (1), L (2),…….L (12), L (9)]}}{\text{Minimum [L (1), L (2),…….L (12), L (9)]}}$$



Note (8) Definition of Transmittance (T%):

Module is without signal input.

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

6. PACKAGING

6.1.PACKING SPECIFICATION

1. 20 LCD cells / 1 Dense Pack Box
2. Carton Dimension: 687 (L) X 384(W) X 505(H) mm
3. Weight: Approximately 35.6Kg (40 cells per Carton)

6.2 PACKING METHOD

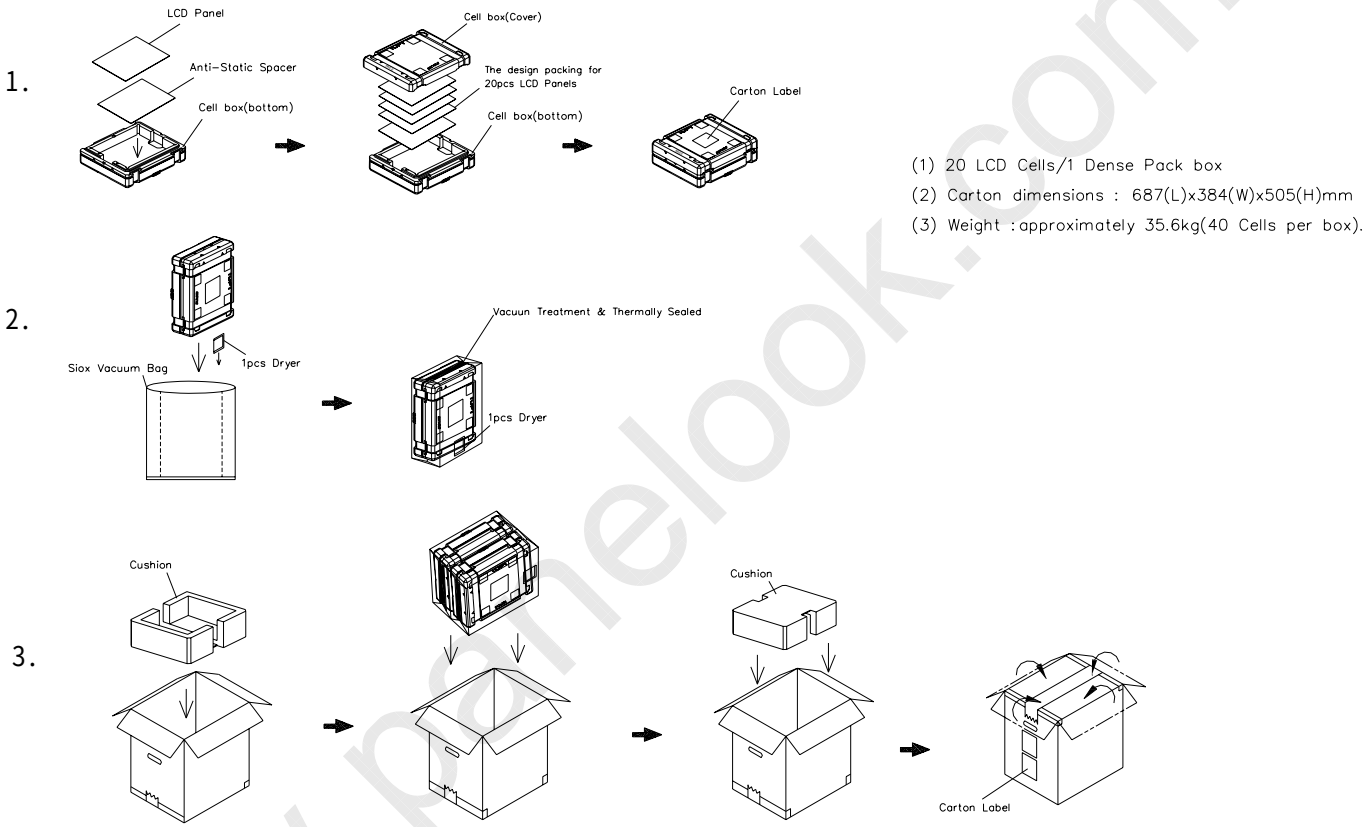


Figure. 6-1 Packing method

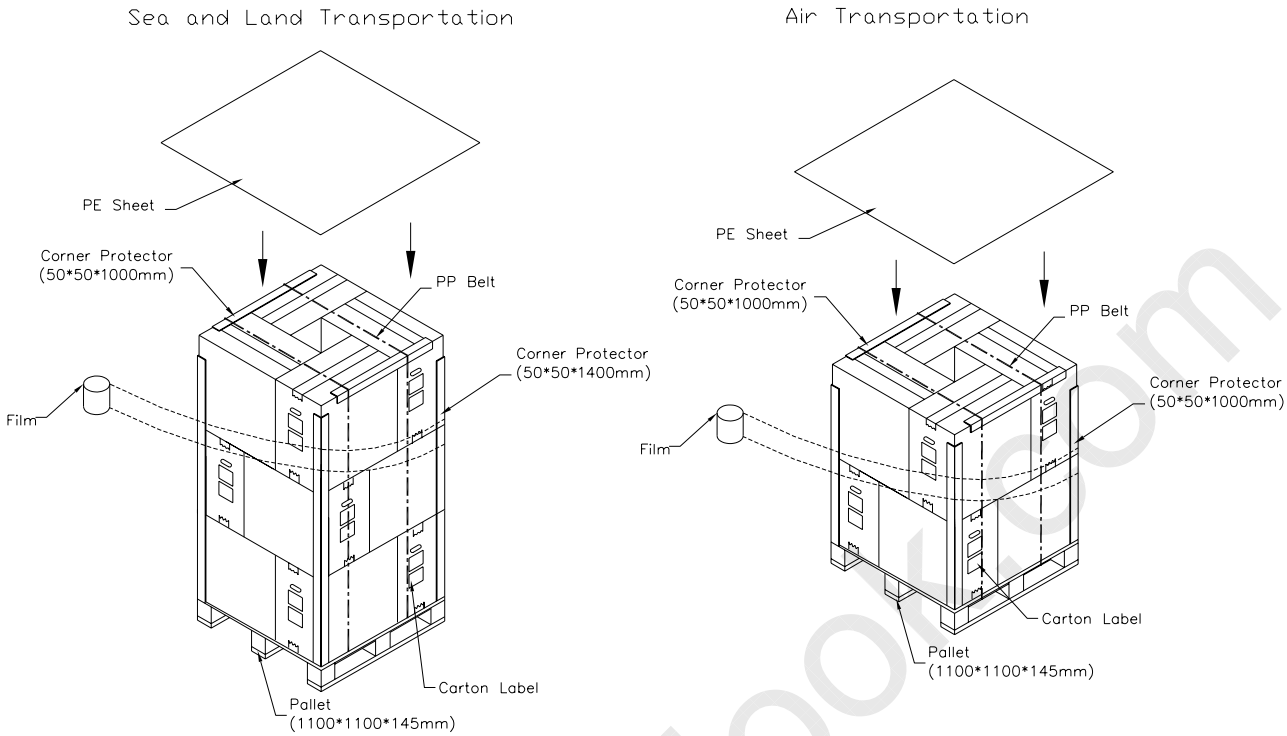


Figure. 6-2 Packing method

7. DEFINITION OF LABEL

1. Mode Name: M220Z1- C03
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

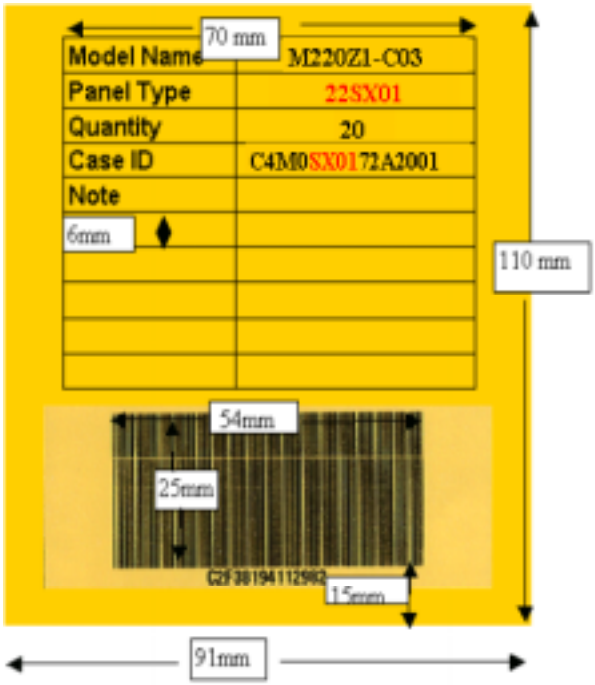


Figure. 7-1 Carton Label

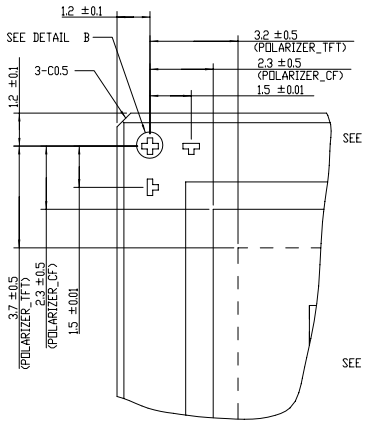
8. PRECAUTIONS

8.1 ASSEMBLY AND HANDLING PRECAUTIONS

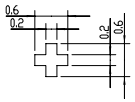
1. Do not apply rough force such as bending or twisting to the cell during assembly.
2. To assemble or install cell into customer's module can be only in clean working areas. The dust and oil may cause electrical short or worsen the polarizer.
3. It's not permitted to have pressure or impulse on the 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

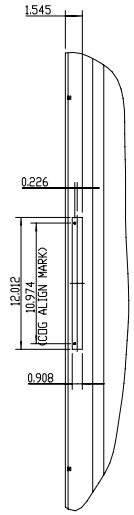
1. If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contact with hands, skin or clothes, it has to be washed away thoroughly with soap.



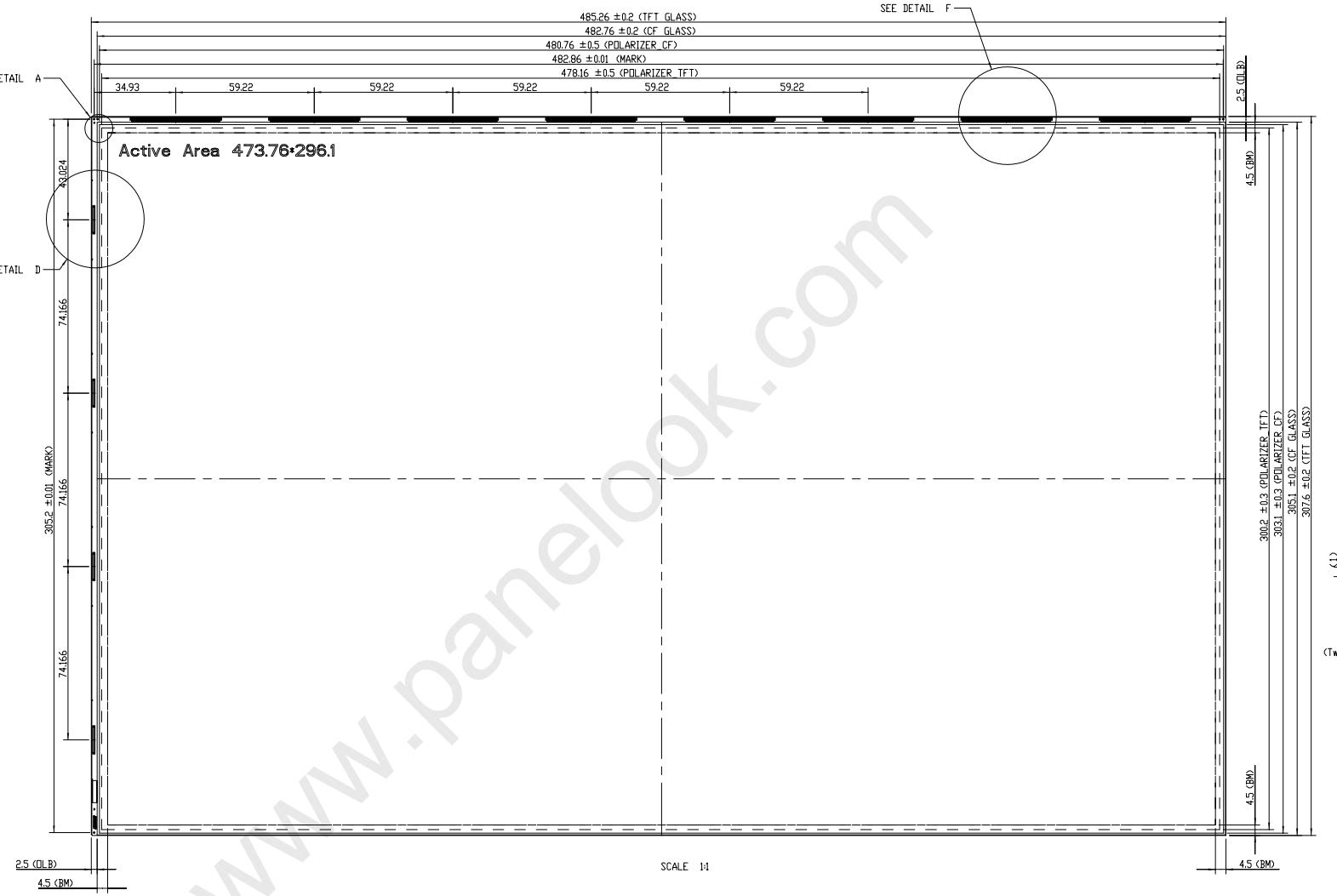
DETAIL A
SCALE 10:1



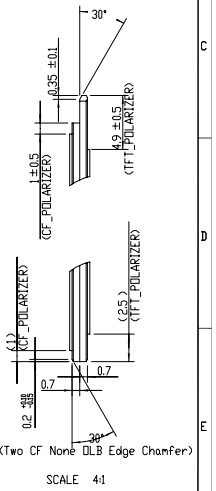
DETAIL B
SCALE 20:1



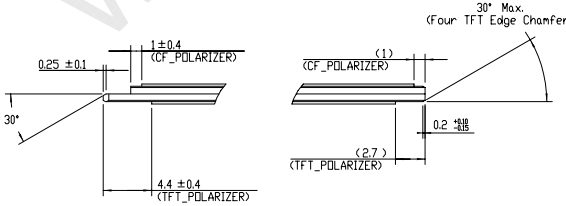
DETAIL D
SCALE 4:1



SCALE 1:1



SCALE 4:1



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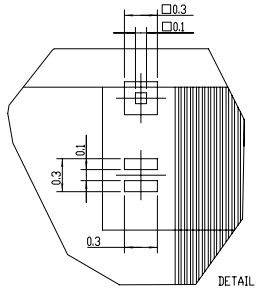
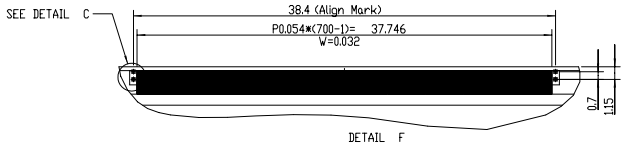


DETAIL C
SCALE 40:1



DETAIL F
SCALE 4:1

Mark	Description	Date	Changed_By	Approved_By	ECN No.	Remark

TITLE	PAD_DATA_M220Z1-L01					2D REV.	A
						3D REV.	L1+
Approved	BILL_SHEU	Drawing No.	M22012202A				
Checked	JEMMY_CHANG	Part No.	TBD				
Drawer	ROCKY_YANG	Material	TBD		Sheet	1 / 1	A1
Designer	ROCKY_YANG	Date	25-Apr.-2006	Scale	1:1	Unitmm	

CHI MEI OPTOELECTRONICS CORP.