东茂伟业科技有限公司

INNOLUX8 寸　　模组规格书

SPECIFCATION

承　认　印 Approved　by	
审核：	确认：

客户确认结果：

客　　户：_____

品　　名：MD080NA-05A

模组外形：_____

日　　期：2017.05.08

Approved 核　准	Checked 审　核	Prepared 制　作

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目　　录

规格书更改记录				
序号	日期	内　容	版本	修订者
1	17.05.17	首次发行	A	

1．适用范围

本承认书适用东茂伟业科技有限公司生产的 8 寸模组

2．产品规格

2．1 主要零部件构成

序号	部件名称	备 注	用量
1	上框	镀铝锌板	1PCS
2	下框	镀铝锌板	1PCS
3	胶框	PC灰	1PCS
4	导光板	透明PMMA	1PCS
5	反射片	白反射	1PCS
6	端子线	3.5端子	1PCS
7	扩散片	半透明	1PCS
8	增光片	棱镜结构	2PCS
9	PCB	FR-4 丝印绿油	1PCS
10	LED	白光发光二极管	24PCS
11	FOG	8寸INNOLUX FOG	1PCS

3．玻璃特性

CHIMEI INNOLUX DISPLAY CORPORATION

LCD MODULE

SPECIFICATION

Customer: _____

Model Name: EE080NA-06A

Date: 2011/05/25

Version: 01

■ Preliminary Specification

□ Final Specification

Remark
8D2 FOG

For Customer's Acceptance

Approved by	Comment

Approved by	Reviewed by	Prepared by
James Yu 2011/05/**	Charlie Chou 2011/05/**	David Lee 2011/05/**

Record of Revision

Version	Revise Date	Page	Content
Pre-Spec.01	2011/05/25		Initial Release.

CHIMEI INNOLUX

Contents

1. General Specifications

No.	Item	Specification	Remark
1	LCD size	8.0 inch(Diagonal)	
2	Driver element	a-Si TFT active matrix	
3	Resolution	800 × 3(RGB) × 600	
4	Display mode	Normally White, Transmissive	
5	Dot pitch	0.0675(W) × 0.2025(H) mm	
6	Active area	162.0(W) × 121.5(H) mm	
7	TFT size	171.0(W) × 132.7(H) × 1.43(D) mm	Note 1
8	Surface treatment	Anti-Glare	
9	Color arrangement	RGB-stripe	
10	Interface	Digital	
11	Panel power consumption	TBD (Typ.)	
12	Weight	TBD(Typ.)	

Note 1: Refer to Mechanical Drawing.

2. Pin Assignment

2.1. TFT LCD Panel Driving Section

1. FPC Connector is used for the module electronics interface. The recommended model is FH12A-50S-0.5SH manufactured by Hirose.

Pin No.	Symbol	I/O	Function	Remark
1	NC		No connection	
2	NC		No connection	
3	NC		No connection	
4	NC		No connection	
5	GND	P	Power ground	
6	V_{COM}	I	Common voltage	
7	V_{CC}	P	Power for Digital circuit	
8	MODE	I	DE/SYNC mode select	Note3
9	DE	I	Data Input Enable	
10	VS	I	Vertical Sync Input	
11	HS	I	Horizontal Sync Input	
12	B7	I	Blue data(MSB)	
13	B6	I	Blue data	
14	B5	I	Blue data	
15	B4	I	Blue data	
16	B3	I	Blue data	
17	B2	I	Blue data	
18	B1	I	Blue data	
19	B0	I	Blue data(LSB)	
20	G7	I	Green data (MSB)	
21	G6	I	Green data	
22	G5	I	Green data	
23	G4	I	Green data	
24	G3	I	Green data	
25	G2	I	Green data	
26	G1	I	Green data	
27	G0	I	Green data (LSB)	
28	R7	I	Red data (MSB)	
29	R6	I	Red data	
30	R5	I	Red data	
31	R4	I	Red data	

32	R3	I	Red data	
33	R2	I	Red data	
34	R1	I	Red data	
35	R0	I	Red data (LSB)	
36	GND	P	Power ground	
37	DCLK	I	Sample clock	
38	GND	P	Power ground	
39	L/R	I	Right/ left selection	Note2,5
40	U/D	I	Up/down selection	Note2,5
41	V_{GH}	P	Gate ON voltage	
42	V_{GL}	P	Gate OFF voltage	
43	AV_{DD}	P	Power for Analog circuit	
44	RESET	I	Global reset pin.	Note1
45	NC		No connection	
46	V_{COM}	I	Common voltage	
47	DITHB	I	Dithering function	Note 4
48	GND	P	Power ground	
49	NC		No connection	
50	NC		No connection	

I: input, O: output, P: Power

Note 1: Global reset pin. Active Low to enter Reset State. Suggest to connecting with an RC reset circuit for stability. Normally pull high.

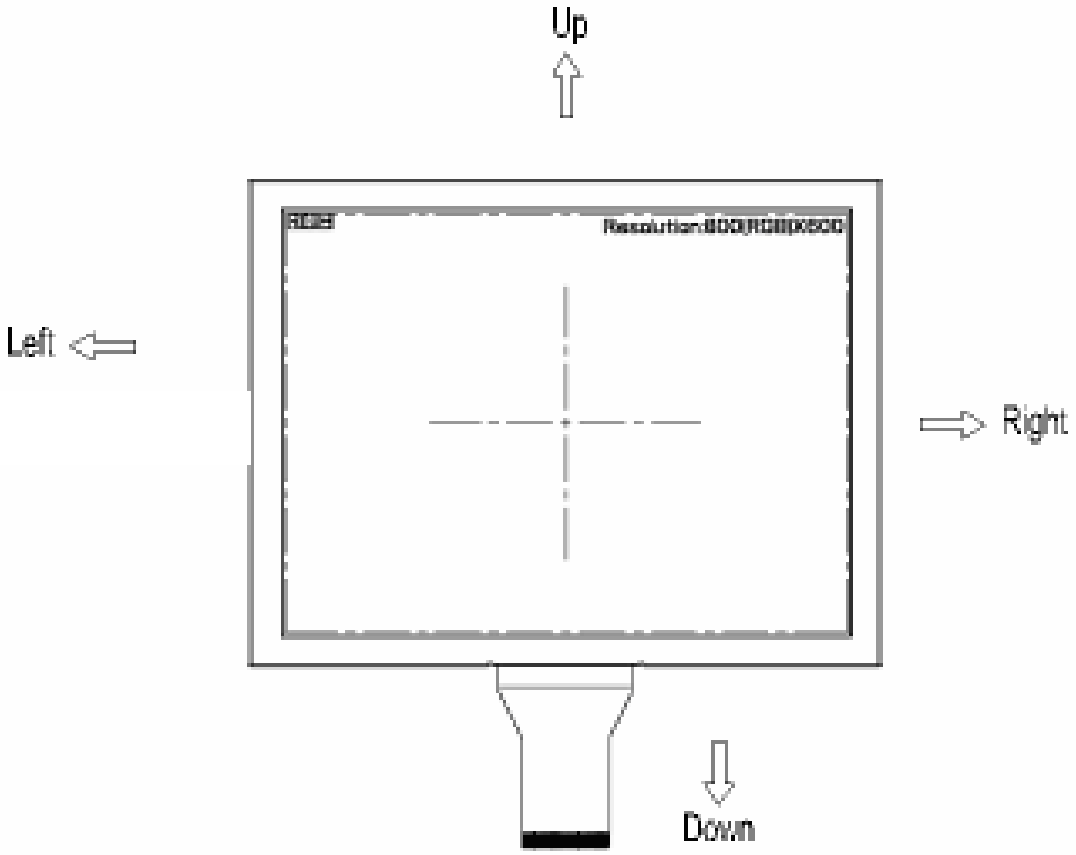
Note 2: Selection of scanning mode

Setting of scan control input		Scanning direction
U/D	R/L	
GND	V_{CC}	Up to down, left to right
V_{CC}	GND	Down to up, right to left
GND	GND	Up to down, right to left
V_{CC}	V_{CC}	Down to up, left to right

Note 3: DE/SYNC mode select, Normally pull high.
H: DE mode.
L: HS/VS mode.

Note4: Dithering function enable control.Normally pull high.
DITHB="1",Disable internal dithering function. For 18bit RGB interface, connect two LSB bits of all the R/G/B data buses to GND.
DITHB="0",Enable internal dithering function, For TTL 24bit parallel RGB image data input.

Note 5: Definition of scanning direction.
Refer to the figure as below:



3. Operation Specifications

3.1. Absolute Maximum Rating

(GND=AV_{SS}=0V, Note 1)

Item	Symbol	Values		Unit	Remark
		Min.	Max.		
Power voltage	V_{CC}	-0.3	5.0	V	
	AV_{DD}	-0.5	13.5	V	
	V_{GH}	13.0	19.0	V	
	V_{GL}	-12.0	-2.0	V	
	V_{GH}-V_{GL}	-	31.0	V	
Operation Temperature	T_{OP}	-20	70	℃	
Storage Temperature	T_{ST}	-30	80	℃	

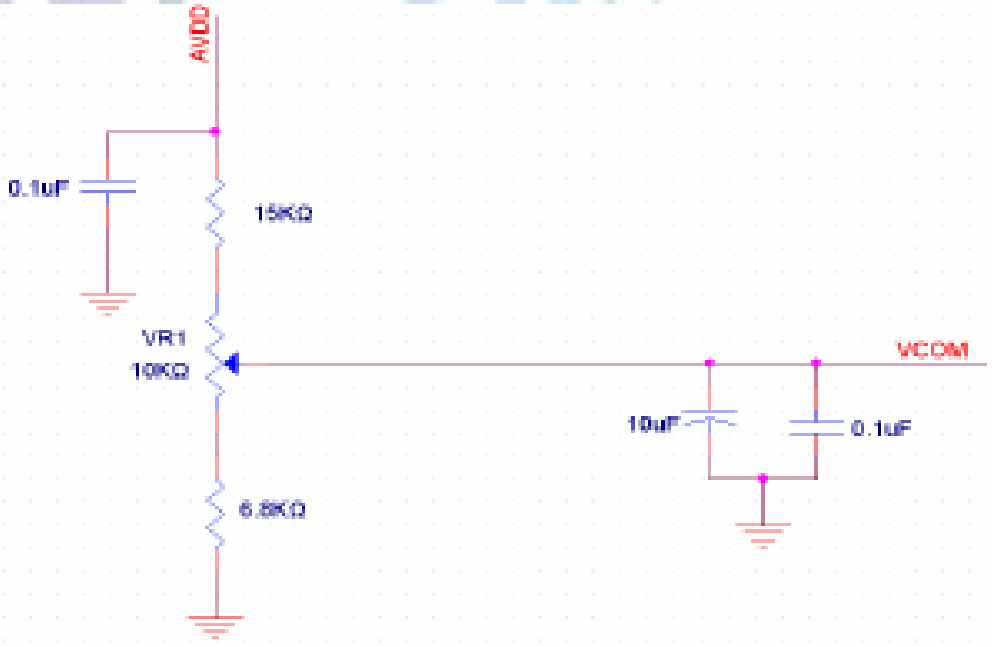
Note 1: The absolute maximum rating values of this product are not allowed to be exceeded at any times. Should a module be used with any of the absolute maximum ratings exceeded, the characteristics of the module may not be recovered, or in an extreme case, the module may be permanently destroyed.

3.1.1. Typical Operation Conditions

(GND=AV_{SS}=0V, Note 1)

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Power voltage	V_{CC}	3.0	3.3	3.6	V	Note 2
	AV_{DD}	10.2	10.4	10.6	V	
	V_{GH}	15.3	16.0	16.7	V	
	V_{GL}	-7.7	-7.0	-6.3	V	
Input signal voltage	V_{COM}	2.8	3.8	4.8	V	Note 4
Input logic high voltage	V_{IH}	0.7V_{CC}	-	V_{CC}	V	Note 3
Input logic low voltage	V_{IL}	0	-	0.3V_{CC}	V	

Note 1: Be sure to apply V_{CC} and V_{GL} to the LCD first, and then apply V_{GH}.
Note 2: V_{CC} setting should match the signals output voltage (refer to Note 3) of customer's system board .
Note 3: DCLK,HS,VS,RSTB,UPDN,STLR,MODE,DITHB.
Note 4: Typical VCOM is only a reference value, it must be optimized according to each LCM. Be sure to use VR;



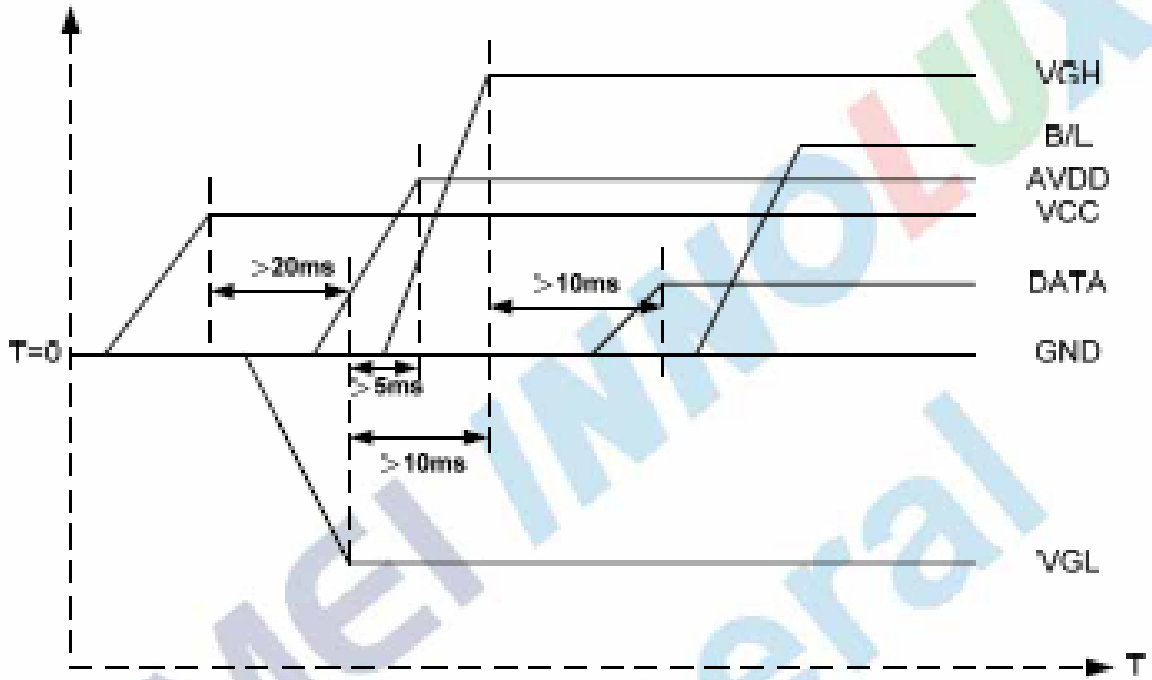
3.1.2. Current Consumption

(GND=AV_{SS}=0V)

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Current for Driver	I_{GH}	-	0.2	0.5	mA	V_{GH} =16.0V
	I_{GL}	-	0.2	1.0	mA	V_{GL} = -7.0V
	I_{CC}	-	5.5	10.0	mA	V_{CC} =3.3V
	IAV_{DD}	-	32.0	50.0	mA	AV_{DD} =10.4V

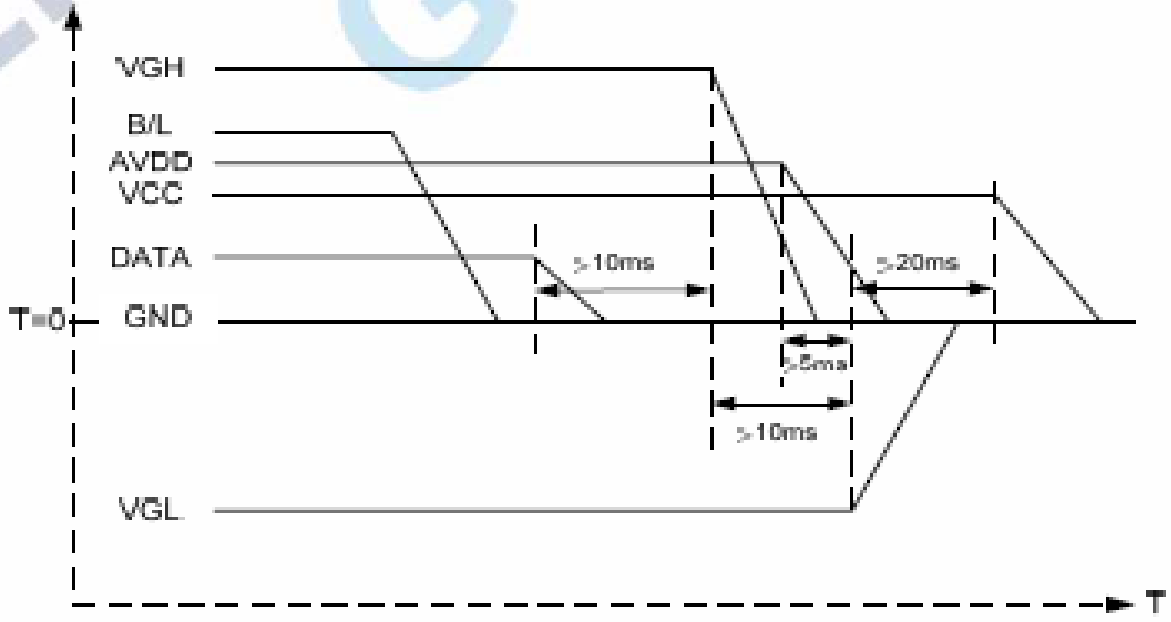
3.2. Power Sequence

3.2.1. Power on:



VCC→VGL→VGH→Data→B/L

3.2.2. Power off:



B/L→Data→VGH→VGL→VCC

Note: Data include R0~R5, B0~B5, G0~G5, STLR,UPDN, DCLK, HS,VS,DE.

3.3. Timing Characteristics

3.3.1. AC Electrical Characteristics

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
HS setup time	T_{hst}	8	-	-	Ns	
HS hold time	T_{hhd}	8	-	-	Ns	
VS setup time	T_{vst}	8	-	-	Ns	
VS hold time	T_{vhd}	8	-	-	Ns	
Data setup time	T_{dsu}	8	-	-	Ns	
Data hole time	T_{dhd}	8	-	-	Ns	
DE setup time	T_{esu}	8	-	-	Ns	
DE hole time	T_{ehd}	8	-	-	Ns	
VDD Power On Slew rate	T_{POR}	-	-	20	ms	
RSTB pulse width	T_{Rst}	10	-	-	us	
CLKIN cycle time	T_{cch}	20	-	-	Ns	
CLKIN pulse duty	T_{cwh}	40	50	60	%	
Output stable time	T_{sst}	-	-	8	us	

3.3.2. Timing

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Horizontal Display Area	thd	-	800	-	DCLK	
DCLK Frequency	fclk	-	40	50	MHz	
One Horizontal Line	Th	862	1056	1200	DCLK	
HS pulse width	thpw	1	-	40	DCLK	
HS Back Porch(Blanking)	thb	46	46	46	DCLK	
HS Front Porch	thfp	16	210	354	DCLK	

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Vertical Display Area	tvd	-	600	-	TH	
VS period time	tv	624	635	700	TH	
VS pulse width	tvpw	1	-	20	TH	
VS Back Porch(Blanking)	tvb	23	23	23	TH	
VS Front Porch	tvfp	1	12	77	TH	

3.3.3. Timing Diagram

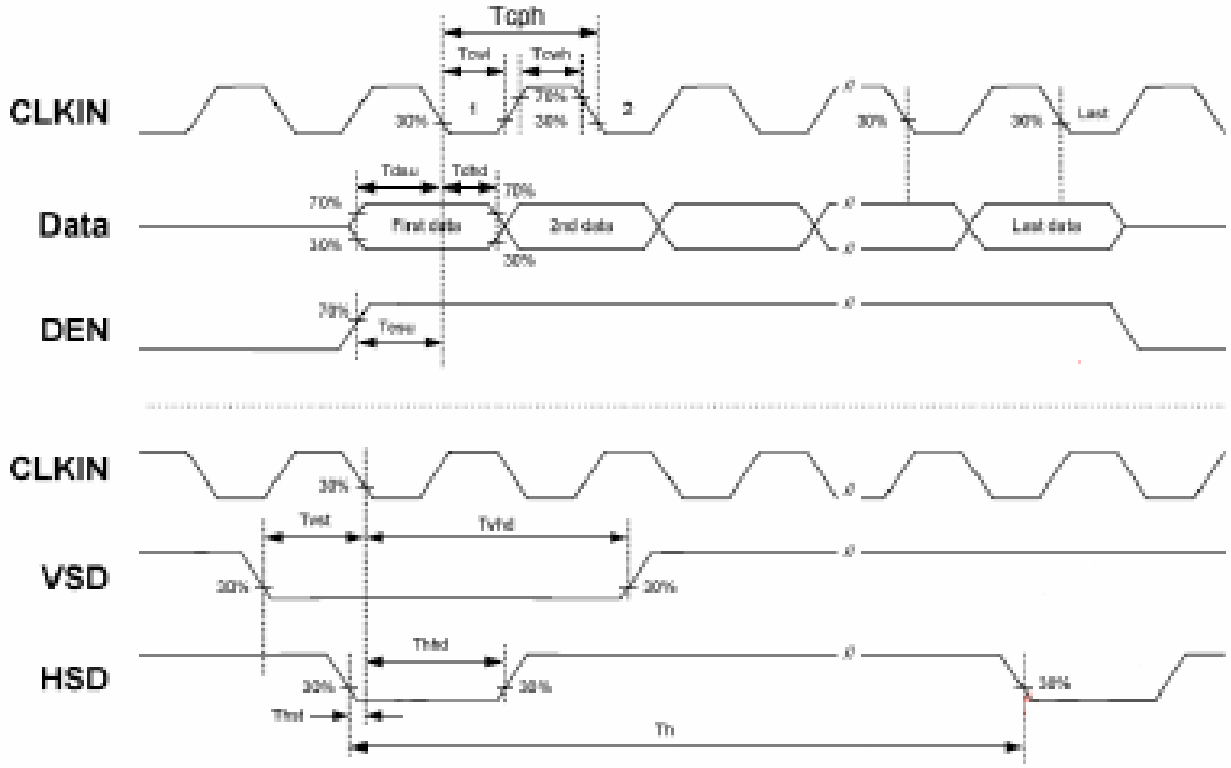


Figure 3.1 Input Clock and Data Timing Diagram

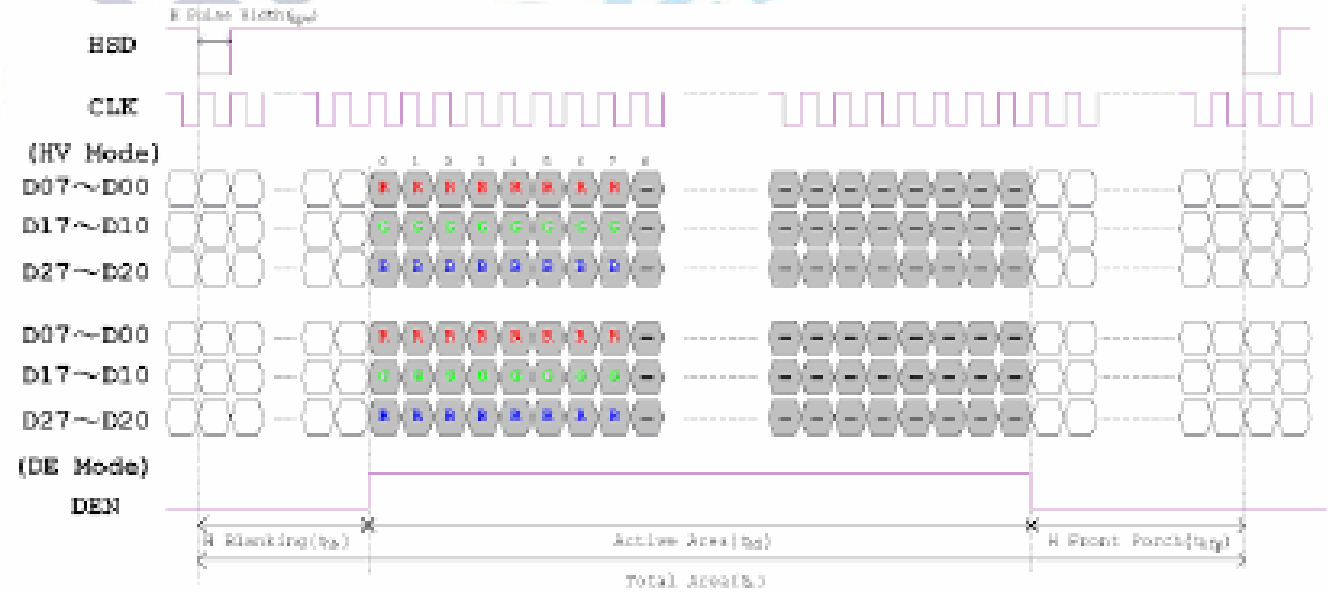


Figure 3.2 Horizontal input timing diagram.

4. Optical Specifications

Note: Base on INNOLUX LCM.

Item	Symbol	Condition	Values			Unit	Remark
			Min.	Typ.	Max.		
Viewing angle (CR≥ 10)	θ_L	Φ=180°(9 o'clock)	60	70	-	degree	Note 1
	θ_R	Φ=0°(3 o'clock)	60	70	-		
	θ_T	Φ=90°(12 o'clock)	40	50	-		
	θ_B	Φ=270°(6 o'clock)	60	70	-		
Response time	T_{ON}	Normal θ=Φ=0°	-	10	20	msec	Note 3
	T_{OFF}		-	15	30	msec	Note 3
Contrast ratio	CR		400	500	-	-	Note 4
Color chromaticity	W_X		0.26	0.31	0.36	-	Note 2 Note 5
	W_Y		0.28	0.33	0.38	-	
Transmittance	Tr	-	4.82	5.49	-	%	

Test Conditions:

1. V_{CC}=3.3V, the ambient temperature is 25℃.
2. The test systems refer to Note 2.

Note 1: Definition of viewing angle range

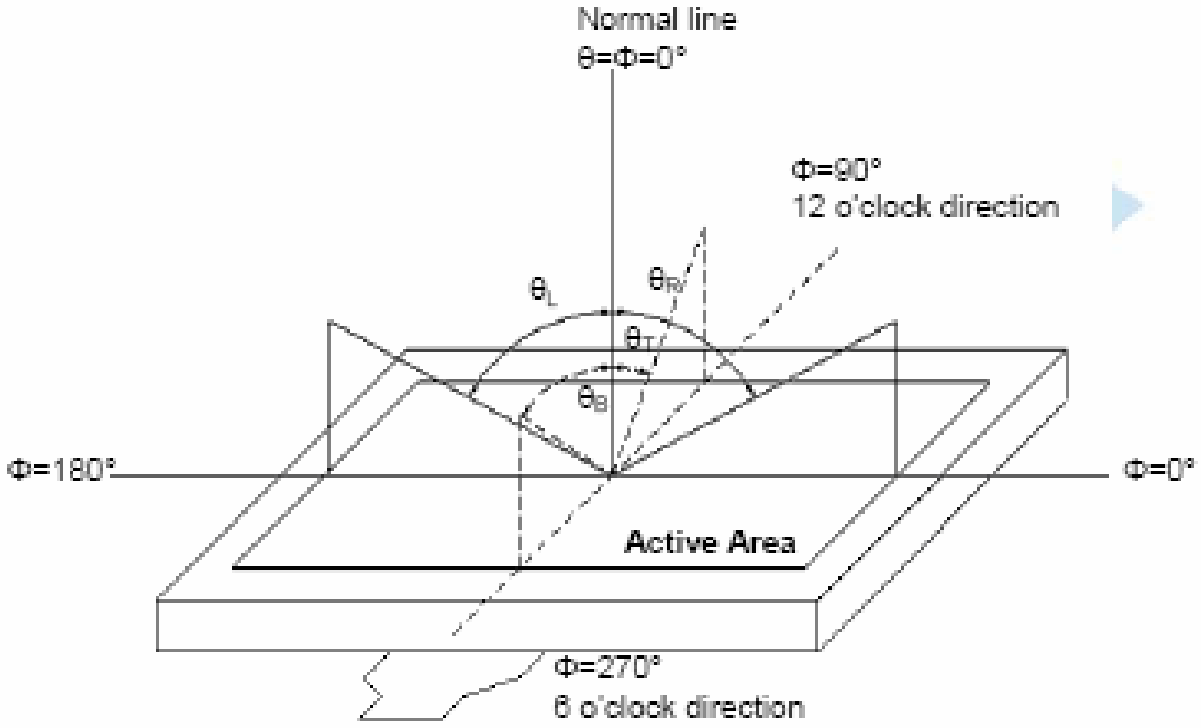


Fig. 4-1 Definition of viewing angle

Note 2: Definition of optical measurement system.
The optical characteristics should be measured in dark room. After 30 minutes operation, the optical properties are measured at the center point of the LCD screen. (Response time is measured by Photo detector TOPCON BM-7, other items are measured by BM-5A/Field of view: 1° /Height: 500mm.)

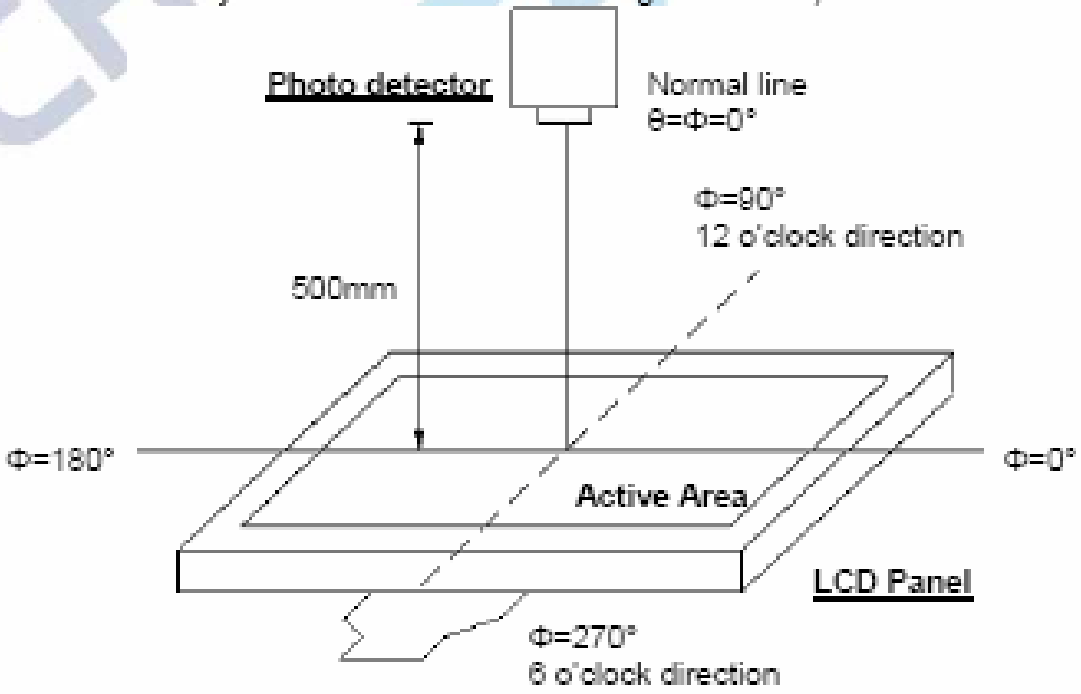


Fig. 4-2 Optical measurement system setup

Note 3: Definition of Response time

The response time is defined as the LCD optical switching time interval between "White" state and "Black" state. Rise time (T_{ON}) is the time between photo detector output intensity changed from 90% to 10%. And fall time (T_{OFF}) is the time between photo detector output intensity changed from 10% to 90%.

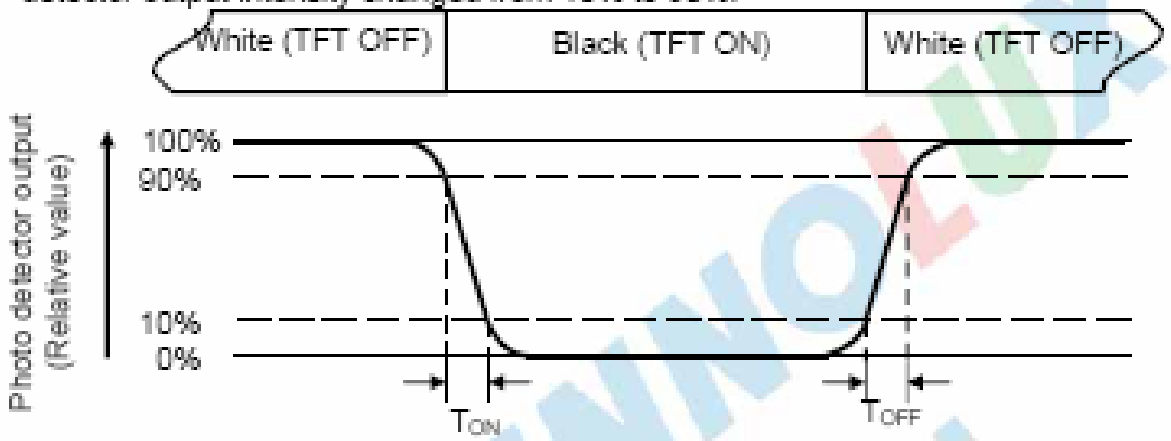


Fig. 4-3 Definition of response time

Note 4: Definition of contrast ratio

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$

Note 5: Definition of color chromaticity (CIE1931)
Color coordinates measured at center point of LCD.

Note 6: All input terminals LCD panel must be ground while measuring the center area of the panel.

5. Reliability Test Items

(Note3)

Item	Test Conditions		Remark
High Temperature Storage	Ta = 80℃	240hrs	Note 1，Note 3
Low Temperature Storage	Ta = -30℃	240hrs	Note 1，Note 3
High Temperature Operation	Ts = 70℃	240hrs	Note 2，Note 3
Low Temperature Operation	Ta = -20℃	240hrs	Note 1，Note 3
Operate at High Temperature and Humidity	+40℃, 90%RH	240hrs	Note 3

Note 1: Ta is the ambient temperature of samples.
Note 2: Ts is the temperature of panel's surface.
Note 3: Before cosmetic and function test, the product must have enough recovery time, at least 2 hours at room temperature.

6. General Precautions

6.1. Safety

Liquid crystal is poisonous. Do not put it in your mouth. If liquid crystal touches your skin or clothes, wash it off immediately by using soap and water.

6.2. Handling

1. The LCD panel is plate glass. Do not subject the panel to mechanical shock or to excessive force on its surface.
2. The polarizer attached to the display is easily damaged. Please handle it carefully to avoid scratch or other damages.
3. To avoid contamination on the display surface, do not touch the module surface with bare hands.
4. Keep a space so that the LCD panels do not touch other components.
5. Put cover board such as acrylic board on the surface of LCD panel to protect panel from damages.
6. Transparent electrodes may be disconnected if you use the LCD panel under environmental conditions where the condensation of dew occurs.
7. Do not leave module in direct sunlight to avoid malfunction of the ICs.

6.3. Static Electricity

1. Be sure to ground module before turning on power or operating module.
2. Do not apply voltage which exceeds the absolute maximum rating value.

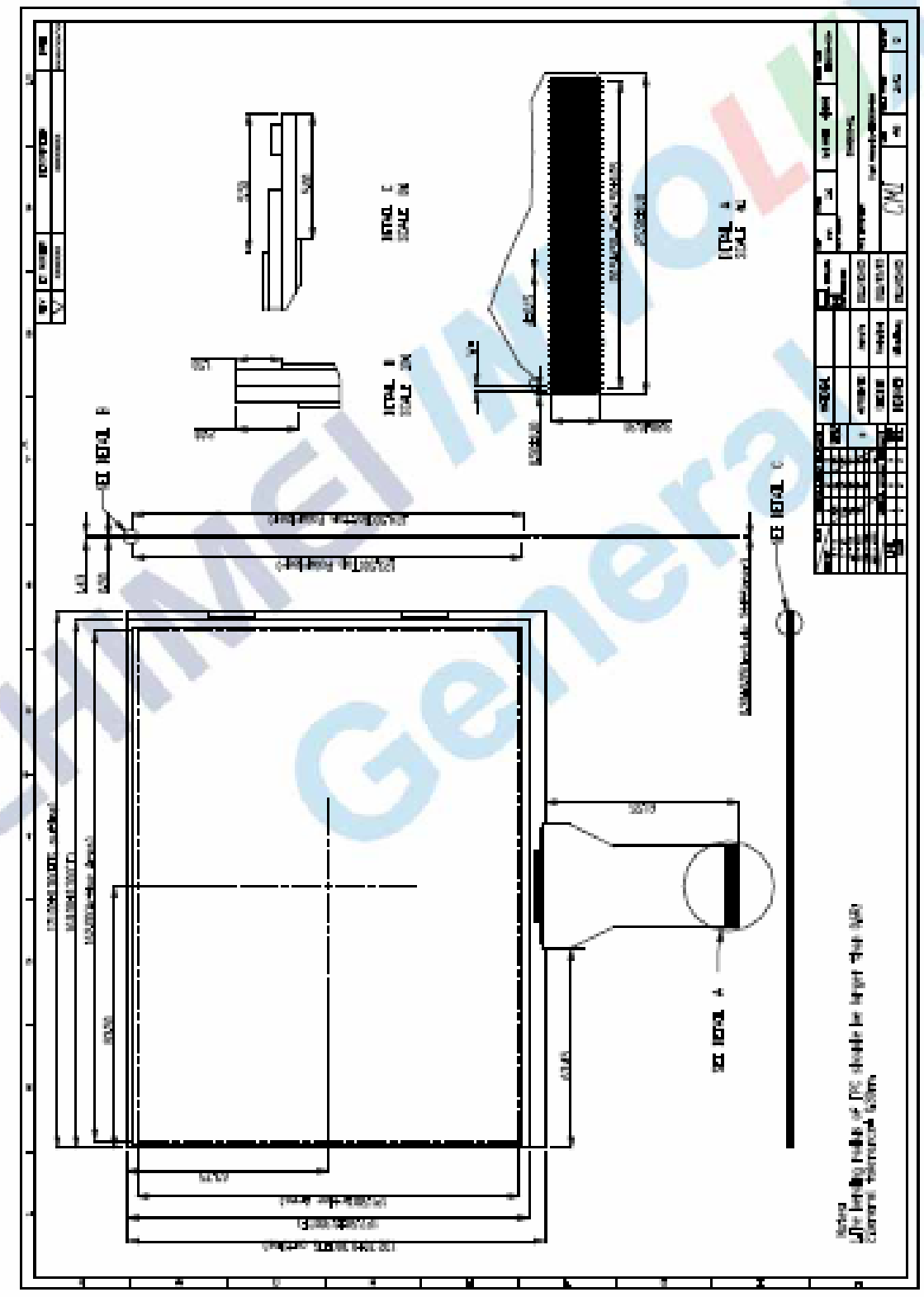
6.4. Storage

1. Store the module in a dark room where must keep at 25±10℃ and 65%RH or less.
2. Do not store the module in surroundings containing organic solvent or corrosive gas.
3. Store the module in an anti-electrostatic container or bag.

6.5. Cleaning

1. Do not wipe the polarizer with dry cloth. It might cause scratch.
2. Only use a soft sloth with IPA to wipe the polarizer, other chemicals might permanent damage to the polarizer.

7. Mechanical Drawing



8. Package Drawing

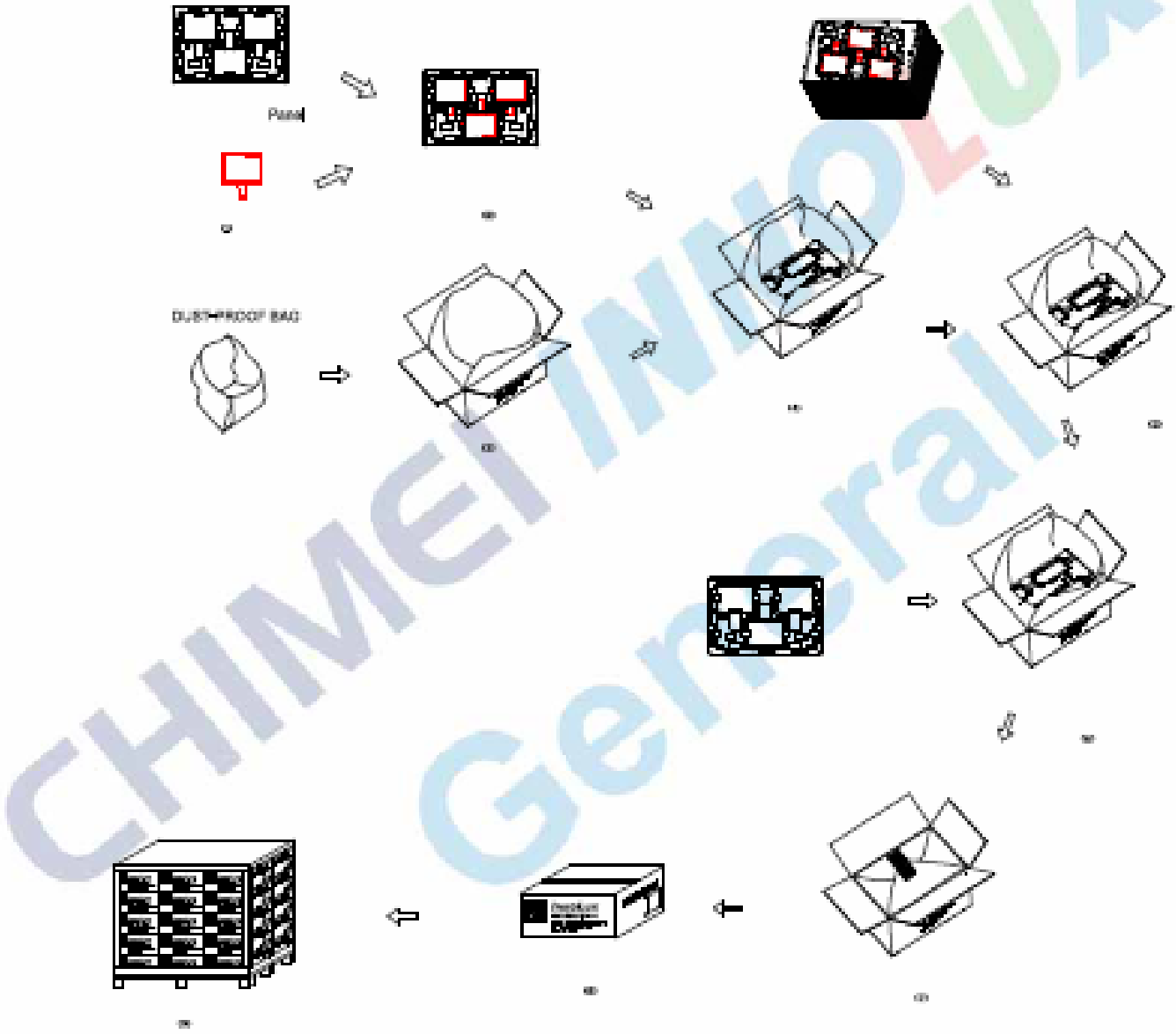
8.1 Packaging Material Table

No.	Item	Model (Material)	Dimensions(mm)	Unit Weight (kg)	Quantity (pcs)	Remark
1	Panel Assembly	AT080TN50	171.0×132.7 × 1.43	TBD	60	
2	Dust-Proof Bag	PE	700 x 530	0.050	1	
3	Tray	PET	505 x 338 x 16.5	0.210	21	Anti-static
4	Partition	Corrugated Paper	512 x 350 x 225	0.290	1	
6	Carton	Corrugated Paper	530 x 355 x 255	0.810	1	
7	Total weight	TBD± 5%Kg				

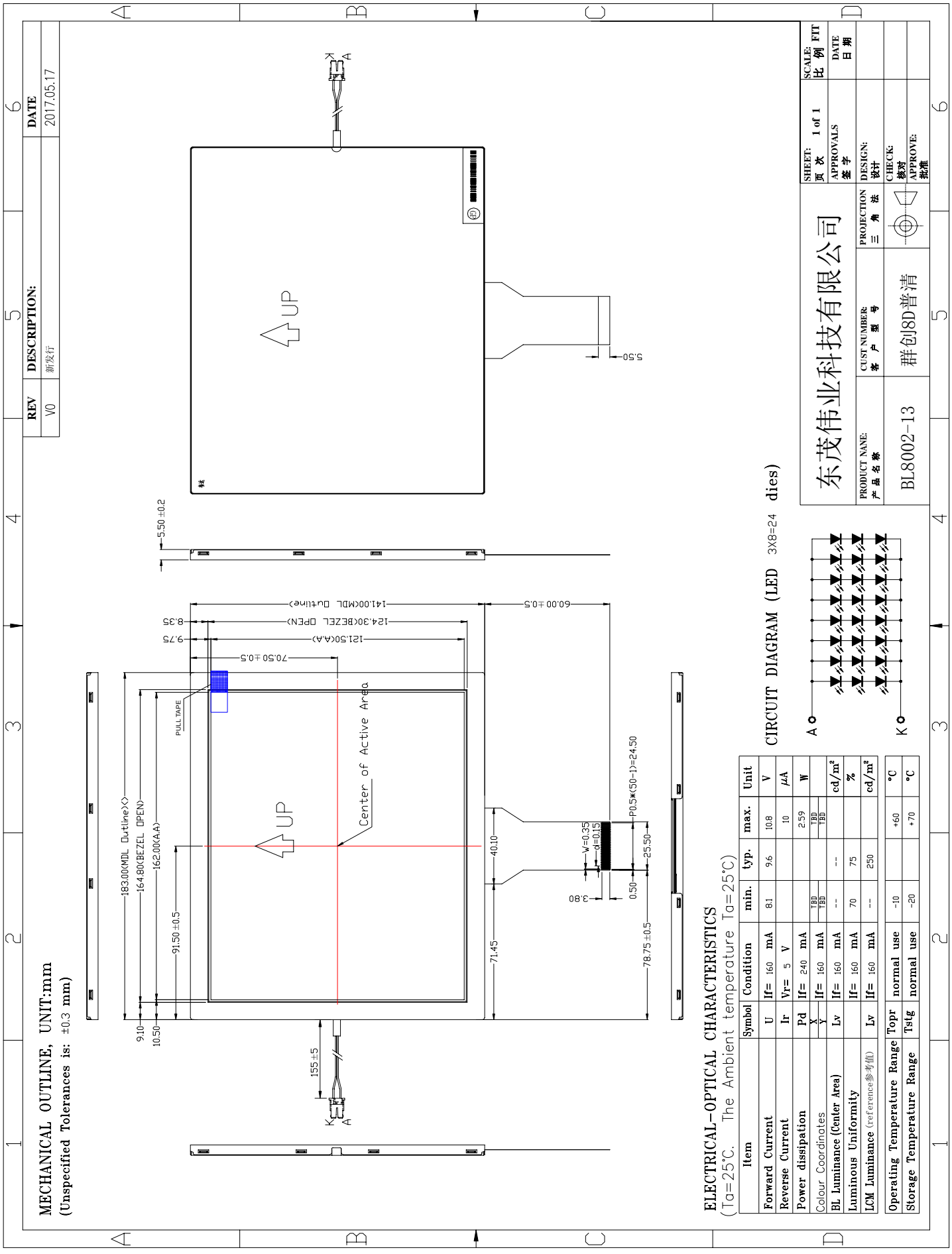
8.2 Packaging Quantity

(1) LCM quantity per tray :	1 row x 3column = 3 pcs
(2) Total LCM quantity of per Carton:	3 pcs/ tray x 20 tray / Box =60 pcs

8.3 Packaging Drawing



3．1 产品成品图纸



ELECTRICAL-OPTICAL CHARACTERISTICS
(Ta=25°C. The Ambient temperature Ta=25°C)

Item	Symbol	Condition	min.	typ.	max.	Unit
Forward Current	U	If= 160 mA	8.1	9.6	10.8	V
Reverse Current	Ir	Vr= 5 V			10	μA
Power dissipation	Pd	If= 240 mA			2.59	W
Colour Coordinates	X	If= 160 mA	TBD		TBD	
	Y	If= 160 mA	TBD		TBD	
BL Luminance (Center Area)	Lv	If= 160 mA	--	--		cd/m²
Luminous Uniformity		If= 160 mA	70	75		%
LCM Luminance (reference参考值)	Lv	If= 160 mA	--	250		cd/m²
Operating Temperature Range	Topr	normal use	-10		+60	°C
Storage Temperature Range	Tstg	normal use	-20		+70	°C

3．2测定条件

在无特别指定条件下，产品于温度 25±2℃，湿度 60±10%环境条件进行测试。

4．品质要求

4．1 光学特性

项目	符号	条件	规 格			单位	备注
			Min	Typ	Max		
均匀度	△I	面内九点	70	75	-	%	
色度	X	中心点	--		--		
	Y	中心点	--		--		
模组亮度	I	中心点	--	250	-	cd/m²	

注 1：表内测定点规格需在发光条电流(160)mA，周围环境温度 25±2℃测试。

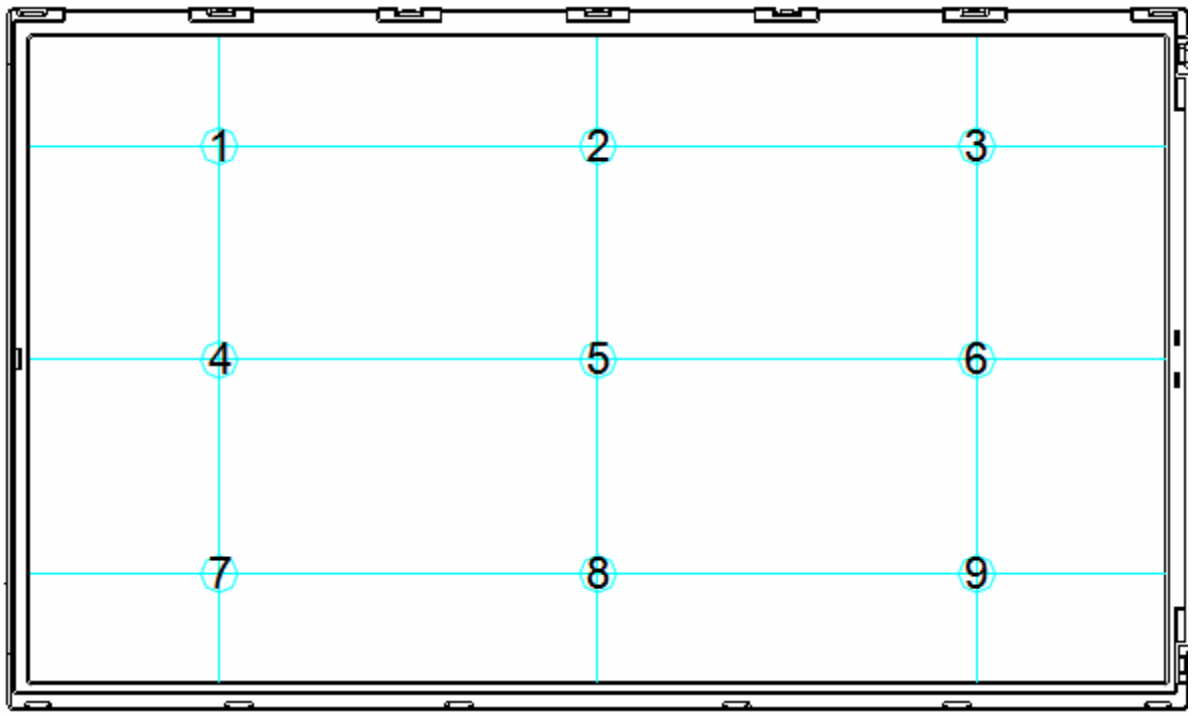
注 2：测试条件：1）以规定的电流电压正常点亮；

2）测试环境：暗室（10Lux 以下）

3）辉度、色坐标测试点：见下图

4）光学特性测试点图

注 3：均匀性△I=（IMIN÷IMAX）×100%



4．2 电气特性

4．2．1 LED电性规格

项目	符号	条件	规 格			单位	备注
			Min	Typ	Max		
LED电流	I_L	常温25℃	-	160	-	mA	
LED电压	V_L	常温25℃	2.7	3.2	3.6	V	I_L=20mA
点亮延迟到	TD	注2				sec	
注1：LED点亮电流不可超过最大电流限定值，否者LED寿命和亮度将会受到严重影响。 注2：点亮测试延迟时间：ON 30sec--OFF 30sec							

4．2．2 LED灯条适用电性规格

项目	符号	条件	规 格			单位	备注
			Min	Typ	Max		
灯条电压	V_L	常温25℃	8.1	9.6	10.8	Vrms	I_L=160mA
灯条电流	I_L	常温25℃		160		mArms	
点亮功率	W_L	常温25℃			(2.59)	Wrms	I_L=240mA
注1：灯条点亮功率需在要求范围以内。							

4．3 产品寿命

周围温度+25℃±2℃，湿度 60±20%RH，以每灯 20mA 工作电流之推荐使用条件，背光源之寿命为：

辉度减半平均寿命： 30，000 小时以上

辉度减半保证寿命： 20，000 小时以上

注：辉度减半平均寿命指背光源平均辉度衰减到初期平均辉度的 50%所需时间。