深圳市鸿富海电子科技有限公司

产品规格书

Product Type: 7″ TFT LCD Module

LCD Nunmber: CLAP070LF02CW

HLY Module No.: HLY070ML257-12A

CUSTOMER APPROVED	PREPARE BY	CHECK BY	APPROVED BY
SUPPLIER APPROVED	PREPARE BY	CHECK BY	APPROVED BY
	Miaowang Nie		Shenping Pan

鸿富海电子科技有限公司.

Address:Room 1601-1603,Hailrun Complex Hotdl,Shennan Road NO.6021,Futian District,S.Z.

Factory: Bldg.7,HongFUHAI industry zone,Sili Road Guanlan Town Baoan District, S.Z.

Tel:(86)-755-33959928 Fax:(86)-755-33959915 Web:www.Hly-LCM.com

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Document Revision History				
Change No.	Date	Subject And Reason	Version No.	Responser
1	2011.03.03	New	01	Miaowang Nie
2	2011.04.08	更换长排线玻璃	02	聂淼旺

1.0 General Description

1.1 Introduction

CLAB070LF02CW is is 7.0″ color TFT-LCD (Thin Film Transistor Liquid Crystal Display) OLB module (finish outer lead bonding) composed of LCD panel and driver ICs (the backlight is not included in this OLB module). The 7.0″ screen produces 800(*3)X 480 resolution image. By applying R.G.B. input signal, full color images are displayed.

1.2. Features

7 (16:9 diagonal) inch configuration
Compatible with NTSC & PAL system
Image Reversion: UP/DOWN and LEFT/RIGHT
ROHS design

1.3. General information

1.3.1Portable TV
1.3.2Portable DVD
1.3.3Multimedia applications and Others AV system

1.4. General information

Item	Specification	Unit
Outline Dimension	164.9 (H) x 100 (V) x 5.1 (D)	mm
Display area	154.08 (H) × 85.92 (V)	mm
Number of Pixel	800(H) × 3(RGB)×480(V)	pixels
Pixel pitch	0.1926(H)×0.1790(V)	mm
Pixel arrangement	RGB Vertical stripe	
Number of color	16.2M	
Response Time (Tr+Tf)	25ms (typ.	
Panel Transmittance	5.1 (TYP.)	%
Power Consumption(W)	327mW(typ.)	
Color Filter Array	RGB vertical strip	
Surface Treatment	Anti-Glare, Hardness:3H	

2.0 Absolute Maximum Ratings

2.1 Electrical Absolute Rating

2.1.1 TFT LCD Module

Item	Symbo	Min.	Max.	Unit	Note
Digital Supply Voltage	DVDD	-0.3	+5.0	V	
Analog Supply Voltage	AVDD	-0.5	+13.5	V	
Gate On Voltage	VDDG	-0.3	+42	V	
Gate Off Voltage	VEEG	-20	+0.3	V	
Gate.On-Gate.Off.Voltage	VDDG-VEEG	12	40	V	
Operation Temperature	T_{op}	-20	70	℃	Note 1
Storage Temperature	T_{stg}	-30	80	℃	Note 1

Note1: If users use the product out off the environmemtal operation range (temperature and humidity), it will have visual quality concerns.

2.2 Environment Absolute Rating

Item	Symbol	Min.	Max.	Unit	Note
Operating Temperature	Topa	-10	60	℃	
Storage Temperature	Tstg	-20	70	℃	

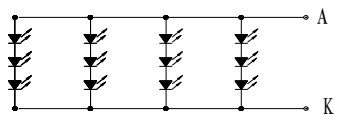
2.3 Back-light Unit:

PARAMETER	Sym.	Min.	Typ.	Max.	Unit	Test Condition	Note
LED Current	IF	-	80	-	mA	-	-
LED Voltage (Total)	VF	9	9.9	10.5	V	-	-
Life Time		-	25000	-	Hr.	I≦80mA	-
Color	White						

Note (1) Permanent damage may occur to the LCD module if beyond this specification. Functional operation should be restricted to the conditions described under normal operating conditions.

(2)Ta=25±2℃

(3)Test condition: LED Current 80mA



Back-Light LED circuit

3.0 Optical Characteristics

3.1 Optical specification

Item		Symbol	Condition	Min.	Typ.	Max	Unit
Panel Transmittance		-	-	4.8	5.1	—	%
LCM luminance (Center)		Y_L	I=80mA	150	180	—	cd/㎡
Response time	Rising	T_R	Point-5	—	20	35	ms
	Falling	T_F					
Color chromaticity (CIE1931)	White	W_X		0.30	0.32	0.34	-
		W_Y		0.32	0.34	0.36	
Viewing angle	Hor.	Φ	Point-5 CR≧10	120	140	—	°
	Ver.	Φ		100	120	—	°

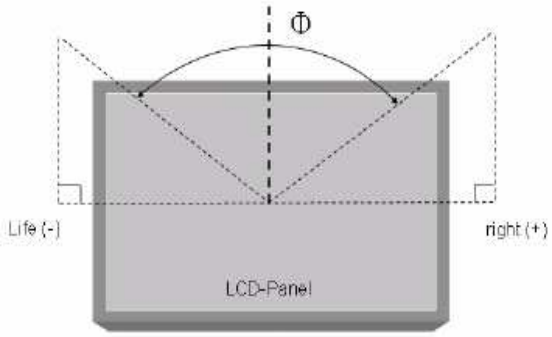
3.2 Measuring Condition

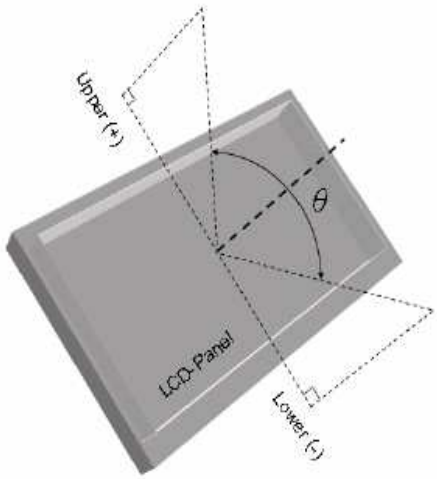
- Measuring surrounding : dark room
- Ambient temperature : 25±2℃
- The measured value of luminace and color coordinate bases HLY's BM-7

3.3 Measuring Equipment

- TOPCON BM-7
- Measuring spot size : field 2°

Note (1) Definition of Viewing Angle :

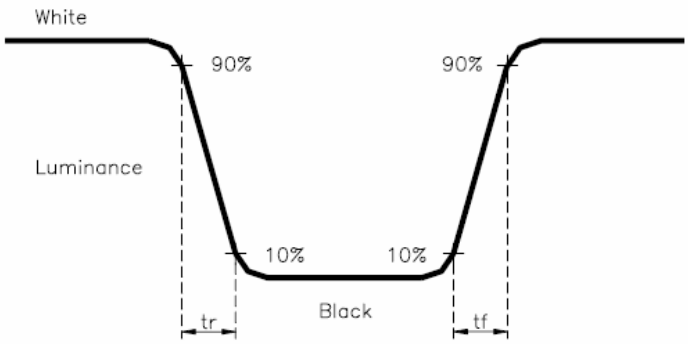




Note (2) Definition of Contrast Ratio(CR) :
measured at the center point of panel

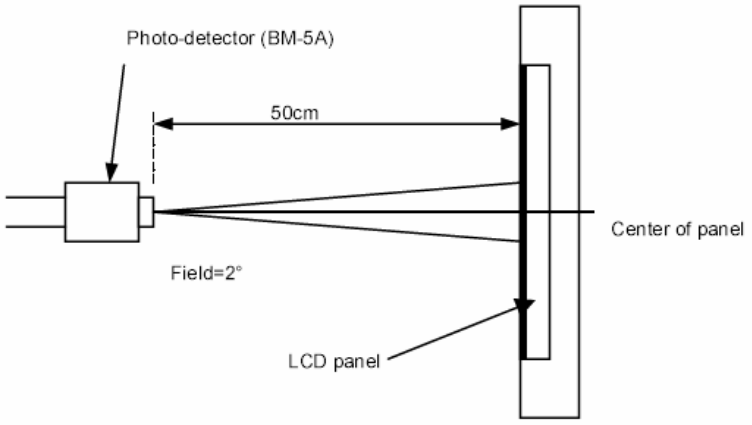
$$CR = \frac{\text{Luminance with all pixels white}}{\text{Luminance with all pixels black}}$$

Note (3) Definition of Response Time : Sum of T_r and T_f

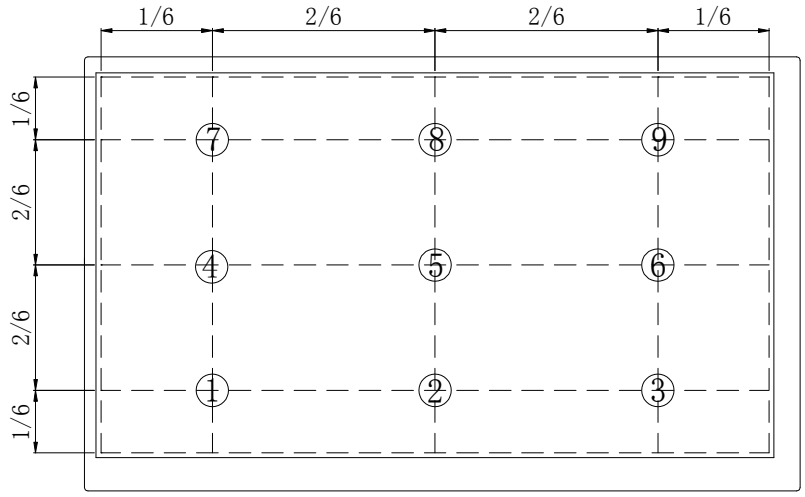


Definition of Response Time

Note (4) Definition of optical measurement setup



Note (5) Definition of brightness uniformity



4.0 Interface Pin Connection

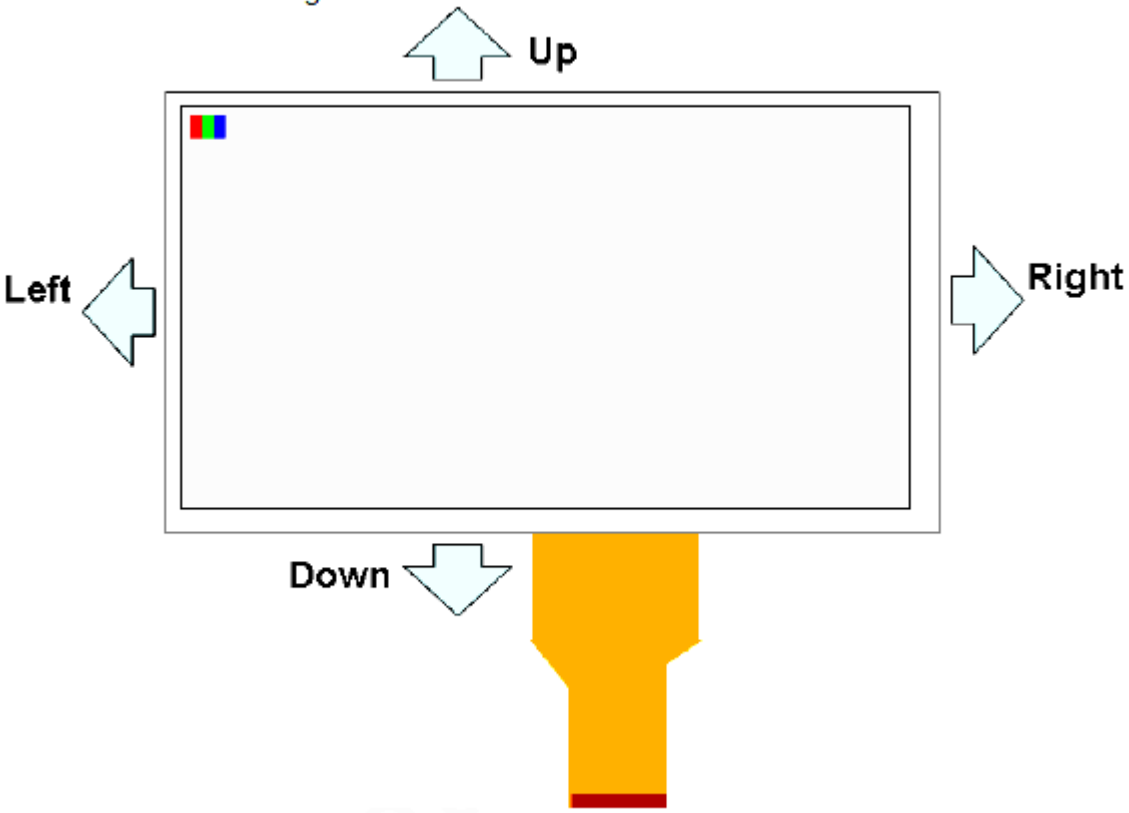
Pin No.	Symbol	DESCRIPTION
1	V_{LED+}	Power for LED backlight (Anode)
2	V_{LED+}	Power for LED backlight (Anode)
3	V_{LED-}	Power for LED backlight(Cathode)
4	V_{LED-}	Power for LED backlight(Cathode)
5	GND	Power ground
6	VCOM	Common Voltage
7	DVDD	Digital Power
8	MODE	DE/SYNC mode select. Normally pull high H: DE mode. L: HSD/VSD mode
9	DE	Data Enable signal
10	VSD	Vertical sync input. Negative polarity
11	HSD	Horizontal sync input. Negative polarity
12	B7	Blue Data Input(MSB)
13	B6	Blue Data Input
14	B5	Blue Data Input
15	B4	Blue Data Input
16	B3	Blue Data Input
17	B2	Blue Data Input
18	B1	Blue Data Input
19	B0	Blue Data Input(LSB)
20	G7	Green Data Input(MSB)
21	G6	Green Data Input
22	G5	Green Data Input
23	G4	Green Data Input
24	G3	Green Data Input
25	G2	Green Data Input

26	G1	Green Data Input
27	G0	Green Data Input(LSB)
28	R7	Red Data Input(MSB)
29	R6	Red Data Input
30	R5	Red Data Input
31	R4	Red Data Input
32	R3	Red Data Input
33	R2	Red Data Input
34	R1	Red Data Input
35	R0	Red Data Input(LSB)
36	GND	Power ground
37	DCLK	Clock input
38	GND	Power ground
39	SHLR	Left or Right Display Control
40	UPDN	Up / Down Display Control
41	VDDG	Positive Power for TFT
42	VEEG	Negative Power for TFT
43	AVDD	Analog Power
44	RSTB	Global reset pin. Active low to enter reset state. Suggest to connecting with an RC reset circuit for stability Normally pull high. (R=10KΩ， C=1μF)
45	NC	Not connect
46	VCOM	Common Voltage
47	DITH	Dithering setting DITH=”H” 6bit resolution(last 2 bit of input data truncated) DITH=”L” 8bit resolution(default setting)
48	GND	Power ground
49	NC	Not connect
50	NC	Not connect

【Note1】SHLR：left or right setting
UPDN：up or down setting

SHLR	UPDN	Data shifting
DVDD	GND	Left→Right，Up→Down(default)
GND	GND	Right→Left，Up→Down
DVDD	DVDD	Left→Right，Down→Up
GND	DVDD	Right→Left，Down→Up

Definition of scanning direction.



5. Electrical Characteristics

5.1 Typical operation conditions

Item	Symbol	Min.	Typ.	Max.	Unit.	Note.
Digital Supply Voltage	DVDD	3	3.3	3.6	V	
Analog Supply Voltage	AVDD	9.4	9.6	9.8	V	
Gate On Voltage	VDDG	17	18	19	V	
Gate Off Voltage	VEEG	-6.6	-6	-5.4	V	
Common Voltage	VCOM	3.8	4	4.2	V	Note1
Logic Input Voltage	VIH	0.7DVDD	-	DVDD	V	
	VIL	GND	-	0.3DVDD	V	

Note1：Please adjust VCOM to make the flicker level be minimum

5.2 Current consumption

Item	Symbol	Condition	Min.	Typ.	Max.	Unit.	Note.
Gate on Current	IVDDG	VDDG =18 V	-	0.5	1	mA	Note1
Gate off Current	IVEEG	VEEG= -6 V	-	0.5	1	mA	Note1
Digital Current	IDVDD	DVDD = 3.3V	-	8	15	mA	Note1
Analog Current	IAVDD	AVDD = 9.2 V	-	30	40	mA	Note1
Total Power Consumption	PC		-	327	458	mW	Note1

Note1: Typ. specification：Gray-level test Pattern

Max. specification：Black test Pattern

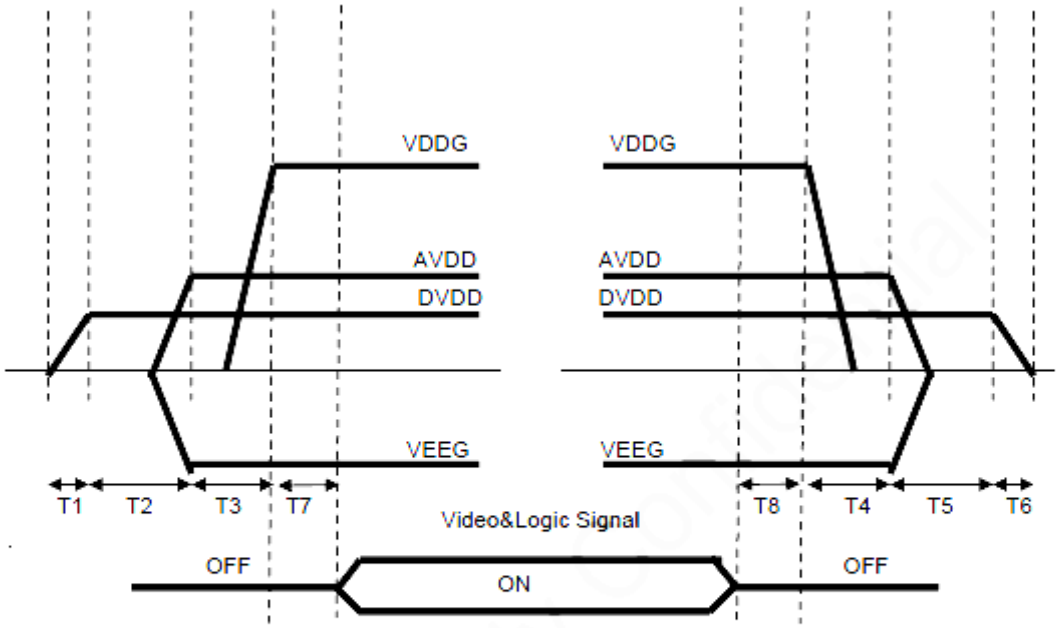
(a)Gray-level Pattern

(b)Black Pattern

5.3 Power、Signal sequence

Power On: DVDD→AVDD/VEEG→VDDG→Video &Logic Signal

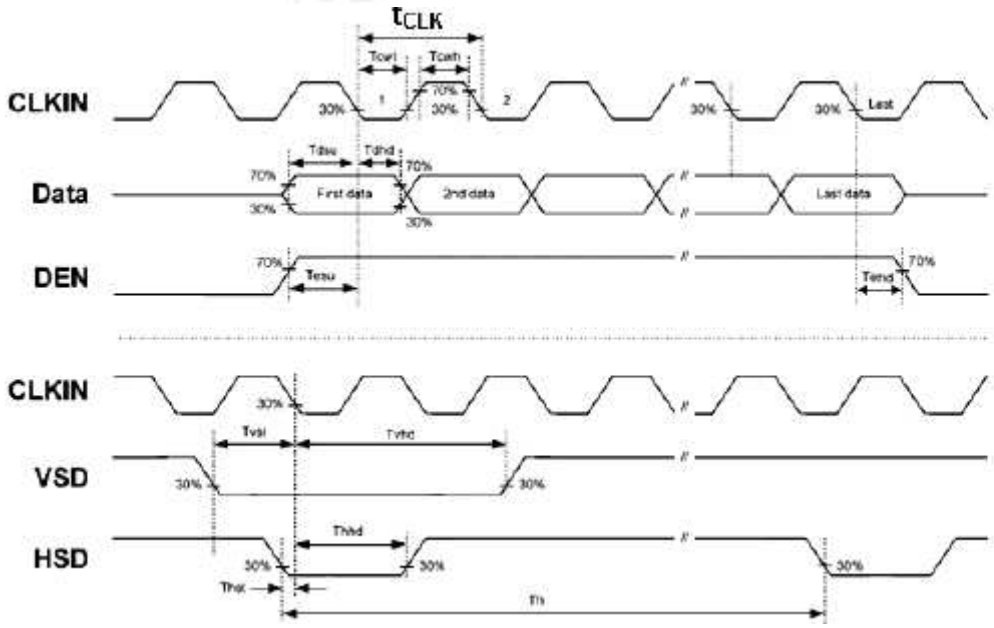
Power Off: Video &Logic Signal→VDDG→AVDD/VEEG→DVDD



0＜T1≦10ms	T5＞0ms
T2＞20ms	T6＞0ms
T3＞10ms	0＜T7≦10ms
T4＞0ms	0＜T8≦10ms

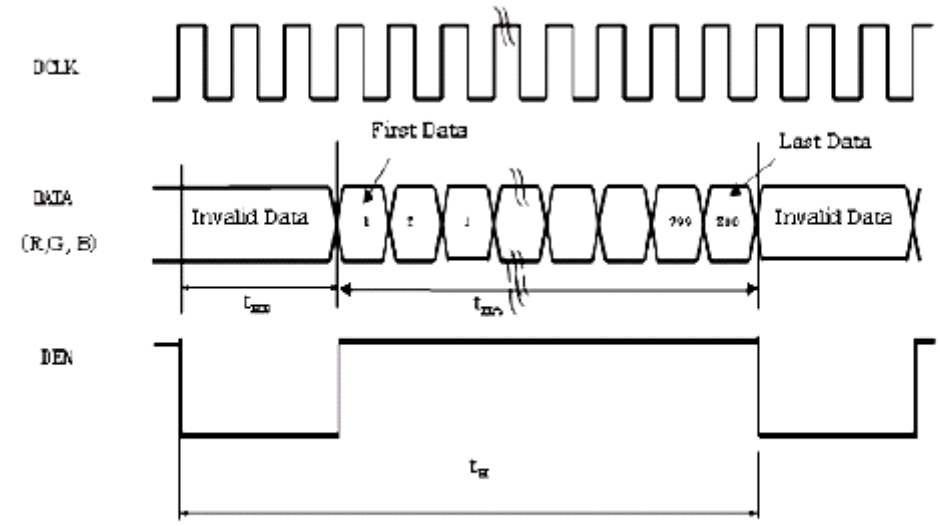
5.4 Timing characteristics of input signals

ITEM		SYMBOL	MIN.	TYP.	MAX.	UNIT	Note
DCLK	Dot Clock	$1/t_{CLK}$	29	33	38	MHz	
	DCLK pulse duty	Tcwh	40	50	60	%	
DE	Setup Time	Tesu	8	-	-	ns	
	Hold time	Tehd	8	-	-	ns	
	Horizontal Period	t_H	1026	1056	1086	t_{CLK}	
	Horizontal Valid	t_{HA}		800		t_{CLK}	
	Horizontal Blank	t_{HB}	-	256	-	t_{CLK}	
	Vertical Period	t_V	515	525	535	t_H	
	Vertical Valid	t_{VA}		480		t_H	
	Vertical Blank	t_{VB}	-	45	-	t_H	
SYNC	HSYNC Setup Time	Thst	8	-	-	ns	
	HSYNC Hold Time	Thhd	8	-	-	ns	
	VSYNC Setup Time	Tvst	8	-	-	ns	
	VSYNC Hold Time	Tvhd	8	-	-	ns	
	Horizontal Period	th	1026	1056	1086	t_{CLK}	
	Horizontal Pulse Width	thpw	-	30	-	t_{CLK}	thb + thpw=46DCLK is fixed
	Horizontal Back Porch	thb	-	16	-	t_{CLK}	
	Horizontal Front Porch	thfp	180	210	240	t_{CLK}	
	Horizontal Valid	thd		800		t_{CLK}	
	Vertical Period	tv	515	525	535	th	
	Vertical Pulse Width	tvpw	-	13	-	th	tvpw + tvb = 23th is fixed
	Vertical Back Porch	tvb	-	10	-	th	
	Vertical Front Porch	tvfp	12	22	32	th	
	Vertical Valid	tvd		480		th	
DATA	Setup Time	Tdsu	8	-	-	ns	
	Hold Time	Tdhd	8	-	-	ns	

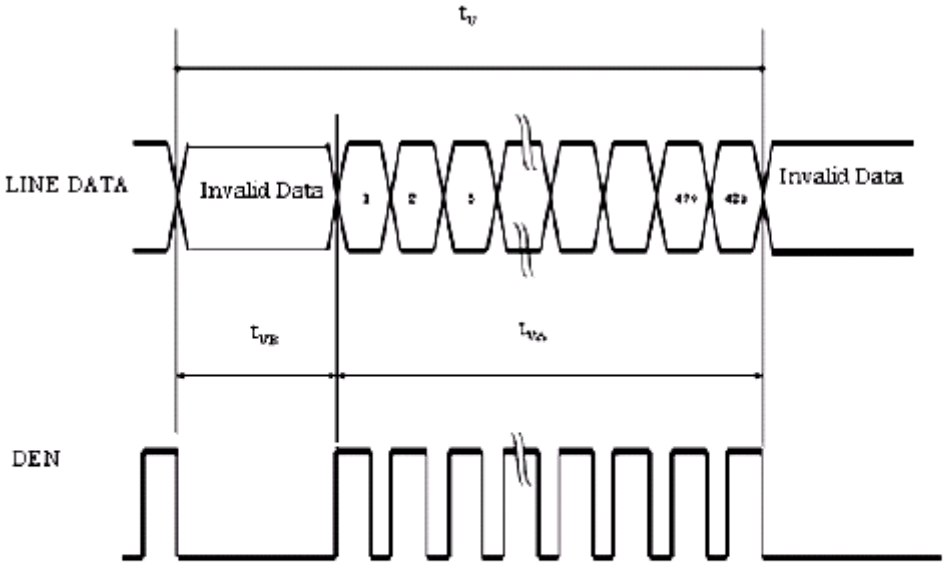


DE mode

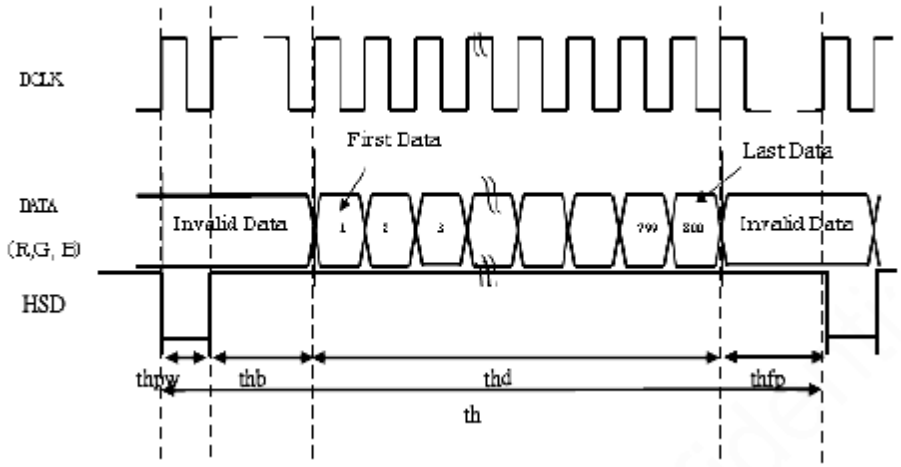
Horizontal timing：



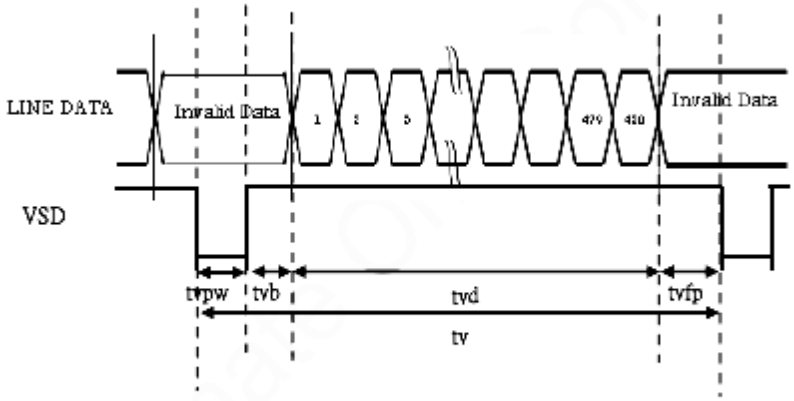
Vertical timing：



Horizontal timing：



Vertical timing：



6.0 Reliability test items

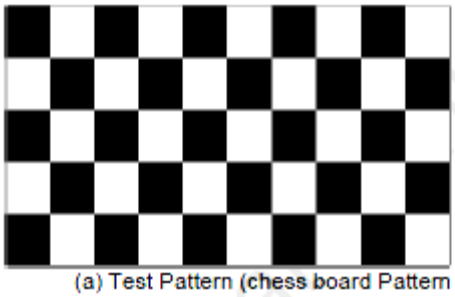
6.1 Temperature and Humidity

TEST ITEMS	CONDITIONS	NOTE
High Temperature Operation	70℃ ; 240hrs	
High Temperature Storage	80℃ ; 240hrs	
High Temperature High Humidity Operation	60℃ ; 90%RH ; 240hrs (No condensation)	
Low Temperature Operation	-20℃ ; 240hrs	
Low Temperature Storage	-30℃ ; 240hrs	
Thermal Shock	–30℃(0.5hr) ~ 80℃(0.5hr) ; 200 Cycles	Non-Operating
Image Sticking	25℃ ; 4hrs	1

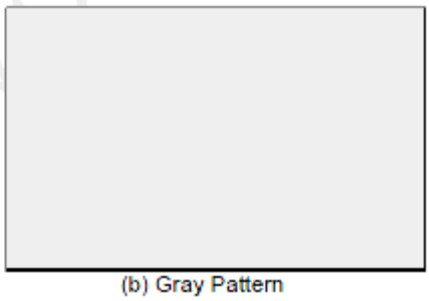
Note 1: Condition of Image Sticking test：25 ℃± 2 ℃

Operation with test pattern sustained for 4 hrs, then change to gray pattern immediately.

After 5 mins, the mura must be disappeared completely .



(a) Test Pattern (chess board Pattern)

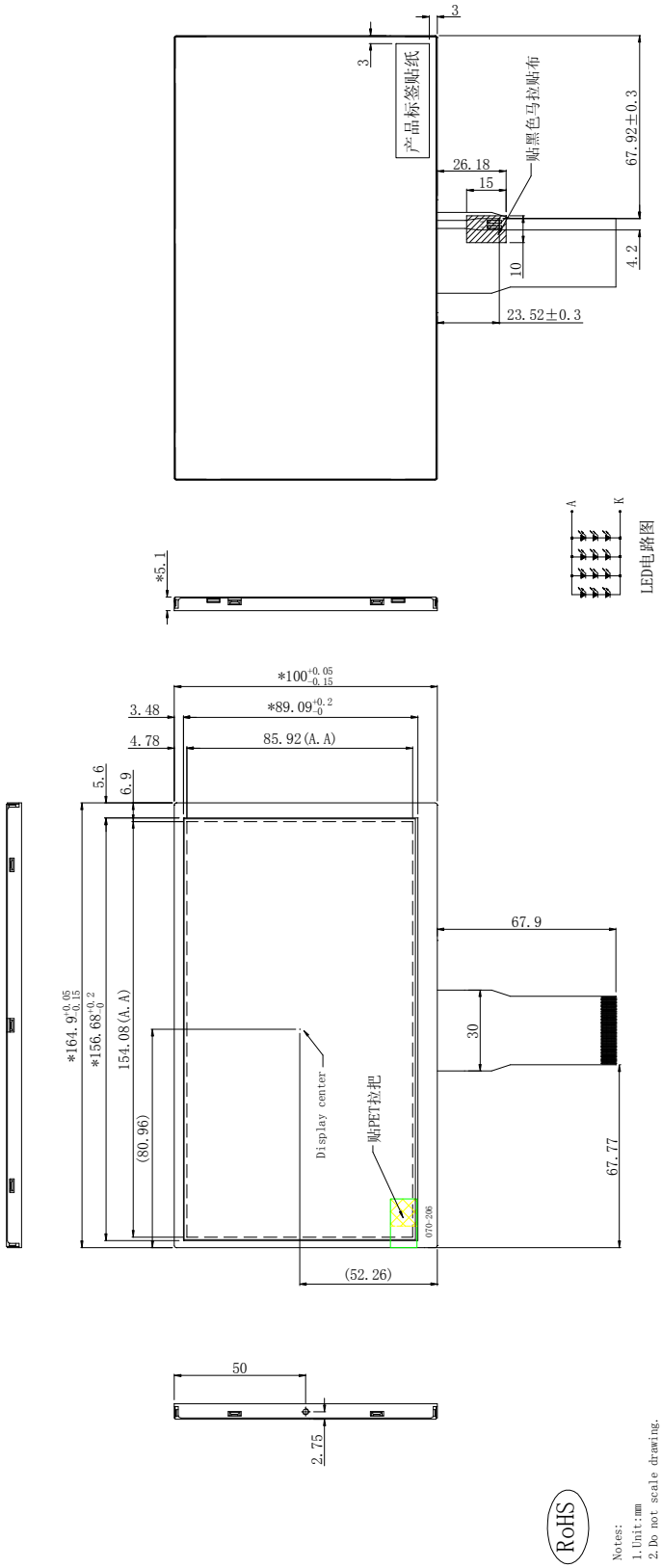


(b) Gray Pattern

6.2 Shock and Vibration

ITEMS	CONDITIONS
Shock (Non-Operation)	● Shock level： 980m/s^2(equal to 100G). ● Waveform： 1/2 Sine wave,6msec ● ±X、±Y、±Z、each axis 1 times
Vibration (Non-Operation)	● Frequency range：8~33.3Hz ● Stoke：1.3 mm ● Vibration： sinusoidal wave, perpendicular axis (both x, z axis:2Hrs, y axis 4Hrs). ● Sweep： 2.9G, 33.3 Hz -400 Hz ● Cycle： 15 min

7.0 Outline dimension



RoHS

Notes:

1. Unit:mm
2. Do not scale drawing.
3. All radii without dimension R0.2
4. Luminous instensity(9 AVG):
   150cd/m^2(Min); 180cd/m^2(Typ);
5. Uniformity : 75%(Min)
   VF:9V(Min);9.9V(Typ);10.5V(Max); IF:80mA(Fix)
6. The color coordinates:

	MIN	TYP	MAX
x	0.30	0.32	0.34
y	0.32	0.34	0.36

7. ⚠ Modification rev. number
8. draft angle 1.0°
9. Genral Tolerance: ±0.2
10. Mark mold cavity indentification in recess approximately where indicated.
11. "※" For important dimension;( ) for reference dimention
12. RoHs must be complied.(Use Lead-free process)

8. Packing form