



**WINSTAR Display Co.,Ltd.**  
**華凌光電股份有限公司**



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**華凌光電股份有限公司**

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## SPECIFICATION

**CUSTOMER :** \_\_\_\_\_

**MODULE NO.:** WF80CTAAUMNNY#

<p><b>APPROVED BY:</b></p> <p>( FOR CUSTOMER USE ONLY )</p>	<p><b>PCB VERSION:</b> _____</p> <p><b>DATA:</b> _____</p>
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SALES BY	APPROVED BY	CHECKED BY	PREPARED BY
			葉虹蘭
<b>ISSUED DATE: 2017/07/10</b>			



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MODLE NO :

**RECORDS OF REVISION**

**DOC. FIRST ISSUE**

VERSION	DATE	REVISED PAGE NO.	<b>SUMMARY</b>
0	2017/07/10		First issue

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# 1.Module Classification Information

W F 80 C T A A U M N N Y #  
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬

①	Brand : WINSTAR DISPLAY CORPORATION												
②	Display Type : F→TFT Type, J→Custom TFT												
③	Display Size : 8.0" TFT												
④	Model serials no.												
⑤	Backlight Type :	F→CCFL, White S→LED, High Light White						T→LED, White Z→Nichia LED, White					
⑥	LCD Polarize Type/ Temperature range/ Gray Scale Inversion Direction	A→Transmissive, N.T, IPS TFT C→Transmissive, N. T, 6:00 ; F→Transmissive, N.T,12:00 ; I→Transmissive, W. T, 6:00 K→Transflective, W.T,12:00 L→Transmissive, W.T,12:00 N→Transmissive, Super W.T, 6:00						Q→Transmissive, Super W.T, 12:00 R→Transmissive, Super W.T, O-TFT V→Transmissive, Super W.T, VA TFT X→Transmissive, W.T, VA TFT Y→Transmissive, W.T, IPS TFT Z→Transmissive, W.T, O-TFT					
⑦	A : TFT LCD B : TFT+FR+CONTROL BOARD C : TFT+FR+A/D BOARD D : TFT+FR+A/D BOARD+CONTROL BOARD E : TFT+FR+POWER BOARD						F : TFT+CONTROL BOARD G : TFT+FR H : TFT+D/V BOARD I : TFT+FR+D/V BOARD J : TFT+POWER BD						
⑧	Resolution:												
	A	128160	B	320234	C	320240	D	480234	E	480272	F	640480	
	G	800480	H	1024600	I	320480	J	240320	K	800600	L	240400	
	M	1024768	N	128128	P	1280800	Q	480800	R	640320	S	480128	
	T	800320	U	8001280	V	176220	W	1280398	X	1024250	Y	1920720	
	Z	800200	2	1024324	3	7201280							
⑨	D: Digital L : LVDS M:MIPI												
⑩	Interface : N:without control board A:8Bit B:16Bit H: HDMI I:I2C Interface R:RS232 S:SPI Interface U:USB												
⑪	TS : N : Without TS T : resistive touch panel C : capacitive touch panel (G-F-F) G : capacitive touch panel(G-G)												
⑫	Version												
⑬	Special Code	#:Fit in with ROHS directive regulations											

## **2.Summary**

TFT 8.0" is a TN transmissive type color active matrix TFT liquid crystal display that use amorphous silicon TFT as switching devices. This module is a composed of a TFT\_LCD module, It is usually designed for industrial application and this module follows RoHs,

### **3. General Specifications**

<b>Item</b>	<b>Dimension</b>	<b>Unit</b>
Size	8.0	inch
Dot Matrix	800 X 3(RGB) X 1280	dots
Module dimension	114.6 ×184.1 × 2.7	mm
Active area	107.64 X 172.224	mm
Dot pitch	0.13455 x 0.13455	mm
LCD type	TFT, Normally Black, Transmissive	
View Direction	Full	
Aspect Ratio	16:9	
Backlight Type	LED, Normally White	
With /Without TP	Without TP	
Surface	Anti-Glare	
Interface	MIPI	

\*Color tone slight changed by temperature and driving voltage.

## 4. Absolute Maximum Ratings

Item	Symbol	Min	Typ	Max	Unit
Operating Temperature	TOP	-20	—	+55	°C
Storage Temperature	TST	-20	—	+60	°C

Note: Device is subject to be damaged permanently if stresses beyond those absolute maximum ratings listed above

1. Temp.  $\leq 40^{\circ}\text{C}$ , 90% RH MAX. Temp.  $> 60^{\circ}\text{C}$ , Absolute humidity shall be less than 40% RH at  $60^{\circ}\text{C}$



# 5. Electrical Characteristics

## 5.1. Typical operation conditions

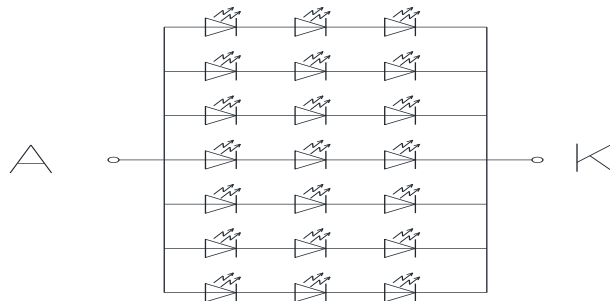
Parameter	Symbol	Values			Unit	Notes
		Min	Typ	Max		
Power Supply Input Voltage	VDD	3.0	3.3	3.6	Vdc	
Logic Power Supply Input Voltage	VDDIO		1.8		Vdc	
Power Supply Ripple Voltage	VRP		300		mV	
Power Supply Current	IDD	-	65	108	mA	1
Power Consumption	PDD		0.22	0.36	Watt	
Logic Power Supply Current	ILOG		14		mA	
Logic Power Consumption	PLOG		25		mW	
Rush current	IRUSH	-		1	A	2

Notes : 1. The supply voltage is measured and specified at the interface connector of LCM. The current draw and power consumption specified is for VDD=3.3V, Frame rate fV=60Hz and Clock frequency = 74.3MHz. Test pattern of power supply current is : typ@White, max@R/G/B  
 2. The duration of rush current is about 2ms and rising time of Power input is 1ms(min)

## 5.2. LED driving conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Supply voltage of white LED backlight	VL	8.7	9.9	10.5	V	Note 1
Current for LED backlight	IL	105	140	175	mA	
LED life time	-	50000	-	-	Hr	Note 1

Note 1 : There are 1 Groups LED



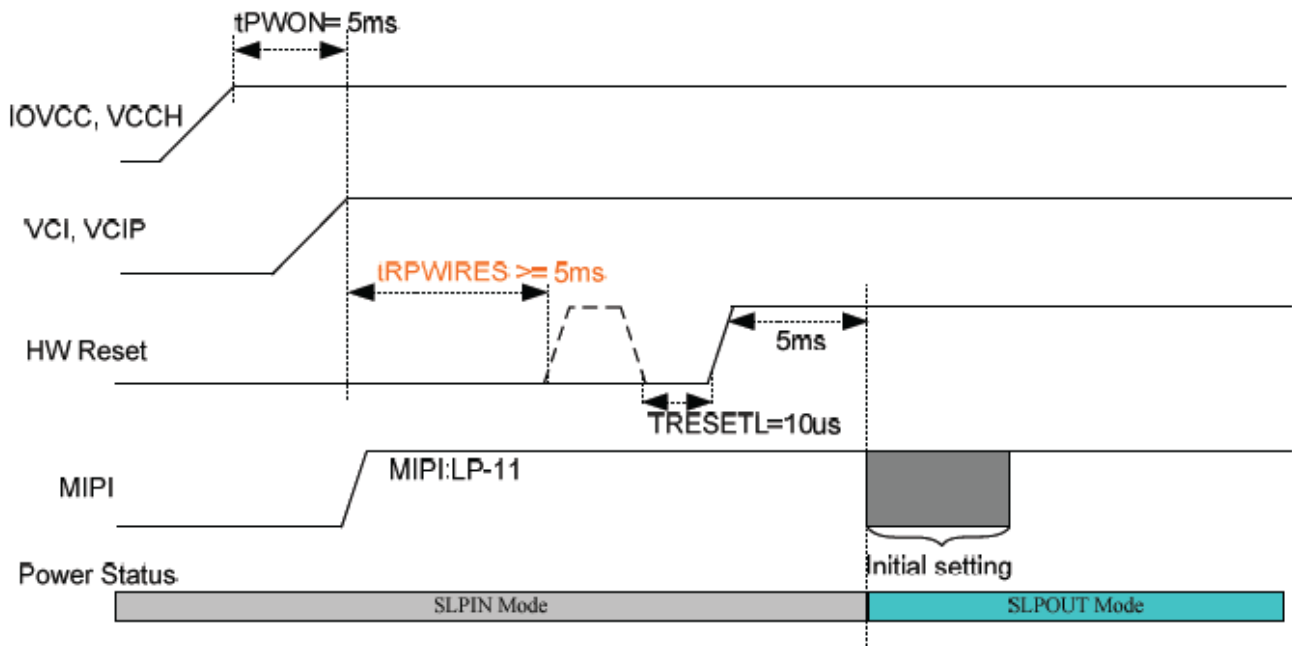
Note 2 : Ta = 25 °C

Note 3 : Brightness to be decreased to 50% of the initial value

Note 4 : The single LED lamp case

### 5.3. Power Sequence

BOOSTM[2:0]=000 / 001 (Internal DC/DC power mode : PFM)  
IOVCC=VCCH=1.65V ~ 3.6V, VCI=VCIP=2.5V ~ 4.8V.



# 6. Timing characteristics

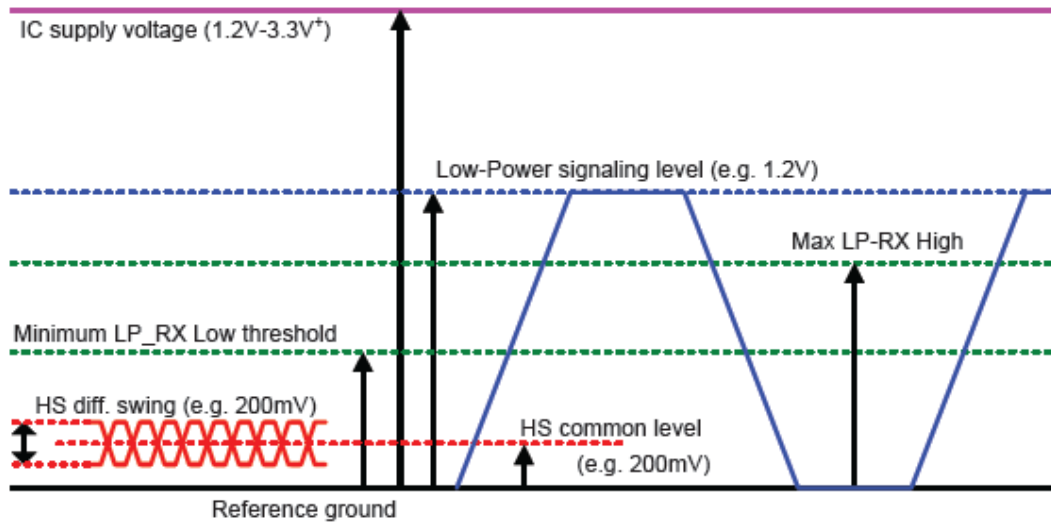
## 6.1. MIPI Input Signal SPEC

(TA=-40 ~ 85 °C, VCIP=2.5 ~ 4.8V, VCI=2.5 ~ 4.8V, IOVCC=1.65~3.3V)

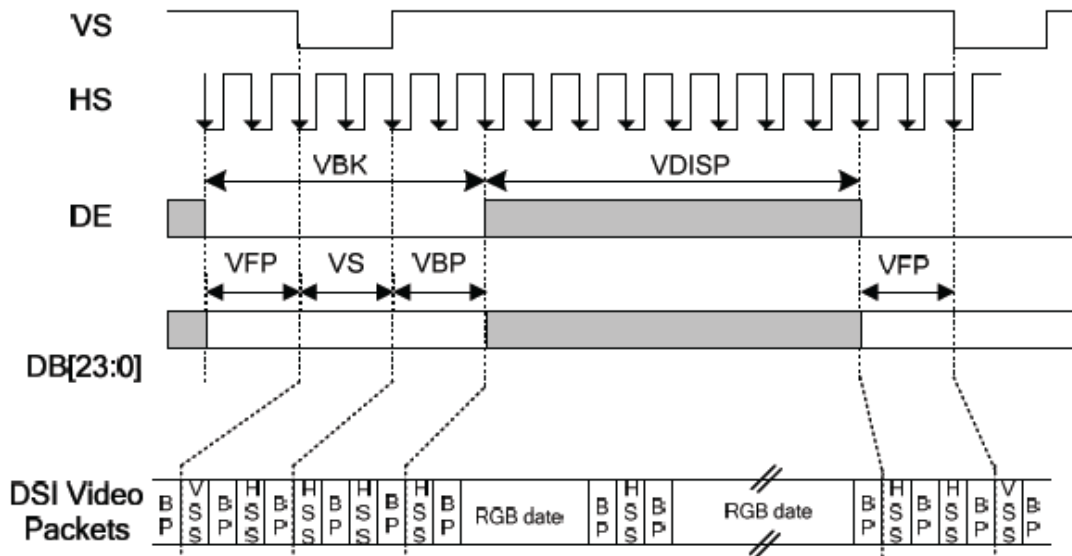
Item	Symbol	Condition	Min.	Typ.	Max.	Unit
IOVCC	VIN	Interface Supply Voltage	1.65	-	3.6	-
VCIP	VIN	Logic Supply Voltage	2.5	-	6.0	-
VCI	VIN	Analog Supply Voltage	2.5	-	6.0	-
VCCH	VIN	High speed interface Supply Voltage	1.65	-	3.6	-
Input high voltage	VIH	IOVCC= 1.65 ~ 3.3V VCIP= 2.5 ~ 3.3V VCI= 2.5 ~ 3.3V	0.7 IOVCC	-	IOVCC	V
Input low voltage	VIL		0	-	0.3 IOVCC	V
VPP	VIH	VPP	7.25V	7.5V	7.75V	V
	VIL					
Output high voltage (SDO, LEDPWM)	VOH1	IOH = -1.0 mA	0.8 IOVCC	-	IOVCC	V
Output low voltage (SDO, LEDPWM)	VOL1	IOVCC= 1.65 ~ 2.4V IOL = 1.0 mA	0	-	0.2 IOVCC	V
Logic High level input current	IIH	VSYNC, HSYNC	-	-	1	uA
		RESX, DCX_SCL, CSX, RDX, WRX_SCL	-	-	1	uA
	IIHD	DB[23...0], SDI, DCX	-	-	1	uA
		DB[23...0]	-	-	1	uA
Logic Low level input current	IIL	VSYNC, HSYNC	-1	-	-	uA
		RESX, DCX, CSX, RDX, WRX_SCL	-1	-	-	uA
	IILD	DB[23...0], SDI, DCX	-1	-	-	uA
		DB[23...0]	-1	-	-	uA
Current consumption standby mode (VCIP/VCI-VSSD)	I <sub>ST(VDD)</sub>	VCIP/VCI=2.8V, IOVCC=1.8V TA =25 °C		TBD		uA
Current consumption standby mode ( IOVCC- VSSD )	I <sub>ST(IOVCC)</sub>			TBD		uA
Current consumption during Deep-standby mode (VCIP/VCI-VSSD)	I <sub>DP-ST(VDD)</sub>	VCIP/VCI=2.8V, IOVCC=1.8V TA =25 °C		TBD		uA
Current consumption during Deep-standby mode	I <sub>DP-ST(IOVCC)</sub>			TBD		uA

Note: 1. The VOTP pin is open on normal mode and in used while OTP programming condition.

2. The GRAM data is eliminated under the Deep standby mode.



## 6.2. Signal Timing Spec



**Figure 1 Vertical Timings for DPI I/F**

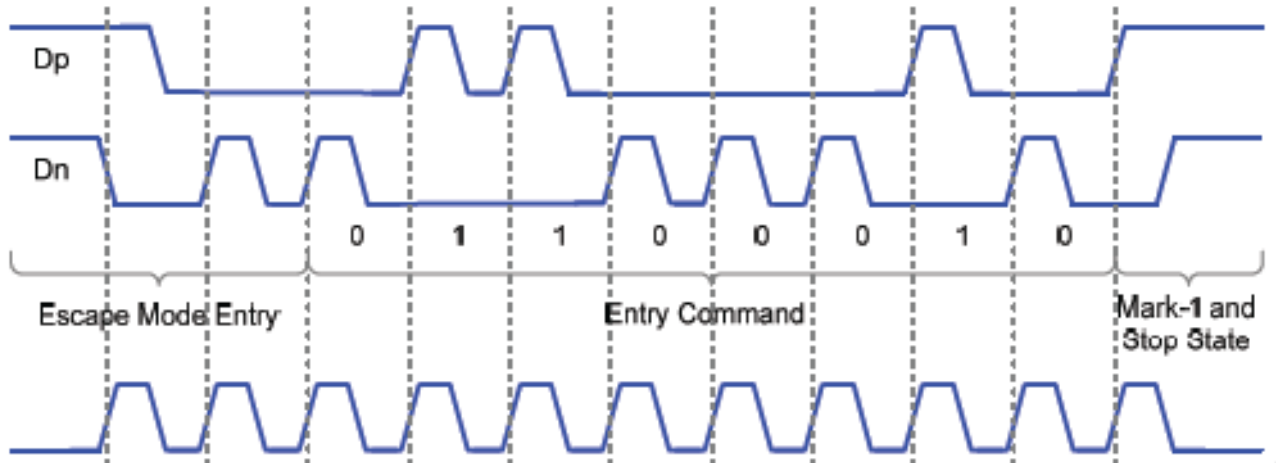
Resolution=800x1280(TA=25°C, IOVCC=1.8V, VCIP=2.8V, VCI=2.8V)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Vertical low pulse width	VS	-	2	-	Note(1)	Line
Vertical front porch	VFP	-	2	-	-	Line
Vertical back porch	VBP	-	2	-	Note(1)	Line
Vertical blanking period	VBK	VS+VBP+VFP	6	-	-	Line
Vertical active area	-	VDISP	-	1280	-	Line
Vertical Refresh rate	VRR	-	-	60	-	Hz

Note: (1) The VS and VBP pulse width are related to GIP start pulse and GIP clock pulse timing. The GIP start pulse and GIP clock pulse must be set at corresponding position for LCD normal display.

### 6.3. Signal Timing wave forms

LP-11->10->00->01->00->01->00->10->00...



# 7. Optical Characteristics

## TFT LCD characteristic (Without Capacitive Touch Panel)

Item	Symbol	Condition.	Min	Typ.	Max.	Unit	Remark	
Response time	$T_r$	$\theta=0^\circ$ 、 $\phi=0^\circ$	-	25	40	ms	Note 3,5	
	$T_f$							
Contrast ratio	CR	At optimized viewing angle	700	900	-	-	Note 4,5	
Color Chromaticity	White	$W_x$	$\theta=0^\circ$ 、 $\phi=0$	0.271	0.291	0.311		Note 2,6,7
		$W_y$		0.318	0.338	0.358		
Viewing angle (Gray Scale Inversion Direction)	Hor.	$\theta_R$	$CR \geq 10$	-	89	-	Deg.	Note 1
		$\theta_L$		-	89	-		
	Ver.	$\phi_T$		-	89	-		
		$\phi_B$		-	89	-		
Brightness	-	-	250	300	-	cd/m <sup>2</sup>	Center of display	

$T_a=25\pm 2^\circ\text{C}$

Note 1: Definition of viewing angle range

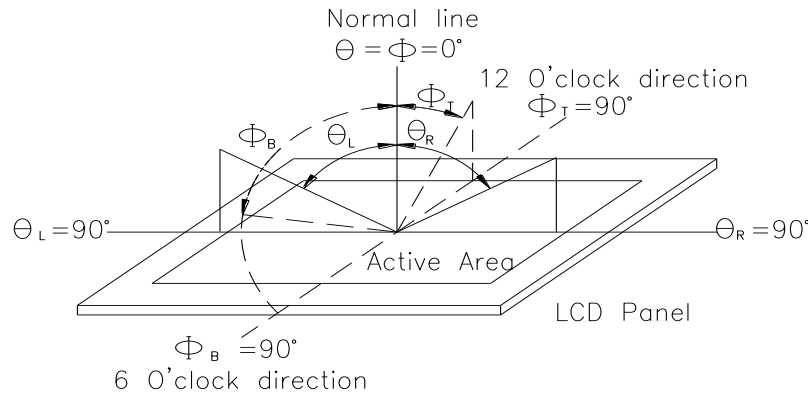


Fig.7.1. Definition of viewing angle

Note 2: Test equipment setup:

After stabilizing and leaving the panel alone at a driven temperature for 10 minutes, the measurement should be executed. Measurement should be executed in a stable, windless, and dark room. Optical specifications are measured by Topcon BM-7orBM-5 luminance meter 1.0° field of view at a distance of 50cm and normal direction.

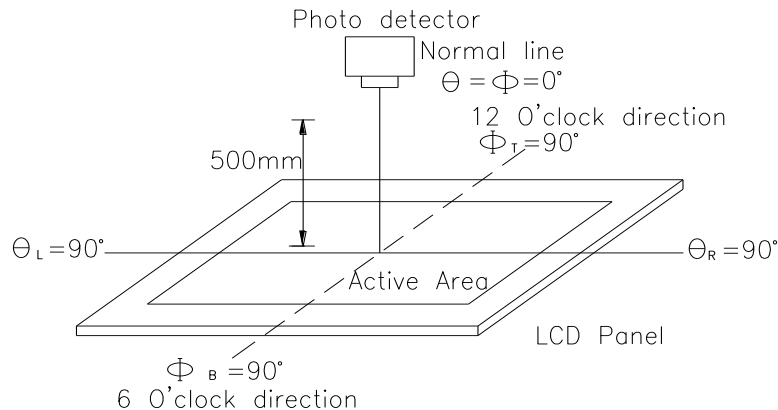
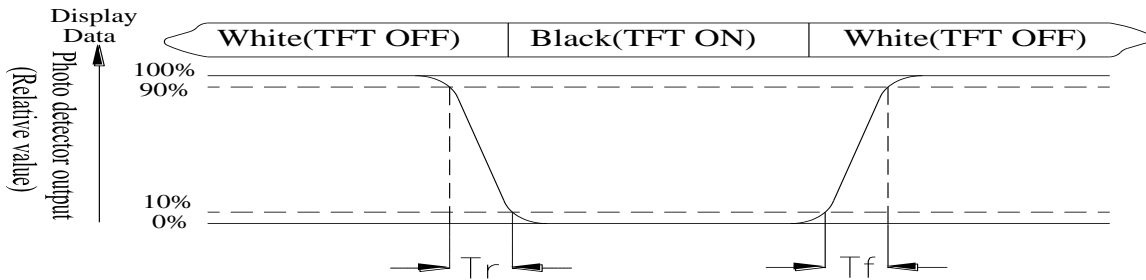


Fig. 7.2. Optical measurement system setup

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,  $T_r$ , is the time between photo detector output intensity changed from 90% to 10%. And fall time,  $T_f$ , is the time between photo detector output intensity changed from 10% to 90%



Note 4: Definition of contrast ratio:

The contrast ratio is defined as the following expression.

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

Note 5: White  $V_i = V_{i50} \pm 1.5V$

Black  $V_i = V_{i50} \pm 2.0V$

" $\pm$ " means that the analog input signal swings in phase with VCOM signal.

" $\pm$ " means that the analog input signal swings out of phase with VCOM signal.

The 100% transmission is defined as the transmission of LCD panel when all the input terminals of module are electrically opened.

Note 6: Definition of color chromaticity (CIE 1931)

Color coordinates measured at the center point of LCD

Note 7: Measured at the center area of the panel when all the input terminals of LCD panel are electrically opened.

# 8.Interface

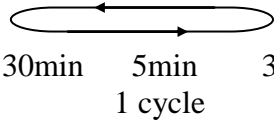
## 8.1. LCM PIN Definition

Pin No.	Symbol	Description	Remarks
1~2	LEDA	LED ANODE	
3~6	NC	No connection	
7-8	LEDK	LED CATHODE	
9	RESET	Global reset pin, Active low	
10	GND	Ground	
11	MIPI_3P	MIPI differential data input	
12	MIPI_3N	MIPI differential data input	
13	GND	Ground	
14	MIPI_2P	MIPI differential data input	
15	MIPI_2N	MIPI differential data input	
16	GND	Ground	
17	MIPI_DCLKP	MIPI differential clock input	
18	MIPI_DCLKN	MIPI differential clock input	
19	GND	Ground	
20	MIPI_1P	MIPI differential data input	
21	MIPI_1N	MIPI differential data input	
22	GND	Ground	
23	MIPI_0P	MIPI differential data input	
24	MIPI_0N	MIPI differential data input	
25	GND	Ground	
26-27	NC	No connection	
28-29	VDD	Power supply 3.3V	
30	IOVCC	Power supply 1.8V	



# 9. Reliability

Content of Reliability Test (Wide temperature, -20°C ~55°C)

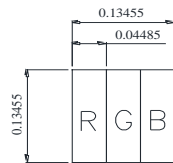
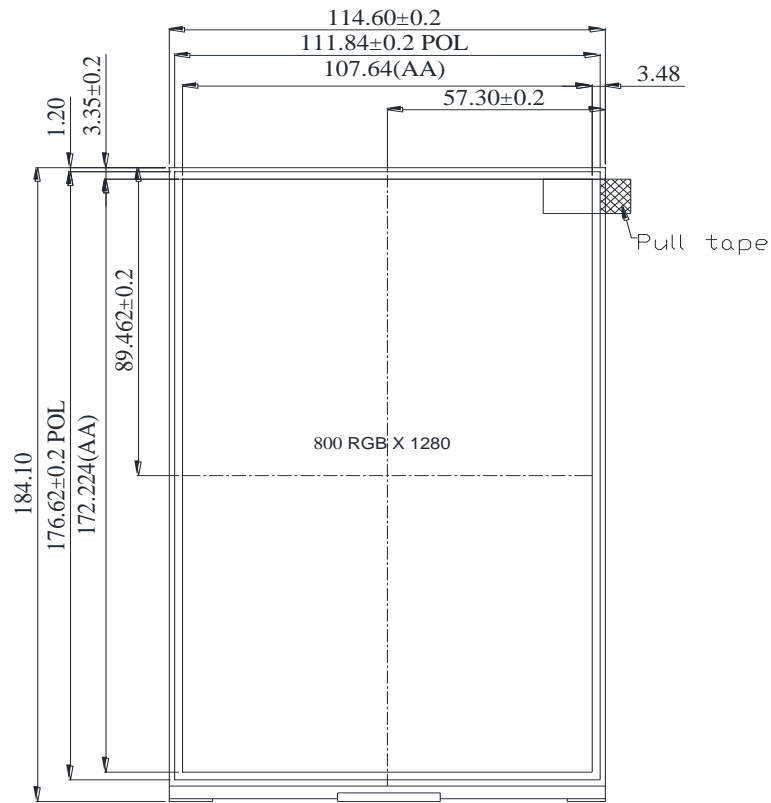
Environmental Test			
Test Item	Content of Test	Test Condition	Note
High Temperature storage	Endurance test applying the high storage temperature for a long time.	60°C 200hrs	2
Low Temperature storage	Endurance test applying the low storage temperature for a long time.	-20°C 200hrs	1,2
High Temperature Operation	Endurance test applying the electric stress (Voltage & Current) and the thermal stress to the element for a long time.	55°C 200hrs	—
Low Temperature Operation	Endurance test applying the electric stress under low temperature for a long time.	-20°C 200hrs	1
High Temperature/ Humidity Operation	The module should be allowed to stand at 40 °C, 90%RH max	40°C, 90%RH 96hrs	1,2
Thermal shock resistance	<p>The sample should be allowed stand the following 10 cycles of operation</p> <p style="text-align: center;">           -20°C    25°C    55°C              30min    5min    30min            1 cycle         </p>	-20°C/55°C 10 cycles	—
Vibration test	Endurance test applying the vibration during transportation and using.	Total fixed amplitude : 1.5mm Vibration Frequency : 10~55Hz One cycle 60 seconds to 3 directions of X,Y,Z for Each 15 minutes	3
Static electricity test	Endurance test applying the electric stress to the terminal.	VS=±600V(contact), ±800v(air), RS=330Ω CS=150pF 10 times	—

Note1: No dew condensation to be observed.

Note2: The function test shall be conducted after 4 hours storage at the normal Temperature and humidity after remove from the test chamber.

Note3: The packing have to including into the vibration testing.

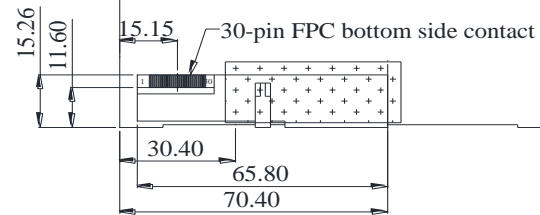
# 10. Contour Drawing



SCALE:200X

2.70MAX

5.00MAX



1	LEDA
2	LEDA
3	NC
4	NC
5	NC
6	NC
7	LEDK
8	LEDK
9	RESET
10	GND
11	MIPI_3P
12	MIPI_3N
13	GND
14	MIPI_2P
15	MIPI_2N
16	GND
17	MIPI_DCLKP
18	MIPI_DCLKN
19	GND
20	MIPI_1P
21	MIPI_1N
22	GND
23	MIPI_OP
24	MIPI_ON
25	GND
26	NC
27	NC
28	VDD
29	VDD
30	IOVCC

The non-specified tolerance of dimension is ±0.3mm.



**1、Panel Specification :**

- 1. Panel Type :  Pass  NG , \_\_\_\_\_
- 2. View Direction :  Pass  NG , \_\_\_\_\_
- 3. Numbers of Dots :  Pass  NG , \_\_\_\_\_
- 4. View Area :  Pass  NG , \_\_\_\_\_
- 5. Active Area :  Pass  NG , \_\_\_\_\_
- 6. Operating Temperature :  Pass  NG , \_\_\_\_\_
- 7. Storage Temperature :  Pass  NG , \_\_\_\_\_
- 8. Others : \_\_\_\_\_

**2、Mechanical Specification :**

- 1. PCB Size :  Pass  NG , \_\_\_\_\_
- 2. Frame Size :  Pass  NG , \_\_\_\_\_
- 3. Material of Frame :  Pass  NG , \_\_\_\_\_
- 4. Connector Position :  Pass  NG , \_\_\_\_\_
- 5. Fix Hole Position :  Pass  NG , \_\_\_\_\_
- 6. Backlight Position :  Pass  NG , \_\_\_\_\_
- 7. Thickness of PCB :  Pass  NG , \_\_\_\_\_
- 8. Height of Frame to PCB :  Pass  NG , \_\_\_\_\_
- 9. Height of Module :  Pass  NG , \_\_\_\_\_
- 10. Others :  Pass  NG , \_\_\_\_\_

**3、Relative Hole Size :**

- 1. Pitch of Connector :  Pass  NG , \_\_\_\_\_
- 2. Hole size of Connector :  Pass  NG , \_\_\_\_\_
- 3. Mounting Hole size :  Pass  NG , \_\_\_\_\_
- 4. Mounting Hole Type :  Pass  NG , \_\_\_\_\_
- 5. Others :  Pass  NG , \_\_\_\_\_

**4、Backlight Specification :**

- 1. B/L Type :  Pass  NG , \_\_\_\_\_
- 2. B/L Color :  Pass  NG , \_\_\_\_\_
- 3. B/L Driving Voltage (Reference for LED Type) :  Pass  NG , \_\_\_\_\_
- 4. B/L Driving Current :  Pass  NG , \_\_\_\_\_
- 5. Brightness of B/L :  Pass  NG , \_\_\_\_\_
- 6. B/L Solder Method :  Pass  NG , \_\_\_\_\_
- 7. Others :  Pass  NG , \_\_\_\_\_



**5、Electronic Characteristics of Module :**

- 1. Input Voltage :                       Pass                       NG , \_\_\_\_\_
- 2. Supply Current :                       Pass                       NG , \_\_\_\_\_
- 3. Driving Voltage for LCD :            Pass                       NG , \_\_\_\_\_
- 4. Contrast for LCD :                     Pass                       NG , \_\_\_\_\_
- 5. B/L Driving Method :                 Pass                       NG , \_\_\_\_\_
- 6. Negative Voltage Output :           Pass                       NG , \_\_\_\_\_
- 7. Interface Function :                  Pass                       NG , \_\_\_\_\_
- 8. LCD Uniformity :                     Pass                       NG , \_\_\_\_\_
- 9. ESD test :                               Pass                       NG , \_\_\_\_\_
- 10. Others :                                 Pass                       NG , \_\_\_\_\_

**6、Summary :**

Sales signature : \_\_\_\_\_

Customer Signature : \_\_\_\_\_

Date :        /        /        \_\_\_\_\_