



晶采光電科技股份有限公司
AMPIRE CO., LTD.

Specifications for LCD module

Customer	
Customer part no.	
Ampire part no.	AM-800600P4TMQW-B0H-E
Approved by	
Date	

Approved For Specifications




Approved For Specifications & Sample

AMPIRE CO., LTD.

4F., No.116, Sec. 1, Xintai 5th Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

新北市汐止區新台五路一段 116 號 4 樓(東方科學園區 A 棟)

TEL:886-2-26967269 , FAX:886-2-26967196 or 26967270

Approved by	Checked by	Organized by
		

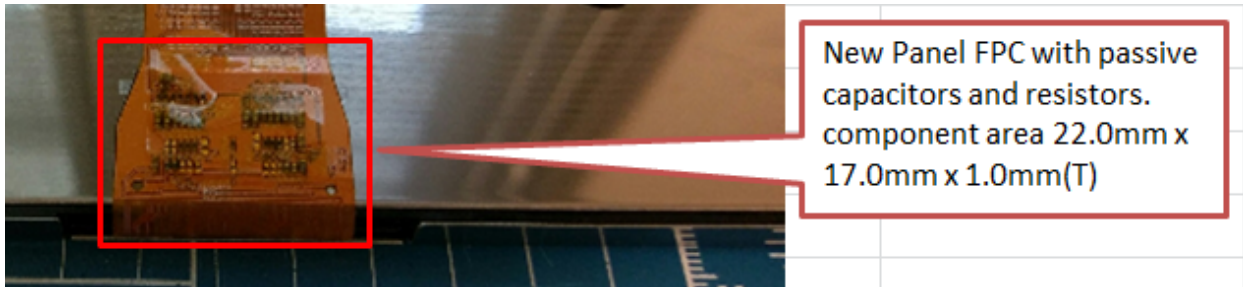
RECORD OF REVISION

Revision Date	Page	Contents	Editor
2018/6/14	--	New Release	Jessica

1. Features

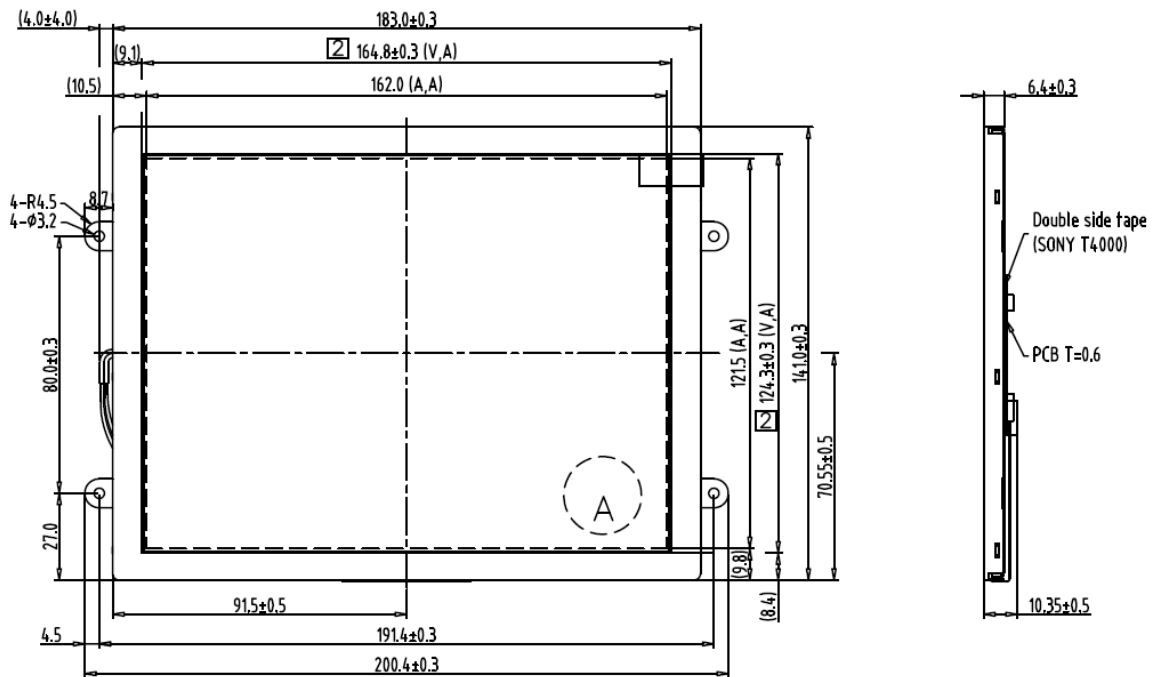
8 inch Amorphous-TFT-LCD (Thin Film Transistor Liquid Crystal Display) module. This module is composed of the 8" TFT-LCD panel, LED backlight, LED driver unit and power circuit unit.

- (1) Construction: 8" a-Si TFT active matrix, White LED Backlight and power circuit board.
- (2) Resolution (pixel): 800(R.G.B) X600
- (3) Number of the Colors : 262K colors (R , G , B 6 bit digital each)
- (4) LCD type : Transmissive, normally White
- (5) Interface: RGB interface 40 pin
- (6) Power Supply Voltage: 3.3V for logic voltage, 5.0V for LED driver power voltage.
- (7) Viewing Direction: 6 O'clock (Gray Inversion)
- (8) New TFT LCD Panel (LCD Mask). Passive RC on FPC.



2. Physical Specifications

Item	Specifications	unit
LCD size	8 inch (Diagonal)	
Resolution	800 x 3(RGB) x 600	dot
Active area	162.0(W) x 121.5(H)	mm
Color arrangement	RGB-stripe	
Interface	Digital	



3. Absolute Max. Ratings

Item	Symbol	Values		Unit	Note
		Min.	Max.		
Power voltage	VCC	-0.5	5	V	
	VLED	-0.5	18		
Input signal voltage	Vi	-0.3	VCC+0.3	V	Note 1
Operation temperature	TOP	-20	70	°C	
Storage temperature	TST	-30	80	°C	

Note(1) The product is subject to be damaged permanently if stresses beyond those absolute maximum ratings listed above.

Note(2) Signals include: DCLK, DE, HS, VS, R0~R5, G0~G5, B0~B5.

4. Electrical Characteristics

4.1 Typical Operation Conditions

Item	Symbol	Values			Unit	Remark	
		Min.	Typ.	Max.			
Power Voltage	VCC	3.0	3.3	3.6	V	Note(1),(2)	
Power Consumption	ICC	-	125	-	mA	Note(1),(2) VCC=3.3V	
Logic Input Voltage	Input Voltage	VIN	0	-	VCC	V	
	Logic input high voltage	VTH	0.7*VCC	-	VCC	V	Note(3)
	Logic input low voltage	VTL	GND	-	0.3*VCC	V	Note(3)

Note(1) Value for Power Board combined panel.

Note(2) VCC setting should match the signals output voltage (refer to Note 3) of customer's system board.

Note(3) DCLK, DE, HS, VS, R0~R5, G0~G5, B0~B5.

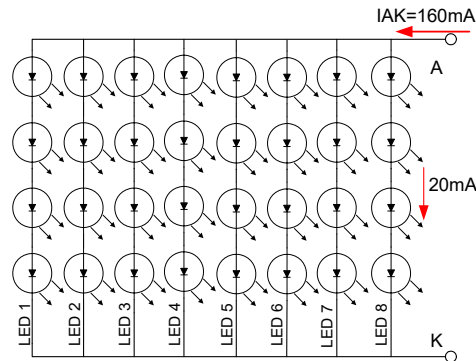
4.2 Backlight Driving Conditions

Item	Symbol	Values			Unit	Note
		Min.	Typ.	Max.		
LED Driver voltage	VLED	4.5	5	5.5	V	
Power Supply Current For LED Driver	ILED	-	510	-	mA	VLED=5V VADJ=3.3V (duty 100%)
ADJ Input Voltage	VADJ	-	3.3	5	V	duty=100% Note(3)
LED voltage	VAK	12	13.2	14.4	V	IAK=160mA Ta=25°C
LED current	IAK	144	160	178	mA	Ta=25°C
		--	120	--	mA	Ta=60°C
LED Life Time	-	--	25K	--	Hour	Note (2)

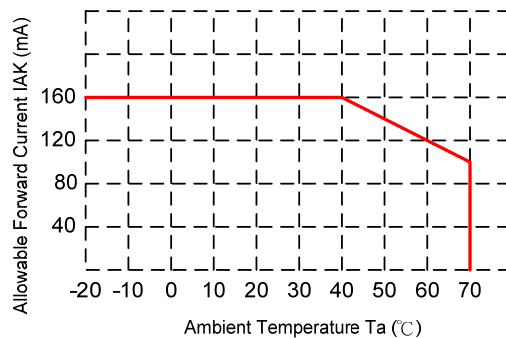
Note(1) The constant current source is needed for white LED back-light driving.

When LCM is operated over 60°C ambient temperature, the IAK of the LED back-light should be adjusted to 120mA max.

Note(2) Brightness to be decreased to 50% of the initial value.



Note(3) When LCM is operated over 40°C ambient temperature, the IAK should be follow :



5. Optical Specifications

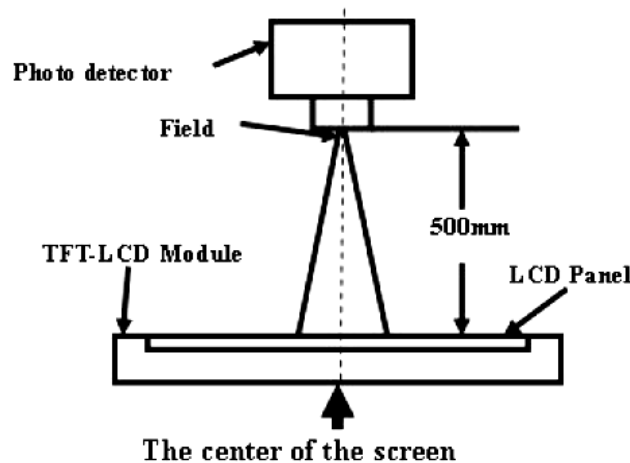
Item	Symbol	Condition	Values			Unit	Note
			Min.	Typ.	Max.		
Viewing angle (CR \geq 10)	θ_L	$\Phi = 180^\circ$ (9 o'clock)	60	70	--	degree	Note1
	θ_R	$\Phi = 0^\circ$ (3 o'clock)	60	70	--		
	θ_T	$\Phi = 90^\circ$ (12 o'clock)	40	50	--		
	θ_B	$\Phi = 270^\circ$ (6 o'clock)	60	70	--		
Response time	TON	T=25°	--	25	30	msec	Note3
	TOFF		--	25	30	msec	
Contrast ratio	CR	Normal $\theta = \Phi = 0^\circ$	400	500	--	--	Note4
Color chromaticity (BM-7)	Rx		Typ. -0.05	Typ. +0.05	0.603	--	Note5 Note6
	Ry				0.325		
	Gx				0.304		
	Gy				0.552		
	Bx				0.138		
	By				0.136		
	Wx				0.314		
	Wy				0.338		
Luminance (BM-7)	L		400	500	--	cd/m ²	Note6
Transmittance	L	5.8	6.1	--	%	Note7	

Test Conditions:

1. The ambient temperature is 25°C.
2. The test systems refer to Note(1) and Note(2).

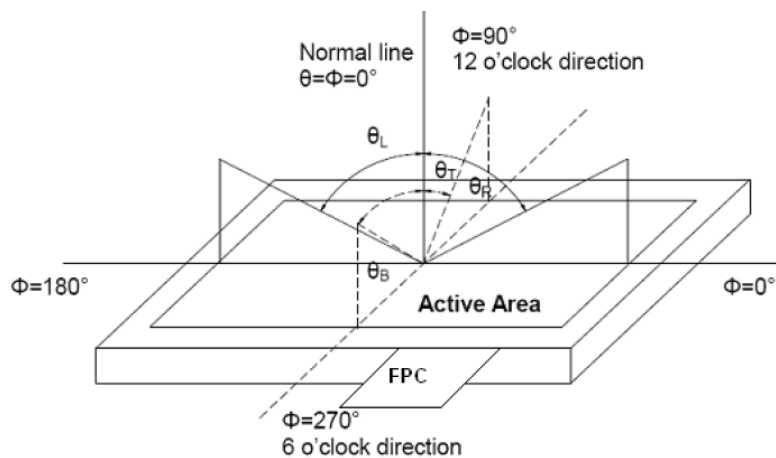
Note(1) Definition of optical measurement system.

The optical characteristics should be measured in dark room. After 5 Minutes operation, the optical properties are measured at the center point of the LCD screen. All input terminals LCD panel must be ground when measuring the center area of the panel.



Note(2) Definition of viewing angle range and measurement system.

Viewing angle is measured at the center point of the LCD by conoscope (ergo-80).



Note(3) Definition of contrast ratio

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

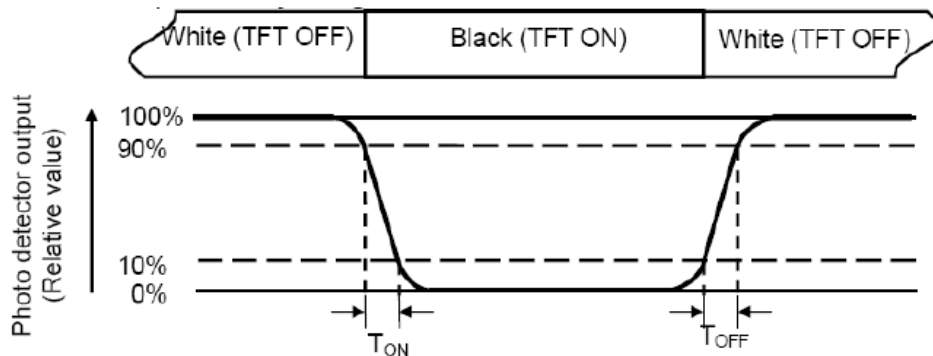
“White state “: The state is that the LCD should drive by V_{white} .

“Black state”: The state is that the LCD should drive by V_{black} .

V_{white} : To be determined V_{black} : To be determined.

Note(4) Definition of Response time

The response time is defined as the LCD optical switching time interval between “White” state and “Black” state. Rise time (TON) is the time between photo detector output intensity changed from 90% to 10%. And fall time (TOFF) is the time between photo detector output intensity changed from 10% to 90%.



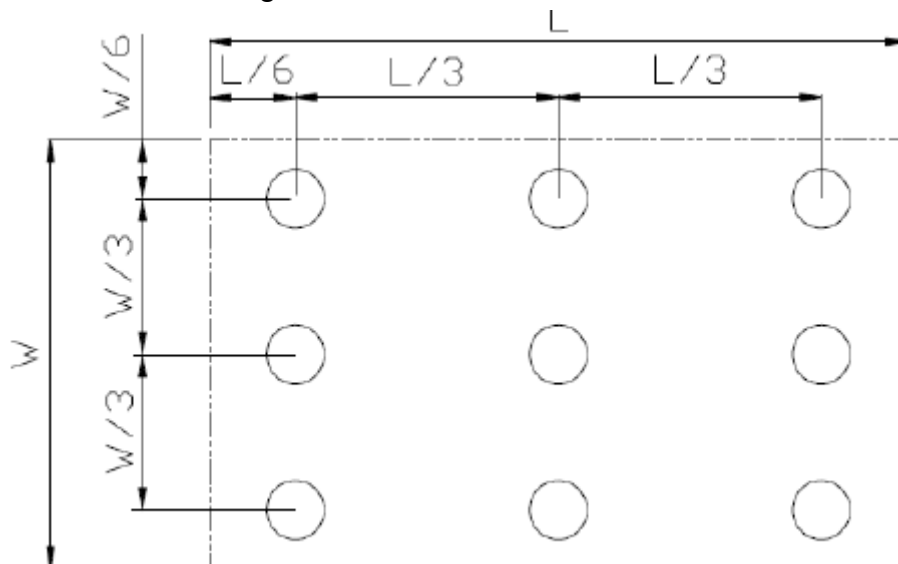
Note(5) Definition of color chromaticity (CIE1931) Color coordinates measured at center point of LCD.

Note(6) Definition of Luminance Uniformity.

Active area is divided into 9 measuring areas (Refer Fig. 2). Every measuring point is placed at the center of each measuring area.

$$\text{Luminance Uniformity (U)} = \text{Lmin} / \text{Lmax}$$

L----Active area length, W---- Active area width



Lmax: The measured Maximum luminance of all measurement position.

Lmin: The measured Minimum luminance of all measurement position.

Note(7) Definition of Luminance

Measure the luminance of white state at center point.

6. Interface

TFT LCD Panel Driving Section

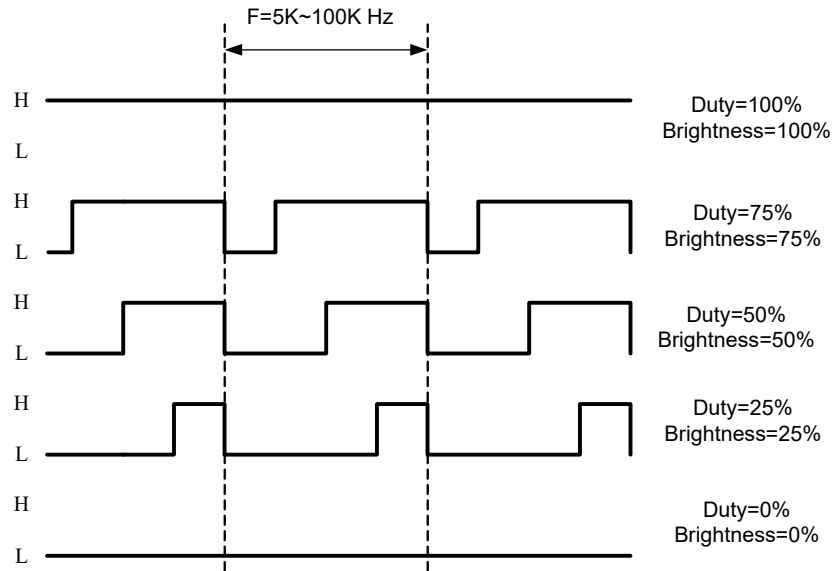
Pin No.	Symbol	I/O	Description	Note
1	VLED	P	Voltage for LED circuit (5.0V)	
2	VLED	P	Voltage for LED circuit (5.0V)	
3	ADJ	I	Adjust the LED brightness	(1)
4	GLED	P	Ground for LED circuit	
5	GLED	P	Ground for LED circuit	
6	VCC	P	Power supply for digital circuit (3.3V)	
7	VCC	P	Power supply for digital circuit (3.3V)	
8	MODE	I	DE or SYNC mode control	(2)
9	DE	I	Data enable	
10	VSYNC	I	VSYNC signal input	
11	HSYNC	I	HSYNC signal input	
12	GND	P	Power ground	
13	B5	I	Blue data input (MSB)	
14	B4	I	Blue data input	
15	B3	I	Blue data input	
16	GND	P	Power ground	
17	B2	I	Blue data input	
18	B1	I	Blue data input	
19	B0	I	Blue data input (LSB)	
20	GND	P	Power ground	
21	G5	I	Green data input (MSB)	
22	G4	I	Green data input	
23	G3	I	Green data input	
24	GND	P	Power ground	
25	G2	I	Green data input	

26	G1	I	Green data input	
27	G0	I	Green data input (LSB)	
28	GND	P	Power ground	
29	R5	I	Red data input (MSB)	
30	R4	I	Red data input	
31	R3	I	Red data input	
32	GND	P	Power ground	
33	R2	I	Red data input	
34	R1	I	Red data input	
35	R0	I	Red data input (LSB)	
36	GND	P	Power ground	
37	DCLK	I	Sample clock	
38	GND	P	Power ground	
39	L/R	I	Select left to right scanning direction	(3)
40	U/D	I	Select up or down scanning direction	(3)

I: input, O: output, P: power

Note(1) Pin3: ADJ is PWM signal input. It is for brightness control.

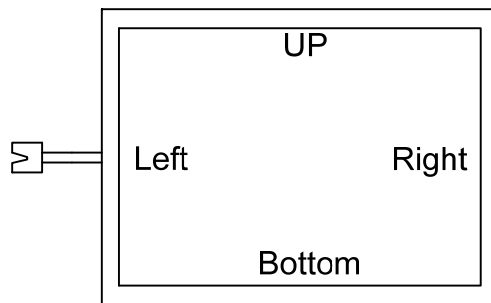
Item	Symbol	Min.	Typ.	Max.	Unit
ADJ signal frequency	fPWM	5K	20K	100K	Hz
ADJ signal logic level High	VIH	2.4V	--	VLED (5.0V)	V
ADJ signal logic level Low	VIL	0	--	0.8	V



Note(2) DE Mode, Mode="H", HSYNC floating and VSYNC floating
HV Mode, Mode="L" and DE floating

Note(3) Selection of scanning mode

Setting of scan control input		Scanning direction
U/D	L/R	
GND	VCC	Up to Down, Left to Right
VCC	GND	Down to Up, Right to Left
GND	GND	Up to Down, Right to Left
VCC	VCC	Down to Up, Left to Right



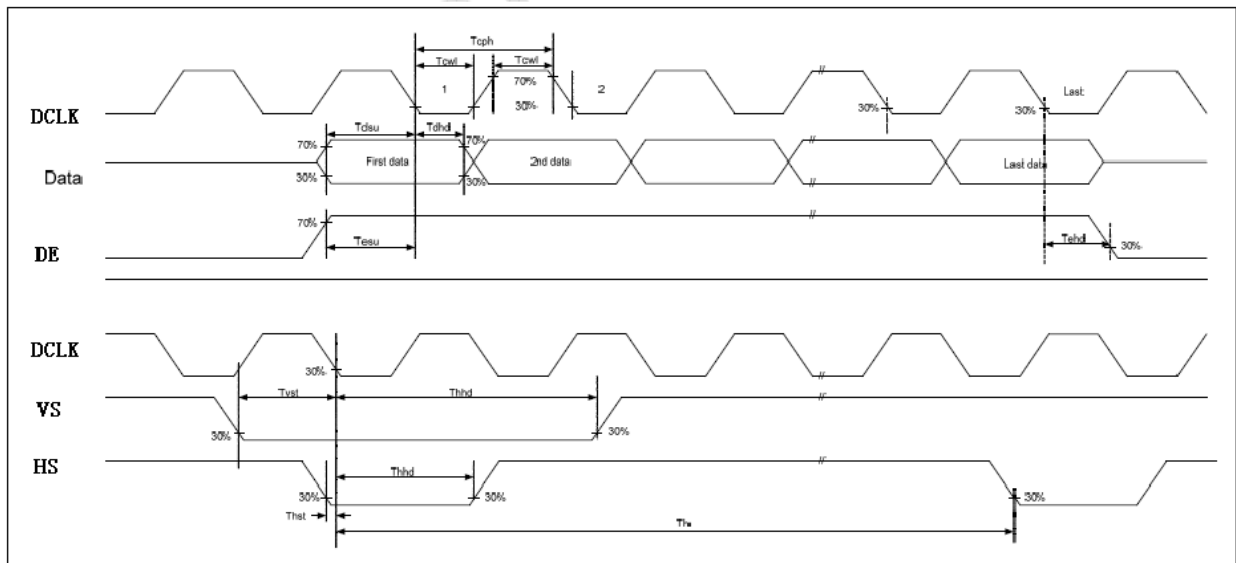
7. Interface Timing

7.1 TFT-LCD Input

VCC=3.3V, AVDD=12.5V, AGND=GND=0V, Ta=25°C

Parameter	Symbol	Min	Typ.	Max	Unit	Conditions
DCLK Frequency	Fclk	-	40	50	MHz	-
DCLK Cycle Time	Tcph	20	25		ns	-
DCLK Pulse Width	Tcw	40%	50%	60%	Tcph	-
VSD Setup Time	Tvst	8	-	-	ns	-
VSD Hold Time	Tvhd	8	-	-	ns	-
HSD Setup Time	Thst	8	-	-	ns	-
HSD Hold Time	Thhd	8	-	-	ns	-
Data Setup Time	Tdsu	8	-	-	ns	Data to DCLK
Data Hold Time	Tdhd	8	-	-	ns	Data to DCLK
DE Setup Time	Tesu	8	-	-	ns	-
DE Hold Time	Tehd	8	-	-	ns	-

Input Clock and Data timing Diagram:



7.2 Recommended Timing Setting Of TCON

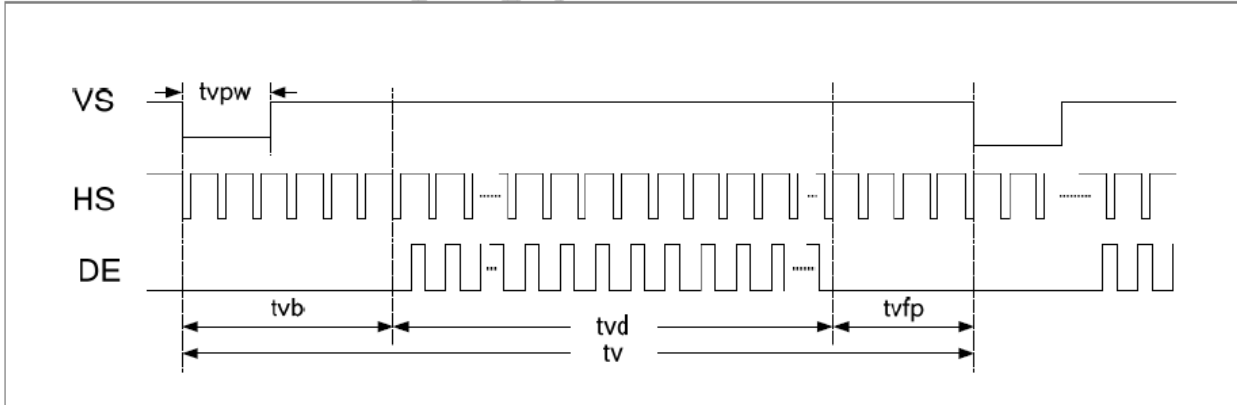
TCON (Embedded In Source IC) Input Timing (DCLK, HSD, VSD, DE)

VCC=3.3V, AVDD=12.5V, AGND=GND=0V, Ta=25°C

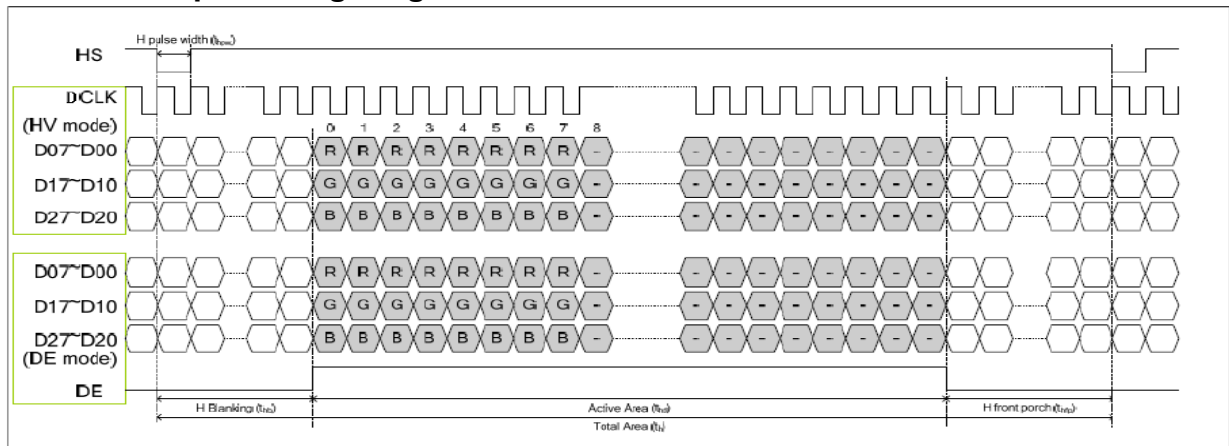
Parameter	Symbol	Min	Typ.	Max	Unit	Remark
DCLK	F _{clk}	-	40	50	MHz	-
	t _{clk}	20	25	-	ns	-
HSD	t _h	-	1000	-	t _{clk}	-
	t _{hd}	-	800	-	t _{clk}	-
	t _{h_{pw}}	1	48	-	t _{clk}	-
	t _{hb}	-	88	-	t _{clk}	-
	t _{h_{fp}}	-	112	-	t _{clk}	-
VSD	t _v	-	660	-	th	-
	t _{vd}	-	600	-	th	-
	t _{v_{pw}}	-	3	-	th	-
	t _{vb}	-	39	-	th	-
	t _{v_{fp}}	-	21	-	th	-

Note: DE timing refer to HSD, VSD input timing.

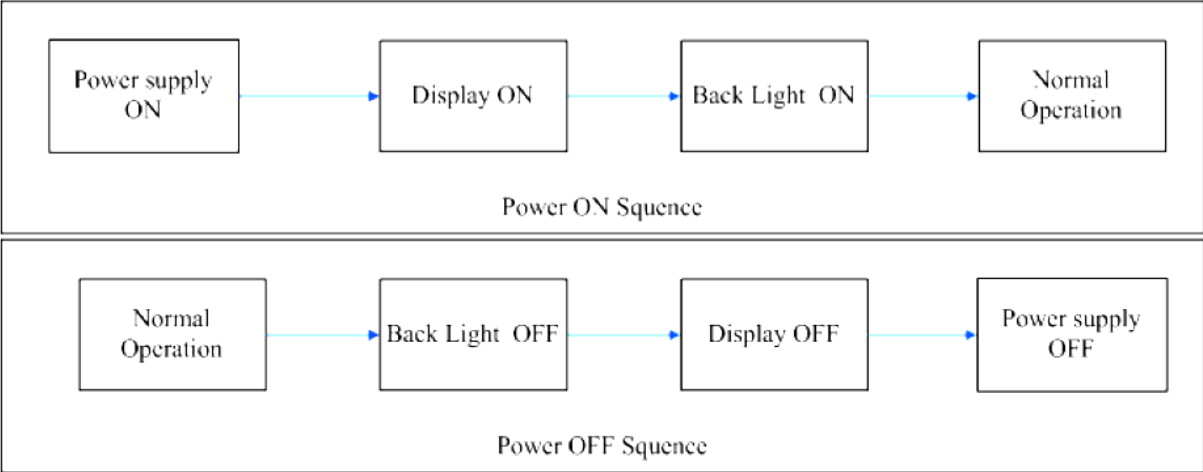
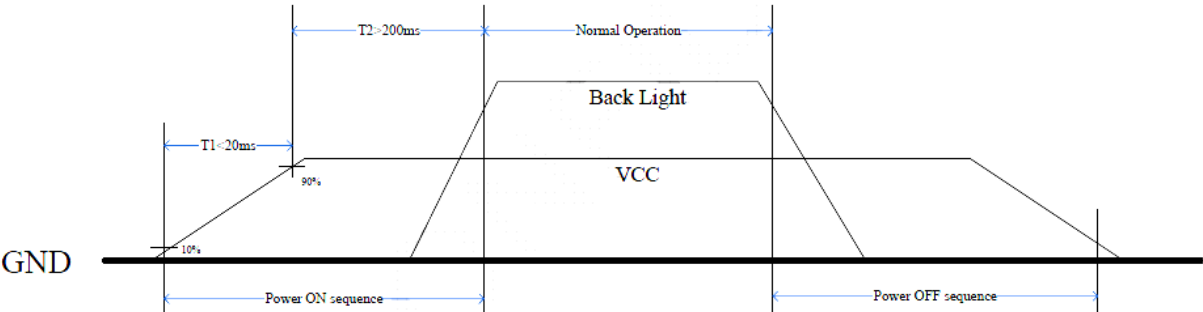
Vertical input timing Diagram:



Horizontal input timing Diagram:



7.3 Power ON/OFF Sequence



8. Reliability Test Conditions

Test Item	Test Conditions	Note
High Temperature Operation	70±3°C , t=240 hrs	
Low Temperature Operation	-20±3°C , t=240 hrs	
High Temperature Storage	80±3°C , t=240 hrs	1,2
Low Temperature Storage	-30±3°C , t=240 hrs	1,2
Storage at High Temperature and Humidity	60°C, 90% RH , 240 hrs	1,2
Thermal Shock Test	-20°C (30min) ~ 70°C (30min) 100 cycles	1,2
Vibration Test (Packing)	Sweep frequency : 10 ~ 55 ~ 10 Hz/1min Amplitude : 0.75mm Test direction : X.Y.Z/3 axis Duration : 30min/each axis	2

Note(1) Condensation of water is not permitted on the module.

Note(2) The module should be inspected after 1 hour storage in normal conditions (15-35°C, 45-65%RH).

Note(3) The module shouldn't be tested over one condition, and all the tests are independent.

Note(4) All reliability tests should be done without the protective film.

Definitions of life end point:

- Current drain should be smaller than the specific value.
- Function of the module should be maintained.
- Appearance and display quality should not have degraded noticeably.
- Contrast ratio should be greater than 50% of initial value.

9. General Precautions

9.1 Safety

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

9.2 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.

9.3 Static Electricity

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

9.4 Storage

- (1) Store the module in a dark room where must keep at $+25\pm 10^{\circ}\text{C}$ 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.

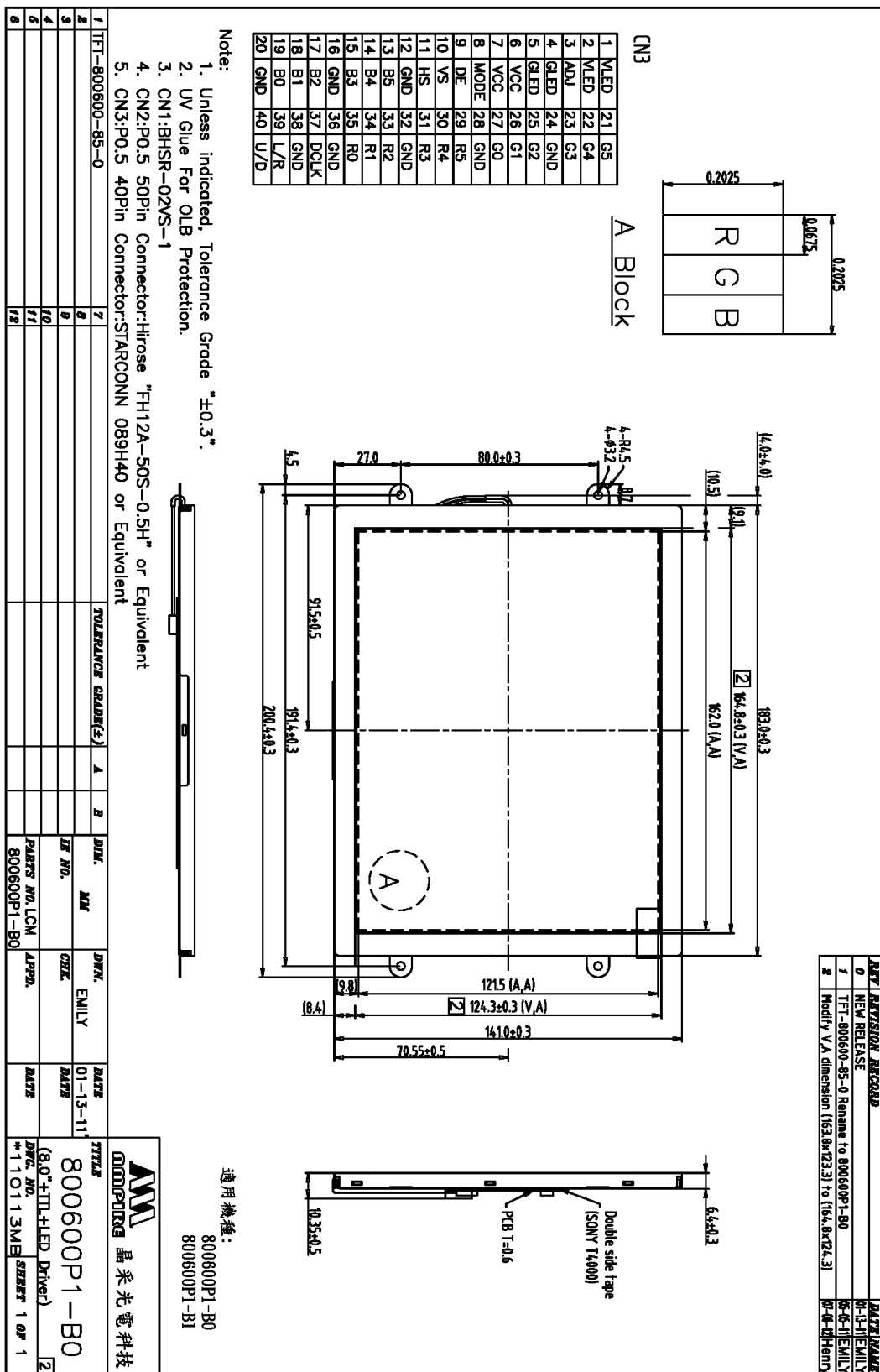
9.5 Cleaning

- (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.

9.6 Others

- (1) Do not disassemble or take the LC module into pieces. The LC modules once disassembled or taken into pieces are not the guarantee articles.
- (2) AMIPRE will provide one year warrantee for all products and three months warrantee for all repairing products.
- (3) Do not keep the LCD at the same display pattern continually. The residual image will happen and it will damage the LCD. Please use screen saver.

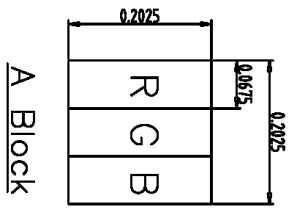
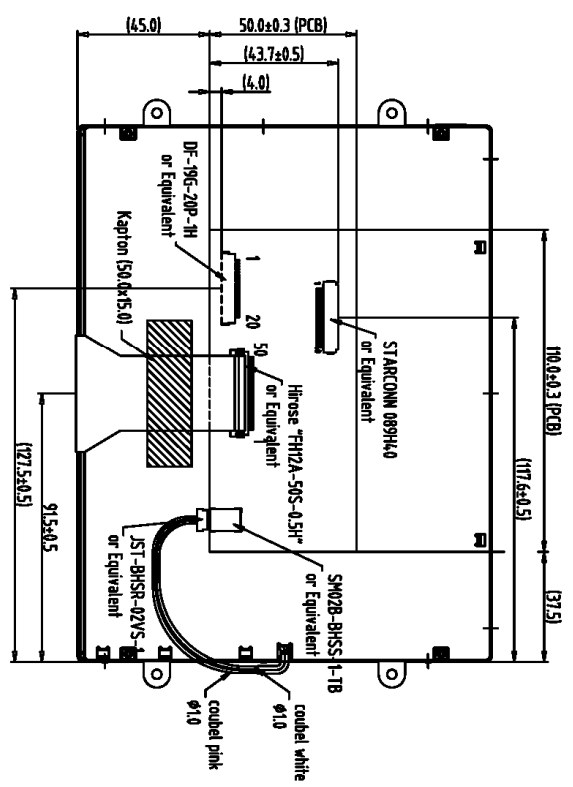
10. Outline Dimension



DATE	REVISION	RECORD
0	NEW RELEASE	
1	TFT-800600-85-0 Rename to 800600P1-B0	
DATE	NAME	
05-11	EMILY	
05-11	EMILY	

CN3

1	VLED	21	G5
2	VLED	22	G4
3	ADJ	23	G3
4	GLED	24	GND
5	GLED	25	G2
6	VCC	26	G1
7	VCC	27	G0
8	MODE	28	GND
9	DE	29	R5
10	VS	30	R4
11	HS	31	R3
12	GND	32	GND
13	B5	33	R2
14	B4	34	R1
15	B3	35	R0
16	GND	36	GND
17	B2	37	DCLK
18	B1	38	GND
19	B0	39	L/R
20	GND	40	U/D



- Note:
1. Unless indicated, Tolerance Grade "±0.3".
 2. UV Glue For OLB Protection.
 3. CN1:BHSR-02VS-1
 4. CN2:PO.5 50Pin Connector:Hirose "FH12A-50S-0.5H" or Equivalent
 5. CN3:PO.5 40Pin Connector:STARCONN 089H40 or Equivalent

Back View

適用機種：
800600P1-B0
800600P1-B1

1	TFT-800600-85-0	7	TOLERANCE GRADIENT(S)	A	B	DIR.	MM	DIR.	EMILY	DATE
2		8								05-05-11
3		9				IR NO.		CHK		DATE
4		10								
5		11				PARTS NOLCM-1		APPN.		DATE
6		12				800600P1-B0				
<p>TTTTP</p> <p>800600P1-B0</p> <p>(8.0"+TTL+LED Driver)</p> <p>DIR. NO. *110114MA</p> <p>SHEET 1 OF 1</p>										