



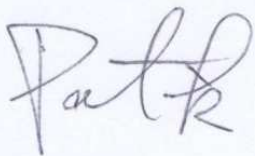


晶采光電科技股份有限公司
AMPIRE CO., LTD.

SPECIFICATIONS FOR LCD MODULE

CUSTOMER	
CUSTOMER PART NO.	
AMPIRE PART NO.	AM-800600P4TMQW-A0H
APPROVED BY	
DATE	

- Approved For Specifications
- Approved For Specifications & Sample

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APPROVED BY	CHECKED BY	ORGANIZED BY
		

RECORD OF REVISION

Revision Date	Page	Contents	Editor
2013/12/5	--	New Release	Kokai

1. Features

8 inch Amorphous-TFT-LCD (Thin Film Transistor Liquid Crystal Display) module. This module is composed of a 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: 20 Pin (LVDS interface)
- (6) Power Supply Voltage: 3.3V for logic voltage, 5.0V for LED driver power voltage.
- (7) Viewing Direction: 6 O'clock (Gray Inversion)

2. PHYSICAL SPECIFICATIONS

Item	Specifications	unit
LCD size	8 inch (Diagonal)	
Resolution	800 x 3(RGB) x 600	dot
Dot pitch	0.0675(W) x 0.2025(H)	mm
Active area	162.0(W) x 121.5(H)	mm
Module size	200.4(W) x 141.0(H) x 10.35(D)	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.

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	V_{CC}	3.0	3.3	3.6	V	Note 1,2
Power Consumption	I_{CC}	-	125	-	mA	Note 1,2 $V_{CC}=3.3V$
Logic Input Voltage	Input Voltage	V_{IN}	0	-	V_{CC}	V
	Logic input high voltage	V_{TH}	$0.7V_{CC}$	-	V_{CC}	V Note 3
	Logic input low voltage	V_{TL}	GND	-	$0.3V_{CC}$	V Note 3

Note 1: Value for Power Board combined panel.

Note 2: V_{CC} 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.

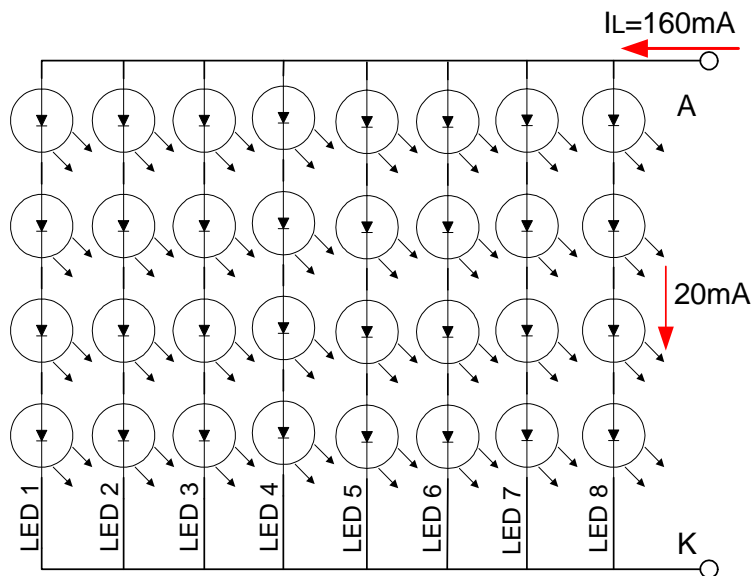
4-2 Backlight Driving Conditions

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	V _{ADJ}	-	3.3	5	V	duty=100% Note(3)
LED voltage	V _{AK}	12	13.2	14.4	V	I _L =160mA Ta=25°C
LED current	I _L	144	160	178	mA	Ta=25°C
		--	120	--	mA	Ta=60°C
LED Life Time	-	--	25K	--	Hour	Note (2)

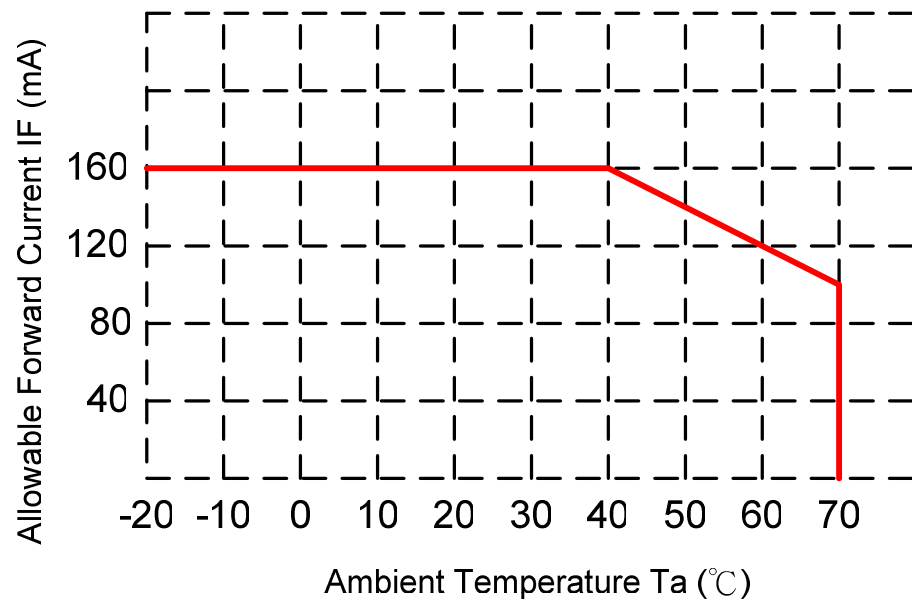
Note (1) The constant current source is needed for white LED back-light driving.

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

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



When LCM is operated over 40°C ambient temperature, the ILED 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	Rx		0.553	0.603	0.653	--	Note5 Note6
	Ry		0.275	0.325	0.375		
	Gx		0.254	0.304	0.354		
	Gy		0.502	0.552	0.602		
	Bx		0.088	0.138	0.188		
	By		0.086	0.136	0.186		
	Wx		0.264	0.314	0.364		
	Wy		0.288	0.338	0.388	--	
Luminance	L		400	500	--	cd/m ²	Note6
Transmittance	L	5.8	6.1	--	%	Note7	

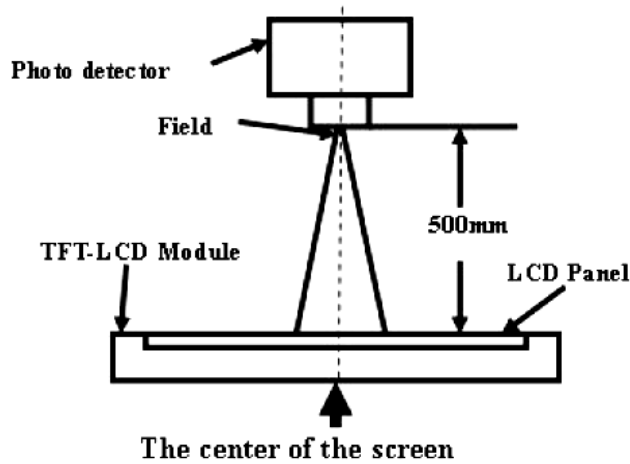
Test Conditions:

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

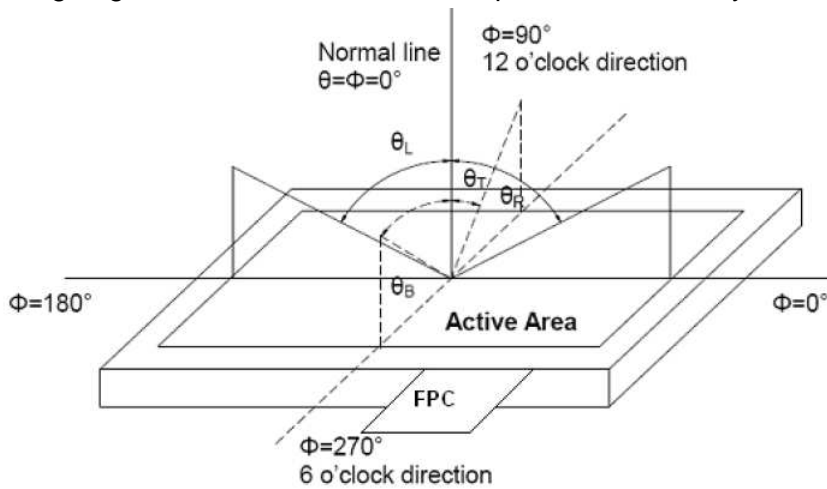
panel must be ground when measuring the center area of the panel.



Item	Photo detector	Field
Contrast Ratio	BM-5A	1°
Luminance		
Lum Uniformity		
Chromaticity	SR-3A	
Response Time	TRD100	-

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.

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

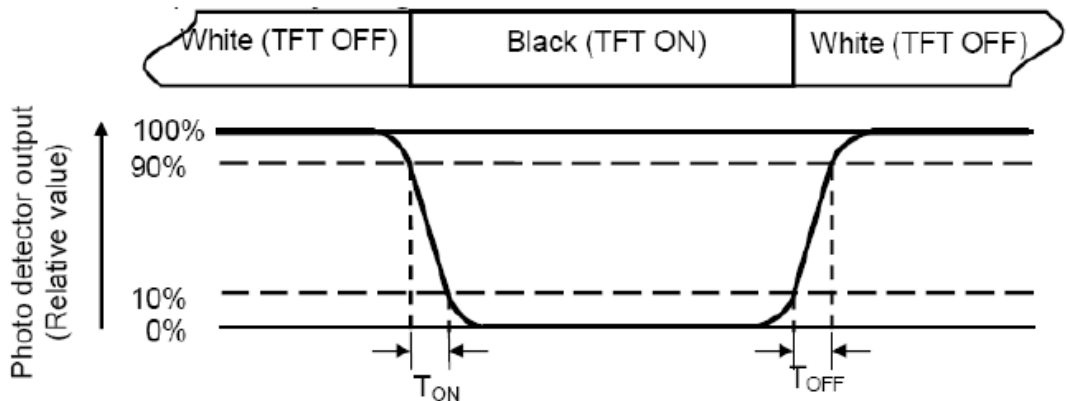
“White state “: The state is that the LCD should drive by V_{white} .

“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 (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%.



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

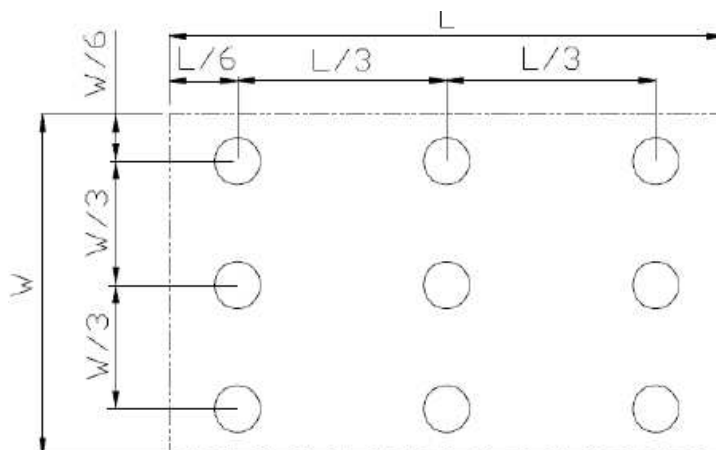
Note 6: Definition of Luminance Uniformity.

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

the center of each measuring area.

Luminance Uniformity (U) = L_{min} / L_{max}

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



L_{max} : The measured Maximum luminance of all measurement position.

L_{min} : The measured Minimum luminance of all measurement position.

Note 7: Definition of Luminance.

Measure the luminance of white state at center point.

6. INTERFACE

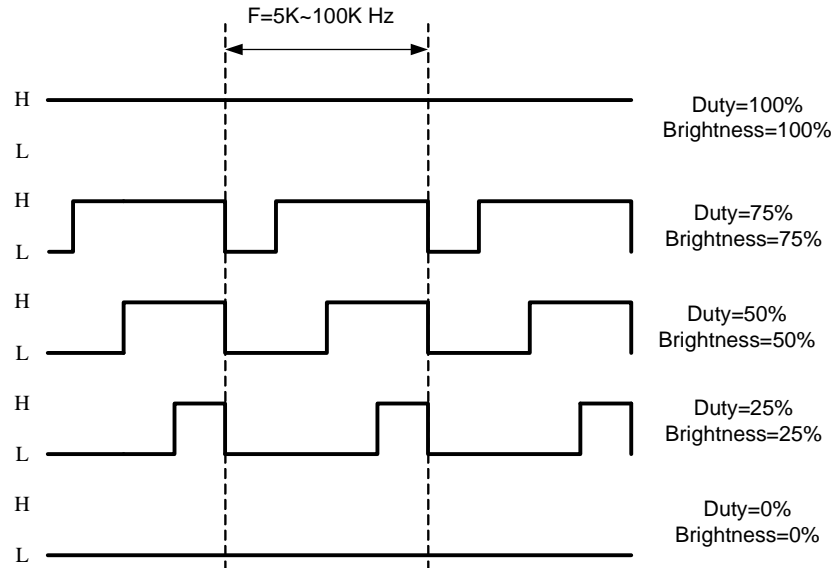
TFT LCD Panel Driving Section

Pin No.	Symbol	Description	Note
1	VDD	POWER SUPPLY:3.3V	
2	VDD	POWER SUPPLY:3.3V	
3	GND	Power Ground	
4	GND	Power Ground	
5	IN0-	Transmission Data	
6	IN0+	Transmission Data	
7	GND	Power Ground	
8	IN1-	Transmission Data	
9	IN1+	Transmission Data	
10	GND	Power Ground	
11	IN2-	Transmission Data	
12	IN2+	Transmission Data	
13	GND	Power Ground	
14	CLK-	Sampling Clock	
15	CLK+	Sampling Clock	
16	GND	Power Ground	
17	VLED	POWER SUPPLY for Backlight : 5V	
18	VLED	POWER SUPPLY for Backlight : 5V	
19	GND	Power Ground	
20	ADJ	Adjust the LED brightness	

NOTE :

(1) Pin19: ADJ is PWM signal input. It is for brightness control.

ITEM	SYMBOL	MIN	TYP	MAX	UNIT
ADJ signal frequency	f_{PWM}	5K	20K	100K	Hz
ADJ signal logic level High	V_{IH}	2.4V	--	V_{LED} (5.0V)	V
ADJ signal logic level Low	V_{IL}	0	--	0.8	V



7. INTERFACE TIMING (The information as below is to be defined.)

7.0 Recommended Timing Setting Of TCON

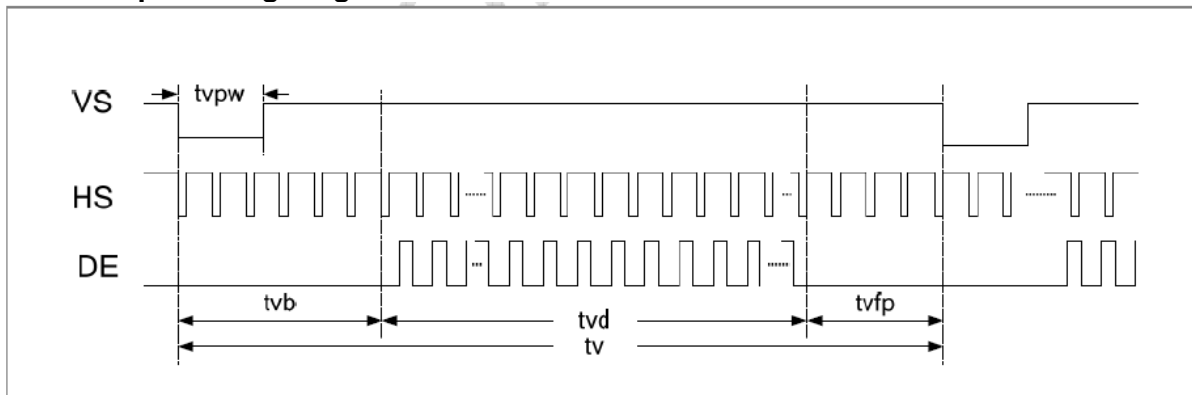
TCON (Embedded In Source IC) Input Timing (DCLK, HSD, VSD, DE)

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

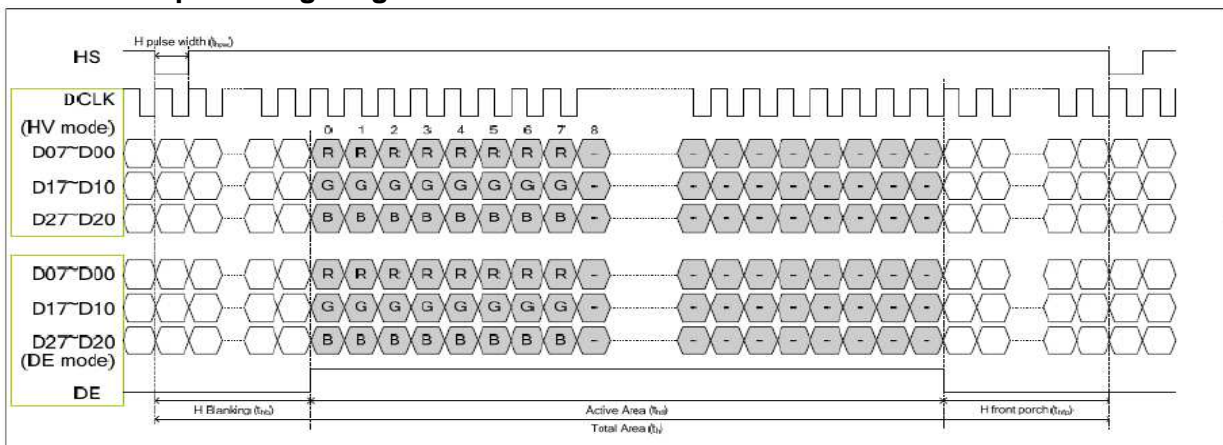
Parameter	Symbol	Min	Typ.	Max	Unit	Remark
DCLK	F _{clk}	-	40	50	MHz	-
	t _{clk}	20	25	-	ns	-
HSD	t _h	-	1000	-	t _{clk}	-
	t _{hd}	-	800	-	t _{clk}	-
	t _{hpw}	1	48	-	t _{clk}	-
	t _{hb}	-	88	-	t _{clk}	-
	t _{hfp}	-	112	-	t _{clk}	-
VSD	t _v	-	660	-	th	-
	t _{vd}	-	600	-	th	-
	t _{vpw}	-	3	-	th	-
	t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

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

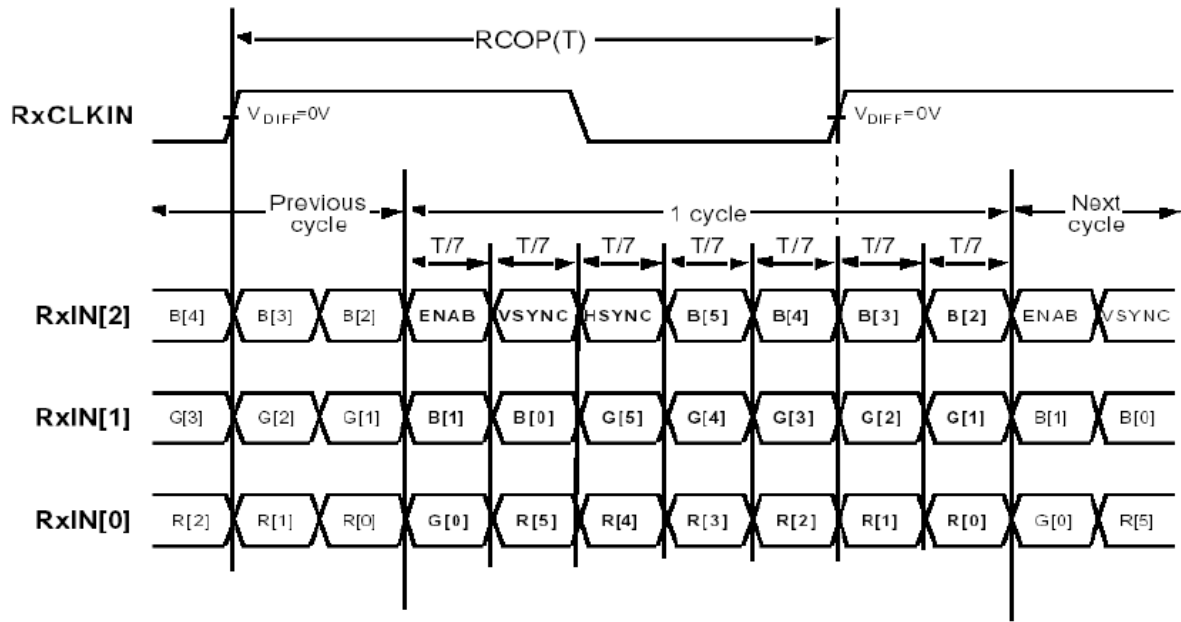
Vertical input timing Diagram:



Horizontal input timing Diagram:

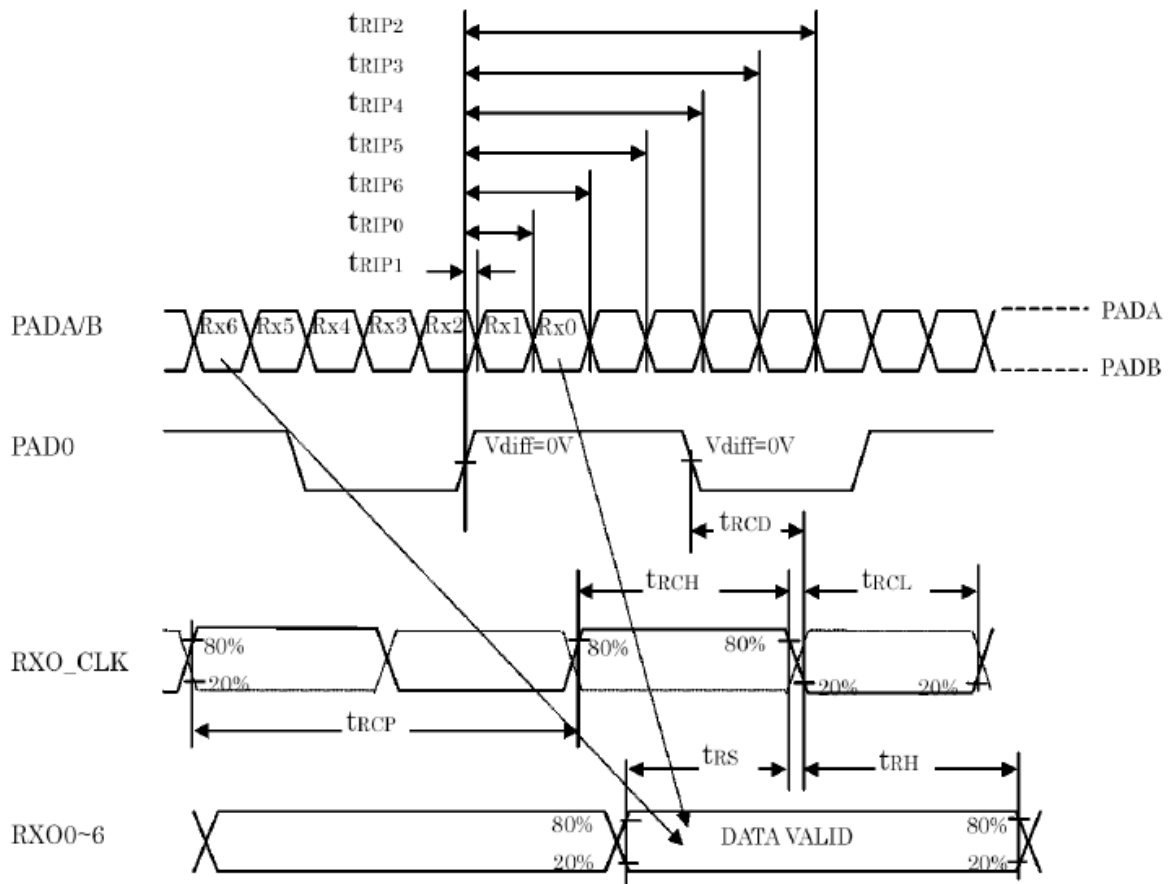


7-1 LVDS SIGNAL :



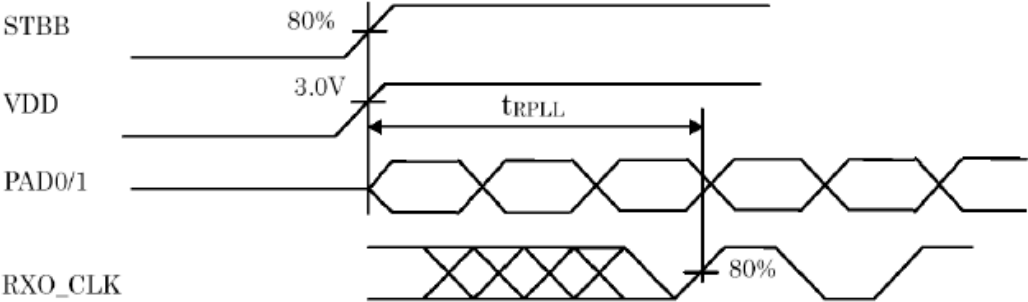
Note : R/G/B[5]s are MSBs and R/G/B[0]s are LSBs

7-2 LVDS AC Timing Diagram :

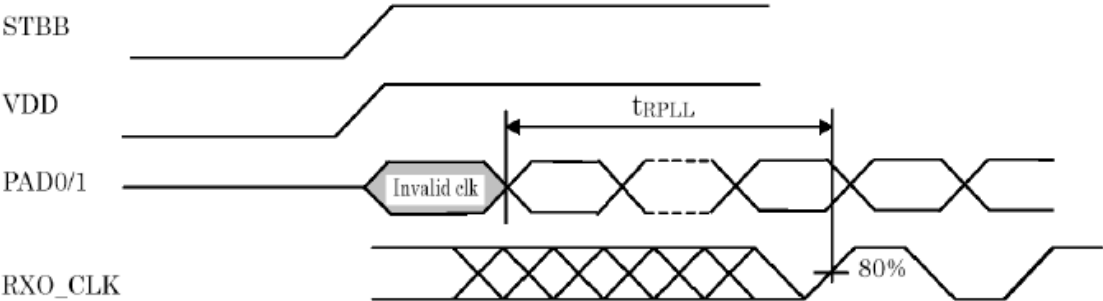


7-3 Phase Lock Loop Set Time :

(Case1)



(Case2)

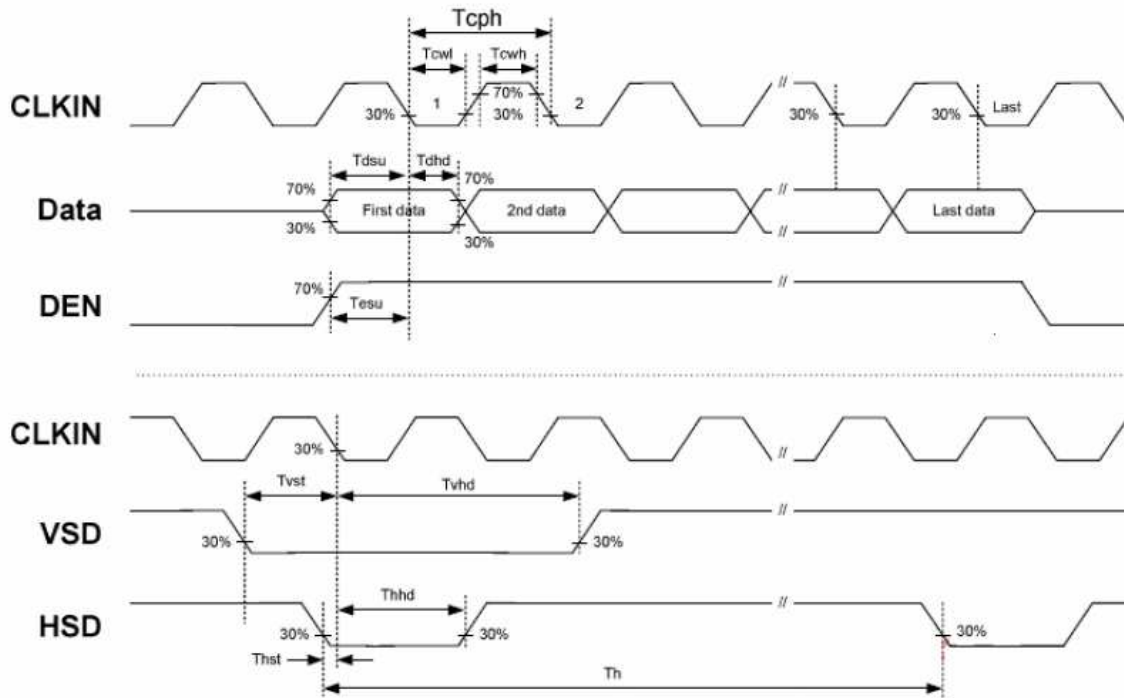


7-4 Switching Characteristics :

< recommended operating condition (unless otherwise noted) >

Parameter	Symbol	min	typ	max	Unit
RXO_CLK Period	t_{RCP}	11.76	T	50	ns
RXO_CLK High Time	t_{RCH}	-	T/2	-	ns
RXO_CLK Low Time	t_{RCL}	-	T/2	-	ns
PAD0/1 to RXO_CLK Delay	t_{RCD}	-	3T/7	-	ns
Data Setup to RXO_CLK	t_{RS}	1.9	-	-	ns
Data Hold from RXO_CLK	t_{RH}	3.0	-	-	ns
Input Data Position 0 (T=11.76ns) (note1)	t_{RIP1}	-0.4	0	0.4	ns
Input Data Position 1 (T=11.76ns) (note1)	t_{RIP0}	T/7-0.4	T/7	T/7+0.4	ns
Input Data Position 2 (T=11.76ns) (note1)	t_{RIP6}	2T/7-0.4	2T/7	2T/7+0.4	ns
Input Data Position 3 (T=11.76ns) (note1)	t_{RIP5}	3T/7-0.4	3T/7	3T/7+0.4	ns
Input Data Position 4 (T=11.76ns) (note1)	t_{RIP4}	4T/7-0.4	4T/7	4T/7+0.4	ns
Input Data Position 5 (T=11.76ns) (note1)	t_{RIP3}	5T/7-0.4	5T/7	5T/7+0.4	ns
Input Data Position 6 (T=11.76ns) (note1)	t_{RIP2}	6T/7-0.4	6T/7	6T/7+0.4	ns
Phase Lock Loop Set	t_{RPLL}	-	-	10	ms

note1 : VDD=3.3V, Ta=25°C



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).

10. General Precautions

10-1 Safety

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.

10-2 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.

10-3 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.

10-4 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.

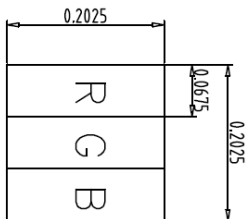
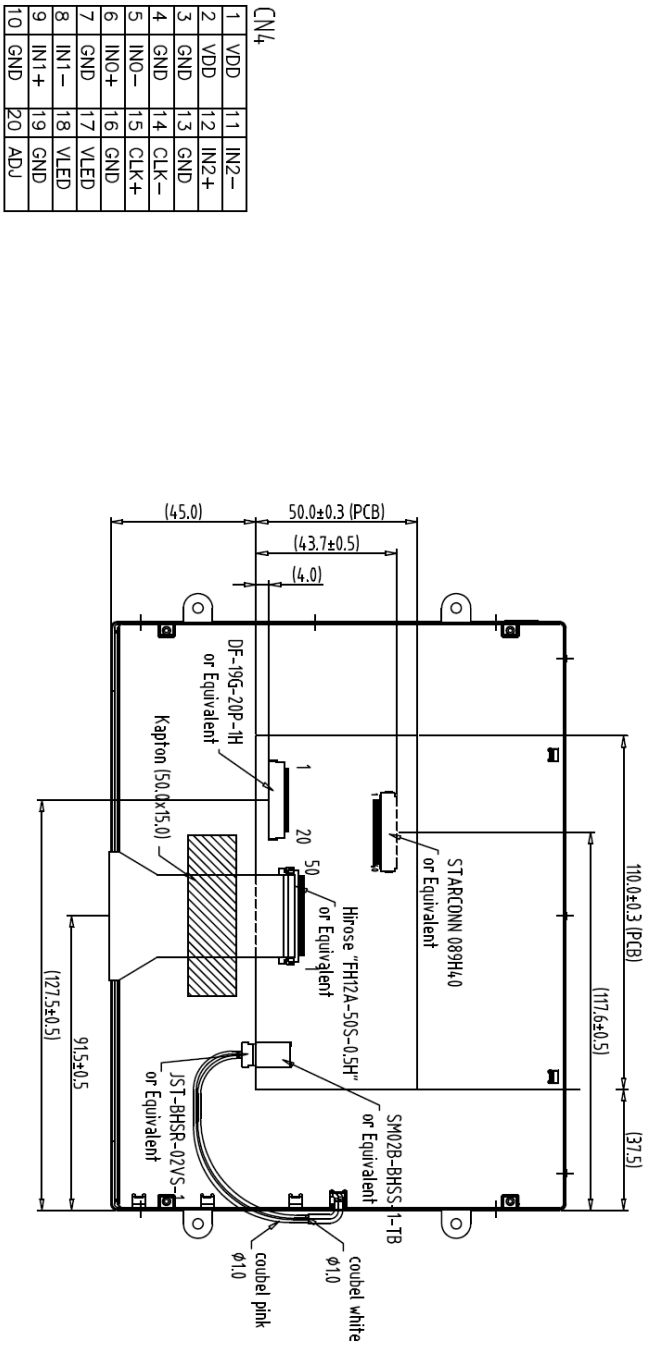
10-5 Cleaning

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.

10-6 Others

1. AMIPRE will provide one year warrantee for all products and three months warrantee for all repairing products.
2. Do not disassemble or take the LC module into pieces. The LC modules once disassembled or taken into pieces are not the guarantee articles.
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.**

REV	REVISION RECORD	DATE	NAME
0	NEW RELEASE	01-14-11	EMILY
1	TFT-800600-85A-0 Rename to 800600P1-A0	05-07-11	EMILY
2	增加適用機種 (800600P4-A0 & 800600P4-A1)	06-04-11	EMILY



A Block

CN4			
1	VDD	11	IN2-
2	VDD	12	IN2+
3	GND	13	GND
4	GND	14	CLK-
5	INO-	15	CLK+
6	INO+	16	GND
7	GND	17	VLED
8	INI-	18	VLED
9	INI+	19	GND
10	GND	20	ADJ

- Note:
1. Unless indicated, Tolerance Grade "±0.3".
 2. UV Glue For OLB Protection.
 3. CN1:BHSR-02VS-1
 4. CN2:P0.5 50Pin Connector:Hirose "FH12A-50S-0.5H" or Equivalent
 5. CN4:P1.0 20Pin Connector:HIROSHI DF19G-20P-1H or Equivalent

Back View

適用機種:
 800600P1-A0
 800600P1-A1
 800600P4-A0
 800600P4-A1

1	TFT-800600-85A-0	2	TOLERANCE GRADE(±)	A	B	DIM.	MM	DWG.	EMILY	DATE	TITLE
2		8				IE NO.		CHEK		DATE	800600P1-A0
3		9				PARTS NO.	LCM-1	APPD.		DATE	(8.0"+LVDS+LED Driver)
4		10				800600P1-A0					DWG. NO.
5		11									*110116MB
6		12									SHEET 1 OF 1

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