



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-800600PBTMQW-TA3H
APPROVED BY	
DATE	

Approved For Specifications

Approved For Specifications & Sample

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RECORD OF REVISION

Revision Date	Page	Contents	Editor
2012/06/05	--	New Release	Kain

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 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), DE mode.
- (6) Power Supply Voltage: 3.3V for logic voltage, 5.0V for LED driver power voltage.
- (6) Viewing Direction: 6 O'clock (The direction it's hard to be discolored)

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	183.0(W) x 141.0(H) x 10.35(D)	mm
Surface treatment	Anti-Glare	
Color arrangement	RGB-stripe	
interface	Digital	
Weight	270	g

3. ABSOLUTE MAX. RATINGS

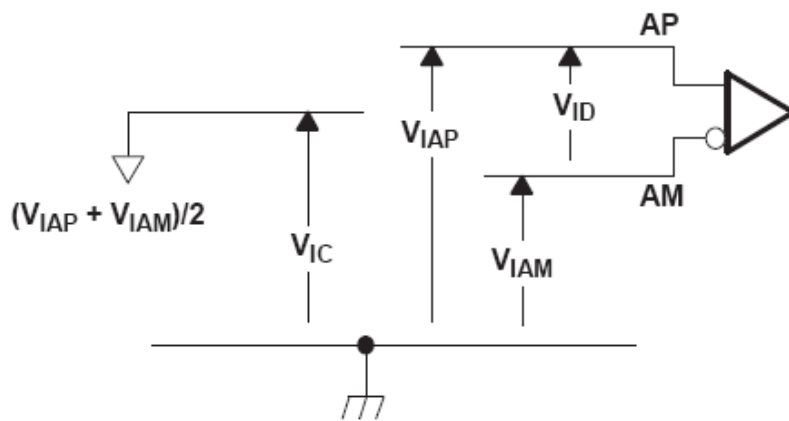
Item	Symbol	Values		UNIT	Note
		Min.	Max.		
Power voltage	VCC	-0.5	5	V	
	VLED	-0.5	6.0		
Input signal voltage	Vi	-0.3	VCC+0.3	V	Note 1
Operation temperature	TOP	-20	70	°C	
Storage temperature	TST	-30	80	°C	

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

4. ELECTRICAL CHARACTERISTICS

4-1 TFT LCD Module

		MIN	NOM	MAX	UNIT
V_{CC}	Supply voltage	3	3.3	3.6	V
V_{IH}	High-level input voltage (SHTDN)	2			V
V_{IL}	Low-level input voltage (SHTDN)			0.8	V
$ V_{ID} $	Magnitude differential input voltage	0.1		0.6	V
V_{IC}	Common-mode input voltage	$\frac{ V_{ID} }{2}$		$2.4 - \frac{ V_{ID} }{2}$	V

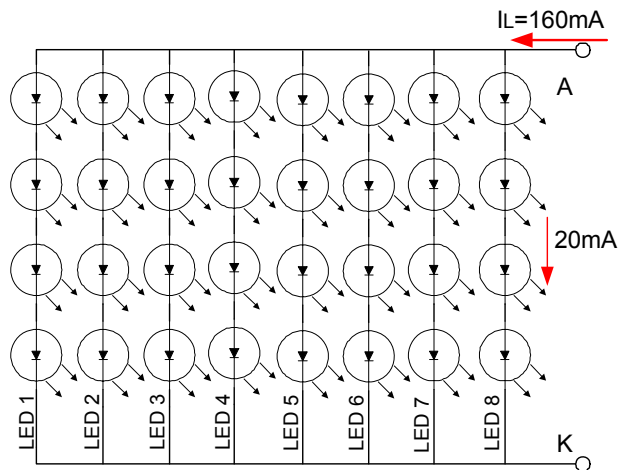


4-2 Backlight Driving Conditions

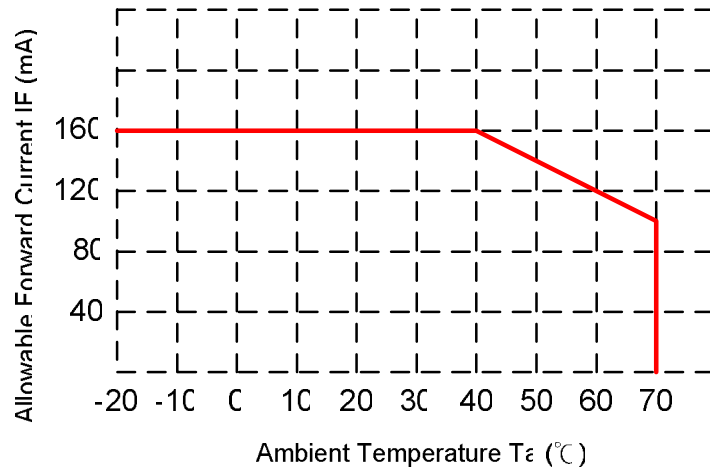
Item	Symbol	Values			Unit	Note
		Min.	Typ.	Max.		
LED Driver voltage	VLED	3.3	5	18	V	
Power Supply Current For LED Driver	ILED	-	510	-	mA	VLED=5V VADJ=3.3V (duty 100%)
ADJ Input Voltage	V _{ADJ}	-	3.3	5	V	duty=100% Note(3)
LED voltage	V _{AK}	12	13.2	14.4	V	I _L =160mA Ta=25°C
LED current	I _L	144	160	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

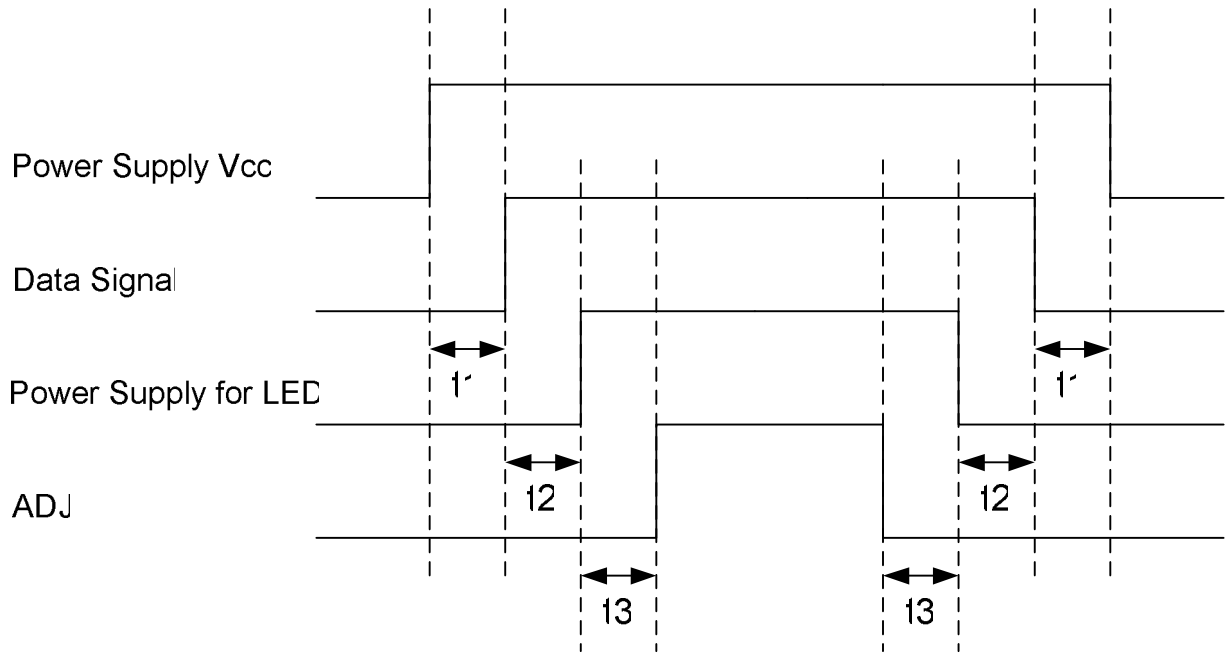
Note (2) Brightness to be decreased to 50% of the initial value.



When LCM is operated over 40°C ambient temperature, the ILED should be follow :

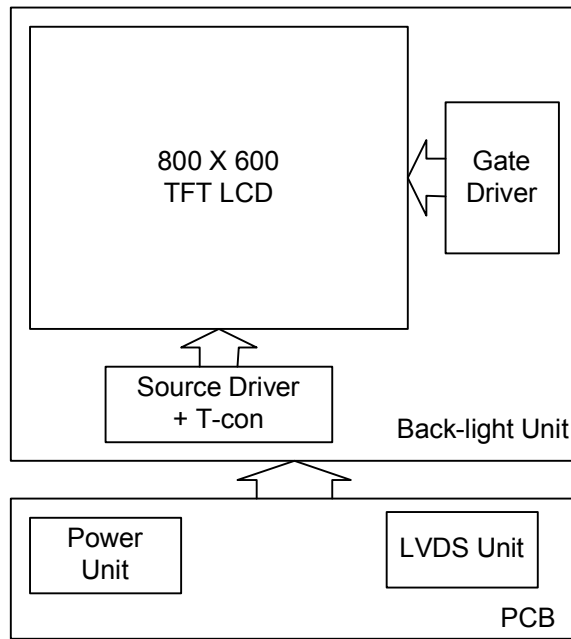


4-3 Power Sequence



$t_1 > 50 \text{ mSec}$
 $t_2 \geq 200 \text{ mSec}$
 $t_3 \geq 50 \text{ mSec}$

4-4 Block Diagram



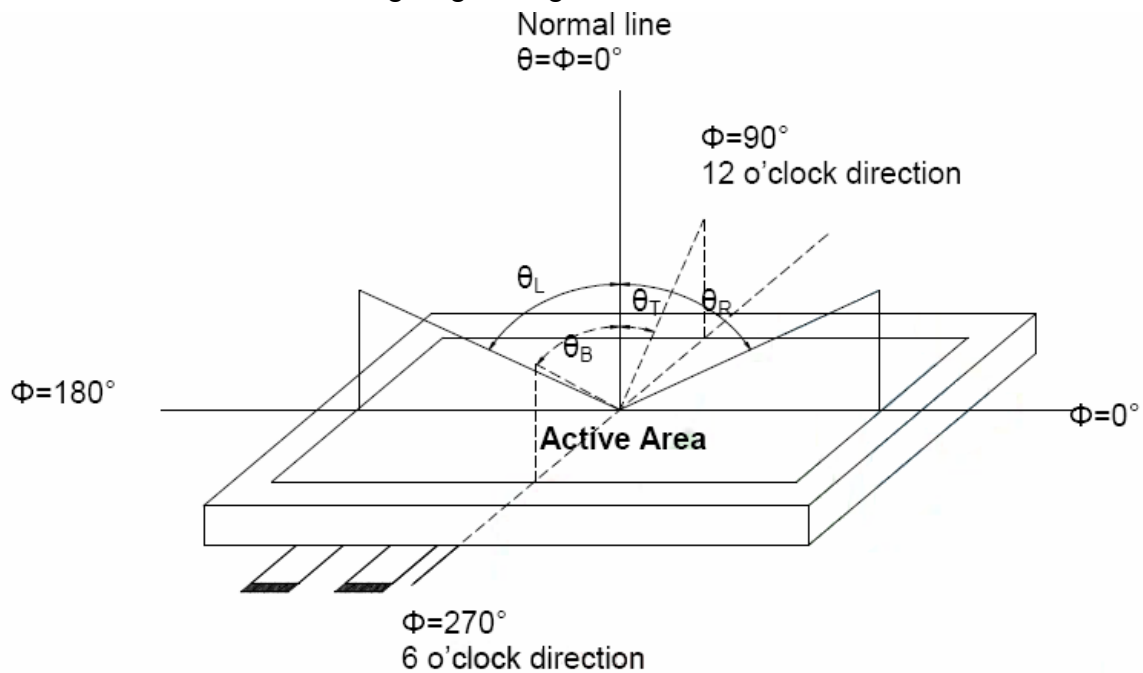
5. Optical Specifications

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	Normal $\theta = \Phi = 0^\circ$	--	10	20	msec	Note3
	TOFF		--	15	30	msec	
Contrast ratio	CR		400	500	--	--	Note4
Color chromaticity	Rx		0.578	0.628	0.678	--	Note5 Note6
	Ry		0.294	0.344	0.394		
	Gx		0.289	0.339	0.389		
	Gy		0.538	0.588	0.538		
	Bx		0.104	0.154	0.204		
	By		0.081	0.131	0.181		
	Wx		0.26	0.31	0.36		
	Wy	0.28	0.33	0.38	--		
Luminance	L	400	500	--	cd/m ²	Note6	
Luminance uniformity	YU	70	75	--	%	Note7	

Test Conditions :

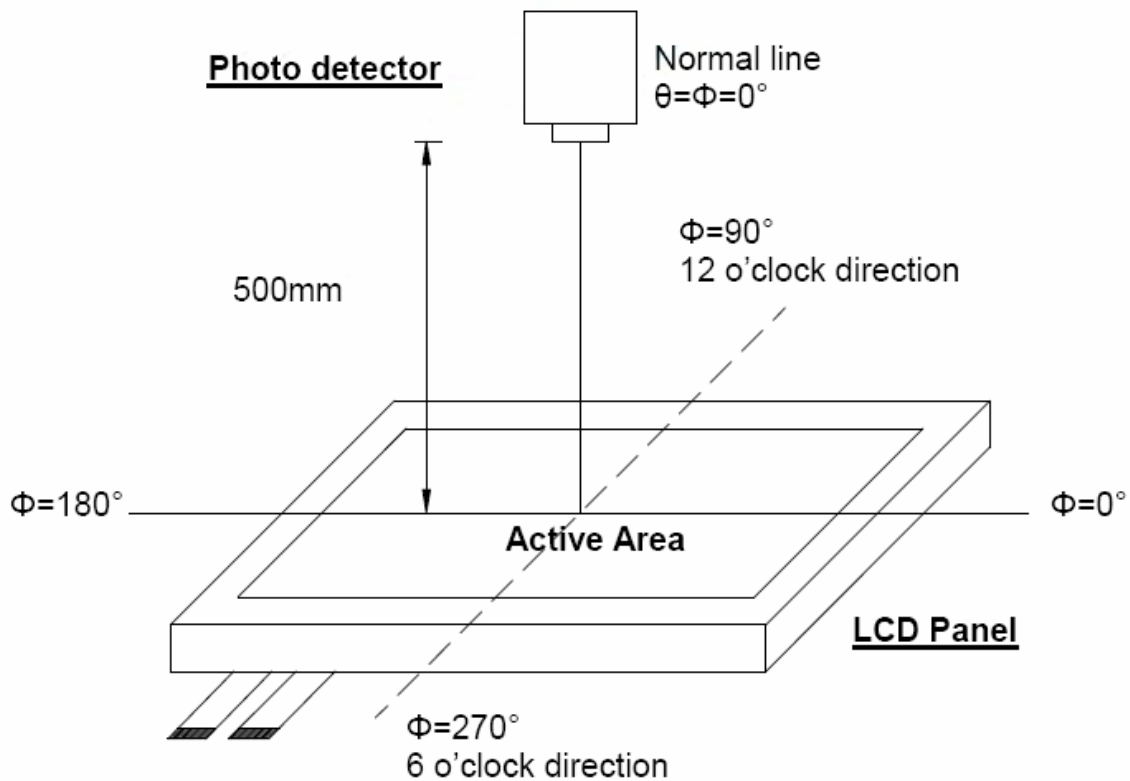
1. $V_{LED} = 5V$, $I_L = 160mA$ (Backlight current), the ambient temperature is $25^\circ C$.
2. The test systems refer to Note 2.

Note 1 : Definition of viewing angle range



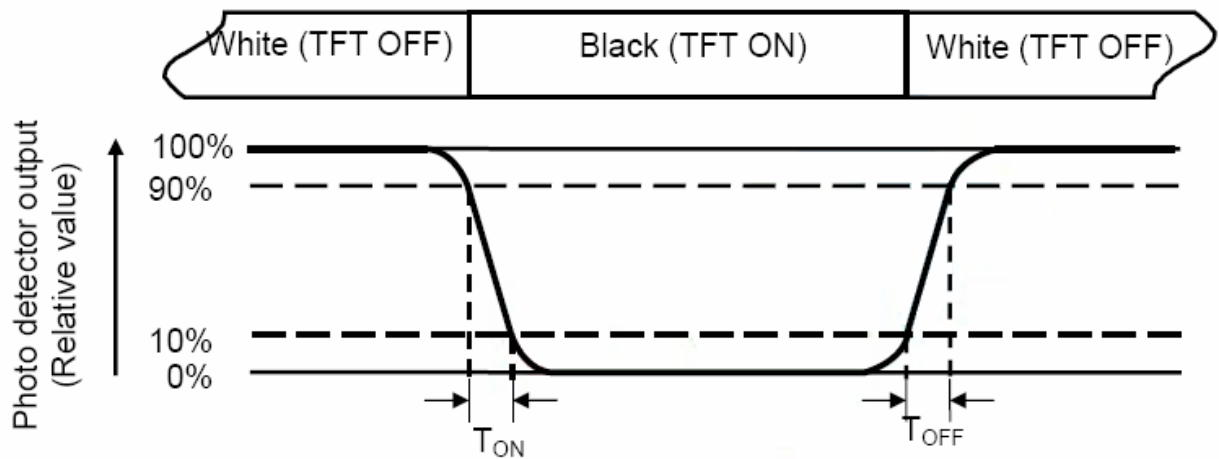
Note 2 : Definition of optical measurement system.

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.)



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%.



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 coordinated measured at center point of LCD.

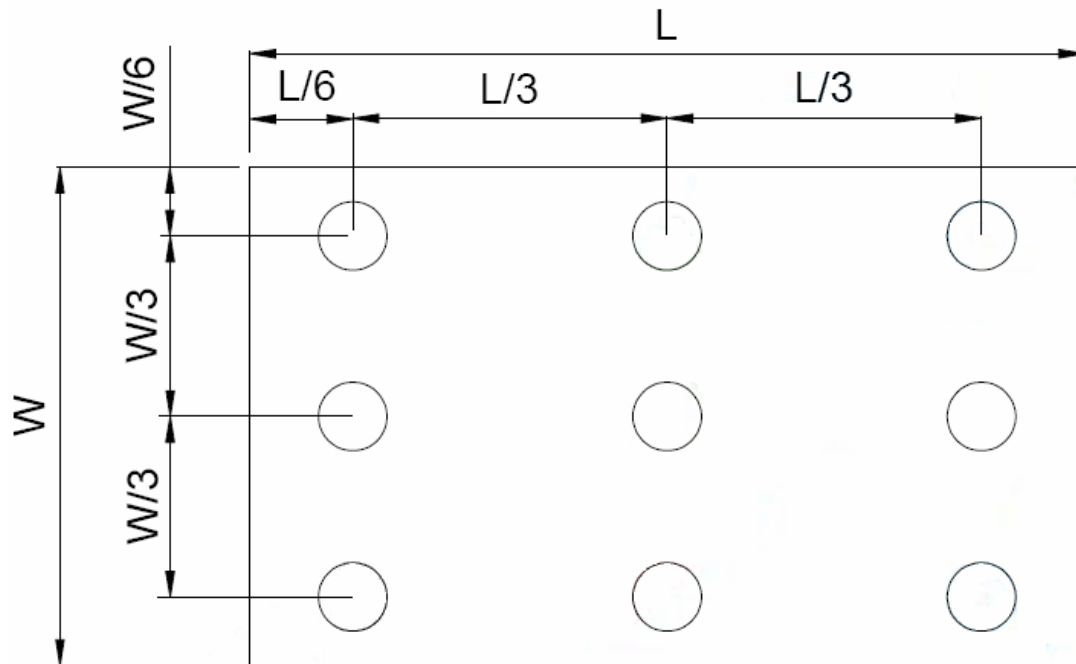
Note 6 : All input terminals LCD panel must be ground when measuring the center area of the panel.

Note 7 : Definition of Luminance Uniformity

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

$$\text{Luminance Uniformity (Yu)} = \frac{B_{\min}}{B_{\max}}$$

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



B_{\max} : The measured maximum luminance of all measurement position.

B_{\min} : The measured minimum luminance of all measurement position.

6. INTERFACE

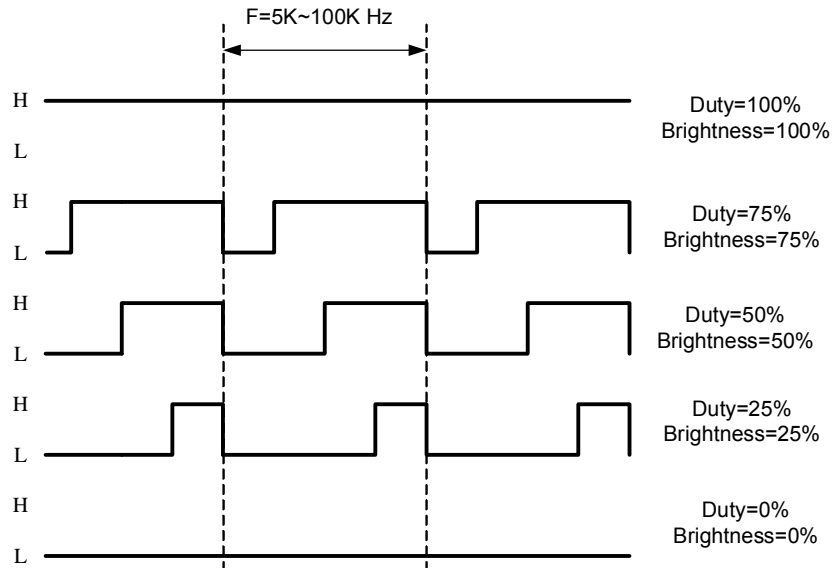
TFT LCD Panel Driving Section

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 :

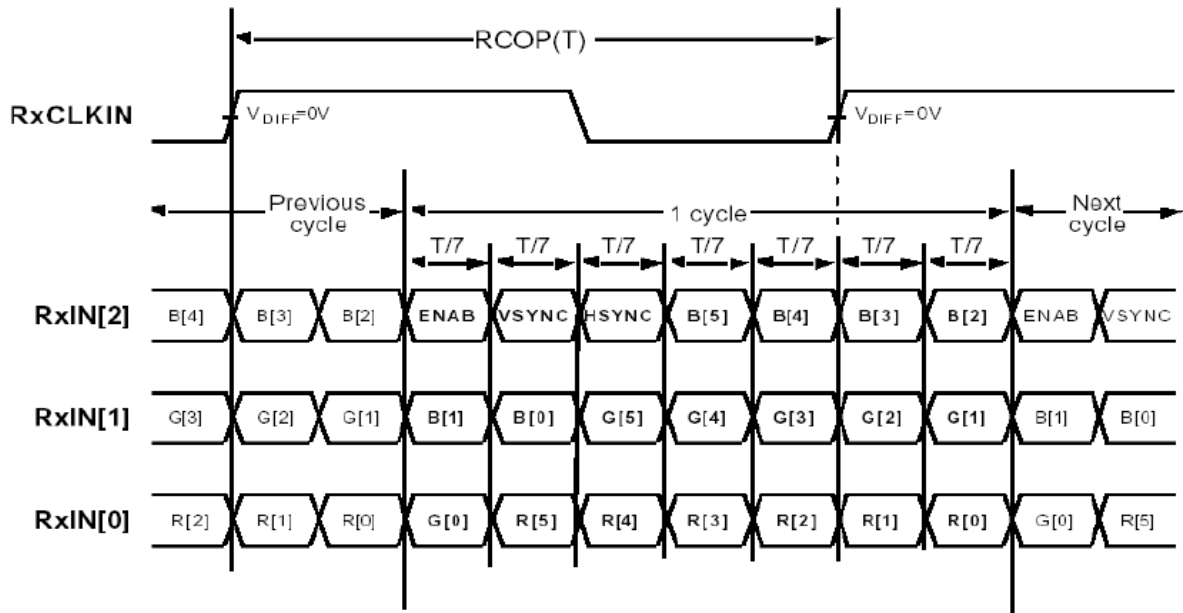
(1) Pin19: ADJ is PWM signal input. It is for brightness control.

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



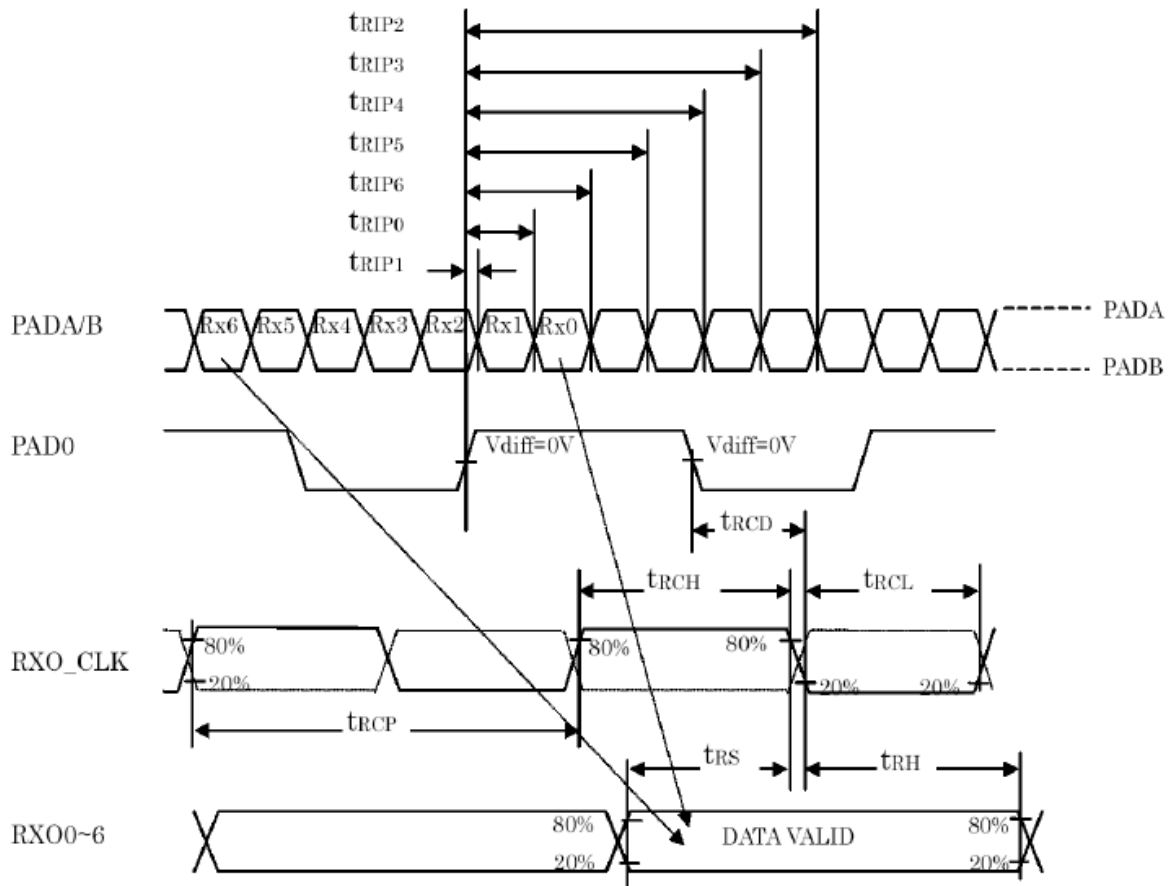
7. INTERFACE TIMING (The information as below is to be defined.)

7-1 LVDS SIGNAL :



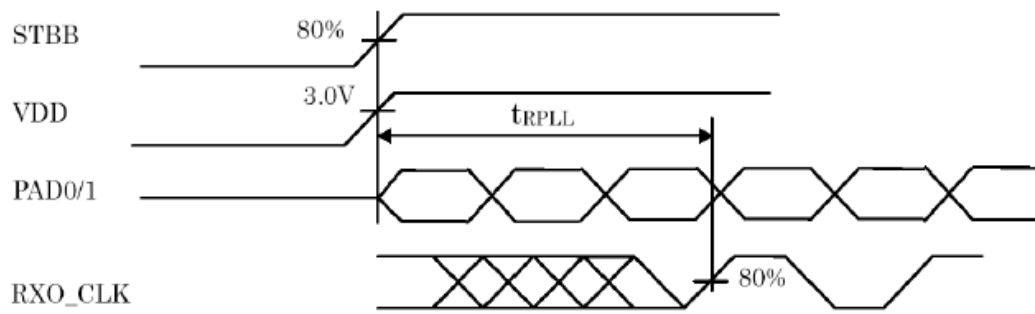
Note : R/G/B[5]s are MSBs and R/G/B[0]s are LSBs

7-2 LVDS AC Timing Diagram :

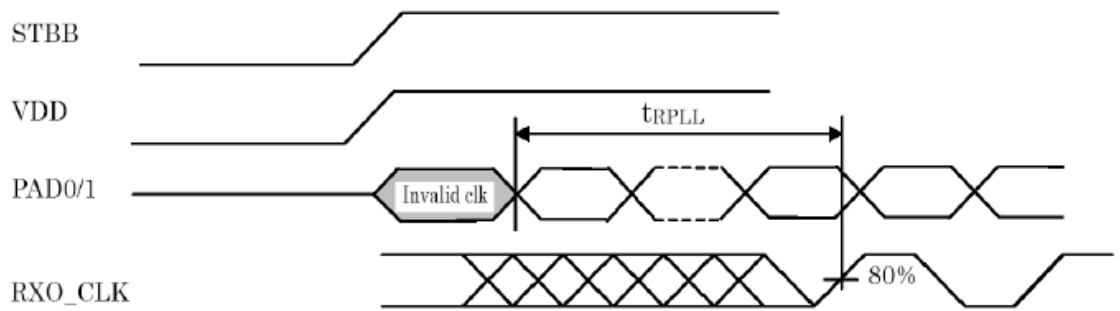


7-3 Phase Lock Loop Set Time :

(Case1)



(Case2)

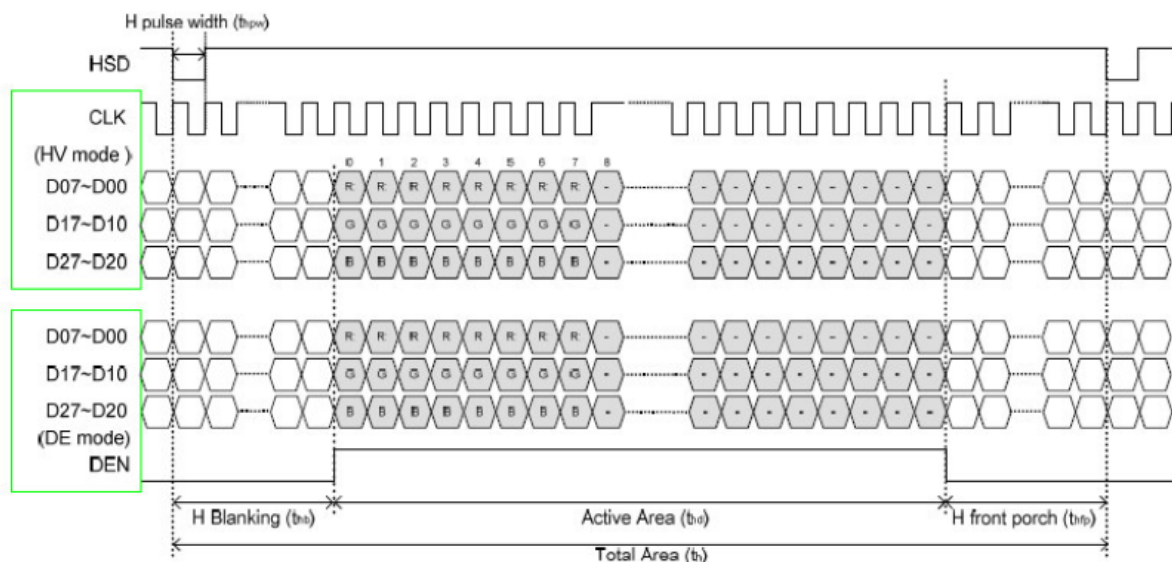


7-4 Recommended Input Timing of LVDS transmitter :

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	

Horizontal input timing



8. Touch Panel

8.1. Touch Panel Specifications

Item	Specifications	unit
Touch Panel Active Area	164.1(H) X 123.51(V)	mm
Substrate Thickness	0.5	mm
Resolution	4096x4096	dot

8.1. Absolute MAX. Ratings

Item	Symbol	Values		UNIT	Note
		Min.	Max.		
Power voltage	VDD	-0.3	5	V	GND=0V

8.2. Recommended Operating range

Item	Symbol	Values			UNIT	Note
		Min.	Typ.	Max.		
Power voltage	VDD	4.8	5	5.2	V	GND=0V

8.3. Touch Panel Electrical specification

8.3.1 Basic Characteristic

ITEM	SPECIFICATION
Interface Type	Projective Capacitive Multi-Touch Panel
Activation	Two-fingers or Signal-finger

8.3.2 Operation Environmental Characteristic

ITEM	SPECIFICATION
Operation Temperature	-10~60°C
Storage Temperature	-20~70°C

8.3.3 Optical Characteristic

ITEM	SPECIFICATION
Transmittance	80% (min)

8.3.4 Electrical Characteristic

ITEM	SPECIFICATION
USB Interface	USB protocol

8.3.5 Interface Pin Assign

Pin	Name	Description
1	GND	Power GND
2	D-	Data -
3	D+	Data +
4	V _{USB}	USB Power
5	NC	No connection
6	NC	No connection

9. 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. OUTLINE DIMENSION

