



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-800600GTMQW-02H
APPROVED BY	
DATE	

- Approved For Specifications
 Approved For Specifications & Sample

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RECORD OF REVISION

Revision Date	Page	Contents	Editor
2008/6/25 2008/9/3	-	New Release Add an INCOMING INSPECTION	EricLin Sunglin

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 T-CON board unit.

- (1) Construction: 8" a-Si TFT active matrix, White LED Backlight .
- (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 single power input.
- (7) 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 5.8(D)	mm
Surface treatment	Anti-Glare	
Color arrangement	RGB-stripe	
interface	Digital	

3. ELECTRICAL CHARACTERISTICS

3-1 TFT LCD Module voltage

ITEM	SYMBOL	MIN	TYP	MAX	UNIT	NOTE
Power Supply Voltage	VDD	--	3.3	--	V	
Power Supply Current	IDD	--	150	165	mA	
Power Consumption	PLCD	--	0.5	0.55	mW	

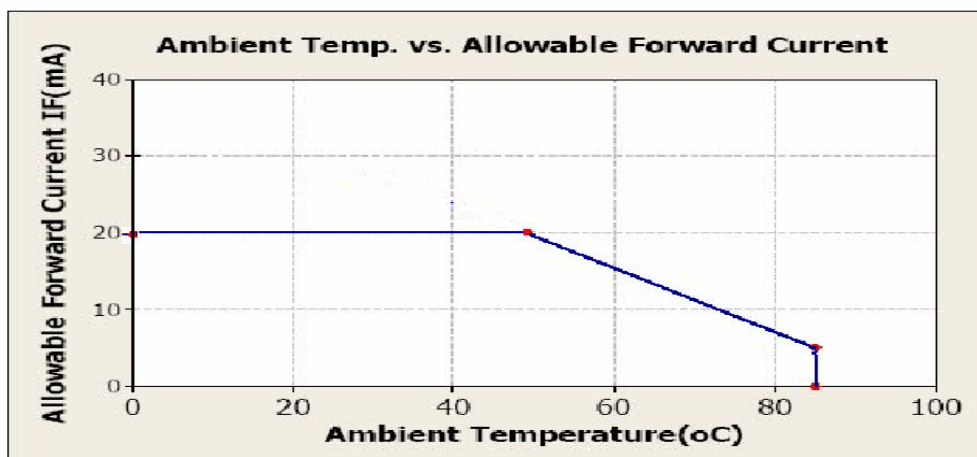
3-2 Backlight Driving Conditions

Item	Symbol	Values			Unit	Note
		Min.	Typ.	Max.		
LED voltage	VL	9.3	9.9	10.5	V	Note 1
LED current	IL	--	18	20	mA	Note 1
LED life time	--	20,000	--	--	Hr	Note 2

Note 1 : The LED driving condition is defined for each LED module. (3 LED Serial)

Note 2 : The "LED life time" is defined as the module brightness decrease to 50% original brightness that ambient temperature is 25°C and IL = 20mA.

Note 3 : When LCM is operated over 40°C ambient temperature, the ILED of each LED module (3 LED Serial) should be follow :



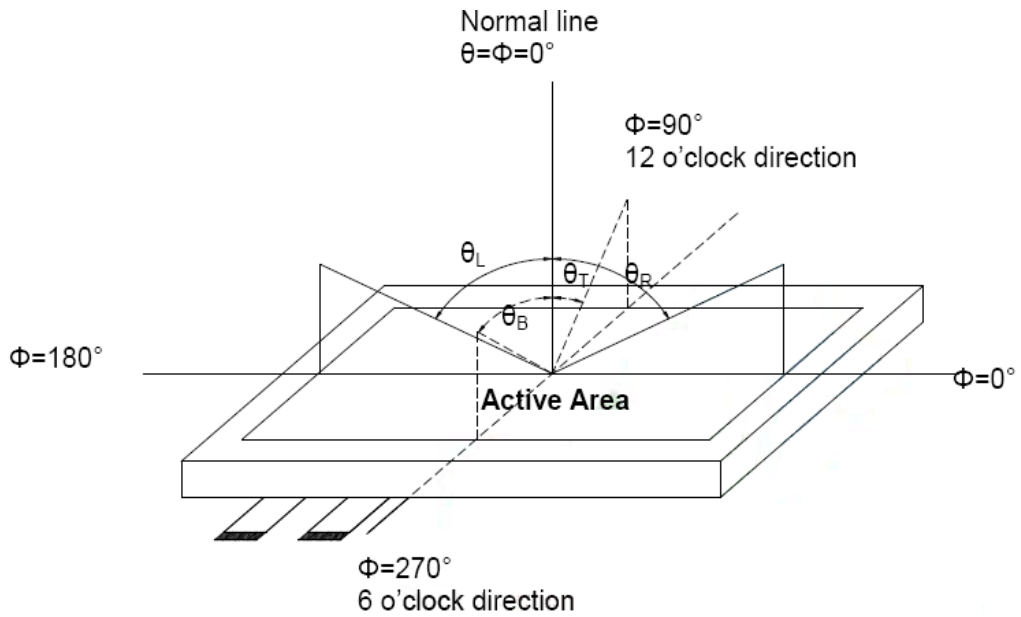
4. Optical Specifications

Item	Symbol	Condition	Values			Unit	Note	
			Min.	Typ.	Max.			
Viewing angle (CR \geq 10)	θL	$\Phi = 180^\circ$ (9 o'clock)	--	70	--	degree	Note1	
	θR	$\Phi = 0^\circ$ (3 o'clock)	--	70	--			
	θT	$\Phi = 90^\circ$ (12 o'clock)	--	60	--			
	θB	$\Phi = 270^\circ$ (6 o'clock)	--	70	--			
Response time	$T_r + T_f$	Normal $\theta = \Phi = 0^\circ$	--	25		msec	Note3	
Contrast ratio	CR		--	400	--	--	Note4	
Color chromaticity	Red		Rx	0.57	0.62	0.67	--	Note5 Note6
			Ry	0.29	0.34	0.39	--	
	Green		Gx	0.29	0.34	0.39		
			Gy	0.56	0.61	0.66		
	Blue		Bx	0.09	0.14	0.19		
			By	0.05	0.10	0.15		
	White		Wx	0.27	0.32	0.37		
			Wy	0.31	0.36	0.41		
Luminance	L	250	300	--	cd/m ²	Note6		
Luminance uniformity	YU	70	75	--	%	Note7		

Test Conditions :

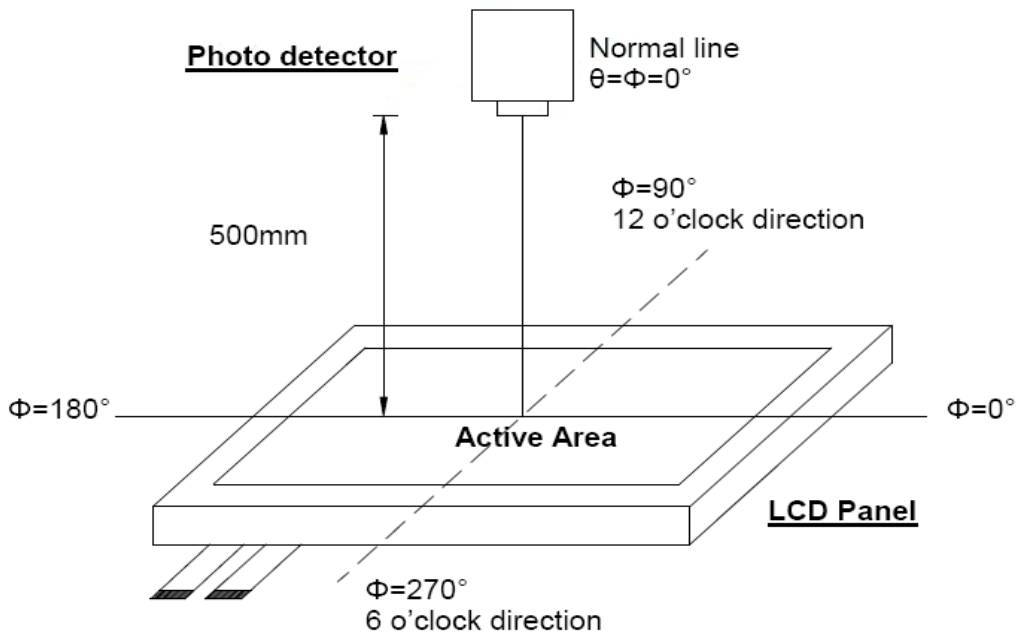
1. VCC = 3.3V, I_L = 20mA (Backlight current), the ambient temperature is 25°C.
2. The test systems refer to Note 2.

Note 1 : Definition of viewing angle range



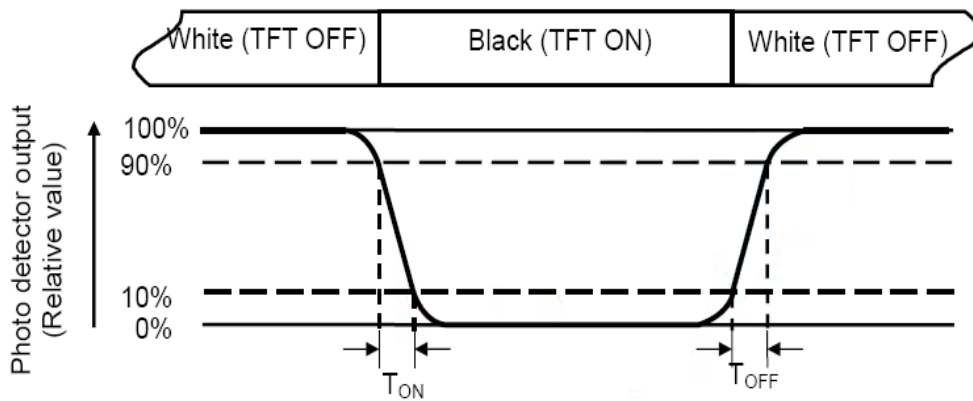
Note 2 : Definition of optical measurement system.

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

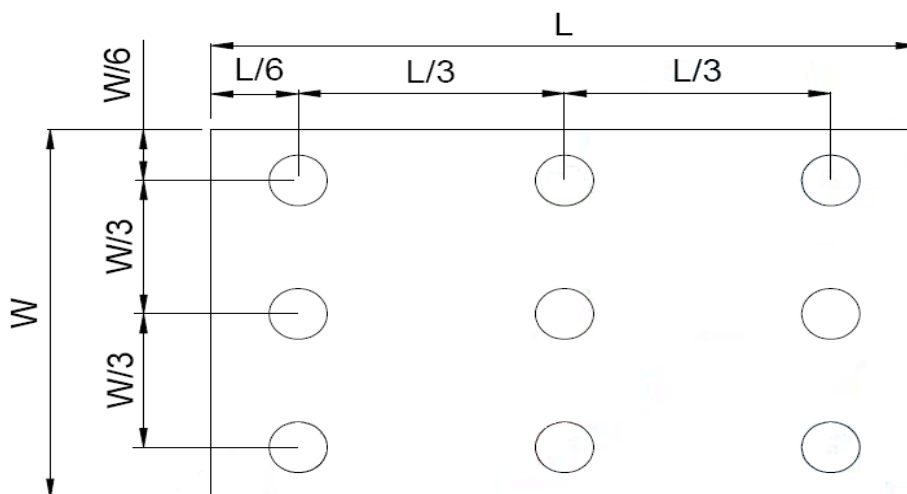
Active area is divided into 9 measuring areas (Refer to bellow figure). Every measuring point is placed at the center of each measuring area.

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

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

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

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

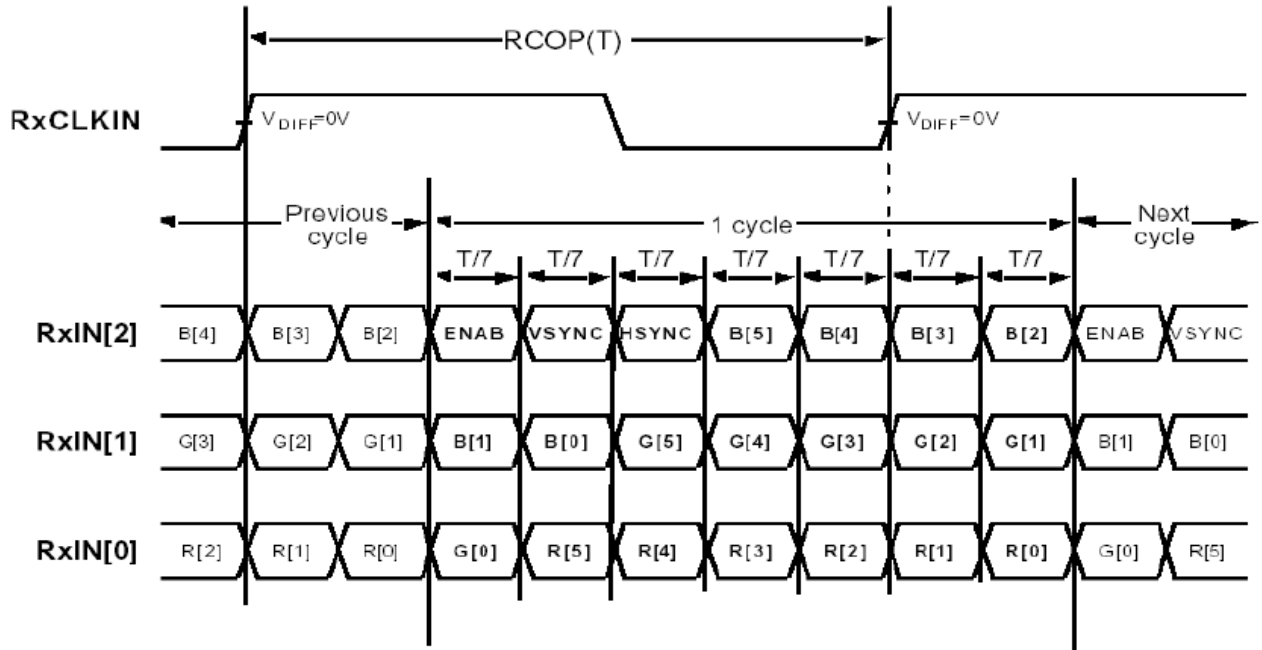


5. Pin Assignment (CN1)

Pin no	Symbol	Function
1	VDD	POWER SUPPLY:3.3V
2	VDD	POWER SUPPLY:3.3V
3	Gnd	Power Ground
4	Gnd	Power Ground
5	IN0-	Transmission Data of Pixels(R data input)
6	IN0+	Transmission Data of Pixels(R data input)
7	Gnd	Power Ground
8	IN1-	Transmission Data of Pixels 1(G data input)
9	IN1+	Transmission Data of Pixels 1(G data input)
10	Gnd	Power Ground
11	IN2-	Transmission Data of Pixels 2(B data input)
12	IN2+	Transmission Data of Pixels 2(B data input)
13	Gnd	Power Ground
14	CLK-	Sampling Clock
15	CLK+	Sampling Clock
16	Gnd	Power Ground
17	NC	No Connect
18	NC	No Connect
19	Gnd	Power Ground
20	Gnd	Power Ground

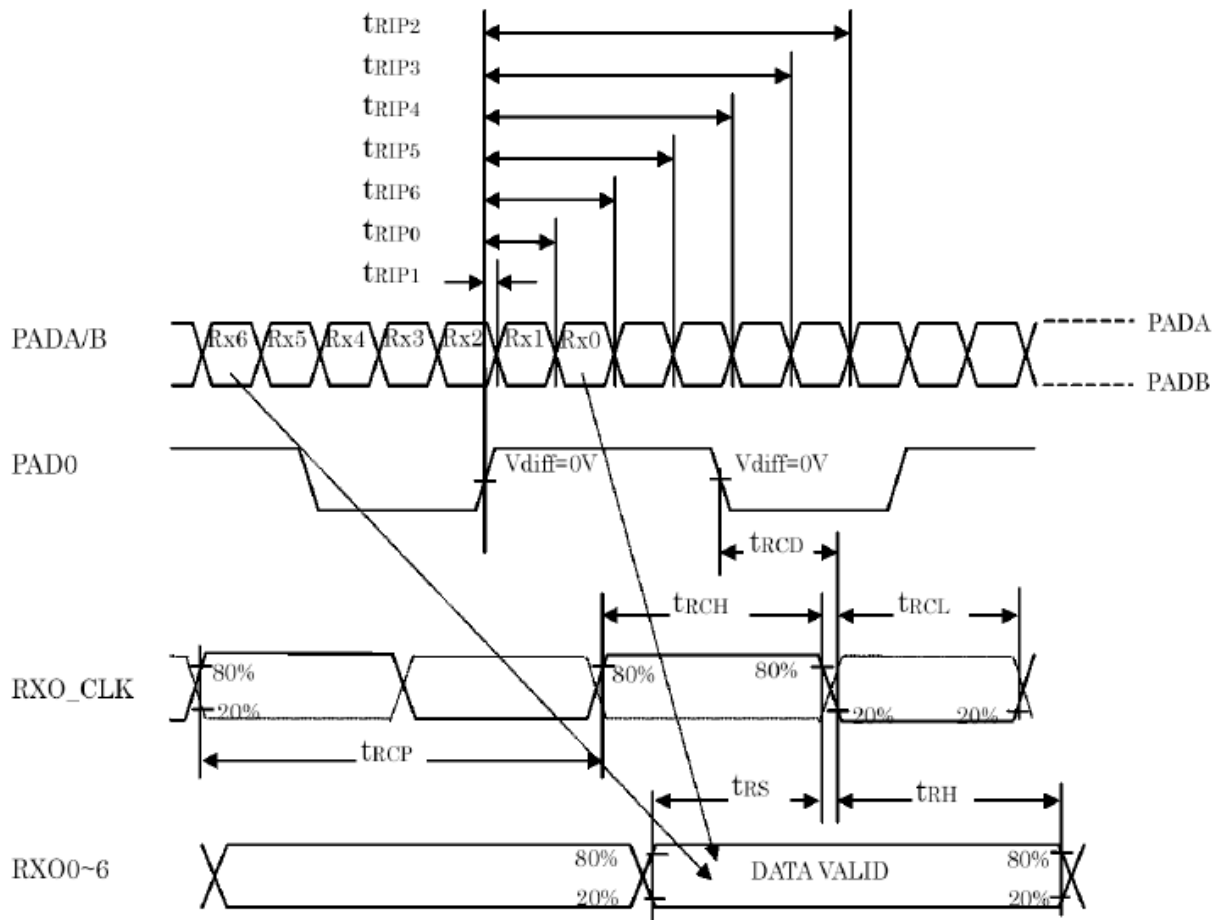
6. INPUT SIGNAL : (The information as below is to be defined.)

6-1 LVDS SIGNAL :



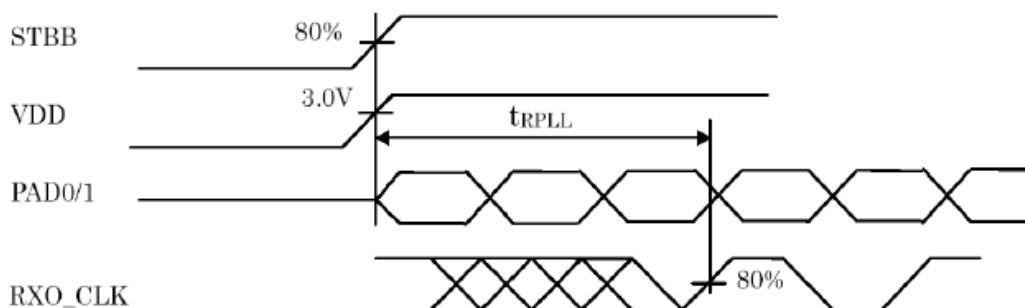
Note : R/G/B[5]s are MSBs and R/G/B[0]s are LSBs

6-2 LVDS AC Timing Diagram :

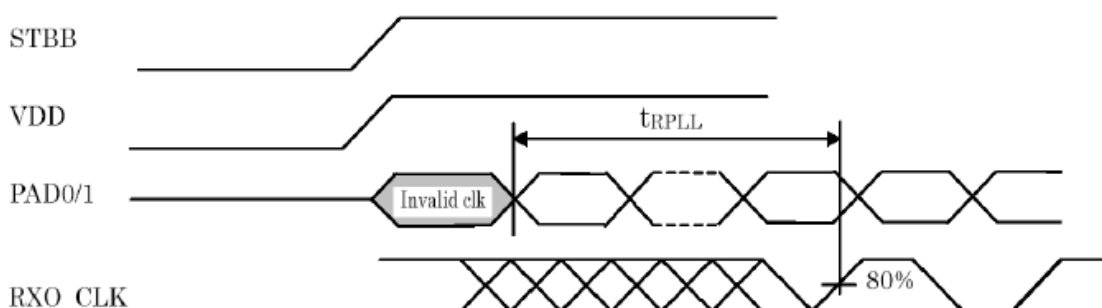


6-3 Phase Lock Loop Set Time

(Case1)



(Case2)



6-4 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

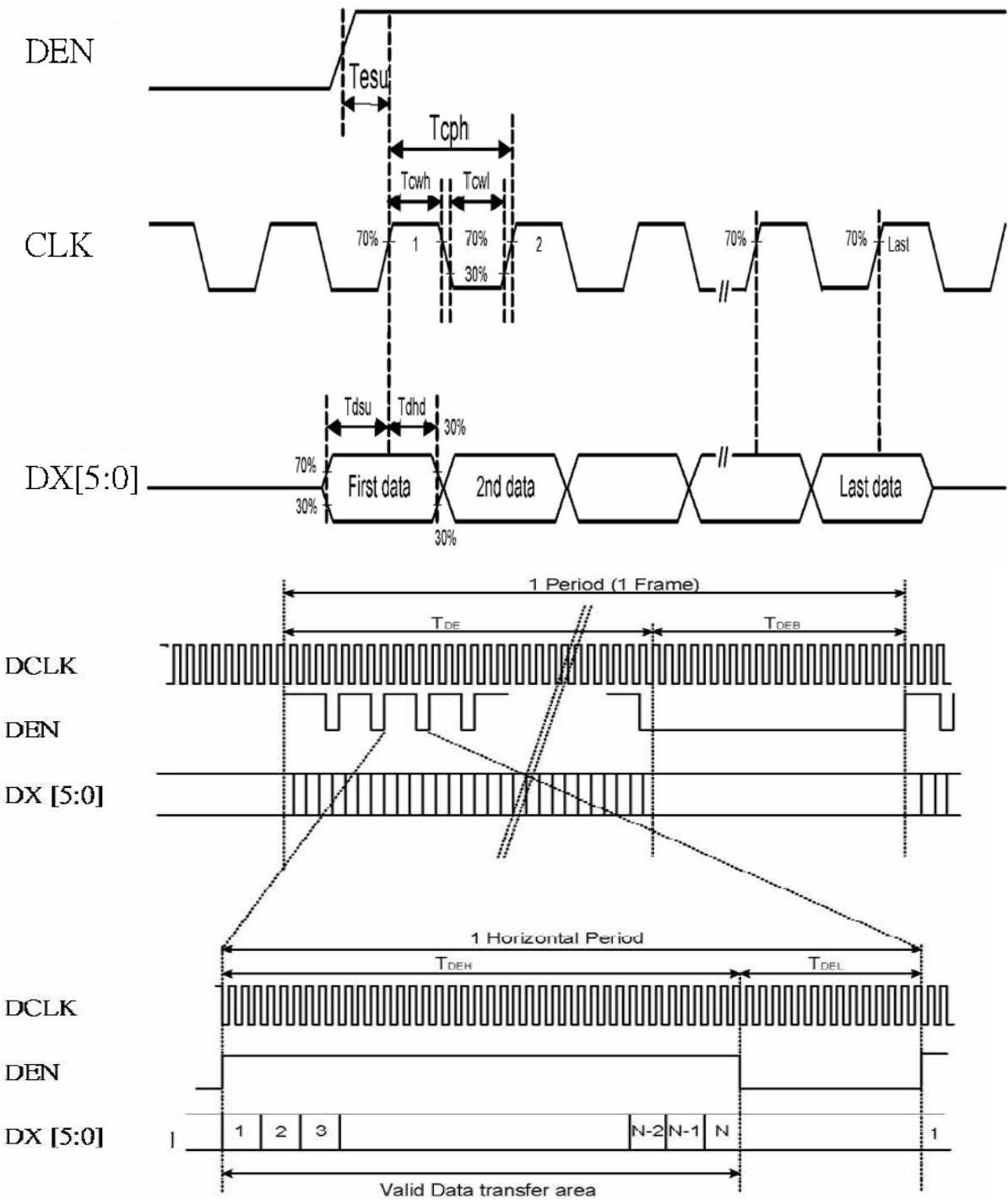
6-5 TTL SIGNAL :

Timing Condition

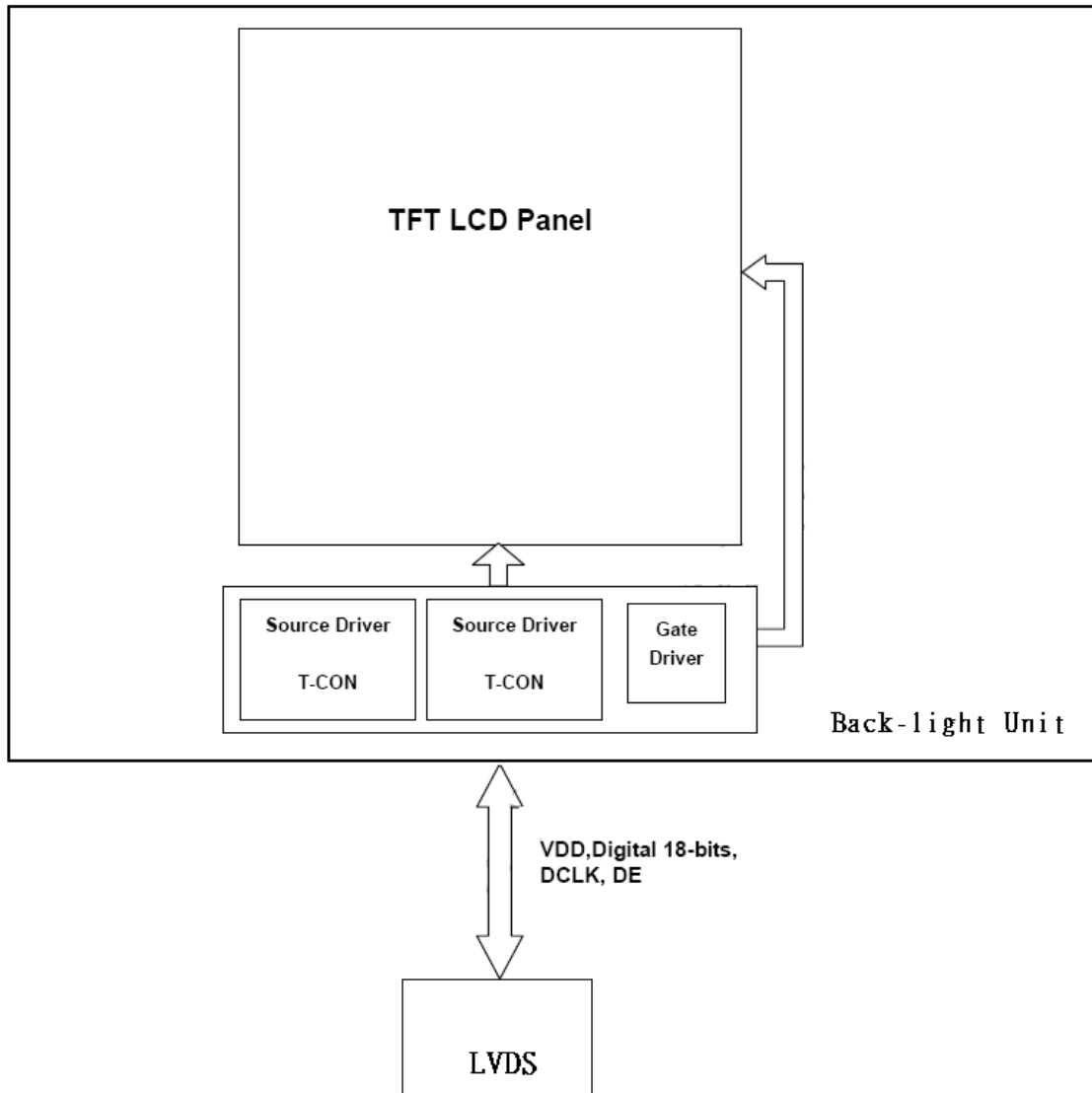
Parameter	Symbol	Values			Unit	Note
		Min.	Typ.	Max.		
CLK Frequency	FCPH	--	39.79	--	MHZ	
CLK Period	FCPH	--	25.13	--	ns	
CLK Pulse Duty	FCWH	40	50	60	%	
DE Period	Fdeh+T DEL	1000	1056	--	TCPH	
DE Pulse Width	FDH	--	800	--	TCPH	
DE Frame Blanking	FHS	10	28	110	FDEH+ TDEL	
DE Frame Width	FEP	--	600	--	FDEH+ TDEL	
OEV Pulse Width	TOEV	--	150	--	TCPH	
OKV Pulse Width	TCKV	--	133	--	TCPH	
DE(internal)-STV Time	T1	--	4	--	TCPH	
DE(internal)-CKV Time	T2		40		TCPH	
DE(internal)-OEV Time	T3		23		TCPH	
DE(internal)-POL Time	T4	--	157	--	TCPH	
STV Pulse Width	-		1		TH	

$$THS+THA < TH$$

6-6 Timing Characteristic



6-7 Block Diagram



7 INCOMING INSPECTION STANDARD FOR TFT-LCD PANEL

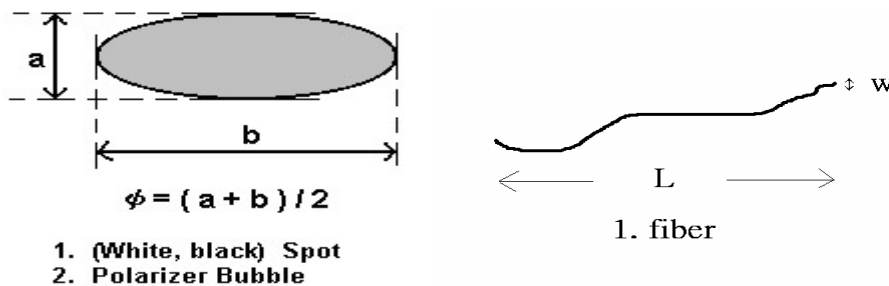
DEFECT TYPE		LIMIT		Note
VISUAL DEFECT	INTERNAL	SPOT	$\varphi < 0.15\text{mm}$	Ignore
			$0.15\text{mm} \leq \varphi \leq 0.5\text{mm}$	$N \leq 4$
			$0.5\text{mm} < \varphi$	$N=0$
	INTERNAL	FIBER	$0.03\text{mm} < W \leq 0.1\text{mm}, L \leq 5\text{mm}$	$N \leq 3$
			$1.0\text{mm} < W, 1.5\text{mm} < L$	$N=0$
	INTERNAL	POLARIZER	$\varphi < 0.15\text{mm}$	Ignore
$0.15\text{mm} \leq \varphi \leq 0.5\text{mm}$			$N \leq 2$	

		BUBBLE	$0.5\text{mm} < \varphi$	N=0	
		Mura	It' OK if mura is slight visible through 6%ND filter		
ELECTRICAL DEFECT	BRIGHT DOT	A Grade	B Grade		
		Total	Total	Note3	
	$N \leq 4$	$N \leq 5$	Note2		
	DARK DOT	$N \leq 5$	$N \leq 8$		
	TOTAL DOT	$N \leq 9$	$N \leq 12$	Note2	
	TWO ADJACENT DOT	$N \leq 4$ pair	$N \leq 5$ pair	Note4	
	THREE OR MORE ADJACENT DOT	$N \leq 1$			
LINE DEFECT	NOT ALLOWED				

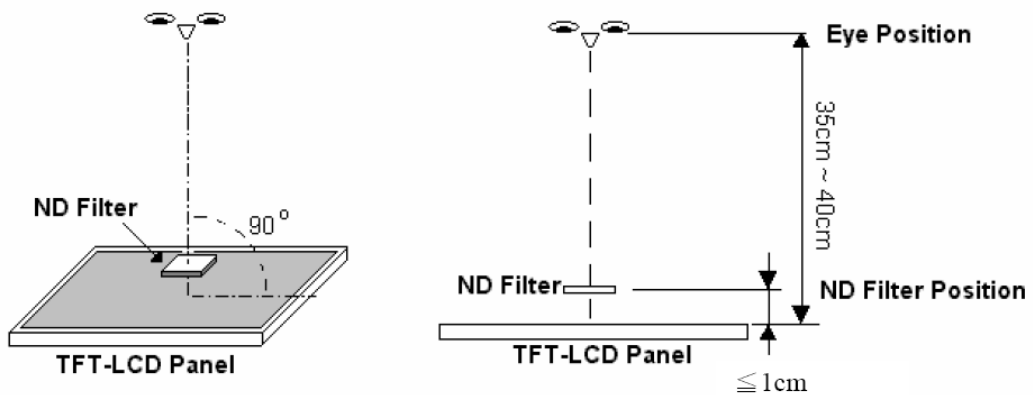
(1) One pixel consists of 3 sub-pixels, including R,G, and B dot.(Sub-pixel = Dot)

(2) LITTLE BRIGHT DOT ACCEPTITABLE UNDER 6 % ND-Filter

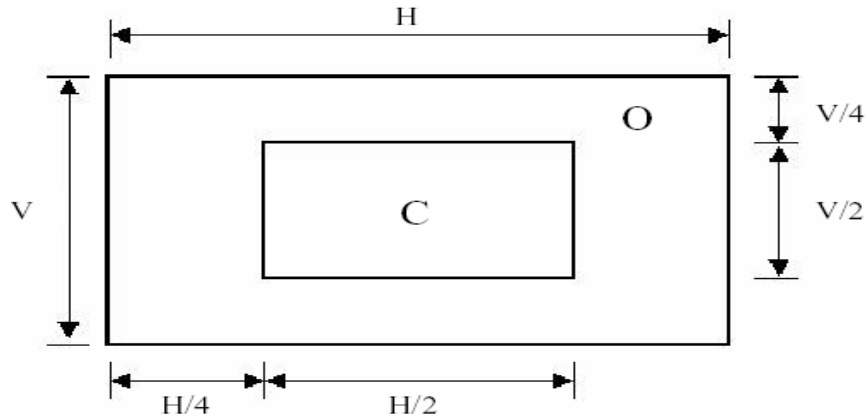
[Note1] W : Width[mm], L : Length[mm], N : Number, φ : Average Diameter



[Note2] Bright dot is defined through 6% transmission ND Filter as following.



[Note3]

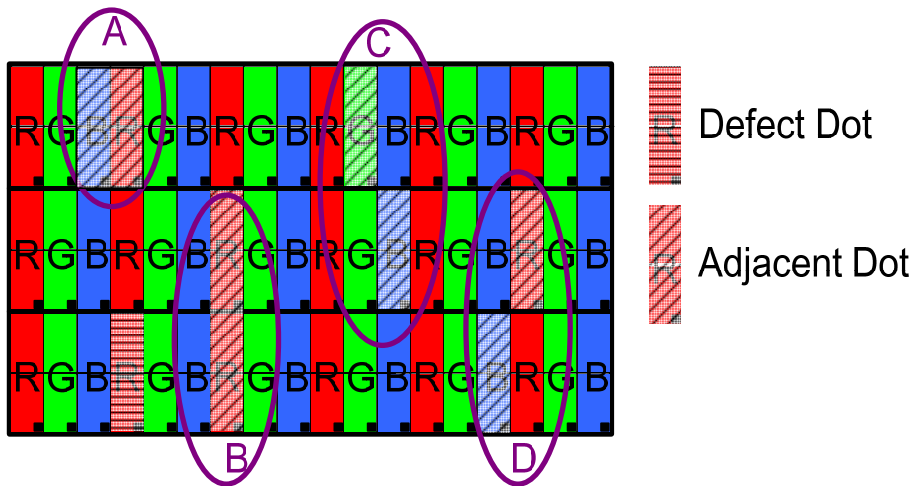


C Area: Center of display area

O Area: Outer of display area

[Note4]

Judge defect dot and adjacent dot as following. Allow below (as A, B, C and D status) adjacent defect dots, including bright and dark adjacent dot. And they will be counted 2 defect dots in total quantity.



(1) The defects that are not defined above and considered to be problem shall be reviewed and discussed by both parties.

(2) Defects on the Black Matrix, out of Display area, are not considered as a defect or counted.

8. RELIABILITY TEST CONDITIONS

Test Item	Test Conditions	Note
High Temperature Operation	70±3°C , t=96 hrs	
Low Temperature Operation	-20±3°C , t=96 hrs	
High Temperature Storage	80±3°C , t=96 hrs	1,2

Low Temperature Storage	-30±3°C , t=96 hrs	1,2
Thermal Shock Test	-20°C ~ 25°C ~ 70°C 30 m in. 5 min. 30 min. (1 cycle) Total 5 cycle	1,2
Humidity Test	40 °C, Humidity 90%, 96 hrs	1,2

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).

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 the initial value.

9. USE PRECAUTIONS

9-1 Handling precautions

- (1) The polarizing plate may break easily so be careful when handling it. Do not touch, press or rub it with a hard-material tool like tweezers.
- (2) Do not touch the polarizing plate surface with bare hands so as not to make it dirty. If the surface or other related part of the polarizing plate is dirty, soak a soft cotton cloth or chamois leather in benzine and wipe off with it. Do not use chemical liquids such as acetone, toluene and isopropyl alcohol. Failure to do so may bring chemical reaction phenomena and deteriorations.
- (3) Remove any spit or water immediately. If it is left for hours, the suffered part may deform or decolorize.
- (4) If the LCD element breaks and any LC stuff leaks, do not suck or lick it. Also if LC stuff is stuck on your skin or clothing, wash thoroughly with soap and water immediately.

9-2 Installing precautions

- (1) The PCB has many ICs that may be damaged easily by static electricity. To prevent breaking by static electricity from the human body and clothing, earth the human body properly using the high resistance and discharge static electricity during the operation. In this case, however, the resistance value should be approx. $1M\Omega$ and the resistance should be placed near the human body rather than the ground surface. When the indoor space is dry, static electricity may occur easily so be careful. We recommend the indoor space should be kept with humidity of 60% or more. When a soldering iron or other similar tool is used for assembly, be sure to earth it.
- (2) When installing the module and ICs, do not bend or twist them. Failure to do so may crack LC element and cause circuit failure.
- (3) To protect LC element, especially polarizing plate, use a transparent protective plate (e.g., acrylic plate, glass etc) for the product case.
- (4) Do not use an adhesive like a both-side adhesive tape to make LCD surface (polarizing plate) and product case stick together. Failure to do so may cause the polarizing plate to peel off

9-3 Storage precautions

- (1) Avoid a high temperature and humidity area. Keep the temperature between 0°C and 35°C and also the humidity under 60%.
- (2) Choose the dark spaces where the product is not exposed to direct sunlight or fluorescent light.
- (3) Store the products as they are put in the boxes provided from us or in the same conditions as we recommend.

9-4 Operating precautions

- (1) Do not boost the applied drive voltage abnormally. Failure to do so may break ICs. When applying power voltage, check the electrical features beforehand and be careful. Always turn off the power to the LC module controller before removing or inserting the LC module input connector. If the input connector is removed or inserted while the power is turned on, the LC module internal circuit may break.
- (2) The display response may be late if the operating temperature is under the normal standard, and the display may be out of order if it is above the normal standard. But this is not a failure; this will be restored if it is within the normal standard.
- (3) The LCD contrast varies depending on the visual angle, ambient temperature, power voltage etc. Obtain the optimum contrast by adjusting the LC drive voltage.
- (4) When carrying out the test, do not take the module out of the low-temperature space suddenly. Failure to do so will cause the module condensing, leading to malfunctions.
- (5) Make certain that each signal noise level is within the standard (L level: $0.2V_{dd}$ or less and H level: $0.8V_{dd}$ or more) even if the module has functioned properly. If it is beyond the standard, the module may often malfunction. In addition, always connect the module when making noise level measurements.
- (6) The CMOS ICs are incorporated in the module and the pull-up and pull-down function is not adopted for the input so avoid putting the input signal open while the power is ON.
- (7) The characteristic of the semiconductor element changes when it is exposed to light emissions, therefore ICs on the LCD may malfunction if they receive light emissions. To prevent these malfunctions, design and assemble ICs so that they are shielded from light emissions.
- (8) Crosstalk occurs because of characteristics of the LCD. In general, crosstalk occurs when the regularized display is maintained. Also, crosstalk is affected by the LC drive voltage. Design the contents of the display, considering crosstalk.

9-5 Other

- (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) The residual image may exist if the same display pattern is shown for hours. This residual image, however, disappears when another display pattern is shown or the drive is interrupted and left for a while. But this is not a problem on reliability.
- (3) AMIPRE will provide one year warrantee for all products and three months warrantee for all repairing products.

10. OUTLINE DIMENSION

