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-T01H
APPROVED BY	
DATE	

☐Approved For Specifications
☑ Approved For Specifications & Sample

AMPIRE CO., LTD.
2F., No.88, Sec. 1, Sintai 5th Rd., Sijhih City, Taipei County 221, Taiwan (R.O.C.)台北縣汐止市新台五路一段88號2樓(東方科學園區D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
2008/6/25	-	New Release	EricLin
2008/12/15	3 5	Remodify PHYSICAL SPECIFICATIONS & Luminance	John

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 ,T-CON board and Touch Panel .

(1) Construction: 8" a-Si TFT active matrix, White LED Backlight and Touch Panel.
(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: 40 pin
(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 9.85(D)	mm
Surface treatment	Anti-Glare	
Color arrangement	RGB-stripe	
interface	Digital	

3. ELECTRICAL CHARACTERISTICS

3-1 Typical Operation Conditions

Item	Symbol	Values			UNIT	Note
		Min.	Typ.	Max.		
Digital Power Supply	VCC	--	3.3	--	V	
Digital Operating Current	IVCC	--	120	132	mA	
Power Consumption	PLCD	--	396	436	mW	

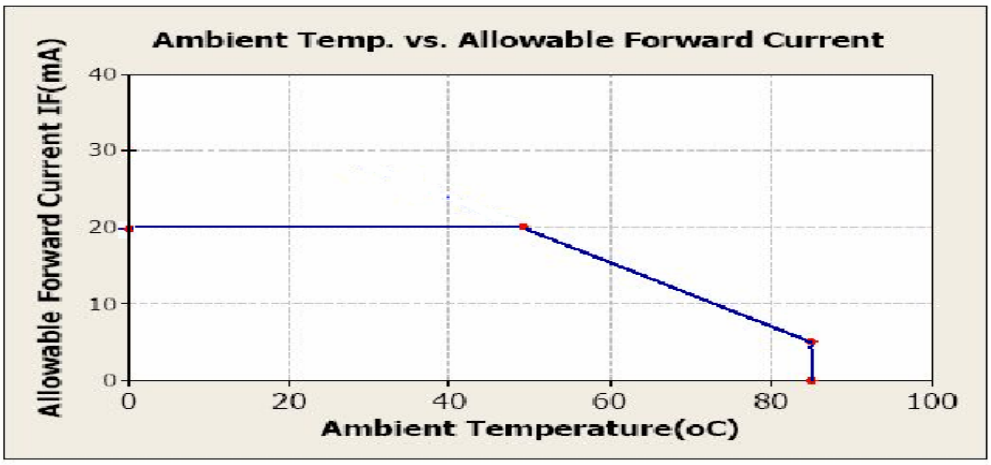
3-2 Backlight Driving Conditions

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℃ and I_L = 20mA.

Note 3 : When LCM is operated over 40℃ ambient temperature, the I_{LED} of each LED module (3 LED Serial) should be follow :



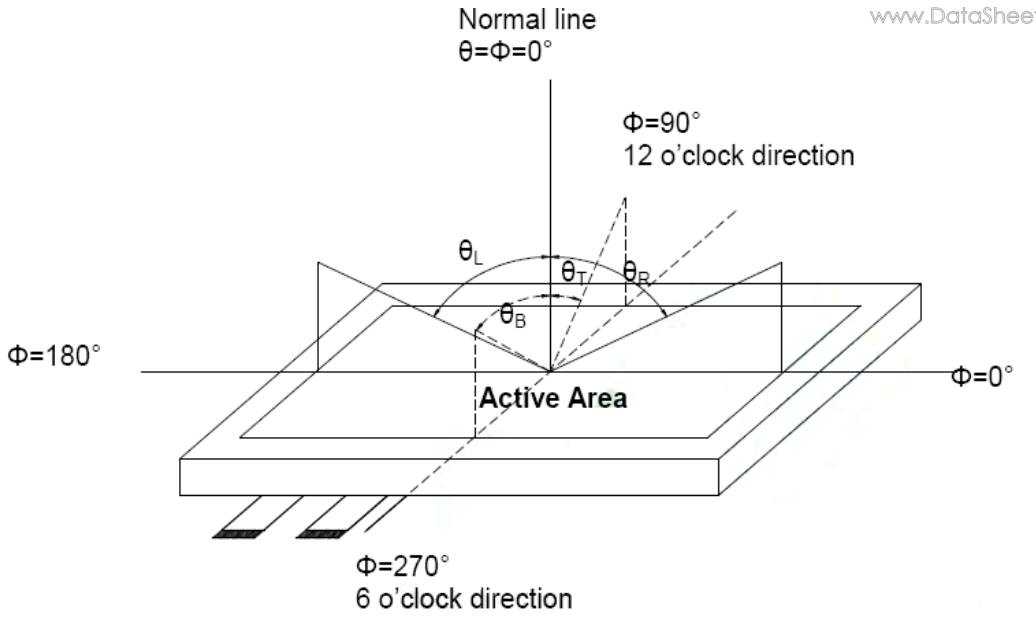
4. Optical Specifications

Item		Symbol	Condition	Values			Unit	Note
				Min.	Typ.	Max.		
Viewing angle (CR≧10)		θ L	Φ = 180° (9 o'clock)	--	70	--	degree	Note1
		θ R	Φ = 0° (3 o'clock)	--	70	--		
		θ T	Φ = 90° (12 o'clock)	--	60	--		
		θ B	Φ = 270° (6 o'clock)	--	70	--		
Response time		$T_r + T_f$	Normal θ =Φ=0°	--	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		200	240	--	cd/㎡	Note6
Luminance uniformity		YU		70	75	--	%	Note7

Test Conditions :

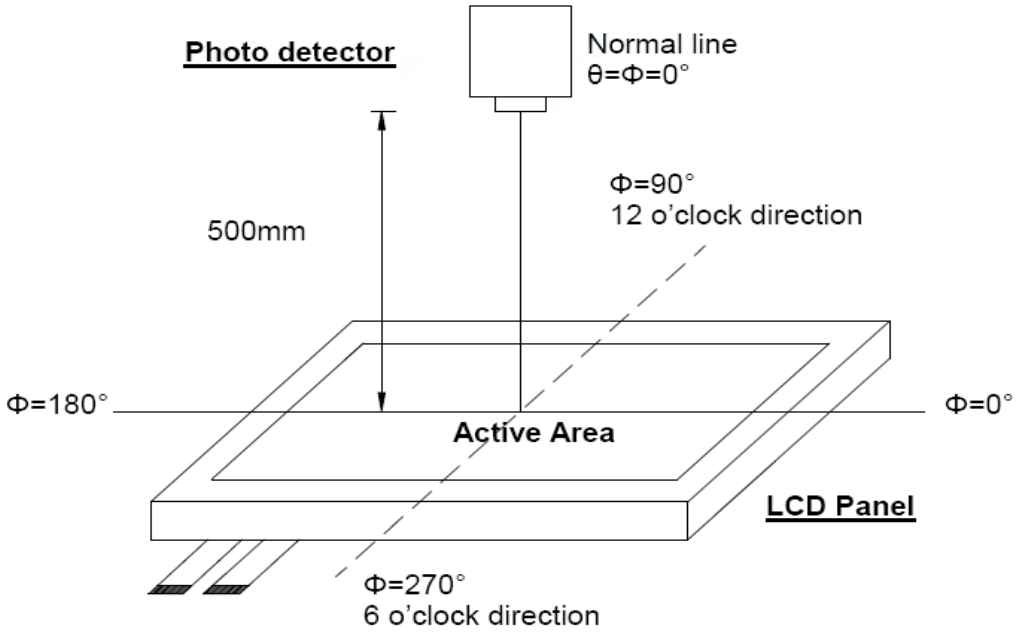
1. VCC = 3.3V, I_L = 20mArms (Backlight current), the ambient temperature is 25℃.
2. The test systems refer to Note 2.

Note 1 : Definition of viewing angle range



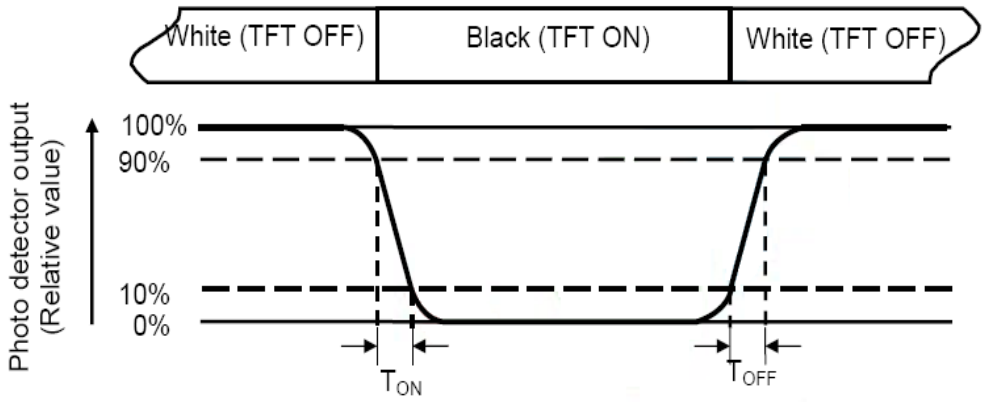
Note 2 : Definition of optical measurement system.

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 (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 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

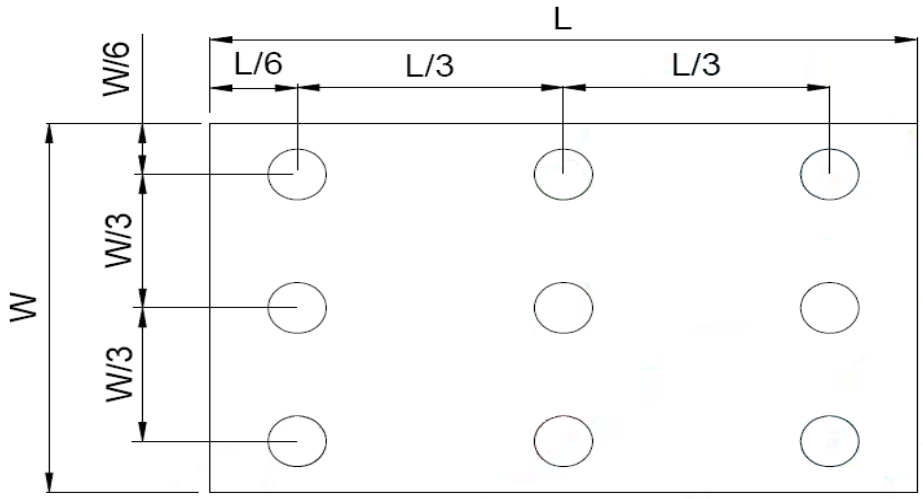
Active area is divided into 9 measuring areas (Refer to bellow figure). Every measuring point is placed at the center of each measuring area.

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

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. INTERFACE

5-1 TFT LCD Panel Driving Section

Pin No.	Symbol	I/O	Description	Note
1	GND	P	Power ground	
2	GND	P	Power ground	
3	NC		NC	
4	VCC	I	Power supply for digital circuit(3.3V)	Note 1
5	VCC	I	Power supply for digital circuit(3.3V)	Note 1
6	VCC	I	Power supply for digital circuit(3.3V)	Note 1
7	VCC	I	Power supply for digital circuit(3.3V)	Note 1
8	NC		NC	
9	DE	I	Data enable	
10	GND	P	Power ground	
11	GND	P	Power ground	
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	GND	P	Power ground	
38	DCLK	I	Clock Signal input. Latching data at the Rising edge.	
39	GND	P	Power ground	
40	GND	P	Power ground	

Note : input, O : output, P : power

Note 1: Typ. Vcc = 3.3V, Min. Vcc = 3.0V, Max. Vcc = 3.6V

5-2 Backlight Unit Section

Pin No.	Symbol	I/O	Description	Note
1	HI	P	Power supply for backlight unit	RED
2	GND	P	Ground for backlight unit	BLACK

5-3 Touch Panel

Pin No.	Symbol	I/O	Description	Note
1	Y1	O	Touch Panel Bottom Signal in Y Axis.	
2	X1	O	Touch Panel Left Signal in X Axis.	
3	Y2	O	Touch Panel Top Signal in Y Axis.	
4	X2	O	Touch Panel Right Signal in X Axis.	

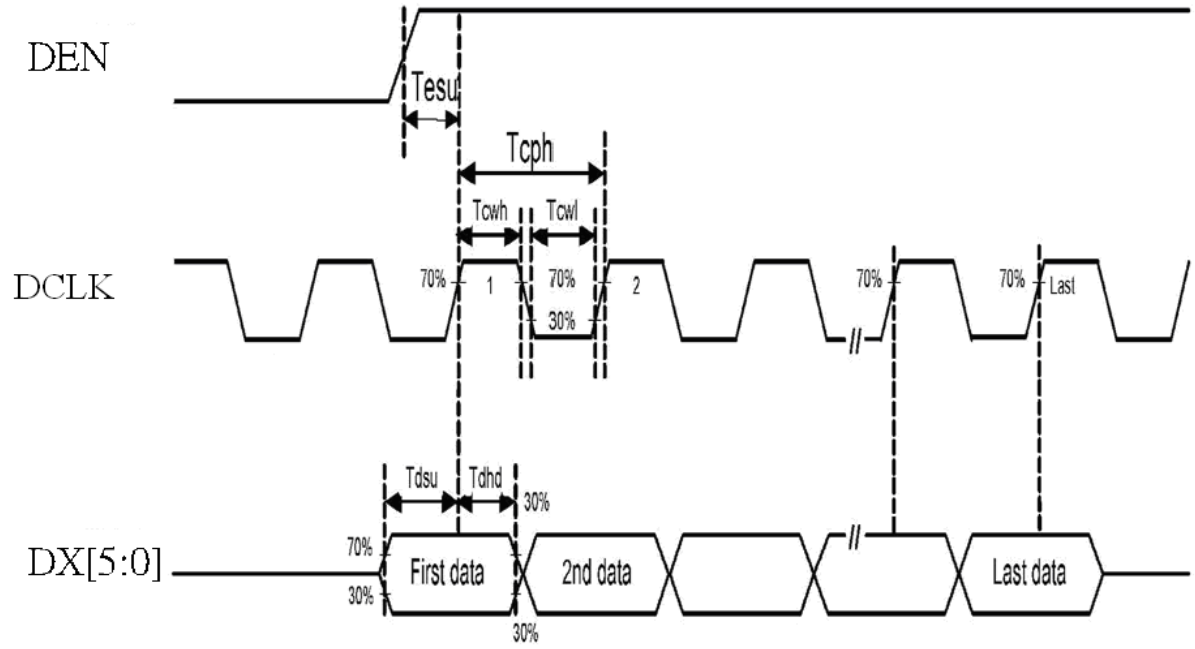
6. INPUT SIGNAL :

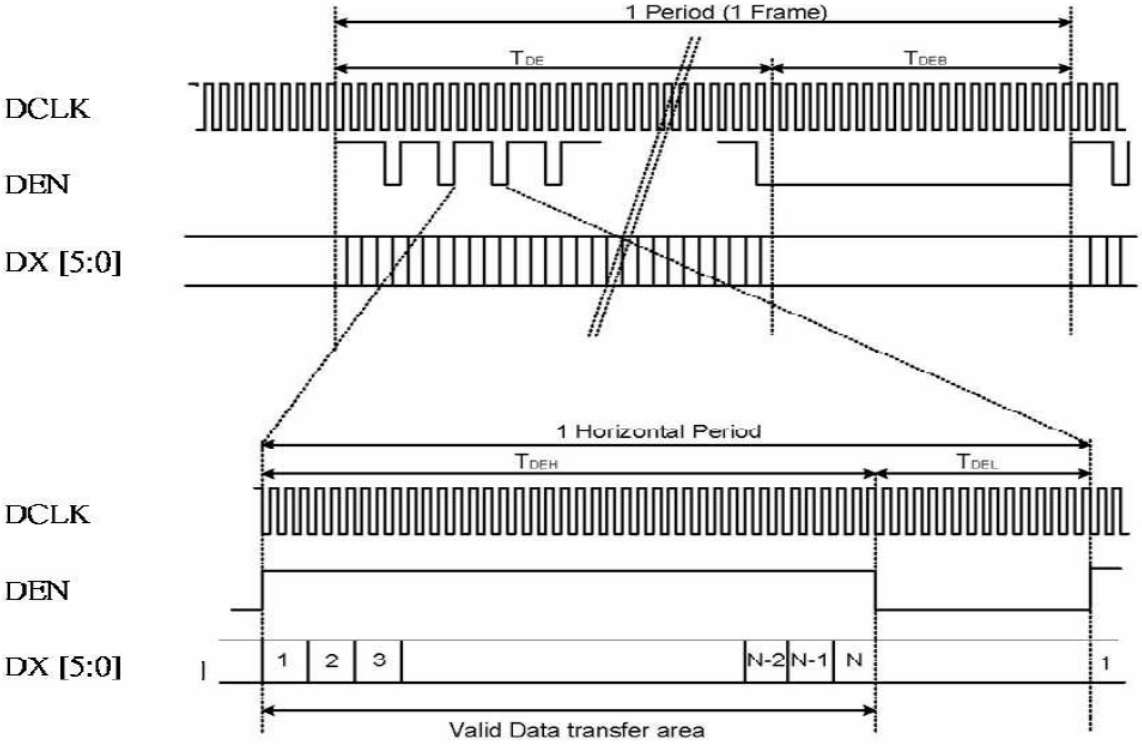
6-1 Timing Condition

Parameter	Symbol	Values			Unit	Note
		Min.	Typ.	Max.		
DCLK Frequency	FCPH	--	39.79	--	MHZ	
DCLK Period	FCPH	--	25.13	--	ns	
DCLK Pulse Duty	FCWH	40	50	60	%	
DE Period	Fdeh+TDEL	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	

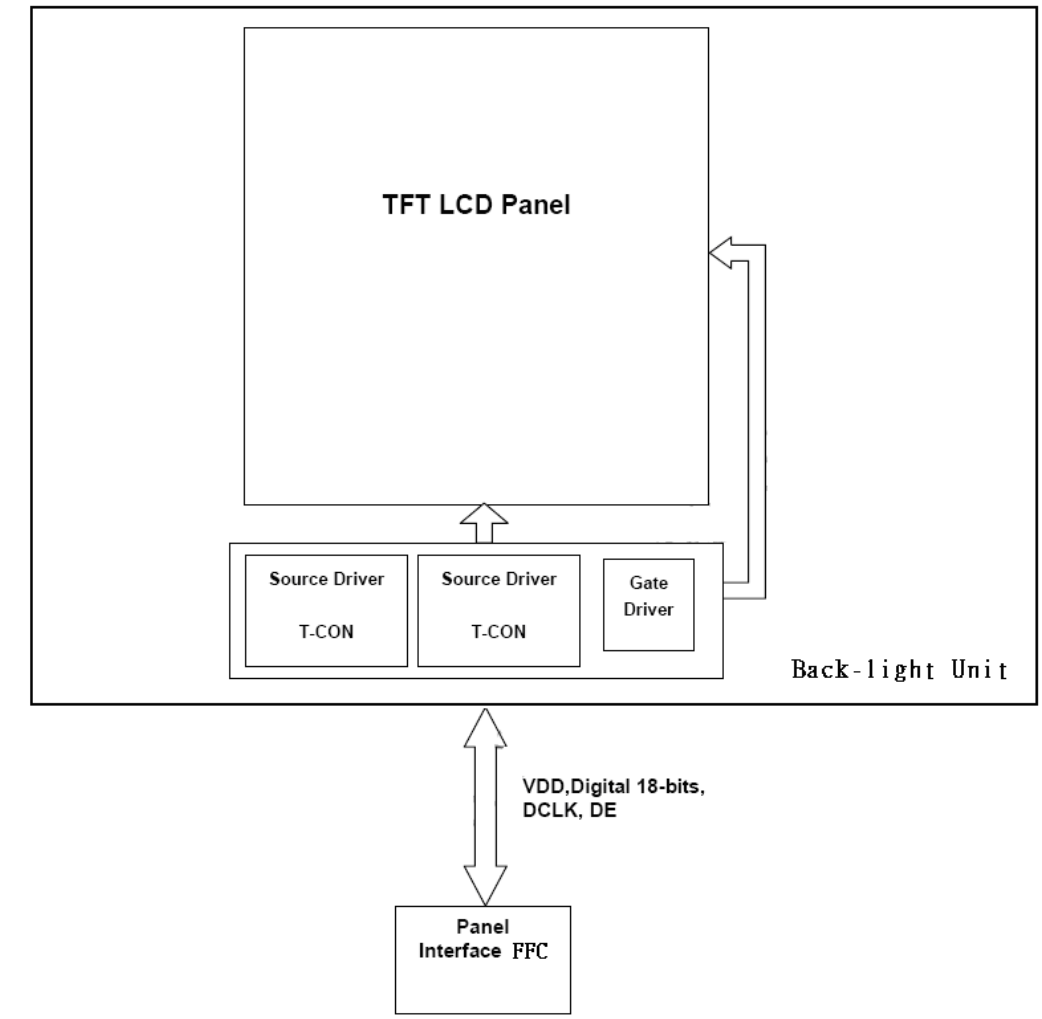
THS+THA<TH

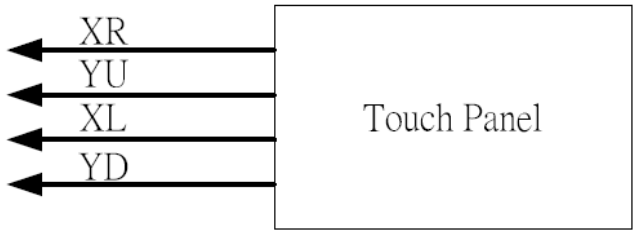
6-2 Timing Characteristic





6-3 Block Diagram





7. Touch Panel Electrical Specifications

Parameter	Condition	Standard Value
Terminal Resistance	X Axis	300 ~ 1100 Ω
	Y Axis	150 ~ 650 Ω
Insulating Resistance	DC 25 V	More than 20MΩ
Linearity	--	±1.5 %
Notes life by Pen	Note a	100,000 times(min)
Input life by finger	Note b	1,000,000 times (min)

Note A .

Notes area for pen notes life test is 10 x 9 mm.

Size of word is 7.5 x 6.75

Shape of pen end : R0.8

Load : 250 g

Note B

By Silicon rubber tapping at same point

Shape of rubber end : R8

Load : 200g

Frequency : 5 Hz

Interface

No.	Symbol	Function
1	Y1	Touch Panel Bottom Signal in Y Axis
2	X1	Touch Panel Left Signal in X Axis
3	Y2	Touch Panel Top Signal in Y Axis
4	X2	Touch Panel Right Signal in X Axis

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. 1MΩ 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 dive 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: 0.2Vdd or less and H level: 0.8Vdd 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