



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.	
APPROVED BY	
DATE	

Approved For Specifications

Approved For Specifications & Sample

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RECORD OF REVISION

Revision Date	Page	Contents	Editor
2013/07/25	-	New Release	Emil
2013/09/09	-	Issued the official Part No. to AM-1280800J3TZQW-00.	Emil
2013/09/12	11,19,20	Correct the pin definition.	Emil

1. Features

10.1 TFT Liquid Crystal Display module is a color active matrix thin film transistor (TFT) liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. It is composed of a TFT LCD panel, a timing controller, voltage reference, common voltage, column driver, and row driver circuit. This TFT LCD has a 10.1-inch diagonally measured active display area with 1280 horizontal by 800 vertical pixel array resolution.

2. PHYSICAL SPECIFICATIONS

Item	Specifications	Remark
LCD size	10.1 inch(Diagonal)	
Driver element	a-Si TFT active matrix	
Display resolution	1280 (W) × 3(RGB) x 800(H) dots	
Display mode	Normally Black, Transmissive (IPS)	
Dot pitch	0.0565 (W) x0.1695 (H) mm	
Active area	216.96 (W) x 135.6 (H) mm	
Module size	231 (W) x 150.7 (H) × 5 (D) mm	Note 1
Surface treatment	HC	
Color arrangement	R.G.B-stripe	
Interface	Digital	
Backlight power consumption	2.2Watt	Note 2
Panel power consumption	1.056Watt	Note 3
Weight	TBD	

Note 1: Refer to Mechanical Drawing.

Note 2: Including LED Driver power consumption.

Note 3: Including T-con Board power consumption.

3. ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	VALUES		UNIT	REMARK
		MIN	MAX		
Power Voltage	V_{DD}	-0.5	5.0	V	VSS=0V, TA=25°C
	V_{LED}	-0.3	6	V	
Operation Temperature	T_{op}	0	50	°C	
Storage Temperature	T_{st}	-20	60	°C	

Note 1: The absolute maximum rating values of this product are not allowed to be exceeded at any times.

Should a module be used with any of the absolute maximum ratings exceeded, the characteristics of the module may not be recovered, or in an extreme case, the module may be permanently destroyed.

4. ELECTRICAL SPECIFICATIONS

4.1 Typical Operation Conditions

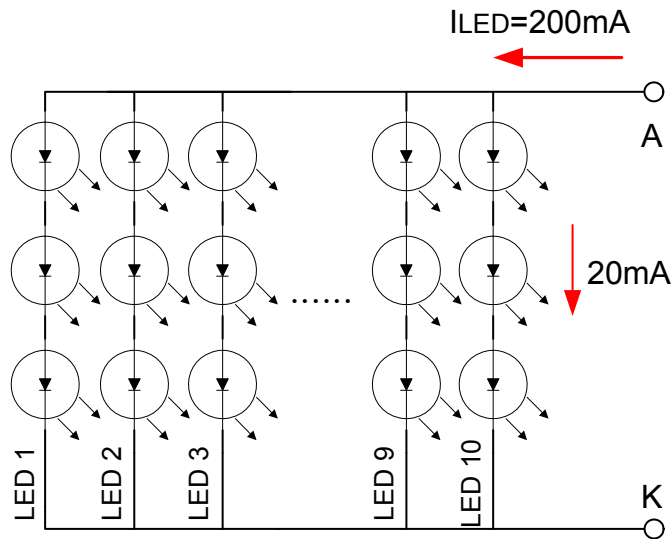
ITEM	SYMBOL	VALUES			UNIT	REMARK
		MIN	TYP.	MAX		
Power Voltage	V_{DD}	3.0	3.3	3.6	V	
	V_{LED}	4.8	5.0	5.5	V	
Input logic high voltage	V_{IH}	3.0	3.3	3.6	V	
Input logic low voltage	V_{IL}	0	--	0.5	V	
Current for Driver	I_{DD}	--	320	--	mA	$V_{DD}=3.3V$
	I_{LED}	--	440	--	mA	$V_{LED}=5V$, Duty=100%
PWM Control Level	PWM High Level	1.4	--	V_{LED}	V	
	PWM Low Level	--	--	0.5	V	
PWM Control Frequency	f_{PWM}	100	--	200k	Hz	
LED life time	--	15		--	kHr	

(GND=0V, TA=25°C)

4-2 LED Driving Conditions

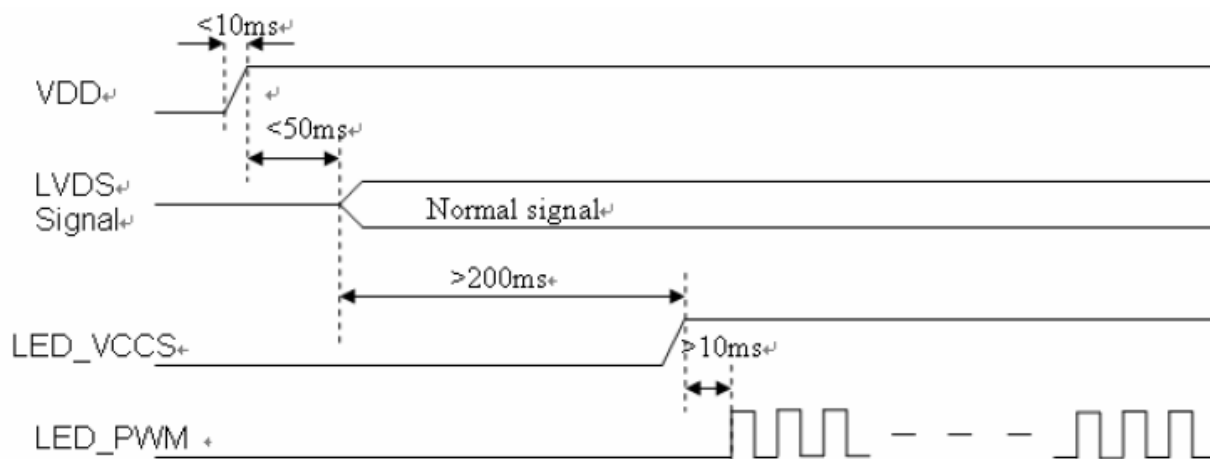
ITEM	SYMBOL	MIN	TYP	MAX	UNIT	CONDITION
LED Backlight Voltage	V_{BL}	8.1	8.8	10.8	V	For reference
LED Backlight Current	I_{BL}	-	200	220	mA	Ta=25°C
LED Life Time		15	-	-	kHr	Note*

Note* : Brightness to be decreased to 50% of the initial value.

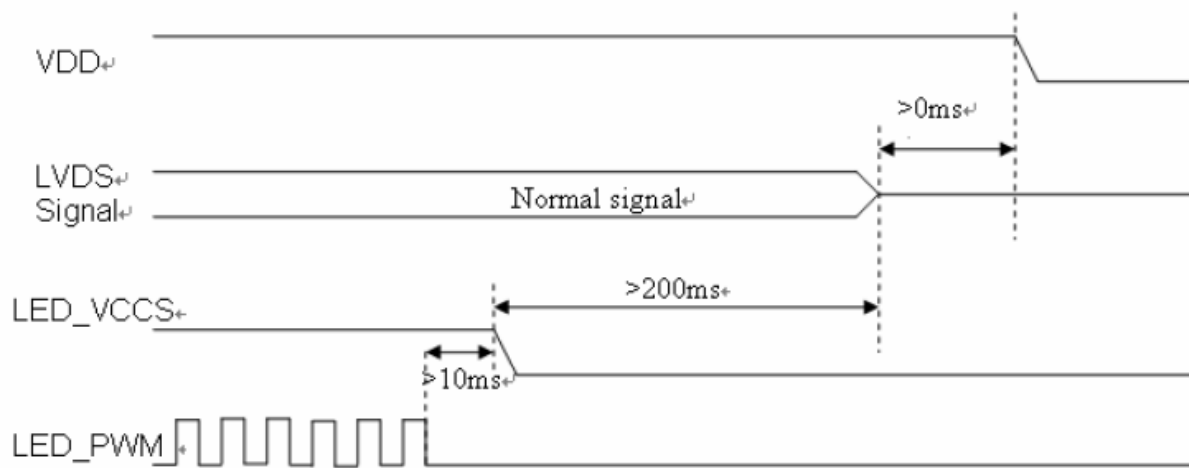


4.3 Power Sequence

a. Power on:



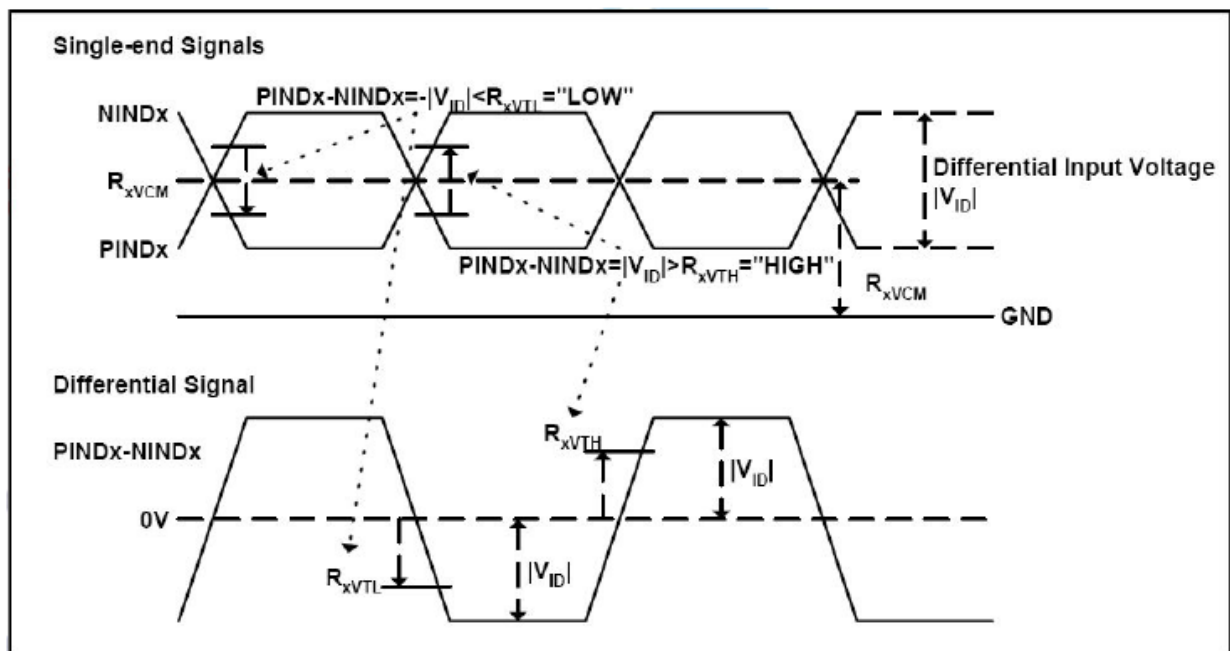
b. Power off:



4.4 LVDS Signal Timing Characteristics

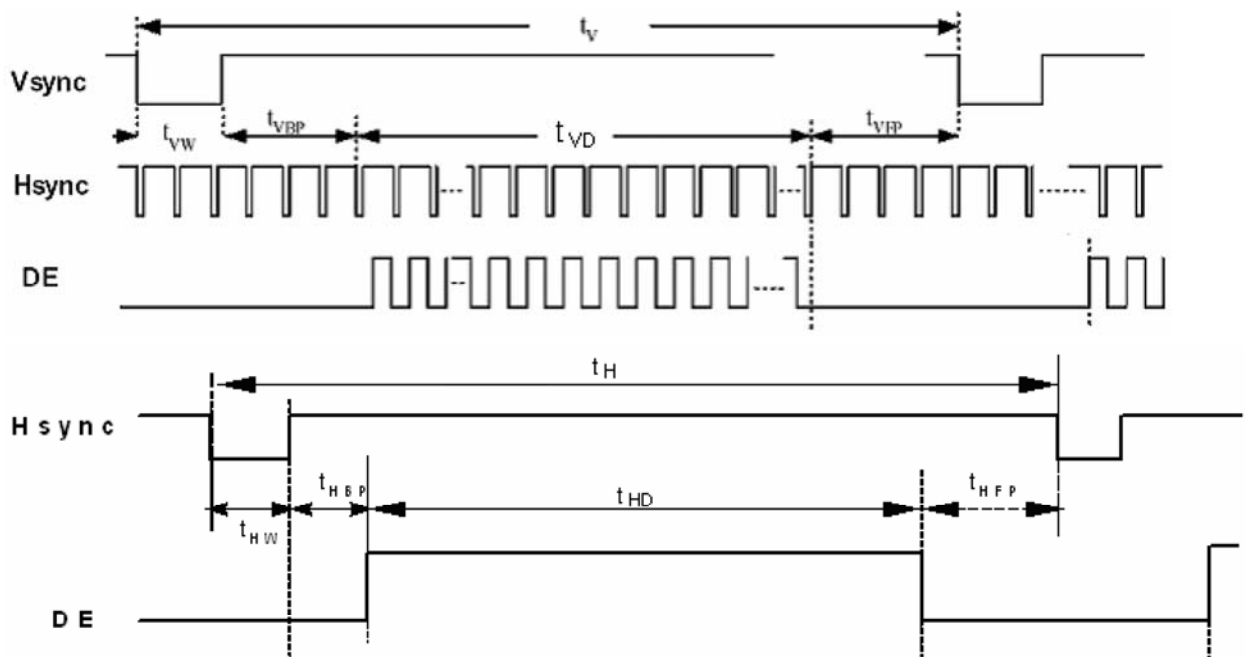
4.4.1 AC Electrical Characteristics

ITEM	SYMBOL	VALUES			UNIT	REMARK
		MIN	TYP.	MAX		
LVDS Differential input high Threshold voltage	R_{xVTH}	--	--	+100	mV	$R_{xVCM}=1.2V$
LVDS Differential input low Threshold voltage	R_{xVTL}	-100	--	--	mV	
LVDS Differential input common mode voltage	R_{xVCM}	0.7	--	1.6	V	
LVDS Differential voltage	$ V_{ID} $	250	--	600	mV	

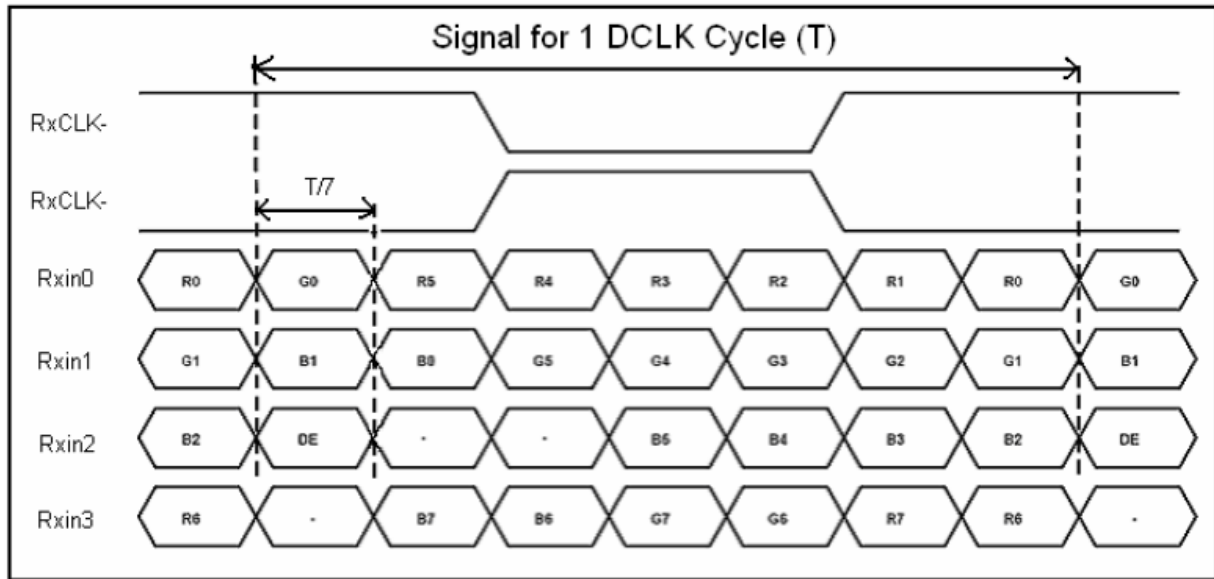


4.4.2 Timing Table

ITEM	SYMBOL	VALUES			UNIT	REMARK
		MIN	TYP.	MAX		
Clock Frequency	$1/T_c$	68.9	71.1	73.4	MHz	Frame rate =60Hz
Horizontal display area	t_{HD}	1280			Tc	
HS period time	t_H	1410	1440	1470	Tc	
HS Width +Back Porch +Front Porch	$t_{HW}+t_{HBP}+t_{HFP}$	60	160	190	Tc	
Vertical display area	t_{VD}	800			t_H	
VS period time	T_v	815	823	833	t_H	
VS Width +Back Porch +Front Porch	$t_{VW}+t_{VBP}+t_{VFP}$	15	23	33	t_H	



4.5.3 LVDS Data Input Format

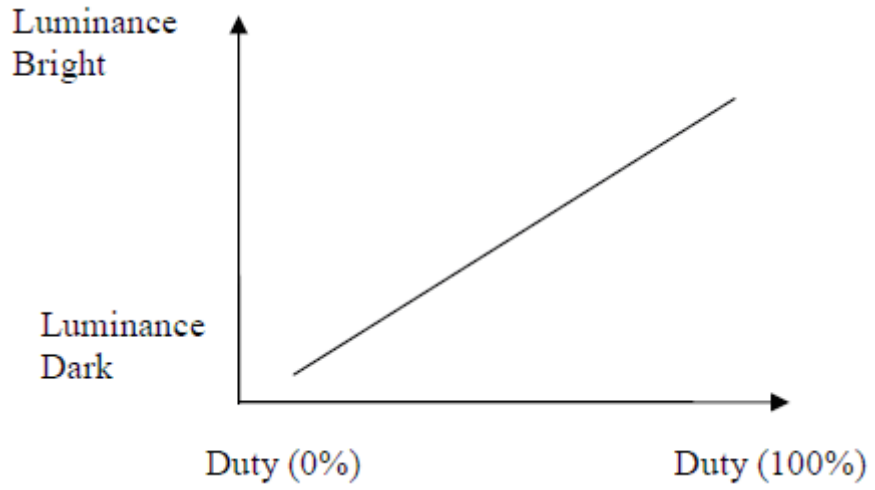


5. INTERFACE

Pin No.	Symbol	Description	Note
1	GND	Ground	
2	VDD	3.3V Power	
3	VDD	3.3V Power	
4	V_EDID	3.3V Power for EDID	
5	ADJ	Adjust for LED brightness	Note*
6	CLK_EDID	EDID Clock Input	
7	DATA_EDID	EDID Data Input	
8	RXIN0-	LVDS Signal - channel0-	
9	RXIN0+	LVDS Signal+ channel0+	
10	GND	Ground	
11	RXIN1-	Data Input channel1-	
12	RXIN1+	Data Input channel1+	
13	GND	Ground	
14	RXIN2-	Data Input channel2-	
15	RXIN2+	Data Input channel2+	
16	GND	Ground	
17	RXCLKIN-	Data Input CLK-	
18	RXCLKIN+	Data Input CLK+	
19	GND	Ground	
20	RXIN3-	Data Input channel3-	
21	RXIN3+	Data Input channel3+	
22	GND	Ground	
23	GND	Ground	
24	VLED	VLED Power +5V	
25	VLED	VLED Power +5V	
26	VLED	VLED Power +5V	
27	NC	No connection	

28	NC	No connection	
29	NC	No connection	
30	NC	No connection	

Note: LED_PWM is used to adjust backlight brightness.



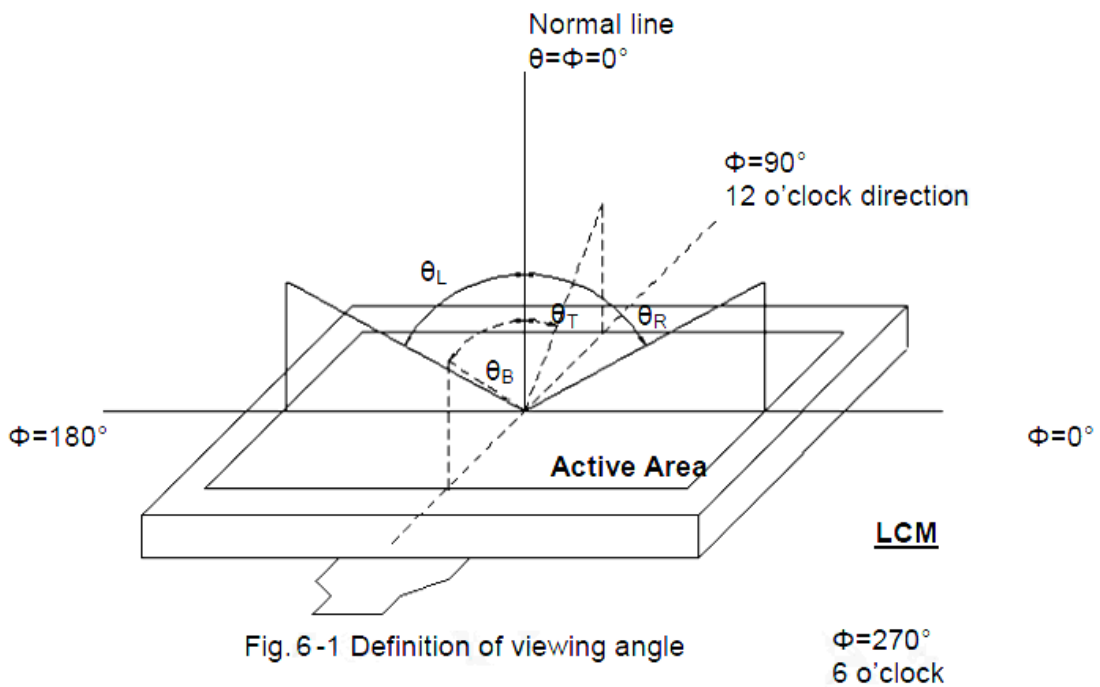
6. Optical Specifications

Item	Symbol	Condition	Values			Unit	Remark
			Min.	Typ.	Max.		
Viewing angle (CR≥ 10)	θ_L	$\Phi=180^\circ$ (9 o'clock)	75	85	-	degree	Note 1
	θ_R	$\Phi=0^\circ$ (3 o'clock)	75	85	-		
	θ_T	$\Phi=90^\circ$ (12 o'clock)	75	85	-		
	θ_B	$\Phi=270^\circ$ (6 o'clock)	75	85	-		
Response time	T_{ON}	Normal $\theta=\Phi=0^\circ$	-	10	20	msec	Note 3
	T_{OFF}		-	15	30	msec	Note 3
Contrast ratio	CR		600	800	-	-	Note 4
Color chromaticity	W_X		0.26	0.31	0.36	-	Note 2 Note 5
	W_Y		0.28	0.33	0.38	-	Note 6
Luminance	L		300	350	-	cd/m ²	Note 6
Luminance uniformity	Y_U		75	80	-	%	Note 7

Test Conditions:

1. VDD=2.5V,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. (Viewing angle is measured by ELDIM-EZ contrast/Height :1.2mm, Response time is measured by Photo detector TOPCON BM-7, other items are measured by BM-5A/ Field of view: 1° /Height: 500mm.)

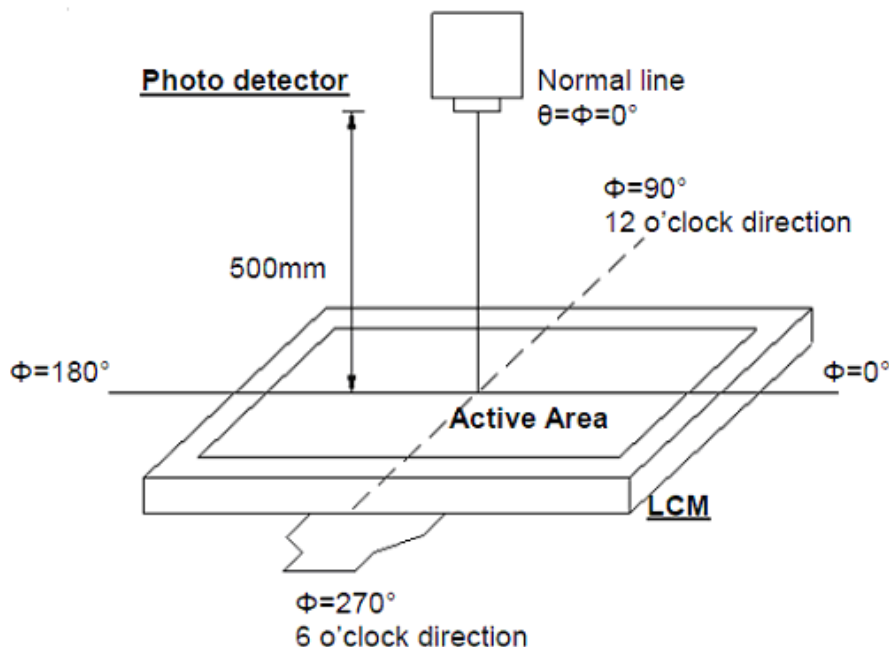


Fig. 6-2 Optical measurement system setup

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%.

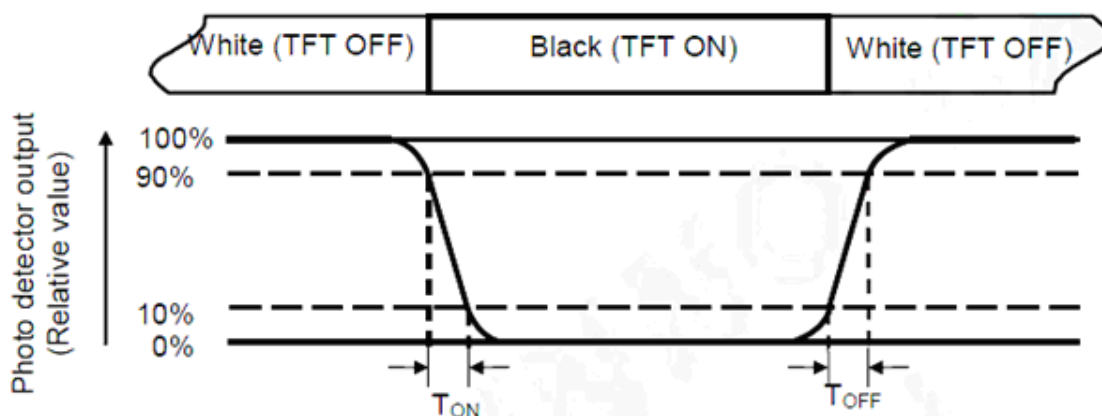


Fig. 6-3 Definition of response time

Note 4: Definition of contrast ratio

$$\text{Contrast ratio (CR)} = \frac{\text{Brightness @ "White" state}}{\text{Brightness @ "Black" state}}$$

Note 5: Definition of color chromaticity (CIE1931)

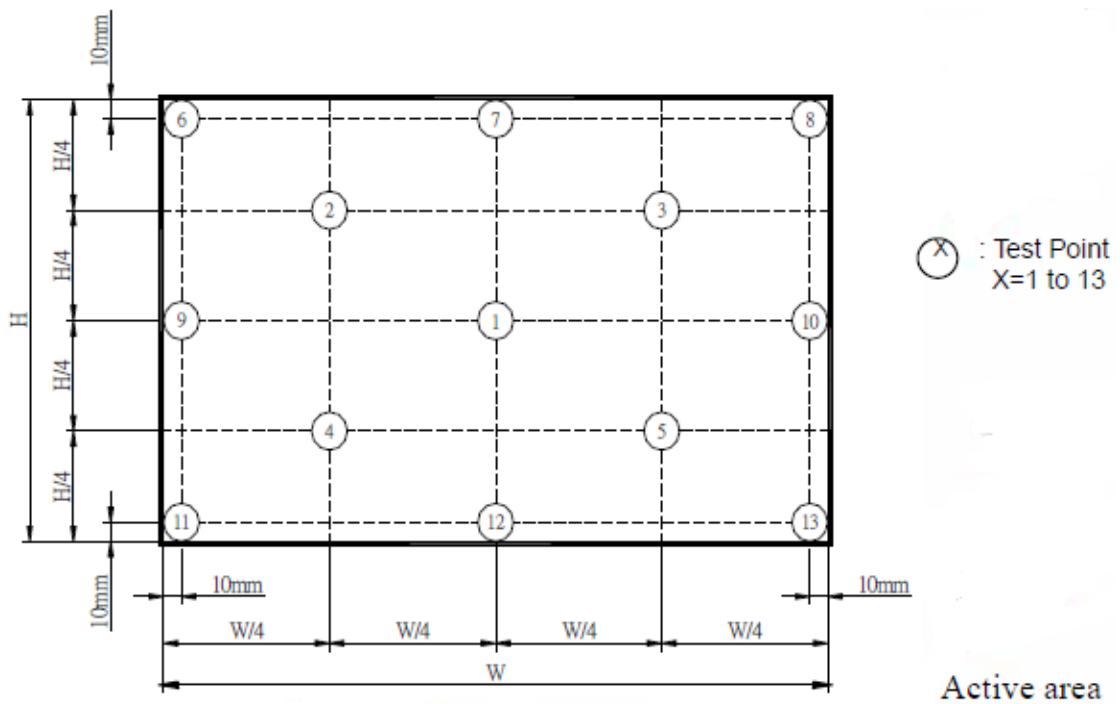
Color coordinates measured at center point of LCD.

Note 6: All input terminals LCD panel must be ground while measuring the center area of the panel. The LED driving condition is IL=200mA.

Note 7: Definition of Luminance Uniformity

Measure the luminance of gray level 63 at 9 points

$$\delta W_{9p} = \left\{ \frac{\text{Minimum [L (1)+ L (6)+ L (7)+ L (8)+ L (9)+ L (10)+ L (11) +L (12) +L (13)]}}{\text{Maximum [L (1) + L (6)+ L (7)+ L (8)+ L (9)+ L (10)+ L (11) +L (12) +L (13)]}} \right\} * 100\%$$



7. RELIABILITY TEST CONDITIONS

Item	Test Conditions	Note
High Temperature Storage	Ta = 60°C 240 hrs	Note 1,Note 4
Low Temperature Storage	Ta = -20°C 240 hrs	Note 1,Note 4
High Temperature Operation	Ts = 50°C 240 hrs	Note 2,Note 4
Low Temperature Operation	Ts = 0°C 240 hrs	Note 1,Note 4
High Temperature and High Humidity (operation)	Ta = +40°C, 90%RH 240 hrs	Note 4
Thermal Cycling Test (non operation)	-20°C (30min) → +60°C (30min), 100cycles	Note 4
Electrostatic Discharge	±2KV, 100pF/1500Ω, Human Body Mode	
Vibration	Frequency range: 10~55Hz Stroke: 1.5mm Sweep: 10Hz~55Hz~10Hz 2 hours for each direction of X. Y. Z. (6 hours for total)	
Mechanical Shock	100G 6ms, ±X, ±Y, ±Z 3 times for each direction	
Vibration (with carton)	Random Vibration : 0.015G*G/Hz from 5-200HZ, -6dB/Octave from 200-500HZ 2 hours for each direction of X. Y. Z. (6 hours for total)	
Drop (with carton)	Height: 60cm 1 corner, 3 edges, 6 surfaces	

Note 1: Ta is the ambient temperature of samples.

Note 2: Ts is the temperature of panel's surface.

Note 3: In the standard condition, there shall be no practical problem that may affect the display function.

After the reliability test, the product only guarantees operation, but don't guarantee all of the cosmetic specification.

Note 4: Before cosmetic and function test, the product must have enough recovery time, at least 2 hours at room temperature.

8. GENERAL PRECAUTION

8.1 Use Restriction

This product is not authorized for use in life supporting systems, aircraft navigation control systems, military systems and any other application where performance failure could be life-threatening or otherwise catastrophic.

8.2 Disassembling or Modification

Do not disassemble or modify the module. It may damage sensitive parts inside LCD module, and may cause scratches or dust on the display. AMPIRE does not warrant the module, if customers disassemble or modify the module.

8.3 Breakage of LCD Panel

- (1) If LCD panel is broken and liquid crystal spills out, do not ingest or inhale liquid crystal, and do not contact liquid crystal with skin.
- (2) If liquid crystal contacts mouth or eyes, rinse out with water immediately.
- (3) If liquid crystal contacts skin or cloths, wash it off immediately with alcohol and rinse thoroughly with water.
- (4) Handle carefully with chips of glass that may cause injury, when the glass is broken.

8.4 Electric Shock

- (1) Disconnect power supply before handling LCD module.
- (2) Do not pull or fold the LED cable.
- (3) Do not touch the parts inside LCD modules and the fluorescent LED's connector or cables in order to prevent electric shock.

8.5 Absolute Maximum Ratings and Power Protection Circuit

- (1) Do not exceed the absolute maximum rating values, such as the supply voltage variation, input voltage variation, variation in parts' parameters, environmental temperature, etc., otherwise LCD module may be damaged.
- (2) Please do not leave LCD module in the environment of high humidity and high temperature for a long time.
- (3) It's recommended to employ protection circuit for power supply.

8.6 Operation

- (1) Do not touch, push or rub the polarizer with anything harder than HB pencil lead.
- (2) Use fingerstalls of soft gloves in order to keep clean display quality, when persons handle the LCD module for incoming inspection or assembly.
- (3) When the surface is dusty, please wipe gently with absorbent cotton or other soft material.
- (4) Wipe off saliva or water drops as soon as possible. If saliva or water drops contact with polarizer for a long time, they may cause deformation or color fading.
- (5) When cleaning the adhesives, please use absorbent cotton wetted with a little petroleum benzene or other adequate solvent.

8.7 Mechanism

Please mount LCD module by using mounting holes arranged in four corners tightly.

8.8 Static Electricity

- (1) Protection film must remove very slowly from the surface of LCD module to prevent from electrostatic occurrence.
- (2) Because LCD modules use CMOS-IC on circuit board and TFT-LCD panel, it is very weak to electrostatic discharge. Please be careful with electrostatic discharge. Persons who handle the module should be grounded through adequate methods.

8.9 Strong Light Exposure

The module shall not be exposed under strong light such as direct sunlight. Otherwise, display characteristics may be changed.

8.10 Disposal

When disposing LCD module, obey the local environmental regulations.

8.11 Others

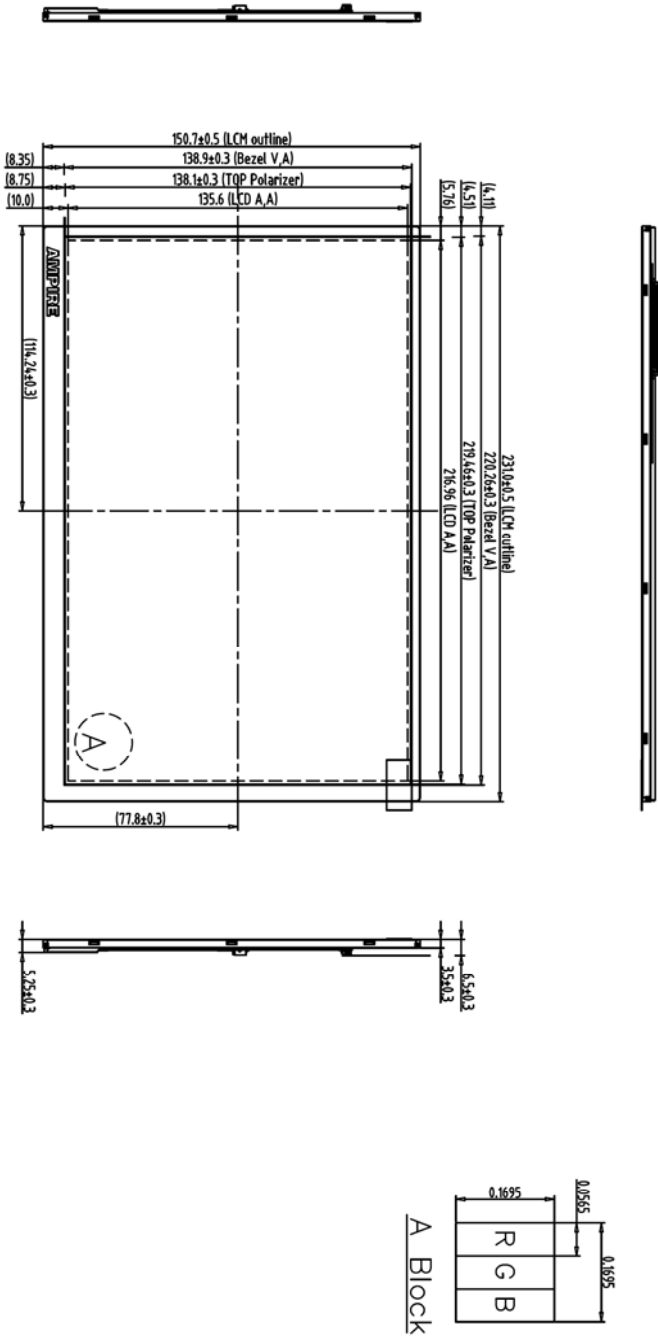
AMIPRE will provide one year warrantee for all products and three months warrantee for all repairing products.

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.

9. OUTLINE DIMENSION

REV	REVISION RECORD	DATE	NAME
0	NEW RELEASE	07-25-13	EMILY
1	TF1-1280800-10-0 Renames to 1280800J3	09-06-13	EMILY
2	Modify Interface pin 20 & 21	09-12-13	EMILY

1	GND	16	GND
2	VDD	17	RXCCLKIN-
3	VDD	18	RXCCLKIN+
4	V_EDID	19	GND
5	ADJ	20	RXIN3-
6	CLK_EDID	21	RXIN3+
7	DATA_EDID	22	GND
8	RXIN0-	23	GND
9	RXIN0+	24	VLED
10	GND	25	VLED
11	RXIN1-	26	VLED
12	RXIN1+	27	NC
13	GND	28	NC
14	RXIN2-	29	NC
15	RXIN2+	30	NC



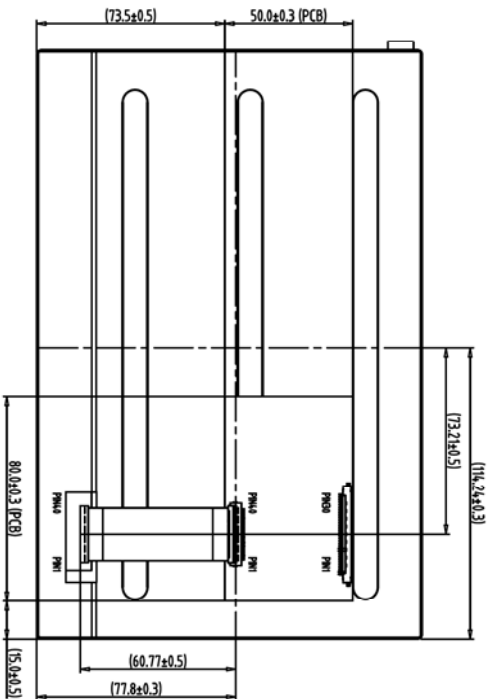
Note:
1. Unless indicated, Tolerance "±0.3"

- UV Glue For OLB Protection.
- LCM connector :F62240-H1210A or equivalent.
- CN2 connector :P0.5 40PIN H2.0/089H40-000000-G2-C or equivalent.
- CN3 connector :P1.0 30PIN H2.3/DS100-230-H23 or equivalent.

1	TF1-1280800-10-0	7	TOLERANCE GRAD(F)	A	B	DIM.	MR	DWN.	EMILY	DATE	TITLE
2		8				IE NO.		CHEK.		07-25-13	晶采光电科技
3		9				PARTS NO. LCM	1280800J3	APPD.		DATE	1280800J3
4		10									
5		11									
6		12									

REV	REVISION RECORD	DATE	NAME
0	NEW RELEASE	07-25-13	EMILY
1	TFT-1280800-10-0 Rename to 1280800J3	09-06-13	EMILY
2	Modify interface pin 20 & 21	09-12-13	EMILY

1	GND	16	GND
2	VDD	17	RXCCLKIN-
3	VDD	18	RXCCLKIN+
4	V_EDID	19	GND
5	ADJ	20	RXIN3-
6	CLK_EDID	21	RXIN3+
7	DATA_EDID	22	GND
8	RXIN0-	23	GND
9	RXIN0+	24	VLED
10	GND	25	VLED
11	RXIN1-	26	VLED
12	RXIN1+	27	NC
13	GND	28	NC
14	RXIN2-	29	NC
15	RXIN2+	30	NC



Back View

Note:

1. Unless indicated, Tolerance " ± 0.3 "
2. UV Glue For OLB Protection.
3. LCM connector : F62240-H1210A or equivalent.
4. CN2 connector : P0.5 40PIN H2.0/089H40-000000-G2-C or equivalent.
5. CN3 connector : P1.0 30PIN H2.3/DS100-230-H23 or equivalent.

1	TFT-1280800-10-0	7		TOLERANCE GRADE(F)	A	B	DIM.	MM	DWN.	EMILY	DATE	TITLE
2		8					IE NO.		CHK.		07-25-13	1280800J3
3		9					PARTS NO. LCM-1				DATE	DWG. NO.
4		10					1280800J3		APPD.		DATE	*13076CMA
5		11									DATE	SHEET 1 OF 1
6		12									DATE	

AMPIRE 晶采光電科技

TITLE
1280800J3
DWG. NO.
*13076CMA
SHEET 1 OF 1