



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-1280800NJTZQW-T12H
APPROVED BY	
DATE	

Approved For Specifications

Approved For Specifications & Sample

AMPIRE CO., LTD.

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APPROVED BY	CHECKED BY	ORGANIZED BY

RECORD OF REVISION

Revision Date	Page	Contents	Editor
2019/07/16	-	New Release	Mark

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, [Projective Capacitive Touch\(USB Interface\)](#), 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 resolutions.

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	0.1695 (W) x0.1695 (H) mm	
Active area	216.96 (W) x 135.6 (H) mm	
Color arrangement	R.G.B-stripe	
Interface	Digital	

3. ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	VALUES		UNIT	REMARK
		MIN	MAX		
Power Voltage	V_{DD}	-0.3	4.0	V	VSS=0V, TA=25°C
	V_{LED}	-0.3	24	V	
Operation Temperature	T_{op}	-20	70	°C	
Storage Temperature	T_{st}	-30	80	°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.

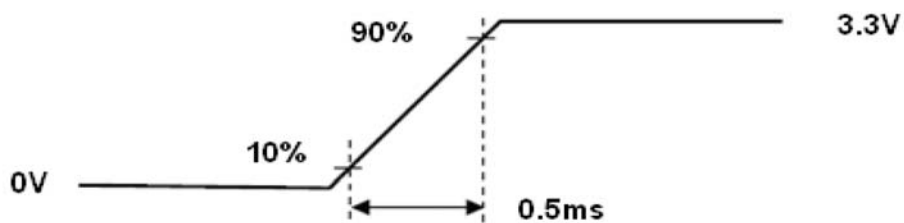
4. ELECTRICAL SPECIFICATIONS

4.1 Typical Operation Conditions

Item		Symbol	Min	Typ	Max	Unit	Note
LCD Drive Voltage		VDD	3.0	3.3	3.6	V	(2),(4)
VDD Current	White Pattern	IDD	--	0.27	--	A	(3),(4)
VDD Power Consumption	White Pattern	PDD	--	--	1.0	W	(3),(4)
Rush Current		Irush			1.5	A	(1),(4),(5)
Allowable Logic/LCD Drive Ripple Voltage		VDDrp			300	mV	(4)
LED Driver Power Voltage		VLED	--	12	--	V	
LED Driver Current		ILED	--	0.37	--	A	LED_EN =ADJ=High
ADJ frequency		fPWM	100	--	20k	Hz	
ADJ logic level High		VIH	2.4	--	--	V	
ADJ logic level High		VIL	--	--	0.7	V	

Note 1.Measure Condition

Figure 9 VDD rising time

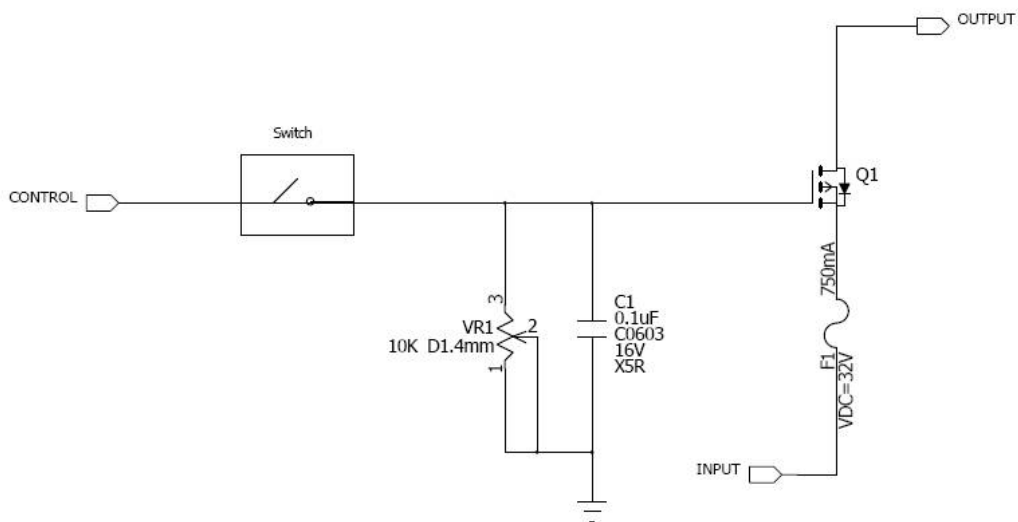


VDD rising time

Note (2) Frame Rate=60Hz, VDD=3.3V,DC Current.

Note (3) Operating temperature 25°C , humidity 55%RH.

Note (4) The reference measurement circuit of rush current.

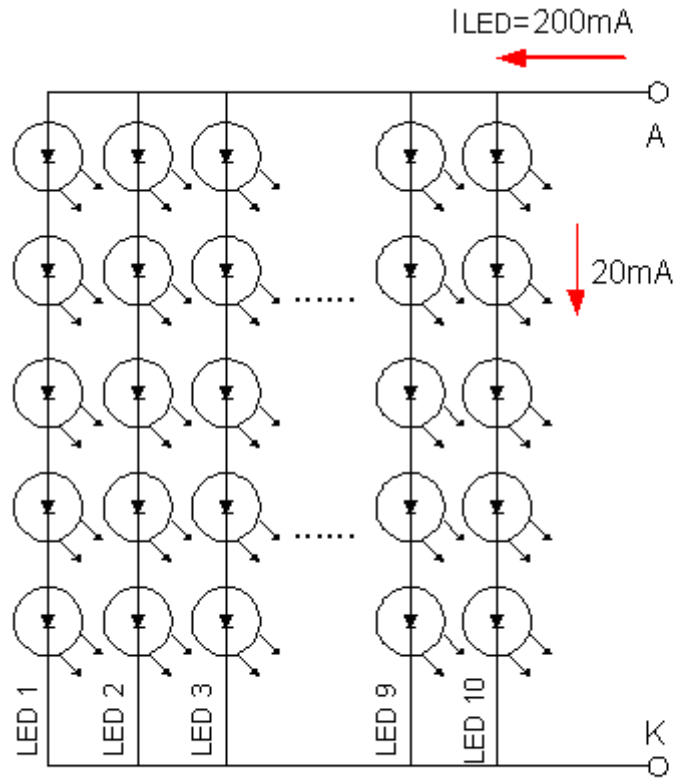


4-2 LED Driving Conditions

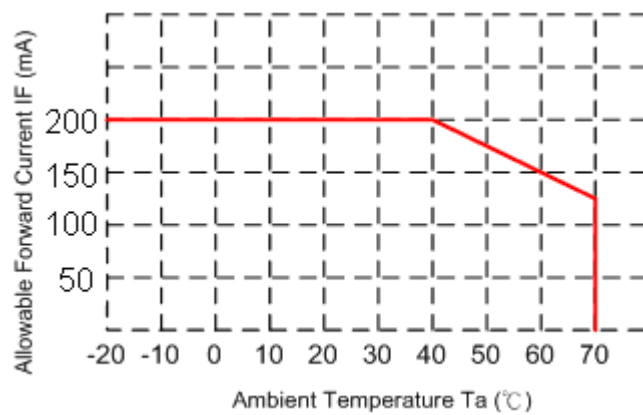
ITEM	SYMBOL	MIN	TYP	MAX	UNIT	CONDITION
LED Backlight Voltage	V_{BL}	--	16	18	V	For reference
LED Backlight Current	I_{BL}	-	200	--	mA	Ta=25°C
LED Life Time		--	30K	-	kHr	Note*

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

Ta=25°C



When LCM is operated over 40°C ambient temperature, the I_{LED} should be follow :



4.3 Power Sequence

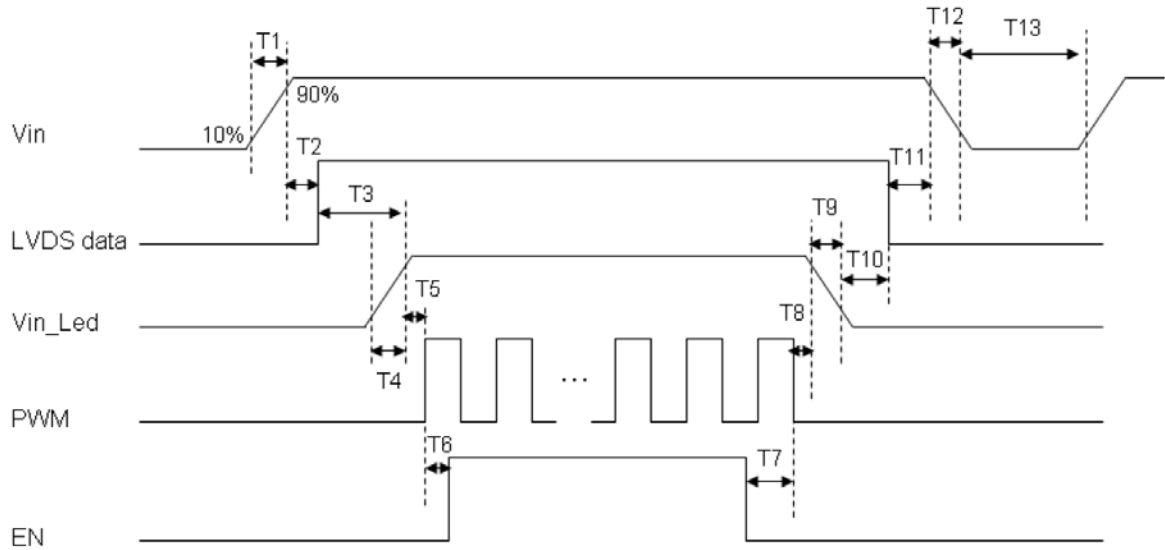


Table 10 Power Sequencing Requirements

Parameter	Symbol	Unit	Min	Typ.	Max
VIN Rise Time	T1	ms	0.5	--	10
VIN Good to Signal Valid	T2	ms	30	--	90
Signal Valid to Backlight On	T3	ms	200	--	--
Backlight Power On Time	T4	ms	0.5	--	--
Backlight VDD Good to System PWM On	T5	ms	10	--	--
System PWM ON to Backlight Enable ON	T6	ms	10	--	--
Backlight Enable Off to System PWM Off	T7	ms	0	--	--
System PWM Off to B/L Power Disable	T8	ms	10	--	--
Backlight Power Off Time	T9	ms	--	10	30
Backlight Off to Signal Disable	T10	ms	200	--	--
Signal Disable to Power Down	T11	ms	0	--	50
VIN Fall Time	T12	ms	--	10	30
Power Off	T13	ms	500	--	--

4.4 LVDS Signal Timing Characteristics

4.4.1 AC Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Differential Input High	V _{th}	-	-	+100	mV	V _{CM} =+1.2V
Differential Input Low	V _{tl}	-100	-	-	mV	V _{CM} =+1.2V
Magnitude Differential Input	V _{ID}	200	-	400	mV	-
Common Mode Voltage	V _{CM}	0.3+(V _{ID} /2)	-	VDD-1.2-(V _{ID} /2)	V	-
Common Mode Voltage	ΔV _{CM}	-	-	50	mV	V _{CM} =+1.2V

Note (1) Input signals shall be low or Hi-Z state when VDD is off.

(2) All electrical characteristics for LVDS signal are defined and shall be measured at the interface connector of LCD.

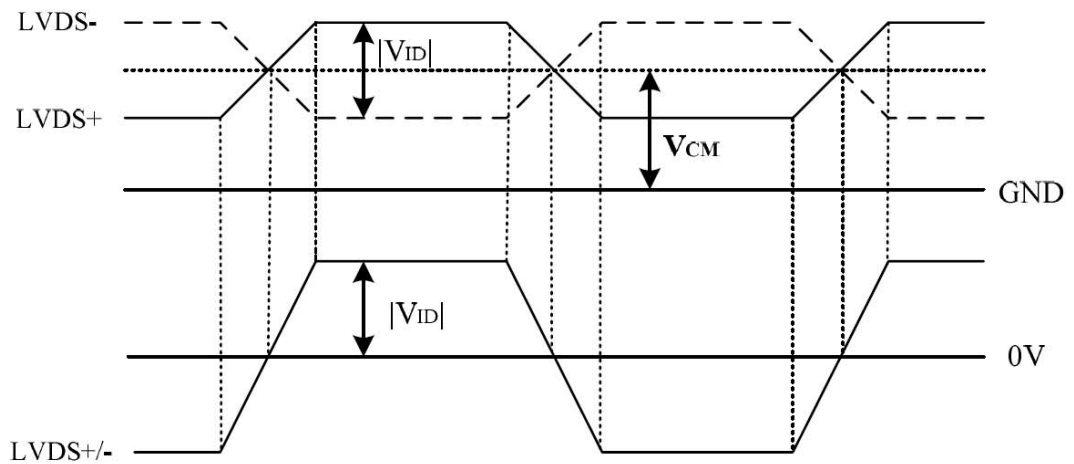
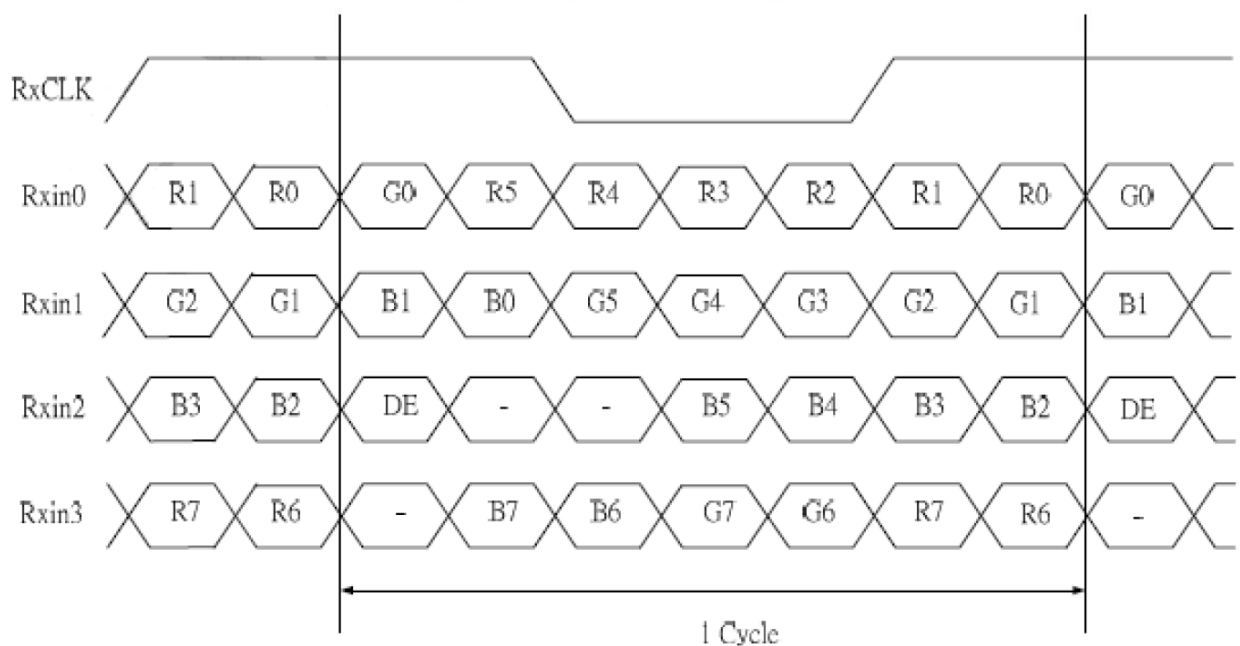
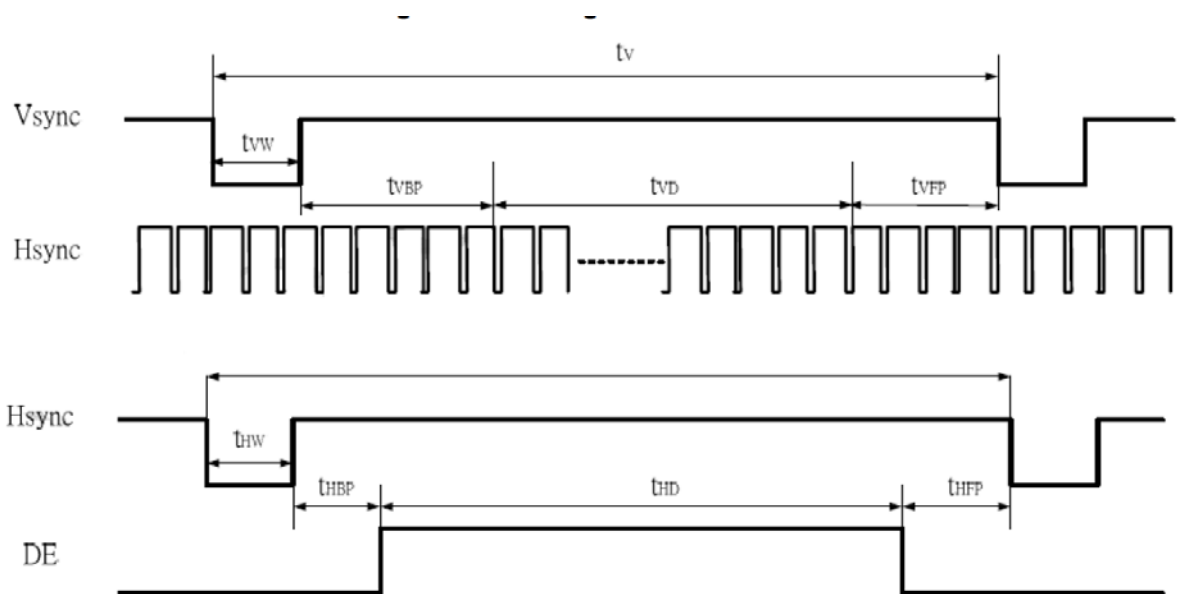


Figure 9 LVDS Data Mapping



4.4.2 Timing Table

Parameter	Symbol	Unit	Min.	Typ.	Max.
Frame Rate	--	Hz	-	60	-
Frame Period	t_v	line	(815)	(823)	(1023)
Vertical Display Time	t_{VD}	line	800		
Vertical Blanking Time	$t_{VW}+t_{VBP}+t_{VFP}$	line	(15)	(23)	(33)
1 Line Scanning Time	t_H	clock	(1410)	(1440)	(1470)
Horizontal Display Time	t_{HD}	clock	1280		
Horizontal Blanking Time	$t_{HW}+t_{HBP}+t_{HFP}$	clock	(60)	(160)	(190)
Clock Rate	$1/T_C$	MHz	(68.9)	(71.1)	(73.4)



5. INTERFACE

CN1 (Input signal): Starconn / 300E40-0010RA-G3

Pin #	Signal Name	Description	Remarks
1	NC	Not Connect	-
2	VDD	Power Supply, 3.3V (typical)	-
3	VDD	Power Supply, 3.3V (typical)	
4	VDD_EDID	Power Supply for EDID I2C Flash IC	
5	SCL_EDID	I2C Serial Clock for EDID I2C Flash IC	
6	SDA_EDID	I2C Serial Data for EDID I2C Flash IC	
7	NC	Not Connect	
8	LV0N	-LVDS differential data input	
9	LV0P	+LVDS differential data input	
10	GND	Ground	
11	LV1N	-LVDS differential data input	
12	LV1P	+LVDS differential data input	
13	GND	Ground	
14	LV2N	-LVDS differential data input	
15	LV2P	+LVDS differential data input	
16	GND	Ground	
17	LVCLKN	-LVDS differential data input	
18	LVCLKP	+LVDS differential data input	
19	GND	Ground	
20	LV3N	-LVDS differential data input	
21	LV3P	+LVDS differential data input	
22	GND	Ground	
23	NC	Not Connect	
24	NC	Not Connect	
25	NC	Not Connect	
26	NC	Not Connect	
27	NC	Not Connect	
28	NC	Not Connect	
29	CABC_EN	Not Connect	
30	NC	Not Connect	
31	NC	Not Connect	
32	NC	Not Connect	
33	NC	Not Connect	
34	NC	Not Connect	
35	BIST	BIST pin	
36-40	NC	Not Connect	

5.2 LED DRIVER BOARD INTERFACE

CN2: 4PIN/FPHT1-104TTW000

Pin No.	Symbol	I/O	Description	Note
1	VLED	P	Voltage for LED circuit	
2	LED_EN	I	LED BLU ON/OFF. High level: ON; Low level: OFF.	
3	GND	I	Power ground	
4	ADJ	P	Adjust the LED brightness by PWM	

6. Optical Specifications

Table 2 Optical Characteristics

Item	Conditions		Min.	Typ.	Max.	Unit	Note	
Viewing Angle (CR>10)	Horizontal	θ_L	(75)	(85)	-	degree	(1),(2),(3)	
		θ_R	(75)	(85)	-			
	Vertical	θ_T	(75)	(85)	-			
		θ_B	(75)	(85)	-			
Contrast Ratio	Center		(600)	(800)	-	-	(1),(2),(4)	
Response Time	Rising		-	-	-	ms	(1),(2),(5)	
	Falling		-	-	-	ms		
	Rising + Falling		-	25	-	ms		
Color Chromaticity (CIE1931)	NTSC		-	45	-	%	(1),(2)	
	Red	x	Typ. -0.05	0.561	Typ. +0.05	-	(1),(2)	
	Red	y		0.334				
	Green	x		0.341				
	Green	y		0.568				
	Blue	x		0.161				
	Blue	y		0.129				
	White	x		-		0.313		-
	White	y		-		0.329		-
White Luminance	Center			380		425		-
Luminance Uniformity	9Points		70	75	-	%	(1),(2),(6)	

Note (1) Measurement Setup:

The LCD module should be stabilized at given temperature(25°C) for 15 minutes to Avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting backlight for 15 minutes in a windless room.

Figure 4 Measurement Setup

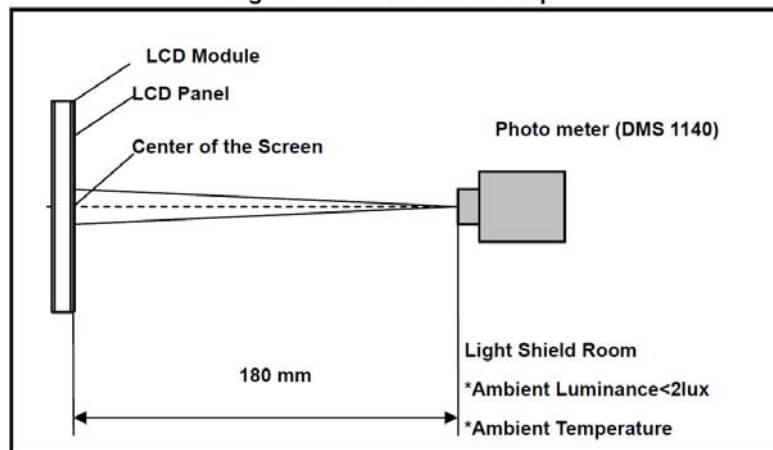
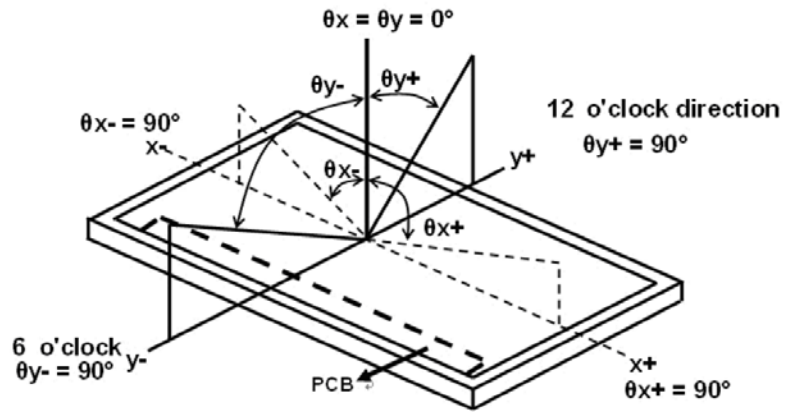


Figure 5 Definition of Viewing Angle



Note (4) Definition Of Contrast Ratio (CR)

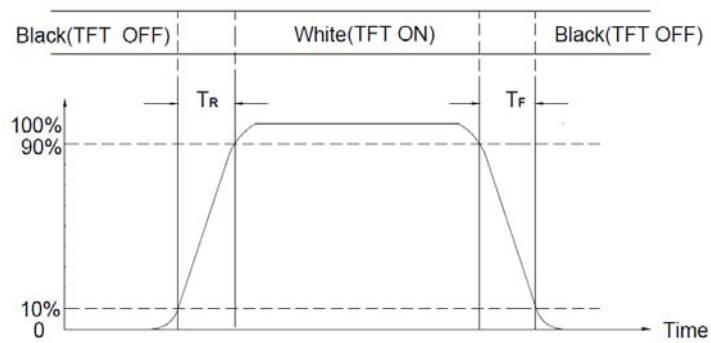
The contrast ratio can be calculated by the following expression

$$\text{Contrast Ratio (CR)} = L_{255} / L_0$$

L63: Luminance of gray level 255, L0: Luminance of gray level 0

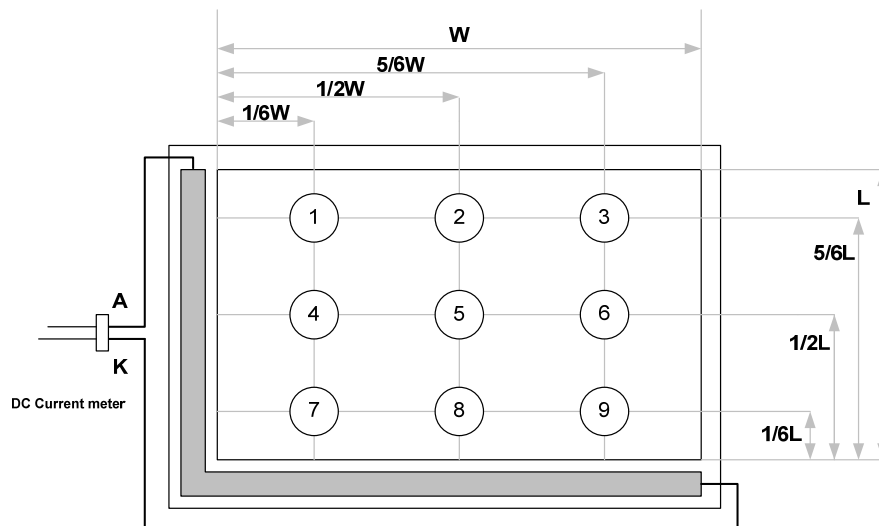
Note (5) Definition Of Response Time (T_R , T_F)

Figure 6 Definition of Response Time



(6) : Definition of Luminance Uniformity

$$\Delta L = [L(\text{min.}) \text{ of } 9 \text{ points} / L(\text{max.}) \text{ of } 9 \text{ points}] \times 100\%$$



7. Projected capacitive-type Touch panel specification

Basic Characteristic

ITEM	SPECIFICATION
Type	Projective Capacitive Touch Panel
Activation	Multi-finger
X/Y Position Reporting	Absolute Position
Touch Force	No contact pressure required
Calibration	No need for calibration
Report Rate	Approx 100 points/sec
Interface	USB
Control IC	ILI2511
Conductive susceptibility IEC/EN61000-4-6	10Vrms
Radiated Susceptibility IEC/EN61000-4-3	30V/m
Cover Glass	1mm chemically strength glass with black border
Bonding method	CG to sensor: optical bonding
	TP module to LCM: tape bonding

Specify the normal operating condition

(GND=0V)

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Power Supply Voltage	PVDD	4.75	5.0	5.25	V	
Power Consumption	IPVDD		T.B.D		mA	

Interface

CN6		
Pin No.	Symbol	Function
1	PGND	Ground
2	D-	USB Data-
3	D+	USB Data+
4	PVDD	Power supply of PCAP touch controller
5	NC	NC
6	NC	NC

8. ELIABILITY TEST CONDITIONS

Test Item	Test Conditions	Note								
High Temperature Operation	70±3°C , Dry t=240 hrs									
Low Temperature Operation	-20±3°C ,Dry t=240 hrs									
High Temperature Storage	80±3°C , Dry t=240 hrs	1,2								
Low Temperature Storage	-30±3°C ,Dry t=240 hrs	1,2								
Thermal Shock Test	-20°C ~ 25°C ~ 70°C 30 m in. 5 min. 30 min. (1 cycle) Total 100 cycle(Dry)	1,2								
Storage Humidity Test	60 °C, Humidity 90%, 240 hrs	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								
Image sticking	7x5 Chessboard pattern 8Hrs at normal temperature, change to 50% gray pattern, release 2min by ND 8% filter	3								
	<table border="1"> <thead> <tr> <th>7x5 Chessboard duration</th> <th>Time of Image releasing</th> </tr> </thead> <tbody> <tr> <td>2Hrs</td> <td>1min by ND8% filter</td> </tr> <tr> <td>4Hrs</td> <td>1min by ND8% filter</td> </tr> <tr> <td>8Hrs</td> <td>2min by ND8% filter</td> </tr> </tbody> </table>		7x5 Chessboard duration	Time of Image releasing	2Hrs	1min by ND8% filter	4Hrs	1min by ND8% filter	8Hrs	2min by ND8% filter
	7x5 Chessboard duration		Time of Image releasing							
	2Hrs		1min by ND8% filter							
4Hrs	1min by ND8% filter									
8Hrs	2min by ND8% filter									

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).

Note 3 : The module shouldn't be tested more than one condition, and all the test conditions are independent.

Note 4 : All the reliability tests should be done without protective film on the module.

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.

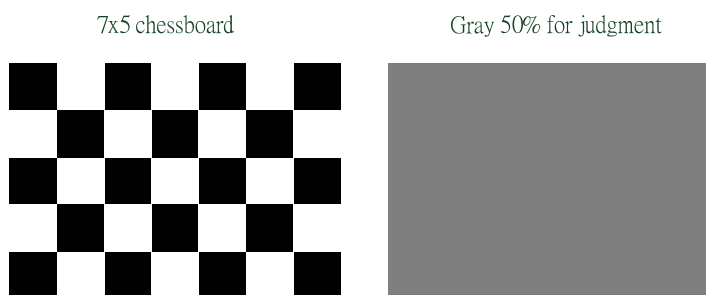


Image stick test pattern

9. GENERAL PRECAUTION

9-1 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.

9-2 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.

9-3 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.

9-4 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.

9-5 Cleaning

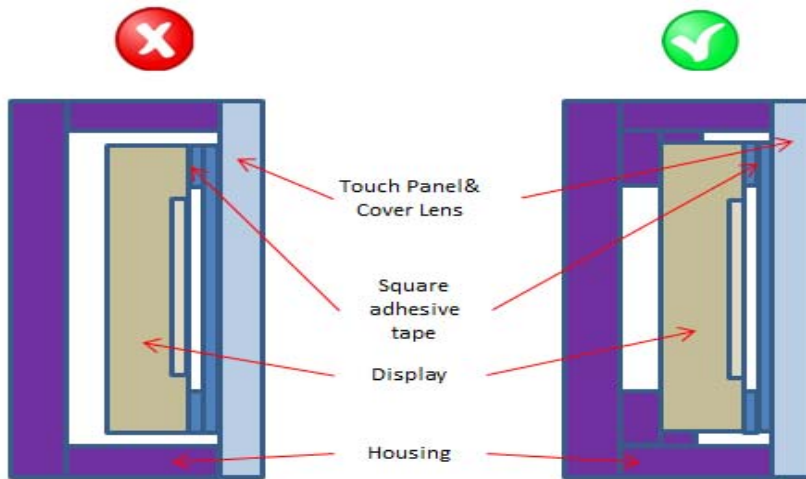
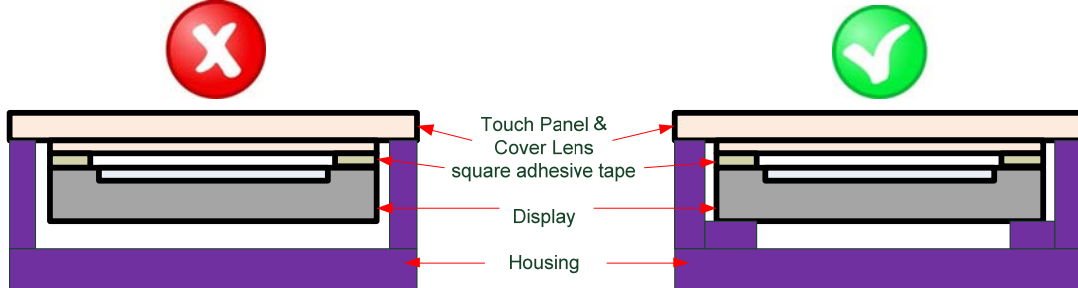
1. Do not wipe the polarizer with dry cloth. It might cause scratch.

2. Only use a soft sloth with IPA to wipe the polarizer, other chemicals might permanent damage to the polarizer.

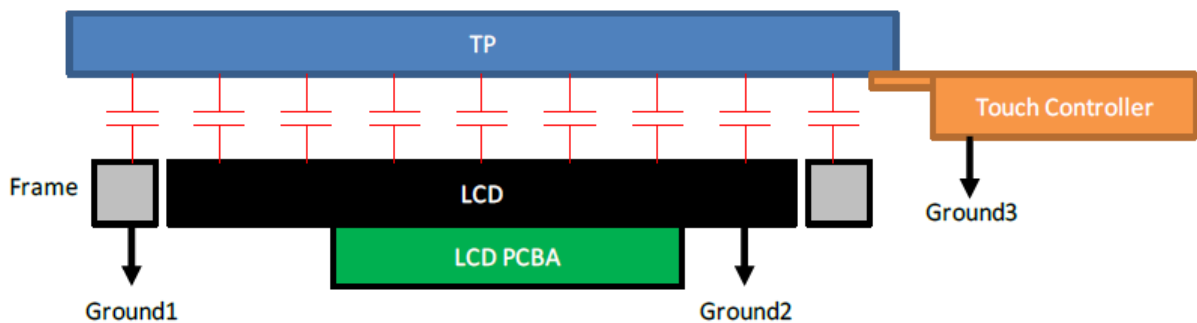
9-6 Mechanism (if the LCM using air bonding)

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

(2) The square adhesive tape which is between the touch panel and display can't provide well supporting in the long term and high ambient temperature condition. Whether upright or horizontal position the support holder which is in the back side of the display is needed. Do not let the display floating.



(3) TP needs to work in environment with stable stray capacitance. In order to minimize the variation in stray capacitance, all conductive mechanical parts must not be floating. Intermittent floating any conductive part around the touch sensor may cause significant stray capacitance change and abnormal touch function. It is recommended to keep all conductive parts having same electrical potential as the GND of the touch controller module.

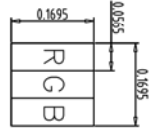


GND1, GND2 and GND3 should be connected together to have the same ground

9-7 Others

1. AMIPRE will provide one year warrantee for all products and three months warrantee for all repairing products.
2. 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

10. OUTLINE DIMENSION



A Block

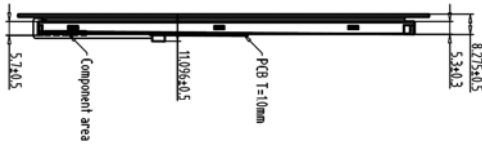
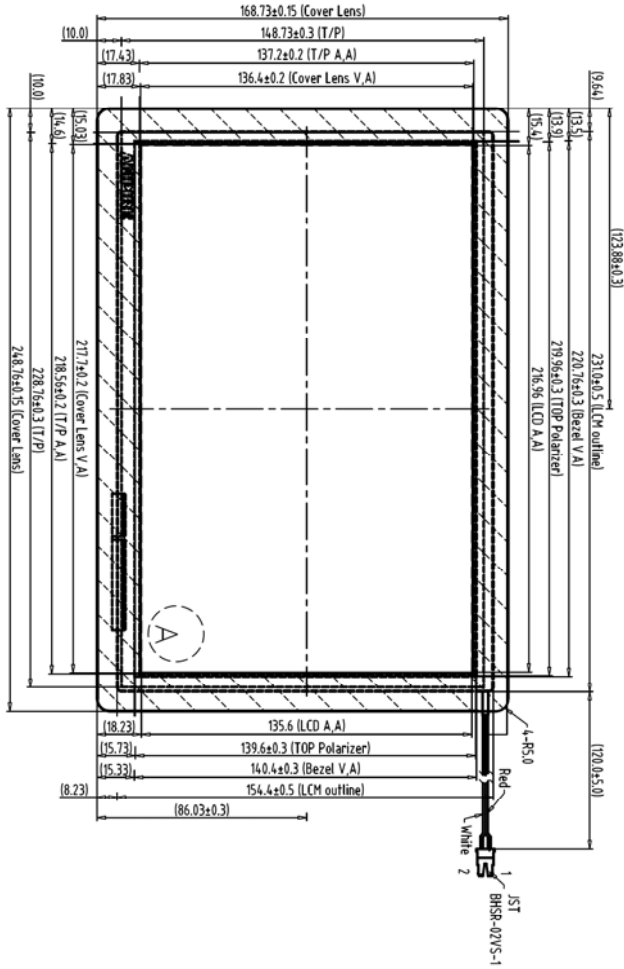
1	NC	21	LV3P	
2	VDD	22	GND	
3	VDD	23	NC	
4	VDD	EDID	24	NC
5	SCL	EDID	25	NC
6	SDA	EDID	26	NC
7	NC	27	NC	
8	LVON	28	NC	
9	LVOP	29	CA8C_EN	
10	GND	30	NC	
11	LV1N	31	NC	
12	LV1P	32	NC	
13	GND	33	NC	
14	LV2N	34	NC	
15	LV2P	35	BIST	
16	GND	36	NC	
17	LVCLKN	37	NC	
18	LVCLKP	38	NC	
19	GND	39	NC	
20	LV3N	40	NC	

CN1

1	PGND
2	D-
3	D+
4	PVDD
5	NC
6	NC

Note:

1. Unless indicated, Tolerance " $\pm 0.5^\circ$ "
2. LVDS Connector: Starconn/300E40-0010RA-G3 or Equivalent
3. T/P Controller board: ENTERY 3808K-F06N-03L or Equivalent

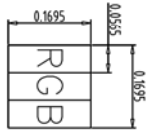


REV	REVISION RECORD	DATE	NAME
0	NEW RELEASE	14-1-18	EMILY

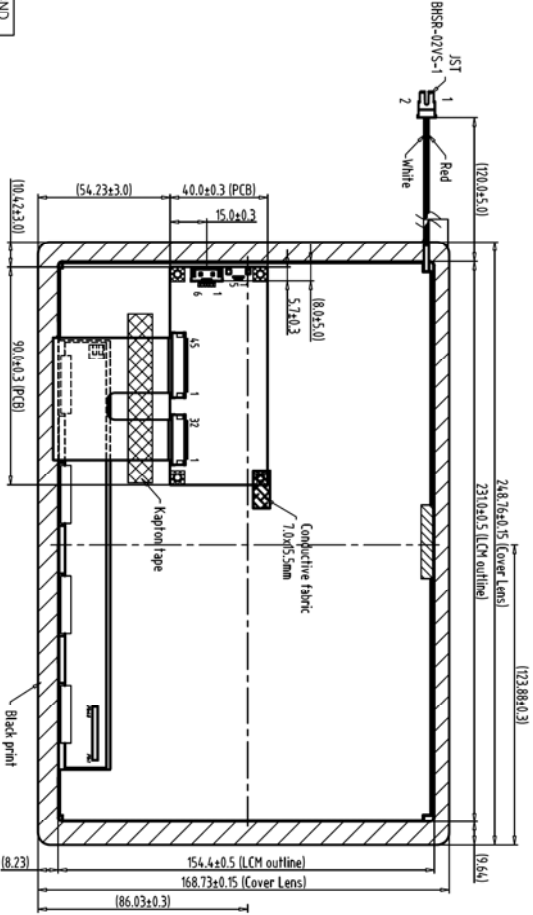
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2	1280800N-T CTP (1791280811)	8	8								04-13-18	1280800N1-T02
3	1024600LD-T T/P Controller Board	9	9				IE NO.		CHK.		DATE	(10.1")
4	2810246011(USB)(L12511)	10	10						APPD.		DATE	DWG. NO.
5		11	11								DATE	*180458MA
6		12	12								DATE	SHEET 1 OF 1

晶采光電科技

REV	REVISION RECORD	DATE	NAME
0	NEW RELEASE	14-13-18	EMILY



A Block



CN1

1	NC	21	LV3P	
2	VDD	22	GND	
3	VDD	23	NC	
4	VDD	EDID	24	NC
5	SCL	EDID	25	NC
6	SDA	EDID	26	NC
7	NC	27	NC	
8	LVON	28	NC	
9	LVOP	29	CA8C_EN	
10	GND	30	NC	
11	LV1N	31	NC	
12	LV1P	32	NC	
13	GND	33	NC	
14	LV2N	34	NC	
15	LV2P	35	BRST	
16	GND	36	NC	
17	LVCLKN	37	NC	
18	LVCLKP	38	NC	
19	GND	39	NC	
20	LV3N	40	NC	

JP3

1	PGND
2	D-
3	D+
4	PVDD
5	NC
6	NC

Back view

- Note:
1. Unless indicated, Tolerance "±0.5"
 2. LVDS Connector: Starconn/300E40-0010RA-G3 or Equivalent
 3. T/P Controller board: ENTERY 3808K-F06N-03L or Equivalent

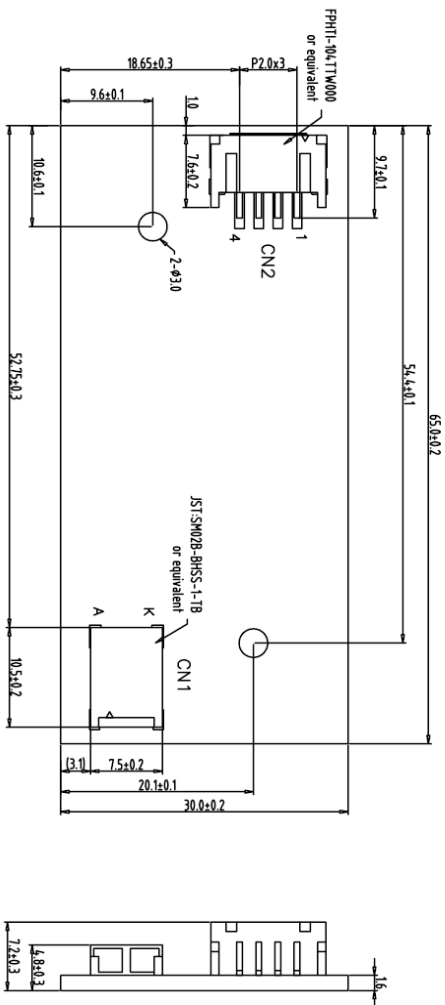
1	1280800N1 LCM	7	7	TOLENANCE GRADE(F)	A	B	DIM.	MM	DWN:	EMILY	DATE	DATE	TITLE	DWG. NO.	SHEET
2	1280800N-T C/P (1791280811)	8	8								04-13-18	DATE	1280800N-T02	*180459MA	1 OF 1
3	1024600LD-T T/P Controller Board	9	9								DATE	DATE			
4	2810246011(USB)(U12511)	10	10								DATE	DATE			
5		11	11								DATE	DATE			
6		12	12								DATE	DATE			



10. LED DRIVER BOARD MECHANICAL DRAWING

1. V.LED
2. LED_EN
3.GND
4.PWM

Note:
1. Unless indicated, Tolerance Grade "B" is adopted.
2. UV Glue For OLB Protection.



REV	REVISION RECORD	DATE	NAME
0	NEW RELEASE	12-23-10	EMILY
1	Added Dimensions	01-07-11	EMILY
2	TFT-1024600-11-0 Rename to 1024600B2-01	01-11-11	EMILY

1	TFT-1024600-11-0	7			TOLERANCE GRADE(±)	A	B	DIM.	MM	DWN.	EMILY	DATE	12-23-10
2		8		~6	0.05	0.1							
3		9		6~18	0.08	0.18		IE NO.		CHK.			
4		10		18~50	0.1	0.25							
5		11		50~180	0.2	0.4		PARTS NO.	LCM-2	APPD.			
6		12		180~	0.3	0.5		1024600B2					

2	
1	AM-1024600B2TMQW-01H
No.	適用品號
品栄光電科技 CORPORATION	
TITLE	
1024600B2 (10.1")	
DWG. NO.	SHEET
*101272MA	1 OP 1