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-800600P5TMQW-B0H**
APPROVED BY	
DATE	

☑**Approved For Specifications**
☐**Approved For Specifications & Sample**

AMPIRE CO., LTD.
4F., No.116, Sec. 1, Xintai 5th Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)
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APPROVED BY	CHECKED BY	ORGANIZED BY

RECORD OF REVISION

Revision Date	Page	Contents	Editor
2013/07/19	--	New Release	Emil
2013/08/05	6	Correct the LED life time	Rober
2013/9/12	12	Correct Interface	Rober

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, LED driver unit 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: RGB interface 40 pin
(6) Power Supply Voltage: 3.3V for logic voltage, 5.0V for LED driver power voltage.
(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 10.35(D)	mm
Surface treatment	Anti-Glare	
Color arrangement	RGB-stripe	
interface	Digital	
Weight	TBD	g

3. ABSOLUTE MAX. RATINGS

Item	Symbol	Values		UNIT	Note
		Min.	Max.		
Power voltage	VCC	-0.5	5	V	
	VLED	-0.5	12		
Input signal voltage	Vi	-0.3	VCC+0.3	V	Note 1
Operation temperature	TOP	-20	70	℃	
Storage temperature	TST	-30	80	℃	

Note 1: The product is subject to be damaged permanently if stresses beyond
those absolute maximum ratings listed above.
Signals include : DCLK, DE, HS, VS, R0~R5, G0~G5, B0~B5.

4. ELECTRICAL CHARACTERISTICS

4-1　Typical Operation Conditions

Item		Symbol	Values			Unit	Remark
			MIN	TYP	MAX		
Power Voltage		V_{CC}	3.0	3.3	3.6	V	Note 1,2
Current Consumption		I_{CC}	--	200	--	mA	Note 1,2 VCC=3.3V
LED Driver Power Voltage		V_{LED}	3.3	5	18	V	
Current Consumption of LED		I_{LED}	-	0.55	-	A	VLED=5V
Logic Input Voltage	Input Voltage	V_{IN}	0	-	V_{CC}	V	
	Logic input high voltage	V_{TH}	$0.7V_{CC}$	-	V_{CC}	V	Note 3
	Logic input low voltage	V_{TL}	GND	-	$0.3V_{CC}$	V	Note 3

Note 1: Value for Power Board combined panel.

Note 2: VCC setting should match the signals output voltage (refer to Note 3) of customer's system board.

Note 3: DCLK, DE, HS, VS, R0~R5, G0~G5, B0~B5.

4-2 Backlight Driving Conditions

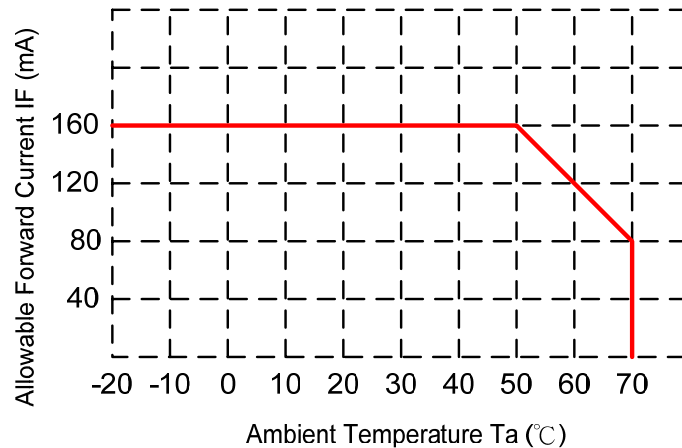| Item	Symbol	Values			Unit	Note
		Min.	Typ.	Max.		
LED Driver voltage	VLED	3.3	5	9	V	
ADJ Input Voltage	V_{ADJ}	-	3.3	5	V	duty=100% Note(3)
LED voltage	VAK	--	9.9	15	V	I_{LED} =160mA Ta=25℃
LED current	I_L	--	160	--	mA	Ta=25℃
		--	150	--	mA	Ta=60℃
LED Life Time	-	--	25K	--	Hour	Note (2)

Note (1) The constant current source is needed for white LED back-light driving.
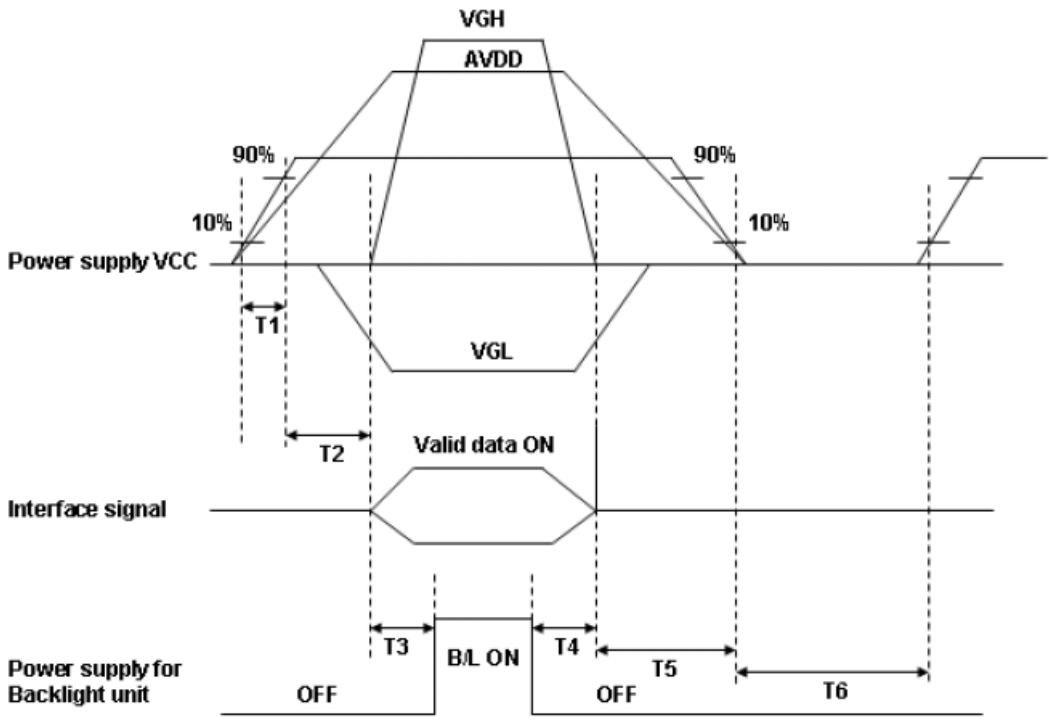When LCM is operated over 60℃ ambient temperature, the IL of the LED back-light should be adjusted to 150mA max

Note (2) Brightness to be decreased to 50% of the initial value.
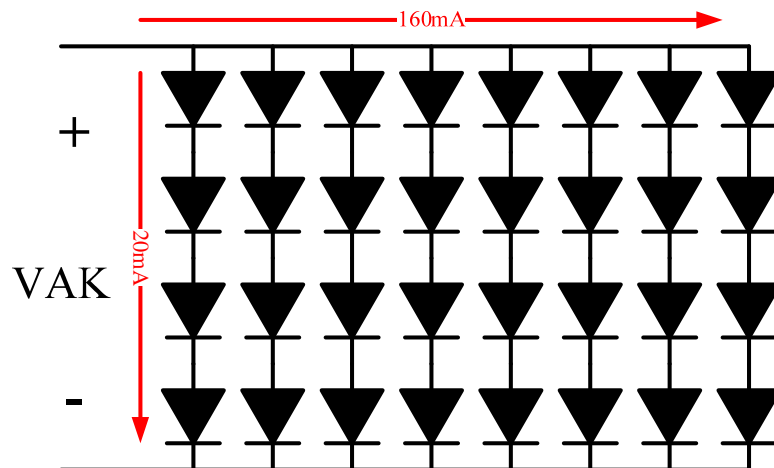
When LCM is operated over 40℃ ambient temperature, the I_{LED} should be follow :

Power Sequence

Parameter	SPEC.			Unit
	Min.	Typ.	Max.	
T1	1		2	ms
T2	0	60		ms
T3	200			ms
T4	200			ms
T5	1			ms
T6	1000			ms

5. Optical Specifications

Item	Symbol	Condition	Values			Unit	Note
			Min.	Typ.	Max.		
Viewing angle (CR≧10)	θ L	Φ = 180° (9 o'clock)	60	70	--	degree	Note1
	θ R	Φ = 0° (3 o'clock)	60	70	--		
	θ T	Φ = 90° (12 o'clock)	40	50	--		
	θ B	Φ = 270° (6 o'clock)	60	70	--		
Response time	TON		--	10	--	msec	Note3
	TOFF		--	15	--	msec	
Contrast ratio	CR		400	500	--	--	Note4
Color chromaticity	Rx	Normal θ =Φ=0°	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	0.638		
	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		--	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℃.
2. The test systems refer to Note 2.

Note 1 : Definition of viewing angle range
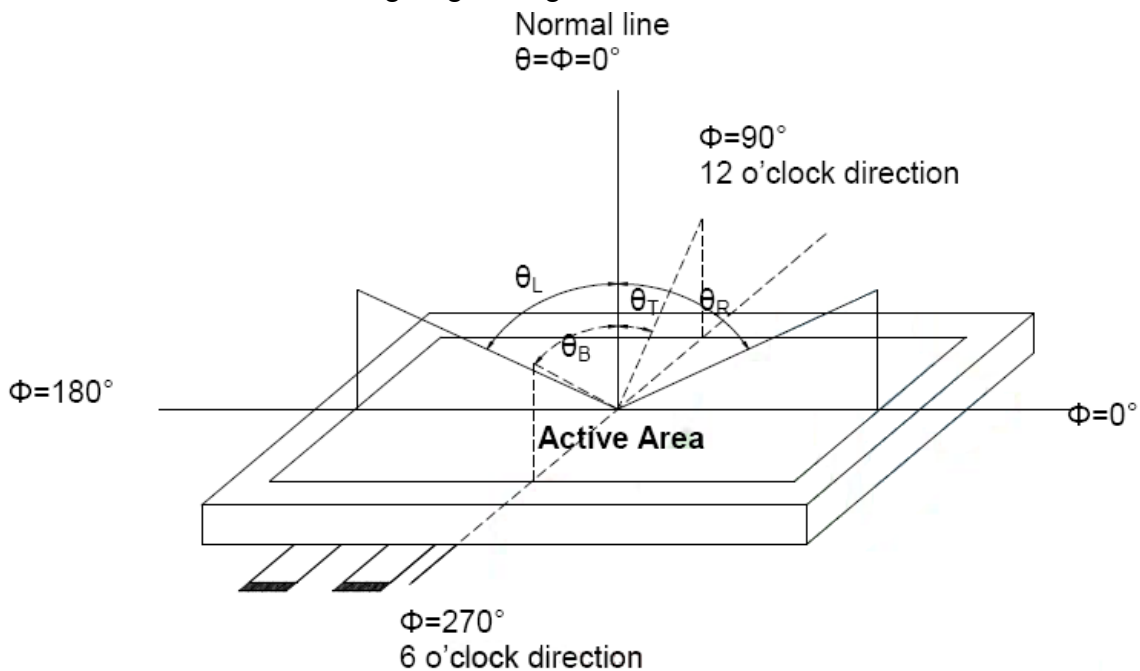
Note 2 : Definition of optical measurement system.

　　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.)
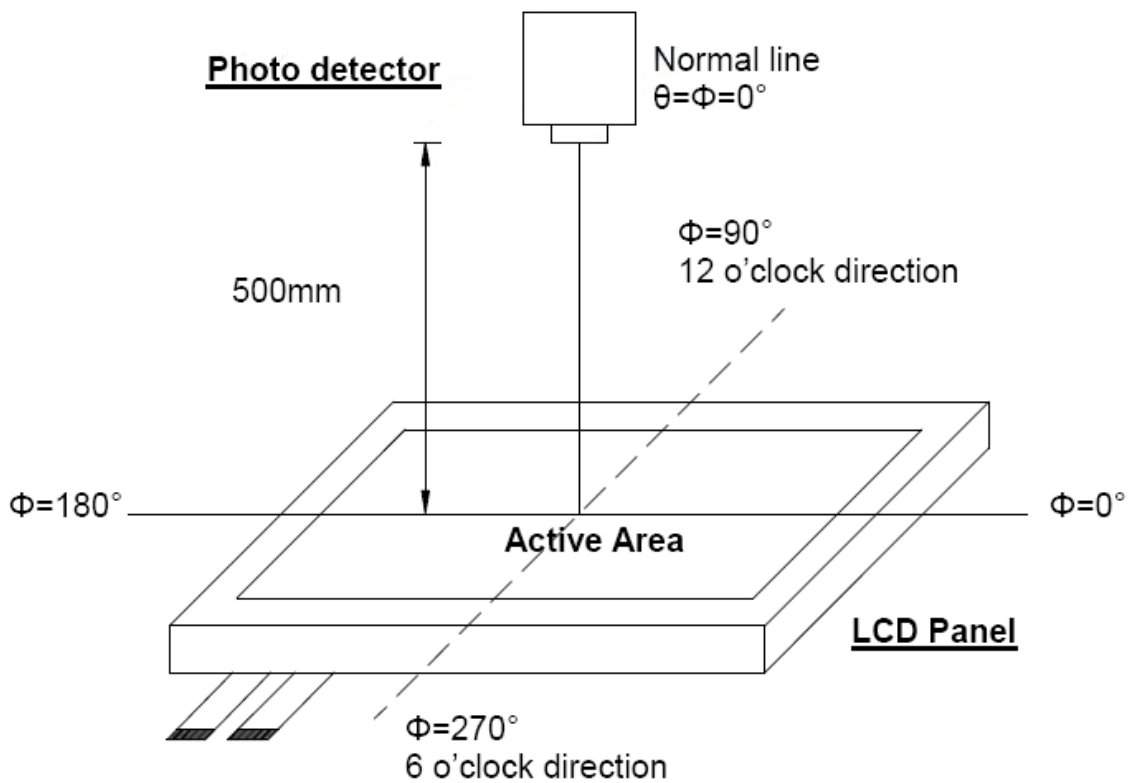
Note 3 : Definition of Response time

     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%.
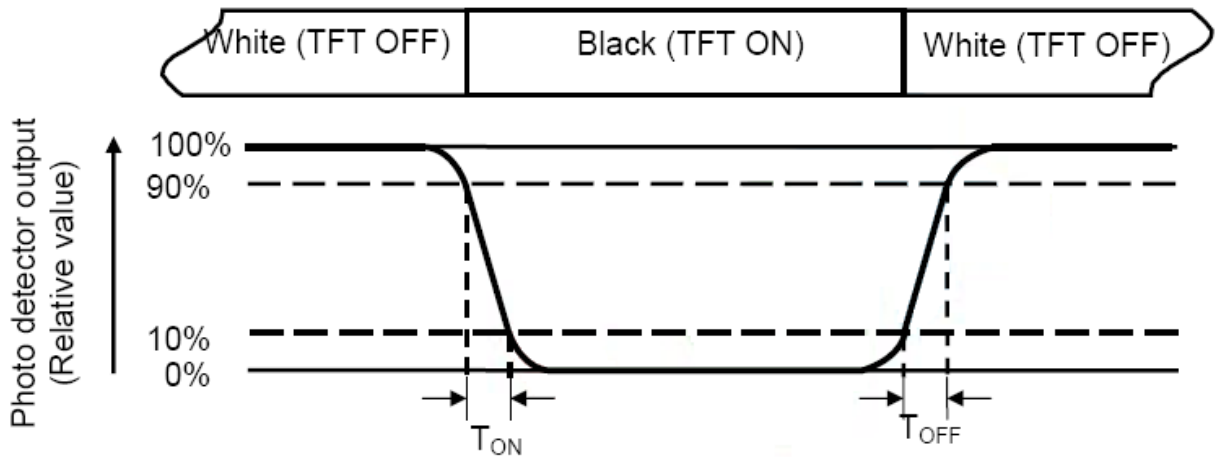
Note 4 : Definition of contrast ratio

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$

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.

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

L ----- Active area length   W ----- Active area width
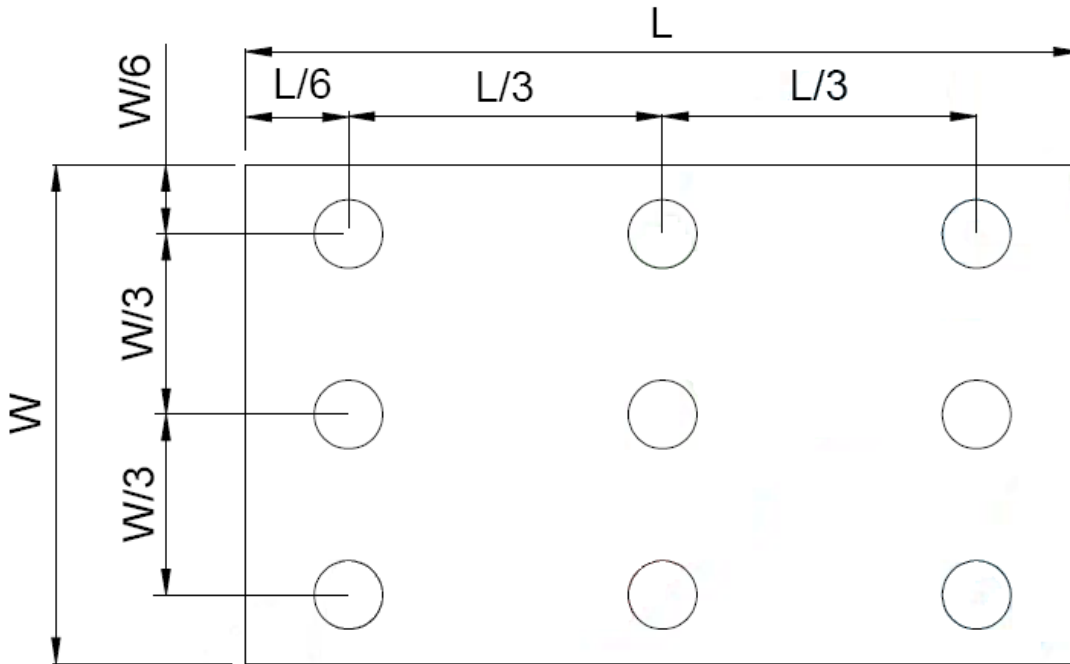
B_{max} : The measured maximum luminance of all measurement position.

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

6. INTERFACE
TFT LCD Panel Driving Section

Pin No.	Symbol	I/O	Description	Note
1	VLED	P	Voltage for LED circuit (5.0V)	
2	VLED	P	Voltage for LED circuit (5.0V)	
3	ADJ	I	Adjust the LED brightness	(1)
4	GLED	P	Ground for LED circuit	
5	GLED	P	Ground for LED circuit	
6	VCC	P	Power supply for digital circuit (3.3V)	
7	VCC	P	Power supply for digital circuit (3.3V)	
8	MODE	I	DE or SYNC mode control	
9	DE	I	Data enable	
10	VS	I	VSYNC signal input	
11	HS	I	HSYNC signal input	
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	DCLK	I	Sample clock	
38	GND	P	Power ground	
39	L/R	I	Select left to right scanning direction	(3)
40	U/D	I	Select up or down scanning direction	(3)

I : input, O : output, P : power

NOTE :
(1) Pin3: 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	VIH	2.4V	--	VLED (5.0V)	V
ADJ signal logic level Low	VIL	0	--	0.8	V
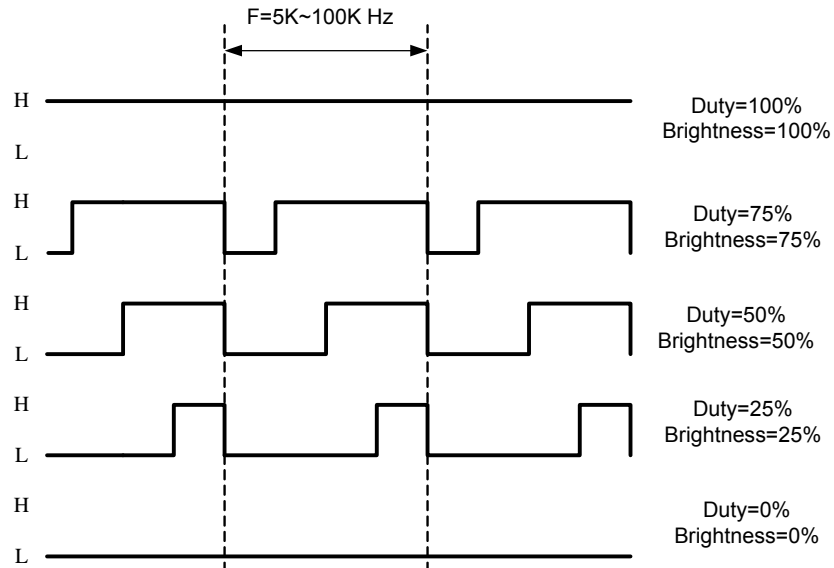
(3) Selection of scanning mode

Setting of scan control input		Scanning direction
U/D	L/R	
GND	VCC	Up to Down, Left to Right
VCC	GND	Down to Up, Right to Left
GND	GND	Up to Down, Right to Left
VCC	VCC	Down to Up, Left to Right
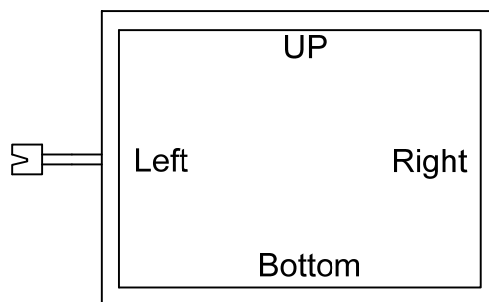
7. INPUT SIGNAL :

Parameter	Symbol	Min	Typ.	Max	Unit	Remark
DCLK	Fclk	-	40	50	MHz	-
	tclk	20	25	-	ns	-
HSD	th	-	1000	-	tclk	-
	thd	-	800	-	tclk	-
	thpw	1	48	-	tclk	-
	thb	-	88	-	tclk	-
	thfp	-	112	-	tclk	-
VSD	tv	-	660	-	th	-
	tvd	-	600	-	th	-
	tvpw	-	3	-	th	-
	tvb	-	39	-	th	-
	tvfp	-	21	-	th	-

Note: DE timing refer to HSD, VSD input timing.

Vertical input timing Diagram:
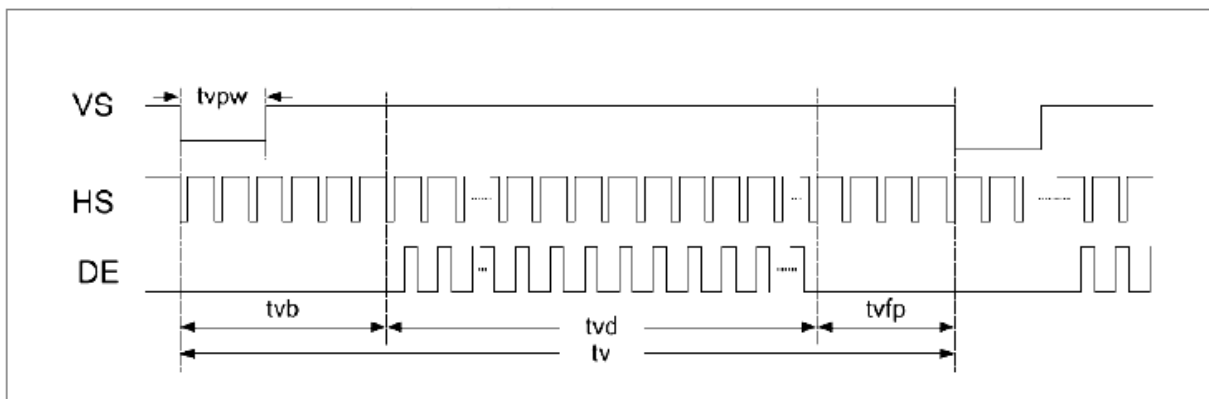
Horizontal input timing Diagram:
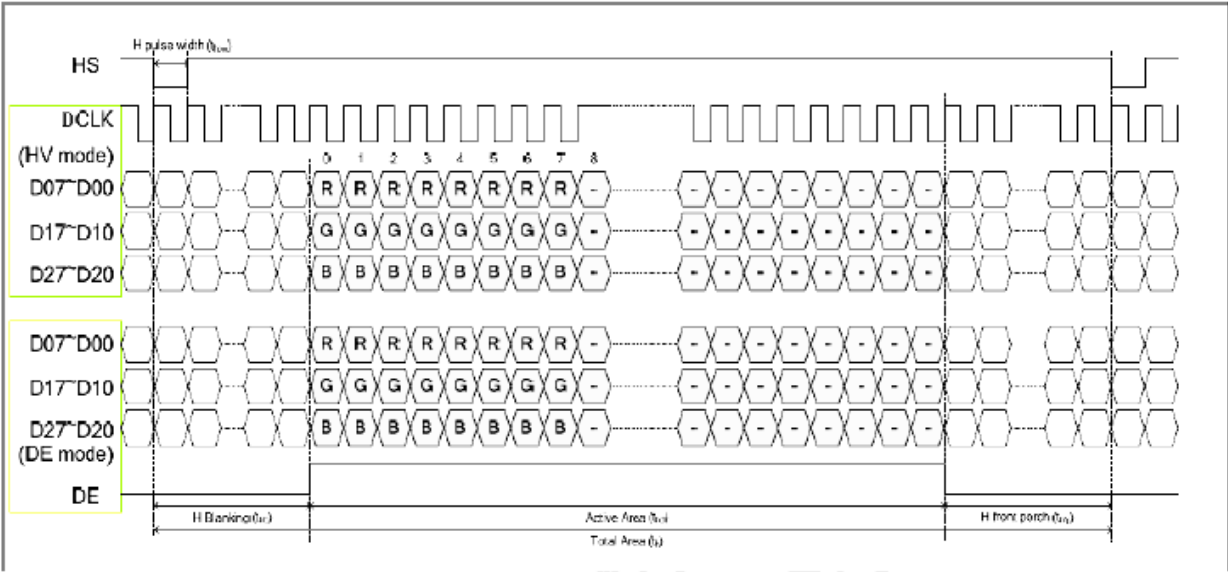
8. RELIABILITY

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).

9. General Precautions

9-1   Safety

Liquid crystal is poisonous. Do not put it your month. 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±10℃ 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.

9-5   Others

1. 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.

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

10. OUTLINE DIMENSION

CN3

| Pin	Signal	Pin	Signal
1	VLED	21	G5
2	VLED	22	G4
3	ADJ	23	G3
4	GLED	24	GND
5	GLED	25	G2
6	GLED	26	G1
7	VCC	27	G0
8	MODE	28	GND
9	DE	29	R5
10	VS	30	R4
11	HS	31	R3
12	GND	32	GND
13	B5	33	R2
14	B4	34	R1
15	B3	35	R0
16	GND	36	GND
17	B2	37	DCLK
18	B1	38	GND
19	B0	39	L/R
20	GND	40	U/D

Note:
1. Unless indicated, Tolerance "±0.3".
2. UV Glue For OLB Protection.
3. CN1:BHSR-02VS-1
4. CN2:P0.5 50Pin Connector:Hirose "FH12A-50S-0.5H" or Equivalent
5. CN3:P0.5 40Pin Connector:STARCONN 089H40 or Equivalent

A Block: R G B
0.2025 0.0675 0.2025

REVISION RECORD

REV	REVISION	DATE	NAME
0	NEW RELEASE	05-05-11	EMILY
1	Modify V.A dimension (163.8x123.3) to (164.8x124.3) (800600P5-B0 & 800600P5-B1)	07-09-12	Henry
2	增加適用機種 (800600P5-B0 & 800600P5-B1)	06-04-13	EMILY

適用機種:
800600P2-B0
800600P2-B1
800600P5-B0
800600P5-B1

PARTS NO. LCM 800600P2-B0

TITLE: 800600P2-B0 (8.0"+TTL+LED Driver)

DWG. NO.: *11051 3MC

SHEET 1 OF 1

AMPIRE 晶采光電科技

Double side tape (SONY T4000)
PCB T=0.6

CN3

1	VLED	21	G5
2	VLED	22	G4
3	ADJ	23	G3
4	GLED	24	GND
5	GLED	25	G2
6	VCC	26	G1
7	VCC	27	G0
8	MODE	28	GND
9	DE	29	R5
10	VS	30	R4
11	HS	31	R3
12	GND	32	GND
13	B5	33	R2
14	B4	34	R1
15	B3	35	R0
16	GND	36	GND
17	B2	37	DCLK
18	B1	38	GND
19	B0	39	L/R
20	GND	40	U/D
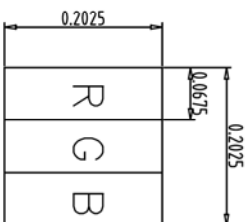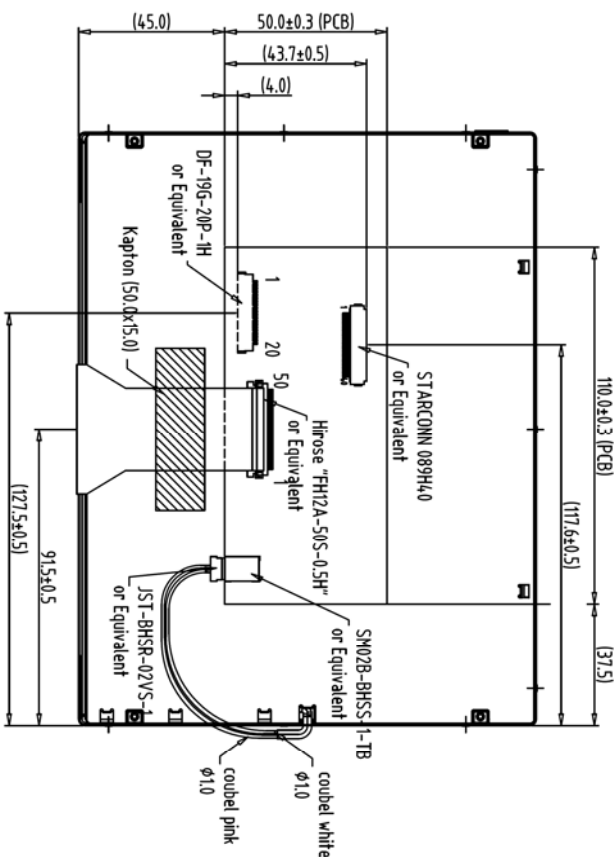
Note:
1. Unless indicated, Tolerance "±0.3".
2. UV Glue For OLB Protection.
3. CN1:BHSR-02VS-1
4. CN2:P0.5 50Pin Connector:Hirose "FH12A-50S-0.5H" or Equivalent
5. CN3:P0.5 40Pin Connector:STARCONN 089H40 or Equivalent

Back View

DF-19G-20P-1H
or Equivalent

Kapton (50.0x15.0)

Hirose "FH12A-50S-0.5H"
or Equivalent

STARCONN 089H40
or Equivalent

SM02B-BHSS-1-TB
or Equivalent

JST-BHSR-02VS-1
or Equivalent

coubel pink   Φ1.0
coubel white   Φ1.0

(45.0)
50.0±0.3 (PCB)
(43.7±0.5)
(4.0)
110.0±0.3 (PCB)
(117.6±0.5)
(37.5)
(127.5±0.5)
91.5±0.5

A Block

R   G   B

0.2025   0.0675   0.2025

適用機種:
800600P2-B0
800600P2-B1
800600P5-B0
800600P5-B1

TOLERANCE GRADE(±)

	A	B	DIM. MM
			IE NO.

PART'S NO.LCM-1
800600P2-B0

DWN. EMILY   DATE 05-05-11
CHK.   DATE
APPD.   DATE

適用機種

1	7
2	8
3	9
4	10
5	11
6	12