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-800480RJTMQW-B0H
APPROVED BY	
DATE	

☐Approved For Specifications
☐Approved For Specifications & Sample

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RECORD OF REVISION

Revision Date	Page	Contents	Editor
2012/06/21	--	New Release	Emil
2012/06/26	--	Issued the official PN to AM-800480RJTMQW-B0H.	Emil

1. INTRODUCTION

Ampire Display Module is a color active matrix TFT-LCD that uses amorphous silicon TFT as a switching device . This model is composed of a TFT-LCD panel, timing controller . This TFT-LCD has a high resolution (800(R.G.B) X 480) and can display up to16.7M colors.

1-1. Features

- 7” WVGA (16:9 diagonal) configuration
- Input interface voltage : 3.3V
- Data enable mode

1-2. Applications

- Portable TV
- Car user DVD
- Industrial application
- HMI (Human machine interface)

2. PHYSICAL SPECIFICATIONS

Item	Specifications	unit
Display resolution(dot)	800RGB (W) x 480(H)	dots
Active area	152.4 (W) x 91.44 (H)	mm
Pixel pitch	0.1905 (W) x 0.1905 (H)	mm
Color configuration	R.G.B Vertical stripe	
Overall dimension	165.0(W)x104.44(H)X6.76(T)	mm
Brightness	500 nit	cd/m^2
Contrast ratio	400 : 1	
Backlight unit	LED	
Display color	16.7M	colors

3. ABSOLUTE MAX. RATINGS

ITEM	SYMBOL	MIN	MAX	UNIT
Power Supply Voltage for LCD	Vcc	-0.5	6.0	V
Signal input voltage	DCLK DE R0~R7 G0~G7 B0~B7	-0.5	VCC+0.3	V
Operation Temperature	Top	-20	70	℃
Storage Temperature	Tstg	-30	80	℃

The following values are maximum operation conditions , If exceeded , it may cause faulty operation or damage

4. ELECTRICAL CHARACTERISTICS

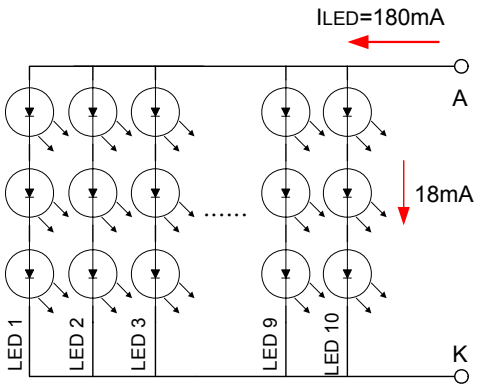
4-1 TFT LCD Module voltage

ITEM		SYMBOL	MIN	TYP	MAX	UNIT	CONDITION
Power Supply Voltage For LCD		Vcc	3.0	3.3	3.6	V	
Power Supply Current For LCD		Icc	-	170	220	mA	Black pattern
Logic Input Voltage	Input Voltage	V_{IN}	0	-	Vcc	V	Logic Input Voltage
	Threshold Voltage(High)	V_{TH}	0.7Vcc	-	Vcc	V	
	Threshold Voltage(Low)	V_{TL}	0	-	0.3Vcc	V	

4-2 LED B/L Driving Conditions

ITEM	SYMBOL	MIN	TYP	MAX	UNIT	CONDITION
LED Backlight Voltage	V_{AK}	-	9.6	-	V	I_{BL} = 180mA
LED Backlight Current	I_{AK}	-	180	-	mA	Ta=25℃
LED Life Time			40K		Hr	Note*

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



5. INTERFACE

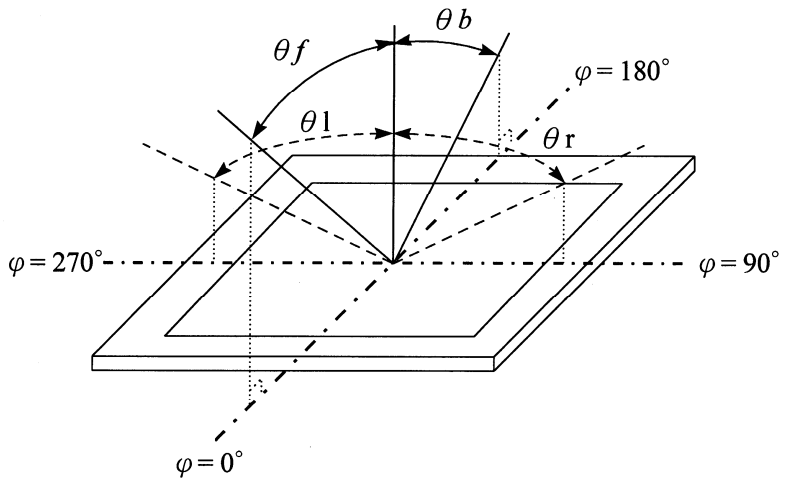
Pin No	Symbol	Function
1	Vss	Power Ground
2	Vss	Power Ground
3	Vcc	Power Supply for LCD
4	Vcc	Power Supply for LCD
5	PD16	Data 16
6	PD17	Data 17
7	PD18	Data 18
8	PD19	Data 19
9	PD20	Data 20
10	PD21	Data 21
11	PD22	Data 22
12	PD23	Data 23
13	PD8	Data 8
14	PD9	Data 9
15	PD10	Data 10
16	PD11	Data 11
17	PD12	Data 12
18	PD13	Data 13
19	PD14	Data 14
20	PD15	Data 15
21	PD0	Data 0
22	PD1	Data 1
23	PD2	Data 2
24	PD3	Data 3
25	PD4	Data 4
26	PD5	Data 5
27	PD6	Data 6
28	PD7	Data 7
29	Vss	Power Ground
30	DCLK	Clock Signals
31	NC	NC
32	Hsync	Honizontal SYNC. (Sync mode used)
33	Vsync	Vertical SYNC. (Sync mode used)
34	DE	Data Enable
35	LED_A	LED anode
36	LED_A	LED anode
37	Vss	Power Ground
38	Vss	Power Ground
39	LED_K	LED cathode
40	LED_K	LED cathode

6. OPTICAL CHARACTERISTICS

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Viewing Angle	Front	θ f	CR≧10	55	60	--	deg.	Viewing Angle
	Back	θ b		55	60	--		
	Left	θ l		65	70	--		
	Right	θ r		65	70	--		
Contrast ratio		CR	Θ=Φ=0°	250	400	--	--	(1)(3)
Response Time		T_r	Θ=Φ=0°	--	5	10	ms	(1)(4)
		T_f		--	11	16	ms	(1)(4)
Color chromaticity	White	Wx		0.239	0.299	0.359	--	Color chromaticity
		Wy		0.268	0.328	0.388		
Luminance		L	Θ=Φ=0°	400	500	--	cd/m²	(1)(5)
Luminance Uniformity		ΔL	Θ=Φ=0°	70	--	--	%	(1)(5)(6)

Note 1: Ta=25°C. To be measured on the center area of panel after 10 minutes operation.

Note 2: Definition of Viewing Angle



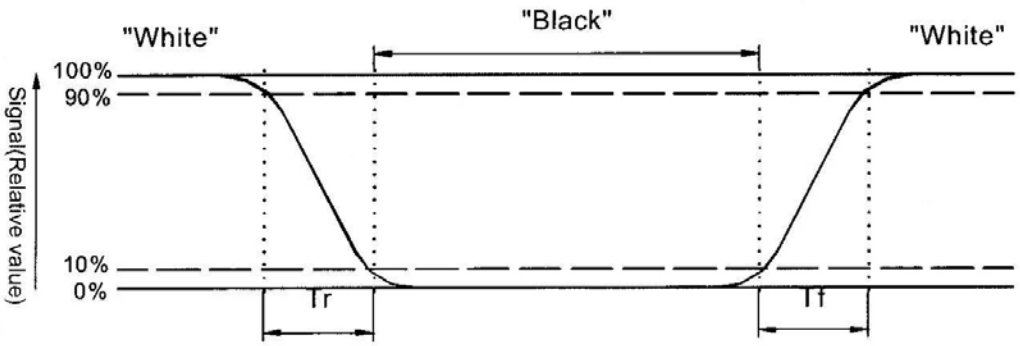
Note 3: Definition of contrast ratio:

Contrast ratio is calculated with the following formula.

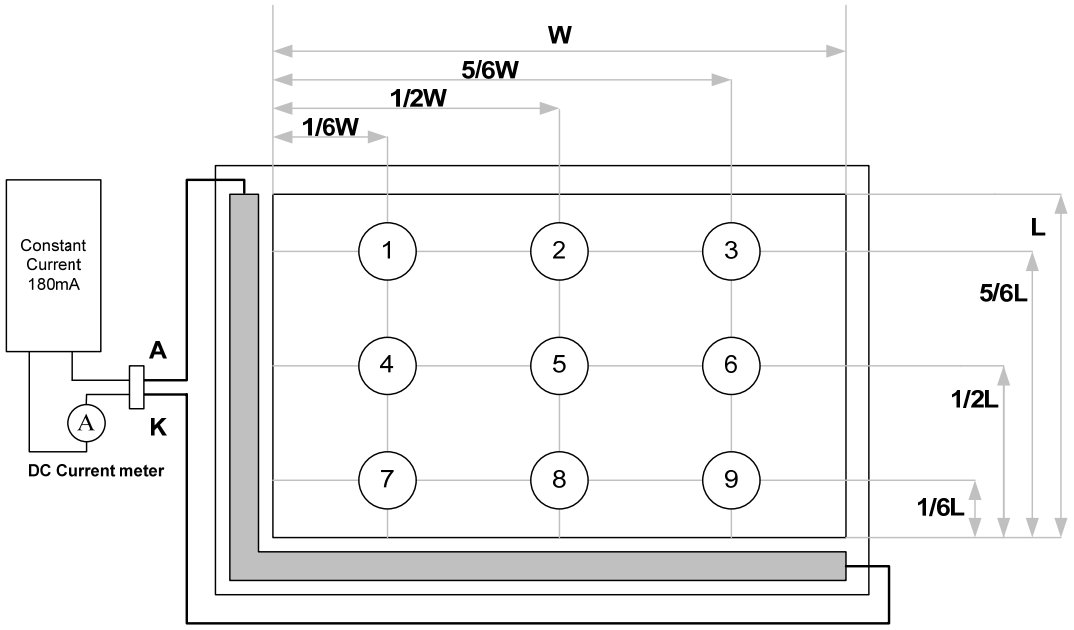
$$\text{Contrast ratio(CR)} = \frac{\text{Photo detector output when LCD is at "White" state}}{\text{Photo detector Output when LCD is at "Black" state}}$$

Note 4: Definition of response time:

The output signals of photo detector are measured when the input signals are changed from “black“ to “white”(falling time) and from ”white” to “black” (rising time) respectively. The response time is defined as the time interval between the 10% and 90% of amplitudes. Refer to figure as below.



Note 5 : Luminance is measured at point 5 of the display.



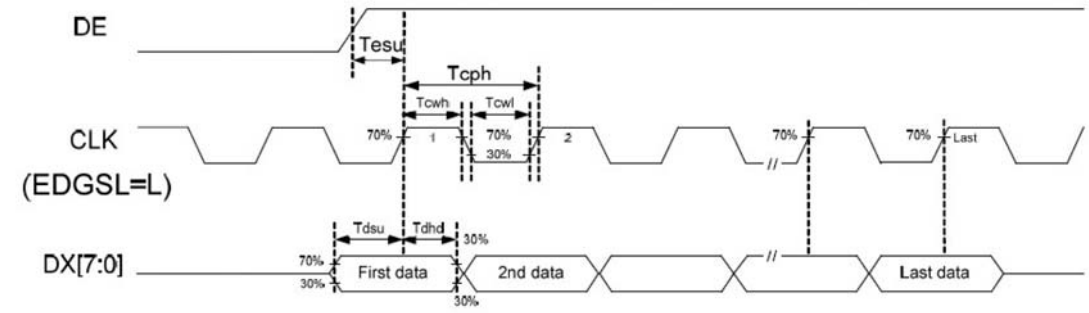
Note 6 : Definition of Luminance Uniformity

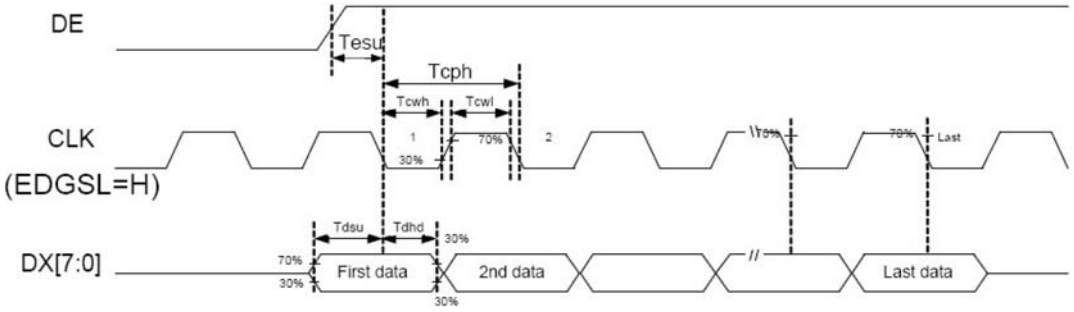
ΔL = [L(min.) of 9 points / L(max.) of 9 points] X 100%

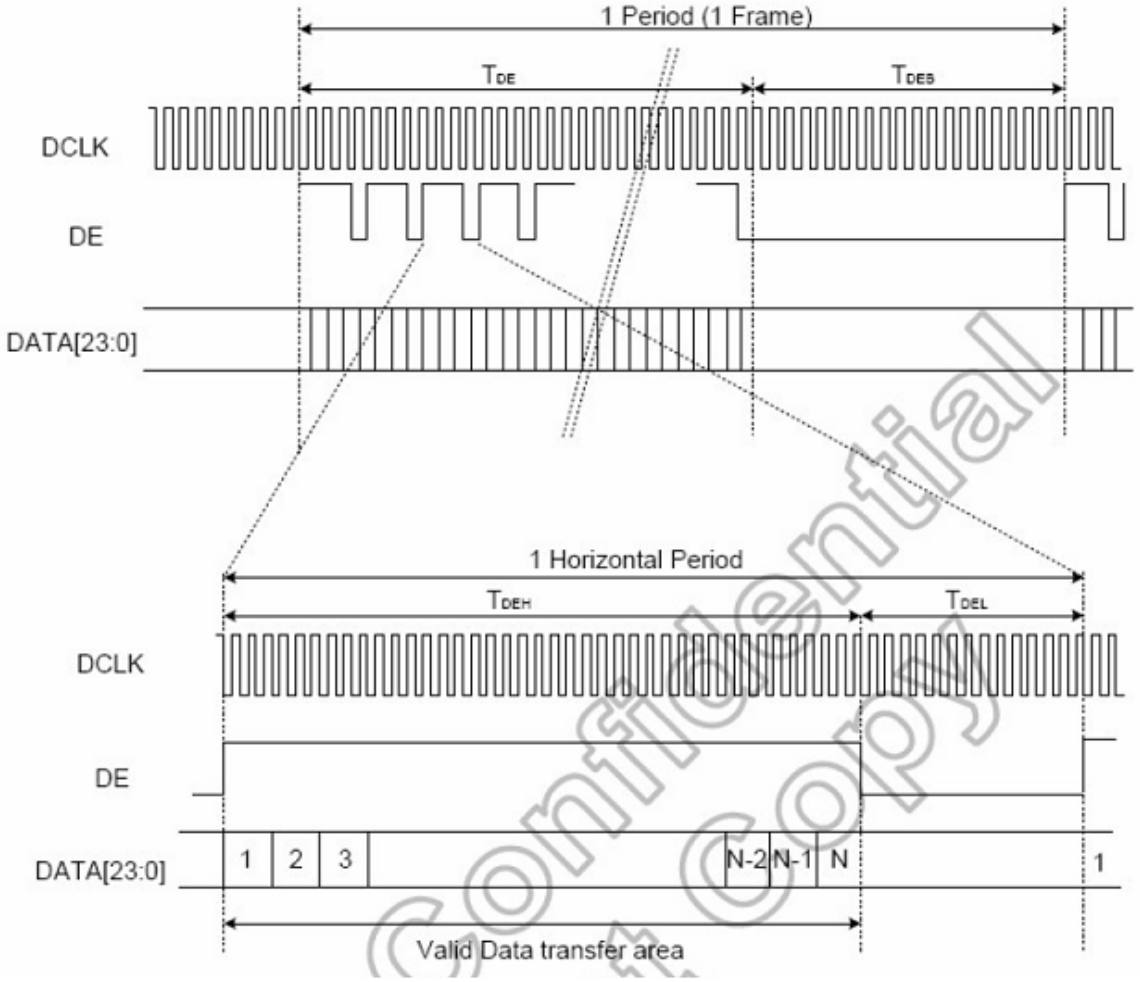
7. INPUT SIGNAL (DE ONLY MODE)

Parameter	Symbol				Unit
		Min.	Typ.	Max.	
Data setup time	Tdsu	6	-	-	ns
Data hold time	Tdhd	6	-	-	Tcph
DE setup time	Tesu	6	-	-	Tcph
CLK frequency	F_{CPH}		33.26		MHz
CLK period	T_{CPH}		30.06		ns
CLK pulse duty	T_{CWH}	40	50	60	%
DE period	$T_{DEH}+T_{DEL}$	1000	1056	1200	T_{CPH}
DE pulse width	T_{DEH}	-	800	-	T_{CPH}
DE frame blanking	T_{DEB}	10	45	110	$T_{DEH}+T_{DEL}$
DE frame width	T_{DE}	-	480	-	$T_{DEH}+T_{DEL}$

Note：We suggest using the typical value, so it can have better performance.







8. INCOMING INSPECTION STANDARD FOR TFT-LCD PANEL

Reliability Test Items

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. 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.

(1) 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.

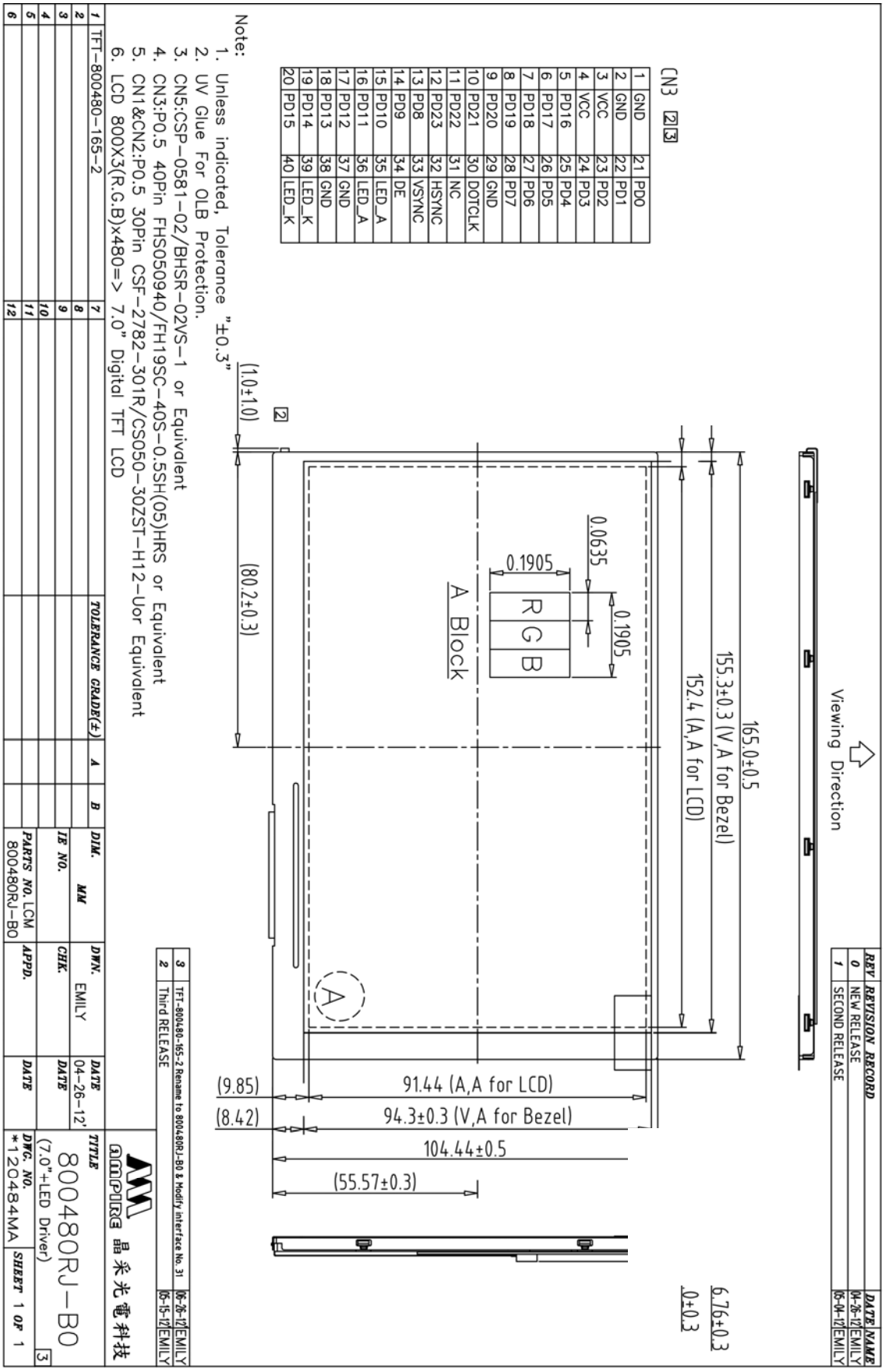
9-5 Other

(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..

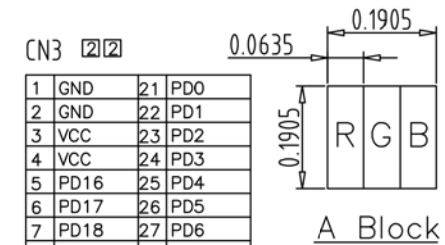
10. OUTLINE DIMENSION

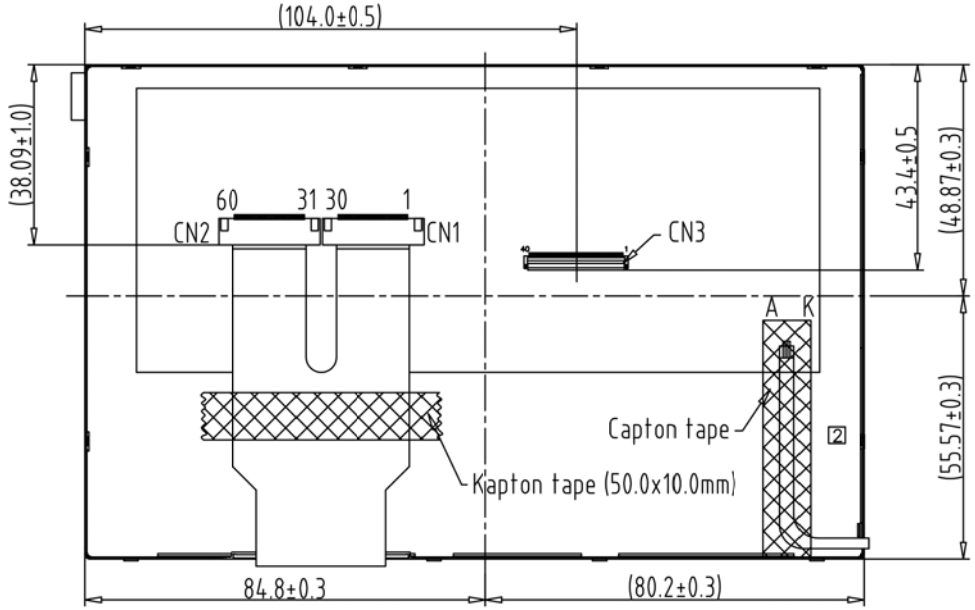


REV	REVISION RECORD	DATE	NAME
0	NEW RELEASE	04-26-12'	EMILY
1	SECOND RELEASE	05-04-12'	EMILY
2	Third RELEASE	05-15-12'	EMILY
3	TFT-800480-165-2 Rename to 800480RJ-B0 & Modify interface No. 31	06-26-12'	EMILY

CN3 [2][2]

1	GND	21	PD0
2	GND	22	PD1
3	VCC	23	PD2
4	VCC	24	PD3
5	PD16	25	PD4
6	PD17	26	PD5
7	PD18	27	PD6
8	PD19	28	PD7
9	PD20	29	GND
10	PD21	30	DOTCLK
11	PD22	31	NC
12	PD23	32	HSYNC
13	PD8	33	VSYNC
14	PD9	34	DE
15	PD10	35	LED_A
16	PD11	36	LED_A
17	PD12	37	GND
18	PD13	38	GND
19	PD14	39	LED_K
20	PD15	40	LED_K





Back View

Note:
1. Unless indicated, Tolerance "±0.3"
2. UV Glue For OLB Protection.
3. CN5:CSP-0581-02/BHSR-02VS-1 or Equivalent
4. CN3:P0.5 40Pin FHS050940/FH19SC-40S-0.5SH(05)HRS or Equivalent
5. CN1&CN2:P0.5 30Pin CSF-2782-301R/CS050-30ZST-H12-Uor Equivalent
6. LCD 800X3(R.G.B)x480=> 7.0" Digital TFT LCD

1	TFT-800480-165-2	7		TOLERANCE GRADE(±)	A	B	DIM. MM	DWN. EMILY	DATE 04-26-12'
2		8					IE NO.	CHK.	DATE
3		9							
4		10							
5		11					PARTS NO. LCM-1 800480RJ-B0	APPD.	DATE
6		12							

AMPIRE 晶采光電科技

TITLE: 800480RJ-B0 (7.0"+LED Driver) [3]

DWG. NO. *120485MA SHEET 1 OF 1