晶采光電科技股份有限公司
AMPIRE CO., LTD.

SPECIFICATIONS FOR LCD MODULE

CUSTOMER	Preliminary Reference Only
CUSTOMER PART NO.	
AMPIRE PART NO.	AM800480E3TMQW-00H
APPROVED BY	
DATE	2007/10/02

☑ Approved For Specifications
☐ Approved For Specifications & Sample

AMPIRE CO., LTD.
TOWER A, 4F, No.114, Sec. 1, HSIN-TAI 5th RD., HIS-CHIH,
TAIPEI HSIEN, TAIWAN(R.O.C.)
台北縣汐止鎮新台五路一段114號4樓(東方科學園區A棟)
TEL:886-2-26967269, FAX:886-2-26967196 or 886-2-26967270

APPROVED BY	CHECKED BY	ORGANIZED BY

RECORD OF REVISION

Revision Date	Page	Contents	Editor
2007/7/20	-	New Release	Donlin

1. INTRODUCTION

Ampire Display Module AM800480E3 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 ,This TFT-LCD has a high resolution (800(R.G.B) X 480) and can display up to 262,144 colors .

1-1. Features

- 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)

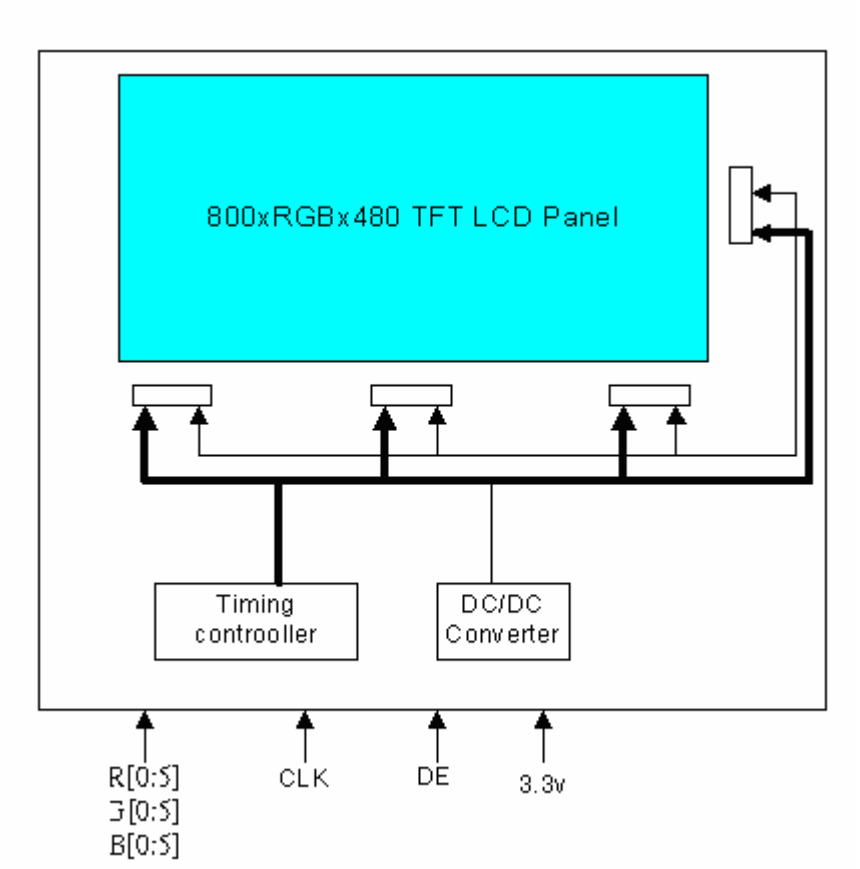
2. PHYSICAL SPECIFICATIONS

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)x104.0(H)	mm
Weight	TBD	g
Brightness	300 nit(typ)	cd/m^2
Contrast ratio	250 : 1	
Backlight unit	LED	
Display color	262,144	colors

3. ABSOLUTE MAX. RATINGS

ITEM	SYMBOL	MIN	MAX	UNIT
Power Supply Voltage for LCD	Vcc	-0.5	5.0	V
Signal input voltage	DCLK DE R0~R5 G0~G5 B0~b5	-0.5	VCC+0.5	V
Operation Temperature	Top	-10	60	℃
Storage Temperature	Tstg	-20	70	℃

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



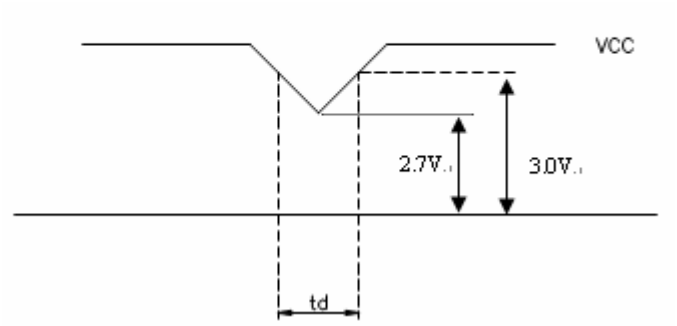
4. ELECTRICAL CHARACTERISTICS

4-1 TFT LCD Module voltage

ITEM		SYMBOL	MIN	TYP	MAX	UNIT
Power Supply Voltage For LCD		Vcc	3.0	3.3	4.0	V
Power Supply Voltage For LED		VLED	9.3	9.6	9.9	V
Logic Input Voltage	Input Voltage	V_{IN}	0	-	Vcc	V
	Threshold Voltage(High)	V_{TH}	3.0	-	Vcc	V
	Threshold Voltage(Low)	V_{TL}	GND	-	0.5	V

VCC –dip codition:

1) When 2.7 V≦VCC＜3.0V，td≦10ms.
2) VCC＞3.0V，VCC-dip condition should be same as VCC-turn-on condition.



5. INTERFACE

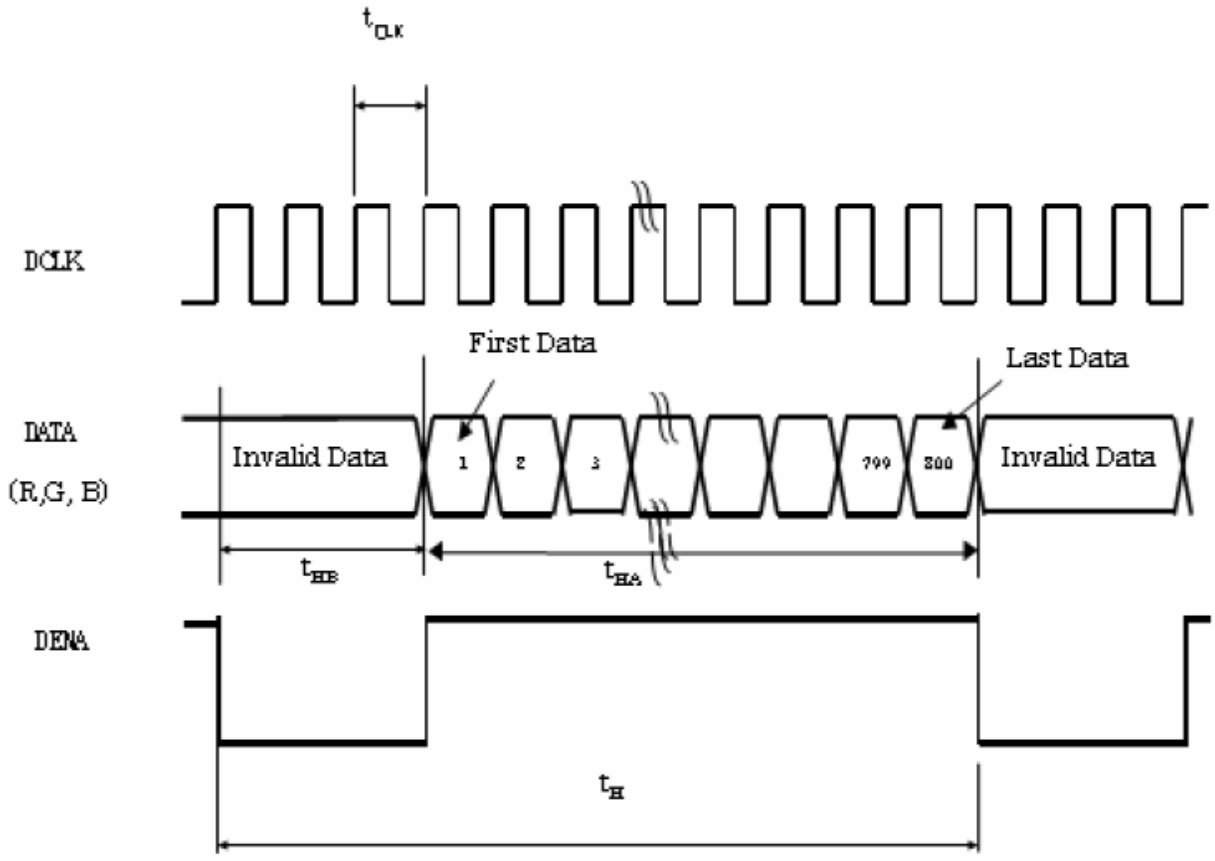
Pin no	Symbol	Function
1	GND	Ground
2	GND	Ground
3	AGING (NC)	Aging test mode, No Connection.
4	VCC	Power supply (3.3V)
5	VCC	Power supply (3.3V)
6	VCC	Power supply (3.3V)
7	VCC	Power supply (3.3V)
8	HS (NC)	HSYNC for test mode, NO Connection.
9	DE	Data Enable Timing Signal
10	GND	Ground
11	GND	Ground
12	GND	Ground
13	B5	Blue data (MSB)
14	B4	Blue data
15	B3	Blue data
16	GND	Ground
17	B2	Blue data
18	B1	Blue data
19	B0	Blue data (LSB)
20	GND	Ground
21	G5	Green data (MSB)
22	G4	Green data
23	G3	Green data
24	GND	Ground
25	G2	Green data
26	G1	Green data
27	G0	Green data (LSB)
28	GND	Ground
29	R5	Red data (MSB)
30	R4	Red data
31	R3	Red data
32	GND	Ground
33	R2	Red data
34	R1	Red data
35	R0	Red data (LSB)
36	GND	Ground
37	GND	Ground
38	DCLK	Data Clock
39	GND	Ground
40	GND	Ground

6. INPUT SIGNAL (DE ONLY MODE):

6.1 Time specification

ITEM		SYMBOL	MIN	TYP	MAX	UNIT
DCLK	Dot Clock	1/tclk	25	30	35	MHz
	Low Level Width	twcl	6			ns
	High Level Width	Twch	6			
DE	Setup Time	Tdes	5			ns
	Hold Time	tdes	10			
	Horizontal Period	Thp	850	900	950	tclk
	Horizontal Valid	Thv		800		
	Horizontal Blank	Thbk	50	100	150	
	Vertical Period	Tvp	490	500	520	thp
	Vertical Vaild	Tvv		480		
	Vertical Blank	Tvbk	10	20	40	
	Vertical Frequency	Fv	55	60	65	Hz
DATA	Setup Time	Tds	5	--	--	ns
	Hold Time	Tdh	10	--	--	

* This module is operated by DE only mode



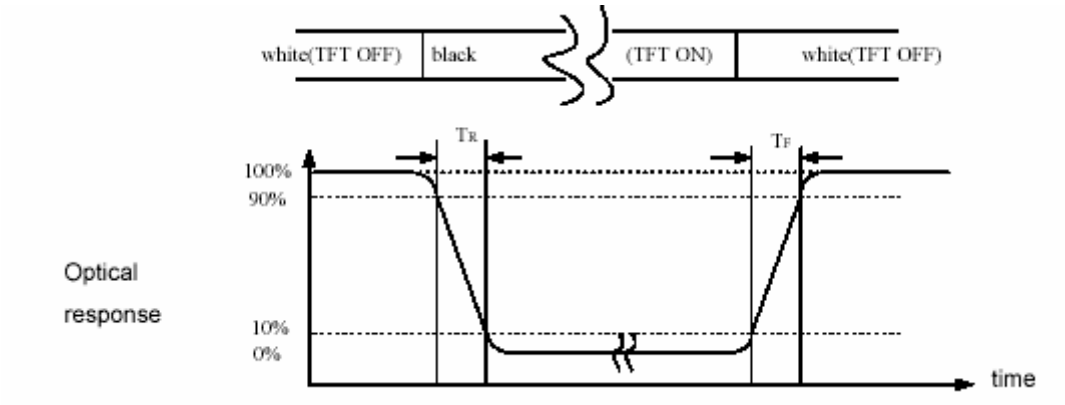
7. OPTICAL CHARACTERISTICS

Item		Symbol	Conditon	Min.	Typ.	Max.	Unit	Note
Response Time		$T_r + T_f$	Θ=Φ=0°	-	20	30	ms	(1)
Contrast ratio		CR			250			(2)(3)
Viewing Angle	Vertical	Θ	CR≧10		120			(5)
	Horizontal	Φ			140			
Luminance		L	Θ=Φ=0°		300			(3)(4)
Color chromaticity	Red	Rx	Θ=Φ=0°	0.582	0.612	0.642		(3)
		Ry		0.314	0.344	0.374		
	Green	Gx		0.278	0.308	0.338		
		Gy		0.516	0.546	0.576		
	Blue	Bx		0.104	0.134	0.164		
		By		0.129	0.159	0.189		
	White	Wx		0.277	0.307	0.337		
		Wy		0.319	0.349	0.379		

NOTE :

- These items are measured by BM-7(TOPCON) in the dark room (no ambient light)
- Brightness conditions : IL=180mA.

(1) Definition of Response Time (White-Black)



(2) Definition of Contrast Ratio

Measure contrast ratio on the below 5 points(refer to figurel,#1~#5point) and take the average value

Contrast ratio is calculated with the following formula :

Contrast Ratio(CR)=(White)Luminance of ON ÷ (Black)Luminance of OFF

(3) Definition of Luminance :

Measure white luminance on the same 5 points and take the average value

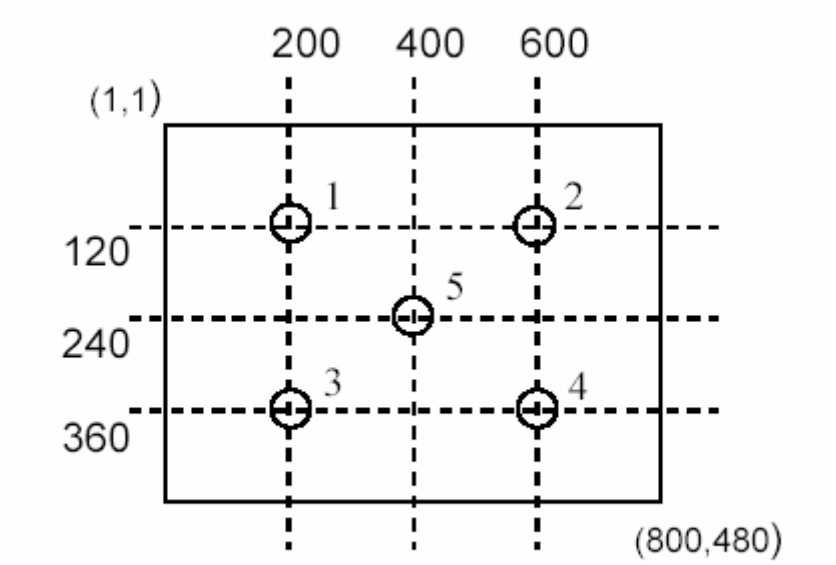
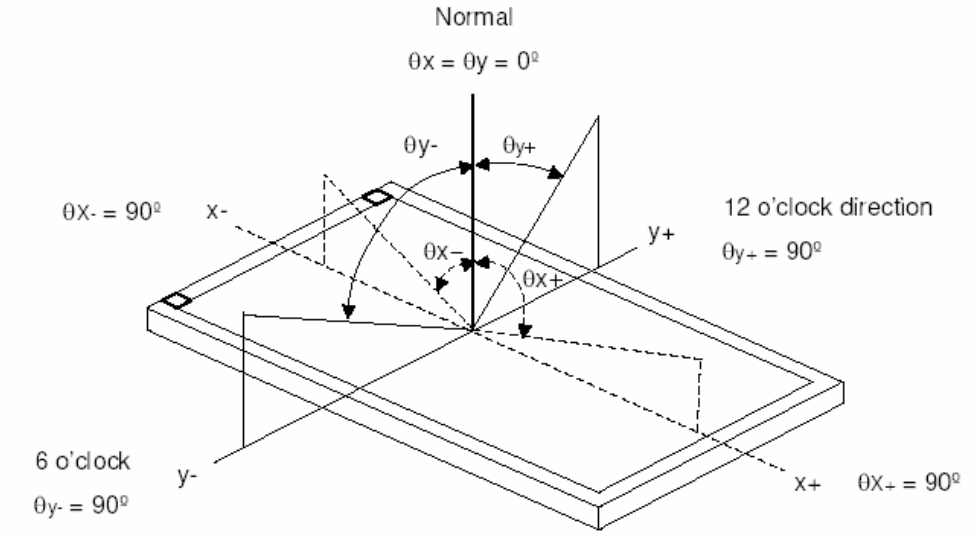


Fig.1 Measuring point

(1) Definition of Luminance Uniformity :
Measured Maximum luminance[L(MAX)] and Minimum luminance[L(MIN)] on the 5 points
Luminance Uniformity is calculated with the following formula :

ΔL =[L(MAX) / L(MIN) –1] X 100

(2) Definition of Viewing Angle



Φ =(Θx+)+(Θx-) Θ =(Θy+)+(Θy-)

8. RELIABILITY TEST CONDITIONS

ITEM	CONDITIONS	NOTE
HIGH TEMPERATURE OPERATION	60℃ , 240Hrs	
HIGH TEMPERATURE AND HIGH HUMIDITY OPERATION	40℃ , 90%RH , 240Hrs	
HIGH TEMPERATURE AND HIGH HUMIDITY STORAGE	60℃ , 90%RH , 48 Hrs	
HIGH TEMPERATURE STORAGE	70℃ , 240Hrs	
LOW TEMPERATURE OPERATION	-10℃ , 240Hrs	
LOW TEMPERATURE STORAGE	-20℃ , 240Hrs	
THERMAL SHOCK (No operation)	-20℃(0.5Hr) ~60℃(0.5Hr) 200Cycle	
ESD	±8kV&±15kV air & contact test	(1)
	0Ω,±200V contact test	(2)

NOTE : Measure point :

(1) LCD glass and bezel

(2) IF connector pins

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

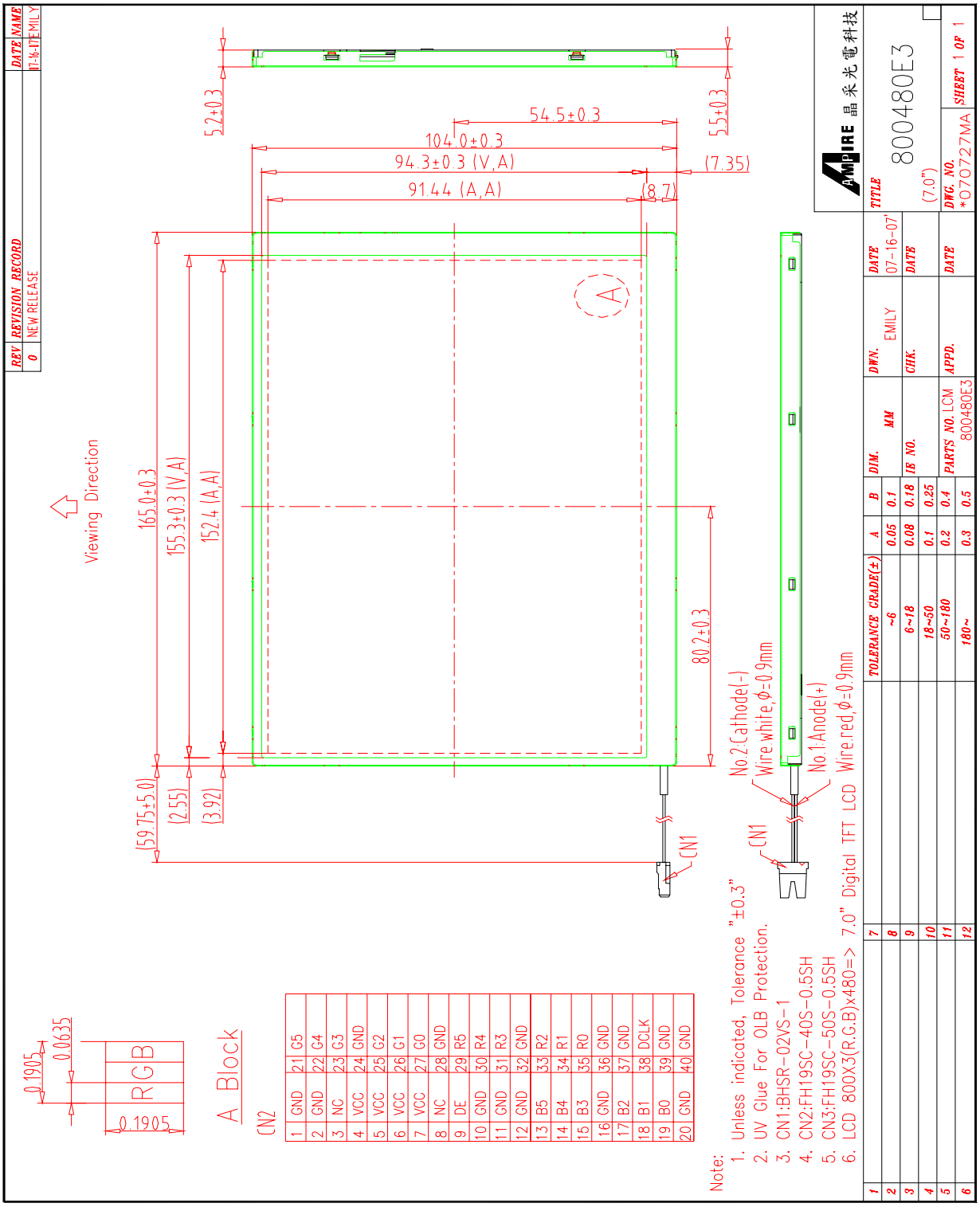
(1) Do not boost the applied drive voltage abnormally. Failure to do so may break ICs. When applying power voltage, check the electrical features beforehand and be careful. Always turn off the power to the LC module controller before removing or inserting the LC module input connector. If the input connector 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.

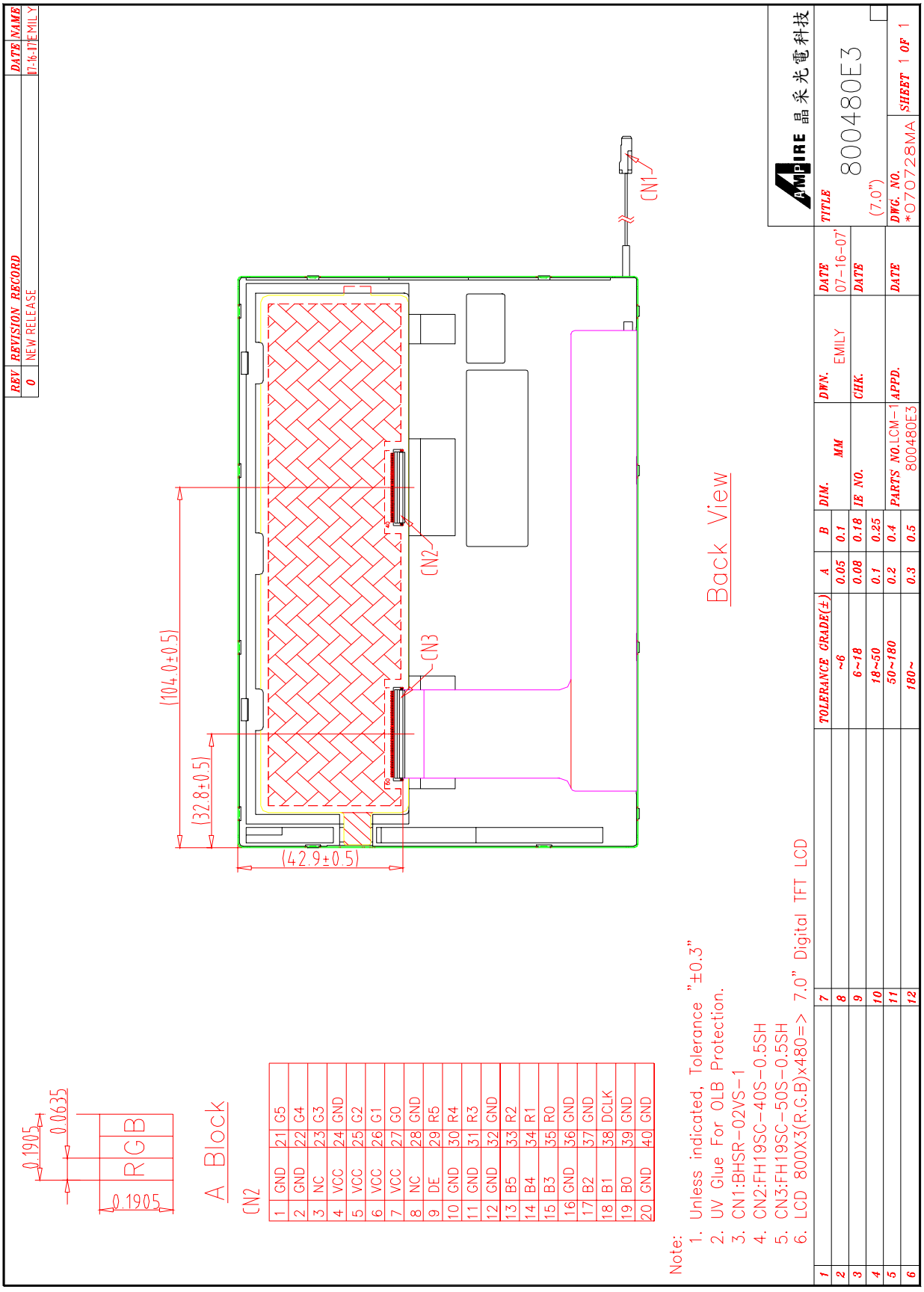
9-5 Other

(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.

10. OUTLINE DIMENSION

10-1 Front view(unit:mm)




REV
REVISION RECORD
DATE
NAME
0
NEW RELEASE
07-16-07
EMILY
Back View
(104.0±0.5)
(32.8±0.5)
(42.9±0.5)
CN1
CN2
CN3
A Block
CN2
1 GND 21 G5
2 GND 22 G4
3 NC 23 G3
4 VCC 24 GND
5 VCC 25 G2
6 VCC 26 G1
7 VCC 27 G0
8 NC 28 GND
9 DE 29 R5
10 GND 30 R4
11 GND 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 GND
18 B1 38 DCLK
19 B0 39 GND
20 GND 40 GND
0.1905
0.0635
0.1905
RGB
Note:
1. Unless indicated, Tolerance "±0.3"
2. UV Glue For OLB Protection.
3. CN1:BHSR-02VS-1
4. CN2:FH19SC-40S-0.5SH
5. CN3:FH19SC-50S-0.5SH
6. LCD 800X3(R.G.B)x480=> 7.0" Digital TFT LCD
TOLERANCE GRADE(±)
A
B
~6
0.05
0.1
6~18
0.08
0.18
18~50
0.1
0.25
50~180
0.2
0.4
180~
0.3
0.5
DIM.
MM
IE NO.
PARTS NO.LCM-800480E3
DWN.
EMILY
CHK.
APPD.
DATE
07-16-07
DATE
DATE
TITLE
800480E3
(7.0")
DWG. NO.
*070728MA
SHEET 1 OF 1