

AMPIRE CO., LTD. AMP DISPLAY INC.

SPECIFICATIONS

5.7-in Color VGA TFT MODULE

CUSTOMER:	
CUSTOMER PART NO.	
AMP DISPLAY PART NO.	AM-640480G2TMQW-00H
APPROVED BY:	
DATE:	



APPROVED FOR SPECIFICATIONS

APPROVED FOR SPECIFICATION AND PROTOTYPES

AMP DISPLAY INC

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Revision Date	Page	Contents	Editor
2008/4/29		New Release	Sunglin

RECORD OF REVISION

1. INTRODUCTION

Ampire Display Module AM640480G is a color active matrix TFT-LCD that uses amorphous silicon TFT as a switching device . This model is composed of a 5.7inch TFT-LCD panel, touch panel, a driving circuit and LED backlight system. This TFT-LCD has a high resolution (640(R.G.B) X 480) and can display up to 262,144 colors.

1-1. Features

- VGA Resolution
- 6 Bits color driver with 1 channel TTL interface
- Wide range operation temperature

1-2. Applications

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

2. PHYSICAL SPECIFICATIONS

Item	Specifications	unit
Display resolution(dot)	640RGB (W) x 480(H)	dots
Display area	116.16 (W) x 87.12 (H)	mm
Pixel pitch	0.18 (W) x 0.18 (H)	mm
Color configuration	R.G.B Vertical stripe	
Overall dimension	127.0(W)x98.43(H)x6.6(D)(Typ)	mm
Surface treatment	Antiglare , Hard-Coating(3H)	
Brightness	500	cd/m ²
Contrast ratio	250 : 1	
Backlight unit	LED	
Display color	262,144	colors
Viewing Direction	12 o'clock	
Display Mode	Normally White	

3. ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	MIN	MAX	UNIT	NOTE
Power Supply Voltage	Vcc	-0.5	5	V	
Signal Input Voltage	DCLK , DE R0~R5 G0~G5 B0~B5	-0.5	Vcc + 0.5	V	
ICC Rush Current	IRUSH		1	Α	(3)
Operation Temperature	Тор	-5	60	°C	(1)
Storage Temperature	Tstg	-20	70	°C	(1)

4. ELECTRICAL CHARACTERISTICS(T.B.D)

4-1 TFT LCD Module voltage

ITEM	SYMBOL	MIN	TYP	MAX	UNIT	NOTE
Power Voltage For LCD	V _{CC}	3.0	3.3	3.6	V	(1)
Power Voltage For LED	V_{DD}		(T.B.D)		V	
Logic Input Voltago	VIH	V _{CC} *0.7		V_{CC}	V	
	VIL	0		V _{CC} *0.3	V	
	VIH	3.0		3.3	V	
ADJ input voltage	VIL	GND		0.3	V	

NOTE : 1. Vcc – dip condition :

When 2.7V ${\leq}$ Vcc ${<}$ 3.0V , td ${}$ ${\leq}$ 10ms

 $Vcc\!>\!3.0V$, Vcc- dip condition should be same as Vcc turn-on condition



2. LED Lift Time : MTBF 20,000 hours.(T.B.D)

4-2 TFT LCD current comsumption

ITEM	SYMBOL	MIN	TYP	MAX	UNIT	NOTE
LCD Power Current	lcc	-	(T.B.D)	-	mA	(1)
LED Power Current	I _{LED}	-	(T.B.D)	-	mA	(2)

NOTE : (1) Typ : under 64 gray pattern Max : under black pattern





(a) 64 Gray Pattern

(b) Black Pattern

(2) Typ : When V_{LED} is 5.0V Max : When V_{LED} is 4.5V One LED Dice :





50ms≦t2

1sec≦t5

 $\begin{array}{l} t1 \!\leq\! 10 ms \\ 0 \!<\! t4 \!\leq\! 10 ms \\ 200 ms \!\leq\! t7 \end{array}$

0<t3≦50ms 200ms≦t6

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6. INTERFACE

Pin No	Symbol	Function
1	U/D	Up or Down Display Control
2	(NC)	No connection
3	Hsync(NC)	Honizontal SYNC. (Sync mode used)
4	VLED	Power Supply for LED
5	VLED	Power Supply for LED
6	VLED	Power Supply for LED
7	Vcc	Power Supply for LCD
8	Vsync(NC)	Vertical SYNC. (Sync mode used)
9	DE	Data Enable
10	Vss	Power Ground
11	Vss	Power Ground
12	ADJ	Adjust for LED Brightness
13	B5	Blue Data 5 (MSB)
14	B4	Blue Data 4
15	B3	Blue Data 3
16	Vss	Power Ground
17	B2	Blue Data 2
18	B1	Blue Data 1
19	B0	Blue Data 0 (LSB)
20	Vss	Power Ground
21	G5	Green Data 5 (MSB)
22	G4	Green Data 4
23	G3	Green Data 3
24	Vss	Power Ground
25	G2	Green Data 2
26	G1	Green Data 1
27	G0	Green Data 0 (LSB)
28	Vss	Power Ground
29	R5	Red Data 5 (MSB)
30	R4	Red Data 4
31	R3	Red Data 3
32	Vss	Power Ground
33	R2	Red Data 2
34	R1	Red Data 1
35	R0	Red Data 0 (LSB)
36	Vss	Power Ground
37	Vss	Power Ground
38	DCLK	Clock Signals
39	Vss	Power Ground
40	L/R	Left or Right Display Control

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NOTE :

1. ADJ adjust brightness to control Pin , Pulse duty the bigger the brighter.



2. ADJ signal = $0 \sim 3.3V$, operation frequency : $20\pm10KHz$



- 3. VSS Pin must ground contact , can not be floating.
- 4. U/D and L/R are controlled function

L/R	U/D	Function
1	0	Normally display
0	0	Left and Right opposite
1	1	Up and Down opposite
0	1	Left and Right opposite , Up and Down opposite

7. INPUT SIGNAL :

7-1 Timing Specification. All of information as below are to be define.

	abaraatariatiaa	Cumbal							
	charactenstics	Symbol	Min	Тур	Max	UNIT			
	Dot Clock	Fosc	23	25	30	MHz			
	Horizontal Period	Тн	750	800	900				
	Horizontal Valid	Тн∨		640		Tosc			
	Horizontal Blank	Тнвк	110	160	260				
	Vertical Period	Tvp	515	525	560				
	Vertical Valid	Τvv		480		Тн			
	Vertical Blank	Тувк	35	45	80				
	Vertical Frequency	F٧	55	60	65	Hz			
	Horizontal Period	Тн	750	800	900				
	Horizontal Pulse Width	Tнs	1	1	1				
	Horizontal Pulse Width + Back Proch	Тнрwв	46	46	46	Tosc			
	Horizontal Front Proch	THF	64	114	214				
	Horizontal Valid	Тну		640					
SYNC MODE	Vertical Period	Τνρ	515	525	560				
	Vertical Pulse Width	Tvs	1	1	1				
	Vertical Pulse Width + Back Proch	Турув	34	34	34	Τн			
	Vertical Front Proch	Tvf	1	11	46				
	Vertical Valid	Tvv		480					
	Vertical Frequency	Fv	55	60	65	Hz			

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7-2 Timing chart

Horizontal Timing Sequence



Sync mode Timing

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7-3 Color Data Assignment

	Input			R D	ATA					G D	ATA					ΒD	ATA		
COLOR	Data	R5 MSB	R4	R3	R2	R1	R0 LSB	G5 MSB	G4	G3	G2	G1	G0 LSB	B5 MSB	B4	B3	B2	B1	B0 LSB
	BLACK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(63)	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	GREEN(63)	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
BASIC	BLUE(63)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
COLOR	CYAN	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
	MAGENTA	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1
	YELLOW	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0
	WHITE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	RED(0)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(1)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
PED	RED(2)	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
RED			-			-													
	RED(62)	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(63)	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	GREEN (0)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	GREEN (1)	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
ODEEN	GREEN (2)	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
GREEN		-			-			-		-			-	-					
	GREEN (62)	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0
	GREEN (63)	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
	BLUE (0)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	BLUE (1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
DILLE	BLUE (2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
BLUL											1	1				1	I	1	
	BLUE (62)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	BLUE (63)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

NOTE : (1) Definition of Gray Scale , Color(n) : n is series of Gray Scale The more n value is the bright Gray Scale

(2) Data : 1-High , 0-Low

8. TOUCH PANEL ELECTRICAL SPECIFICATION

8.1 Touch Screen Panel Characteristics

- Operation Temperature : -5°C ~ +60°C
 Storage Temperature : -20°C ~ +70°C
- 2. Life Time : > 1,000,000 times
- 3. Linearity : $\leq 1.5\%$
- 4. TOP ITO Film : Anti-Glare Hard Coating & Anti-Newton Ring

Sheet Resistance : $380\Omega \sim 1180\Omega$;

BOTTOM GLASS : Sheet Resistance : $180\Omega \sim 470\Omega$

- 5. Tai Type : FPC Gold-plated
- 6. Meet for ROHS.
- 7. All Tolerance Without Marked : ±0.3
- 8. Insulating Resistance : More than 20M Ω at DC 25 V

8.2 Touch Screen Pane & Interface



X : Glass electrode

Y : Film electrode

Pin No.	Symbol	I/O	Function
1	YU(Y1)	Тор	Top electrode – differential analog
2	XL(X2)	Left	Left electrode – differential analog
3	YD(Y2)	Bottom	Bottom electrode – differential analog
4	XR(X1)	Right	Right electrode – differential analog

9. OPTICAL CHARACTERISTICS All of information as below are to be define.

Item		Symbol	Condition	Min.	Тур.	Max.	Unit	Note	
Contrast ra	atio		CR		200	250			(1)(2)(3)
Luminance	9		Lw	Deint C		500	-	cd/m ²	(1)(3)
Luminance	e Unifo	ormity	ΔL	$\Theta = \Phi = 0^{\circ}$	70	80	-	%	(1)(3)
Response Time (White – Black))	T _r +T _f			30	50	ms	(1)(3)(5)
Viewing	Vertical		Vertical O		80	100	-	Deg	(1)(2)(4)
Angle	Hor	izontal	Φ	Point – 5	120	140	-	Deg.	(1)(2)(4)
		Pod	Rx		0.580	0.610	0.640		
		Reu	Ry		0.306	0.336	0.366		
		Green	Gx		0.300	0.330	0.360		
Color		Green	Gy	Point - 5	0.544	0.574	0.604		(1)(2)
chromaticity		Plue	Bx	Θ= Φ = 0°	0.116	0.148	0.176		(1)(3)
		Diue	Ву		0.080	0.110	0.140		
		\//bito	Wx		0.283	0.313	0.343		
		vville	Wy		0.299	0.329	0.359		

NOTE :

(1) Measure conditions : 25°C ±2°C , 60±10%RH under 10Lux , in the dark room by BM-7TOPCON) ,viewing 2° , VCC=3.3V , VDD=3.3V



(2) Definition of Contrast Ratio :

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

 (3) Definition of Luminance : Definition of Luminance Uniformity Measure white luminance on the point 5 as figure9-1

Measure white luminance on the point 1 ~ 9 as figure 9-1



 $\Delta L = [L(MIN) / L(MAX)] X 100\%$

Fig9-1 Measuring point

(4) Definition of Viewing Angle(Θ, Φ), refer to Fig9-2 as below :





Fig9-2 Definition of Viewing Angle

(5) Definition of Response Time.(White - Black)

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Fig9-3 Definition of Response Time(White-Black)

10. RELIABILITY TEST CONDITIONS

ITEM	CONDITIONS
HIGH TEMPERATURE OPERATION	$60^\circ\!\mathrm{C}$, 240Hrs
HIGH TEMPERATURE AND HIGH HUMIDITY OPERATION	60℃,90%RH,240Hrs
HIGH TEMPERATURE STORAGE	70℃,240Hrs
LOW TEMPERATURE OPERATION	-5°C , 240Hrs
LOW TEMPERATURE STORAGE	-20℃,240Hrs
THERMAL SHOCK	-20°C (0.5Hr) ~70°C (0.5Hr) 200Cycle

10.1 OTHERS

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

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11. OUTLINE DIMENSION



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