A Brighter Solution

AMP DISPLAY INC.

SPECIFICATIONS

4.0-in COLOR TFT MODULE

CUSTOMER:	
CUSTOMER PART NO.	
AMP DISPLAY PART NO.	A M - 4 8 0 2 7 2 D 1 T M Q W - 0 0 H
APPROVED BY:	
DATE:	

☐ APPROVED FOR SPECIFICATIONS

☐ APPROVED FOR SPECIFICATION AND PROTOTYPES

AMP DISPLAY INC

9856 SIXTH STREET RANCHO CUCAMONGA CA 91730

TEL: 909-980-13410 FAX: 909-980-1419

WWW.AMPDISPLAY.COM

RECORD OF REVISION

Revision Date	Page	Contents	Editor
2007/4/25	-	New Release	Kokai
2007/5/2		Modify the Absolute maximum ratings of VCC +40V Input connector : Molex connector/part no. 522710779	Kokai
			Kokai
2007/5/15		Modify Outline dimension Drawing Surface treatment : glare	
2007/7/24		Rename to AM-480272D1TMQW-00H Surface treatment : Anti-glare	Kokai

1. INTRODUCTION

This specification is apply for ”4”(10.16cm)color TFT-LCD (Thin Film Transistor Liquid Crystal Display) module(pixel number：480×272)。This module composed of LCD panel, driver ICs, control circuit and backlight。The 10.16cm (“4") screen produces 480 ×RGB×272 resolution image。By applying 8 bits digital data, 16.7 million color images are displayed on the “4” diagonal screen. Built-in Video decoder for Video application.

1.1. Features

- 16:9 diagonal configuration
- Resolution 480XRGBX272
- High brightness
- Video System: NTSC/PAL Auto Switching.
- 2D NTSC and PAL comp-filter for Y/C separation of CVBS input.

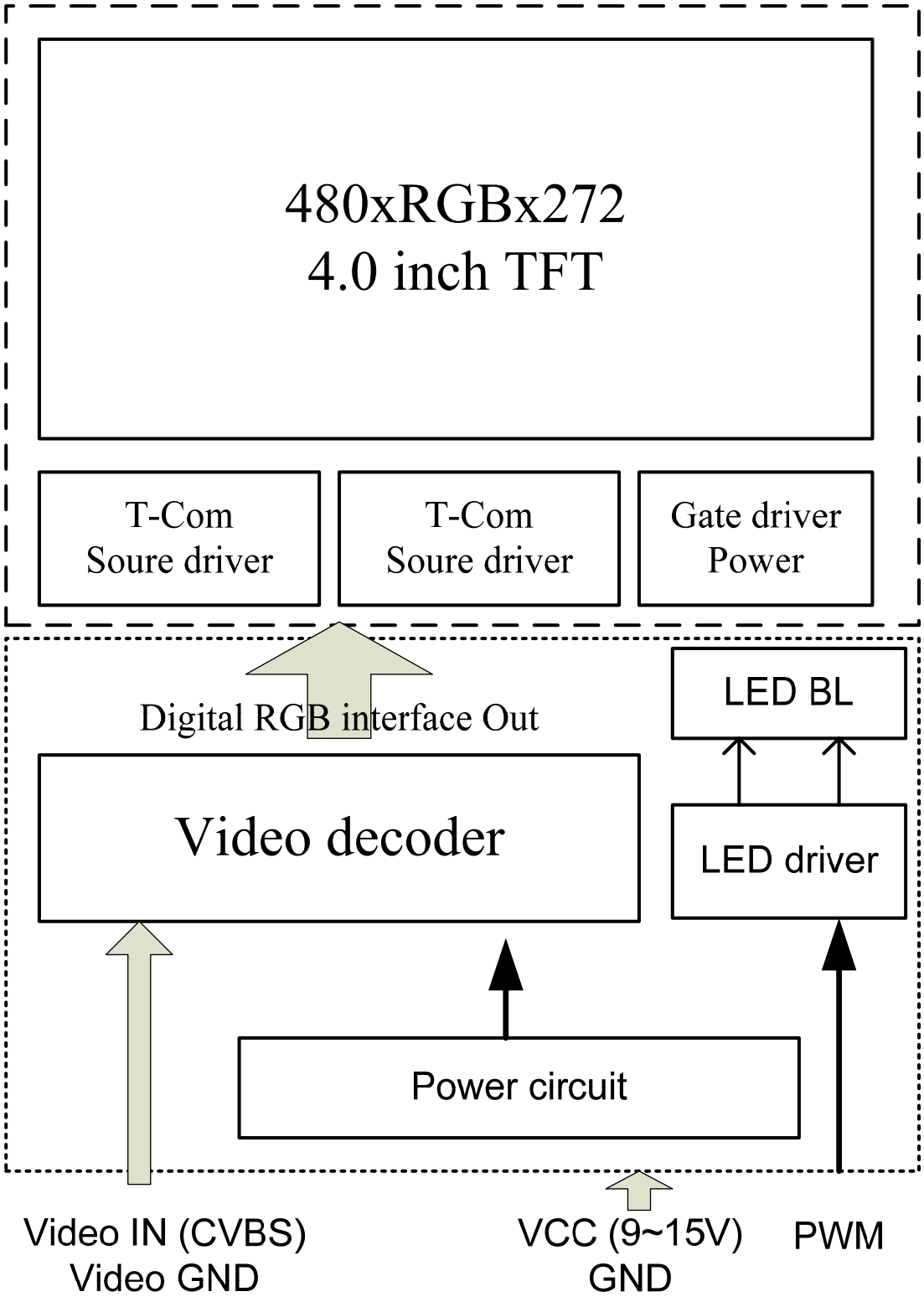
1.2. Applications

- PMP
- GPS
- GAME

2. PHYSICAL SPECIFICATIONS

Item	Specifications	unit
Display resolution(dot)	480RGB (W) x 272(H)	dots
Active area	90.6 (W) x 52.7 (H)	mm
Pixel pitch	0.183 (W) x 0.183 (H)	mm
Color configuration	R.G.B Vertical stripe	
Overall dimension	98.3(W)x62.6(H)x12.4max(D)	mm
Weight	TBD	g
Surface treatment	Anti-glare	
Brightness	400	cd/m^2
Contrast ratio	T.B.D	
Backlight unit	LED	

3. BLOCK DIAGRAM



4. Electrical Specifications

4.1 TFT LCD Panel FPC Descriptions

Pin no	Symbol	Function
1	VCC	Power Supply +9~+15V DC input
2	GND	Power Ground
3	PWM	PWM input for BL brightness Adjust.
4	GND	Power Supply
5	Video GND	Video Ground
6	Video IN	Video input
7	Video GND	Video Ground

4.2 ABSOLUTE MAXIMUM RATINGS

item	Symbol	Values		Unit	Remark
		Min	Max		
Power Voltage	VCC	-0.3	+40	V	GND=0
Operation Temperature (Ambient)	TOP	-30	80	℃	
Storage Temperature (Ambient)	TST	-40	85	℃	

*TFT LCD Ratings

4.3 Power Voltage

item	Symbol	Values			Unit	Remark
		Min	Typ	Max		
power supply	VCC	9.0	12.0	15.0	V	
Power supply current	IVCC	--	150	220	mA	

4.4 Backlight

----- White LED Back-light Characteristics -----							
Parameter	**Symbol**	**Condition**	**Min**	**Typ**	**Max**	**Unit**	**Note**
Forward Current	IF	--	--	20	23	mA	Note 4
LCM Luminous intensity (Full White pattern)		IF=20mA	300	--	--	cd/m^2	Note 4
Forward Voltage	VF	IF=20mA	--	23.1	24.5	V	Note 5
LED C.I.E	X	IF=20mA	0.26	0.30	0.34		Note 6
	Y	IF=20mA	0.27	0.31	0.35		

Note 4: Luminous intensity is decided by forward current of White LED.

Note 5: White LEDs are with voltage tolerance.

Note 6: White LEDs are with color tolerance.

5. OPTICAL CHARACTERISTICS

Item		Symbol	Conditon	Min.	Typ.	Max.	Unit	Note
Response Time		$T_r + T_f$	Θ=Φ=0°	-	(25)		ms	(3)
Contrast ratio		CR			TBD	-	-	(1)
Viewing Angle	Vertical	Θ	CR≧10		(110)	-	Deg.	(4)
	Horizontal	Φ			(130)	-		
Luminance		L	Θ=Φ=0°	300	-	-	cd/m^2	(2)
Color chromaticity	White	Wx			T.B.D			(2)(3)
		Wy			T.B.D			

NOTE :

Measure Condition: (IL= 20.0mA)

Measure Item Definition as follow：

(1)Definition of Contrast Ratio：(Measured by BM-7 (TOPCON) [dark room])

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

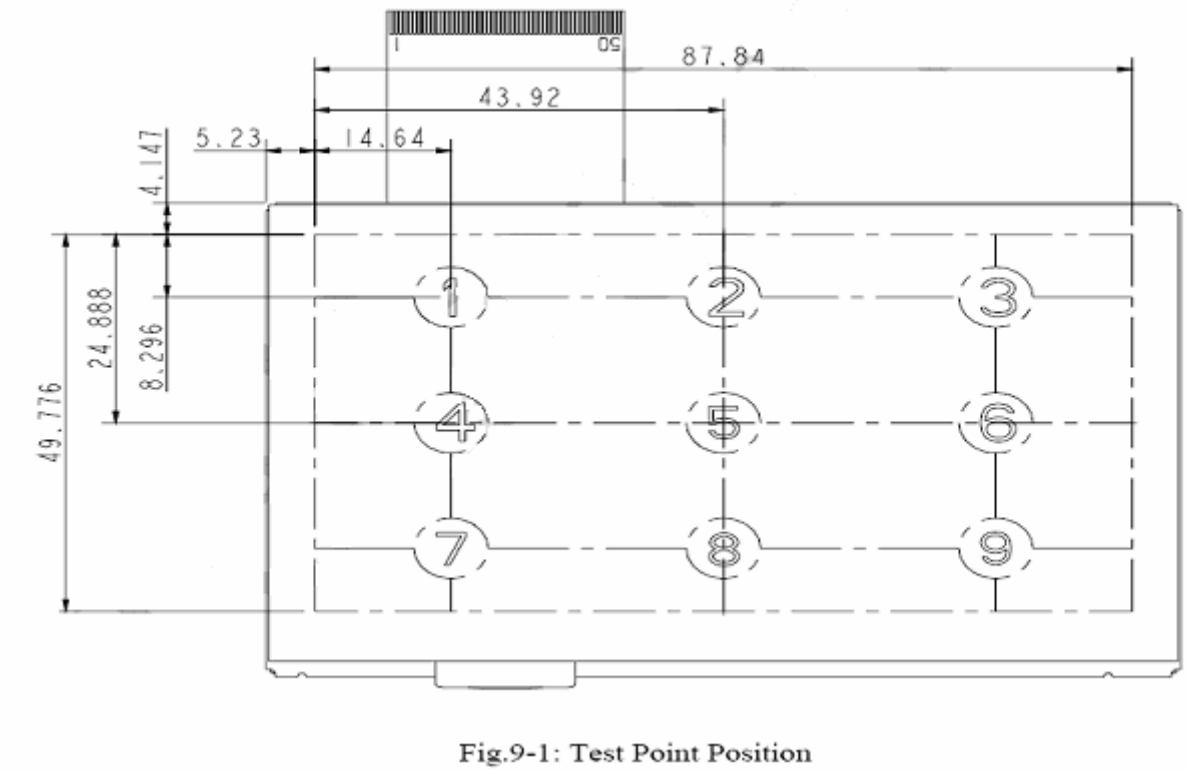


Fig.9-1: Test Point Position

(2) Definition of Center Luminance &Luminance Uniformity：(Measured by BM-7 (TOPCON) [dark room])

Center Luminance：Measure luminance on Point No5 as figure 9-1.

Luminance Uniformity：Measure maximum luminance(L(MAX))and minimum luminance (L(MIN))on the **9** points as figure 9-1.

L = [L(MIN)/L(MAX)]×100%△

(3) Response Time (White - Black)

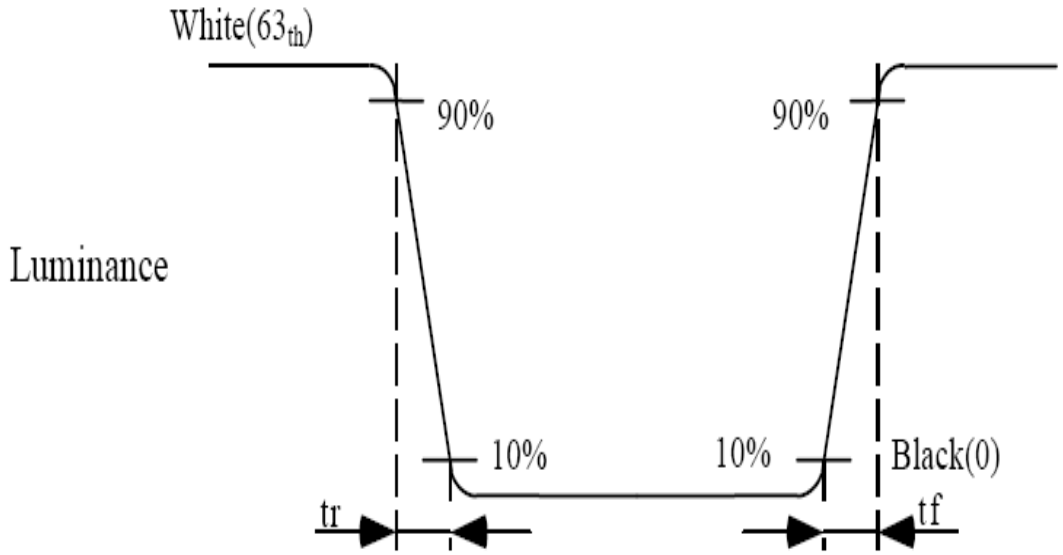
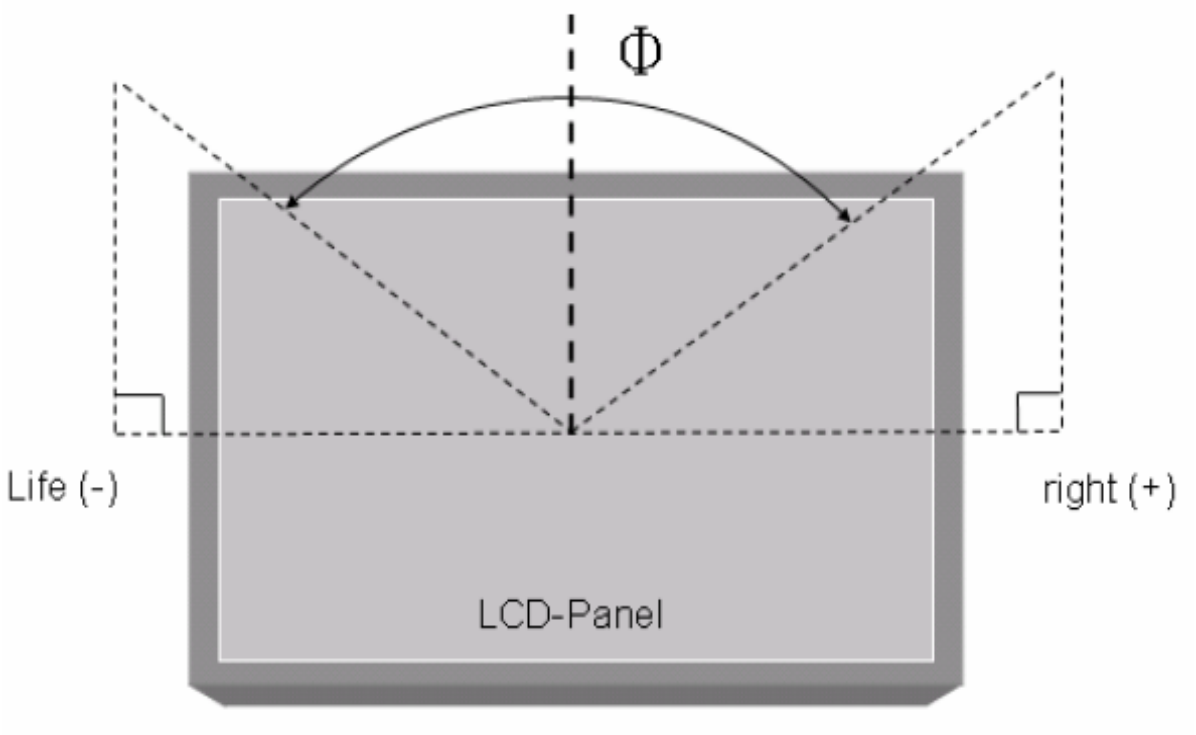
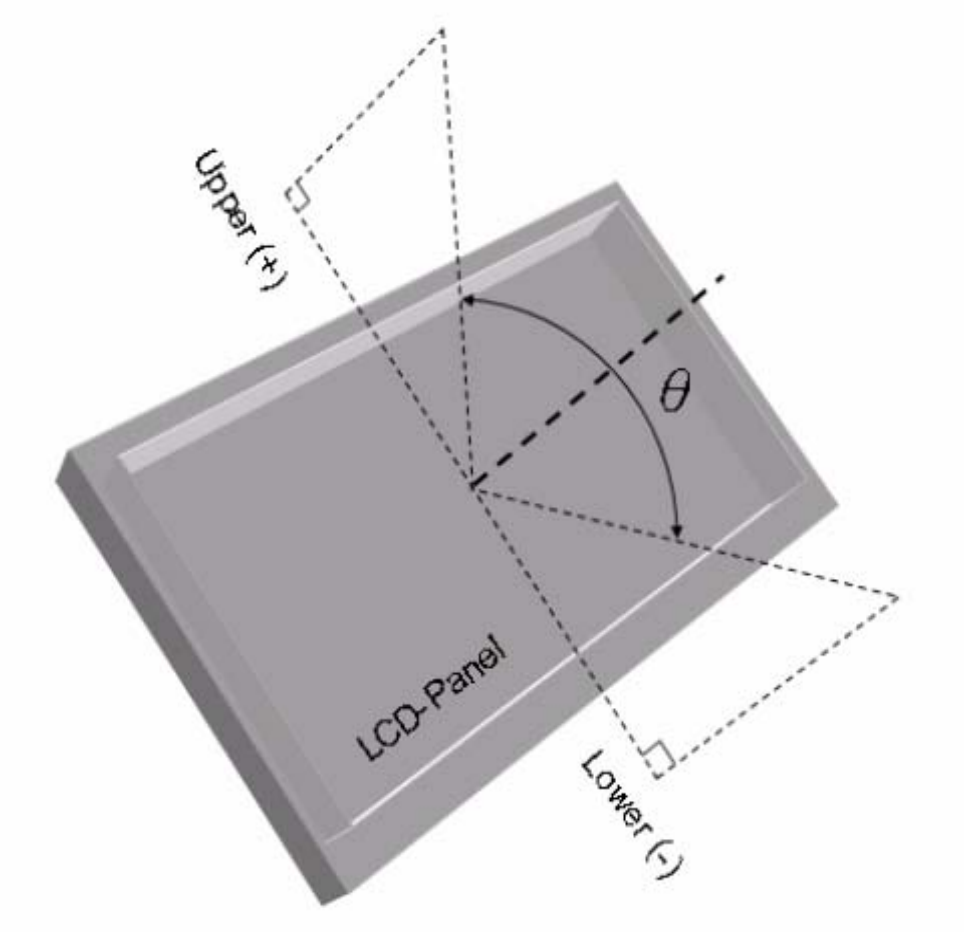


Fig.9-2: Definition of Response Time (White - Black)

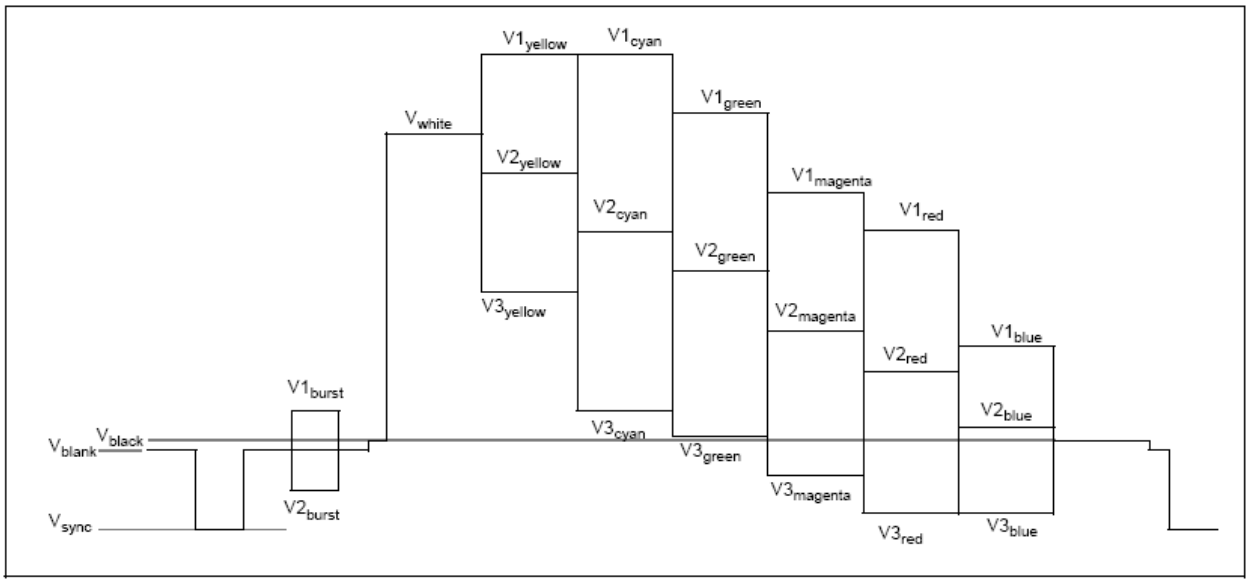
(4)Definition of Viewing Angle () ：(by EZ-CONTRAST (ELDIM) in the dark room.)




Upper (+)
θ
LCD-Panel
Lower (-)

6. Video Input Signal

NTSC/PAL Composite input:



8. RELIABILITY TEST CONDITIONS

ITEM	CONDITIONS	NOTE
HIGH TEMPERATURE OPERATION	80℃ , 240Hrs	
HIGH TEMPERATURE AND HIGH HUMIDITY OPERATION	60℃ , 90%RH , 240Hrs	
HIGH TEMPERATURE STORAGE	85℃ , 240Hrs	
LOW TEMPERATURE OPERATION	-30℃ , 240Hrs	
LOW TEMPERATURE STORAGE	-40℃ , 240Hrs	
THERMAL SHOCK	-30℃(1Hr) ~80℃(1Hr) 200Cycle	

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