Tailorpixels

A Professional Manufacturer of Display

Manufacturer Certificated

9001 CERT. No.: 282Q19070712006

14001 CERT. No.: 282E19070712007

Product Specification

Model: TBZ043C480272-01

4.3″ UART TFT Display Module (480*272)

This module uses RoHS material

Tailor Pixels Technology Co., Ltd.
www.tailorpixels.com
tailor@tailorpixels.com
Ph: 86-755-8821 2653

Contents in this document are subject to change without notice. No part of this document can be reproduced or transmitted by any means for any purpose without the written permission of Tailor Pixels Technology Co., Ltd.

CHANGE HISTORY:

Date	Revision	Description	Person in Charge
2021-10-25	V01	First Release	Tony

CONTENTS

■ GENERAL DESCRIPTION

TBZ043C480272-01 is a TFT dot matrix LCD module. It is composed of a PCBA, color TFT LCD panel, Source and Gate driver IC, FPC, CTP and a backlight unit. The module display area contains 480x272 pixels. This product accords with RoHS environmental criterion.

■ LCM PARAMETER

Item	Contents	Unit	Notes
LCD Type	TFT Transmissive	/	/
Viewing Direction	6	O' Clock	/
PCBA Dimension	122(W) x 75.2(H) x 7.5(T)	mm	/
LCM Dimension	105.5(W) x 67.2 (H) x 5.0(T)	mm	/
Active Area (W x H)	95.04(W) x 53.856(H)	mm	/
Number of Dots	480 x 272	Pixels	/
Touch Type	G+G Capactive touch panel	/	/
Backlight Type	7 LEDS / White	/	Vbl=21V
Backlight Luminance	230	cd/m2	/
Interface	Uart	/	8 Pin
Input Voltage	4.5~18	V	

■ ELECTRICAL CHARACTERISTICS

Item	Min.	Typical	Max.	Unit	Notes
Operating Voltage	4.5	5.0	18	V	VDD
Operating Current	---	275	---	mA	5V Power
Operating Temperature	-10	25	60	°C	/
Storage Temperature	-20	25	80	°C	/
Serial Baud Rate	---	9600	115200	bps	Standards
Serial Output Level	3.0	3.3	---	V	/
Serial Input Level	3.0	3.3	---	V	/
Flash Size	---	64M	---	bits	Nor Flash

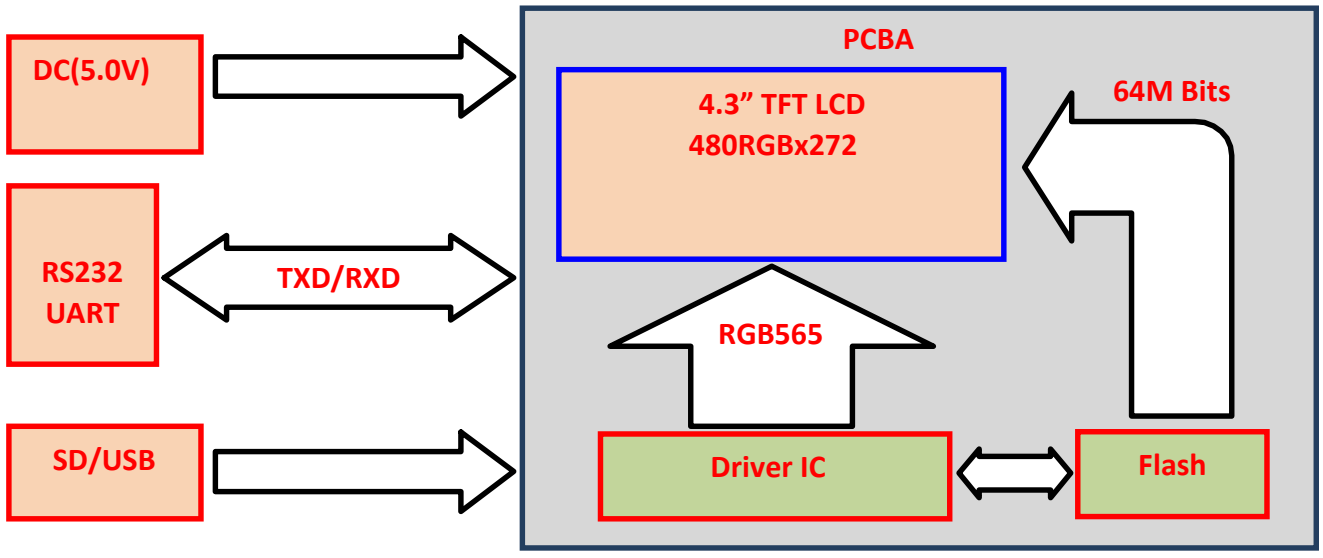
Display RAM	---	128M	---	Bytes	MCU
Flash Memory	---	512K	---	Bytes	MCU
SRAM Memory	---	256K	---	Bytes	MCU
MCU Frequency	120	150	---	MHz	MCU

■ BACKLIGHT CHARACTERISTICS

Condition: Constant Current Driving Method (If=20mA(+/-10%)

Item	Symbol	Min.	Typ.	Max	Unit	Condition
Forward Voltage	Vf	20.2	21	22.5	V	If=20mA
Luminance with LCD	Lv	180	230	--	cd/m2	/
Number of LED	/	7			Pcs	/
Connection mode	S	7 Serial			/	/

■ BLOCK DIAGRAM



■ PIN DESCRIPTION

J2: RS232 or UART (Used 8Pin 2mm Pitch Connector)

Pin. No	Symbol	Description
1 , 2	VDD	Power Supply
3	BUSY	Not Defined
4	TXD	UART transmit data output (3.3V TTL)
5 , 6	RXD	UART receiving data input (3.3V TTL)
7 , 8	GND	Ground

J12: RTP (4PIN)

Standard (NC)

J10: TFT (40PIN)

Standard Use

J11: CTP (6PIN)

Standard Use

J6: SD Upgrade (Standard Use)

Pin. No	Symbol	Description
1	DAT2	Data bit 2
2	CD/DAT3	Data bit 3/Card detection
3	CMD	Command Response
4	VCC	Power Supply Positive (+3.3V+/-0.3V)
5	CLK	Clock
6	VSS	Ground
7	DAT0	Data bit 0
8	DAT1	Data bit 1
9	On/Off	Wake-up input

J7: USB Upgrade (Standard use)

Pin. No	Symbol	Description
1	VDD	Power Supply Voltage (5.0V+/-0.3V)

2	DM	USB Data Negative
3	DP	USB Data Positive
4	NC	None
5	GND	Ground

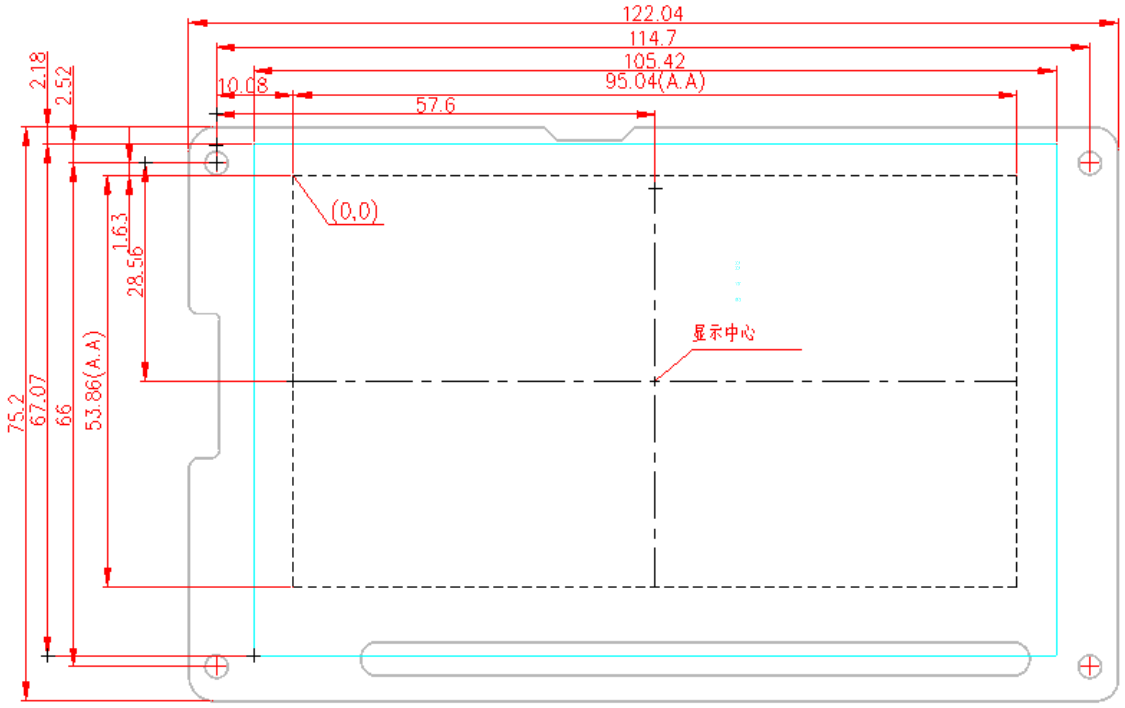
J1: MCU Debug (3PIN)

Standard (Not use)

SP1: Audio Speaker Interface (2PIN)

Standard (Not use)

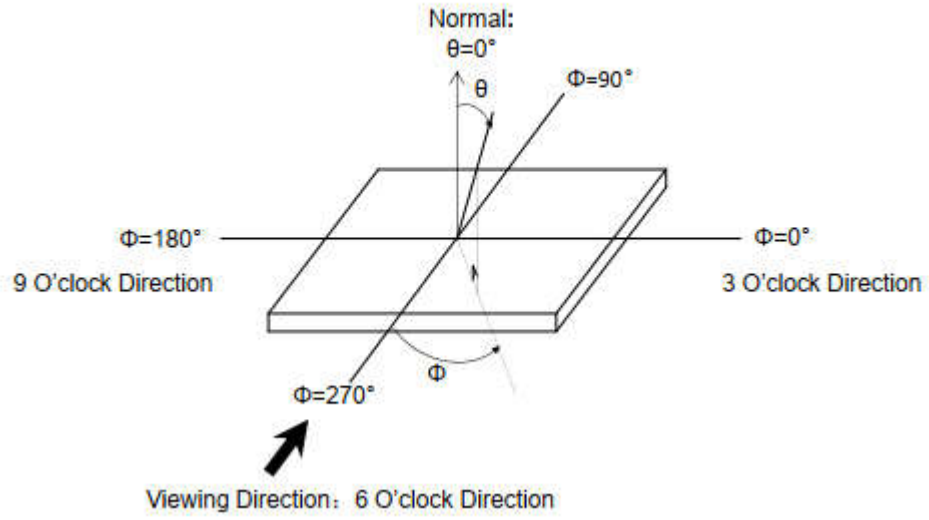
■ OUTLINE DIMENSION



■ OPTICAL SPECIFICATIONS

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Response time		Tr+Tf	θ=0° Φ=0° Ta=25℃	-	25	50	ms	/
Contrast ratio		Cr		-	400	-	-	/
Viewing angle range		θ	Φ=0°	60	70	-	deg	/
			Φ=90°	40	50	-	deg	
			Φ=180°	60	70	-	deg	
			Φ=270°	60	70	-	deg	
CIE(x,y) Chromaticity with C light	White	x		0.26	0.31	0.36		
		y		0.28	0.333	0.38		

Definition of Viewing Angle θ and Φ



■ TFT LCM protocol table without master terminal

主功能	细项功能	主控端发送 (TFT串口屏接收)						主控端接收 (TFT串口屏发送)					
		起始码 (1Bytes)	指令码 (1Byte)	序号 (1Byte)	指令参数	CRC码 (2Bytes)	结束码 (4Bytes)	起始码 (1Bytes)	指令码 (1Byte)	序号 (1Byte)	信息码/反馈码 (1Bytes)	CRC码 (2Bytes)	结束码 (4Bytes)
显示图片	单张/多张图片	Start	80h	nn		CRC	End	Start	80h	nn	信息码	CRC	End
	单张/多张图片	Start	8Ah	nn		CRC	End	Start	8Ah	nn	信息码	CRC	End
	单张图片	Start	8Fh	nn	X, Y, PNG, Pnn	CRC	End	Start	8Fh	nn	信息码	CRC	End
	循环播放	Start	81h	nn		CRC	End	Start	81h	nn	信息码	CRC	End
	取消循环播放	Start	84h	nn		CRC	End	Start	84h	nn	信息码	CRC	End
	透明图片	Start	82h	nn		CRC	End	Start	82h	nn	信息码	CRC	End
	GIF动画	Start	88h	nn		CRC	End	Start	88h	nn	信息码	CRC	End
	取消GIF动画	Start	89h	nn		CRC	End	Start	89h	nn	信息码	CRC	End
	设定缓冲区	Start	8Eh		0, 1	CRC	End	Start	8Eh	00	信息码	CRC	End
	弹出图片	Start	D8h	nn		CRC	End	Start	D8h	nn	信息码	CRC	End
	循环卷动	Start	D9h	nn		CRC	End	Start	D9h	nn	信息码	CRC	End
	取消循环卷动	Start	DBh	nn		CRC	End	Start	DBh	nn	信息码	CRC	End
	数字图片-1	Start	90h	nn	ddd.d	CRC	End	Start	90h	nn	信息码	CRC	End
	真彩数字图片	Start	91h	nn	ddd.d	CRC	End	Start	91h	nn	信息码	CRC	End
显示控件图片	全屏滑动图片	Start	B4h	nn		CRC	End	Start	B4h	Nn	信息码	CRC	End
	显示单一控件图片	Start	A0h	nn		CRC	End	Start	A0h	Nn	信息码	CRC	End
		按下控件图片时						Start	A0h	Nn	31h	CRC	End
		放开控件图片时						Start	A0h	Nn	30h	CRC	End
	取消单一控件图片	Start	A1h	nn		CRC	End	Start	A1h	Nn	信息码	CRC	End
	虚拟控件	Start	A2h	nn		CRC	End	Start	A2h	nn	信息码	CRC	End
		按下控件区域时						Start	A2h	nn	31h	CRC	End
		放开控件区域时						Start	A2h	nn	30h	CRC	End
	取消虚拟控件	Start	A3h	nn		CRC	End	Start	A3h	nn	信息码	CRC	End
	显示底图及所有控件图片	Start	9Ch	00		CRC	End	Start	9Ch	00	信息码	CRC	End
		屏幕滑动后						Start	9Ch	页号	信息码	CRC	Start
		按下控件图片时						Start	9Bh	图标ID号	31h	CRC	End
		放开控件图片时						Start	9Bh	图标ID号	30h	CRC	End

主功能	细项功能	主控端发送 (TFT串口屏接收)						主控端接收 (TFT串口屏发送)					
		起始码 (1Bytes)	指令码 (1Byte)	序号 (1Byte)	指令参数	CRC码 (2Bytes)	结束码 (4Bytes)	起始码 (1Bytes)	指令码 1Byte)	序号 (1Byte)	信息码/反馈码 (1Bytes)	CRC码 (2Bytes)	结束码 (4Bytes)
指标与造图	进度条指标图	Start	B0h	nn	Value (2 Bytes)	CRC	End	Start	B0h	nn	信息码	CRC	End
	指针指标图	Start	B1h	nn	Angle (2 Bytes)	CRC	End	Start	B1h	nn	信息码	CRC	End
	环形指标图	Start	DCh	nn	S_Angle, A_Angle	CRC	End	Start	DCh	nn	信息码	CRC	End
	二维码生成	Start	98h	nn	字符串	CRC	End	Start	98h	nn	信息码	CRC	End
触控滑条控制	设置触控滑条	Start	94h	nn		CRC	End	Start	94h	nn	信息码	CRC	End
		触控滑条被按下时						Start	94h	nn	Value (1 Byte)	CRC	End
	移除触控滑条	Start	95h	nn		CRC	End	Start	95h	nn	信息码	CRC	End
	设置环形触控滑条	Start	96h	nn		CRC	End	Start	96h	nn	信息码	CRC	End
		环形触控滑条被按下时						Start	96h	nn	Value (1 Byte)	CRC	End
	移除环形触控滑条	Start	97h	nn		CRC	End	Start	97h	nn	信息码	CRC	End
显示字串	字库-1	Start	C0h	nn	字符串	CRC	End	Start	C0h	nn	信息码	CRC	End
	字库-2	Start	C1h	nn	字符串	CRC	End	Start	C1h	nn	信息码	CRC	End
	字库-3	Start	C2h	nn	字符串	CRC	End	Start	C2h	nn	信息码	CRC	End
	字库-4	Start	C3h	nn	字符串	CRC	End	Start	C3h	nn	信息码	CRC	End
	大字库-1	Start	D0h	nn	字符串	CRC	End	Start	D0h	nn	信息码	CRC	End
	大字库-2	Start	D1h	nn	字符串	CRC	End	Start	D1h	nn	信息码	CRC	End
	大字库-3	Start	D2h	nn	字符串	CRC	End	Start	D2h	nn	信息码	CRC	End
	大字库-4	Start	D3h	nn	字符串	CRC	End	Start	D3h	nn	信息码	CRC	End
图形光标	光标On/Off	Start	86h		00/01/02	CRC	End	Start	86h	nn	信息码	CRC	End
	显示光标	Start	87h	N	X, Y	CRC	End	Start	87h	N	信息码	CRC	End
背光亮度	设置亮度	Start	BAh		BL (00~0Fh)	CRC	End	Start	BAh	BL (00~0Fh)	信息码	CRC	End
	On/Off	Start	BCh		00 或 01	CRC	End	Start	BCh	00 或 01	信息码	CRC	End
Wav檔	播放	Start	B8h		REP(Bit7) + WAV 编号	CRC	End	Start	B8h	REP(Bit7) + WAV 编号	信息码	CRC	End
	停止	Start	B9h			CRC	End	Start	B9h	00	信息码	CRC	End
开机指令	开机指令	Start	9Ah	00		CRC	End	Start	9Ah	00	信息码	CRC	End
合并指令	合并指令	Start	9Ah	nn		CRC	End	Start	9Ah	nn	信息码	CRC	End
设定时钟	设定时钟	Start	8Ch		Y, M, D, H, M, S, W (7 Bytes)	CRC	End	Start	8Ch	00	信息码	CRC	End
	读取时钟	Start	8Dh			CRC	End	Start	8Dh	Y, M, D, H, M, S, W (8)	信息码	CRC	End

主功能	细项功能	主控端发送 (TFT串口屏接收)						主控端接收 (TFT串口屏发送)					
		起始码 (1Bytes)	指令码 (1Byte)	序号 (1Byte)	指令参数	CRC码 (2Bytes)	结束码 (4Bytes)	起始码 (1Bytes)	指令码 (1Byte)	序号 (1Byte)	信息码/反馈码 (1Bytes)	CRC码 (2Bytes)	结束码 (4Bytes)
电阻屏校验	电阻屏校验	Start	88h			CRC	End	Start	88h	00	信息码	CRC	End
复位	Reset LT7689	Start	BDh			CRC	End	Start	BDh	00	信息码	CRC	End
几何图形	画点	Start	DFh	nn	X,Y	CRC	End	Start	DFh	nn	信息码	CRC	End
	直线	Start	E0h	nn		CRC	End	Start	E0h	nn	信息码	CRC	End
	空心圆形	Start	E1h	nn		CRC	End	Start	E1h	nn	信息码	CRC	End
	实心圆形	Start	E2h	nn		CRC	End	Start	E2h	nn	信息码	CRC	End
	带框实心圆形	Start	E3h	nn		CRC	End	Start	E3h	nn	信息码	CRC	End
	空心椭圆	Start	E4h	nn		CRC	End	Start	E4h	nn	信息码	CRC	End
	实心椭圆形	Start	E5h	nn		CRC	End	Start	E5h	nn	信息码	CRC	End
	带框实心椭圆	Start	E6h	nn		CRC	End	Start	E6h	nn	信息码	CRC	End
	空心矩形	Start	E7h	nn		CRC	End	Start	E7h	nn	信息码	CRC	End
	实心矩形	Start	E8h	nn		CRC	End	Start	E8h	nn	信息码	CRC	End
	带框矩形	Start	E9h	nn		CRC	End	Start	E9h	nn	信息码	CRC	End
	空心圆角矩形	Start	EAh	nn		CRC	End	Start	EAh	nn	信息码	CRC	End
	实心圆角矩形	Start	EBh	nn		CRC	End	Start	EBh	nn	信息码	CRC	End
	带框圆角矩形	Start	ECh	nn		CRC	End	Start	ECh	nn	信息码	CRC	End
	空心三角形	Start	EDh	nn		CRC	End	Start	EDh	nn	信息码	CRC	End
	实心三角形	Start	EEh	nn		CRC	End	Start	EEh	nn	信息码	CRC	End
	带框三角形	Start	EFh	nn		CRC	End	Start	EFh	nn	信息码	CRC	End
	空心四边形	Start	F0h	nn		CRC	End	Start	F0h	nn	信息码	CRC	End
	实心四边形	Start	F1h	nn		CRC	End	Start	F1h	nn	信息码	CRC	End
	空心五边形	Start	F2h	nn		CRC	End	Start	F2h	nn	信息码	CRC	End
	实心五边形	Start	F3h	nn		CRC	End	Start	F3h	nn	信息码	CRC	End
	圆柱体	Start	F4h	nn		CRC	End	Start	F4h	nn	信息码	CRC	End
	方柱体	Start	F5h	nn		CRC	End	Start	F5h	nn	信息码	CRC	End
	表格视窗	Start	F6h	nn		CRC	End	Start	F6h	nn	信息码	CRC	End

主功能	细项功能	主控端发送 (TFT 串口屏接收)						主控端接收 (TFT 串口屏发送)					
		起始码 (1Bytes)	指令码 (1Byte)	序号 (1Byte)	指令参数	CRC 码 (2Bytes)	结束码 (4Bytes)	起始码 (1Bytes)	指令码 1Byte)	序号 (1Byte)	信息码/反馈码 (1Bytes)	CRC 码 (2Bytes)	结束码 (4Bytes)
数字键盘	数字键盘输入	Start	A4h	00		CRC	End	Start	A4h	nn	信息码	CRC	End
		按下数字键后						Start	A4h	nn	ASCII + 信息码	CRC	End
		按下 CR 键后						Start	A4h	nn	ASCII + 信息码 + 内容	CRC	End
	取消数字键盘	Start	A5h	00		CRC	End	Start	A5h	nn	信息码	CRC	End
串口屏侦测	联机检查	Start	BEh			CRC	End	Start	BEh	00	5Ah, or 55h	CRC	End
	版本检查	Start	BFh			CRC	End	Start	BFh	MCU Code(5) + Module Info. (42)	信息码	CRC	End

■ PRECAUTIONS

Handing Precautions

(1) The display panel is made of glass and polarizer. As glass is fragile, it tends to become or chipped during handling especially on the edges. Please avoid dropping or jarring. Do not subject it to a mechanical shock by dropping it or impact.

(2) If the display panel is damaged and the liquid crystal substance leaks out, be sure not to get any in your mouth. If the substance contacts your skin or clothes, wash it off using soap and water.

(3) Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary. Do not touch the display with bare hands. This will stain the display area and degraded insulation between terminals (some cosmetics are determined to the polarizer).

(4) The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully. Do not touch, push or rub the exposed polarizers with anything harder than an HB pencil lead (glass, tweezers, etc.). Do not put or attach anything on the display area to avoid leaving marks on. Condensation on the surface and contact with terminals due to cold will damage, stain or dirty the polarizer. After products are tested at low temperature they must be warmed up in a container before coming is contacting with room temperature air.

(5) If the display surface becomes contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If it is heavily contaminated, moisten cloth with one of the following solvents

- Isopropyl alcohol
- Ethyl alcohol

Do not scrub hard to avoid damaging the display surface.

(6) Solvents other than those above-mentioned may damage the polarizer. Especially, do not use the following.

- Water
- Ketone
- Aromatic solvents

Wipe off saliva or water drops immediately, contact with water over a long period of time may cause deformation or color fading. Avoid contacting oil and fats.

(7) Exercise care to minimize corrosion of the electrode. Corrosion of the electrodes is accelerated by water droplets, moisture condensation or a current flow in a high-humidity environment.

(8) Install the LCD Module by using the mounting holes. When mounting the LCD module make sure it is free of twisting, warping and distortion. In particular, do not forcibly pull or bend the I/O cable or the backlight cable.

(9) Do not attempt to disassemble or process the LCD module.

(10) NC terminal should be open. Do not connect anything.

(11) If the logic circuit power is off, do not apply the input signals.

(12) Since LCM has been assembled and adjusted with a high degree of precision, avoid applying excessive shocks to the module or making any alterations or modifications to it.

- Do not alter, modify or change the shape of the tab on the metal frame.
- Do not make extra holes on the printed circuit board, modify its shape or change the positions of components to be attached.
- Do not damage or modify the pattern writing on the printed circuit board.
- Except for soldering the interface, do not make any alterations or modifications with a soldering iron.
- Do not drop, bend or twist LCM.

Storage Precautions

When storing the LCD modules, the following precaution is necessary.

(1). Storing in an ambient temperature 10°C to 30°C, and in a relative humidity of 45% to 75%. Don’ t expose to sunlight or fluorescent light.

(2). Storing in a polyethylene bag with the opening sealed so as not to enter fresh air outside in it . And with no desiccant.
(3). Placing in a dark place where neither exposure to direct sunlight nor light' s keeping the storage temperature range.
(4). Storing with no touch on polarizer surface by the anything else.

Caution against static charge

The LCD module use CMOS LSI drivers, so we recommended that you :

Connect any unused input terminal to Vdd or Vss, do not input any signals before power is turned on, and ground your body, work/assembly areas, assembly equipment to protect against static electricity.

Others

Liquid crystals solidify under low temperature (below the storage temperature range) leading to defective orientation or the generation of air bubbles (black or white). Air bubbles may also be generated if the module is subject to a low temperature.
If the LCD modules have been operating for a long time showing the same display patterns, the display patterns may remain on the screen as ghost images and a slight contrast irregularity may also appear. A normal operating status can be regained by suspending use for some time. It should be noted that this phenomenon does not adversely affect performance reliability.
To minimize the performance degradation of the LCD modules resulting from destruction caused by static electricity etc., exercise care to avoid holding the following sections when handling the modules.
- Exposed area of the printed circuit board.
-Terminal electrode sections.