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TFT | OLED | CHARACTER | GRAPHIC | UWVD | SEGMENT | CUSTOM

TFT Display Module
Part Number E43RC-I-RS1071-R

Overview:

- 4.3-inch TFT (105.4x67.15mm)
- 800 x 480 Pixels
- 24-Bit RGB Interface
- Operating Temp: -30C to 85C
- Storage Temp -30C to 85C
- Viewing Angle: All
- Transmissive / Normally Black
- Resistive Touch Panel
- 1071 NITS
- TFT IC: ST7262
- RoHS Compliant

Description

This is a color active matrix TFT (Thin Film Transistor) LCD (Liquid Crystal Display) that uses amorphous silicon TFT as a switching device. This model is composed of a transmissive TFT-LCD Panel, driver circuit, resistive touch panel and backlight unit. The resolution of the 4.3" TFT-LCD contains 800x480 pixels and can display up to 16.7M colors.
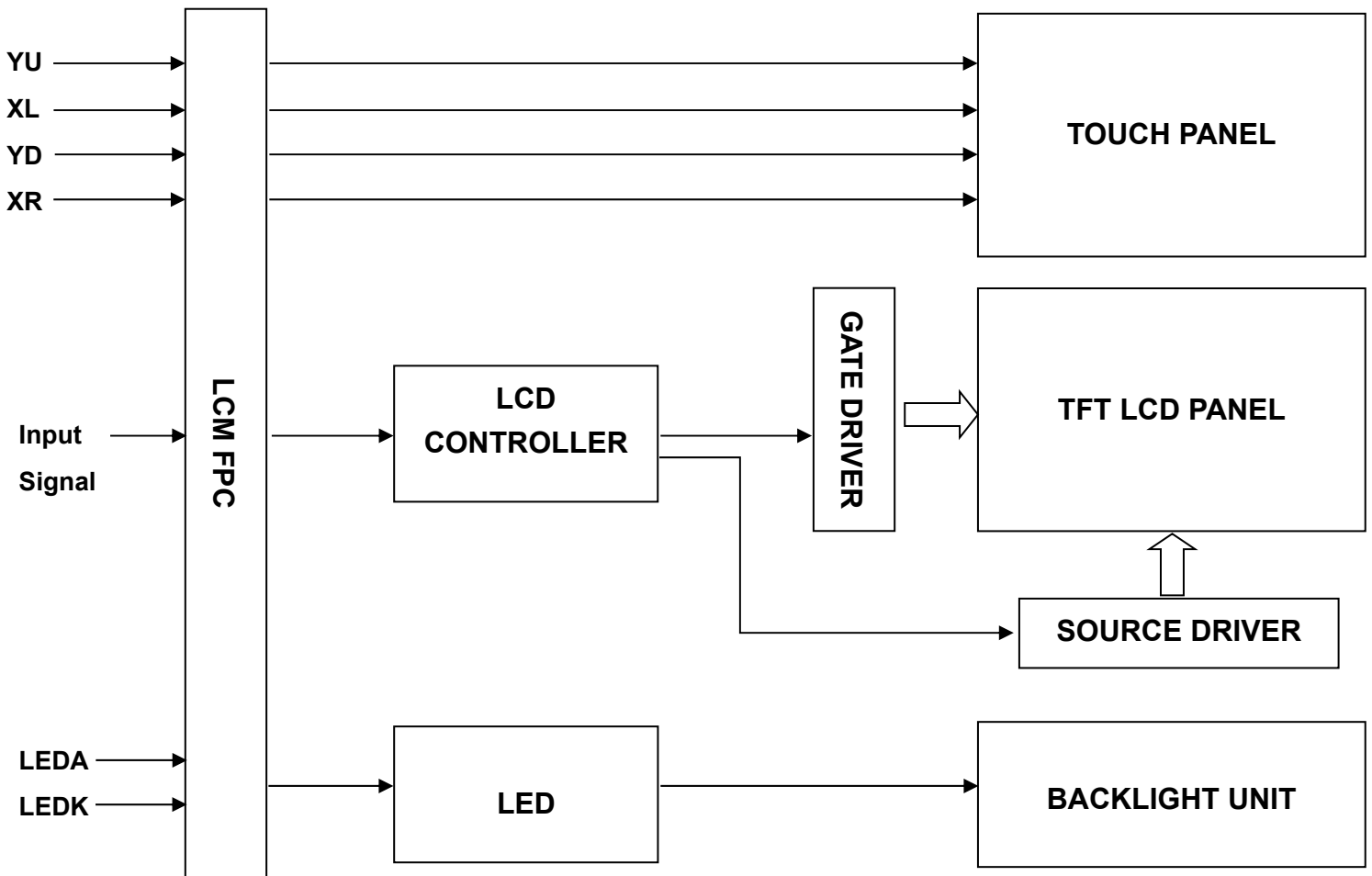
Features

Input Voltage: 3.3V
TFT Interface: 24-Bit RGB

General Information Items	Specification	Unit	Note
	Main Panel		
TFT Display Area (AA)	95.04(H)*53.86(V) (4.3 Inch)	mm	--
Display Colors	16.7M	colors	--
Number of Pixels	800(RGB)x480	dots	--
TFT Pixel Arrangement	RGB Vertical Stripe	--	--
Viewing Angle	Free	--	--
TFT Controller IC	ST7262	--	--
Display Mode	Transmissive/Normally Black	--	--
Operating Temperature	-30 to +85	°C	--
Storage Temperature	-30 to +85	°C	--

Mechanical Information

Item		Min.	Typ.	Max.	Unit	Note
Module Size	Horizontal (H)	--	105.4	--	mm	--
	Vertical (V)	--	67.15	--	mm	--
	Depth (D)	--	4.01	--	mm	--
Weight		--	TBD	--	g	--

Block Diagram

1. Outline Dimensions

Rev.	Description	Date
1.0	First	5/17/2022

Front View

105.40±0.2 (LCM O.D)
104.73±0.2 (RTP O.D)
96.04 (RTP A.A & TCON)
95.04 (LCD A.A)
(52.70)
(0.34)
(4.68)
(5.18)
(0.20)
(3.62)
(4.10)

YU

4.3"

800*RGB*480

XL   AIL   XR

YD

Pull Tape

Black c

67.15±0.2 (LCM O.D)
64.84±0.2 (RTP O.D)
54.86 (RTP A.A & TCON)
53.86 (LCD A.A)
(31.03)

46.00±0.5
18.51±0.5
3.50±0.3
20.14

P:0.50
W:0.30
0.50±0.1
P0.5*(40-1)=19.50

Side view

0.40
(Soldering)

Side view (Front/Back)

4.01±0.3 (LCM+RTP)
2.91±0.2 (LCM)

Front   Back

1.50Max
(Components)

0.40Max
(Soldering)

0.13±0.03 (FPC)

Contact Side   PI Stiffener

0.30±0.3

Back view

29.79
3.00 (Mark Line)
5.00±0.3 (PI Stiffener)
(10.25)
20.50±0.1

B/L Circuit

A○   ○K

RTP Characteristics

PIN	SYMBOL
1	YU
2	XL
3	YD
4	XR

PIN	SYMBOL
1	VLED-
2	VLED+
3	GND
4	VDD
5	R0
6	R1
7	R2
8	R3
9	R4
10	R5
11	R6
12	R7
13	G0
14	G1
15	G2
16	G3
17	G4
18	G5
19	G6
20	G7
21	B0
22	B1
23	B2
24	B3
25	B4
26	B5
27	B6
28	B7
29	GND
30	PCLK
31	DISP
32	HSYNC
33	VSYNC
34	DE
35	NC
36	GND
37	(XR)
38	(YD)
39	(XL)
40	(YU)

NOTES:

1. DISPLAY TYPE: 4.3 TFT-LCD 16.7M Colors

2. DISPLAY MODE: Normally Black /IPS

3. LCM DRIVER IC: ST7262E43-G4

4. OPERATING VOLTAGE: 3.3V

5. OPERATING TEMPERATURE: -30°C TO +85°C

6. STORAGE TEMPERATURE: -30°C TO +85°C

7. VIEWING DIRECTION: All

8. BACKLIGHT: 12 Dual Chip White LED
   VF = 25.6V IF = 60mA

9. ROHS COMPLIANT.

Model Name: E43RC-I-RS1071-R

General Tol: ±0.3

Approvals	Date
DWN:	
CHK:	
APP:	

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Drawing No.:

Scale:

Size:

Unit: mm   Page: 1/1

2. Input Terminal Pin Assignment

2.1 TFT Pin Assignment

Recommended TFT Connector: FH12S-40S-0.5SH(55)

NO.	Symbol	Description	I/O
1	V_{LED-}	Power for LED Backlight Cathode	P
2	V_{LED+}	Power for LED Backlight Anode	P
3	GND	Power Ground	P
4	V_{DD}	Power Voltage	P
5	R0	Red Data	I
6	R1	Red Data	I
7	R2	Red Data	I
8	R3	Red Data	I
9	R4	Red Data	I
10	R5	Red Data	I
11	R6	Red Data	I
12	R7	Red Data	I
13	G0	Green Data	I
14	G1	Green Data	I
15	G2	Green Data	I
16	G3	Green Data	I
17	G4	Green Data	I
18	G5	Green Data	I
19	G6	Green Data	I
20	G7	Green Data	I
21	B0	Blue Data	I
22	B1	Blue Data	I
23	B2	Blue Data	I
24	B3	Blue Data	I
25	B4	Blue Data	I
26	B5	Blue Data	I
27	B6	Blue Data	I
28	B7	Blue Data	I
29	GND	Power Ground	P
30	CLK	Pixel Clock	I
31	DISP	Display On/Off	I
32	HSYNC	Horizontal Sync Signal	I

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33	VSYNC	Vertical Sync Signal	I
34	DE	Data Enable	I
35	NC	No Connection	--
36	GND	Power Ground	P
37	XR	Right Electrode	--
38	YD	Bottom Electrode	--
39	XL	Left Electrode	--
40	YU	Top Electrode	--

I: Input, O: Output, P: Power

3. LCD Optical Characteristics

3.1 Optical Specifications

Item			Symbol	Condition	Min	Typ.	Max	Unit	Note
Contrast Ratio			CR	$\Theta=0$	--	1200	--		(1)(2)
Response time	Rising		T_R+T_F	Normal viewing angle	--	30	--	msec	(1)(3)
	Falling								
Color Gamut			S(%)		--	50	--	%	C-light
Color Filter Chromacicity	White	W_X			0.2600	0.3000	0.3400		(1)(4) CF glass
		W_Y			0.2915	0.3315	0.3715		
	Red	R_X			0.5709	0.5909	0.6109		
		R_Y			0.3394	0.3594	0.3794		
	Green	G_X			0.3132	0.3332	0.3532		
		G_Y			0.5469	0.5669	0.5869		
	Blue	B_X			0.1355	0.1555	0.1755		
		B_Y			0.0946	0.1146	0.1346		
Viewing angle	Hor.	ΘL		CR>10	--	80	--		(1)(4)
		ΘR			-	80	--		
	Ver.	ΘU			-	80	--		
		ΘD			-	80	--		
Option View Direction				Free					

Optical Specification Reference Notes:

(1) Definition of Viewing Angle:

The viewing angle is the angle at which the contrast ratio is greater than 10. The viewing angles are determined for the horizontal or 3,9 o'clock direction and the vertical or 6,12 o'clock direction with respect to the optical axis which is normal to the LCD surface.
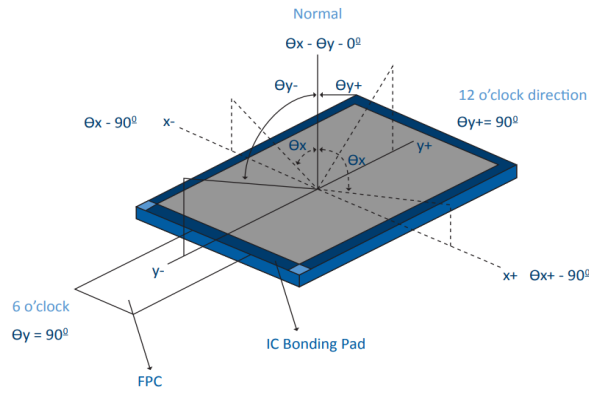
(2) Definition of Contrast Ratio:

Measured at the center point of panel. The contrast ratio (Cr) measured on a module, is the ratio between the luminance (Lw) in a full white area (R=G=B=1) and the luminance (Ld) in a dark area (R=G=B=0).

$$Cr = \frac{Lw}{Ld}$$

(3) Definition of Transmittance (T%):

The transmittance of the panel including the polarizers is measured with electrical driving. The equation for transmittance Tr is:

$$Tr = \frac{It}{Io}x \, 100\%$$
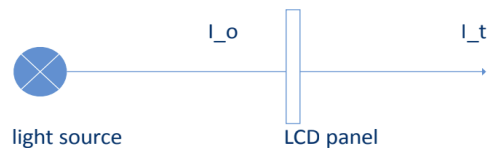
Io = the brightness of the light source.
It = the brightness after panel transmission

(4) Definition of Response Time (T$_R$, T$_F$):

The rise time 'Tr' is defined as the time for luminance to change from 90%to 10% as a result of a change of the electrical condition. The fall time 'Tf' is defined as the time for luminance to change from 10% to 90% as a result of a change of the electrical condition.
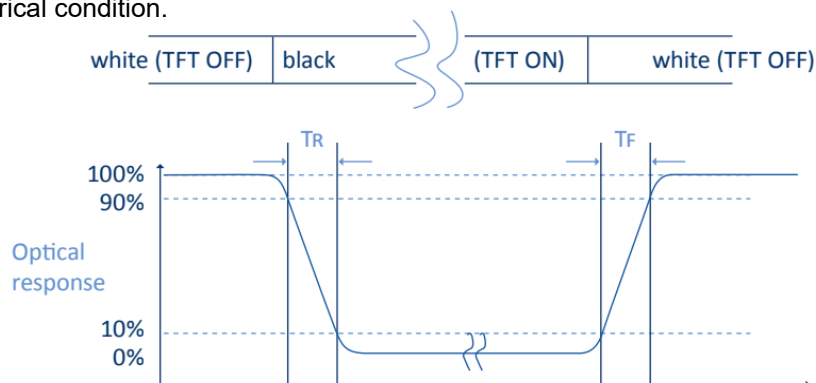
(5) Definition of Color Gamut:

Measuring machine CFT-01. NTSC's Primaries: R(x,y,Y),G(x,y,Y), B(x,y,Y). FPM520 of Westar Display Technologies, INC., which utilized SR-3 for Chromaticity and BM-7A for other optical characteristics. The color chromaticity shall be calculated from the spectral data measured with all pixels first in red, green, blue and white. Measurements shall be made at the center of the panel.
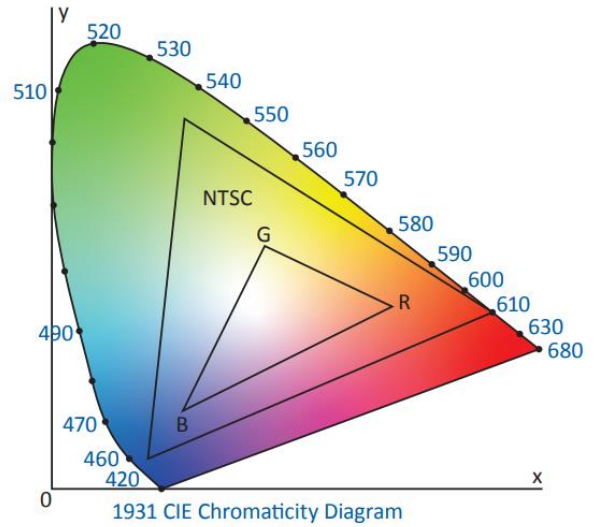

Fig. 1931 CIE chromacity diagram

$$\text{Color gamut: } S = \frac{\text{Area of RGB triangle}}{\text{Area of NTSC triangle}} \times 100\%$$

(6) Definition of Optical Measurement Setup:

The LCD module should be stabilized at a given temperature for 20 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting backlight for 20 minutes.

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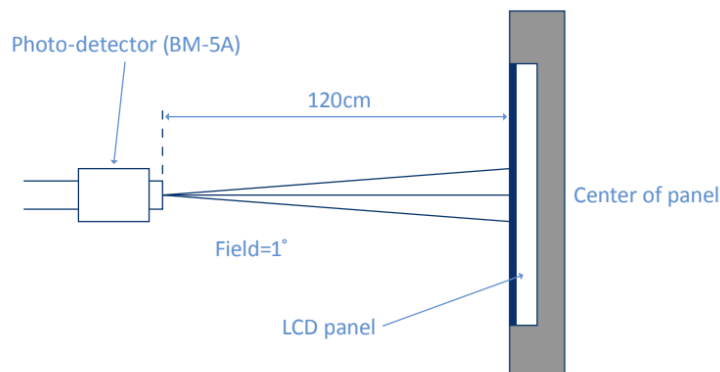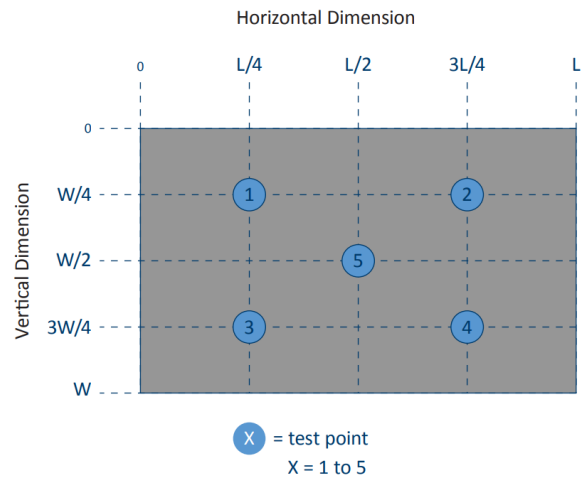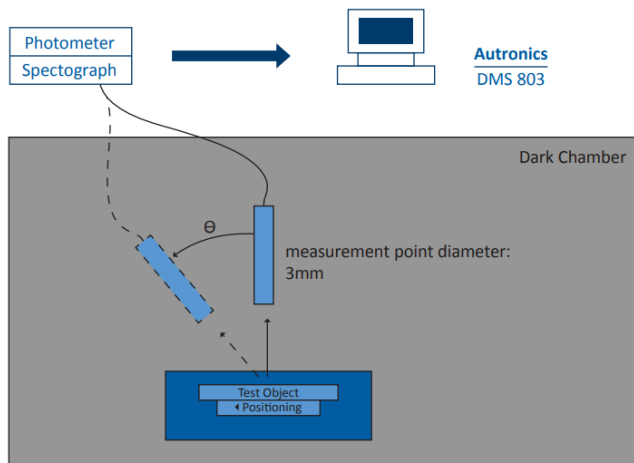
4. TFT Electrical Characteristics

4.1 Absolute Maximum Rating (Ta=25±2°C, VSS=GND=0V)

Characteristics	Symbol	Min	Max	Unit
Digital Supply Voltage	VDD	VSS-0.3	4.0	V
Operating Temperature	TOP	-30	+85	°C
Storage Temperature	TST	-30	+85	°C

NOTE: If the absolute maximum rating of the above parameters is exceeded, even momentarily, the quality of the product may be degraded. Absolute maximum ratings specify the values which the product may be physically damaged if exceeded. Be sure to use the product within the range of the absolute maximum ratings.

4.2 DC Electrical Characteristics

| Characteristics	Symbol	Min	Typ	Max	Unit	Note
Digital Supply Voltage	VCI	3.0	3.3	3.6	V	
Normal mode Current	IDD	--	40	--	mA	
Level input voltage	VIH	0.7VDD	--	VDD	V	
	VIL	GND	--	0.3 VDD	V	
Level output voltage	VOH	VDD-0.4	--	VDD	V	
	VOL	GND	--	GND+0.4	V	

4.3 LED Backlight Characteristics

The backlight system is edge lighting type with 10 LED chips

Item	Symbol	Min	Typ.	Max	Unit	Note
Forward Current	I_F	--	60	--	mA	--
Forward Voltage	V_F	--	25.6	--	V	--
LCM Luminance	L_V	1011	1071	--	cd/m2	(3)
LED Lifetime	Hr	--	50000	--	hour	(1)(2)
Uniformity	Avg	80	--	--	%	(3)

Note 1: *LED lifetime (Hr) can be defined as the time in which it continues to operate under the condition: Ta=25±3°C, typical IL value indicated in the above table until the brightness becomes less than 50%.*

Note 2: *The "LED lifetime" is defined as the module brightness decrease to 50% original brightness at Ta=25° C and I_F = 60mA. The LED lifetime could be decreased if operating I_F is larger than 60mA. The constant current driving method is suggested.*
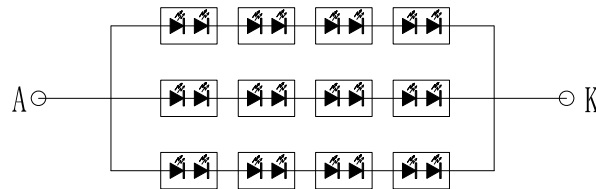
Note 3: *Luminance Uniformity of these 9 points is defined as below:*
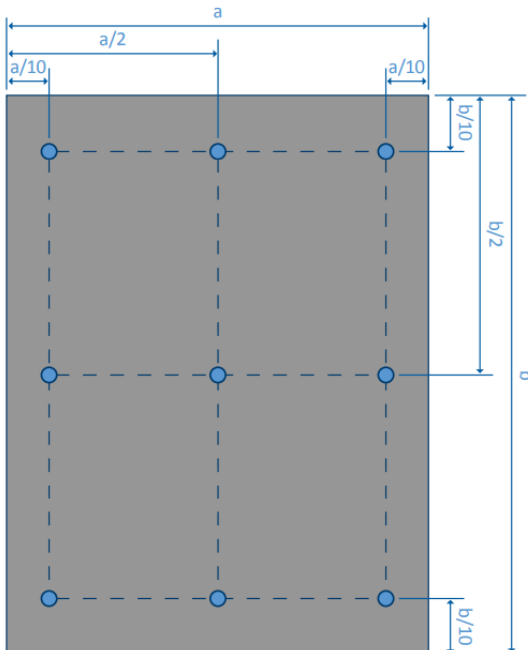
$$Luminance = \frac{(Total\ Luminance\ of\ 9\ Points)}{9}$$

$$Uniformity = \frac{Minimum\ Luminance\ in\ 9\ Points(1\text{-}9)}{Maximum\ Luminance\ in\ 9\ Points(1\text{-}9)}$$

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5.0 TFT AC Characteristics

5.1 Interface Timing

For the interface timing diagram, see diagram on page 49 of the data sheet for controller IC ST7262. The data sheet can be found here https://focuslcds.com/content/ST7262.pdf

6.0 Quality Inspection Standards

For TFT quality inspection standards, please see the following link: https://focuslcds.com/tft-quality-inspection-standards/

7.0 Cautions and Handling Precautions

7.1 Handling and Operating the Module

1. When the module is assembled, it should be attached to the system firmly. Do not warp or twist the module during assembly work.

2. Protect the module from physical shock or any force. In addition to damage, this may cause improper operation or damage to the module and back-light unit.

3. Note that polarizer is very fragile and could be easily damaged. Do not press or scratch the surface.

4. Do not allow drops of water or chemicals to remain on the display surface. If you have the droplets for a long time, staining and discoloration may occur.

5. If the surface of the polarizer is dirty, clean it using some absorbent cotton or soft cloth.

6. The desirable cleaners are water, IPA (Isopropyl Alcohol) or Hexane. Do not use ketene type materials (ex. Acetone), Ethyl alcohol, Toluene, Ethyl acid or Methyl chloride. It might permanent damage to the polarizer due to chemical reaction.

7. If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contact with hands, legs, or clothes, it must be washed away thoroughly with soap.

8. Protect the module from static; it may cause damage to the CMOS ICs.

9. Use fingerstalls with soft gloves in order to keep display clean during the incoming inspection and assembly process.

10. Do not disassemble the module.

11. Protection film for polarizer on the module shall be slowly peeled off just before use so that the electrostatic charge can be minimized.

12. Pins of I/F connector shall not be touched directly with bare hands.

13. Do not connect, disconnect the module in the "Power ON" condition.

14. Power supply should always be turned on/off by the item Power On Sequence & Power Off Sequence.

7.2 Storage and Transportation

1. Do not leave the panel in high temperature, and high humidity for a long time. It is highly recommended to store the module with temperature from 0 to 35 ℃ and relative humidity of less than 70%

2. Do not store the TFT-LCD module in direct sunlight.

3. The module shall be stored in a dark place. When storing the modules for a long time, be sure to adopt effective measures for protecting the modules from strong ultraviolet radiation, sunlight, or fluorescent light.

4. It is recommended that the modules should be stored under a condition where no condensation is allowed. Formation of dewdrops may cause an abnormal operation or a failure of the module. In particular, the greatest possible care should be taken to prevent any module from being operated where condensation has occurred inside.

5. This panel has its circuitry FPC on the bottom side and should be handled carefully in order not to be stressed.