



PRODUCT SPECIFICATIONS

Module No.: NTD-10.1S1280800L150G

TFT(Thin-Film-Transistor) Color Liquid Crystal Display Module

General Specification

- 10.1 inch Diagonal
- 1280xRGBx800 resolution
- LVDS interface
- LED Backlight (1000cd/m²)
Built In-LED Driver
PWM Brightness Control
- 16.7 M colors
- Wide Viewing Angles
- RoHS Compliant

For Customer's Acceptance:

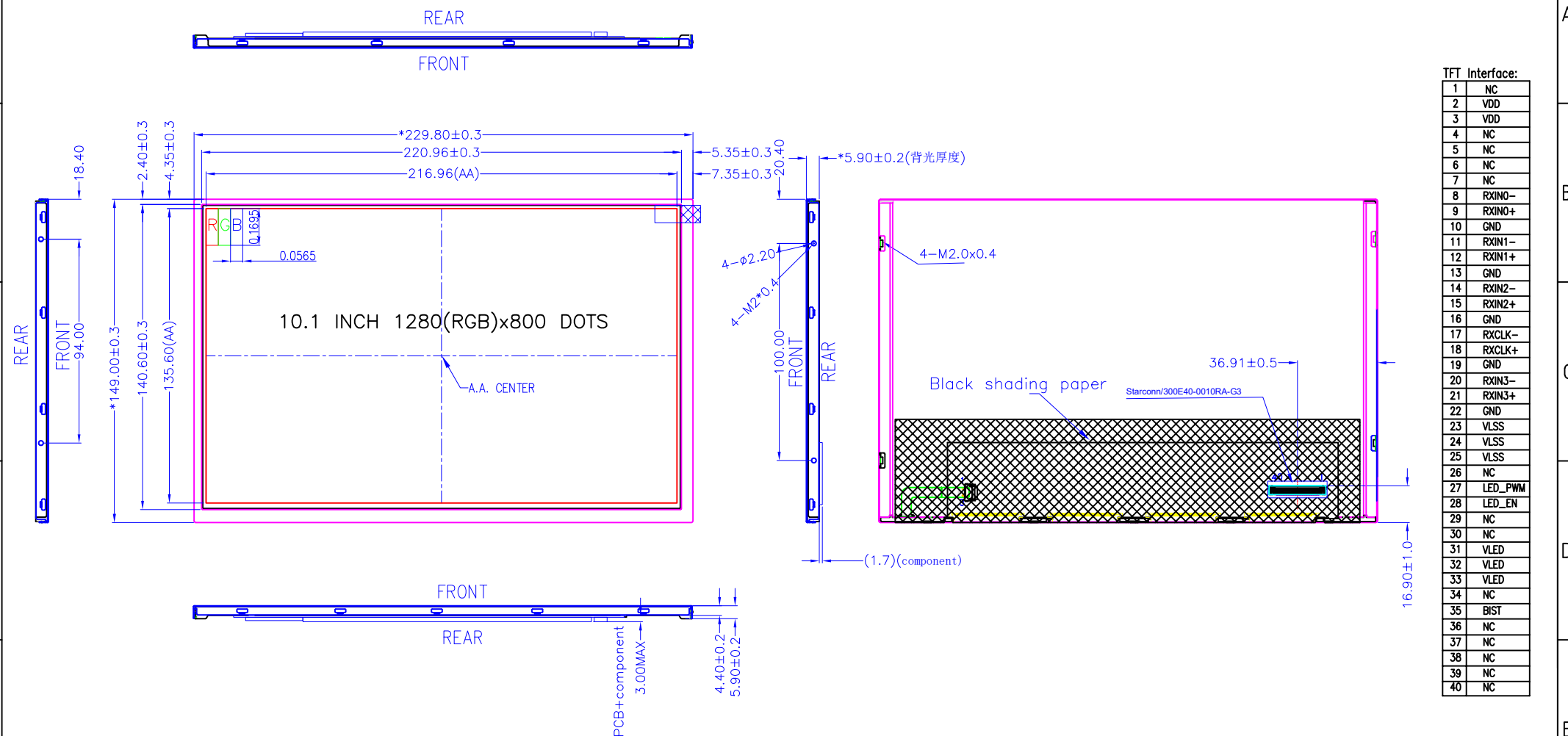
Approved By	Comment

From: NewTrend Display Technology Co., Ltd.

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Outline Drawing

SYMBOL	REVISION	DATE
V0	First	



TFT Interface:

1	NC
2	VDD
3	VDD
4	NC
5	NC
6	NC
7	NC
8	RXIN0-
9	RXIN0+
10	GND
11	RXIN1-
12	RXIN1+
13	GND
14	RXIN2-
15	RXIN2+
16	GND
17	RXCLK-
18	RXCLK+
19	GND
20	RXIN3-
21	RXIN3+
22	GND
23	VLSS
24	VLSS
25	VLSS
26	NC
27	LED_PWM
28	LED_EN
29	NC
30	NC
31	VLED
32	VLED
33	VLED
34	NC
35	BIST
36	NC
37	NC
38	NC
39	NC
40	NC

NOTES:

1. DISPLAY TYPE: 10.1" TFT, Normally Black
2. VIEWING DIRECTION: U/L/D/R 85/85/85/85
3. Top: -30°C~+80°C, Tst: -30°C~+85°C
4. TFT Interface :8-bit LVDS, VDD=3.3V
5. LCM Luminance:LED/1000cd/m² (TYP) VLED:12V,500mA(TYP)
6. RoHS

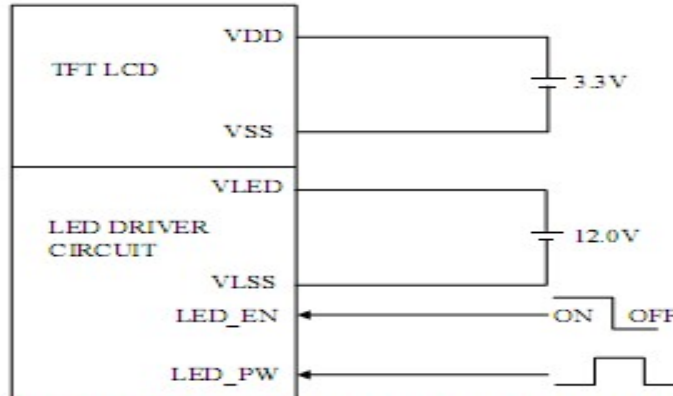
UNLESS OTHERWISE SPECIFIED Unit:mm THIRD ANGLE PROJECTION:		NewTrend Display Technology	
UNLESS OTHERWISE NOTED TOLERANCES :±0.2mm			
SCALE	SHEET	DRAWN BY:	APPROVED BY:
1:1	1 OF 1		

Pin Description:

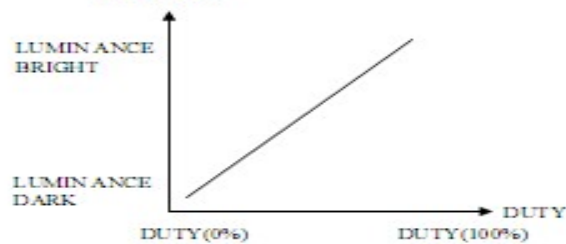
Pin No.	Symbol	Function Description	
1	NC	No connection	
2	VDD	Supply voltage for LCD (+3.3V)	
3	VDD	Supply voltage for LCD (+3.3V)	
4	NC	No connection	
5	NC	No connection	
6	NC	No connection	
7	NC	No connection	
8	RXIN0-	-LVDS differential data input	R0~R5, G0
9	RXIN 0+	+LVDS differential data input	
10	GND	Ground	
11	RXIN 1-	-LVDS differential data input	G1~G5, B0,B1
12	RXIN 1+	+LVDS differential data input t	
13	GND	Ground	
14	RXIN 2-	-LVDS differential data input	B2, B5, HS, VS, DE
15	RXIN 2+	+LVDS differential data input	
16	GND	Ground	
17	RXCLK-	-LVDS differential data input	LVDS, CLK
18	RXCLK+	+LVDS differential data input	
19	GND	Ground	
20	RXIN 3-	-LVDS differential data input	R6, R7,G6,G7,B6,B7
21	RXIN 3+	+LVDS differential data input	
22	GND	Ground	
23	VLSS	Ground	
24	VLSS	Ground	
25	VLSS	Ground	
26	NC	No connection	
27	LED_PWM	Backlight PWM signal input	
28	LED_EN	Backlight enable H: Backlight on, L: Backlight off	
29	NC	No connection	
30	NC	No connection	
31	VLED	Supply Voltage for Backlight Driver (+12V TYP)	
32	VLED	Supply Voltage for Backlight Driver (+12V TYP)	
33	VLED	Supply Voltage for Backlight Driver (+12V TYP)	
34	NC	No connection	
35	BIST	No connection	
36	NC	No connection	
37	NC	No connection	
38	NC	No connection	
39	NC	No connection	
40	NC	No connection	

Recommended cable: 40pin cable.

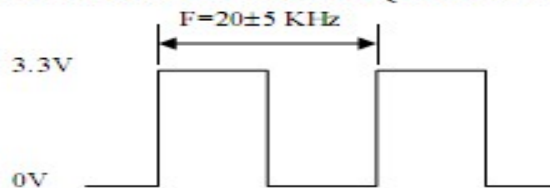
POWER SUPPLY FOR LCM



NOTE (1) : ADJUST THE PWM SIGNAL IN ORDER TO CONTROL LED BACKLIGHTS BRIGHTNESS. THE HIGHER THE DUTY CYCLE, THE HIGHER THE BRIGHTNESS LUMINANCE



NOTE (2) : PWM SIGNAL=0-3.3V · OPERATION FREQUENCY : 20±5KHz



DC Electrical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Operating Temperature Range	Top	Absolute Max	-30	-	+80	°C
Storage Temperature Range	T _{ST}	Absolute Max	-30	-	+85	°C
Digital Supply Voltage	V _{DD}	-	2.75	3.3	3.6	V
Supply Current	I _{DD}	V _{DD} =3.3V		400	480	mA
Input logic high voltage	V _{IH}	-	0.7*V _{DD}	-	V _{DD}	V
Input logic low voltage	V _{IL}	-	GND	-	0.3*V _{DD}	V

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Backlight Supply Voltage	V _{LED}	Top=25°C	8.0	12.0	15.0	
Backlight Supply Current	I _{LED}	V _{LED} =12V	-	500	800	mA
Backlight Enable Voltage Range	LED_EN	-	0		3.3	V
Backlight PWM Voltage Range	LED_PWM	-	0		3.3	V
PWM Frequency Range	LED_PWM		100		20000	HZ
Backlight Lifetime	-	Top=25°C	50000			Hrs

*Backlight lifetime is rated as Hours until half-brightness, under normal operating conditions. The LED of the backlight is driven by current drain, drive voltage is for reference only. Drive voltage must be selected to ensure backlight current drain is below MAX level stated

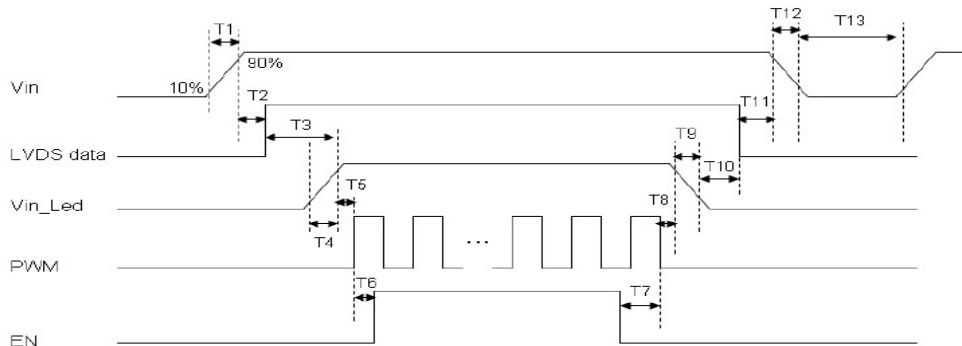
Optical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	
Operating Viewing Angles	Top	-	-	85	-	Deg	
	Bottom	-	-	85	-		
	Left	-	-	85	-		
	Right	-	-	85	-		
Contrast Ratio	CR	Center	600	800	-	-	
Luminance	Lv	PWM DUTY=100%	850	1000	-	cd/m ²	
Response Time	Rise	Tr	Top=25°C	25	35	ms	
	Fall	Tf				ms	
Chromaticity	Red	X _R	-	TYP-0.05	TYP+0.05	-	
		Y _R	-			0.610	-
	Green	X _G	-			0.335	-
		Y _G	-			0.340	-
	Blue	X _B	-			0.595	-
		Y _B	-			0.155	-
	White	X _w	-			0.205	-
		Y _w	-			0.340	-
						0.370	-

Note (1) Measurement Setup: The LCD module should be stabilized at given temp. 25°C for 15 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting backlight for 15 minutes in a windless room.

Timing Characteristics

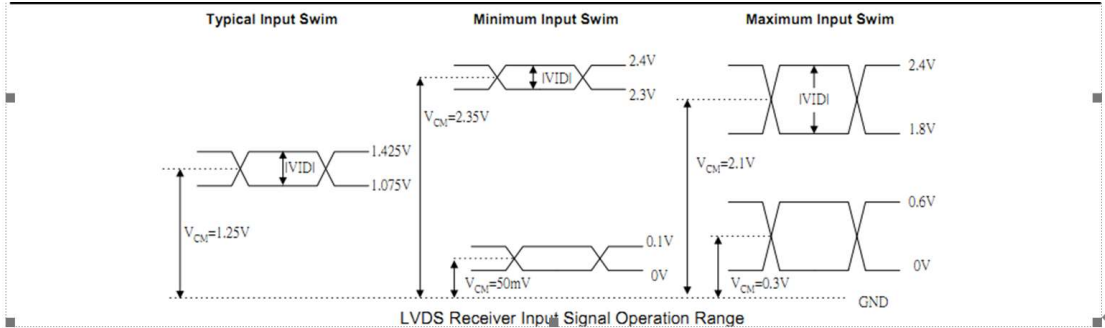
Power On and Reset Timing



Parameter	Symbol	Unit	Min	Typ.	Max
VIN Rise Time	T1	ms	0.5	--	10
VIN Good to Signal Valid	T2	ms	30	--	90
Signal Valid to Backlight On	T3	ms	200	--	--
Backlight Power On Time	T4	ms	0.5	--	--
Backlight VDD Good to System PWM On	T5	ms	10	--	--
System PWM ON to Backlight Enable ON	T6	ms	10	--	--
Backlight Enable Off to System PWM Off	T7	ms	0	--	--
System PWM Off to B/L Power Disable	T8	ms	10	--	--
Backlight Power Off Time	T9	ms	0.5	10	30
Backlight Off to Signal Disable	T10	ms	200	--	--
Signal Disable to Power Down	T11	ms	0	--	50
VIN Fall Time	T12	ms	0.5	10	30
Power Off	T13	ms	500	--	--

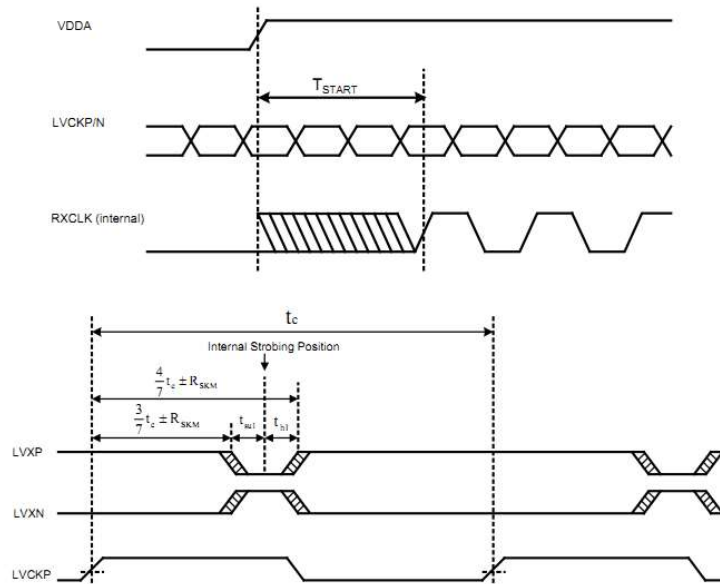
LVDS Signal DC Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Differential Input High Threshold	V_{TH}	$V_{CM} = +1.2V$	-	-	100	mV
Differential Input Low Threshold	V_{TL}		-100	-	-	mV



LVDS AC Characteristics

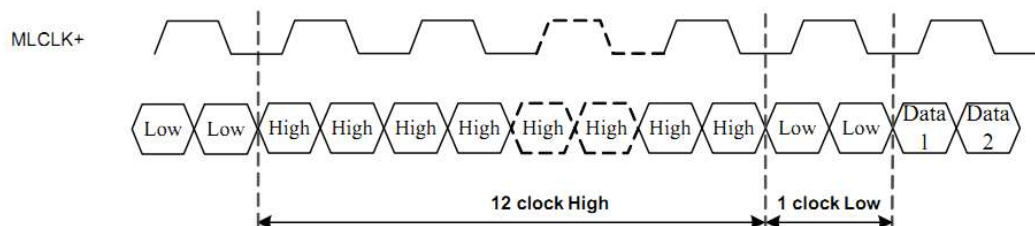
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
F_{OP}	Input Operating Frequency range	$RX_HF=0$	25	-	100	MHz
		$RX_HF=1$	100	-	170	MHz
R_{SKM}	Receiver Skew Margin	85MHz, $ VID =400mV$, $V_{CM}=1.2V$	450	-	-	pS
		150MHz, $ VID =400mV$, $V_{CM}=1.2V$	267	-	-	pS
T_{STRAT}	Receiver startup time (after a valid LVDS clock is applied)		-	-	10	mS



NOTE: LVCK is advanced or delayed with respect to data until errors are observed at the receiver outputs. The advance or delay is then reduced until there are no data errors observed. The magnitude of the advance or delay is $RSKM$.

mini-LVDS Output Timing

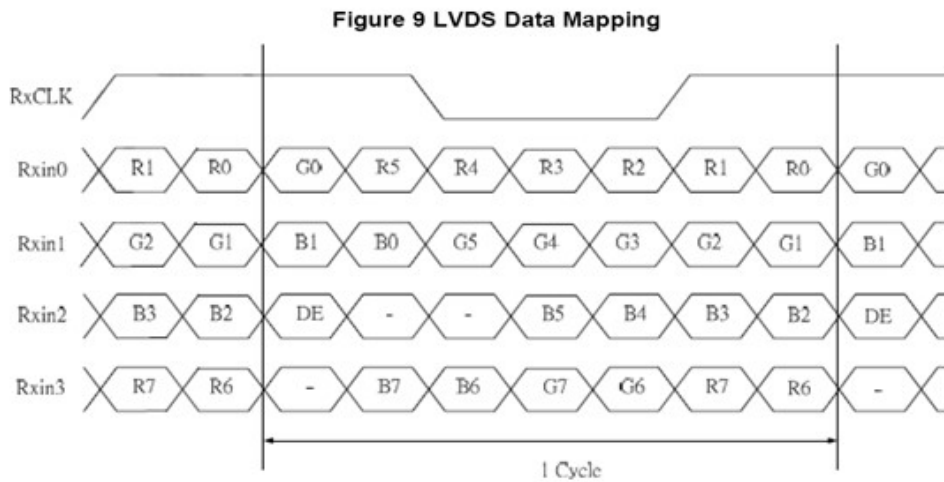
mini-LVDS Reset Pules Timing



Interface Timings

Parameter	Symbol	Unit	Min.	Typ.	Max.
Frame Rate	--	Hz	-	60	-
Frame Period	tV	line	(815)	(823)	(1023)
Vertical Display Time	tVD	line	800		
Vertical Blanking Time	tVW+tVBP+tVFP	line	(15)	(23)	(33)
1 Line Scanning Time	tH	clock	(1410)	(1440)	(1470)
Horizontal Display Time	tHD	clock	1280		
Horizontal Blanking Time	tHW+tHBP+tHFP	clock	(60)	(160)	(190)
Clock Rate	1/TC	MHz	(68.9)	(71.1)	(73.4)

LVDS Data Mapping



Reliability Test Items and Criteria

No	Test Item	Test condition	Criterion
1	High Temperature Storage	85°C±2°C 96H Restore 4H at 25°C, Power off	1. After testing, cosmetic and electrical defects should not happen. 2. Total current consumption should not be more than twice of initial value.
2	Low Temperature Storage	-30°C±2°C 96H Restore 4H at 25°C, Power off	
3	High Temperature Operation	80°C±2°C 96H Restore 4H at 25°C, Power on	
4	Low Temperature Operation	-30°C±2°C 96H Restore 4H at 25°C, Power on	
5	High Temperature/Humidity Storage	60°C±2°C 90%RH 96H Power off	
6	Temperature Cycle	-30°C → +25°C → 85°C → +25°C (30mins) (5mins) (30mins) (5mins) ← 5 Cycle → Restore 4H at 25°C, Power off	

Precautions for Use of LCD Modules

1. Handling Precautions

1.1 The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.

1.2 If the display panel is damaged and the liquid crystal substance inside it leaks out, be sure not to get any in your mouth, if the substance comes into contact with your skin or clothes, promptly wash it off using soap and water.

1.3 Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.

1.4 The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully.

1.5 If the display surface is contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If still not completely clear, moisten cloth with one of the following solvents:

— Isopropyl alcohol — Ethyl alcohol

Solvents other than those mentioned above may damage the polarizer. Especially, do not use the following:

— Water — Ketone — Aromatic solvents

1.6 Do not attempt to disassemble the LCD Module.

1.7 If the logic circuit power is off, do not apply the input signals.

1.8 To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.

a. Be sure to ground the body when handling the LCD Modules.

b. Tools required for assembly, such as soldering irons, must be properly ground.

c. To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.

d. The LCD Module is coated with a film to protect the display surface. Be care when peeling off this protective film since static electricity may be generated.

2. Storage precautions

2.1 When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps.

2.2 The LCD modules should be stored under the storage temperature range. If the LCD modules will be stored for a long time, the recommend condition is:

Temperature : 10°C ~ 40°C

Relatively humidity: ≤60%

2.3 The LCD modules should be stored in the room without acid, alkali and harmful gas.

3. The LCD modules should be no falling and violent shocking during transportation, and also should avoid excessive press, water, damp and sunshine.