PRODUCT SPECIFICATIONS

Module No.: NTD-4.3T480272R100E

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

General Specification

- **4.3 inch Diagonal**
- **480xRGBx272 resolution**
- **24 bit RGB interface**
- **LED Blacklight (600cd/m^2)**
- **16.7 M colors**
- **12:00 O'clock Optimal View**
- **RoHS Compliant**

For Customer's Acceptance:
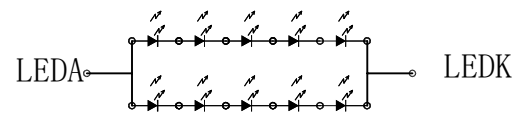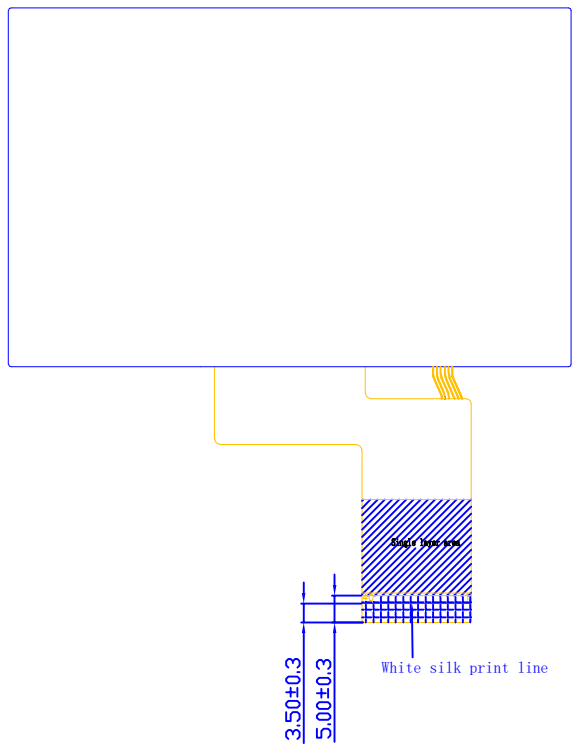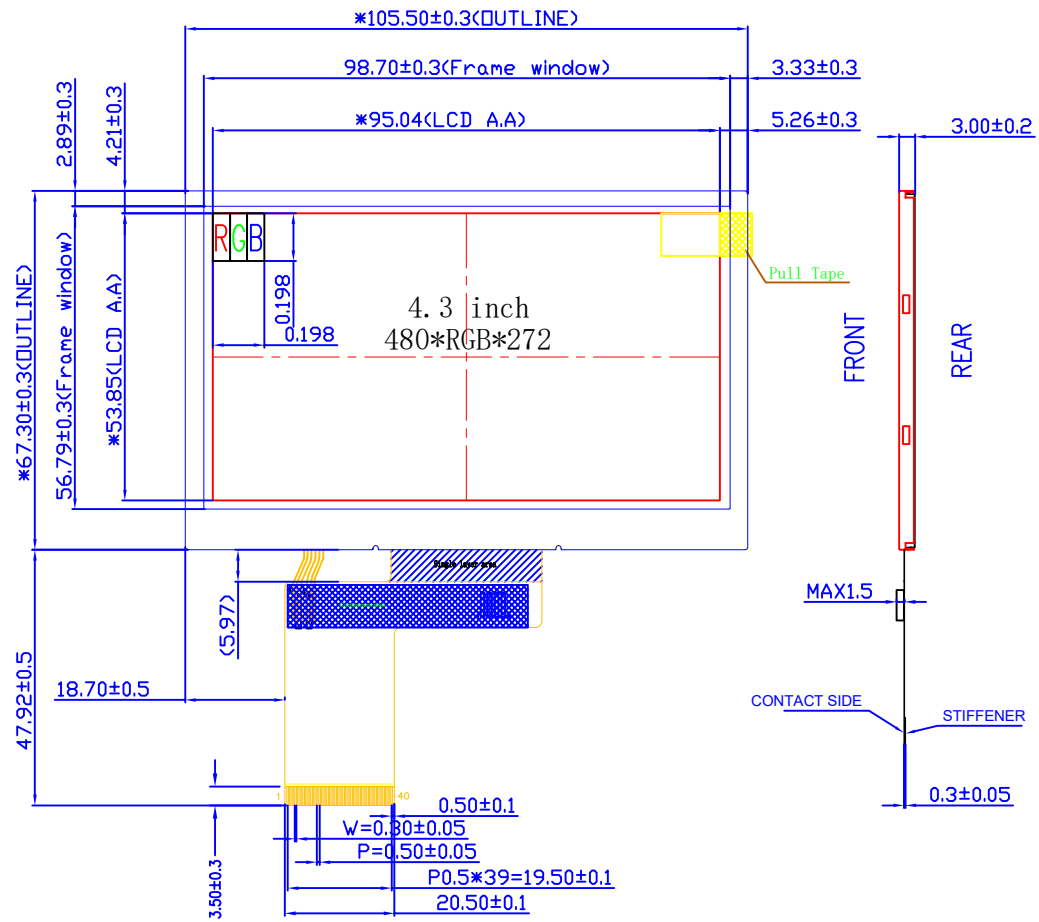
Approved By	Comment

From: NewTrend Display Technology Co., Ltd.

Document Revision History

Revision	Date	Description	Changed by
0		Initial Release	

Outline Drawing

PIN NO.	SYMBOL
1	VLEDK
2	VLEDA
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	DCLK
31	DISP
32	HSYNC
33	VSYNC
34	DE
35	NC
36	GND
37	NC
38	NC
39	NC
40	NC

*105.50±0.3(OUTLINE)
98.70±0.3(Frame window)
*95.04(LCD A.A)
2.89±0.3
4.21±0.3
3.33±0.3
5.26±0.3
3.00±0.2

RGB

*67.30±0.3(OUTLINE)
56.79±0.3(Frame window)
*53.85(LCD A.A)
0.198
0.198

4.3 inch
480*RGB*272

Pull Tape

FRONT
REAR

MAX1.5

CONTACT SIDE
STIFFENER

47.92±0.5
18.70±0.5
(5.97)
3.50±0.3
0.50±0.1
W=0.30±0.05
P=0.50±0.05
P0.5*39=19.50±0.1
20.50±0.1
0.3±0.05

White silk print line

3.50±0.3
5.00±0.3

LEDA   LEDK

BACKLIGHT DIAGRAM

NOTES:
1. DISPLAY TYPE: 4.3" TFT, Transmissive, Normally White
2. OPTIMUM VIEWING : 12:00
3. Top: -20°C~+70°C, Tst: -30°C~+80°C
4. TFT Interface :24-bit RGB Interace, VDD=3.3V
5. LCM Luminance:LED/600cd/m^2(TYP)   IF=40mA,VF=15V(TYP)
6. RoHS

Pin Description:

Pin No.	Symbol	Function Description	Remark
1	LEDK	LED backlight (Cathode).	
2	LEDA	LED backlight (Anode).	
3	GND	Ground for logic.	
4	VDD	Power supply for voltage	
5-12	R0-R7	Red Data.	
13-20	G0-G7	Green Data.	
21-28	B0-B7	Blue Data.	
29	GND	Ground for logic.	
30	CLK	Dot clock signal input.	
31	DISP	Display on/off.	
32	HSYNC	Horizontal sync input. Negative polarity.	
33	VSYNC	Vertical sync input. Negative polarity.	
34	DE	Data enable input. Active high to enable the input data bus.	
35	NC	No connection	
36	GND	Ground for logic.	
37	NC	NC.	
38	NC	NC.	
39	NC	NC.	
40	NC	NC.	

DC Electrical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Operating Temperature Range	Top	Absolute Max	-20	-	+70	℃
Storage Temperature Range	Tst	Absolute Max	-30	-	+80	℃
Digital Supply Voltage	V_{DD}	-	3.0	3.3	3.6	V
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	Vf	Top=25°C If=40mA	14.0	15.0	16.5	V
Backlight Supply Current	If		-	40		mA
Backlight Lifetime	-	Top=25°C If=40mA		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	-	CR≥10		50	-	Deg
	Bottom	-			70	-	
	Left	-			70	-	
	Right	-			70	-	
Contrast Ratio		CR	Center		500	-	-
Luminance		Lv		500	600		cd/m^2
Response Time		Tr+Tf			50		ms
Chromaticity	Red	X_R	-	TYP-0.05	0.5931	TYP+0.05	-
		Y_R			0.358		
	Green	X_G	-		0.3396		-
		Y_G			0.5880		
	Blue	X_B	-		0.1618		-
		Y_B			0.1390		
	White	X_W	-		0.3250		-
		Y_W	-		0.3450		-

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.
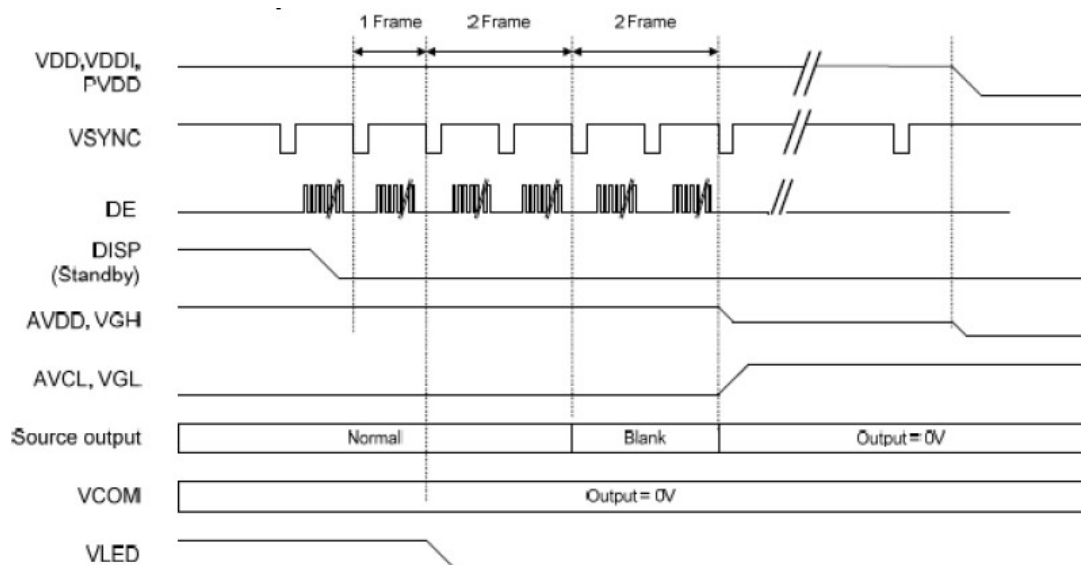
Power Sequence

Power ON Sequence
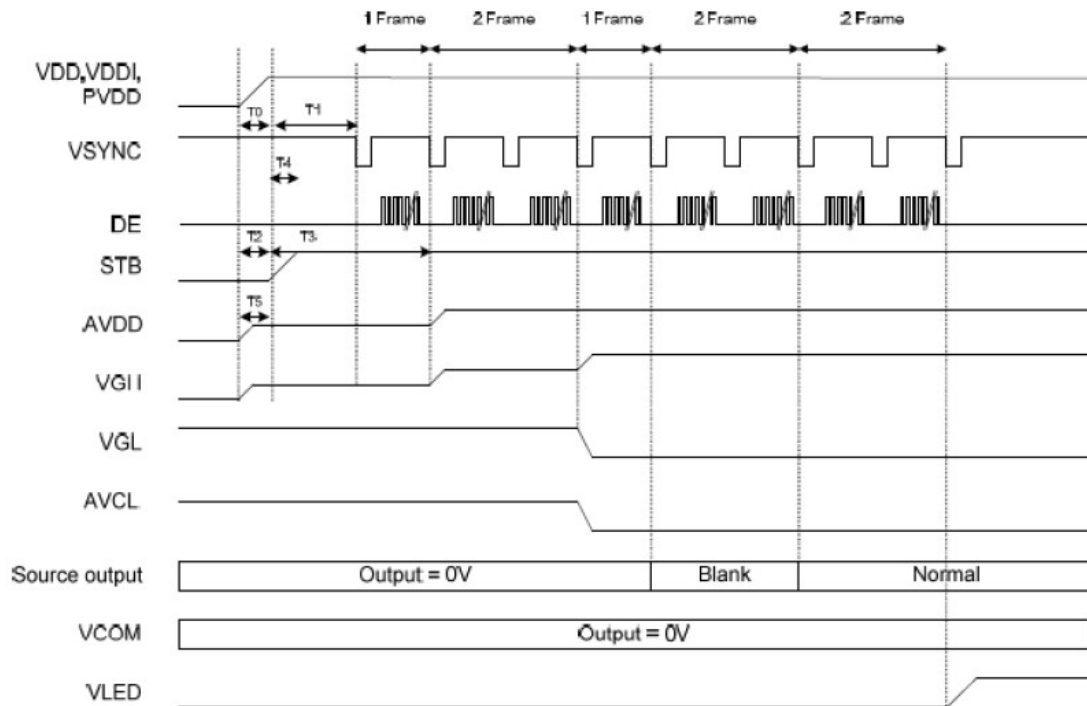
|	Description	Min. Time
T0	Determined by the external power	
T1	Time from stable VDD, VDDI, PVDD set-up to the first VSYNC	T1=0
T2	Time from AVDD=0V to AVDD=3.3V	T2=T0
T3	Time from AVDD=3.3V to AVDD=6.0V	T3=T1+ (1*Frame)
T4	Time from stable VDD, VDDI, PVDD set-up to DISP asserted	T4=0
T5	Time from VGH=0V to VGH=3.3V	T5=T0

Power OFF Sequence

AC Electrical Characteristics
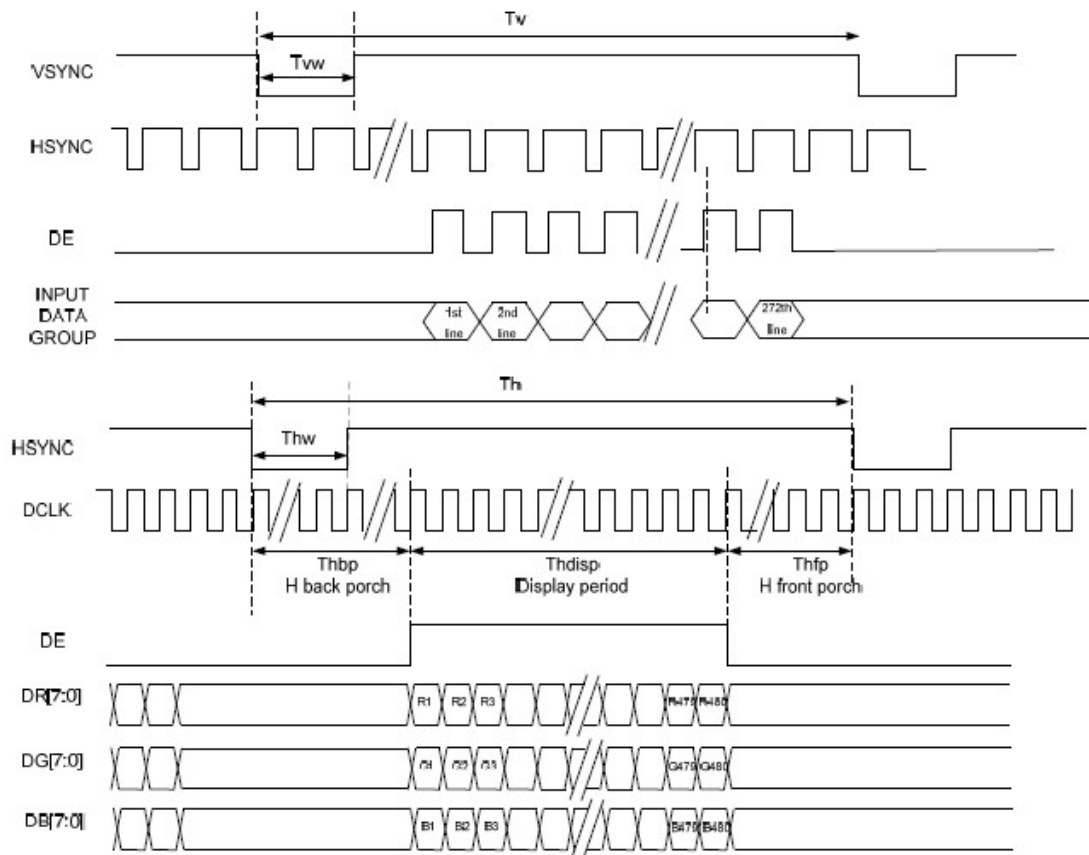### Clock and Data Input Timing Diagram
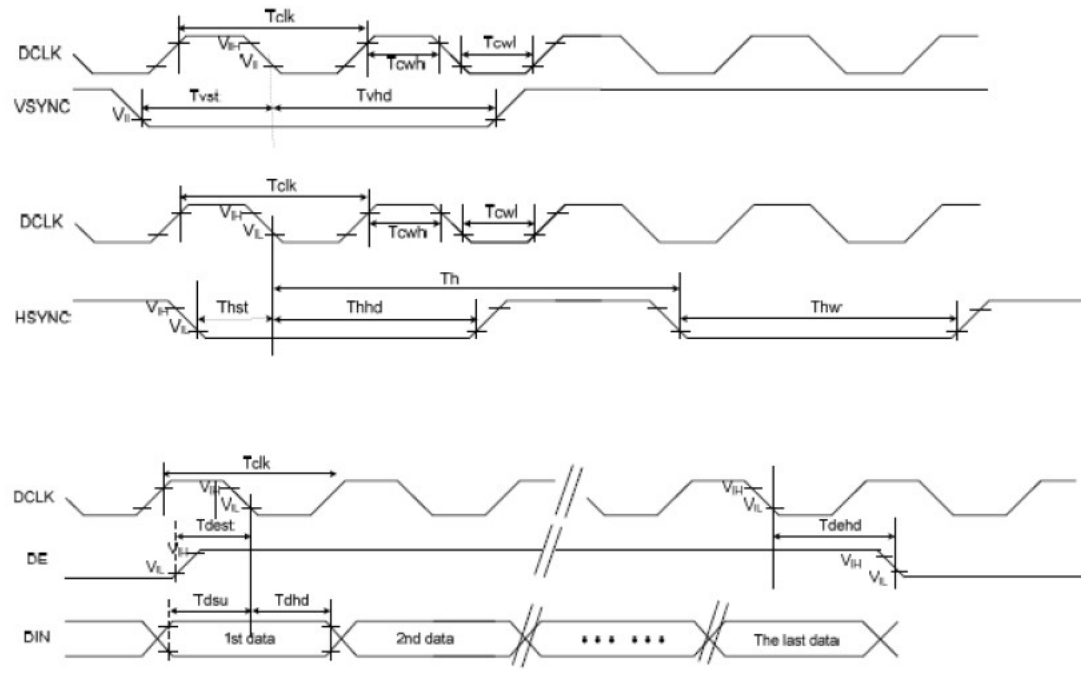
SYNC-DE Mode Timing Diagram
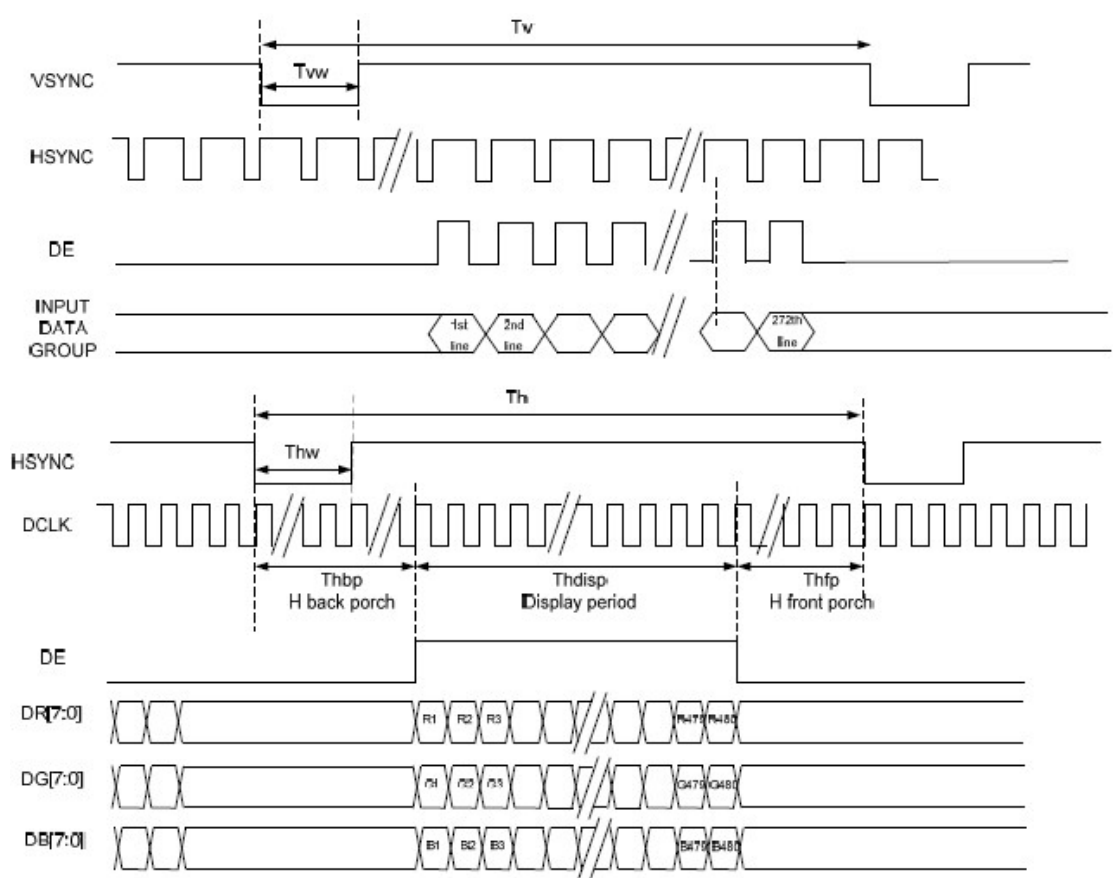
DE Mode Timing Diagram

Parallel 24-bit RGB Timing Table

Item		Symbol	Min.	Typ.	Max.	Unit	Remark
DCLK Frequency		Fclk	8	9	12	MHz	
DCLK Period		Tclk	83	111	125	Ns	
HSYNC	Period Time	Th	485	531		DCLK	
	Display Period	Thdisp		480		DCLK	
	Back Porch	Thbp	3	43		DCLK	By H_Blanking setting
	Front Porch	Thfp	2	8		DCLK	
	Pulse Width	Thw	2	4		DCLK	
VSYNC	Period Time	Tv	276	292		H	
	Display Period	Tvdisp		272		H	
	Back Porch	Tvbp	2	12		H	By V_Blanking setting
	Front Porch	Tvfp	2	8		H	
	Pulse Width	Tvw	2	4		H	

Note: It is necessary to keep Tvbp =12 and Thbp =43 in sync mode. DE mode is unnecessary to keep it.

Reliability Test Items and Criteria

No	Test Item	Test condition	Criterion
1	High Temperature Storage	80℃±2℃ 96H Restore 4H at 25℃, 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℃±2℃ 96H Restore 4H at 25℃, Power off	
3	High Temperature Operation	70℃±2℃ 96H Restore 4H at 25℃, Power on	
4	Low Temperature Operation	-20℃±2℃ 96H Restore 4H at 25℃, Power on	
5	High Temperature/Humidity Storage	50℃±2℃ 90%RH 96H Power off	
6	Temperature Cycle	-30°C → +25℃ → 80°C → +25℃ (30mins) (5mins) (30mins) (5mins) ◄─────────────────────────► 5 Cycle Restore 4H at 25℃, 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℃～ 40℃

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.