



# PRODUCT SPECIFICATIONS Module No.: NTD-7.0T800480R111C

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

- 7.0 inch Diagonal
- 800xRGBx480 resolution
- 24 bit RGB interface
- LED Blacklight (400cd/m²)
- 16.7 M colors
- 12:00 O'clock Optimal View
- RoHS Compliant

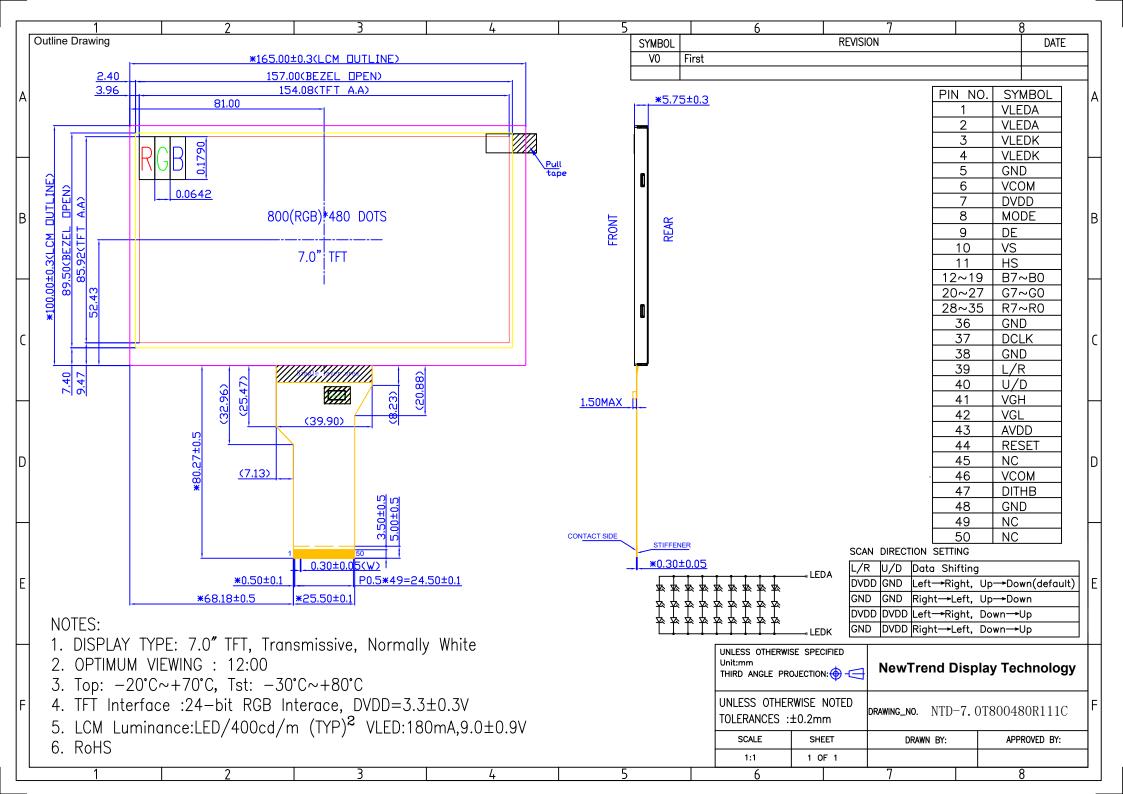
## For Customer's Acceptance:

Approved By	Comment

From: NewTrend Display Technology Co., Ltd.							

## **Document Revision History**

Revision	Date	Description	Changed by
0		Initial Release	
			1
+			
+			



## Pin Description:

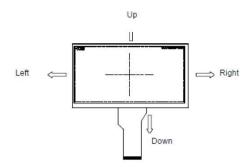
Pin No.	Symbol	Function Description	Remark
1~2	LEDA	LED backlight (Anode).	
3~4	LEDK	LED backlight (Cathode).	
5	GND	Ground.	
6	VCOM	No connection	
7	DVDD	Digital Power.	
8	MODE	DE/SYNC mode select. Normally pull high. H: DE mode. L: HSD/VSD mode.	
9	DE	Data enable input. Active high to enable the input data bus.	
10	VS	Frame sync signal	
11	HS	Line sync signal	
12~19	B7~B0	Blue Data Input	
20~27	G7~G0	Green Data Input	
28~35	R7~R0	Red Data Input	
36	GND	Ground	
37	DCLK	Clock Input	
38	GND	Ground	
39	L/R	Left or Right Display Control.	NOTE1
40	U/D	Up / Down Display Control.	NOTE1
41	VGH	Positive Power for TFT.	
42	VGL	Negative Power for TFT.	
43	AVDD	Analog Power.	
44	RESET	Global reset pin. Active low to enter reset state. Suggest to connecting with an RC reset circuit for stability. Normally pull high.(R=10KΩ, C=1μF)	
45	NC	No connection	
46	VCOM	No connection	
47	DIHTB	Dithering function enable control. (Normally pull high) DITHB="L", to enable internal dithering function. DITHB="H", to disable internal dithering function.	
48	GND	Ground.	
49~50	NC	No connection.	

[ Note1 ] L/R : left or right setting U/D : up or down setting

	9	
L/R	U/D	Data shifting
DVDD	GND	Left → Right,Up → Down(default)
GND	GND	Right → Left, Up → Down
DVDD	DVDD	Left → Right,Down → Up
GND	DVDD	Right → Left, Down → Up

Definition of scanning direction:

Definition of scanning direction:



#### **DC Electrical Characteristics**

Item	Symbol	Condition	Min.	Тур.	Max.	Unit
Operating Temperature Range	Тор	Absolute Max	-20	-	+70	$^{\circ}\mathbb{C}$
Storage Temperature Range	Тѕт	Absolute Max	-30	-	+80	$^{\circ}\mathbb{C}$
Digital Supply Voltage	VDD	-	3.0	3.3	3.6	V
Analog Supply Voltage	AVDD	-	10.2	10.4	10.6	٧
Gate On Voltage	VGH	-	15.3	16.0	16.7	٧
Gate Off Voltage	VGL	-	-7.7	-7.0	-6.3	٧
Input logic high voltage	Vıн	-	0.7*DVDD	-	DVDD	V
Input logic low voltage	VIL	-	GND	-	0.3*DVDD	V

Item	Symbol	Condition	Min.	Тур.	Max.	Unit
Backlight Supply Voltage	Vf	Top=25°C If=180mA	8.1	9.0	9.9	V
Backlight Supply Current	lf		-	180		mA
Backlight Lifetime	-	Top=25°C If=180mA		50000		Hrs

<sup>\*</sup>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.

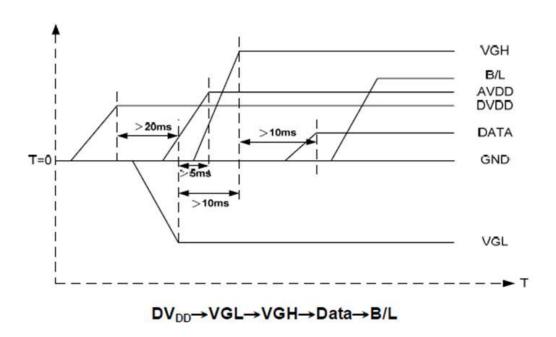
**Optical Characteristics** 

Item		Symbol	Condition	Min.	Тур.	Max.	Unit
	Тор	-		40 50 -			
Operating	Bottom	-	CR≥10	60	70	-	Dog
Viewing Angles	Left	-	UR≥10	60	70	-	Deg
	Right	-		60	70	-	
Contrast Ratio		CR	Center	400	500	-	-
Luminance		Lv		350	400		cd/m <sup>2</sup>
Response Time	Response Time				25	50	ms
	Red	XR	-				-
	Red	YR					
	Green	Xg	-				-
Chromoticity	Green	Yg		TYP-		TVD . 0.05	
Chromaticity	Plue	Хв	-	0.05		TYP+0.05	-
	Blue	Yв					
	White	Xw	-				-
	White	Yw	-				-

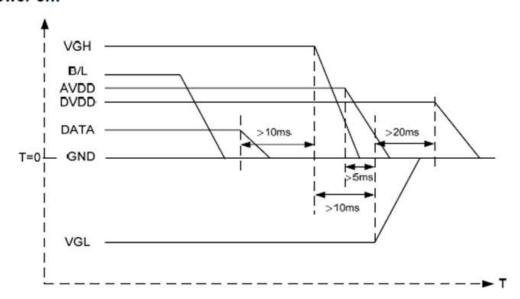
Note (1) Measurement Setup: The LCD module should be stabilized at given temp. 25°C for 15 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting backlight for 15 minutes in a windless room.

## **Power Sequence**

#### a. Power on:



## b. Power off:

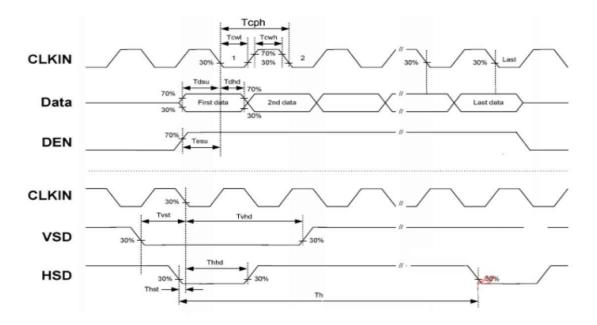


B/L→Data→VGH→VGL→DVDD

Note: Data include R0~R7, B0~B7, GO~G7, U/D, L/R, DCLK, HS,VS,DE.

## **AC Electrical Characteristics**

Item	Cumbal		Values		Unit	Remark
item	Symbol	Min.	Тур.	Max.	Offic	Remark
HS setup time	Thst	8	-	-	ns	
HS hold time	Thhd	8	-	-	ns	
VS setup time	Tvst	8	-	-	ns	
VS hold time	Tvhd	8	_	-	ns	
Data setup time	Tdsu	8	-	-	ns	
Data hole time	Tdhd	8	-	-	ns	
DE setup time	Tesu	8	=	-	ns	
DE hole time	Tehd	8	-	-	ns	
DV <sub>DD</sub> Power On Slew rate	Tpor	-	-	20	ms	From 0 to 90% DV <sub>DD</sub>
RESET pulse width	TRst	1	=	-	ms	
DCLK cycle time	Tcoh	20	-	-	ns	
DCLK pulse duty	Tcwh	40	50	60	%	

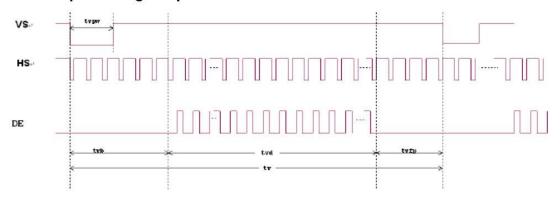


## **Date Input Format**

#### Horizontal input timing diagram



#### Vertial input timing diagram



#### **Timing**

Item	Cumbal	Values			Unit	Remark
item	Symbol	Min.	Min. Typ.		Unit	Kemark
Horizontal Display Area	thd	-	800	-	DCLK	
DCLK Frequency	fclk	26.4	33.3	46.8	MHz	
One Horizontal Line	th	862	1056	1200	DCLK	
HS pulse width	thpw	1	-	40	DCLK	
HS Blanking	thb	46	46	46	DCLK	
HS Front Porch	thfp	16	210	354	DCLK	

Item	Cumbal		Values	11:4	Damania	
item	Symbol	Min.	Тур.	Max.	Unit	Remark
Vertical Display Area	tvd	(-)	480	185	TH	
VS period time	tv	510	525	650	TH	,
VS pulse width	tvpw	1	-	20	TH	
VS Blanking	tvb	23	23	23	TH	
VS Front Porch	tvfp	7	22	147	TH	

**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	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	

#### **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:

<ul><li>— Isopropyl alcohol</li><li>—</li></ul>	Ethyl a	Icoho	l
---	---------	-------	---

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

- 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 :  $10^{\circ}$ C ~  $40^{\circ}$ 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.