PRODUCT SPECIFICATIONS

Module No.: NTD-10.4S1024100R100G

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

General Specification

- **10.4 inch Diagonal**
- **1024xRGBx100 resolution**
- **24 bit RGB interface**
- **LED Blacklight (950cd/m^2)**
- **16.7 M colors**
- **Wide Viewing Angles**
- **RoHS Compliant**
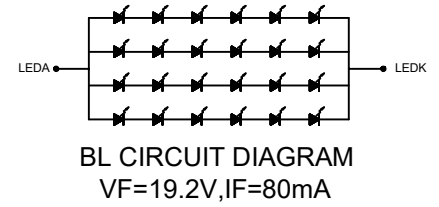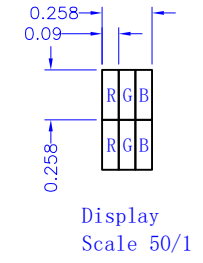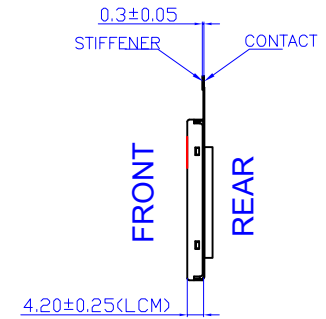
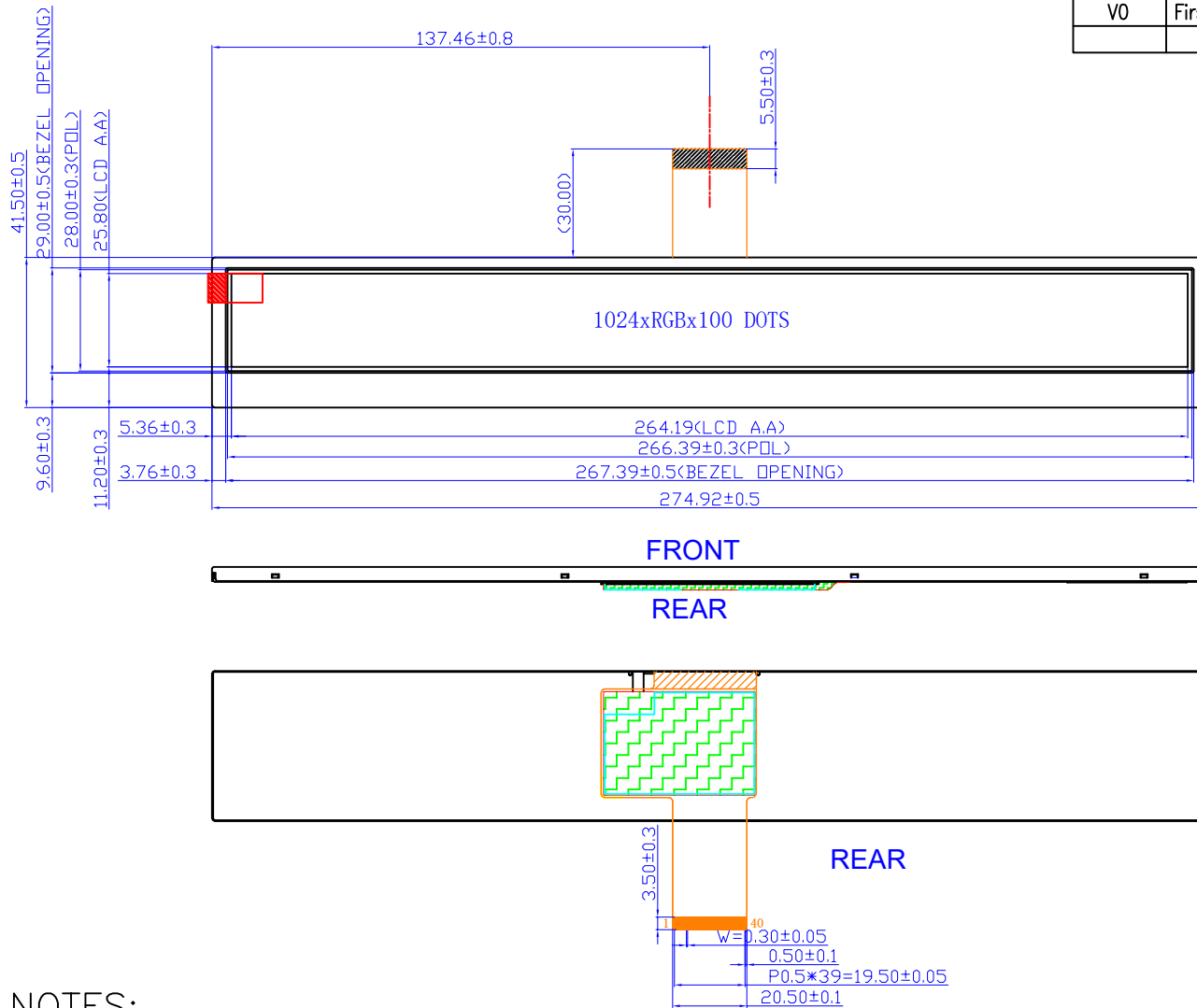For Customer's Acceptance:

Approved By	Comment

From: NewTrend Display Technology Co., Ltd.

Document Revision History

Revision	Date	Description	Changed by
0		Initial Release	

Outline Drawing

TFT Interface

PIN	SYMBOL
1	LEDK
2	LEDA
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	NC
38	NC
39	NC
40	NC

137.46±0.8
5.50±0.3
41.50±0.5
29.00±0.5(BEZEL OPENING)
28.00±0.3(POL)
25.80(LCD A.A)
(30.00)

1024xRGBx100 DOTS

9.60±0.3
11.20±0.3
5.36±0.3
3.76±0.3
264.19(LCD A.A)
266.39±0.3(POL)
267.39±0.5(BEZEL OPENING)
274.92±0.5

FRONT
REAR

0.3±0.05
STIFFENER   CONTACT
FRONT   REAR
4.20±0.25(LCM)

0.258
0.09
R G B
R G B
0.258
Display
Scale 50/1

3.50±0.3
40
1
W=0.30±0.05
0.50±0.1
P0.5*39=19.50±0.05
20.50±0.1

REAR

LEDA   LEDK

BL CIRCUIT DIAGRAM
VF=19.2V,IF=80mA

NOTES:

1. DISPLAY TYPE: 10.4" TFT,NORMALLY WHITE

2. VIEWING DIRECTION : U/L/D/R 80/80/80/80

3. TFT Interface :24-bit RGB, VDD=3.3V±0.3V.

4. Top: -20°C~+70°C, Tst: -30°C~+80°C

5. LCM Luminance:LED/950CD/m² (TYP)

6. ROHS

UNLESS OTHERWISE SPECIFIED
Unit:mm
THIRD ANGLE PROJECTION:

NewTrend Display Technology

UNLESS OTHERWISE NOTED
TOLERANCES :±0.2mm

DRAWING_NO. NTD-10.4S1024100R100G

SCALE	SHEET	DRAWN BY:	APPROVED BY:
1:1	1 OF 1		

Pin Description:

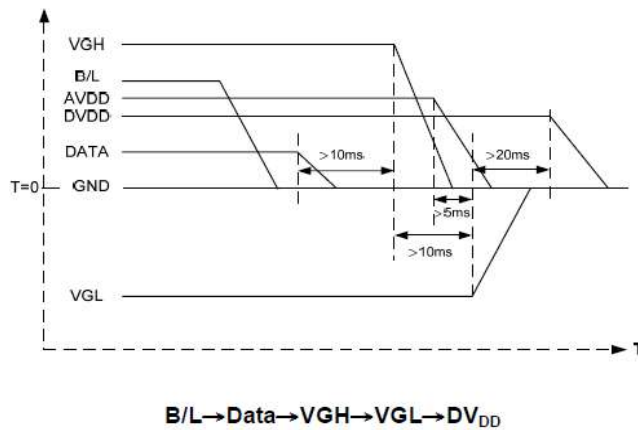| Pin No.	Symbol	Function Description	Remark
1	LEDK	LED backlight (Cathode).	
2	LEDA	LED backlight (Anode).	
3	GND	Ground.	
4	VDD	Power supply.	
5~12	R0~R7	Red Data	
13~20	G0~G7	Green Data	
21~28	B0~B7	Blue Data	
29	GND	Ground.	
30	DCLK	Clock	
31	DISP	Display on/off	
32	HSYNC	Horizontal sync input in RGB mode.	
33	VSYNC	Vertical sync input in RGB mode.	
34	DE	Data enable input. Active high to enable the input data bus.	
35	NC	No connection	
36	GND	Ground.	
37~40	NC	No connection.	

Power Supply For LCM
The power sequence specifications are shown as the following table and diagram.

a. Power on:

$DV_{DD} \rightarrow VGL \rightarrow VGH \rightarrow Data \rightarrow B/L$

b. Power off:

$B/L \rightarrow Data \rightarrow VGH \rightarrow VGL \rightarrow DV_{DD}$
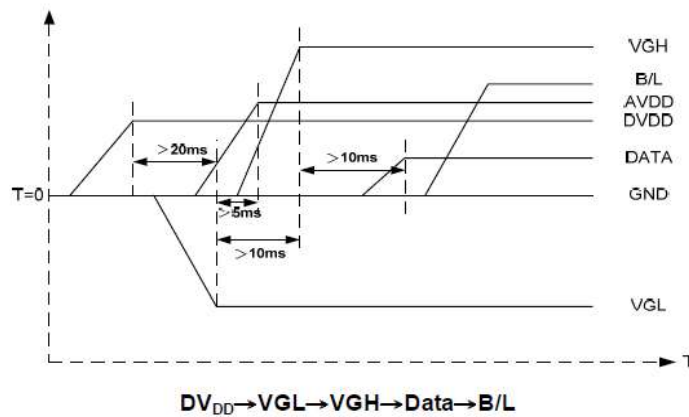
Note: Data include R0~R7, B0~B7, G0~G7, U/D, L/R, DCLK, HS,VS,DE.

DC Electrical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Operating Temperature Range	Top	Absolute Max	-20	-	+70	℃
Storage Temperature Range	T_{ST}	Absolute Max	-30	-	+80	℃
Digital Supply Voltage	V_{DD}	-	3.0	3.3	3.6	V
Supply Current	I_{DD}	$V_{DD}=3.3V$	-	150	280	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	Vf	Top=25°C If=80mA	17.0	19.2	21.6	V
Backlight Supply Current	If		-	80		mA
Backlight Lifetime	-	Top=25°C If=80mA		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	-	80	-	Deg
	Bottom	-		-	80	-	
	Left	-		-	80	-	
	Right	-		-	80	-	
Contrast Ratio		CR	Center		300	-	-
Luminance		Lv		800	950		cd/m^2
Response Time		Tr+Tf			25		ms
Chromaticity	Red	X_R	-	TYP-0.05		TYP+0.05	-
		Y_R					
	Green	X_G	-				-
		Y_G					
	Blue	X_B	-				-
		Y_B					
	White	X_W	-				-
		Y_W	-				-

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.

AC Electrical Characteristics

| Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
HS setup time	T_{hst}	8	-	-	ns	
HS hold time	T_{hhd}	8	-	-	ns	
VS setup time	T_{vst}	8	-	-	ns	
VS hold time	T_{vhd}	8	⊦	-	ns	
Data setup time	T_{dsu}	8	-	-	ns	
Data hole time	T_{dhd}	8	-	-	ns	
DE setup time	T_{esu}	8	-	-	ns	
DE hole time	T_{ehd}	8	-	-	ns	
DV_{DD} Power On Slew rate	T_{POR}	-	-	20	ms	From 0 to 90% DV_{DD}
RESET pulse width	T_{Rst}	1	-	-	ms	
DCLK cycle time	T_{coh}	20	-	-	ns	
DCLK pulse duty	T_{cwh}	40	50	60	%	
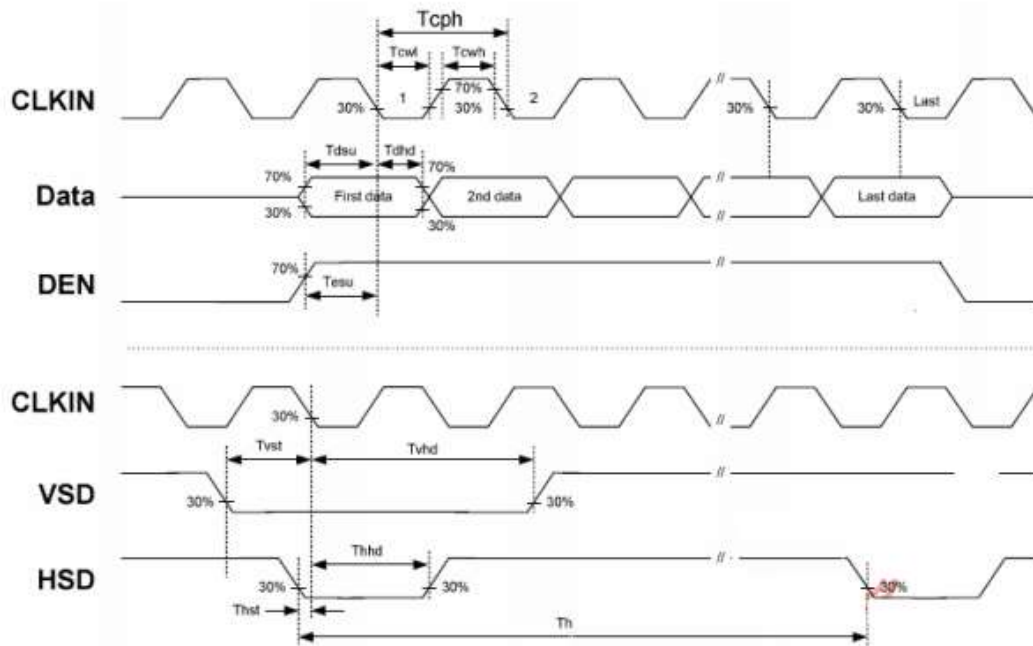
Date Input Format

Horizontal input timing diaqram

Vertial input timing diaqram
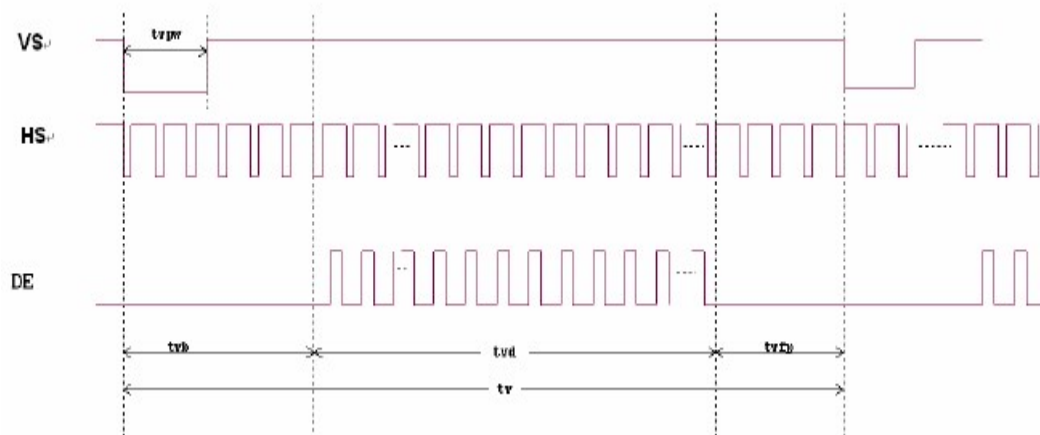
Timing

DCLK latch => Falling latch

FPC

(UD=H，LR=H) 正掃(左上到右下)					
Timing Table HX8282A				SYNC MODE	

Parameter		Symbol	Value			Unit
			Min.	Typ.	Max.	
Frame Rate		-		60.2		Hz
DCLK Frequency		F_DCLK		21		MHz
Horizontal	Ttotal line	t_H		1344		DCLK
	ctive pixce	t_Hact		1024		DCLK
	Back porch	t_HPW		159		DCLK
	Pulse width	t_HBP		1		DCLK
	Front porch	t_HFP		161		DCLK
Vertical	Total time	t_V		258		H
	Active lines	t_Vact		100		H
	Back porch	t_VPW		21		H
	Pulse width	t_VBP		2		H
	Front porch	t_VFP		135		H

Note : Back porch is NOT included pulse width

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	60℃±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.