Product Specification

2.86” 376*960 IPS

Color TFT-LCD Module

Model Name:

TCXD028IBLON-86

(V) Preliminary Specification

( ) Final Specification

Doc. version: 1.0

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Date:2021.7.21

Note: The content of this specification is subject to change without prior notice.

Record of Revision

Version	Revise Date	Page	Content
1.0	2021.7.21		First draft

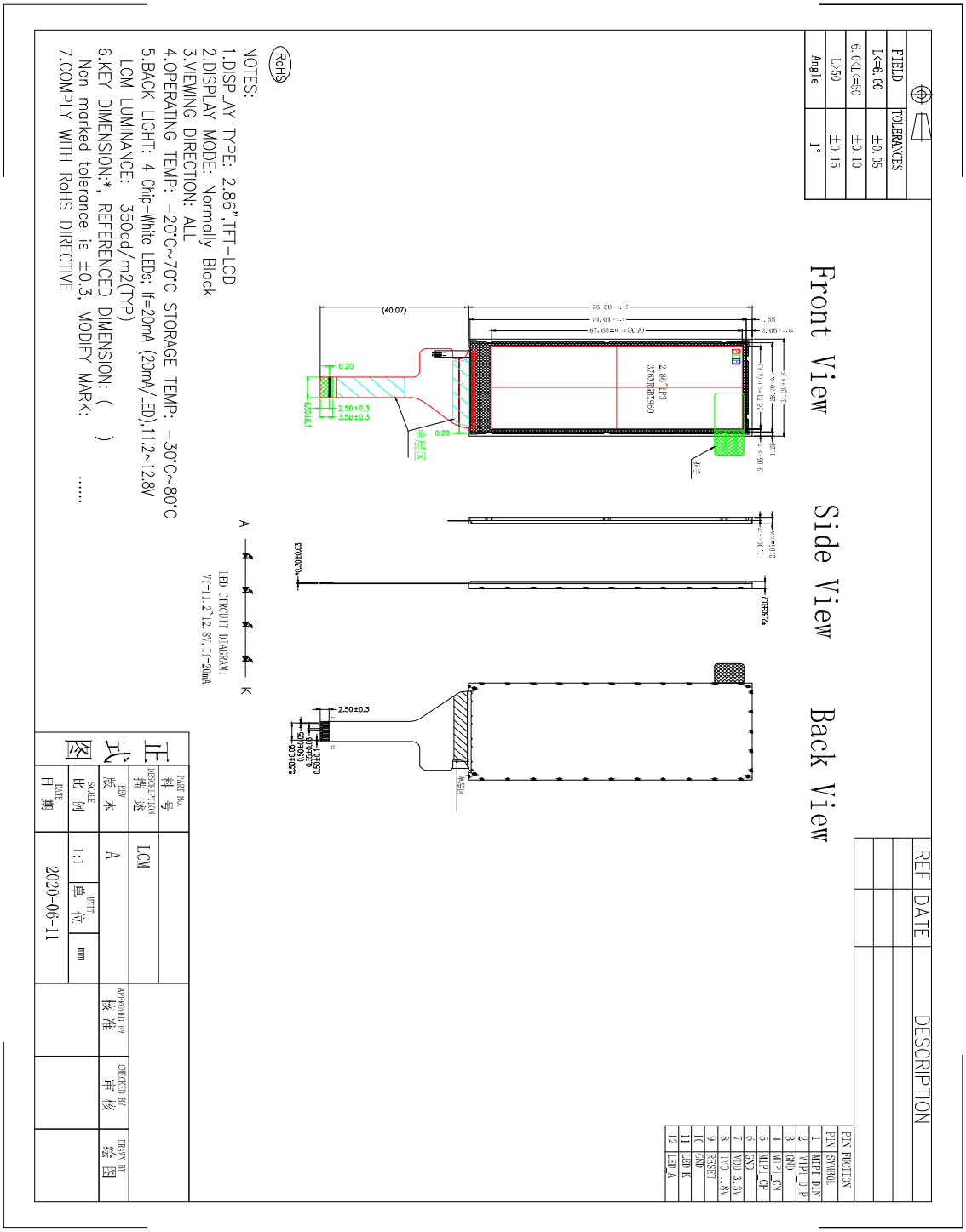
Contents

A. Physical specifications

NO.	Item	Specification	Remark
1	Display resolution (dot)	376 (W) x 960 (H)	
2	Active area (mm)	27.1 x 68.43	
3	Screen size (inch)	2.86” a-si IPS / Transmissive	
4	Dot pitch (mm)	23.5 (H) *3 X 70.5 (V)	
5	Color configuration	RGB-Stripe	
6	Overall dimension (mm)	31.2 x 76.6 x 2.05 (LCM)	
7	Weight (g)	TBD	
8	Panel surface treatment	Glare	

Note 1 :

1. Outline Dimensions

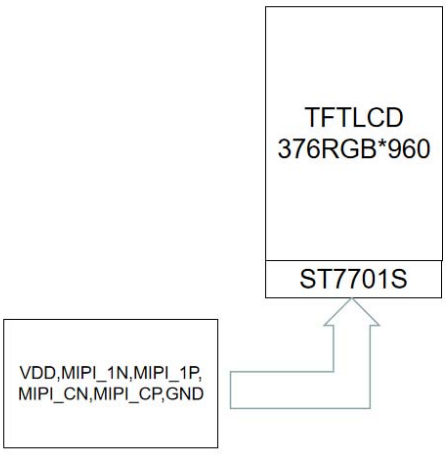


B. Electrical specifications

1. Pin Assignments

NO	Symbol	Level	Description
1	MIPI_D1N	I/O	Negative MIPI differential data input
2	MIPI_D1P	I/O	Positive MIPI differential data input
3	GND	P	Power Ground
4	MIPI_CN	I/O	Negative MIPI differential clock input
5	MIPI_CP	I/O	Positive MIPI differential clock input
6	GND	P	Power Ground
7	VDD 3V3	P	Display on/off
8	IOVCC	P	1.8V
9	RESET	I/O	Reset pin.
10	GND	P	Power Ground
11	LED_K	P	Power supply for Backlight (-)
12	LED_A	P	Power supply for Backlight (+)

2. Block Diagram



LED CIRCUIT DIAGRAM:
Vf=11.2~12.8V, If=20mA

3. Typical Operation Conditions

Item	Symbol	Condition	Standard Value			Unit
			Min.	Typ.	Max.	
Analog power supply	VCC	Ta= +25℃	2.4	2.76	3.3	V
I/O pin Power Supply Voltage	IOVCC		-	-	-	V
Input Voltage “H” Level	VIH	—	0.7VDD	—	VDD	V
Input Voltage “L” Level	VIL	—	VSS	—	0.3VDD	V

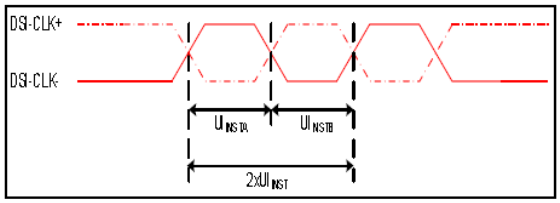
4. Backlight Circuit Characteristics

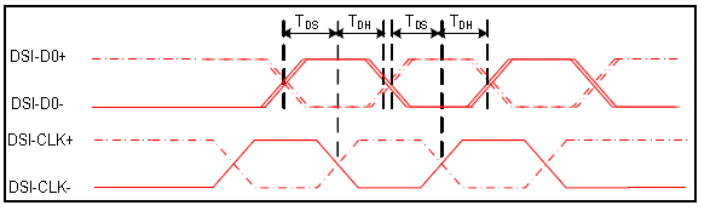
Item	Symbol	Condition	Standard Value			Unit
			Min.	Typ.	Max.	
LED module Forward voltage	VF	IF=20 mA	11.2	12.8	13.6	V
LCM Surface Luminance	LV	BM-7	-	350	-	cd/m2
Uniformity	LD	BM-7	75	80		%
Module color coordinates	X / Y	+/-0.03		TBD		

5. Timing Characteristics

7.5.4 MIPI Interface Characteristics:

7.5.4.1 High Speed Mode





VDDI=1.8, VDD=2.8, AGND=DGND=0V, Ta=25 ℃

Signal	Symbol	Parameter	MIN	MAX	Unit	Description
DSI-CLK+/-	$2xUI_{INSTA}$	Double UI instantaneous	4	25	ns	
DSI-CLK+/-	UI_{INSTA} UI_{INSTB}	UI instantaneous halfs	2	12.5	ns	$UI = UI_{INSTA} = UI_{INSTB}$
DSI-Dn+/-	tDS	Data to clock setup time	0.15	-	UI	
DSI-Dn+/-	tDH	Data to clock hold time	0.15	-	UI	

Table 7 Mipi Interface- High Speed Mode Timing Characteristics

7.5.4.2 Lowe Power Mode

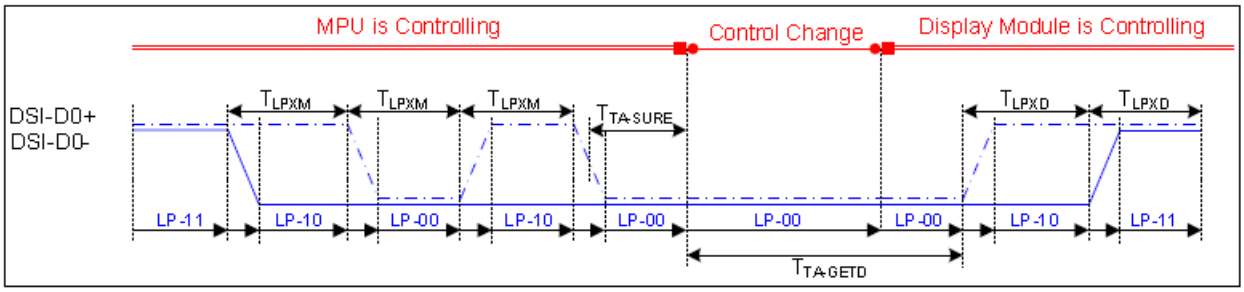


Figure 6 Bus Turnaround (BTA) from display module to MPU Timing

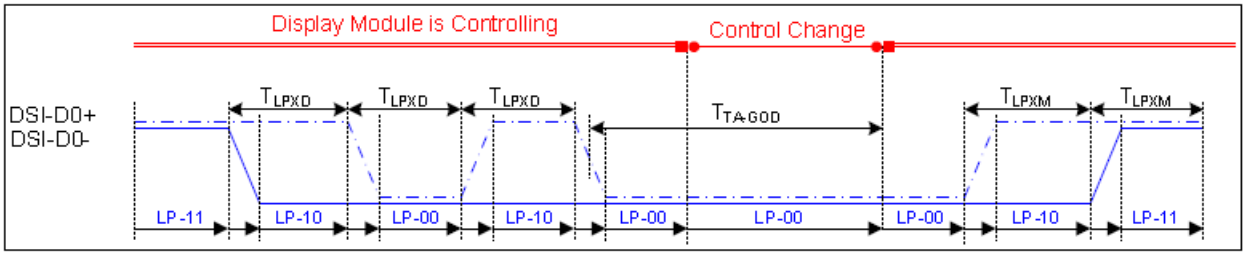


Figure 7 Bus Turnaround (BTA) from MPU to display module Timing

VDDI=1.8,VDD=2.8, AGND=DGND=0V, Ta=25 ℃

Signal	Symbol	Parameter	MIN	MAX	Unit	Description
DSI-D0+/-	TLPXM	Length of LP-00,LP-01, LP-10 or LP-11 periods MPU →Display Module	50	75	ns	Input
DSI-D0+/-	TLPXD	Length of LP-00,LP-01, LP-10 or LP-11 periods MPU →Display Module	50	75	ns	Output
DSI-D0+/-	TTA-SURED	Time-out before the MPU start driving	T_{LPXD}	2x T_{LPXD}	ns	Output
DSI-D0+/-	TTA-GETD	Time to drive LP-00 by display module	5x T_{LPXD}		ns	Input
DSI-D0+/-	TTA-GOD	Time to drive LP-00 after turnaround request-MPU	4x T_{LPXD}		ns	Output

Table8 Mipi Interface Low Power Mode Timing Characteristics

7.5.4.3 DSI Bursts Mode

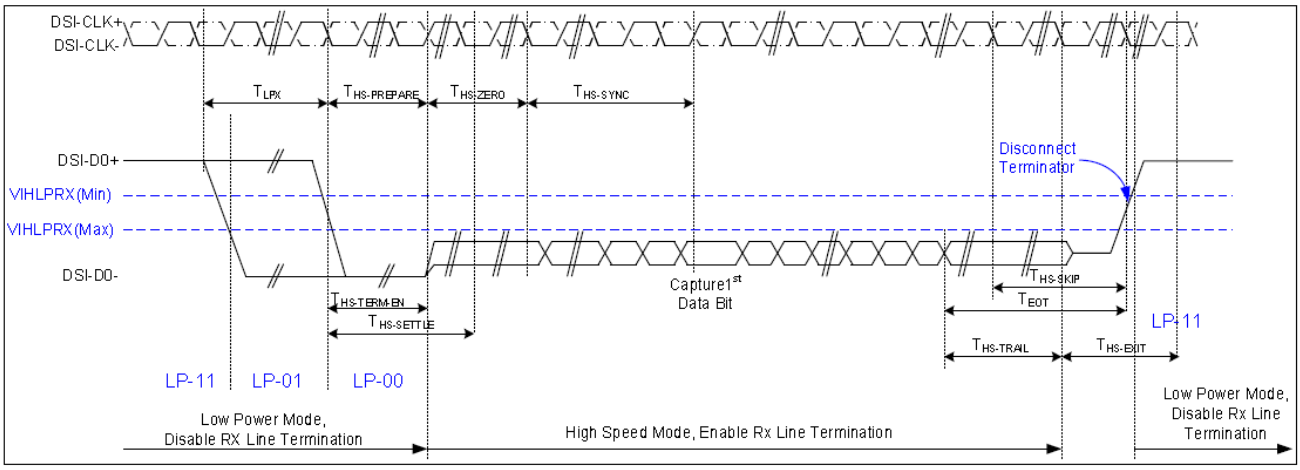


Figure 7 Data lanes-Low Power Mode to/from High Speed Mode Timing

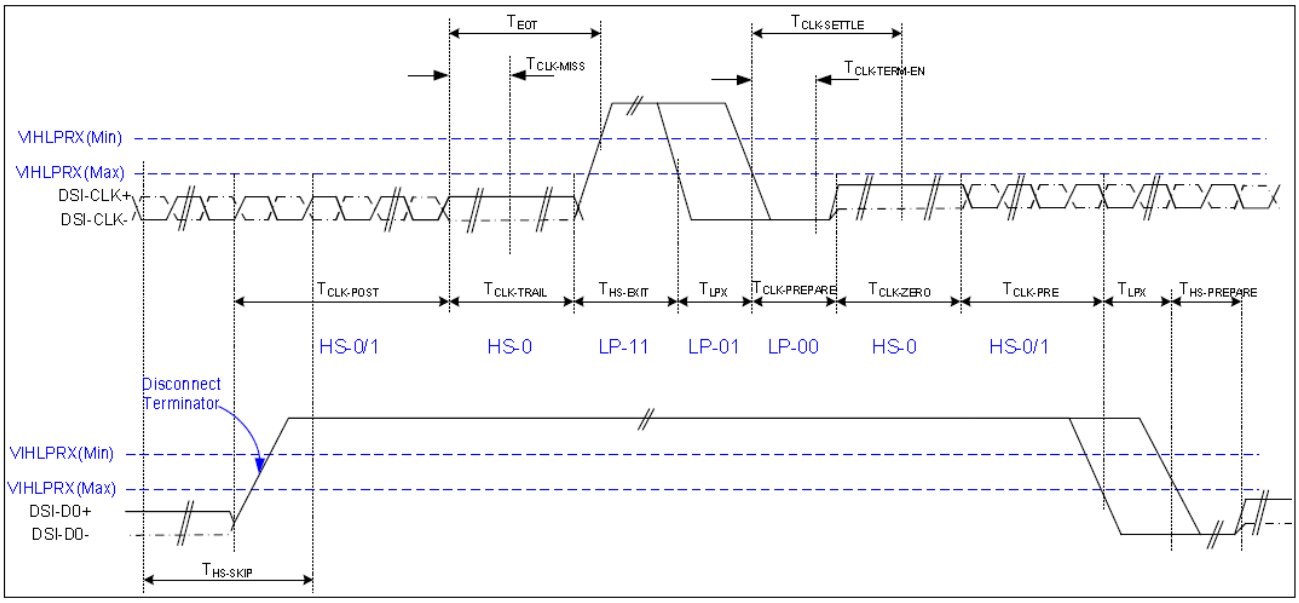


Figure 8 Clock lanes- High Speed Mode to/from Low Power Mode Timing

C. Optical specifications

Item	Symbol	Condition	Specification			Unit	Remark
			Min.	Typ.	Max.		
Response time	Tr+Tf	θ = 0°	-	30	35	ms	4
Contrast ratio	CR	θ = 0°	1000	1500	-		3,5
Viewing angle	Top	CR ≥ 10	75	85	-	Deg.	
	Bottom		75	85	-		
	Left		75	85	-		
	Right		75	85	-		
Color chromaticity (CF only with C light, CIE 1931)	Wx	θ = 0°	-	-	-		
	Wy		-	-	-		
Color Gamut (CF only with C light, CIE 1931)	NTSC	CIE 1931	50	55.1		%	
Trasmittance (with Polarizer)	Trans	θ = 0°	3.0	3.5		%	

Note 1: Ambient temperature=25℃±2℃
Note 2: To be measured in the dark room with backlight unit.
Note 3: To be measured at the center area of panel with a viewing cone of 1 by Topcon luminance meter BM-7A, after 10 minutes operation (module).

D. Reliability test items

No.	Test items	Conditions	Remark
1	High temperature Operating	70° C±2° C for 96 hours	
2	Low temperature Operating	-20° C±2° C for 96 hours	
3	High temperature Storage	80° C±2° C for 96 hours	
4	Low temperature Storage	-30° C±2° C for 96 hours	
5	High temperature & humidity Storage	60℃±2° C, 90%RH ±3%RH, 96 hours	
6	Thermal Shock Storage (No operation)	-30℃ , 30min;25℃ , 5min<=> 80℃ , 30min. one cycle	-30℃/80℃, 10 cycles

Note:
Inspection after 2~4 hours storage at room, the sample shall be free from defects:
1、Air bubble in the LCD.
2、Module display poor function.

E. Precaution

1、 Handling

1.1 Protect the panel from static, it may cause damage to the CMOS Gate Array IC.

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

1.3 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.

1.4 The desirable cleaners are Ethyl alcohol. Don’t use Ketone type materials (ex. Acetone), Toluene, Ethyl acid or Methyl chloride. It might permanent damage to the polarizer due to chemical reaction.

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

1.6 Refrain from strong mechanical shock and / or any force to the panel. In addition to damage, this may cause improper operation or damage to the panel.

2、 Storage

1.1 Do not leave the panel in high temperature, and high humidity for a long time. It is highly recommended to store the panel with temperature from 0 to 35℃ and relative humidity of less than 60%.

1.2 The panel shall be stored in a dark place. It is prohibited to apply sunlight or fluorescent light during the store.

3. Operation

1.1 The LCD shall be operated within the limits specified. Operation at values outside of these limits may shorten life, and/or harm display images.

1.2 Do not exceed the absolute maximum rating value. (the supply voltage variation, Input voltage variation in part contents and environmental temperature and so on). Otherwise the panel may be damaged.

1.3 If the panel displays the same pattern continuously for a long period of time, it can be the situation when the image” Sticks” to the screen.