深圳市启明云端科技有限公司

Product Specification

7.0” 1024*600 IPS

Color TFT-LCD Module

Model Name:

WT-S070I1604-NNa

(V1) Preliminary Specification

( ) Final Specification

Doc. version: 0.2

Total pages:13

Date:2020.9.17

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

Record of Revision

Version	Revise Date	Page	Content
0.1	2020.5.29		First draft
0.2	2020.7.21		将插接端金手指更改到正面
0.3	2020.9.17		修正图纸操作温度范围

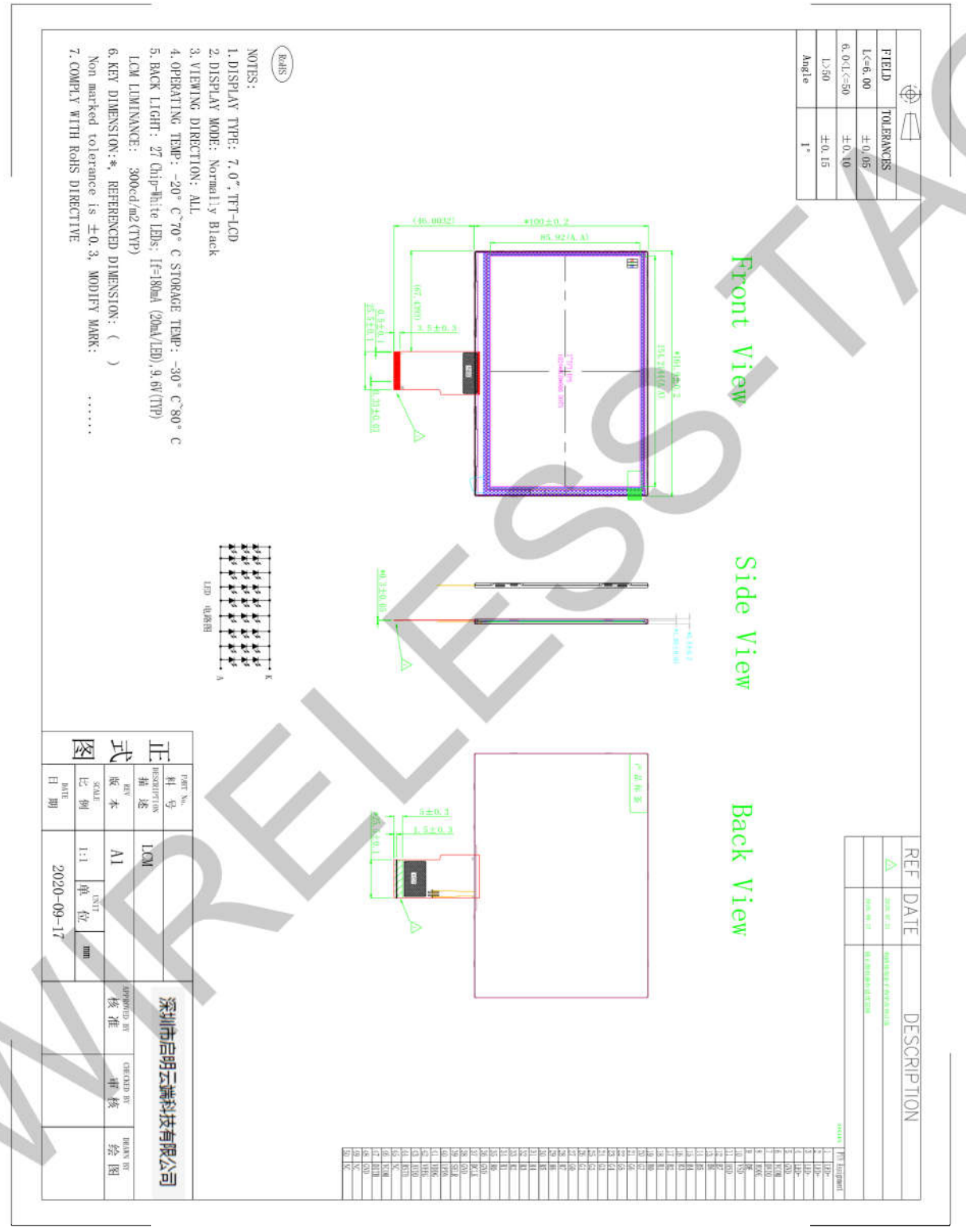
Contents

A. Physical specifications

NO.	Item	Specification	Remark
1	Display resolution (dot)	1024 (W) x 600 (H)	
2	Active area (mm)	154.2144(W) × 85.92(H)	
3	Screen size (inch)	7.0" a-si TFT active matrix	
4	Dot pitch (mm)	0.1506 (W) x 0.1432 (H)	
5	Color configuration	RGB-Stripe	
6	Overall dimension (mm)	164.9 x 100 x 3.45 (LCM)	
7	Weight (g)	TBD	
8	Panel surface treatment	Anti-glare	

Note 1 :

1. Outline Dimensions

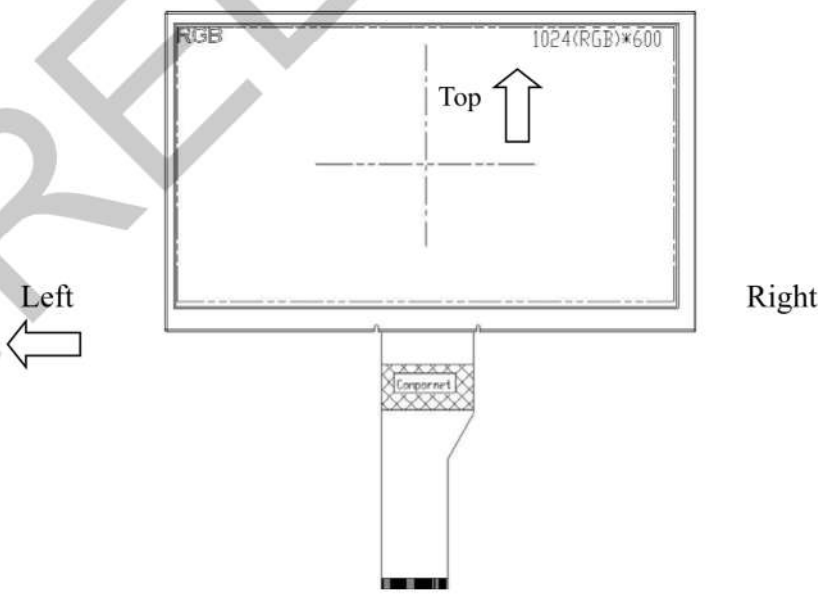


B. Electrical specifications

1. Pin Assignments

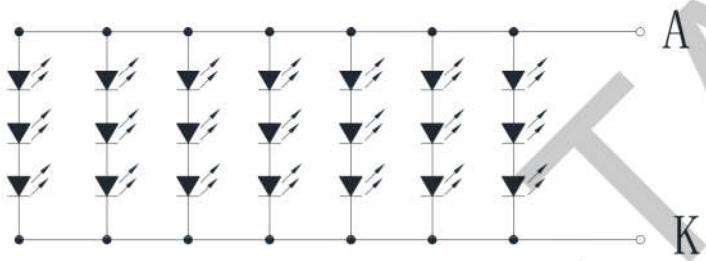
NO	Symbol	Level	Description
1	LED+	P	LED Anode
2	LED+	P	LED Anode
3	LED-	P	LED Cathode
4	LED-	P	LED Cathode
5	GND	P	Ground
6	VCOM	P	Common Voltage
7	DVDD	P	Digital Power
8	MODE	I	DE/SYNC mode select. Normally pull high H: DE mode. L: HSD/VSD mode
9	DE	I	Data Enable signal
10	VSD	I	Vertical sync input. Negative polarity
11	HSD	I	Horizontal sync input. Negative polarity
12	B7	I	Blue Data Input(MSB)
13	B6	I	Blue Data Input
14	B5	I	Blue Data Input
15	B4	I	Blue Data Input
16	B3	I	Blue Data Input
17	B2	I	Blue Data Input
18	B1	I	Blue Data Input
19	B0	I	Blue Data Input(LSB)
20	G7	I	Green Data Input(MSB)
21	G6	I	Green Data Input
22	G5	I	Green Data Input
23	G4	I	Green Data Input
24	G3	I	Green Data Input
25	G2	I	Green Data Input
26	G1	I	Green Data Input
27	G0	I	Green Data Input(LSB)
28	R7	I	Red Data Input(MSB)
29	R6	I	Red Data Input
30	R5	I	Red Data Input
31	R4	I	Red Data Input

32	R3	I	Red Data Input
33	R2	I	Red Data Input
34	R1	I	Red Data Input
35	R0	I	Red Data Input(LSB)
36	GND	P	Ground
37	DCLK	I	Clock input
38	GND	P	Ground
39	SHLR	I	Left or Right Display Control
40	UPDN	I	Up / Down Display Control
41	VDDG	P	Positive Power for TFT
42	VEEG	P	Negative Power for TFT
43	AVDD	P	Analog Power
44	RSTB	I	Global reset pin. Active low to enter reset state. Suggest to connecting with an RC reset circuit for stability. Normally pull high. (R=10K, C=1μF)
45	NC	-	Not connect
46	VCOM	P	Common Voltage
47	DITH	I	Dithering setting DITH=”H” 6bit resolution(last 2 bit of input data truncated) DITH=”L” 8bit resolution(default setting)
48	GND	P	Power ground
49	NC	-	Not connect
50	NC	-	Not connect



Bottom

2. Block Diagram



LED电路图(3串*7并=21LED)

3. Typical Operation Conditions

Item	Symbol	Condition	Standard Value			Unit
			Min.	Typ.	Max.	
Power voltage	DVDD	Ta= +25℃	3	3.3	3.6	V
	AVDD		10.8	11	11.2	V
	VGH		19.7	20	20.3	V
	VGL		-6.5	-6.8	-7.1	V
Input signal Voltage	Vcom		2.7	(3.7)	4.7	V
Input logic high Voltage	V_{IH}		0.7DVDD	-	DVDD	V
Input logic low Voltage	V_{IL}		0	-	0.3DVDD	V

4. Backlight Circuit Characteristics

Item	Symbol	Condition	Standard Value			Unit
			Min.	Typ.	Max.	
LED module Forward voltage	VF	IF=140 mA	-	9.9	-	V
LCM Surface Luminance	LV	BM-7	-	300	-	cd/m2
Uniformity	LD	BM-7	70	75		%
Module color coordinates	X / Y	+/-0.03		TBD		

5. Operation Specifications

5.1.1 Absolute Maximum Ratings

(Note 1)

Item	Symbol	Values		Unit	Remark
		Min.	Max.		
Power voltage	DV_{DD}	-0.3	5.0	V	
	AV_{DD}	6.5	13.5	V	
	V_{GH}	-0.3	42.0	V	
	V_{GL}	-20.0	0.3	V	
	V_{GH}-V_{GL}	-	40.0	V	
Operation Temperature	T_{OP}	-20	70	℃	
Storage Temperature	T_{ST}	-30	80	℃	
LED Reverse Voltage	V_R	-	5	V	Each LED
LED Forward Current	I_F	-	60	mA	Each LED

Note 1: The absolute maximum rating values of this product are not allowed to be exceeded at any times. Should a module be used with any of the absolute maximum ratings exceeded, the characteristics of the module may not be recovered, or in an extreme case, the module may be permanently destroyed.

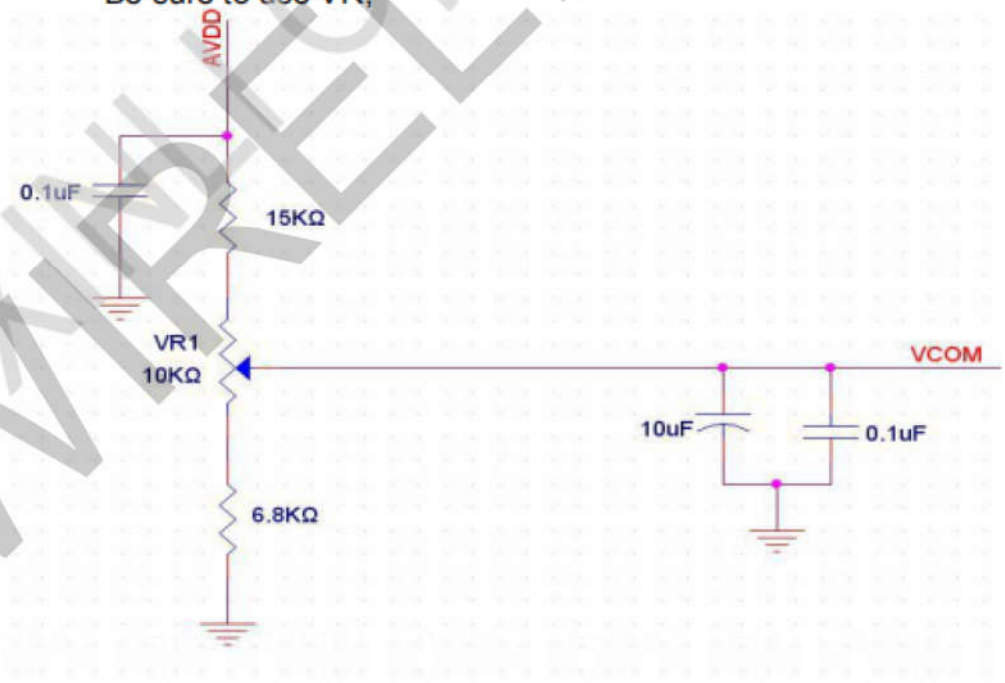
(Note 1)

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Power voltage	DV_{DD}	3.0	3.3	3.6	V	Note 2
	AV_{DD}	10.8	11	11.2	V	
	V_{GH}	19.7	20	20.3	V	
	V_{GL}	-6.5	-6.8	-7.1	V	
Input signal voltage	V_{COM}	2.7	(3.7)	4.7	V	Note 4
Input logic high voltage	V_{IH}	0.7 DV_{DD}	-	DV_{DD}	V	Note 3
Input logic low voltage	V_{IL}	0	-	0.3 DV_{DD}	V	

Note 1: Be sure to apply DV_{DD} and V_{GL} to the LCD first, and then apply V_{GH}. Note 2: DV_{DD} setting should match the signals output voltage (refer to Note 3) of customer's system board.
Note 3: LVDS, Reset.

Note 4: Typ. V_{COM} is only a reference value, it must be optimized according to each LCM.

Be sure to use VR;



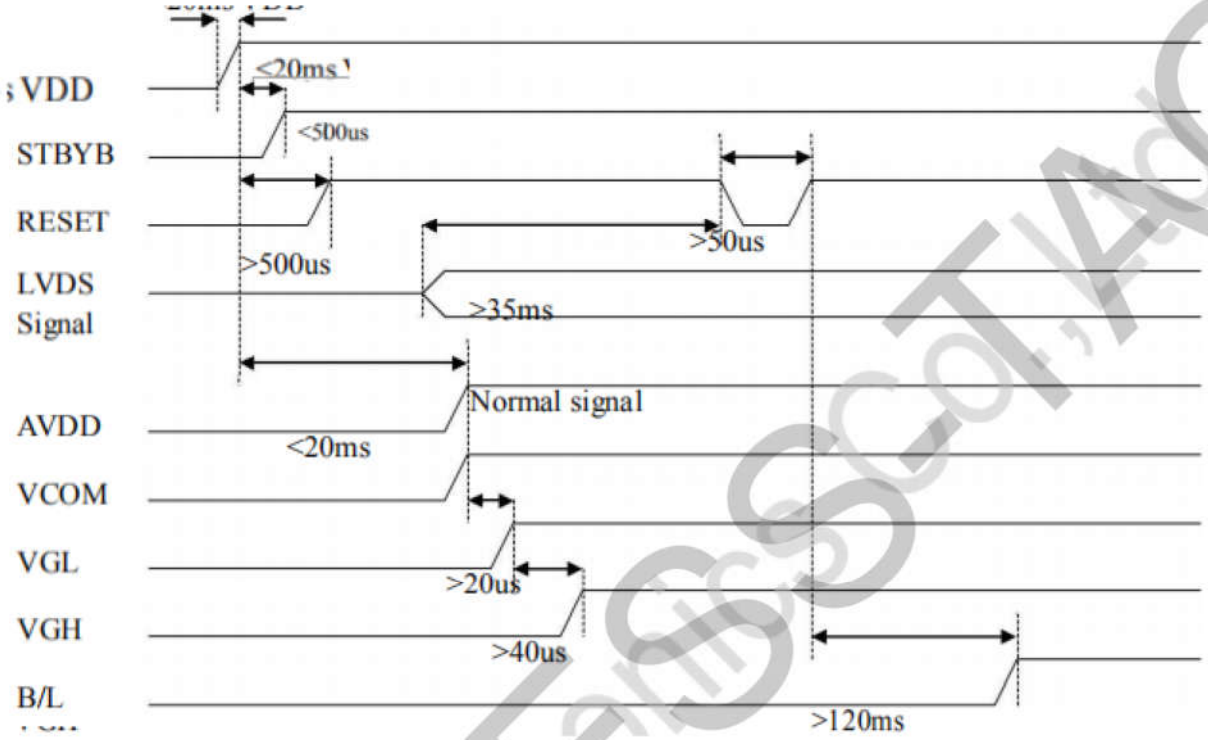
5.1.2 Current Consumption

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Current for Driver	I_{GH}	-	0.26	1	mA	V_{GH} =20V
	I_{GL}	-	0.26	1	mA	V_{GL} = -6.8V
	IDV_{DD}	-	35	60	mA	DV_{DD} =3.3V
	IAV_{DD}	-	20	60	mA	AV_{DD} =11V

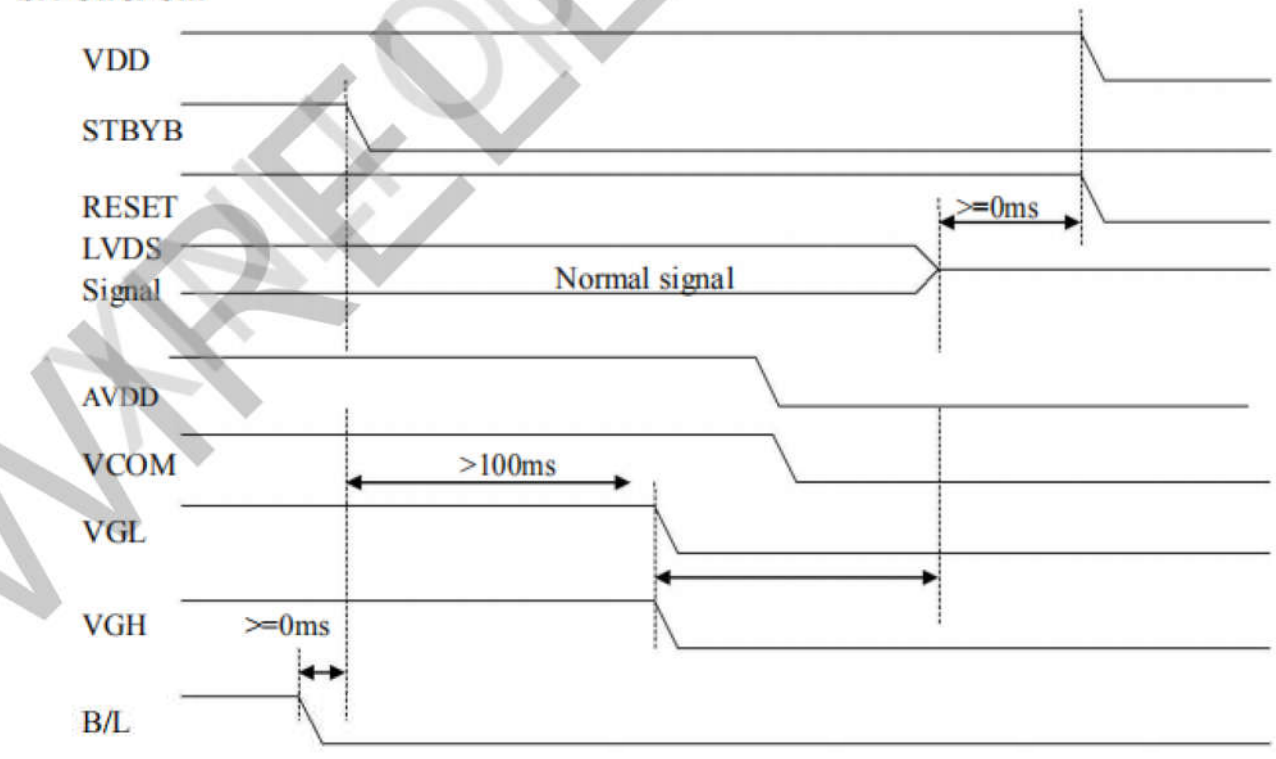
5.1.3 Backlight Driving Conditions

5.2 Power Sequence

a. Power on:



b. Power off:

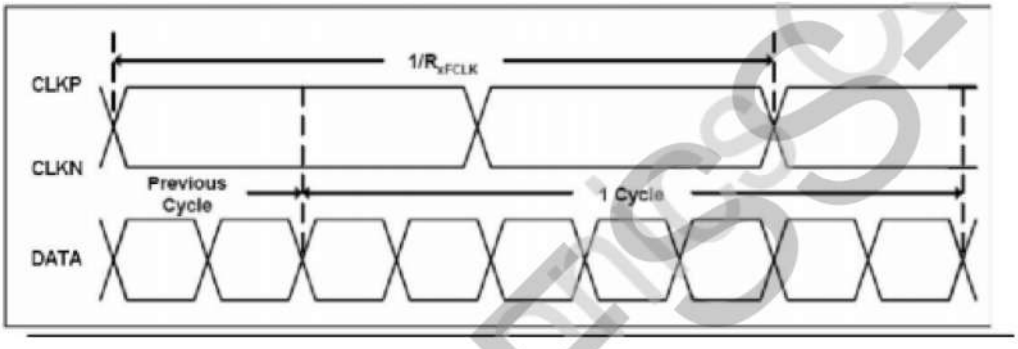


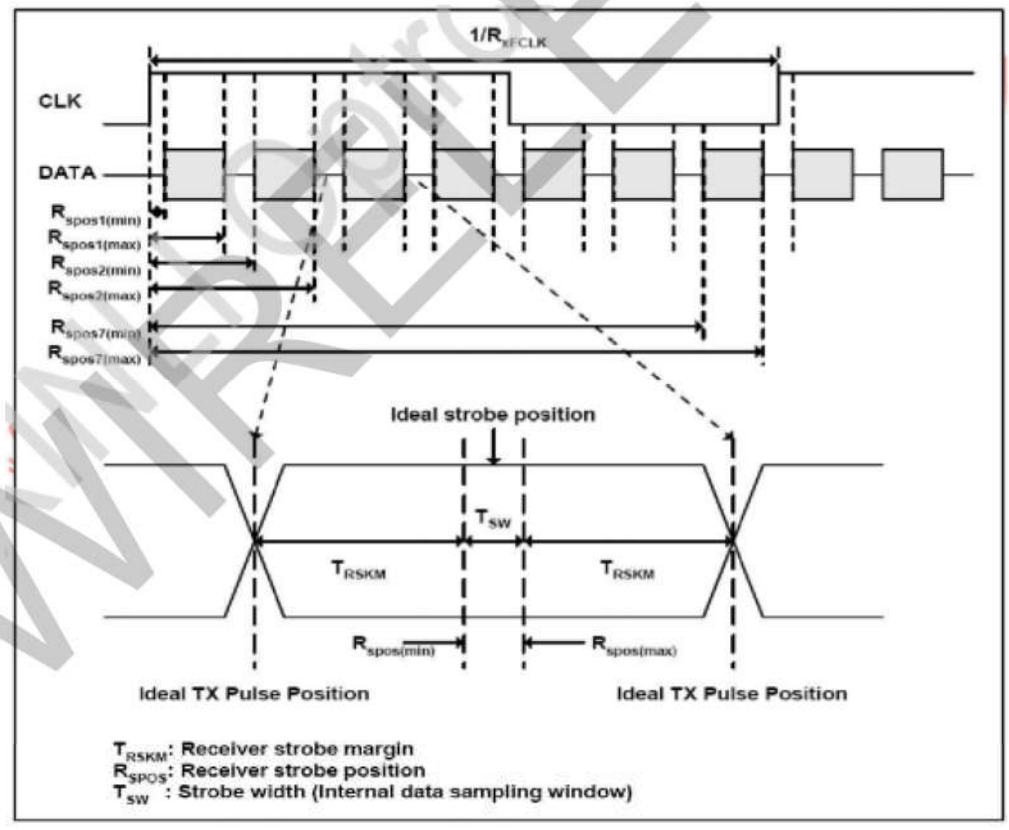
5.3 Timing Characteristics

5.3.1 AC Electrical Characteristics

Parameter	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Clock frequency	R_{xFCLK}	40.8	51.2	67.2	MHz	
Input data skew margin	T_{RSKM}	500	-	-	ps	
Clock high time	T_{LVCH}	-	4/(7* R_{xFCLK})	-	ns	
Clock low time	T_{LVCL}	-	3/(7* R_{xFCLK})	-	ns	

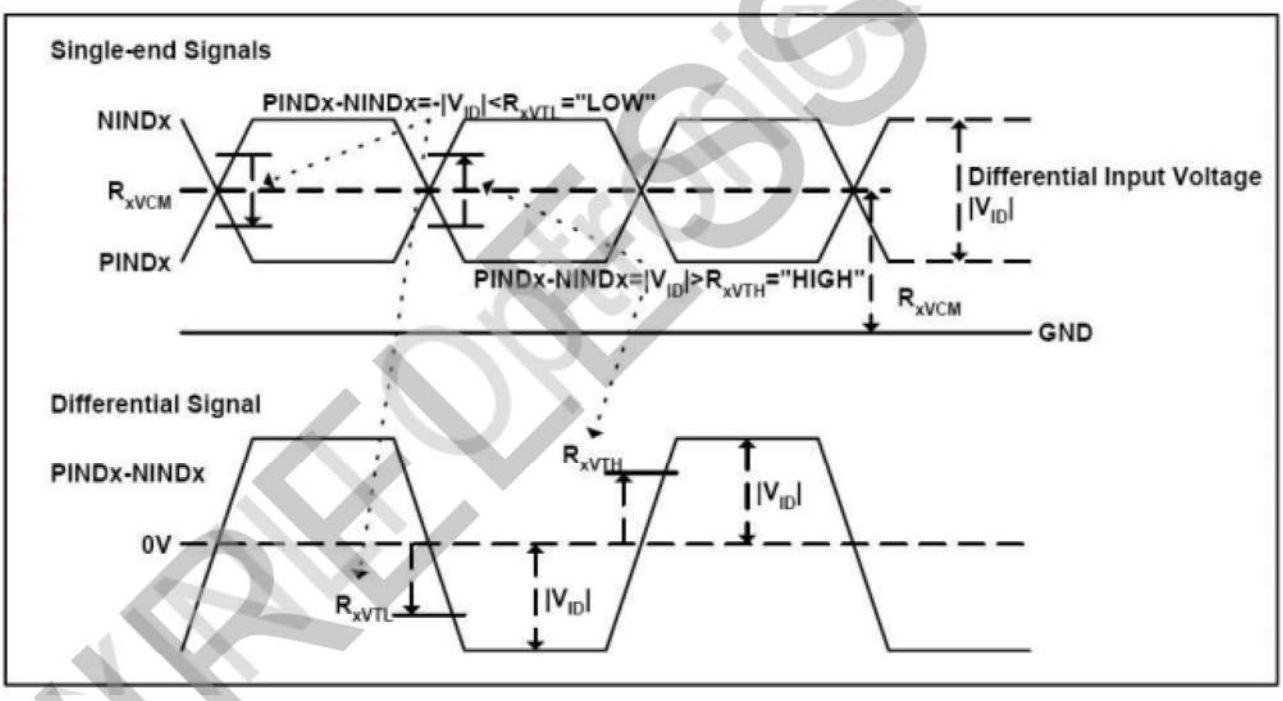
5.3.2 Input Clock and Data Timing Diagram





5.3.3 DC Electrical Characteristics

Parameter	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Differential input high Threshold voltage	R_{xVTH}	-	-	+0.1	V	R_{XVCM}=1.2V
Differential input low Threshold voltage	R_{xVTL}	-0.1	-	-	V	
Input voltage range (singled-end)	R_{xVIN}	0	-	2.4	V	
Differential input common mode voltage	R_{xVCM}	$\|V_{ID}\|/2$	-	$2.4-\|V_{ID}\|/2$	V	
Differential voltage	$\|V_{ID}\|$	0.2	-	0.6	V	
Differential input leakage current	RV_{xiz}	-10	-	+10	uA	

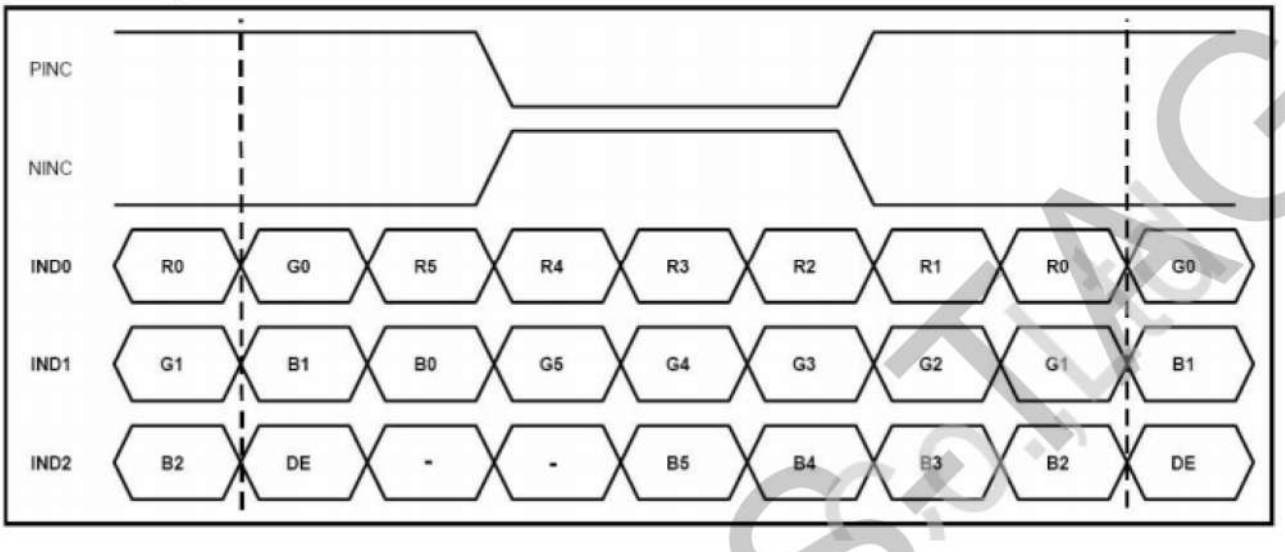


5.3.4 Timing

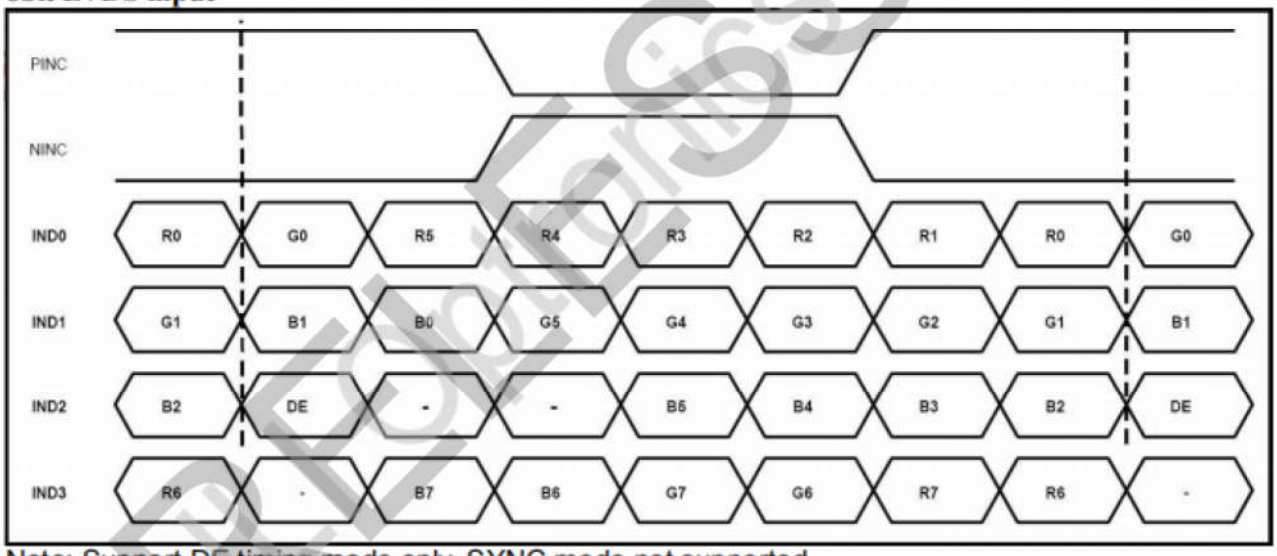
Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Clock Frequency	fclk	40.8	51.2	67.2	MHz	Frame rate =60Hz
Horizontal display area	thd		1024		DCLK	
HS period time	th	1114	1344	1400	DCLK	
HS Blanking	thb	90	320	376	DCLK	
Vertical display area	tvd		600		H	
VS period time	tv	610	635	800	H	
VS Blanking	thb	10	35	200	H	

5.3.5 Data Input Format

6bit LVDS input



8bit LVDS input



Note: Support DE timing mode only, SYNC mode not supported.

C. Optical specifications

Item	Symbol	Condition	Specification			Unit	Remark
			Min.	Typ.	Max.		
Response time	Tr+Tf	θ = 0°	-	25	-	ms	
Contrast ratio	CR	θ = 0°	600	800	-		
Viewing angle	Top	CR ⩾ 10	80	85	-	Deg.	
	Bottom		80	85	-		
	Left		80	85	-		
	Right		80	85	-		
Color chromaticity (CF only with C light, CIE 1931)	Wx	θ = 0°	-	0.319	-		
	Wy		-	0.346	-		
Luminance uniformity	Yu		70	75		%	

D. Reliability test items

No.	Test items	Conditions	Remark
1	High temperature Operating	70° C±2° C for 240 hours	
2	Low temperature Operating	-20° C±2° C for 240 hours	
3	High temperature Storage	80° C±2° C for 240 hours	
4	Low temperature Storage	-30° C±2° C for 240 hours	
5	High temperature & humidity Storage	60℃±2° C, 90%RH ±3%RH, 96 hours	
6	Thermal Shock Storage (No operation)	-30℃ , 30min. <=> 80℃ , 30min. 100 Cycles	
7	ESD test	Contact mode: 150pf, 330Ω, ±2KV Air mode: 150pf, 330Ω, ±2KV	
8	Vibration test	(1) 1.5G / 10-500Hz, 30min/cycle, 1cycle for each X, Y, Z (2) 3Grms, 5~150Hz, 0.37 Oct/min, 30 min./axis	

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.