SPECIFICATION

Customer: _____

Model Name: SAT101B040R04D-FG235143LK

SPEC NO.: _____

Date: _____

Version: _____

■ **Preliminary Specification**

□ **Final Specification**

Approved by	Comment

Prepared by	Reviewed by	Approved by

Record of Revision

Version	Revise Date	Page	Content
Pre-spec.A	2019/09/09		Initial Release

Contents

1. General Specifications

No.	Item	Specification	Remark
1	LCD size	10.1 inch(Diagonal)	
2	Driver element	a-Si TFT active matrix	
3	Resolution	1024 × 3(RGB) ×600	
4	Display mode	Normally White, Transmissive	
5	Pixel pitch	0.2175(H) X 0.2088(V) X RGB mm	
6	Active area	222.72(H) X 125.28(V) mm	
7	Outline dimensions	235(H) X 143(V) X 6.6(D) mm	
8	Surface treatment	Anti-Glare	
9	Color arrangement	RGB-stripe	
10	Interface	LVDS	
11	Backlight Power consumption	TBD	
12	Panel Power consumption	TBD	
13	Weight	TBD	

2. Pin Assignment

No.	Symbol	I/O	Function
1	VCOM	P	Common voltage
2	VDD(3.3V)	P	Digital power
3	VDD(3.3V)	P	Digital power
4	NC	-	Not connect
5	REST(3.3V)	I	Global reset pin. Active low to enter reset state. Suggest to connecting with an RC reset circuit for stability. Normally pull high. (R=100K_，C=1μF)
6	STBYB(3.3V)	I	Standby mode, normally pull high STBYB="1", normal operation STBYB="0",timing control, source driver will turn off, all output are high-Z
7	GND	P	Ground
8	RXIN0-	I	Negative LVDS differential data inputs
9	RXIN0+	I	Positive LVDS differential data inputs
10	GND	P	Ground
11	RXIN1-	I	Negative LVDS differential data inputs
12	RXIN1+	I	Positive LVDS differential data inputs
13	GND	P	Ground
14	RXIN2-	I	Negative LVDS differential data inputs
15	RXIN2+	I	Positive LVDS differential data inputs
16	GND	P	Ground
17	RXCLKIN-	I	Negative LVDS differential clock inputs
18	RXCLKIN+	I	Positive LVDS differential clock inputs
19	GND	P	Ground
20	RXIN3-	I	Negative LVDS differential data inputs
21	RXIN3+	I	Positive LVDS differential data inputs
22	GND	P	Ground
23	NC	-	Not connect
24	NC	-	Not connect
25	GND	P	Ground
26	NC	-	Not connect
27	NC	-	Not connect

28	SELB(3.3V)	I	6bit/8bit mode select H : 6bit / L : 8bit
29	AVDD	P	Power for Analog Circuit
30	GND	P	Ground
31	LED-	P	LED Cathode
32	LED-	P	LED Cathode
33	L/R(3.3V)	I	Horizontal inversion
34	U/D(3.3V)	I	Vertical inversion
35	VGL	P	Negative power for TFT
36	NC	-	Not connect
37	NC	-	Not connect
38	VGH	P	Positive power for TFT
39	LED+	P	LED Anode
40	LED+	P	LED Anode

I：input , O：output , P：Power

【Note】

*1)：When L/R="0" , set right to left scan dirction
When L/R="1" , set left to right scan dirction
When U/D="0" , set top to bottom scan dirction
When U/D="1" , set bottom to top scan dirction

3. Operation Specifications

3.1. Absolute Maximum Ratings

(Note 1)

Item	Symbol	Values		Unit	Remark
		Min.	Max.		
Power voltage	DV_{DD}	-0.3	5.0	V	
	AV_{DD}	-0.5	15	V	
	V_{GH}	-0.3	40.0	V	
	V_{GL}	-20.0	0.3	V	
	V_{GH}-V_{GL}	-	40.0	V	
Operation Temperature	T_{OP}	-20	55	℃	
Storage Temperature	T_{ST}	-30	60	℃	

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.

3.1.1. Typical Operation Conditions

(Note 1)

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Power voltage	DV_{DD}	3.0	3.3	3.6	V	
	AV_{DD}	10.65	10.85	11.05	V	
	V_{GH}	20	21	22	V	
	V_{GL}	-6.5	-5.5	-4.5	V	
Input signal voltage	V_{COM}	3.6	3.8	4.0	V	

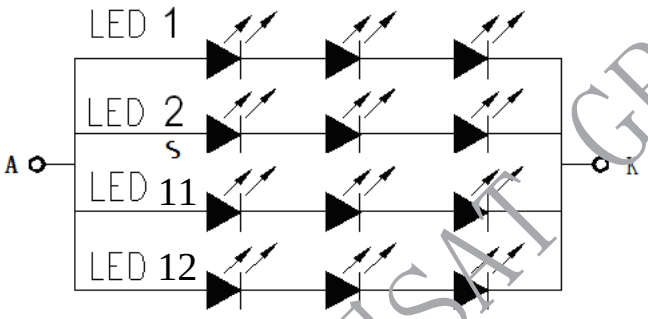
Note 1: Be sure to apply DV_{DD} and V_{GL} to the LCD first, and then apply V_{GH}.
Note 2: DV_{DD} setting should match the signals output voltage (refer to Note 3) of customer's system board.

3.1.2. Current Consumption

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Current for Driver	I_{GH}	-	0.31	-	mA	V_{GH} =21V
	I_{GL}	-	1.841	-	mA	V_{GL} =-5.5V
	IDV_{DD}	-	14.7	-	mA	V_{DD} =3.3V
	IAV_{DD}	-	26.4	-	mA	AV_{DD} =10.85V

3.1.3. Backlight Driving Conditions (36 White Chips)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Supply voltage of white LED backlight	VL	8.7	9.6	10.5	V	Note 1
Current for LED backlight	IL	180	240	300	mA	
Luminance (on the module surface,BM-7)		220	270	-	cd/m^2	
LED life time	-	50,000	-	-	Hr	Note 2

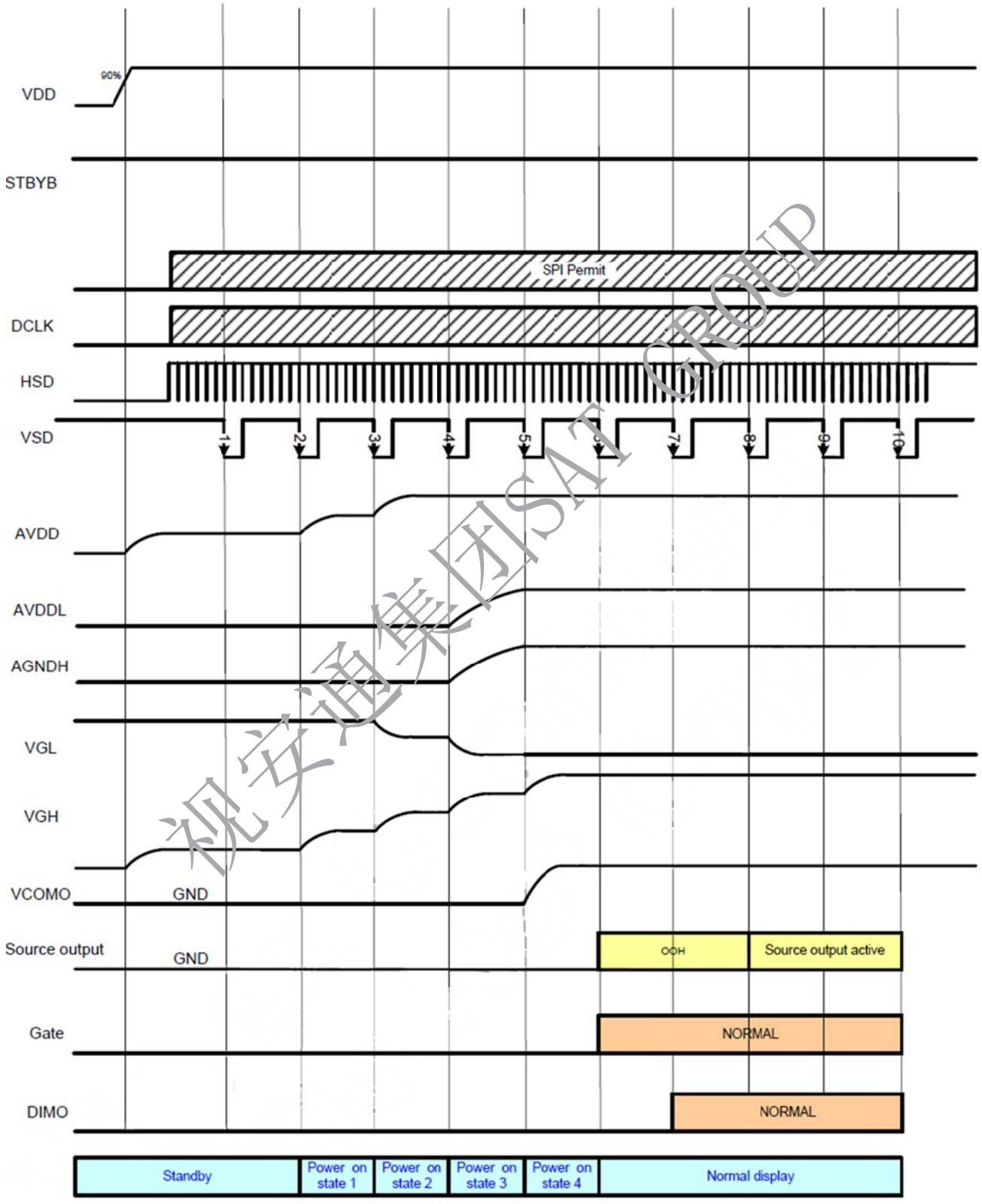


3.2. Power Sequence

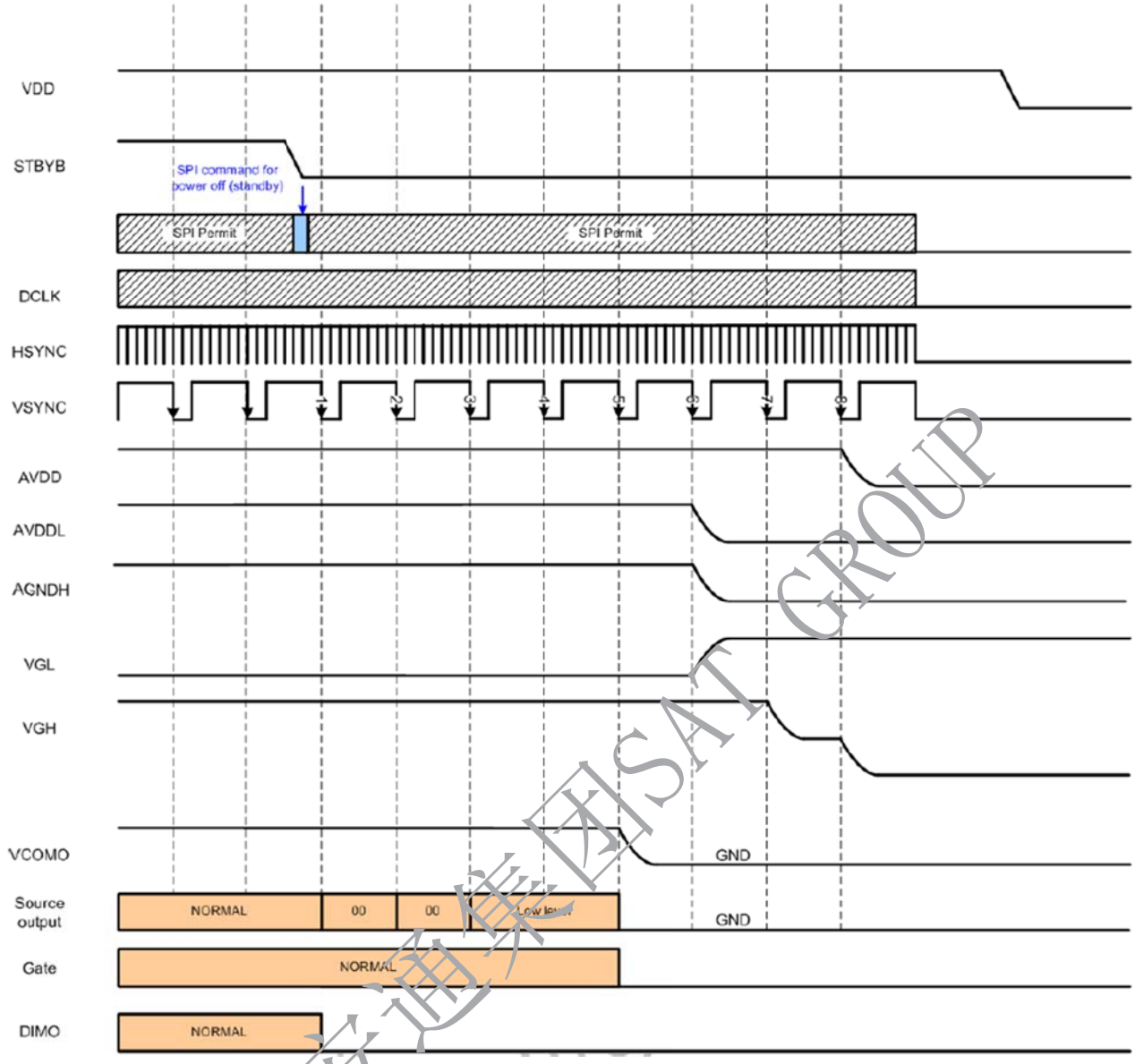
To prevent the device damage from latch up, the power on/off sequence shown below must be followed.

Power on: VDD, GND → AVDD, AGND → V1 to V14

Power off: V1 to V14 → AVDD, AGND→ VDD, GND



Power on timing sequence



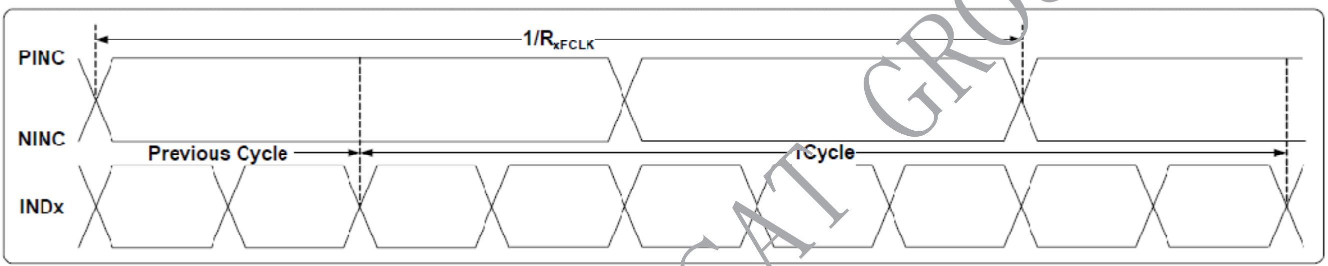
Power off timing sequence

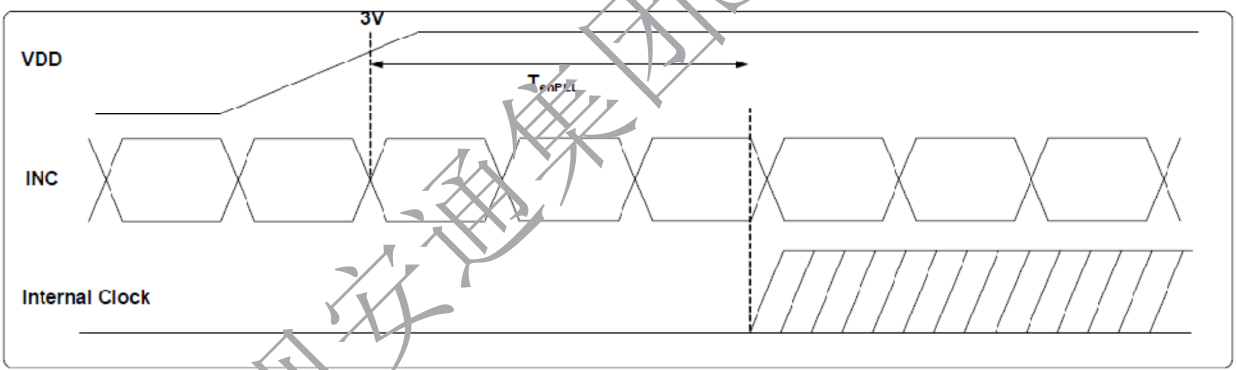
Note: Low level=3FH, when NBW=L (Normally white)
Low level=00H, when NBW=H (Normally black

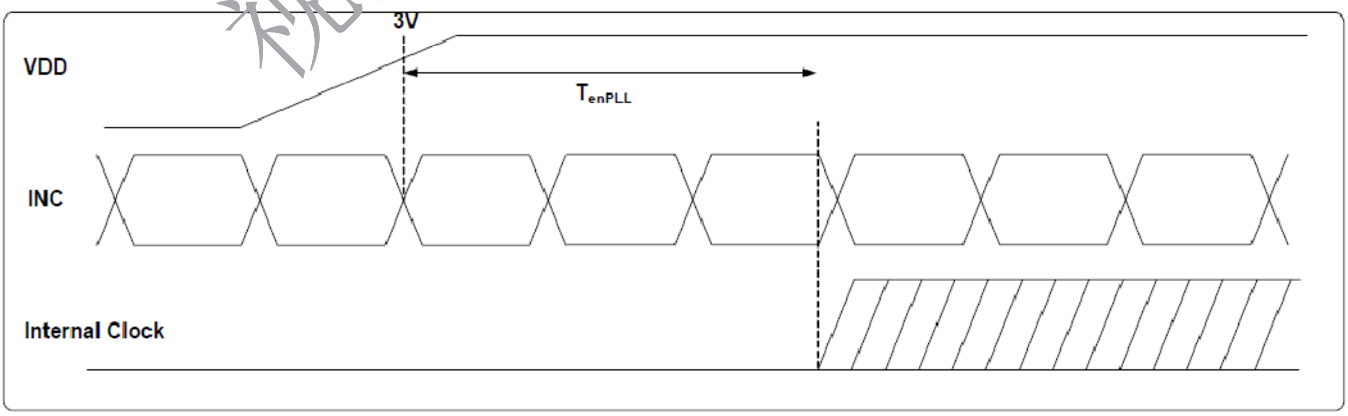
3.3. Timing Characteristics

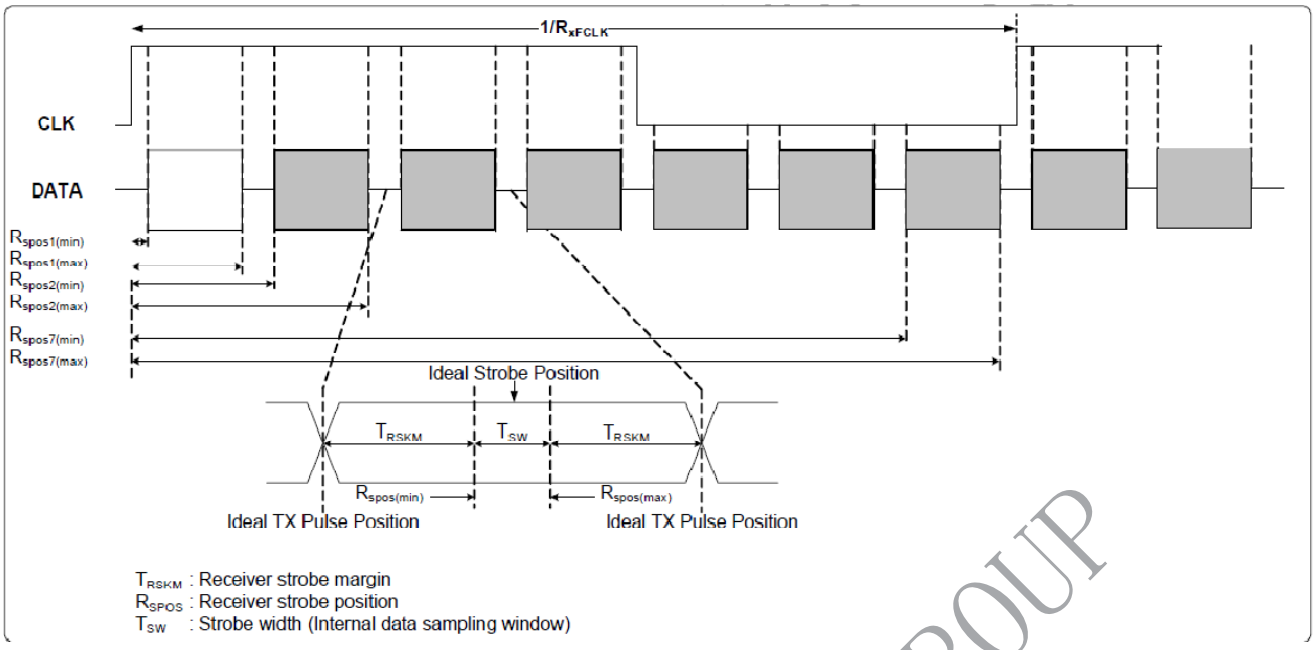
3.3. 1. LVDS mode AC electrical characteristics

Parameter	Symbol	Spec.			Unit	Condition
		Min.	Typ.	Max.		
Clock frequency	RXFCLK	20	-	71	MHz	-
Input data skew margin	TRSKM	500	-	-	pS	| VID |=400mV RXVCM =1.2V RXFCLK =71MHz
Clock high time	TLVCH	-	4/(7* RXFCLK)	-	ns	-
Clock low time	TLVCL	-	3/(7* RXFCLK)	-	ns	-
PLL wake-up time	TemPLL	-	-	150	μs	-





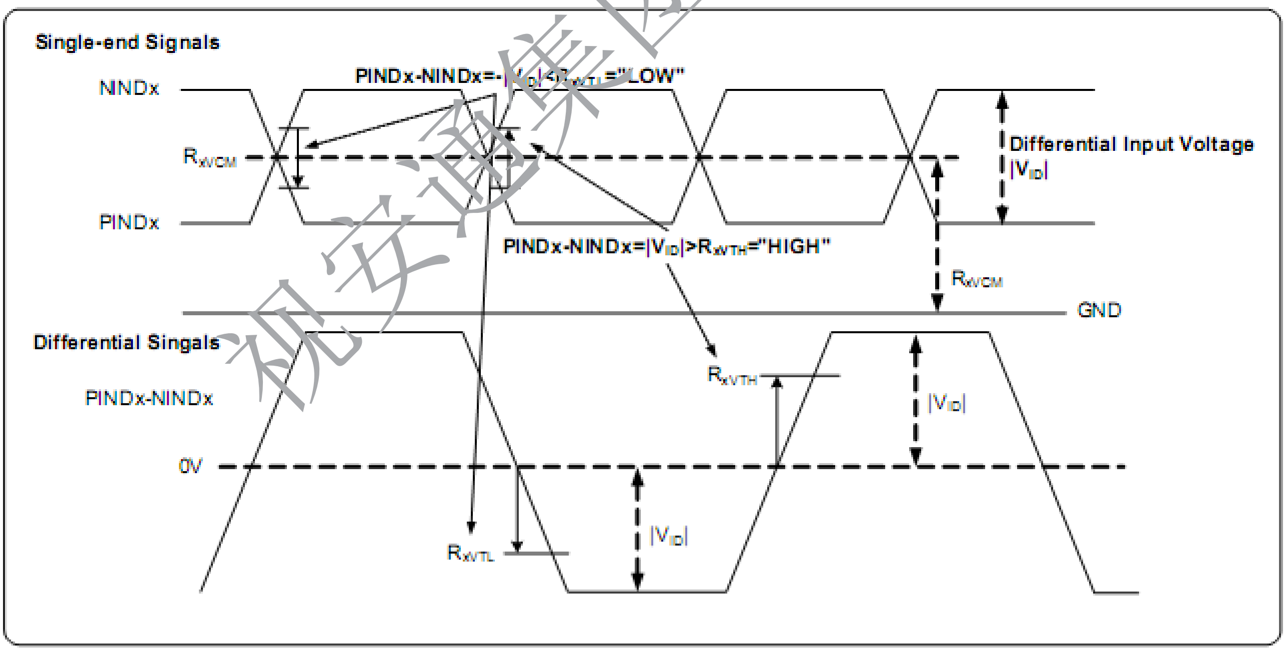




LVDS figure

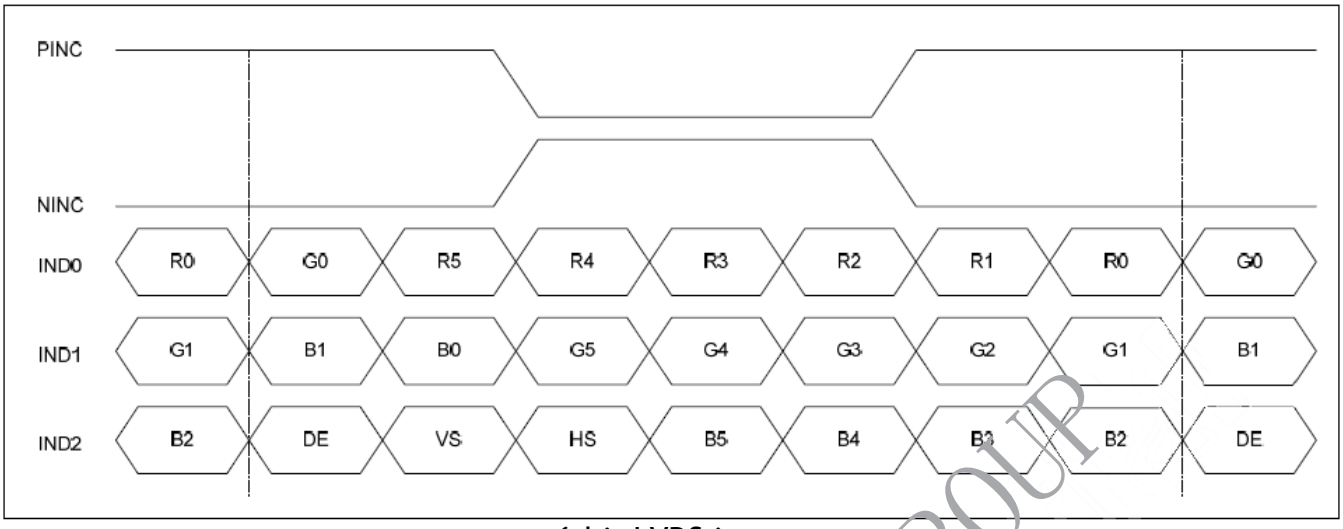
3.3.2.LVDS mode DC electrical characteristics

Parameter	Symbol	Spec.			Unit	Condition
		Min.	Typ.	Max.		
Differential input high Threshold voltage	RXVTH	-	-	+0.1	V	RXVCM=1.2V
Differential input low threshold voltage	RXVTL	-0.1	-	-	V	
Input voltage range (singled-end)	RXVIN	0	-	VDD-1.2+ ∣VID∣/2	V	-
Differential input common Mode voltage	RXVCM	∣VID∣/2	-	VDD-1.2	V	-
Differential input voltage	∣ VID ∣	0.2	-	0.6	V	-
Differential input leakage Current	RVXliz	-10	-	+10	μA	-
LVDS Digital Operating Current	Iddlvds	-	15	30	mA	Fclk=65MHz, VDD=3.3V
LVDS Digital Stand-by Current	Istlvds	-	10	50	μA	Clock & all Functions are stopped

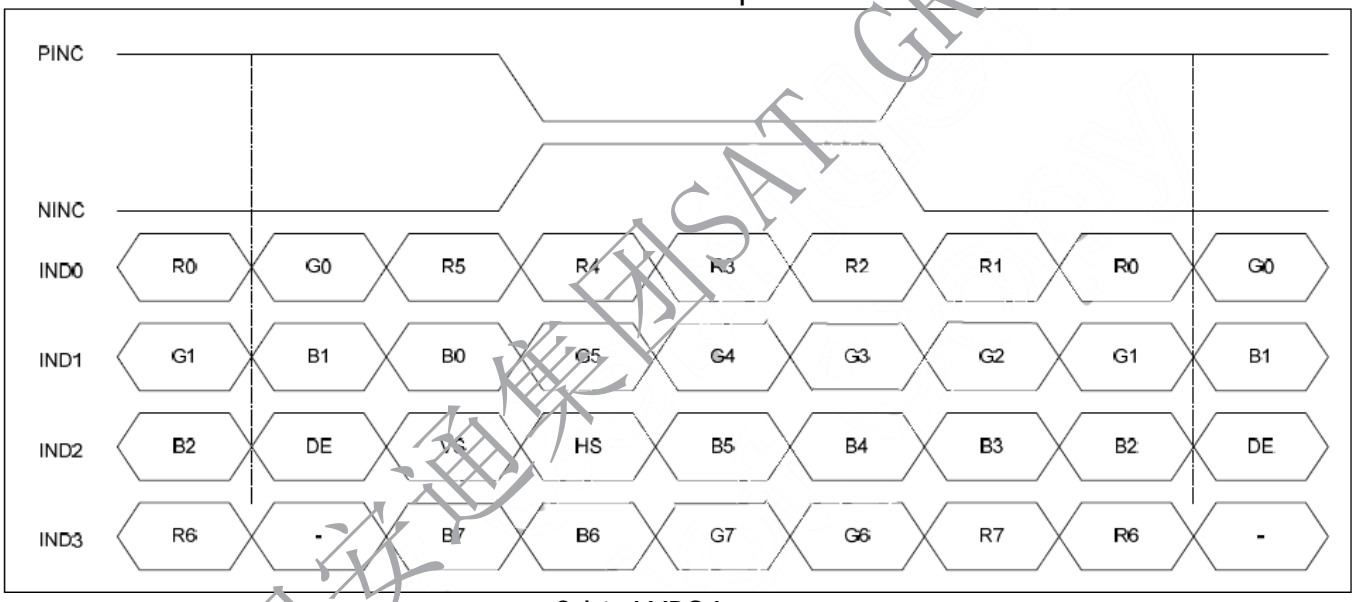


3.4. Data Input Format

3.4.1 LVDS mode data input format



6-bit LVDS input



8-bit LVDS Input

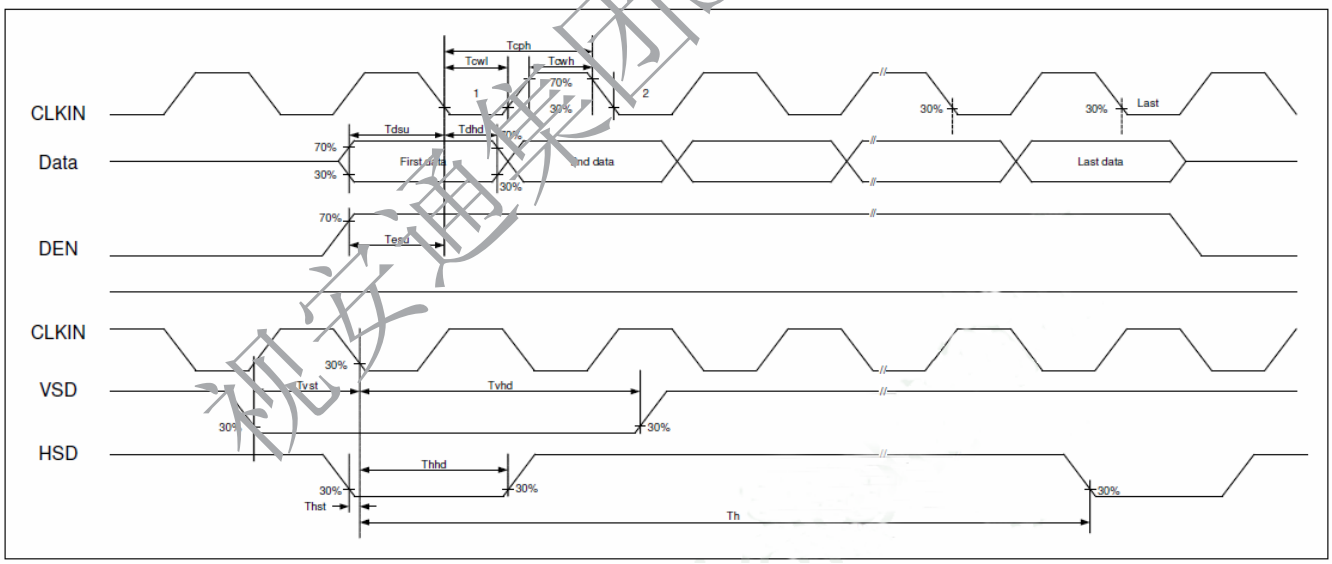
3.5. Parallel RGB Input Timing TABLE

3.5.1DE mode

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
DCLK Frequency	fclk	40.8	51.2	67.2	MHz
Horizontal Display Area	thd		1024		DCLK
HSD Period	th	1114	1344	1400	DCLK
HSD Blanking	thb+ thfp	90	320	376	DCLK
Vertical Display Area	tvd		600		TH
VSD Period	tv	610	635	800	TH
VSD Blanking	tvbp+ tvfp	10	35	200	TH

3.6. Timing Diagram

3.6.1Input Clock and Data Timing Diagram



4. Optical Specifications

Item		Symbol	Condition	Min	Typ	Max	Unit	Remark
View Angles		θT	CR≧10	15	20	--	Degree	Note1
		θB		40	45	--		
		θL		40	45	--		
		θR		40	45	--		
Contrast Ratio		CR	θ=0°	400	450	--		Note4
Response Time		$T_{ON}+T_{OFF}$	25℃	--	8	--	ms	Note3
Chromaticity	White	x	Backlight is on	0.252	0.282	0.312		Note2 Note5 Note6
		y		0.292	0.321	0.352		
	Red	x		0.547	0.577	0.607		
		y		0.310	0.340	0.370		
	Green	x		0.285	0.315	0.345		
		y		0.588	0.618	0.648		
	Blue	x		0.119	0.149	0.179		
		y		0.094	0.124	0.154		
Uniformity		U		70	75	--	%	Note7
NTSC				--	52	--	%	
Luminance		L		220	270	--	cd/m²	Note6

Test Conditions:

1. DV_{DD}=3.3V, I_L = 240mA(Backlight current),the ambient temperature is 25℃.
2. The test systems refer to Note 2.

5. Reliability Test Items

(Note3)

Item	Test Conditions	Remark
High Temperature Storage	Ta =60 ℃ 240hrs	Note 1，Note 4
Low Temperature Storage	Ta = -30℃ 240hrs	Note 1，Note 4
High Temperature Operation	Ts = 55 ℃ 240hrs	Note 2，Note 4
Low Temperature Operation	Ta = -20℃ 240hrs	Note 1，Note 4
Operate at High Temperature and Humidity	+60℃, 90%RH 240hrs	Note 4
Thermal Shock	-30℃/30 min ~ +80℃/30 min for a total 100 cycles, Start with cold temperature and end with high temperature.	Note 4
Vibration Test	Frequency range:10~55Hz Stroke:1.5mm Sweep:10Hz~55Hz~10Hz 2 hours for each direction of X. Y. Z. (6 hours for total)	
Mechanical Shock	100G 6ms,±X, ±Y, ±Z 3 times for each direction	
Package Vibration Test	Random Vibration : 0.015G*G/Hz from 5-200HZ, -6dB/Octave from 200-500HZ 2 hours for each direction of X. Y. Z. (6 hours for total)	
Package Drop Test	Height:60 cm 1 corner, 3 edges, 6 surfaces	
Electro Static Discharge Test (non-operation)	Contact:±4KV,Air:±8KV 200pF，0 ，±200V contact test	

Note 1: Ta is the ambient temperature of samples.
Note 2: Ts is the temperature of panel's surface.
Note 3: In the standard condition, there shall be no practical problem that may affect the display function. After the reliability test, the product only guarantees operation, but don't guarantee all of the cosmetic specification.
Note 4: Before cosmetic and function test, the product must have enough recovery time, at least 2 hours at room temperature.

6. General Precautions

6.1. Safety

Liquid crystal is poisonous. Do not put it in your mouth. If liquid crystal touches your skin or clothes, wash it off immediately by using soap and water.

6.2. Handling

1. The LCD panel is plate glass. Do not subject the panel to mechanical shock or to excessive force on its surface.
2. The polarizer attached to the display is easily damaged. Please handle it carefully to avoid scratch or other damages.
3. To avoid contamination on the display surface, do not touch the module surface with bare hands.
4. Keep a space so that the LCD panels do not touch other components.
5. Put cover board such as acrylic board on the surface of LCD panel to protect panel from damages.
6. Transparent electrodes may be disconnected if you use the LCD panel under environmental conditions where the condensation of dew occurs.
7. Do not leave module in direct sunlight to avoid malfunction of the ICs.

6.3. Static Electricity

1. Be sure to ground module before turning on power or operating module.
2. Do not apply voltage which exceeds the absolute maximum rating value.

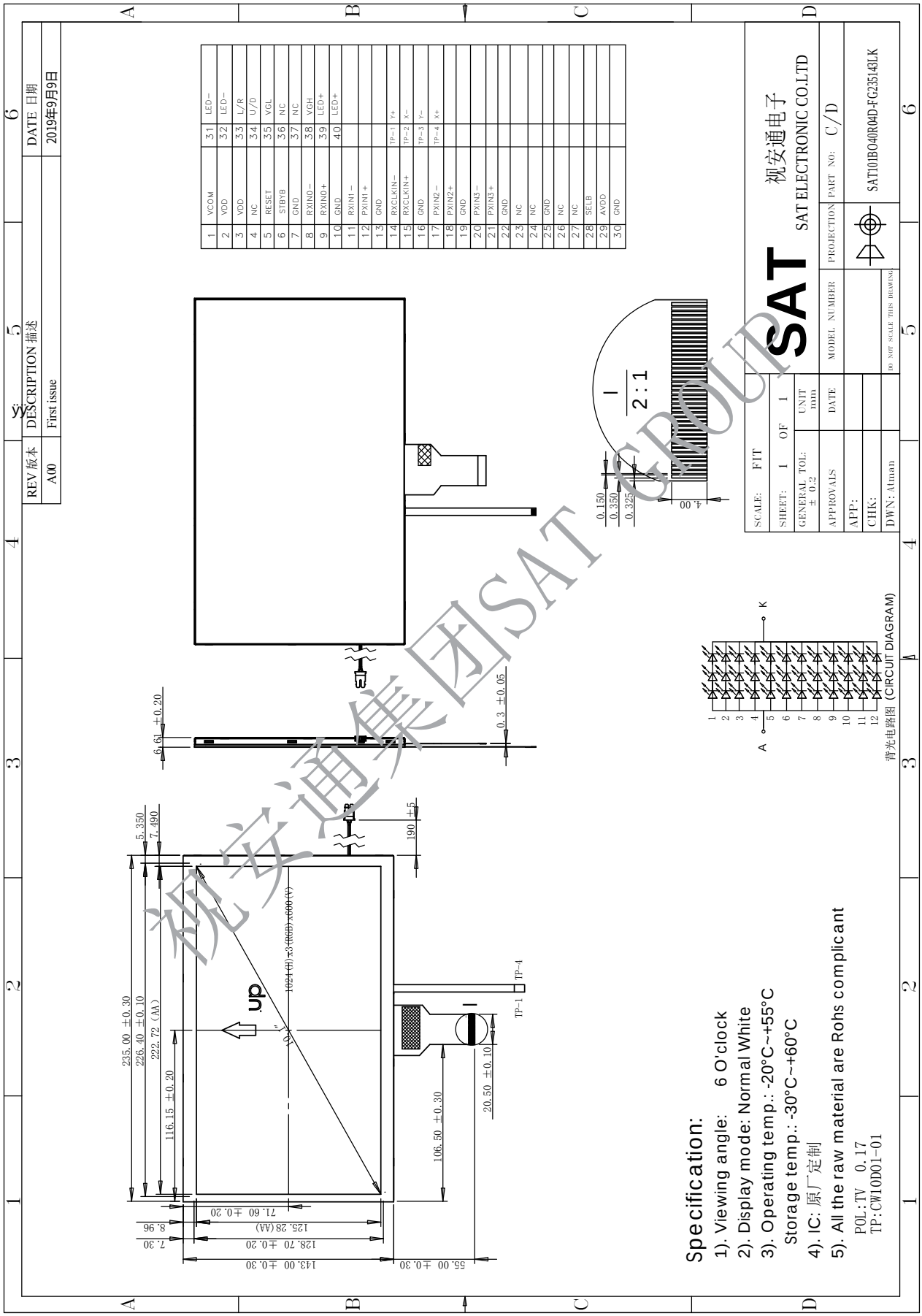
6.4. Storage

1. Store the module in a dark room where must keep at 25±10℃ and 65%RH or less.
2. Do not store the module in surroundings containing organic solvent or corrosive gas.
3. Store the module in an anti-electrostatic container or bag.

6.5. Cleaning

1. Do not wipe the polarizer with dry cloth. It might cause scratch.
2. Only use a soft sloth with IPA to wipe the polarizer, other chemicals might permanent damage to the polarizer.

7. Mechanical Drawing



8.Touch Panel Specification

8.1 Electrical Characteristics

Item	Value			Unit	Remark
	Min.	Typ.	Max.		
Lineanty	-1.5	-	+1.5	%	Afterenvinronment andlifelest
TerminalResistance	200	-	450	Ω	X(Glassside)
	500	-	900	Ω	Y(Glassside)
Insulation Resistance	20	-	-	MΩ	DC25V1min
OperatingVoltage	-	5	-	V	DC

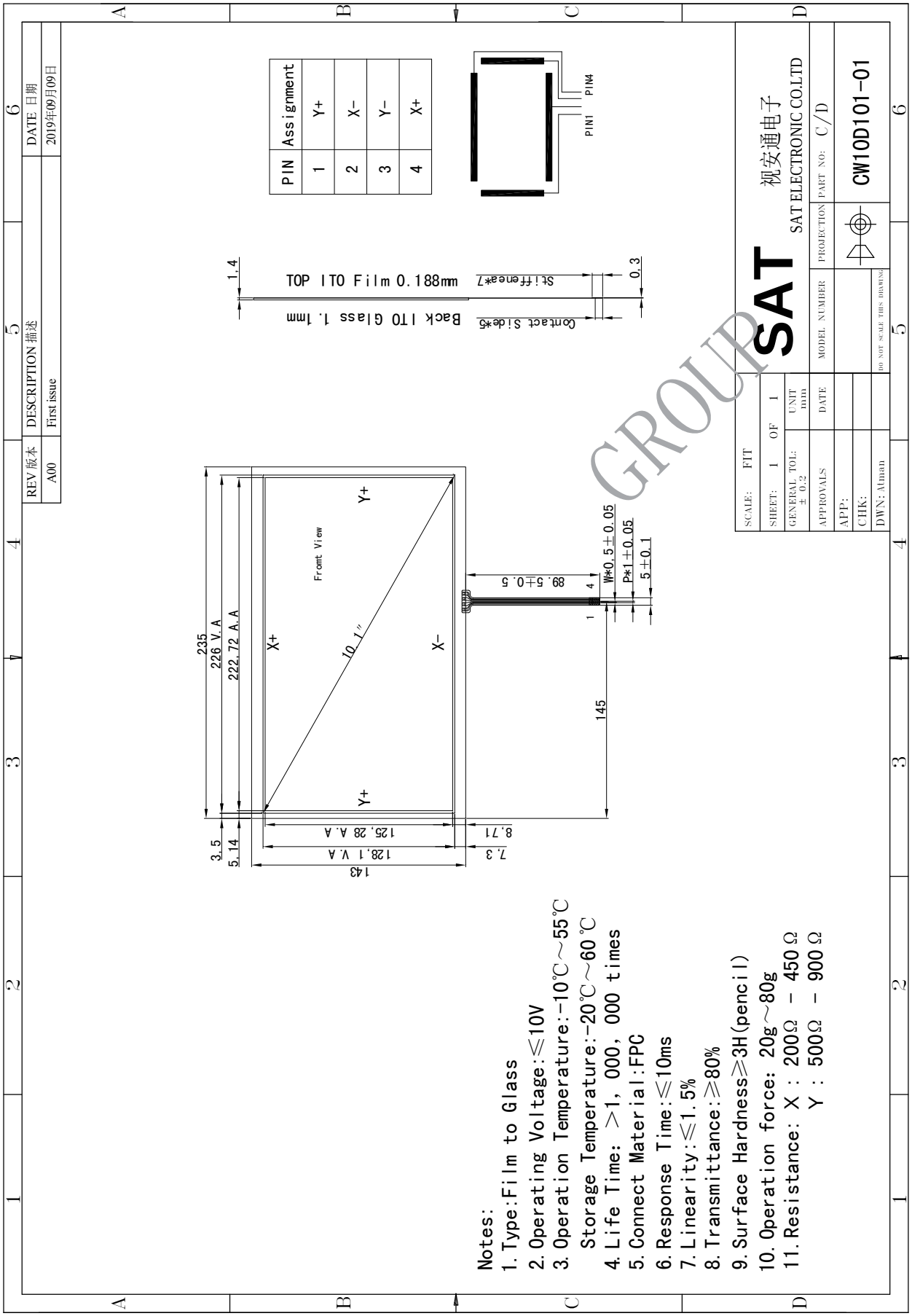
8.2 Optical Characteristcs

Item	Value			Unit	Remark
	Min.	Typ.	Max.		
ResponseTime	-	-	10	ms	100KΩ pull-up
LightTransparency	80	-	-	%	-

8.3 Mechanical Characteristics

Item	Value			Unit	Remark
	Min.	Typ.	Max.		
ActiveForce	20	-	80	g	
SurfaceHardness	3	-	-	H	
PenSlidingDurability	100.000	-	-	time	
HittingDurability	1.000.000	-	-	time	

8.4 Mechanical Drawing



9. Package Drawing