# SPECIFICATION

**Customer:** _____

**Model Name:** SAT101CP40D36B1-50143L058KN

**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 | 2015/08/05 | | Initial Release |

# Contents

1. General Specifications ..... 4
2. Pin Assignment ..... 5
3. Operation Specifications ..... 7
3.1. Absolute Maximum Rating ..... 7
3.1.1. Typical Operation Conditions ..... 8
3.1.2. Current Consumption ..... 8
3.1.3. Backlight Driving Conditions ..... 9
3.2. Power Sequence ..... 10
3.3. Timing Characteristics ..... 12
3.3.1.LVDS mode AC electrical characteristics ..... 12
3.3.2.LVDS mode DC elec trical characteristics ..... 14
3.4. Data Input Format ..... 15
3.5. Parallel RGB Input Timing TABLE ..... 16
3.6. Timing Diagram ..... 16
4. Optical Specifications ..... 17
5. Mechanical Drawing ..... 18

# 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 5.0(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<br>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



I: input, O: output, P: Power

# 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 | 70 | ℃ | |
| Storage Temperature | $T_{ST}$ | -30 | 80 | ℃ | |

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 | |
| | $AV_{DD}$ | 9.40 | 9.60 | 9.80 | V | |
| | $V_{GH}$ | 17 | 18 | 19 | V | |
| | $V_{GL}$ | -6.6 | -6.0 | -5.4 | V | |
| Input signal voltage | $V_{COM}$ | 3.8 | 4.0 | 4.2 | 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.

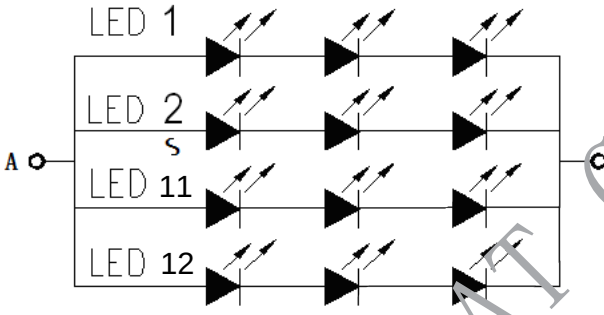


### 3.1.2. Current Consumption

| Item | Symbol | Values | | | Unit | Remark |
|---|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | | |
| Current for Driver | $I_{GH}$ | - | 0.5 | 5.5 | mA | $V_{GH}$ =18V |
| | $I_{GL}$ | - | 4.8 | 9.8 | mA | $V_{GL}$ =-6.0V |
| | $IDV_{DD}$ | - | 17.9 | 22.9 | mA | $V_{DD}$ =3.3V |
| | $IAV_{DD}$ | - | 29.1 | 34.1 | mA | $AV_{DD}$ =9.60V |

### 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 |
| CurrentforLEDbacklight | IL | 180 | 240 | 300 | mA | |
| Luminance (on the module surface,BM-7) | | 230 | 280 | - | Lux | |
| LED life time | - | 50,000 | - | - | Hr | Note 2 |

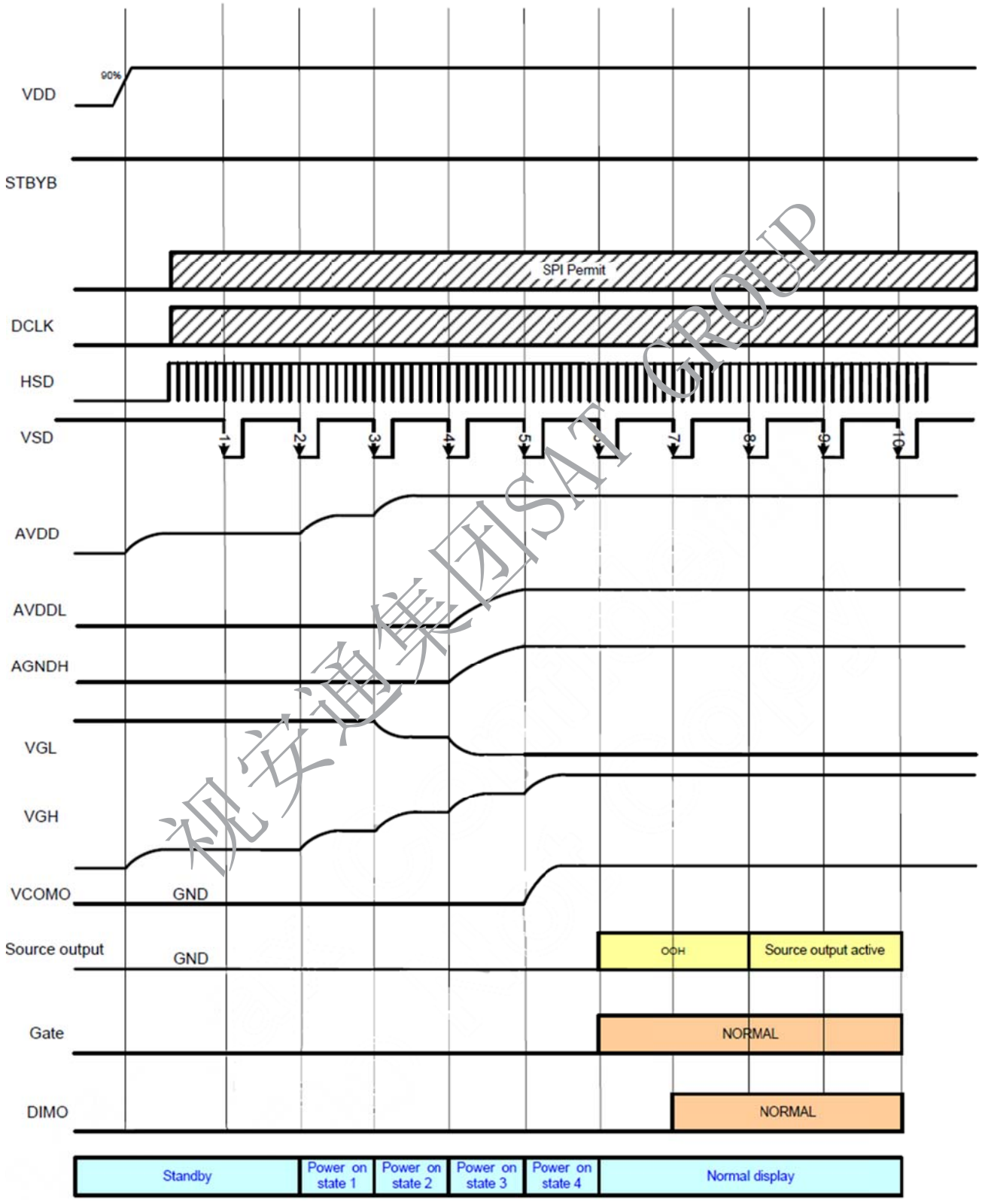


## 3.2. Power Sequence

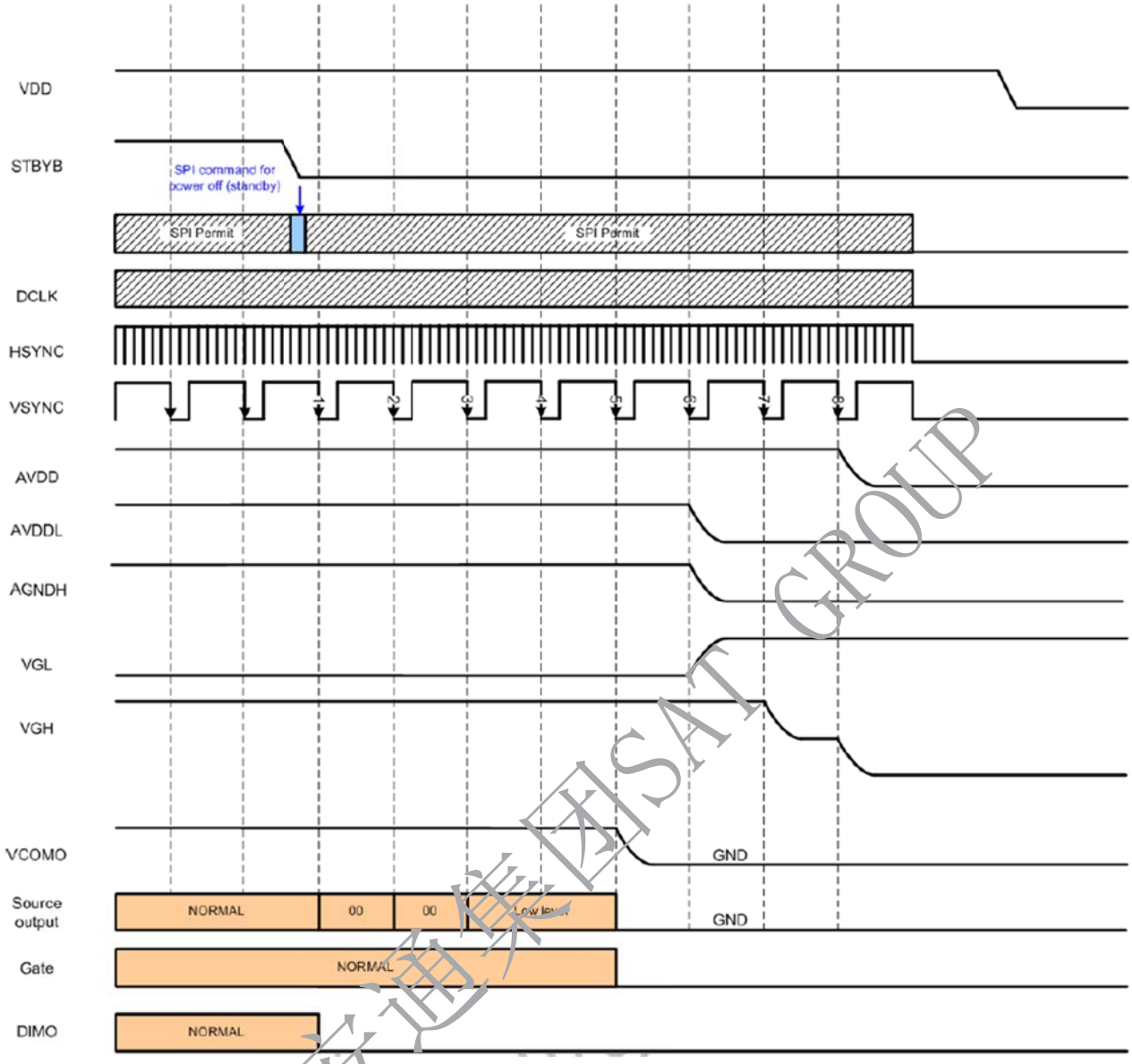
To prevent the device damage from latch up, the power on/off sequence shown below must be followed.

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

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




Power on timing sequence



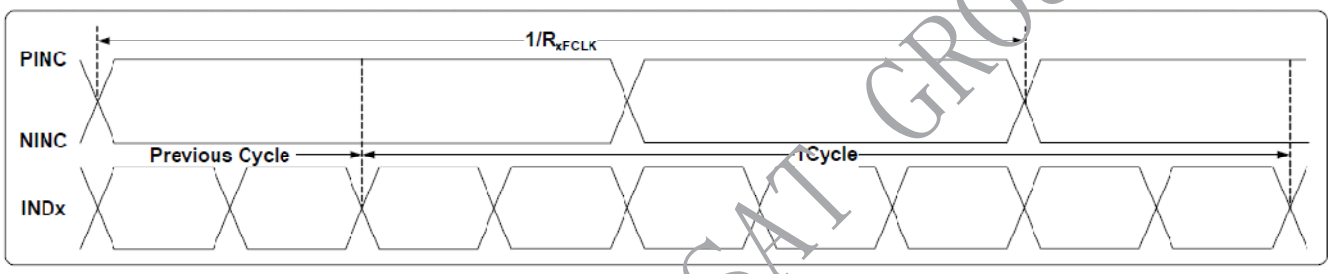

Power off timing sequence

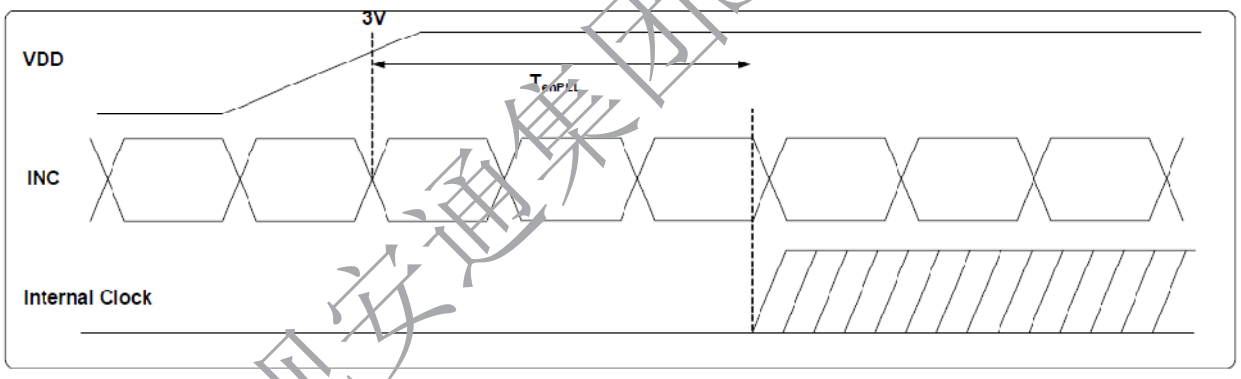
Note: Low level=3FH, when NBW=L (Normally white)
Low level=00H, when NBW=H (Normally black

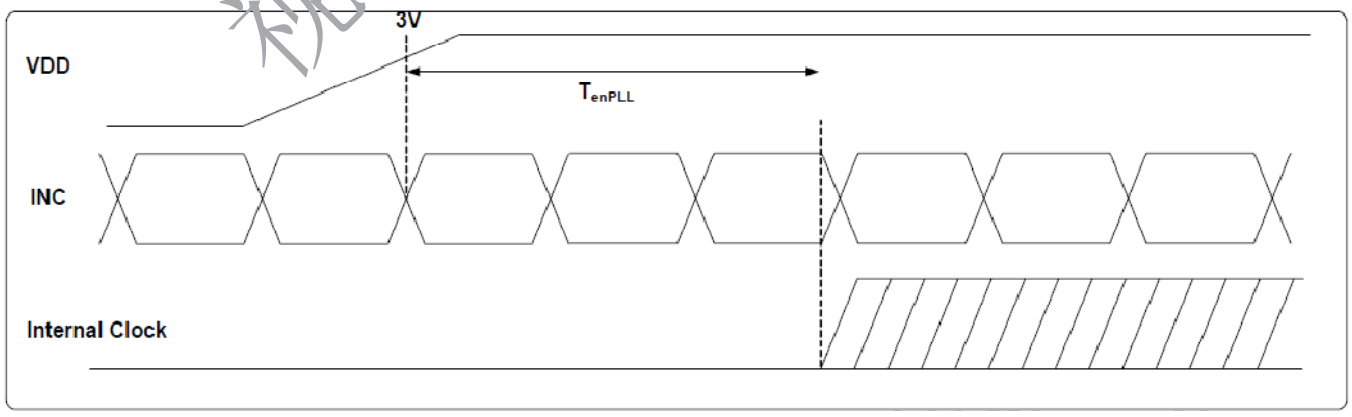
## 3.3. Timing Characteristics

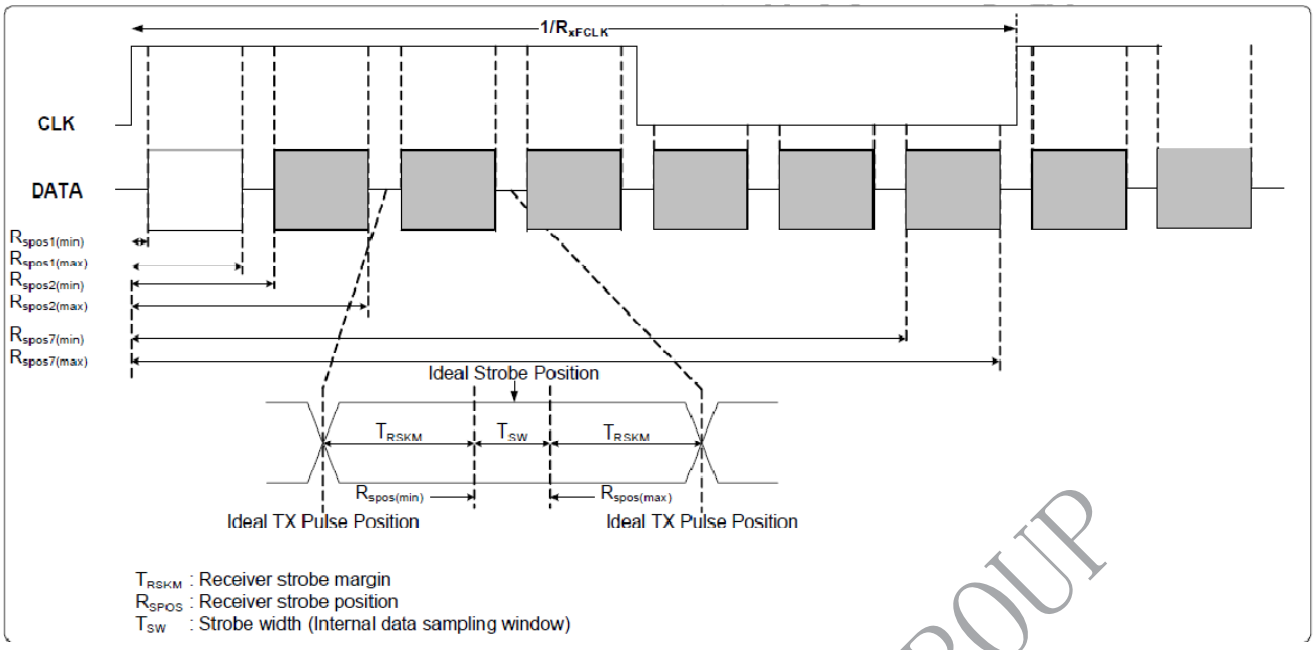
### 3.3. 1. LVDS mode AC electrical characteristics

| Parameter | Symbol | Spec. | | | Unit | Condition |
|---|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | | |
| Clock frequency | RXFCLK | 20 | - | 71 | MHz | - |
| Input data skew margin | TRSKM | 500 | - | - | pS | \| VID \|=400mV<br>RXVCM =1.2V<br>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 | - |



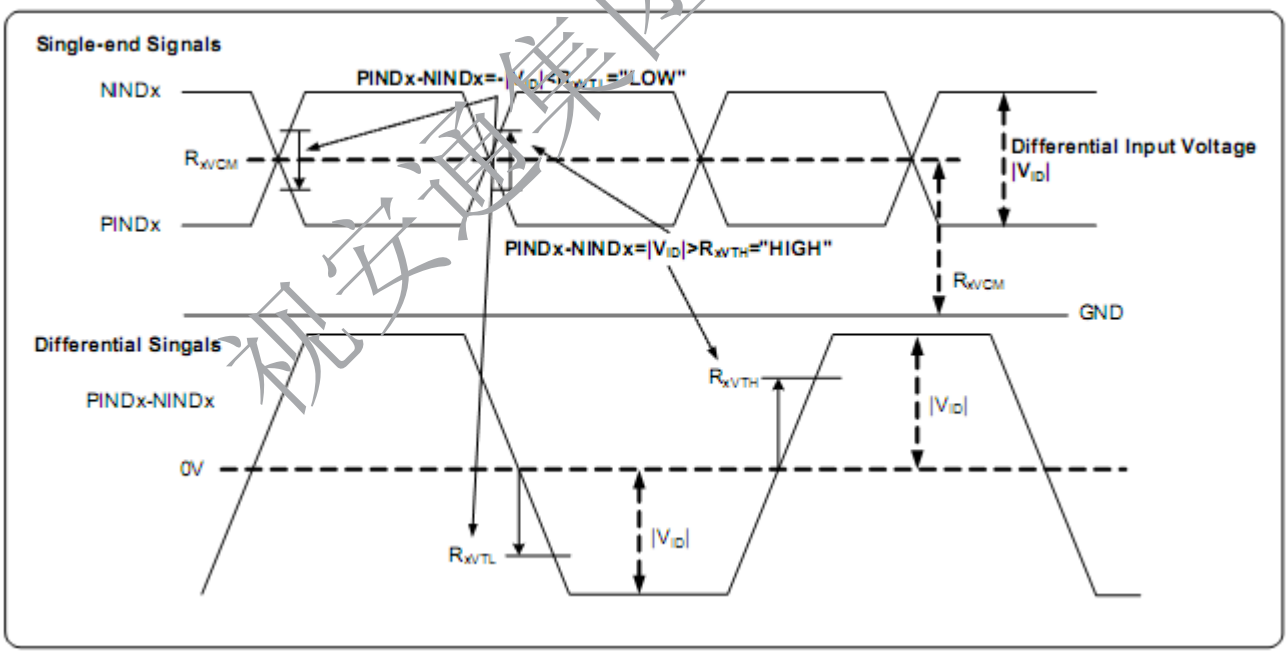






LVDS figure

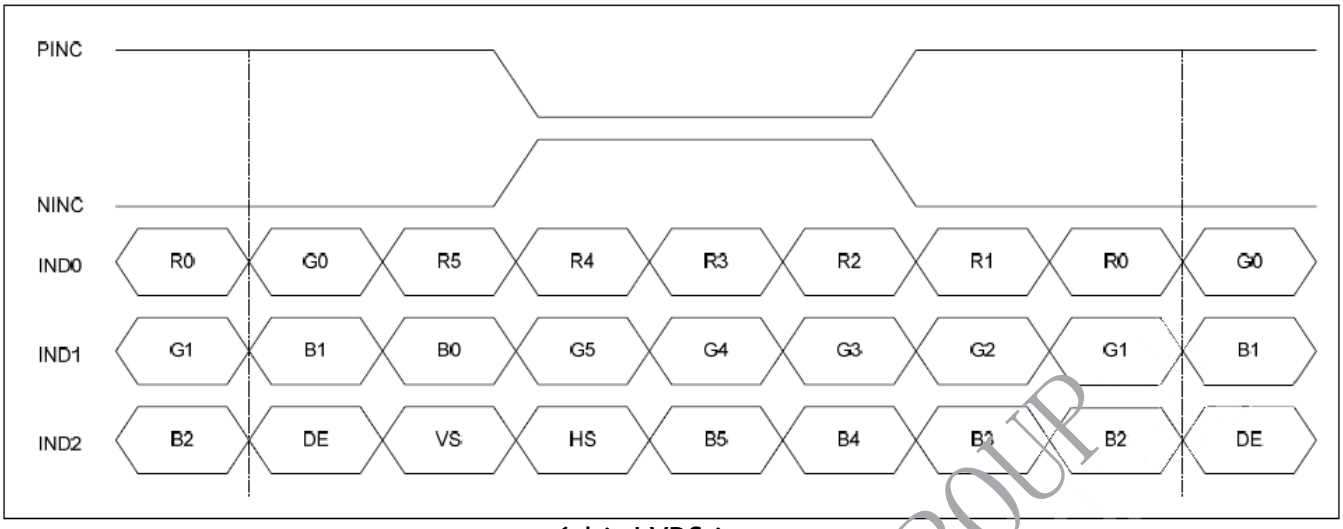
### 3.3.2.LVDS mode DC electrical characteristics

| 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 | lddlvds | - | 15 | 30 | mA | Fclk=65MHz, VDD=3.3V |
| LVDS Digital Stand-by Current | lstlvds | - | 10 | 50 | μA | Clock & all Functions are stopped |

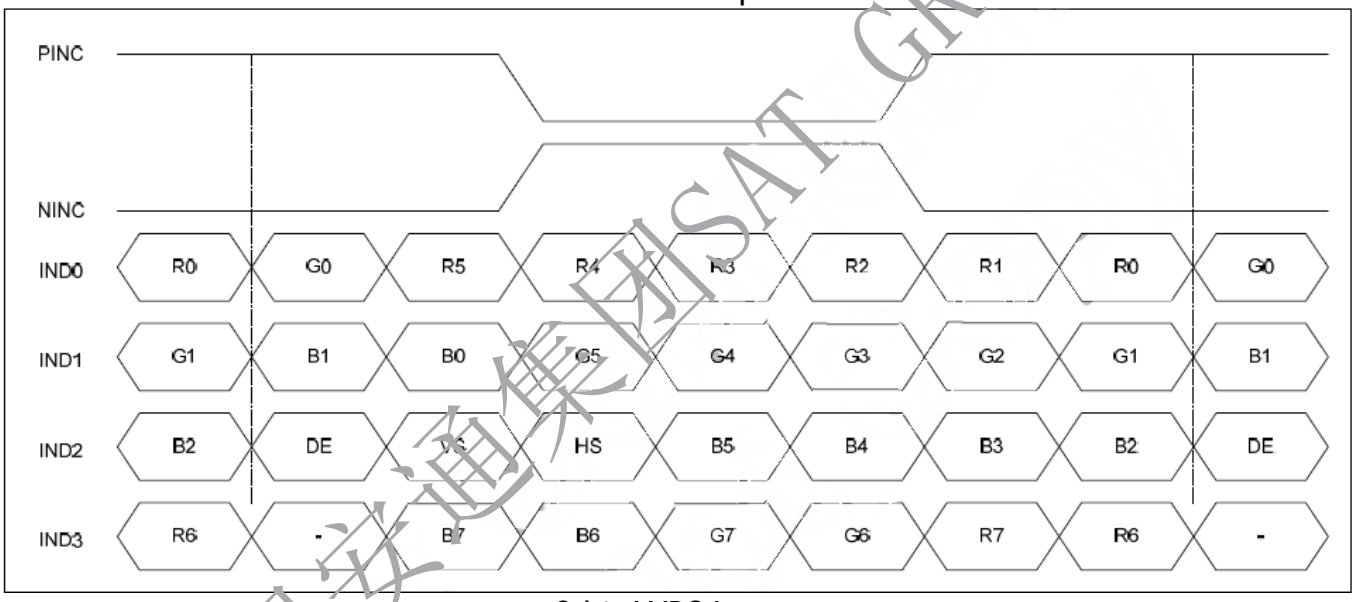


## 3.4. Data Input Format

### 3.4.1 LVDS mode data input format




6-bit LVDS input




8-bit LVDS Input

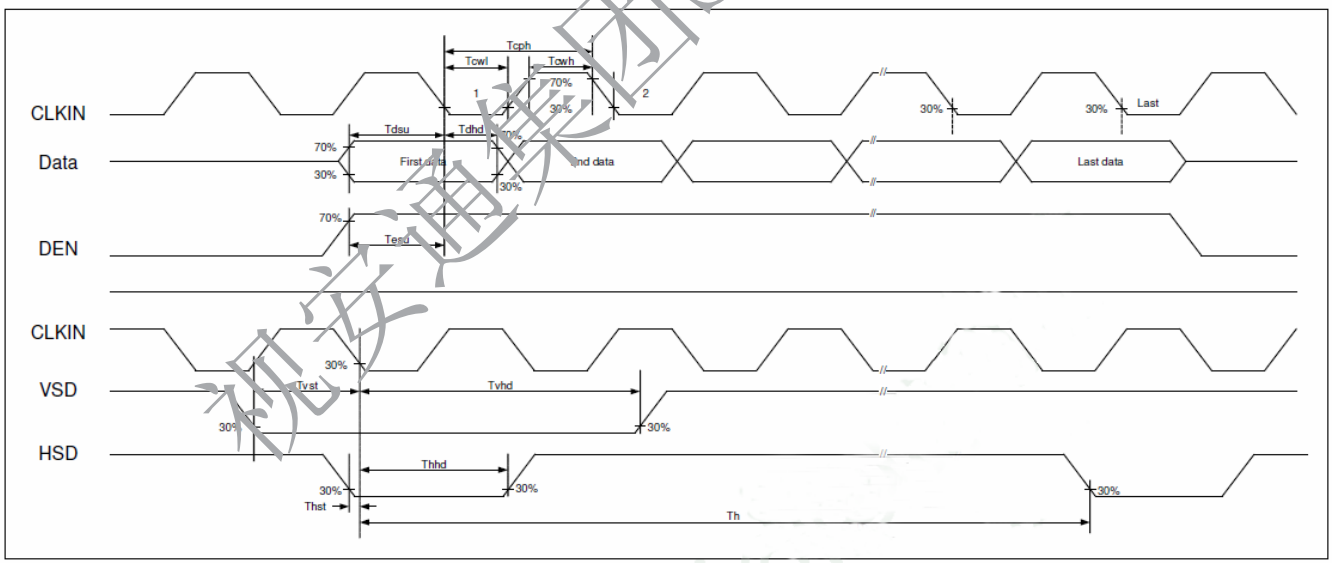
## 3.5. Parallel RGB Input Timing TABLE

### 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 | 60 | 70 | -- | Degree | Note1 |
| | | θB | | 40 | 50 | -- | | |
| | | θL | | 60 | 70 | -- | | |
| | | θR | | 60 | 70 | -- | | |
| Contrast Ratio | | CR | θ=0° | 500 | 600 | -- | | Note4 |
| Response Time | | $T_{ON}+T_{OFF}$ | 25℃ | -- | 8 | -- | ms | Note3 |
| Chromaticity | White | x | Backlight is on | 0.253 | 0.293 | 0.333 | | Note2<br>Note5<br>Note6 |
| | | y | | 0.295 | 0.335 | 0.375 | | |
| | Red | x | | 0.550 | 0.590 | 0.630 | | |
| | | y | | 0.300 | 0.340 | 0.380 | | |
| | Green | x | | 0.301 | 0.341 | 0.381 | | |
| | | y | | 0.554 | 0.594 | 0.634 | | |
| | Blue | x | | 0.117 | 0.157 | 0.197 | | |
| | | y | | 0.075 | 0.115 | 0.155 | | |
| Uniformity | | U | | 70 | 80 | -- | % | Note7 |
| NTSC | | | | -- | 50 | -- | % | |
| Luminance | | L | | 230 | 280 | -- | Lux | 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. Mechanical Drawing