⊙ Tentative Specification
✓ Preliminary Specification
⊙ Specification Approval

# Specification For SID 10.30" BW EPD

# Model Name: JS1030N02-MNG-A0

# Version:V0.1

| SID | PREPARED BY | CHECKED BY | APPROVED BY |
|---|---|---|---|
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| | SIGNATURE | | DATE |
|---|---|---|---|
| CUSTOMER APPROVAL | | | |
| | Notes: | | |

**Notes :**

1、Please contact SID before assigning your product based on this module specification.

2、To improve the quality of product, and this product specification is subject to change without any notice.

# REVISION RECORD

| Rev No. | Rev date | Contents | Remarks |
|---------|----------|----------|---------|
| 0.1 | 20220601 | First release | Preliminary |
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# CONTENTS

# 1  General Description

SE1030N02-A0 is an Active Matrix Electrophoretic Display, with integrated circuits including source and gate drivers, can be used in portable electronic devices, such as E-book Reader. It has 10.3inch active area with 1680 x 2240 pixels, the module is capable to display white/black images at 2-16 gray levels(1-4 bits).

# 2  Features

◆ 1680 x 2240 display

◆ High contrast reflective / electrophoretic technology

◆ Wide viewing angle

◆ Ultra low power consumption

◆ Reflective mode

◆ Bi -stable display

◆ Commercial temperature range

◆ Landscape, portrait modes

# 3 Pin Assignment

| No. | Pin Name | Description |
|---|---|---|
| 1 | VGL | Negative power supply gate driver |
| 2 | NC | NO Connection |
| 3 | VGH | Positive power supply gate driver |
| 4 | NC | NO Connection |
| 5 | VDD | Digital power supply drivers |
| 6 | MODE | Output mode selection gate driver |
| 7 | CKV | Clock gate driver |
| 8 | SPV | Start pulse gate driver |
| 9 | VSS | Ground |
| 10 | VCOM | Common voltage connection |
| 11 | VDD | Digital power supply drivers |
| 12 | VSS | Ground |
| 13 | CLK | Clock source driver |
| 14 | D0 | Data signal source driver |
| 15 | D1 | Data signal source driver |
| 16 | D2 | Data signal source driver |
| 17 | D3 | Data signal source driver |
| 18 | D4 | Data signal source driver |
| 19 | D5 | Data signal source driver |
| 20 | D6 | Data signal source driver |
| 21 | D7 | Data signal source driver |
| 22 | VSS | Ground |
| 23 | D8 | Data signal source driver |
| 24 | D9 | Data signal source driver |
| 25 | D10 | Data signal source driver |
| 26 | D11 | Data signal source driver |
| 27 | D12 | Data signal source driver |
| 28 | D13 | Data signal source driver |
| 29 | D14 | Data signal source driver |
| 30 | D15 | Data signal source driver |
| 31 | SPH | Start pulse source driver |
| 32 | LE | Latch enable source driver |
| 33 | OE | Output enable source driver |
| 34 | NC | NO Connection |
| 35 | NC | NO Connection |
| 36 | VPOS | Positive power supply source driver |
| 37 | NC | NO Connection |
| 38 | VNEG | Negative power supply source driver |
| 39 | NC | NO Connection |
| 40 | VBORDER | Border connection |

# 4 Electrical Characteristics

## 4.1 Module DC Characteristics

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Signal ground | VSS | | - | 0 | - | V |
| Logic Voltage supply | VDD | | 3.0 | 3.3 | 3.6 | V |
| | IVDD | VDD=3.3V | - | TBD | TBD | mA |
| Gate Positive supply | VGH | | 27 | 28 | 29 | V |
| | IVGH | VGH=28V | - | TBD | TBD | mA |
| Gate Negative supply | VGL | | -21 | -20 | -19 | V |
| | IVGL | VGL=-20V | - | TBD | TBD | mA |
| Source Positive  supply | VPOS | | 14.6 | 15 | 15.4 | V |
| | IPOS | VPOS=15V | - | TBD | TBD | mA |
| Source Negative supply | VNEG | | -15.4 | -15 | -14.6 | V |
| | INEG | VNEG=-15V | - | TBD | TBD | mA |
| Asymmetry source | VASYM | VPOS+VNEG | -800 | 0 | 800 | mV |
| Common voltage | VCOM | | -2.5 | Adjusted | -1.5 | V |
| | ICOM | | - | TBD | TBD | mA |
| Standby power module | PSTBY | | - | TBD | TBD | mW |
| Typical power module | PTYP | | - | TBD | TBD | mW |
| Operating  temperature | | | 0 | | 50 | ℃ |
| Storage temperature | | | -20 | - | 70 | ℃ |
| Maximum image update time at 25℃ | | | | | 520 | 960 | ms |

Notes:

1. The maximum power and maximum current are specified for the worst case power consumption (Note 4-1).

2. The typical power is measured when "typical images" are displayed (Note 4-2).

3. The standby power is the consumed power when the module controller is in standby mode.

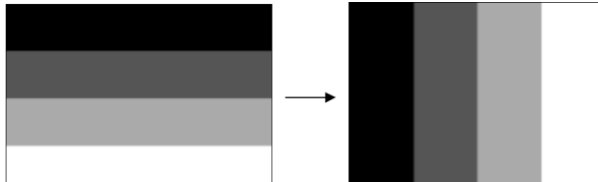4.The listed electrical/optical characteristics are only guaranteed under the controller & waveform provided by SID.

Note 4-1

The maximum power consumption
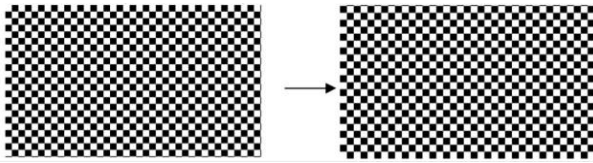
Note 4-2

The typical power consumption

## 4.2 Module AC characteristics

**Note:VDD = 3.0V to 3.6V, unless otherwise specified.**

| Parameter | Symbol | Min. | Typ. | Max. | Unit | App Pin |
|---|---|---|---|---|---|---|
| Clock frequency | fcpv | | | 200 | kHz | CPV |
| Clock CPV high time | tCPVh | 0.5 | - | - | us | |
| Clock CPV low time | tCPVl | 0.5 | - | - | us | |
| Data setup time | tSU | 100 | - | - | ns | CPVSTV |
| Data hold time | tH | 300 | - | - | ns | |
| Clock CLK cycle time | tclk | 40 | - | - | ns | Belowtable |
| D0 .. D7, SPH setup time | tsu | 8 | - | - | ns | |
| D0 .. D7, SPH hold time | th | 8 | - | - | ns | |
| LE on delay time | tLEdly | 40 | - | - | ns | |
| LE high-level pulse width | tLEw | 40 | - | - | ns | |
| LE off delay time | tLEoff | 40 | - | - | ns | |
| SHR setup time | tMsu | 100 | - | - | ns | |
| SHR hold time | tMh | 10 | - | - | ns | |

**Output Latch control signals**
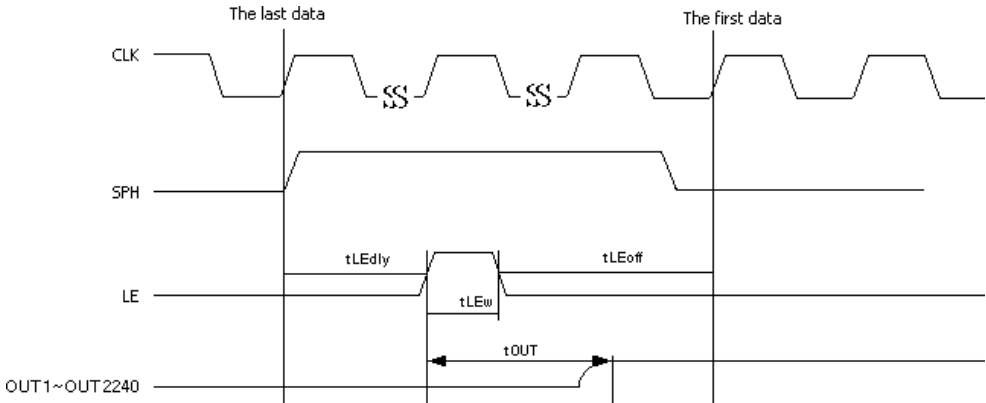


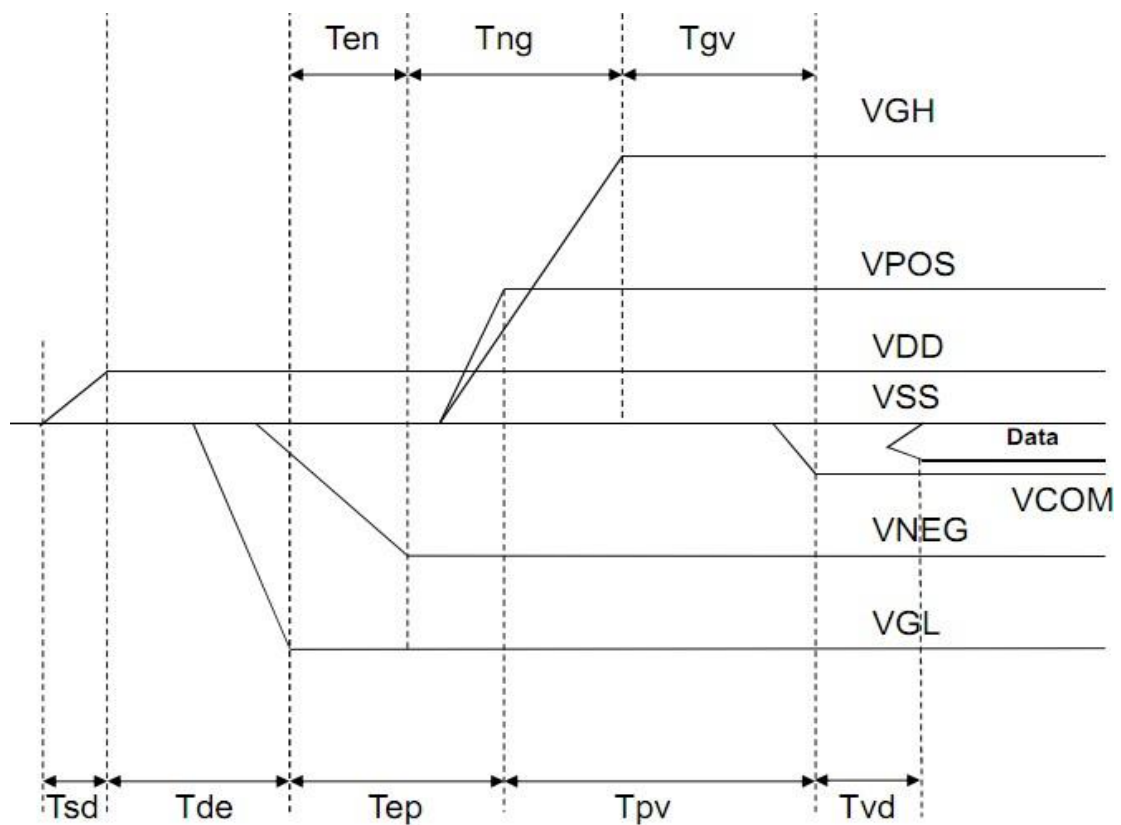**Clock & Data Timing**
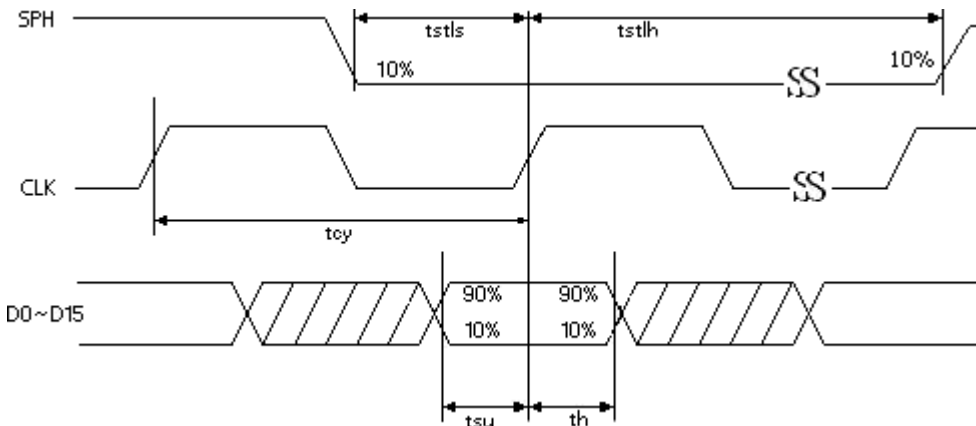


**CKV & SPV Timing**
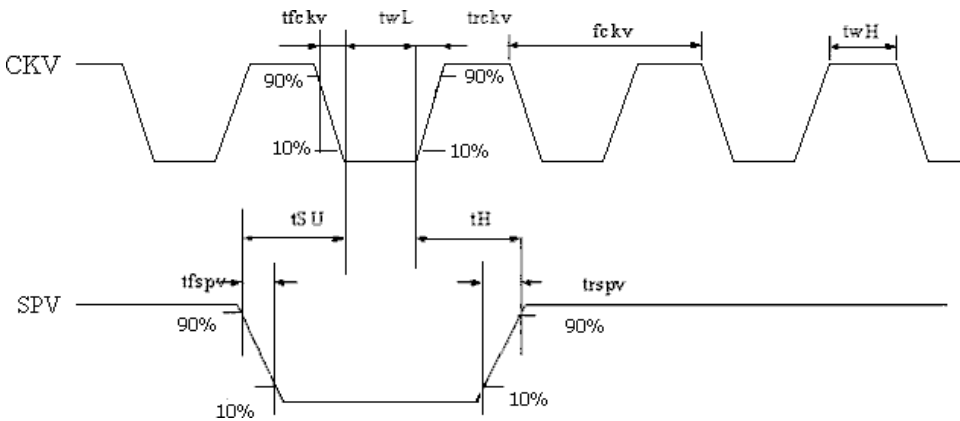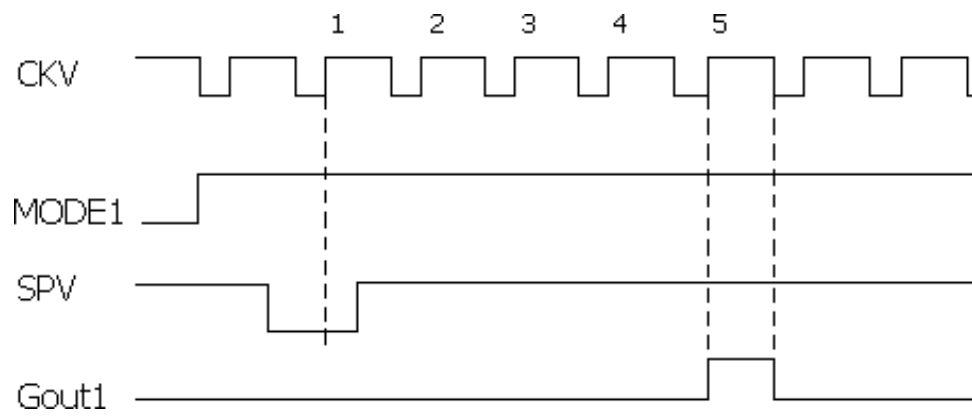
# 5 Power On/Off Sequence

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

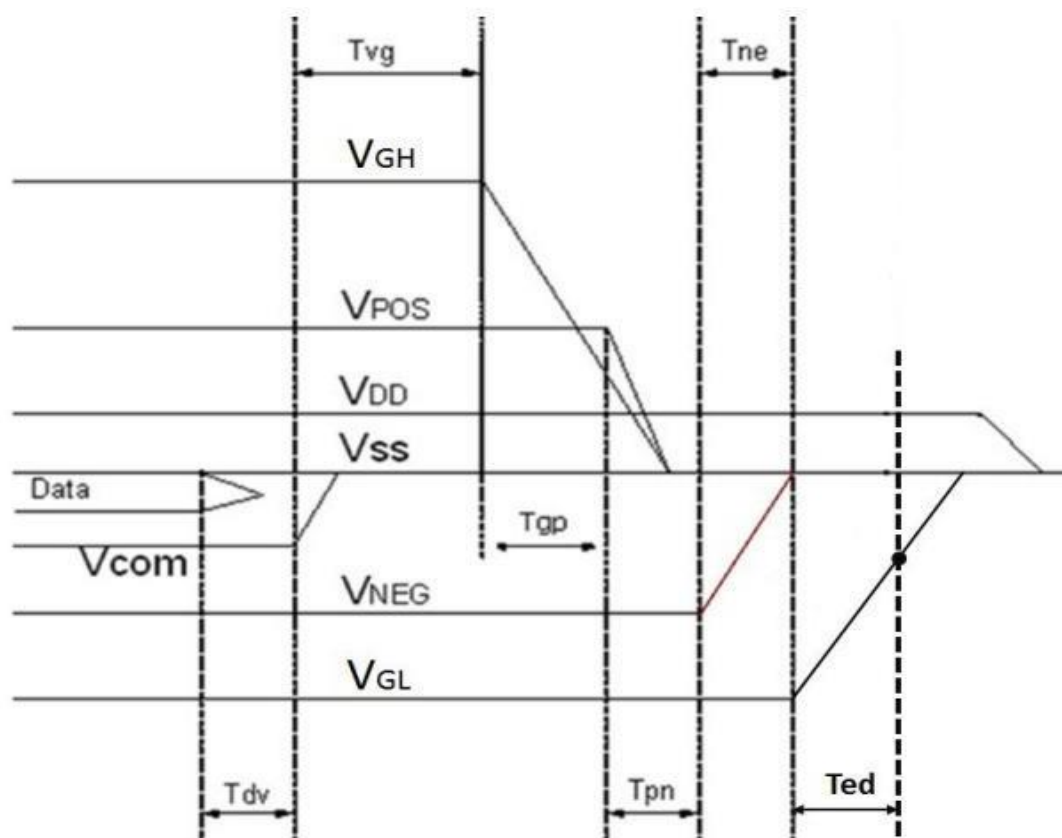When power on: VDD -> VGL -> VNEG/VGH/VPOS ->

Vcom When power off: Vcom -> VNEG/VGH/VPOS ->

VGL -> VDDPower on

| | Min | Max |
|---|---|---|
| Tsd | 30us | |
| Tde | 100us | |
| Tep | 1000us | |
| Tpv | 100us | |
| Tvd | 100us | |
| Ten | 0us | |
| Tng | 1000us | |
| Tgv | 100us | |

Power Off



| | Min | Max |
|---|---|---|
| Tdv | 100us | |
| Tvg | 0us | |
| Tgp | 0us | |
| Tpn | 0us | |
| Tne | 0us | |
| Ted | 0.5us | |

# 6 Mechanical Specifications

## 6.1 Dimension

| PARAMETER | VALUE | UNIT | Remark |
|---|---|---|---|
| Display Resolution | 1680 × 2240 | dots | |
| Active Area Dimensions | | | |
| Horizontal | 157.250 | mm | |
| Vertical | 209.664 | mm | |
| Screen Size | 10.3 | Inch | |
| Pixel Pitch | | | |
| Horizontal | 0.0936 | mm | |
| Vertical | 0.0936 | mm | |
| Pixel Configuration | Square | | |
| Overall dimensions | | | |
| Width | 165.80 | mm | |
| Height | 227.70 | mm | |
| Thickness | 0.97 | mm | |
| Mass of the Module | TBD | g | |

## 6.2 Mechanical Drawing of EPD Module
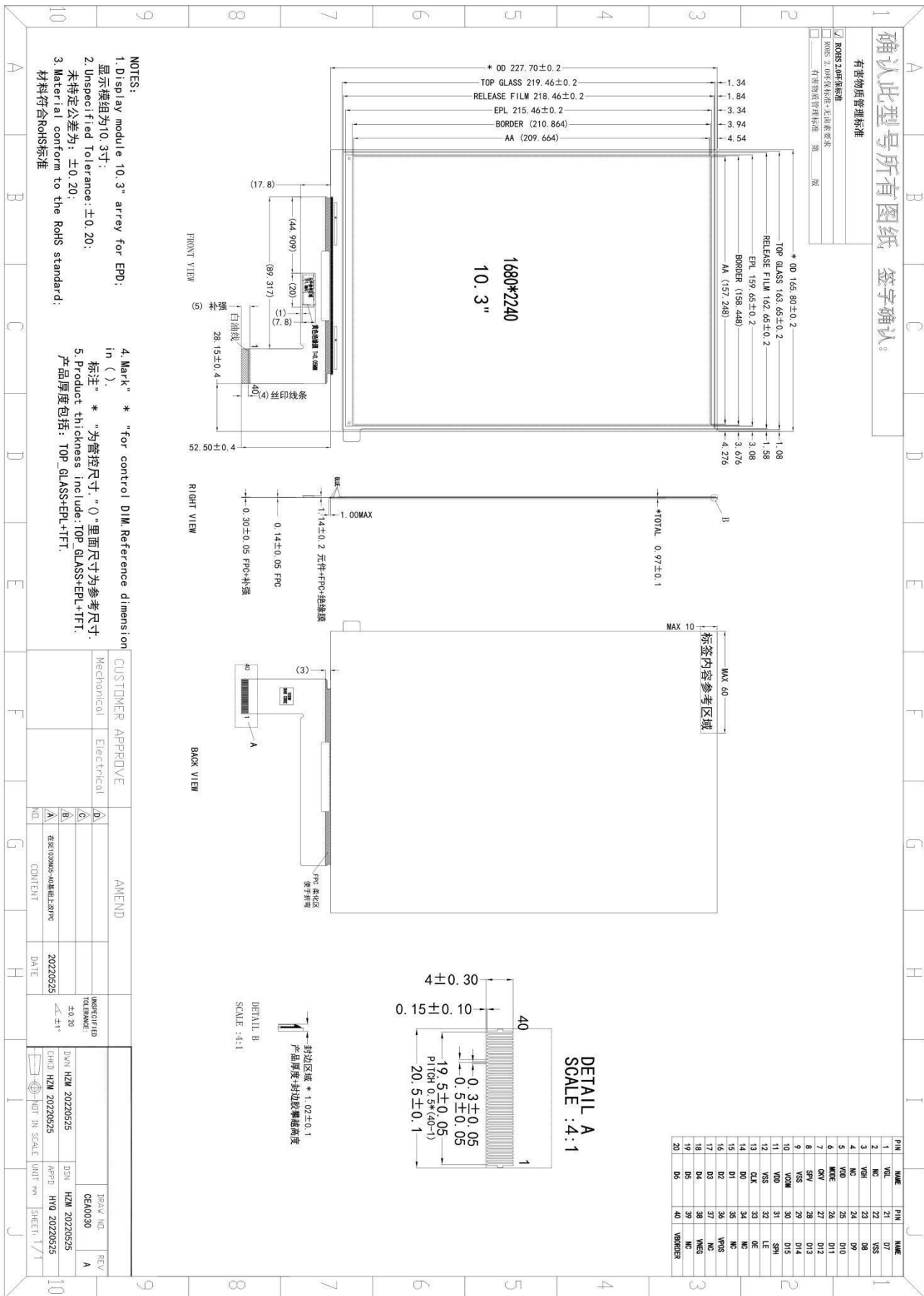
# 7  Optical characteristics

| Parameter | Conditions | Values | | | Units | Notes |
|---|---|---|---|---|---|---|
| | | Min. | Typ. | Max | | |
| White Reflectivity | White | 42 | 45 | | % | - |
| Contrast Ratio (CR) | | 10 | 15 | | - | 1 |

(T=25℃, fv = 85Hz. Measurements are made with Eye-One Pro Spectrophotometer. )

**Notes:**

1.  CR = Surface Reflectance with all white pixel / Surface Reflectance with all black pixels.

# 8 Handling, Safety and Environment Requirements

## Warning

The display glass may break when it is dropped or bumped on a hard surface. Handle with care. Should the display break, donot touch the electrophoretic material. In case of contact with electrophoretic material, wash with water and soap.

## Caution

Disassembling the display module can cause permanent damage and invalidates the warranty agreements. Observe general precautions that are common to handling delicate electronic components. The glass can break and frontsurfaces can easily be damaged. Moreover the display is sensitive to static electricity and other rough environmental conditions.

# 9 Reliability Test

| No. | TEST | CONDITION | METHOD | REMARK |
|---|---|---|---|---|
| 1 | High-Temperature Operation | T = +50°C, RH = 30% for 168 hrs | IEC 60068-2-2Bp | At the end of the test, electrical,mechanical, and optical specifications shall be satisfied. |
| 2 | Low-Temperature Operation | T = 0°C for 168 hrs | IEC 60068-2-2Ab | At the end of the test, electrical, mechanical, and optical specifications shall be satisfied. |
| 3 | High-Temperature Storage | T = +70°C, RH=23% for 168hrs | IEC 60068-2-2Bp | At the end of the test, electrical,mechanical, and optical specifications shall be satisfied. |
| 4 | Low-Temperature Storage | T = -25°C for 168 hrs | IEC 60068-2-1Ab | At the end of the test, electrical,mechanical, and optical specifications shall be satisfied. |
| 5 | High-Temperature, High-Humidity Operation | T = +40°C, RH = 90% for 168 hrs | IEC 60068-2-3CA | At the end of the test, electrical,mechanical, and optical specifications shall be satisfied. |
| 6 | High Temperature, High-Humidity Storage | T = +60°C, RH=80% for 168hrs | IEC 60068-2-3CA | At the end of the test, electrical,mechanical, and optical specifications shall be satisfied. |
| 7 | Thermal Shock | 1 cycle:[-25°C 30min]→[+70°C 30 min] : 50 cycles | IEC 60068-2-14 | At the end of the test, electrical, mechanical, and optical specifications shall be satisfied. |
| 8 | Package Vibration | 1.04G, Frequency:10~500Hz Direction: X,Y,Z Duration: 1 hours in each direction | Full packed for shipment | At the end of the test, electrical, mechanical, and optical specifications shall be satisfied. |
| 9 | Package DropImpact | Drop from height of 122 cm on concrete surface. Drop sequence: 1corner, 3edges, 6 faces One drop for each | Full packed for shipment | At the end of the test, electrical,mechanical, and optical specifications shall be satisfied. |
| 10 | Electrostatic Effect (non-operating) | Machine model +/- 250V, 0Ω, 200pF | IEC 62179, IEC 62180 | At the end of the test, electrical,mechanical, and optical specifications shall be satisfied. |
| 11 | Stylus Tapping | TBD | | |

# 10 Packing

TBD

# 11 Mark and Bar Code Definition

TBD