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CERT. No.: 282Q19070712006



CERT. No.: 282E19070712007

Product Specification

Model: TTS030HVS-01

3.0" TFT Display Module (360*640)

This module uses RoHS material

Tailor Pixels Technology Co., Ltd.

www.tailorpixels.com

tailor@tailorpixels.com

Ph: 86-755-8821 2653

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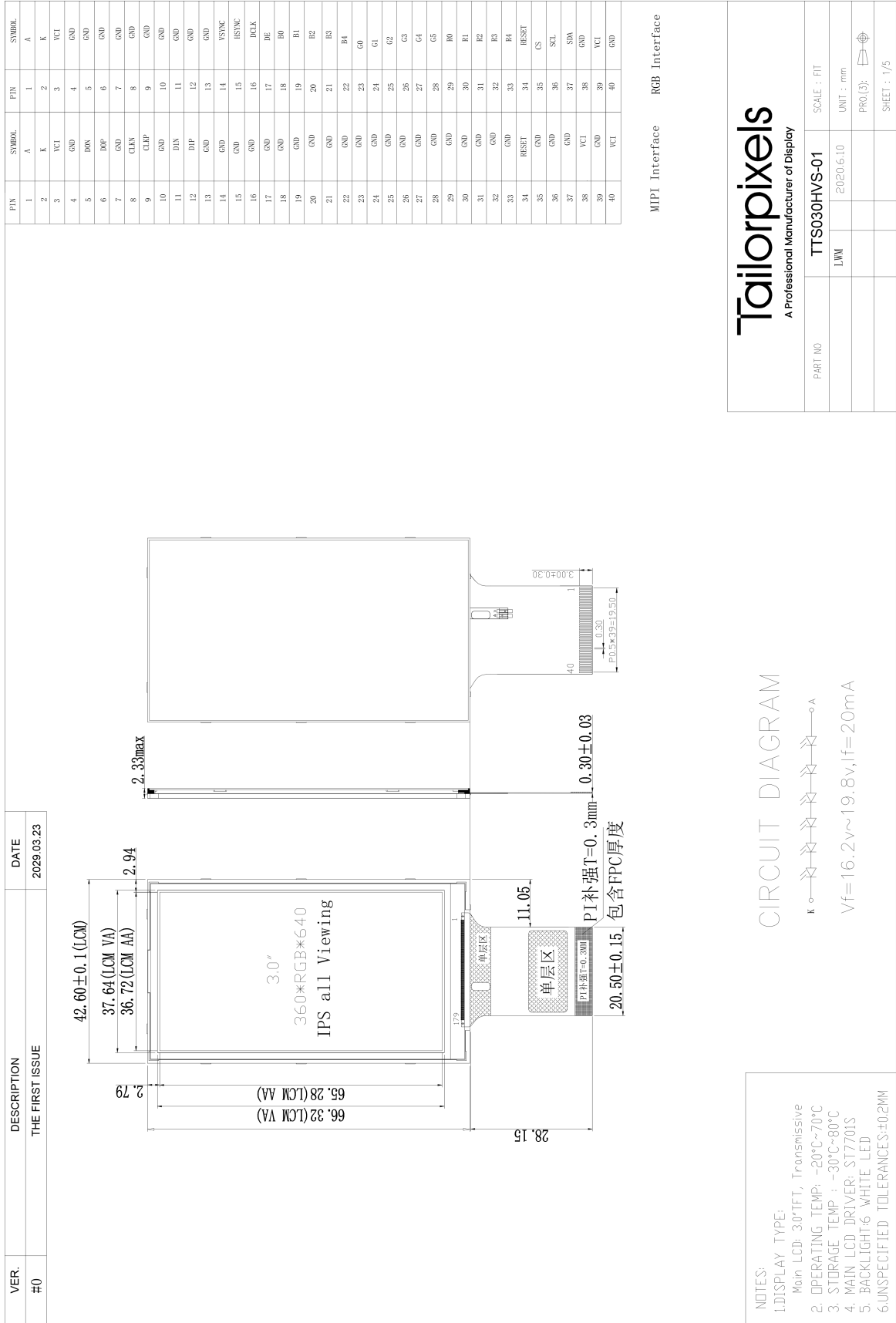
1 Record of Revision

| Version | Revise Date | Content | Remark |
|---------|-------------|---------|--------|
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2 General Specifications

| ITEM | Standard value | UNIT |
|--------------------|----------------------|------|
| LCD Type | TFT Transmissive | / |
| Driver Element | TFT Active matrix | |
| Number of Dots | 360*RGB*640 | Dots |
| Pixel Arrangement | RGB Stripe | |
| Dot Size (W*H) | / | mm |
| Dot Pitch (W*H) | / | mm |
| Active Area | 36.72(W) x65.28(H) | mm |
| Viewing Area (W*H) | 37.64(W) x66.32(H) | mm |
| Glass Area (W*H) | / | mm |
| LCD Duty | / | |
| LCD Bias | / | |
| Viewing Direction | ALL O'CLOCK | |
| Control IC | ST7701S | |
| Module Size(W*H*T) | 42.60*74.50*2.33±0.1 | mm |
| Approx. Weight | TBD | g |
| Back Light | 6 White LED | |

3 Mechanical Drawing



4 Interface

4.1 SPI+RGB Interface Pin Function

| NO. | SYMBOL | Description |
|-------|--------|----------------------------------|
| 1 | A | LED power anode |
| 2 | K | LED power cathode |
| 3 | VCI | Power setting(3.0V-3.3V) |
| 4-13 | GND | Ground |
| 14 | VSYNC | Vertical sync input |
| 15 | HSYNC | Horizontal sync input |
| 16 | DCLK | Data clock input |
| 17 | DE | Data enable input |
| 18-22 | B0-B4 | Data bus |
| 23-28 | G0-G5 | Data bus |
| 29-33 | R0-R4 | Data bus |
| 34 | RESET | RESET PIN |
| 35 | CS | Serial communication chip select |
| 36 | SCL | Serial command clock input |
| 37 | SDA | Serial command data input |
| 38 | GND | Ground |
| 39 | VCI | Power setting(3.0V-3.3V) |
| 40 | GND | Ground |

4.2 MIPI Interface Pin Function

| NO. | SYMBOL | Description |
|-------|--------|--------------------------|
| 1 | A | LED power anode |
| 2 | K | LED power cathode |
| 3 | VCI | Power setting(3.0V-3.3V) |
| 4 | GND | Ground |
| 5 | D0N | Mipi data signal |
| 6 | D0P | Mipi data signal |
| 7 | GND | Ground |
| 8 | CLKN | Mipi clock signal |
| 9 | CLKP | Mipi clock signal |
| 10 | GND | Ground |
| 11 | D1N | Mipi data signal |
| 12 | D1P | Mipi data signal |
| 13-33 | GND | Ground |
| 34 | RESET | RESET PIN |
| 35-37 | GND | Ground |
| 38 | VCI | Power setting(3.0V-3.3V) |
| 39 | GND | Ground |
| 40 | VCI | Power setting(3.0V-3.3V) |

5 Absolute Maximum Ratings

| Parameter | Symbol | Min | Max | Unit |
|--------------------------|------------------|------|-----|------|
| Supply voltage | V _{CI} | -0.3 | 3.6 | V |
| Supply current (one LED) | I _{LED} | - | 20 | mA |
| Operating temperature | T _{OP} | -20 | +70 | °C |
| Storage temperature | T _{ST} | -30 | +80 | °C |

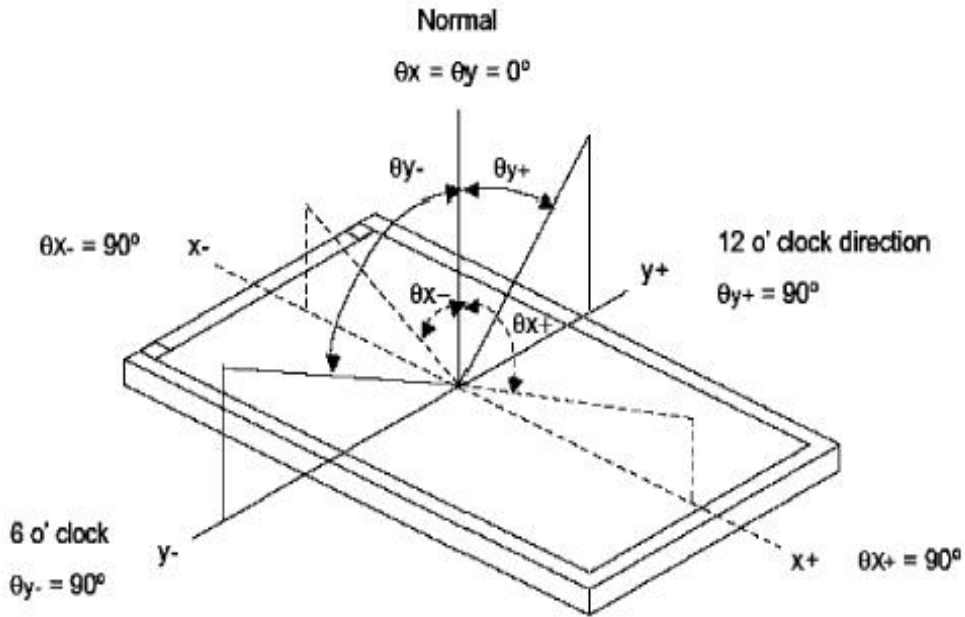
6 Electrical Characteristics

| Item | Symbol | Min | Typ | Max | Unit |
|-------------------------|-------------------------------|---------------------|-----|---------------------|------|
| Supply voltage | V _{CI} | 3.0 | 3.3 | 3.6 | V |
| Input voltage | V _{IL} | V _{SS} | - | 0.3 V _{CI} | V |
| | V _{IH} | 0.7 V _{CI} | - | V _{CI} | V |
| LED Forward voltage | V _f | 16.2 | 18 | 19.8 | V |
| Input backlight current | I _{LED} (One LED) | - | 20 | | mA |

7 Optical Characteristics

| ITEM | | SYMBOL | CONDITIONS | SPECIFICATIONS | | | UNIT | NOTE |
|----------------------|-------|---------------|----------------------|----------------|-------|-------|-------------------|---|
| | | | | MIN. | TYP. | MAX | | |
| Brightness | | B | Viewing normal angle | TBD | 480 | TBD | Cd/m ² | All left side data are based on SHENG JING's product reference only |
| Contrast Ratio | | CR | | 600 | 800 | -- | -- | |
| Response Time | | Tr+Tf | | -- | 30 | 45 | ms | |
| CIE Color coordinate | Red | XR | | 0.614 | 0.644 | 0.674 | | |
| | | YR | | 0.290 | 0.320 | 0.350 | | |
| | Green | XG | | 0.270 | 0.300 | 0.330 | | |
| | | YG | | 0.540 | 0.570 | 0.600 | | |
| | Blue | XB | | 0.104 | 0.134 | 0.164 | | |
| | | YB | | 0.097 | 0.127 | 0.157 | | |
| | White | XW | | 0.267 | 0.297 | 0.327 | | |
| | | YW | 0.302 | 0.332 | 0.362 | | | |
| Viewing Angle | Hor. | θ_{x+} | -- | 80 | -- | Deg. | | |
| | | θ_{x-} | -- | 80 | -- | | | |
| | Ver. | θ_{y+} | -- | 80 | -- | | | |
| | | θ_{y-} | -- | 80 | -- | | | |
| Uniformity | Un | | -- | 80 | -- | % | | |

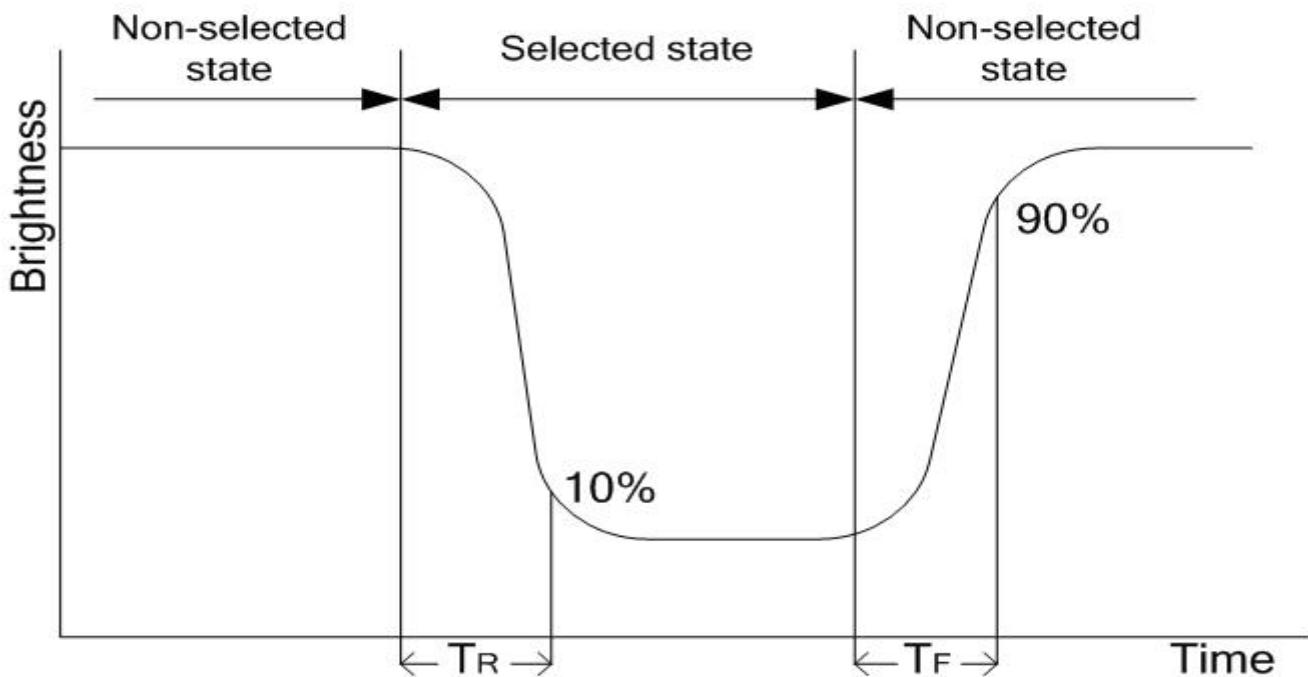
Note 1 : Definition of Viewing Angle θ_x and θ_y :



Note 2: Definition of contrast ratio CR:

$$CR = \frac{\text{Brightness of non-selected dots (white)}}{\text{Brightness of selected dots (black)}}$$

Note 3: Definition of response time (TR, TF)



8 Environmental / Reliability Tests

| No | Test Item | Condition | Remarks |
|----|--------------------------------------|--|--|
| 1 | High Temperature Operation | T _s = +70°C, 240hrs | Note 1 IEC60068-2-2, GB2423. 2-89 |
| 2 | Low Temperature Operation | T _a = -20°C, 240hrs | Note 2 IEC60068-2-1 GB2423.1-89 |
| 3 | High Temperature Storage | T _a = +80°C, 240hrs | IEC60068-2-2 GB2423. 2-89 |
| 4 | Low Temperature Storage | T _a = -30°C, 240hrs | IEC60068-2-1 GB/T2423.1-89 |
| 5 | High Temperature & Humidity Storage | T _a = +60°C, 90% RH max, 160 hours | IEC60068-2-3 GB/T2423.3-2006 |
| 6 | Thermal Shock (Non-operation) | -30°C 30 min ~ +80°C 30 min Change time: 5min, 30 Cycle | Start with cold temperature, end with high temperature IEC60068-2-14, GB2423.22-87 |
| 7 | Electro Static Discharge (Operation) | C=150pF, R=330 Ω, 5 points/panel Air:±6KV, 5 times; Contact: ±2KV, 5 times; (Environment: 15°C ~ 35°C, 30% ~ 60%, 86Kpa ~ 106Kpa) | IEC61000-4-2 GB/T17626.2-1998 |
| 8 | Vibration (Non-operation) | Frequency range: 10~55Hz, Stroke: 1.mm Sweep: 10Hz~55Hz~10Hz 2 hours for each direction of X.Y. Z. (package condition) | IEC60068-2-6 GB/T2423.5-1995 |
| 9 | Shock (Non-operation) | 60G 6ms, ± X, ±Y, ± Z 3 times for each direction | IEC60068-2-27 GB/T2423.5-1995 |
| 10 | Package Drop Test | Height: 60 cm, 1 corner, 3 edges, 6 surfaces | IEC60068-2-32 GB/T2423.8-1995 |

Note: 1. T_s is the temperature of panel's surface.
2. T_a is the ambient temperature of sample.

9 Precautions For Use of LCD modules

9.1 Handling Precautions

- 9.1.1 The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.
- 9.1.2 If the display panel is damaged and the liquid crystal substance inside it leaks out, be sure not to get any in your mouth, if the substance comes into contact with your skin or clothes, promptly wash it off using soap and water.
- 9.1.3 Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.
- 9.1.4 The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully.
- 9.1.5 If the display surface is contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If still not completely clear, moisten the cloth with one of the following solvents:
 - Isopropyl alcohol
 - Ethyl alcoholSolvents other than those mentioned above may damage the polarizer. Especially, do not use the following: Water; Ketene; Aromatic solvents
- 9.1.6 Do not attempt to disassemble the LCD Module.
- 9.1.7 If the logic circuit power is off, do not apply the input signals.
- 9.1.8 To prevent the destruction of the elements by static electricity, be careful to maintain an optimum work environment.
 - 9.1.8.1 Be sure to ground the body when handling the LCD Modules.
 - 9.1.8.2 Tools required for assembly, such as soldering irons, must be properly ground.
 - 9.1.8.3 To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.
 - 9.1.8.4 The LCD Module is coated with a film to protect the display surface. Be careful when peeling off this protective film since static electricity may be generated.

9.2 Storage Precautions

- 9.2.1 When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps.
- 9.2.2 The LCD modules should be stored under the storage temperature range. If the LCD modules will be stored for a long time, the recommended condition is:
Temperature: 0°C ~ 40°C, Relatively humidity: ≤80%
- 9.2.3 The LCD modules should be stored in the room without acid, alkali, and harmful gas.

9.3 Transportation Precautions

The LCD modules should be no falling and violent shocking during transportation, and also should avoid excessive press, water, dampness, and sunshine.