



| | |
|------------------|----------------------------|
| Description | 4.3" TFT LCD Module |
| Model Name | TY430TFT480272 |
| Product Revision | 03 |
| Date | 17 th Sept 2009 |
| Doc. Number | TY430TFT480272 Rev01 |
| Doc. Revision | 01 |

TechToys Company
Unit 1807, Pacific Plaza, 410 Des Voeux Road West, Hong Kong
Tel: 852-28576267
Fax: 852-28576216
Web site: www.TechToys.com.hk

1. Summary

TY430TFT480272 is a transmissive type TFT (Thin Film Transistor) active matrix color liquid crystal display (LCD) comprising an amorphous silicon TFT attached to each signal electrode. This model consists of a TFT-LCD module, driver circuit, backlight unit, and a resistive Touch Panel on a 40-pin FPC interface. This model supports 480*RGB*272 WQVGA mode and displays up to 16 million colors.

2. Features

- a. High resolution: 391,680 dots (480 RGB x 272)
- b. 24-bit RGB interface
- c. The power supply for LED backlight, touch panel signal, and data bus integrated on a single 40-pin-FPC

3. General Specifications

| Parameter | Specifications | Unit | |
|----------------------|-----------------------------|----------|----|
| Screen Size | 4.3" (Diagonal) | inch | |
| Display format | 480* RGB * 272 | dot | |
| Active area | 95.04(H) x 53.856(V) | mm | |
| Pixel size | 198(H) x 198(V) | µm | |
| Surface treatment | Touch Panel, 10% haze | | |
| Pixel Configuration | RGB stripe | | |
| Outline dimension | 105.5(W) x 67.2(H) x 4.0(D) | mm | |
| Weight | 60 | g | |
| View angle direction | 6 O'Clock | | |
| Temperature | Operation | -20 - 70 | °C |
| | Storage | -30 - 80 | °C |

4. Absolute Maximum Ratings (GND = 0V)

| Item | Symbol | Min | Max | Unit |
|----------------------|------------------|------|-----------------------|------|
| Power Voltage | V _{cc} | 0.3 | 5.0 | V |
| Input Logic Voltage | V _{in} | -0.3 | V _{cc} + 0.3 | V |
| Output Logic Voltage | V _{out} | -0.3 | V _{cc} + 0.3 | V |

Note: Device subject to permanent damage if stresses applied beyond those absolute maximum ratings above.

5. Electrical Characteristics

5.1 Recommended Operation Conditions (GND = 0V, Ta = 25°C)

| Parameter | Symbol | Values | | | Unit | Remark |
|----------------------|------------------|--------|------|------|------|---------------|
| | | Min. | Typ. | Max. | | |
| Power supply voltage | V _{cc} | 3.0 | 3.3 | 3.6 | V | |
| Operating Current | I _{Vcc} | - | 30 | - | mA | Black pattern |
| Frame Frequency | fFrame | - | 60 | 90 | Hz | |
| Dot Data Clock | DCLK | - | 9.0 | 15 | MHz | |

5.2 LED Driving Conditions

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Remark |
|-------------------|------------------|------|------|------|------|--------|
| Power consumption | P _{LED} | - | 462 | - | mW | |
| LED current | I _{LED} | - | 20 | - | mA | |
| LED voltage | V _{LED} | - | 23.1 | - | V | |

5.3 DC Characteristics

| Parameter | Symbol | Values | | | Unit | Remark |
|--------------------------|-----------------|---------------------|------|--------------------|------|--------|
| | | Min. | Typ. | Max. | | |
| Low level input voltage | V _{IL} | 0 | - | 0.3V _{cc} | V | |
| High level input voltage | V _{IH} | 0.7*V _{cc} | - | V _{cc} | V | |

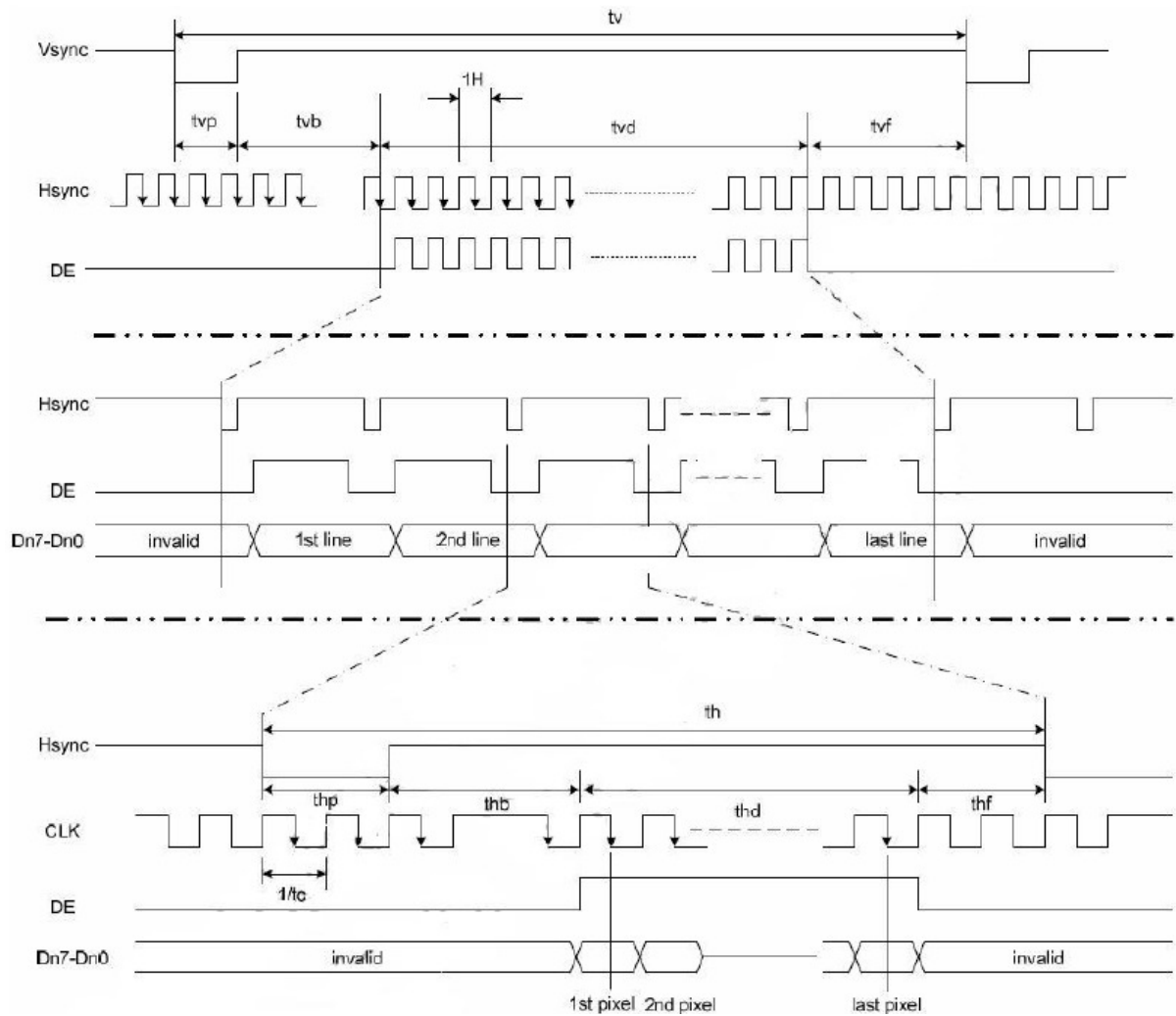
6. AC Characteristics

6.1 AC Timing Characteristics

| Signal | Item | Symbol | Values | | | Unit | Note |
|--------|----------------|--------|--------|------|------|------|------|
| | | | Min. | Typ. | Max. | | |
| Dclk | Frequency | DCLK | - | 9.0 | 15 | MHz | |
| Hsync | Period | TH | - | 525 | - | DCLK | 1 |
| | Pulse Width | Thp | 2 | 41 | - | DCLK | 2 |
| | Back-Porch | Thb | 2 | - | - | DCLK | 2 |
| | Display Period | Thd | - | 480 | - | DCLK | |
| | Front-Porch | Thf | 2 | - | - | DCLK | 2 |
| Vsync | Period | Tv | - | 286 | - | TH | |
| | Pulse Width | Tvp | 1 | 10 | - | TH | |
| | Back-Porch | Tvb | 1 | 2 | - | TH | |
| | Display Period | Tvd | - | 272 | - | TH | |
| | Front-Porch | Tvf | 1 | 2 | - | TH | |

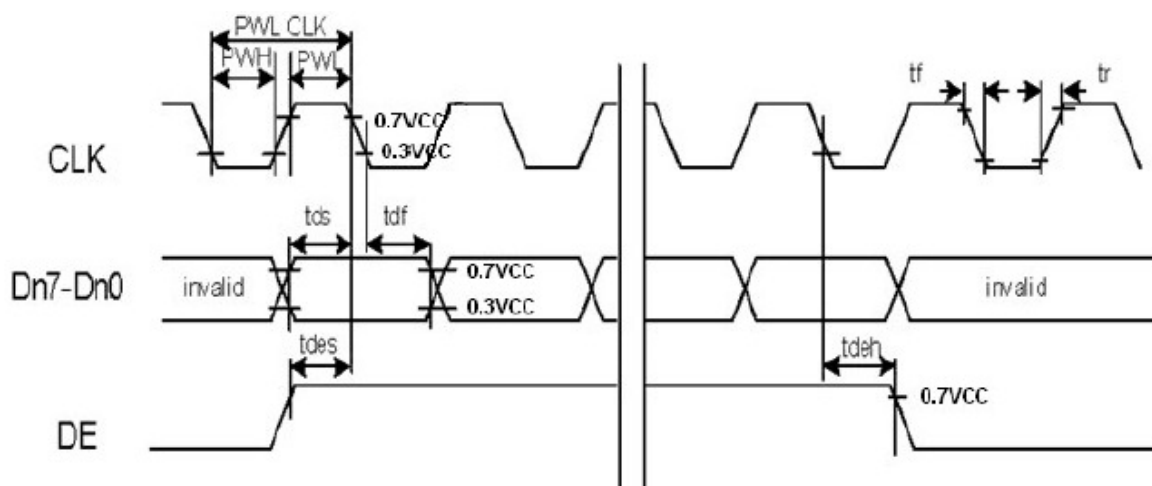
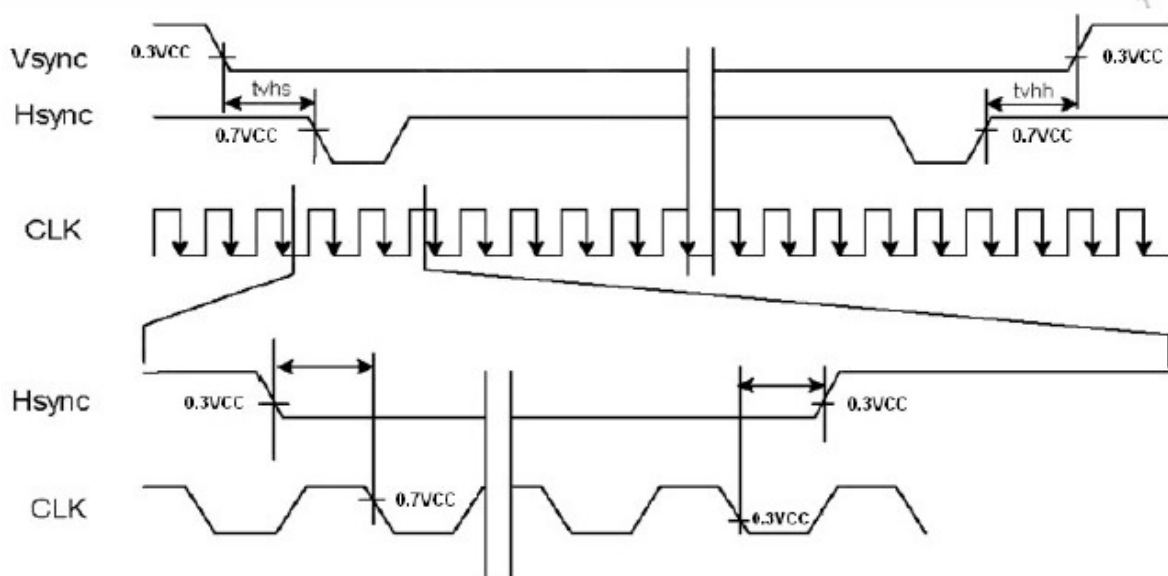
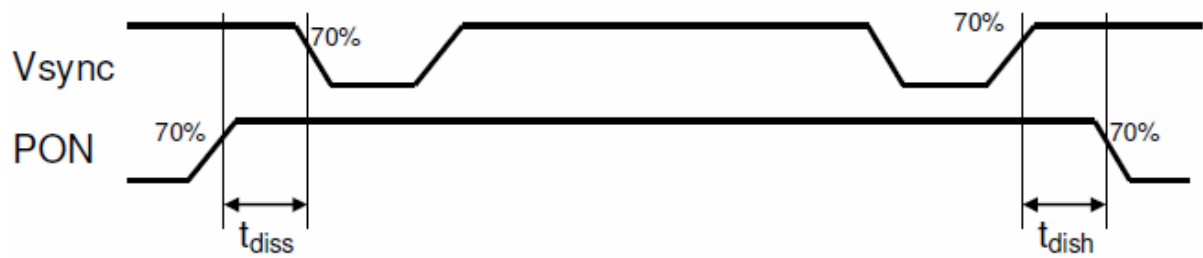
Note 1: Thd=480 DCLK, Thf=2 DCLK, Thp=41 DCLK, Thb=2 DCLK
 525 DCLK=480+2+41+2 (DCLK)

Note 2: Thf + Thp + Thb > 44



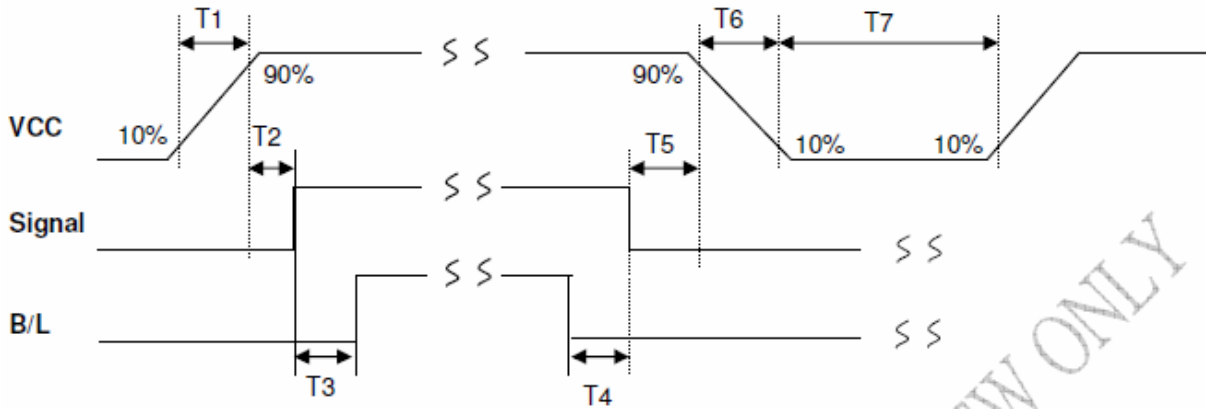
6.2 AC Timing Diagrams

| Parameter | Symbol | Min | Typ | Max | Unit |
|-------------------------|------------|------|-----|-----|------|
| DISP Setup time | t_{diss} | 10 | - | - | ns |
| DISP hold time | t_{dish} | 10 | - | - | ns |
| Clock period | PW_{CLK} | 66.7 | - | - | ns |
| Clock pulse high period | PWH | 26.7 | - | - | ns |
| Clock pulse low period | PWL | 26.7 | - | - | ns |
| Hsync setup time | t_{hs} | 10 | - | - | ns |
| Hsync hold time | t_{hh} | 10 | - | - | ns |
| Data setup time | t_{ds} | 10 | - | - | ns |
| Data hold time | t_{dh} | 10 | - | - | ns |
| DE setup time | t_{des} | 10 | - | - | ns |
| DE hold time | t_{deh} | 10 | - | - | ns |
| Vsync setup time | t_{vhs} | 10 | - | - | ns |
| Vsync hold time | t_{vhh} | 10 | - | - | ns |



7. Power Sequence

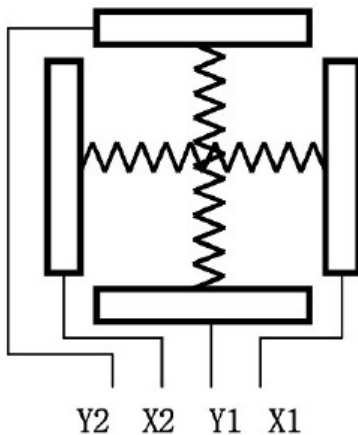
The LCD panel power ON/OFF sequence specified below.



| | Min. | Typ. | Max. | Unit |
|----|------|------|------|------|
| T1 | 1 | | | ms |
| T2 | 1 | 5 | | ms |
| T3 | 1 | | | ms |
| T4 | 1 | | | ms |
| T5 | 1 | 5 | | ms |
| T6 | 1 | | | ms |
| T7 | 1 | | | ms |

8. Touch Panel

8.1 Block Diagram



Top View

X: Upper electrode
Y: Lower electrode

| PIN | Symbol | I/O | Function |
|-----|--------|--------|--|
| 37 | X1 | Right | Right electrode - differential analog |
| 38 | Y1 | Bottom | Bottom electrode - differential analog |
| 39 | X2 | Left | Left electrode - differential analog |
| 40 | Y2 | Top | Top electrode - differential analog |

8.2 Electrical Characteristics of the Touch Panel

| Item | Min. | Typ. | Max. | Unit | Note |
|-----------------------|------|------|------|------------|-----------------|
| Linearity | - | - | 1.5 | % | |
| Terminal resistance | 200 | - | 900 | Ω | X (Film side) |
| | 200 | - | 900 | Ω | Y (Film side) |
| Insulation resistance | 200 | - | - | M Ω | At DC25V, 60sec |
| Voltage | - | - | 5 | V | DC |
| Chattering | - | - | 10 | ms | ON/OFF |
| Transparency | - | 80 | - | % | Non-glare |
| Haze rate | - | - | 10 | % | |

Note: Avoid using the Touch Panel with a hard tip such as ball pens. A polyacetal pin of tip size R0.8mm \emptyset is recommended to operate the Touch Panel.

8.3 Mechanical characteristics

| Item | Min. | Typ. | Max. | Unit | Note |
|-------------------------------|------------------|------|------|------------|------|
| Activation force | - | - | 100 | g | 1 |
| Durability-surface scratching | Write 100,000 | - | - | characters | 2 |
| Durability-surface pitting | 1,000,000 | - | - | Touches | 3 |
| Surface hardness | 3 | - | - | H | |

Note 1: Stylus pen input R0.8mm \emptyset polyacetal pen or Finger

Note 2: Measurement for surface area

- scratch 100,000 times straight lines on the Film with a stylus change every 20,000 times.

- Force = 150g. Speed = 60mm/sec

- Stylus = R0.8mm \emptyset polyacetal tip

Note 3: Pit 1,000,000 times on the Film with a R0.8mm \emptyset silicon rubber

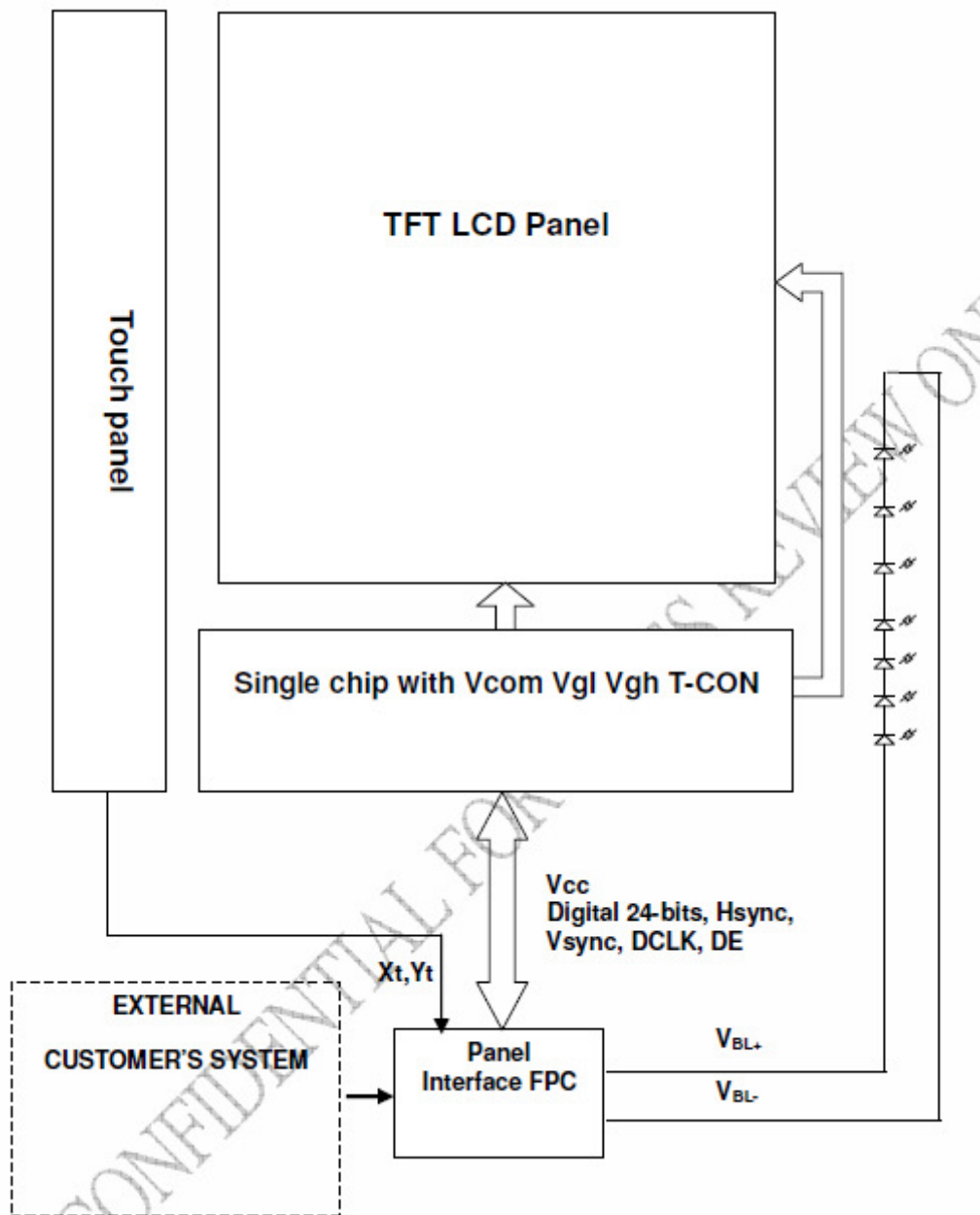
9. Interface

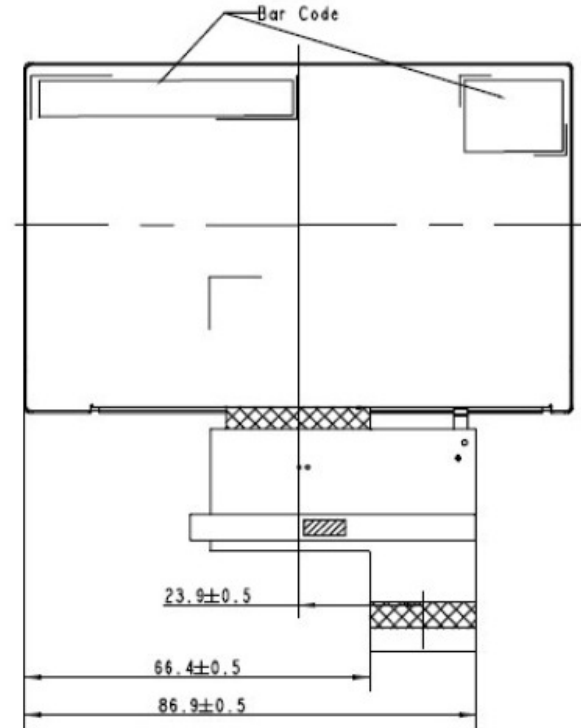
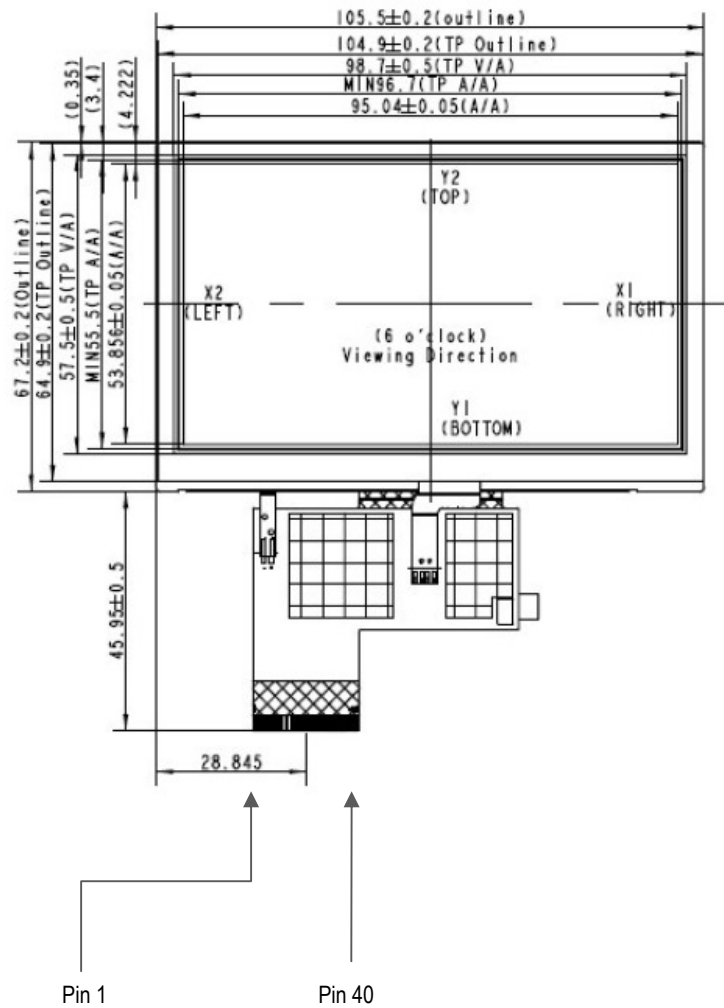
9.1 LCM PIN Definition

| Pin No. | Symbol | Description | Remark |
|---------|-------------------|--|--------|
| 1 | VLED- | LED backlight cathode | |
| 2 | VLED+ | LED backlight anode | |
| 3 | DGND | Digital ground | |
| 4 | V _{cc} | Power Supply for Digital Circuit (+3.3V) | |
| 5 | R0 | Red Data Bit 0 | |
| 6 | R1 | Red Data Bit 1 | |
| 7 | R2 | Red Data Bit 2 | |
| 8 | R3 | Red Data Bit 3 | |
| 9 | R4 | Red Data Bit 4 | |
| 10 | R5 | Red Data Bit 5 | |
| 11 | R6 | Red Data Bit 6 | |
| 12 | R7 | Red Data Bit 7 | |
| 13 | G0 | Green Data Bit 0 | |
| 14 | G1 | Green Data Bit 1 | |
| 15 | G2 | Green Data Bit 2 | |
| 16 | G3 | Green Data Bit 3 | |
| 17 | G4 | Green Data Bit 4 | |
| 18 | G5 | Green Data Bit 5 | |
| 19 | G6 | Green Data Bit 6 | |
| 20 | G7 | Green Data Bit 7 | |
| 21 | B0 | Blue Data Bit 0 | |
| 22 | B1 | Blue Data Bit 1 | |
| 23 | B2 | Blue Data Bit 2 | |
| 24 | B3 | Blue Data Bit 3 | |
| 25 | B4 | Blue Data Bit 4 | |
| 26 | B5 | Blue Data Bit 5 | |
| 27 | B6 | Blue Data Bit 6 | |
| 28 | B7 | Blue Data Bit 7 | |
| 29 | DGND | Digital ground | |
| 30 | DCLK | Dot clock | |
| 31 | DISP | Display ON/OFF | Note 1 |
| 32 | Hsync | Horizontal sync input | |
| 33 | VS _{ync} | Vertical sync input | |
| 34 | DE | Data enable control | Note 2 |
| 35 | NC | No connect | |
| 36 | DGND | Digital ground | |
| 37 | X1 | TP (Right) | |
| 38 | Y1 | TP (Bottom) | |
| 39 | X2 | TP (Left) | |
| 40 | Y2 | TP (Up) | |

Note 1: Display ON when DISP=H.

Note 2: Data can be accessed with when DE=H.





| | | |
|------------------|--|--------------------------|
| TECH TOYS | | TechToys Company |
| Date | | Drawing : TY430TFT480272 |
| | | Rev : 03 |