ST77916

360RGB x 390 262K Color with Display Ram Single-Chip TFT Controller/Driver

Datasheet

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1 GENERAL DESCRIPTION

The ST77916 is a single-chip controller/driver for 262K-color, graphic type TFT-LCD. The 540-channel source driver has true 6-bit resolution, which generates 64 Gamma-corrected values by an internal D/A converter.

The ST77916 is capable of connecting directly to an external microprocessor, and provides 8-bits parallel interface, 6-bit RGB Interface, MIPI interface, 3/4-line serial peripheral interface (3/4 SPI), and Quad serial peripheral interface (QSPI).

Display data can be stored in the on-chip display data RAM of 360x390x18 bits. It can perform display data RAM read/write operation with no external operation clock to minimize power consumption.

In addition, because of the integrated power supply circuit necessary to drive liquid crystal; it is possible to make a display system with fewest components.

另外

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2 FEATURES

- Single chip TFT-LCD Controller/Driver with On-chip Display RAM
- Display Resolution: 360*RGB (H) *390(V)
- LCD Driver Output Circuits
  - Source Outputs: 540 RGB Channels
  - Support gate control signals to gate driver in the panel
- Display Colors (Color Mode)
  - Full Color: 262K, RGB=(666) max., Idle Mode Off
  - Color Reduce: 8-color, RGB=(111), Idle Mode On
- Programmable Pixel Color Format (Color Depth) for Various Display Data Input Format 各式
  - 16-bit/pixel: RGB=(565) 65K color
  - 18-bit/pixel: RGB=(666) 262K color
- Interface
  - Parallel 8080-series MCU Interface (8-bit)
  - 6-bit RGB Interface (VSYNCX, HSYNCX, DOTCLK, ENABLE, DB[5:0])
  - Serial Peripheral Interface (SPI Interface) and 2 data lane SPI
  - Quad Serial Peripheral Interface (QSPI Interface)
  - MIPI Display Serial Interface (DSI V1.01 r11 and D-PHY V1.0, 1 clock and 1 data lane pairs)
- Display Features
  - 1 Gamma (64 gray levels)
  - Brightness Control Block
  - CDC Function
- On Chip Build-In Circuits
  - DC/DC Converter
  - Non-Volatile (NV) Memory
  - Adjustable VCOM Generation
  - Timing Controller
  - Internal VPP for NV Memory
- Build-In NV Memory for LCD Initial Register Setting
  - OTP to store ID1~ID3
  - OTP to store VCOM/VCC/VREGP/VREGN calibration
  - OTP to store CDC and Factory Default Value (Module ID, Module Version, and etc.)
  - OTP to store panel timing, analog power setting, and etc.
- Driving Algorithm
  - 1/2/4-dot Inversion
  - Column Inversion
- Wide Supply Voltage Range

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- I/O Voltage (VDDI to GND): 1.65V ~ 3.3V (VDDI≦VDD)
- Voltage for Analog Circuit (VDD to GND): 2.65V ~ 3.3V

● On-Chip Power System

- VCOM level: GND
- Gamma(+) voltage range: 3.65V~6.2V
- Gamma(-) voltage range: -4.2V~-1.875V
- VGH voltage range: 11.0V~15.5V
- VGL voltage range: -8.4V~-11.7V
- Adjustable voltage range for feed through compensation: 0.1V~2.2V

● Power saving modes

- Sleep in mode
- Deep Sleep in mode
- Deep Standby mode
- Low frame mode 1~50Hz

● Others

- Zero-Cap (Gate <390)
- GIP + Dual-Gate driving
- Single-Gate: pixel number must be a multiple of 4 (* If need Horizontal Scroll, the Pixel number must be a multiple of 12)
- Dual-Gate: pixel number must be a multiple of 8 (* If need Horizontal Scroll, the Pixel number must be a multiple of 24)
- The Source number must be a multiple of 12 and no fewer than 276

  (* If need Horizontal Scroll, the Source number must be a multiple of 36 and no fewer than 288)

● Optimized layout for COG Assembly

● Operate temperature range: −30ºC to +85 ºC

● Lower Power Consumption

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