



TD4377

TDDI product brief

New Full High Definition 144 Hz Touch and Display Driver Integration for Next-generation Smartphones

OMNIVISION Touch & Display Solution's TD4377 touch and display driver integration (TDDI) leverages OMNIVISION's proven image algorithm, high quality and stable supply chain to help tier-one LTPS panel manufacturers speed time to market. It supports higher performance in display and touch with much lower power consumption.

The TD4377 enables 1080 pixel full high definition (FHD) resolution and up to 144 Hz display frame rate for smartphones. It also provides a 2x touch report rate in LCD TDDI solutions.

Upgraded from the TD4375, which was in mass production in millions of Tier1 OEM phones, the TD4377 will be held to the same high quality standards for customers.

Find out more at www.ovt.com.



Applications

- Smartphone LCD display with touch
- Smartdevice LCD display with touch

Touch Features

- Multi-touch coordinate sensing without ghost points
 - Voltage correction circuits enhance the sensitivity (supporting automatic calibration)
- RISC CPU optimized for capacitive sensing and other human interaction
- Supports up to 18x36 electrodes to provide the highest possible accuracy
 - Analog front ends (AFE) support up to 648 receiver pads
- Supports I2C and SPI with OMNIVISION TouchComm protocol for communication with the host
- Proprietary intelligent algorithms, run locally on the CPU facilitate the removal of mechanical buttons and switches, which increases reliability and reduces footprint and component cost
- Low power sensing modes enable wake-up gesture functionality
- Face-detect proximity capability reduces cost by eliminating the need for other proximity sensing components
- Display synchronization and increased voltage capability enable improved performance over discrete touch implementations
- Programmable sensing speed of 50 kHz to 500 kHz to minimize noise interference
- Includes support to control segmented VCOM in-cell touch scanning circuits and enable ultra-thin, low-cost integrated sensing schemes
- High signal-to-noise ratio (SNR) touch AFE improves touch performance
- 144/120/90/60 Hz long H-blank or V-blank sensing
- Low power wake-up gesture (LPWUG)

Display Features

- 16.77 M colors (24 bpp data format) single chip driver for a 1024-grayscale TFT with a resolution of 1080 RGB x 2520-dot graphics (with power supply circuits and supporting low temperature poly-silicon (LTPS) panel)
- Low-power consumption architecture (allowing direct input of the interface I/O power supply)
 - Input power supply voltage: Interface and logic power supply: IOVCC
 - Analog power supply: VSP, VSN
 - MIPI D-PHY power supply: DPHYVCC
 - MIPI C-PHY power supply: DPHYVCC
- 4-lane/1-port MIPI DSI-2 D option interface for high-speed and low power transmission in both directions with low EMI noise (DSI-2 1.0, D-PHY1.3, DCS 1.2)
- 3-lane/1-port MIPI DSI-2 C option interface for more high-speed and low power transmission in both directions with fewer data lane number and low noise (DSI-2 1.0, C-PHY1.3, DCS 1.2)
- Digital pixel processing
 - Digital GAMMA for RGB separate gamma correction function
 - Content adaptive backlight control (CABC)
 - Color enhancement (CE) with color space management
 - Sunlight Readability Enhancement function (SRE)
 - Outline sharpness function
 - Local area Auto Contrast Optimization function (LCO)
 - Paper mode
- Internal liquid crystal drive power supply circuit
 - Source driver and VCOM: VSP-AGND and VSN-AGND
 - DC power supply for VCOM drive: VCI-VCL
 - Interface to the panel: VGH-AGND and VGL-AGND
 - Interface to the panel: SOUT1-48
 - Liquid crystal panel drive circuits: 1080 source signal lines (three multiplexers)
 - One-chip solution for a chip-on-film (COF) module
 - Internal NVM: VCOM can be rewritten up to eight times
 - Dummy pins are opened
 - Chip substrate: Connected to the VSUB, the negative voltage of the chip. Put the isolation tape between the ASIC and the LCM bezel to prevent the substrate from contacting the inappropriate side.

Functional Block Diagram

