



SD2000T – Integrated TFT LCD Display Controller

The SmartASIC **SD2000T** is a highly integrated TFT LCD controller chip with the latest SmartASIC advanced image-processing technology, an integrated ADC/PLL, and embedded timing controller to provide comprehensive solution for Smart Panel and Smart Integration. The SD2000T has advanced programmable non-linear parametric cubic based scaling engine with proprietary sharpness adjustment and text enhancement. SD2000T supports both analog and digital interfaced inputs with an internal ADC/PLL and external DVI receiver. Additionally SD2000T also built in programmable timing controller designed for panel smart integration. The SD2000T has robust handling of a wide variety of TFT LCD panels and strong support of standard or non-standard input timings.

FEATURES

- ◆ Integrated high speed triple 8-bit ADC/PLL support up to 100MHz for XGA-75Hz
- ◆ Advanced image processing with proprietary non linear parametric cubic based scaling engine
- ◆ Built in programmable Timing Controller
- ◆ Support dual interface with an integrated ADC/PLL and an external DVI receiver.
- ◆ Robust auto configuration for input mode detection and clock frequency and phase recovery for standard or non-standard input timing
- ◆ Support video processing with on-chip 2D de-interlacing and color space conversion
- ◆ Support programmable Gamma Correction
- ◆ GPIO pins for flexible system design

Integrated ADC/PLL

- ⇒ Integrated triple 8-bit ADC and video capture PLL support up to 100MHz
- ⇒ Support 32-step fine phase adjustment for every resolution up to XGA
- ⇒ Integrated output PLL to generate output clock

Proprietary scaling engine and output processing

- ⇒ Programmable non-linear parametric cubic based scaling engine can be optimized for any expansion ratio
- ⇒ Independent expansion ratio in both horizontal and vertical direction
- ⇒ User programmable sharpness adjustment
- ⇒ Output digital brightness, contrast and color temperature adjustment with independent DSP
- ⇒ Triple 8-bit Gamma table dedicated to RGB gamma correction independently

Digital RGB input support

- ⇒ Support 24-bit RGB input up to XGA resolution
- ⇒ Support interface to industry standard external ADC/PLL, DVI receiver and video decoder chip

Video input support

- ⇒ YUV 4:2:2 input
- ⇒ Built in color space converter
- ⇒ Support 2D de-interlace
- ⇒ Seamless interface to industry standard video decoder

Timing Controller

- ⇒ Built in flexible and programmable timing controller for direct LCD panel interface up to XGA resolution
- ⇒ Polarity, width and phase of many clock signals and control signals are programmable

Auto Configuration

- ⇒ Robust mode detection for standard or non-standard input timing
- ⇒ Accurate clock frequency and phase recovery

True color support for 6 bit panel

- ⇒ Proprietary spatial based dithering
- ⇒ Optional temporal based dithering

Support multiple TFT LCD panels

- ⇒ Programmable output timing parameters to match specifications of various TFT LCD panels
- ⇒ Single or dual pixel output (24/48 bit RGB)
- ⇒ Support power On/Off sequence to protect TFT LCDpanel

Low-cost system solution

- ⇒ No external frame buffer required
- ⇒ 2-wire serial interface for CPU
- ⇒ 256 pin LPGA package
- ⇒ 2.5V power with 3.3V tolerant I/O
- ⇒ Power Management

Family members

- ⇒ SD2000A: support analog interface only, no Digital RGB input port, no T-CON (PQFP208 package)
- ⇒ SD2000: support analog and digital RGB input ports, but no T-CON (LBGA256 package)
- ⇒ SD2000AT: support analog input port and T-CON embedded, but no Digital RGB Input port (LBGA256 package)
- ⇒ SD2000T: support both analog and digital RGB input ports as well as T-CON embedded (LBGA 256 package)