SD2000 – Integrated TFT LCD Display Controller

The SmartASIC **SD2000** is a highly integrated TFT LCD controller chip with the latest SmartASIC advanced image-processing technology and an integrated ADC/PLL. The SD2000 has advanced programmable non-linear parametric cubic based scaling engine with proprietary sharpness adjustment and text enhancement. SD2000 supports both analog and digital interfaced inputs with an internal ADC/PLL and external DVI receiver. The SD2000 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
- 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

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 LBGA 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)