# SP1015 - Direct Interface LCD PC Controller

The SmartASIC **SP1015** implements a novel architecture dedicated to LCD PC application. It supports both digital interfaced inputs with external DVI receiver and direct interface with Intel 810/810E DVO port and flat panel interface from other PC chip sets without requiring external micro-controller. This feature delivers a very low cost LCD PC solution by removing the redundant DVI transmitter and receiver chip set found in the current LCD PC solution. The SP1015 also implements the forth generation SmartASIC advanced image processing technology, and advanced scaling engine with proprietary sharpness adjustment. The SP1015 can also handle of a wide variety of TFT LCD panels and strongly support of standard or non-standard input timings up to SXGA resolution.

## FEATURES

- Direct interface with Intel 810/810E DVO ports and flat panel interfaces from other PC chip sets. This feature greatly reduces the system cost of LCD PC by removing DVI transmitter/receiver chip set or ADC/DAC chip set
- No external micro-controller is required
- Support both 12 bit and 24 bit input data
- Advanced image processing with proprietary sharpness adjustment
- Up and down scaling for all input resolutions from VGA to SXGA
- Supports digital and video inputs
- Programmable Gamma Correction
- Digital output brightness and contrast adjustments

**Proprietary scaling engine**
- Programmable horizontal and vertical expansion ratio
- Arbitrary down sampling factors

**Advanced image enhancement processor**
- User programmable sharpness adjustment
- Output digital contrast adjustment
- Programmable gamma correction

**Video input support**
- YUV 4:2:2 or RGB input format
- Built in color space converter
- De-interlace to compensate ODD/EVEN field shifting

**RGB input support**
- Input resolution up to SXGA
- 12 bit and 24 bit input support
- Seamless interface to industry standard DVI receivers
- Direct interface with Intel 810/810E DVO ports and flat panel interfaces from other PC chip sets

**True color support for 6 bit panel**
- Proprietary spatial based dithering
- Optional temporal based dithering

**Auto Configuration**
- Robust mode detection for standard or non-standard input timing without requiring external micro-controller
- Auto input contrast adjustment
- Digital interface only use input DE and DCLK

**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)

**Robust handling of invalid input conditions**
- Detect no input signal
- Detect input signal beyond acceptable range
- Output status indicators
- Generate output signal even when no input signal
- Support of non-full screen expansion to avoid exceeding panel specification

**Low-cost system solution**
- No external frame buffer required
- 2-wire serial interface to external EEPROM
- Built in output PLL
- 128 pin PQFP Package
- 3.3V power with 5V tolerant I/O
- Power Management
- Power On/Off sequence

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