STDP6018, STDP6026, STDP6036, STDP6028, STDP6038

Triple input LCD controller for WSXGA+ and WUXGA applications

Data brief

Features

- Programmable zoom and shrink scaling
- DisplayPort 1.1a compliant receiver – four-lane DisplayPort input
- Ultra-Reliable DVI® receiver (165 MHz) (STDP6026/STDP6036)
- Triple-channel (10-bit) ADC (205 MHz) and PLL
- Faroudja RealColor® color processing:
    - Image enhancement
    - 12-bit processing
    - Deep color support
    - xvYCC color space support
- Dual channel 8-bit LVDS output
- HDMI 1.3 receiver integrated with I2S (L/R channel) or SPDIF audio output ports (STDP6028/STDP6038)

- Intel x86-compatible microcontroller with external SPI ROM interface
- 12-bit panel gamma correction and high-quality dithering for 8-bit and 6-bit panel interface
- DDC controller for host interface purposes
- PWM signals for backlight, audio volume control, etc.
- Energy Spectrum Management® (ESM®)
- Package: 128-pin PQFP

Applications

- WSXGA+/FHD/WUXGA LCD monitors with VGA, DP, HDMI 1.3, or DVI inputs (supports wide-gamut panels and high color fidelity applications)
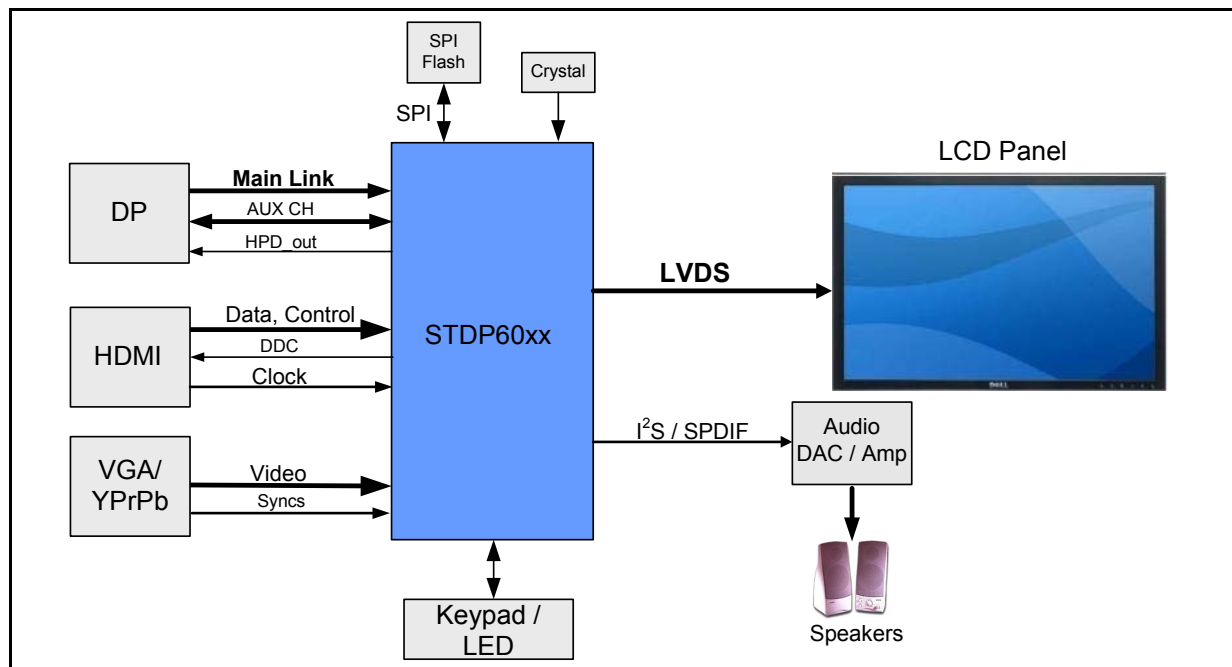
1 Description

STDP60xx is an all-in-one LCD monitor controller with analog (RGB), DisplayPort 1.1a, DVI (STDP6026/STDP6036), and HDMI 1.3a (STDP6028/STDP6038) inputs and supporting resolutions up to WUXGA in a 128 PQFP package. The STDP60xx leverages STMicroelectronics' patented advanced image-processing technology, as well as a proven integrated ADC/PLL and an Ultra-Reliable DVI compliant digital receiver (STDP6026/STDP6036) to deliver a high-quality solution for mainstream dual input monitors.

The output section contains a dual channel 8-bit LVDS transmitter for direct interfacing of commercially available LVDS LCD panel module. In addition, STDP60xx includes an integrated x86 OCM with SPI compatible interface, advanced color control features, a multicolor proportional font OSD engine, and a number of system I/O components.

Along with the high quality and reliability, STDP60xx also provides a very low cost system design by reducing the number of system components by deploying on a small two-layer PCB.

Figure 1. System diagram
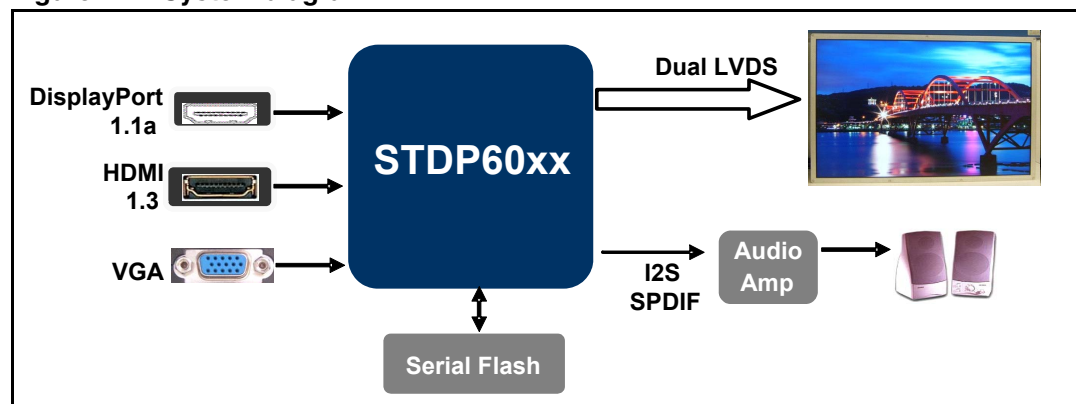
2   Feature attributes

- Advanced color controls
    - TV style color controls including hue and saturation
    - Faroudja RealColor provides six axis color controls, flesh-tone adjustment, gray guarding and image enhancement
    - Multiple-bin ACC extends the dynamic range of the display
- Analog RGB input
    - 205 MHz 10-bit ADC supports analog input up to UXGA @ 75
    - Composite-sync and Sync-on-Green (SOG) support
    - Instant Auto™ for automatic phase and clock adjustment
- Ultra-Reliable DVI input (STDP6026/STDP6036)
    - Operating speed 165 MHz (up to UXGA 60 Hz)
    - Direct connect to all DVI-compliant digital transmitters
    - High-bandwidth Digital Content Protection (HDCP)
- DisplayPort input
    - 4-lane DisplayPort 1.1a compliant Rx
    - One auxiliary channel
    - I2S (up to 8 channels) or SPDIF audio output ports
- HMDI 1.3 compliant Rx (STDP6028/STDP6038)
    - Supports resolutions up to 1080p/WUXGA
    - Deep color and wide gamut support: 12-bit HDMI input at YCC 4:4:4
    - Backwards compatible with DVI
    - Supports integrated HDCP
    - Supports audio
- Intelligent image processing™
    - Programmable coefficients for user sharpness control
    - Real Recovery™ function provides full color recovery image for refresh rates higher than those supported by the LCD panel
- x86 on-chip microcontroller
    - High-performance x86 MCU with on-chip RAM and ROM
    - Unified memory architecture simplifies chip programming
    - Three DDC2Bi ports on VGA, HDMI/DVI and DP/HDMI/DVI inputs with DMA buffer to internal RAM. DDC buses can function as GPIO
    - Slow clock mode for 50mW sleep mode power consumption
- On-chip OSD controller
    - 1, 2 and 4-bit per pixel character cells
    - Blinking, transparency and blending
    - Supports two independent OSD menu rectangles

- LVDS transmitters
  - Double pixel up to UXGA @ 60 output
  - Support for 8 or 6-bit LVDS (with high-quality dithering)
  - Programmable signal amplitude and driving strength
- Highly integrated system-on-a-chip
  - On-chip reset circuit to eliminate external reset IC
  - Broader PWM range from 50 Hz ~ 1 kHz with 256 steps adjustable duty cycle
  - LED direct drive pins
  - Programmable dithering block
  - Store HDCP key in embedded OTP ROM

3   Ordering information

Table 1.   Order codes

Part number	Description
STDP6018-AC	128-pin PQFP
STDP6026-AC	128-pin PQFP
STDP6036-AC	128-pin PQFP
STDP6028-AC	128-pin PQFP
STDP6038-AC	128-pin PQFP

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: *www.st.com*. ECOPACK® is an ST trademark.

4   Revision history

Table 2.   Document revision history

Date	Revision	Changes
05-Jan-2009	1	Initial release.
01-Dec-2009	2	Removed: HMDI 1.3 compliant receiver backward compatible with DVI; embedded virtual EDID; DPTx from block diagram. Changed: True 10-bit processing to 12-bit. Added: Supports wide-gamut panels and high color fidelity applications; HDMI 1.3 compliant Rx
04-Jan-2011	3	Added STDP6018 and STDP6036 part numbers. Specified part numbers that utilize either DVI or HDMI where applicable.

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