1 Description

The STDP8028 IC is an innovative System-on-Chip (SoC) controller designed for multimedia monitors and emerging digital display applications.

This IC provides a complete multimedia LCD monitor solution chassis supporting worldwide video and audio standards where exceptional quality is required.

The STDP8028 proficiently handles video and computer graphics inputs up to WUXGA resolutions. The output port delivers unparalleled image quality and supports display resolutions of up to WUXGA as well. Its rich feature set, high level of integration, and sophisticated implemented technologies for color management, scaling, video processing (Faroudja DCDi Cinema), and audio processing make STDP8028 the ideal answer for a high-quality, cost-effective, integrated multimedia monitor solution.

2   Benefits

- Complete SoC solution with exceptional video and audio quality
- Integrated DisplayPort (DP) 1.1receiver/HDMI 1.3 receiver/
  DVI 1.0 Rx with integrated HDCP key
- Integrated multi-standard worldwide 3D video decoder
- Superior video quality with Faroudja DCDi Cinema technology
- Multi-standard worldwide analog/digital audio decoder and post-processor
- Full HD video capability up to 1080p in/out support
- Additional integration of full audio processing, DPMS mode, UARTs, LBADC, 3D-VD,
  and more to reduce the system BOM costs

3 Feature attributes

- Flexible digital and analog capture
  - 19 configurable analog inputs
  - Integrated dual 10-bit triple ADCs with capture up to 205 MHz
  - Input resolution support up to UXGA@75 Hz/WUXGA@60 Hz
  - Composite-Sync and Sync-on-Green (SOG) support
  - Instant Auto™ for automatic phase and clock adjustment
  - 2 CVBS out support
  - 4:4:4/4:2:2/CCIR656/601 30/24/16/8-bit digital input port
- Integrated HDMI 1.3 receiver
  - Integrated multi-mode HDMI 1.3 receiver
  - Front-end multiplexer supports two physical input ports
  - 1080p HDMI capture support
  - HDCP 1.2 content protection with integrated key storage (not supporting Enhanced Verification Link and Advanced Cipher)
  - xvYCC support based on IEC61966-2-4 color standard
  - Deep color and wide gamut support: 12-bit HDMI input at YCC 4:4:4
- Integrated 3D video decoder
  - Supports all broadcast TV video standards—NTSC (North America and Japan), PAL (I, B, G, H, M, D, N), and SECAM (D, K, L, B, G)
  - Single 3D adaptive comb filter for luma–chroma separation for NTSC (North America and Japan) and PAL (I, B, G, H, M, D, N)
  - Supports Composite, S-Video, and Component SD and HD video input signals
  - Supports NTSC443 and PAL-60 playback video standards
  - Macrovision™ and VCR trick mode support
- Integrated DisplayPort 1.1 receiver
  - DisplayPort interconnectivity provides very high bandwidth compared to conventional digital interfaces, such as HDMI, DVI, and LVDS
  - Low cost interface with fewer signal lines, inexpensive cables and connectors, and low EMI
  - DisplayPort link comprising 4 main lines and 1 auxiliary channel
  - WUXGA capture support
- Integrated audio processing
  - 5 stereo (L/R) analog inputs, 1 mono (MIC) input
  - Additional and separate audio inputs for HDMI, I2S, SIF, and SPDIF
  - Outputs include 5 analog DACs, SPDIF, I2S, DSD, and 2 L/R
  - Worldwide multi-standard audio support
  - Integrated I2S audio delay for exact audio and video synchronization
  - Supports 5.1 analog/digital output stream (left, center, right, LS, RS + LFE)
- Faroudja RealColor
  - Faroudja RealColor provides true 10-bit color processing

- Advanced Color Management with overlapping regions allows for flexible flesh-tone compensation, blue stretch, color regions detection, and other image enhancements
- Advanced Contrast Control delivers smoother, more realistic gradients and ensures that full dynamic range is used in video content
- Patented QuickMatch technology produces uniform color responses for different panels using flexible and programmable techniques
- Integrated noise filter to eliminate contrast noise

● Faroudja DCDi Cinema format conversion
  - Low angle de-interlacing processing
  - Per pixel Motion Adaptive De-interlacing (MADi) up to 1080i format
  - Format conversion up to 1080p resolutions
  - Adaptive 3D/TNR noise reduction

● Picture-in-Picture (PIP)
  - Programmable PIP channel horizontal and vertical filter coefficients
  - Flexible PIP, PBP, and POP support capability (video, graphics)
  - DCDi Edge® processing for second channel window

● Faroudja TrueLife video enhancer
  - High performance programmable sharpening filters with noise coring
  - Programmable main channel horizontal and vertical filter coefficients
  - Non-linear chroma and luma enhancement

● DDR2 memory controller
  - DDR2 memory I/F support
  - Supports 16/32-bit memory I/F 1x16, 2x16, 1x32, 2x32

● On-chip microprocessor and OSD controller
  - Integrated x186-based microprocessor with rich function library
  - General Purpose Inputs/Outputs (GPIOs) available for managing system devices (keypad, backlight, NVRAM, etc.)
  - 2-wire serial master bus interface for external device control
  - Integrated I/R decoder and 4-channel low bandwidth ADC
  - Advanced bit-mapped OSD controller

● Output formats
  - Dual-channel/single-channel 18/24/30-bit LVDS transmitters for direct connection to LCD modules (applicable to STDP8028 only)
  - Single-channel 24/30-bit TTL output
  - Adaptive Contrast Ratio (ACR) control for automatic, intelligent backlight adjustments

4 Ordering information

Table 1.   Order codes

Part number	Description
STDP8028-AB	409-ball HSBGA

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.

5   Revision history

Table 2.   Document revision history

Date	Revision	Changes
28-Apr-2009	1	Initial release.
15-May-2009	2	Updated features section to specify "receiver" when referring to integrated HMDI 1.3 feature. Changed HDCP version from 1.3 to 1.2 and added "not supporting Enhanced Verification Link and Advanced Cipher." Added the word "integrated" to feature heading "DisplayPort 1.1receiver".

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