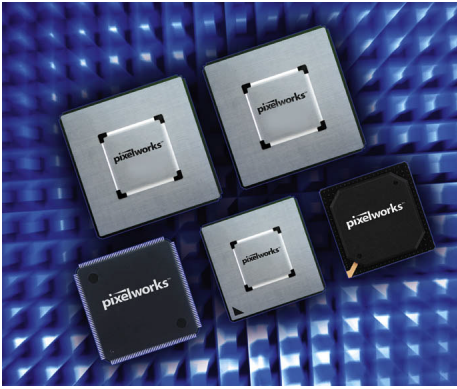


PW164A ImageProcessor

Flat Panel Display Controller IC



Pixelworks provides an unrivaled end-to-end product line of system-on-a-chip integrated circuits (ICs), interface ICs, and software for the advanced display market. The Pixelworks product line speeds time-to-market while setting new benchmarks in image quality, broad compatibility, ease of use, and lower overall system cost.

Pixelworks' innovative system-on-a-chip ImageProcessors and interface ICs process and optimize video, computer graphics, and Web information for display on flat-panel monitors, projectors, digital televisions, and other advanced display products using LCD, plasma, and Digital Light Processing (DLP) technologies.

Applications

- LCD Monitors
- Multimedia Displays
- Plasma Displays
- Projection Displays

The PW164A ImageProcessor is a highly integrated "system-on-a-chip" that interfaces analog, digital, and video inputs in virtually any format to a pixel-based display. Computer and video images from NTSC/PAL to UXGA at virtually any refresh rate can be resized to fit on a fixed-frequency target display device, with any resolution up to SXGA. An embedded SDRAM frame buffer and memory controller perform frame-rate conversion completely on-chip.

With an on-chip microprocessor and reference source code, manufacturers can develop feature-rich products with rapid time-to-market. Programmable features include the user interface, custom start-up screen, all automatic imaging features, and special screen effects.

Graphics Input

- RGB 24/48-bit
- 162 Mpixels/sec maximum input rate
- Interlaced or progressive inputs
- Digital sync separator—H+V, Composite, Sync-on-Green support; DE-only input mode - no other syncs required
- Auto Image Optimization—fast and accurate image optimization of position, frequency, phase, brightness, and contrast; Image can be displayed while optimizing
- Data enable input for non-contiguous inputs
- Programmable COAST and CLAMP output signals

Video Input

- RGB 24-bit; YUV 16/24-bit
- 75 MPixels/sec maximum input rate
- Color space converter supports ITU-R 601
- Interlaced or progressive inputs
- Digital sync separator
- Auto Image Optimization
- Data enable input supports non-contiguous video data

Video Processing

- Video deinterlacing—single field spatial or two-field temporal

Image Memory

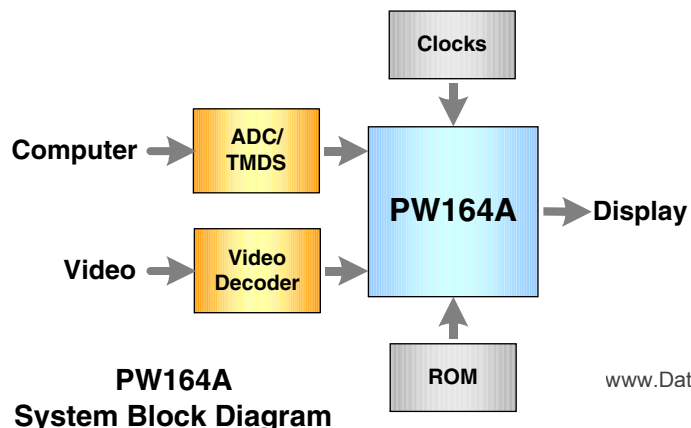
- On-chip SDRAM memory—frame buffer, OSD buffer, uP RAM
- Frame rate conversion or framelocked operation
- Double-buffering for video

Image Scaling

- Up and down image scaling
- Independent vertical and horizontal scale factors
- DSP engine with 160 taps
- Programmable sharpness filters
- Keystone correction and Non-linear scaling for aspect ratio conversion (-TK only)
- Bypass mode available for 1:1 image display

On-Screen Display (OSD)

- On-chip, bitmap-based, OSD controller with on-chip memory
- 4/16-colors from 64k palette
- Typical OSD size—512x360 in 16-color; maximum size 1024x1024 in 4-color
- Hi-Color OSD—16-bit color images for startup-screens and test patterns
- Transparent and translucent OSD
- OSD rotation
- Programmable OSD location and size



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Basic Characteristics

Package: 256-pin PBGA, 27x27mm
 Temperature Range: 0-70° C
 Power Supply: 2.5V and 3.3V
 Process: 0.20µm CMOS embedded DRAM

Device	Features
PW164A-10T/TK -T: XGA Monitors -TK: XGA Projectors	Input resolution to SXGA
	Output resolution to XGA
	Graphics input up to 158 MPixels/second
	Video input up to 75 MPixels/second
	Display output up to 100 MPixels/second
PW164A-20T/TK -T: SXGA Monitors -TK: SXGA Projectors	Input resolution to SXGA
	Output resolution to SXGA
	Graphics input up to 162 MPixels/second
	Video input up to 75 MPixels/second
	Display output up to 108 MPixels/second

Display Port

- 24/48-bit RGB output
- 108 Mpixels/sec maximum output rate
- Programmable display timing generator—HS, VS, Data Enable
- Digital brightness (offset) and contrast (gain) adjustments
- Programmable color lookup tables with 10-bit accuracy for gamma correction
- Color space expander for 8-bit color on 6-bit displays

Microprocessor

- 50MHz 80186 compatible on-chip CPU core
- 32KB maximum on-chip RAM
- Glueless interface to external FLASH ROM
- Up to 16-bits of GPIO
- One Pulse Width Modulation (PWM) output for backlight or audio control
- Two IR Receiver modules
- Chip Select outputs for I/O expansion
- Two timers & one watchdog timer
- One UART with baud rate generator
- Interrupt controller w/external inputs
- JTAG debugger port

Other Features

- Clock generator with low power modes
- Pin compatible with PW164

Software Support

- ImageProcessor SDK—complete reference software with full “C” source code
- Extensive input signal compatibility
- Powerful Windows-based tools (PWConfig, GUIBuilder, FlashUpgrader, and PWDebug)
- Development tools (Paradigm, KADAK, PROMJet)
- Optional device drivers for other system components (ADCs, Video Decoders, more)

Evaluation Kit

- Allows rapid evaluation of ImageProcessor features
- Video and RGB inputs; LVDS and TTL outputs
- RS-232 port for FLASH download, and PWDebug access
- Optional XGA and SXGA LCD Modules
- Complete with keypad, IR Remote, cables, and power supply

