



SXGA-Compatible **AD9884** FLAT PANEL GRAPHICS DIGITIZER

The AD9884 graphics digitizer integrates all analog signal conditioning, clock generation and data conversion circuitry necessary for flat panel LCD monitors, projectors and plasma displays to render analog RGB signals from personal computers and workstations. The device combines a low-jitter PLL and 500 MHz full-power analog bandwidth to ensure LCD image quality comparable to that of the most expensive digital interconnects. The single-chip digitizing device includes on-chip clock generation, A/D conversion and programmable gain and clamp control with demultiplexed CMOS outputs to digital LCD graphics controllers.

ANALOG RGB LEGACY COMPATIBILITY

Fully compliant with VESA Plug & Display standard for flat panel displays

Digitizes analog RGB signals from standard 15-pin, D shell connector on any PC, graphics adaptor or video graphics controller

Maintains monitor compatibility with the installed base of over 1 billion PCs with analog RGB outputs

LOWEST SYSTEM COST

Delivers 33% lower system cost than that of digital TMDS and LVDS interface technologies

Analog RGB signaling avoids 4× cost premium for digital twinax cabling and shielding to ensure compliance with EMI emission standards

Highly integrated triple A/D converter, phase locked loop, programmable gain and clamp control and voltage reference delivers lowest LCD monitor BOM cost

HIGH-RESOLUTION SXGA DISPLAY

140 MSPS encode rate supports display resolutions up to 1280 × 1024 at 75 Hz refresh rates

SUPERIOR LCD IMAGE QUALITY

500 MHz full-power analog bandwidth accurately acquires and digitizes each pixel up to 140 MSPS rates

500 pS p-p jitter and temperature stable PLL ensure the image is free from noise and flicker

COMPANION DESIGN GUIDE

Data sheet includes complete information on device layout, register addresses and performance specifications

Evaluation board includes tips on board layout and suggestions for optimizing circuit performance



PRODUCT SPECIFICATIONS

General

128-lead MQFP package
 Integrates part pre-amps,
 clamps and phase-locked loops (PLL)
 2.5 V to 3.6 V three-state CMOS outputs
 Temperature range from 0°C to +85°C
 140 MSPS maximum conversion rate

Power

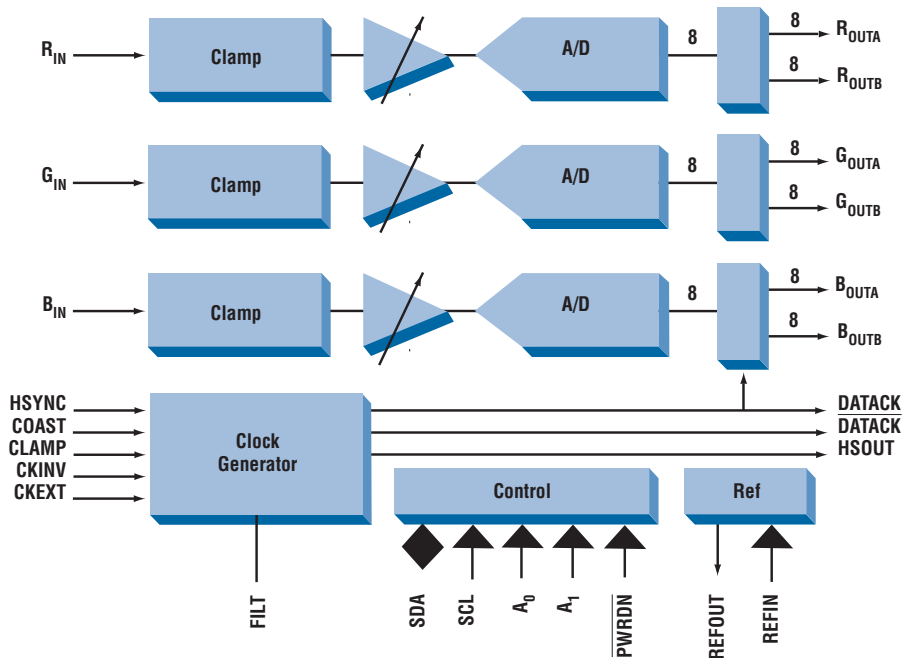
3.3 V power supply
 Low power: 800 mV, typical

Image Quality

500 MHz analog bandwidth
 500 pS p-p PLL clock jitter
 Supports two pixels or one pixel per clock mode

Ease Of Design

Data clock output provided
 Internal PLL generates CLOCK from HSYNC
 Fully programmable serial bus interface available
 Full evaluation board available



AD9884 Block Diagram

TECHNOLOGY

Lowering System Cost

When considering the total interface solution cost for flat panel displays, it's important to include the monitor cable and connectors in addition to the component costs. The analog interface uses simple, low cost VGA cables and connectors that benefit from over a decade of high volume production. The total cost of the analog interface for an XGA (1024 × 768 lines) resolution LCD monitor is now about \$23.50, including the monitor cable, two 15-pin D shell connectors, the AD9884 and all support circuitry.

Digital interface standards such as VESA's Plug and Display and DFP (Digital Flat Panel) use cables and connectors that yield system costs starting at \$35 for an XGA LCD monitor – almost 33% more than an analog interface. Cables alone for digital interfaces currently cost \$15 to \$25 for a two-meter cable – at least four times more than for an analog interface – and require additional shielding (twinax cables) to insure compliance to EMI emission standards.

Even if design improvements in the digital interfaces that reduce EMI are eventually realized, these cables and connectors will always be more expensive because of lower manufacturing volumes and additional copper conductors.

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Printed in the U.S.A. H3416-2-8/98