S1D13505 Embedded RAMDAC LCD/CRT Controller February 2009

■ DESCRIPTION

The S1D13505 is a color/monochrome LCD/CRT graphics controller interfacing to a wide range of CPUs and display devices. The S1D13505 architecture is designed to meet the low cost, low power requirements of the embedded markets, such as Mobile Communications, Hand-Held PCs, and Office Automation.

The S1D13505 supports multiple CPUs, all LCD panel types, CRT, and additionally provides a number of differentiating features. Products requiring a “Portrait” mode display can take advantage of the SwivelView feature. Simultaneous, Virtual and Split Screen Display are just some of the display modes supported, while the Hardware Cursor, Ink Layer, and the Memory Enhancement Registers offer substantial performance benefits. These features, combined with the S1D13505’s Operating System independence, make it an ideal display solution for a wide variety of applications.

■ FEATURES

Memory Interface

- 16-bit EDO-DRAM or FPM-DRAM interface.
- Memory size options:
  512K bytes using one 256K×16 device.
  2M bytes using one 1M×16 device.
- Addressable as a single linear address space.

CPU Interface

- Supports the following interfaces:
  Hitachi SH-4.
  Hitachi SH-3.
  Motorola M68K.
  Philips MIPS PR31500/PR31700.
  Toshiba MIPS TX3912.
  Motorola Power PC MPC821.
  NEC MIPS VR4102/VR4111.
  Epson E0C33.
  PC Card (PCMCIA).
  StrongARM (PC Card).
  ISA bus.
  MPU bus interface with programmable READY.
- CPU write buffer.

Display Support

- 4/8-bit monochrome passive LCD interface.
- 4/8/16-bit color passive LCD interface.
- Single-panel, single-drive displays.
- Dual-panel, dual-drive displays.
- Direct support for 9/12-bit TFT/D-TFD; 18-bit TFT/D-TFD is supported up to 64K color depth (16-bit data).
- Embedded RAMDAC with direct analog CRT drive.
- Simultaneous display of CRT and passive or TFT/D-TFD panels.
- Maximum resolution of 800x600 pixels at a color depth of 16 bpp.

Display Modes

- 1/2/4/8/16 bit-per-pixel (bpp) support on LCD/CRT.
- Up to 16 shades of gray using FRM on monochrome passive LCD panels.
- Up to 4096 colors on passive LCD panels.
- Up to 64K colors on active matrix TFT/D-TFD LCD panels and CRT in 16 bpp modes.
- Split Screen Display: allows two different images to be simultaneously viewed on the same display.
- Virtual Display Support: displays images larger than the display size through the use of panning.
- Double Buffering/multi-pages: provides smooth animation and instantaneous screen update.
- SwivelView: direct hardware 90° rotation of display image for portrait mode display.
- Acceleration of screen updates by allocating full display memory bandwidth to CPU.
- Hardware 64x64 pixel 2-bit cursor or full screen 2-bit ink layer.

Clock Source

- Single clock input for both pixel and memory clocks.
- Memory clock can be input clock or (input clock/2), providing flexibility to use CPU bus clock as input.
- Pixel clock can be memory clock or (memory clock/2) or (memory clock/3) or (memory clock/4).

Power Down Modes

- Software power save mode.
- LCD power sequencing.

General Purpose IO Pins

- Up to 3 General Purpose IO pins are available.

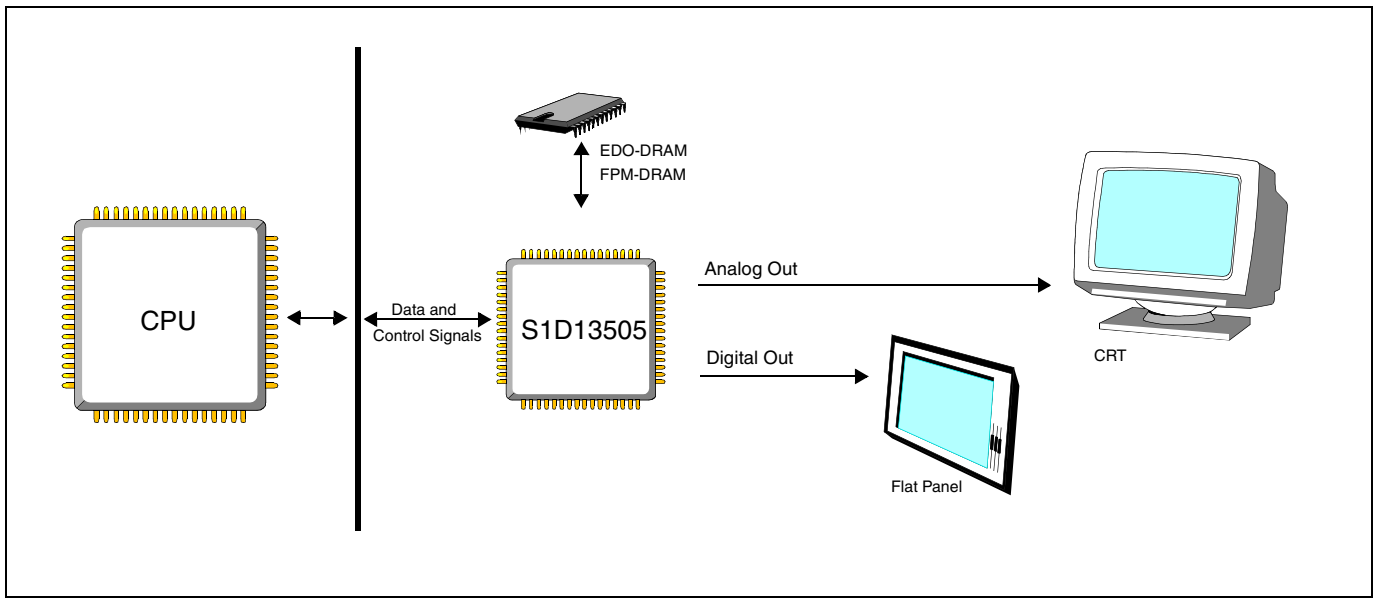
Operating Voltage

- 2.7 volts to 5.5 volts.

Package

- 128-pin QFP15 surface mount package.

■ SYSTEM BLOCK DIAGRAM



CONTACT YOUR SALES REPRESENTATIVE FOR THESE COMPREHENSIVE DESIGN TOOLS

- S1D13505 Technical Manual
- S5U13505 Evaluation Boards
- CPU Independent Software Utilities
- Linux Console Driver
- Windows® CE Display Driver
- VXWorks® Tornado™ Display Driver

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