

**S1D13506 COLOR LCD/CRT/TV CONTROLLER**

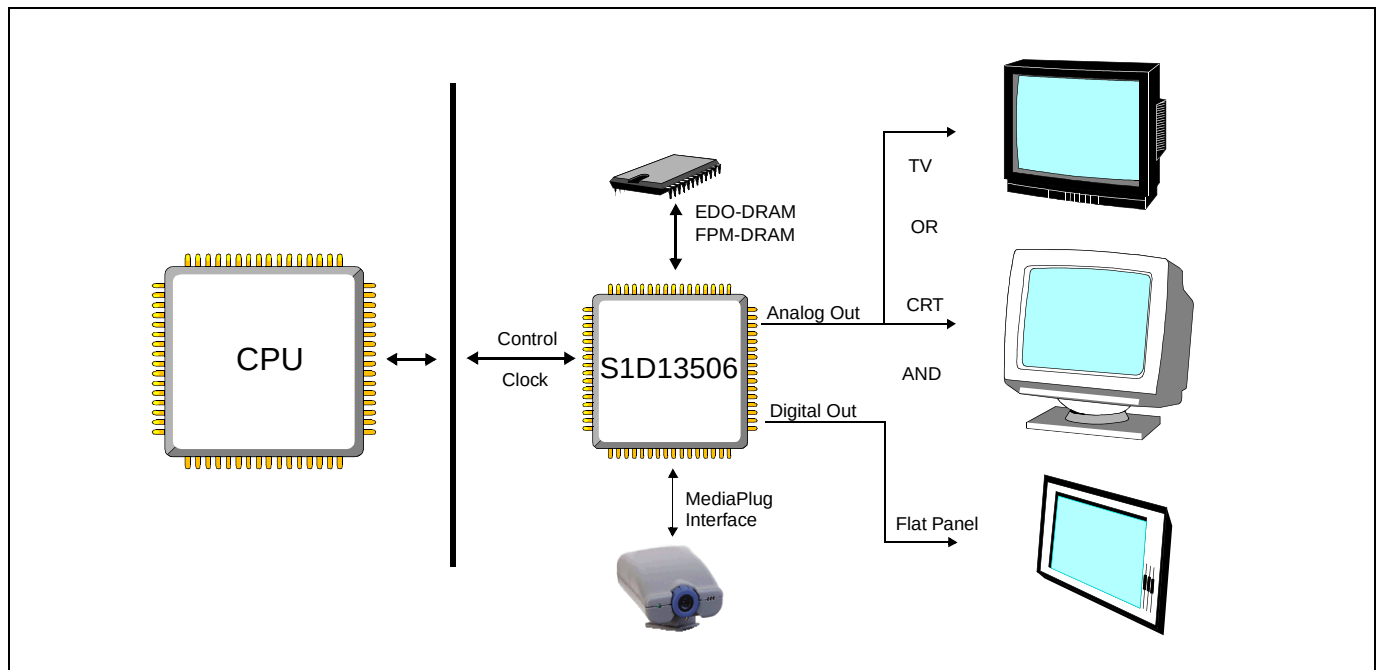
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The S1D13506 is a color LCD/CRT/TV graphics controller interfacing to a wide range of CPUs and display devices. The S1D13506 architecture is designed to meet the low cost, low power requirements of the embedded markets, such as Mobile Communications, Hand-Held PC's, and Office Automation.

The S1D13506 supports multiple CPUs, all LCD panel types, CRT, TV, and additionally provides a number of differentiating features. Products requiring digital camera input can take advantage of the directly supported WINNOV VideumCam™ digital interface. EPSON Independent Simultaneous Display allows the user to configure two different images on two different displays, while the SwivelView™, Hardware Cursor, Ink Layer, and BitBLT engine offer substantial performance benefits. These features, combined with the S1D13506's Operating System independence, make it an ideal display solution for a wide variety of applications.

**■ FEATURES**

- 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.
- Multiple CPU interface support.
- Resolutions up to:  
640×480 at a color depth of 16 bpp.  
800×600 at a color depth of 16 bpp.
- Display Support for:  
4/8/16-bit passive panels.  
9/12 TFT/D-TFD panels.  
18-bit TFT/D-TFD to a depth of 64K colors.  
CRT.  
NTSC and PAL TV Output.
- SwivelView™: 90°, 180°, 270° hardware rotation of displayed image.
- EPSON Independent Simultaneous Display: displays different images on different displays.
- Virtual Display Support: displays images larger than the panel size through the use of panning.
- Hardware Cursor or full screen Ink Layer.
- 2D BitBLT Engine.
- WINNOV Videum® Cam digital camera interface.
- Software initiated Power Save Mode.
- Operating System Independent.

**■ SYSTEM BLOCK DIAGRAM**

## S1D13506

### DESCRIPTION

#### Memory Interface

- 16-bit EDO-DRAM or FPM-DRAM interface.
- Addressable as a single linear address space.

#### CPU Interface

- Supports the following interfaces:
 

|                             |                              |
|-----------------------------|------------------------------|
| EPSON E0C33                 | NEC MIPS VR41xx              |
| Hitachi SH-4/SH-3           | PC Card (PCMCIA)             |
| ISA bus                     | Philips MIPS PR31500/PR31700 |
| Motorola M68xxx             | StrongARM (PC Card)          |
| Motorola MPC821             | Toshiba MIPS TX39xx          |
| MPU with programmable READY |                              |

- CPU Write buffer.

#### Display Support

- LCD Panels: 4/8/16-bit passive LCD interface.  
9/12-bit TFT/D-TFD.  
18-bit TFT/D-TFD to a depth of 64K colors.
- CRT: Embedded RAMDAC for direct analog CRT.
- TV: Composite/S-Video TV output.  
NTSC/PAL support.  
Flicker filter.  
Luminance filter.  
Chrominance filter.
- Maximum resolution of 800x600 at 16 bpp.

#### Power Down Modes

- Software initiated power save mode.
- LCD Power Sequencing.

#### Digital Video Camera Interface

- Built-in WINNOV Videum® Cam digital camera interface.

#### Display Modes

- 4/8/16 bit-per-pixel (bpp) support on LCD, CRT and TV.
- Up to 64 shades of gray on monochrome LCD panels using FRM and Dithering.
- Up to 64K colors on passive LCD, active matrix TFT/D-TFD, CRT and TV in 16 bpp modes.
- SwivelView™: 90°, 180°, 270° hardware rotation of displayed image.
- EPSON Independent Simultaneous Display (EISD): displays different images on different displays.
- Virtual Display Support: displays images larger than the panel size through the use of panning and scrolling.
- Hardware Cursor or full screen Ink Layer.

#### Acceleration

- 2D Engine including the following BitBLTs:
 

|                               |                      |
|-------------------------------|----------------------|
| Write BLT                     | Move BLT             |
| Solid Fill                    | Pattern Fill         |
| Transparent Write BLT         | Transparent Move BLT |
| Read BLT                      | Color Expansion      |
| Move BLT with Color Expansion |                      |

#### Operating Voltage

- 2.7 volts to 5.5 volts.

#### Package

- 128-pin QFP15.

### CONTACT YOUR SALES REPRESENTATIVE FOR THESE COMPREHENSIVE DESIGN TOOLS

- S1D13506 Technical Manual
- QNX® Photon Display Driver
- S5U13506 Evaluation Boards
- VXWorks® UGL and WindML Display Drivers
- CPU Independent Software Utilities
- Windows® CE Display Driver



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