

## S1D13522 EPD Controller

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EPSON's S1D13522 controller builds on the success of the S1D13521 providing high performance, low system cost solutions for E Ink EPDs (Electronic Paper Displays).

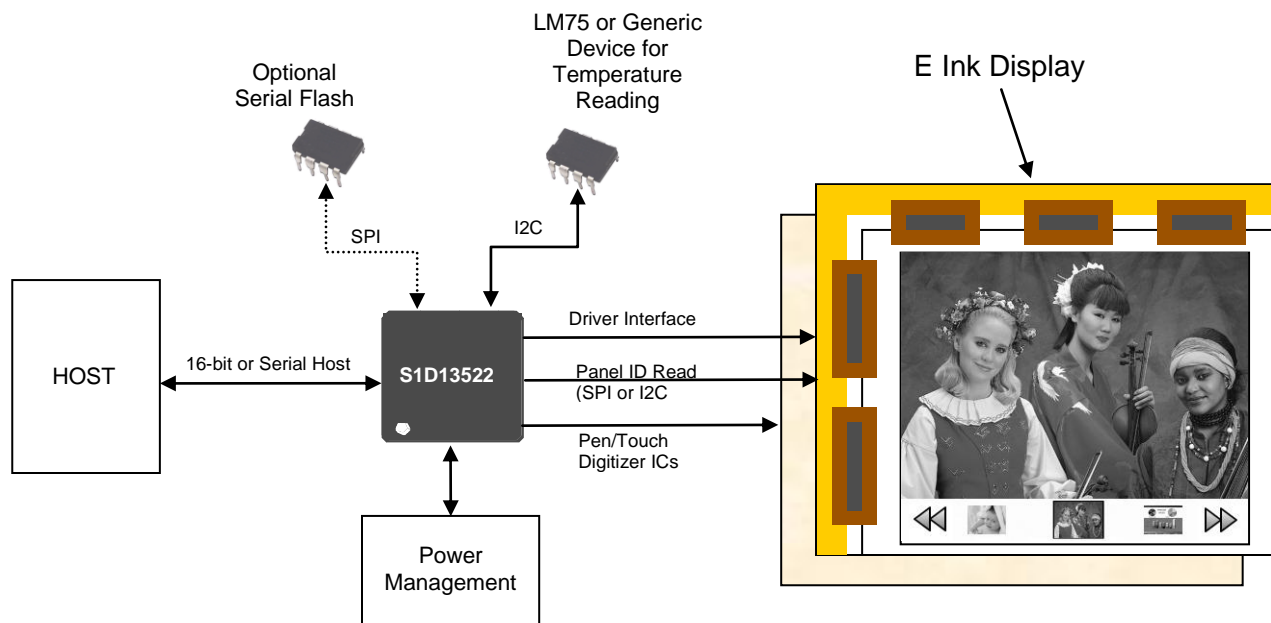
The S1D13522 includes 2M bytes of stacked memory and features that greatly reduce the CPU overhead for EPD applications. Allowing multi-regional and concurrent display updates, the S1D13522 adds interface support for direct Touch/Pen drawing. Picture-in-Picture, Rotation, Transparency, and Hardware Cursor functions further increase the flexibility in delivering the optimal display experience.

The Advanced Sequencer Engine, Power Management, I2C Thermal Sensor, and optional Serial Flash Memory support make a variety of implementations possible. The S1D13522 is the ideal choice for new EPD designs and design upgrades.

### ■ Features

- Targeted for display resolutions up to 1200x825
- Smooth screen updates
- Multi-Regional updates for smooth drawing
- Rotation support for Host Writes
- Low Host overhead
- 16-bit Indirect or Serial Host Support
- I<sup>2</sup>C Thermal Sensor provides temperature support for automatic temperature compensation.
- Optional Serial Flash Memory with auto boot display support and customizable boot screen
- Programmable Power Management for panel power saving
- 2M bytes of stacked memory
- SPI master supporting 2 slave devices
- Advanced Sequencer Engine w/ ALU
- Picture-in-Picture and Cursor functions with separate buffers
- Supports Direct Touch/Pen drawing
- Internal Programmable PLL
- Single MHz Clock Input
- Software Power Save Mode
- General Purpose IO Pins available
- Package: PFBGA (0.8mm and 0.5mm ball pitch)

### ■ System Block Diagram



### ■ Description

**Display Support**

- Compatible with E Ink Active Matrix Panels
- Compatible with LG Display – Gate In Panel (GIP)
- Up to 1200x825 @ 50Hz
- Up to 4-bit grayscale waveforms (16 grey-shades)
- Auto Waveform Management Version 2
- Panel Border Support
- Waveform format: E Ink's

**Stacked Memory**

- 2M bytes of Stacked memory
- Host write rotation: 90°, 180°, or 270°
- Host writes can use packed mode for high-speed transfers
- Host writes with transparency for non-rectangular images
- New image data can be loaded to the image buffer while display updates are in progress

**Host Support**

- Indirect Intel 80 16-bit or Serial Host
- Simplified command style access
- DMA compatible memory bus style host interface
- Advanced Sequencer Engine w/ALU performs pre-programmed series of commands from Host

**Display Features**

- Picture-in-Picture (PIP) window with separate image buffer and transparency function
- Hardware Cursor support

**Serial Flash Memory Waveform Read Support**

- Optional SPI Flash memory for auto boot display support and customizable boot screen
- High Speed SPI Mode

**Power Management Support**

- 4-pin power sequencing control with auto power on/off for update operations

**I<sup>2</sup>C Thermal Sensor Temperature Reading Support**

- Supports LM75 digital temperature sensor and compatible devices
- Generic I2C device support

**Clock Source**

- Internal Programmable PLL
- Single MHz clock input (CLKI/Crystal)

**Miscellaneous**

- SPI master supporting 2 slave devices (i.e. Serial Flash, Panel ID retrieval, etc.)
- Supports Pen/Touch Digitizer ICs (SPI or UART)
- Software Power Save Modes
- Low and ultra-low power modes
- General Purpose Input/Output pins
- Each GPIO pin can be configured for edge detect interrupt
- Package:
  - PFBGA 144-pin (10mm x 10mm, 0.8mm pitch)
  - PFBGA 144-pin (7mm x 7mm, 0.5mm pitch)
- Core Voltage: 1.8V
- IO Voltage: 1.65V ~ 3.6V

n/a

For technical and ordering information for the E Ink AM350 Broadsheet Prototype Kit, contact E Ink at [www.eink.com/kits/](http://www.eink.com/kits/).

For technical and ordering information for the S1D13522 EPD Controller, contact your EPSON sales representative.

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