S1D13524 Color EPD Controller

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EPSON's S1D13524 controller brings color and large panel B/W support to EPD. The S1D13524 is designed with the latest EINK materials in mind, and supports the latest advances in gate and source driver technology. The S1D13524 is the perfect solution to high resolution, high frame rate designs.

The built-in color processor is designed to minimize host processing overhead. It configures easily for each customers unique requirements. The color engine can be configured to match many CFA configurations with build-in dithering to further optimize the Color EPD image with low host overhead.

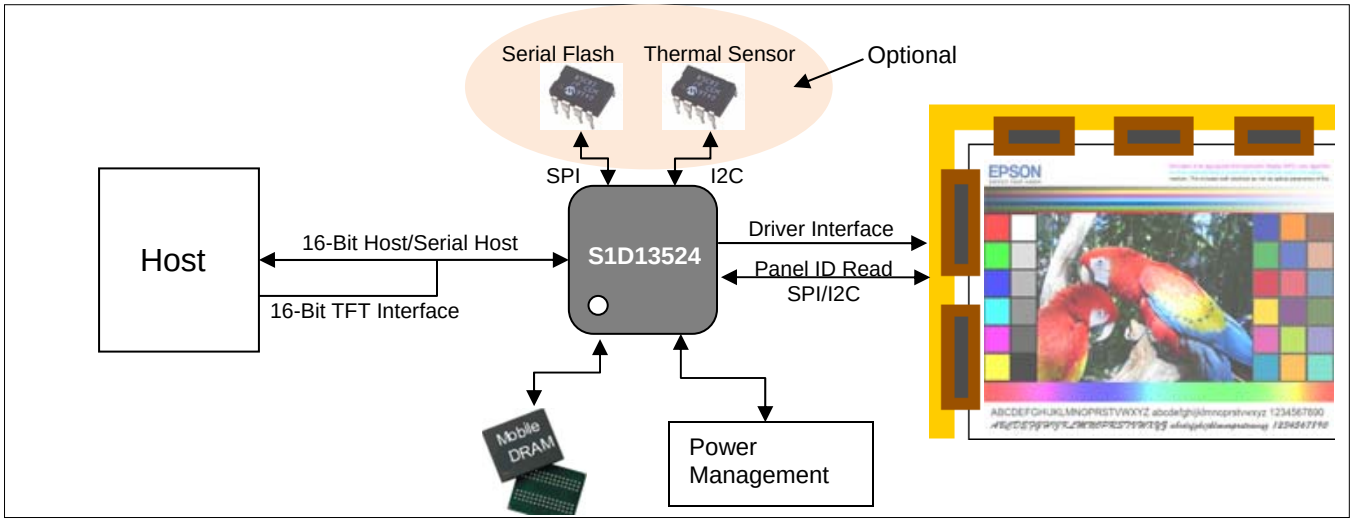
The S1D13524 controller connects to external memory and power management logic; separate flash and thermal sensors are optional. As with all of EPSON EPD controllers, the S1D13524 allows multi-regional and concurrent display updates. The S1D13524 includes support for Rotation, Transparency, Instant On functions.

The Advanced Sequencer Engine, Power Management, I2C Thermal Sensor, and Serial Flash support make a variety of implementations possible. The S1D13524 is the ideal choice for color EPD or large, high frame rate B/W designs.

Features

- Targeted for high resolution, high frame rate Color
- Built-in color processor
- Flexible CFA configurations
- Built-in dither function integrated into the color engine.
- High resolution color up to 2560x2048 @ 85Hz
- Supports 8000x8000 resolutions at lower frame rates
- Multi-Regional updates for smooth drawing
- Rotation support for Host Writes
- 16-bit indirect, TFT or Serial Indirect Host Support
- I^2C Thermal Sensor provides temperature support for automatic temperature compensation.
- Programmable Power Management for panel power saving
- Supports third party PMIC's
- Support for External 16/32-bit LP-DDR and SDR Memory
- SPI master supporting 1 slave devices
- Advanced Sequencer Engine w/ ALU
- Auto boot display allow instant on without OS delay
- Internal Programmable PLL
- Single MHz Clock Input
- Software Power Save Mode
- General Purpose IO Pins available
- Package: TFBGA 241-pin (0.65mm ball pitch)

System Block Diagram



■ Description

Display Support
- Targeted for next generation E-Ink Active Matrix Panels
- Compatible latest PVI and LGD modules
- Color: 2560x2048 @ 85Hz
- B/W: 3200x2560 @ 50Hz
- Max resolution over 8000x8000
- Up to 4-bit grayscale waveforms (16 grey-shades)
- Panel Border Support

Color
- Programmable built-in color processor
- CFA configuration is programmable
- Operates at TFT or pixel resolutions
- Built in dither function
- Supports split mask CFA configurations

Memory
- 16 / 32 bit external DDR or SDR
- Host write rotation: 90°, 180°, or 270°
- Host Write data input can be packed as 8bpp/16bpp (color) or 4bpp (Grey scale) for high-speed transfer
- Image data can be loaded to the image buffer while display updates are in progress

Host Support
- 16 bit (RGB565) streaming TFT input
- 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

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 and Thermal Sensor Support
- Supports discrete power management solutions
- Supports integrated third party PMIC's
- Generic I2C device support to support LM75 digital temperature sensor and compatible devices

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.)
- 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:
  - TFBGA 241-pin (11mm x 11mm, 0.65mm pitch)
- Core Voltage: 1.5V
- IO Voltage: 1.65V – 3.6V

For technical and ordering information for the S1D13524 EPD Controller, contact your EPSON sales representative.

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