

## S1D13517 External SDRAM LCD Controller

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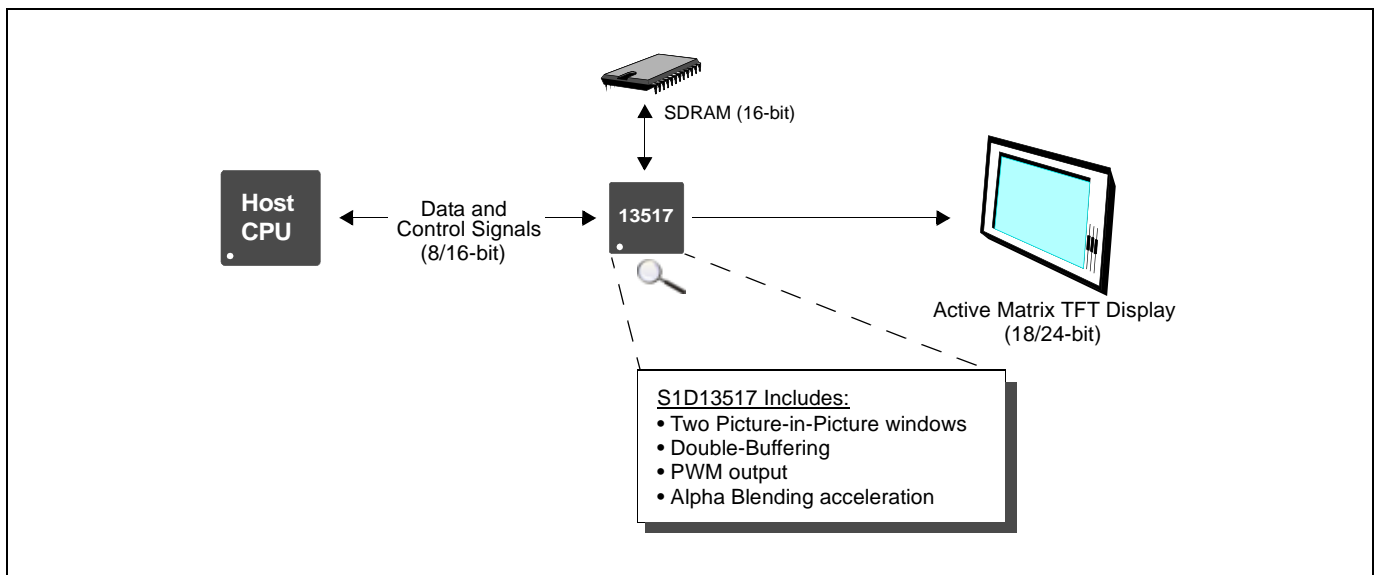
The S1D13517 is a color LCD graphics controller which uses an external SDRAM display buffer. The S1D13517 supports an 8/16-bit indirect host interface while providing high performance bandwidth to external SDRAM, allowing for fast screen updates.

The S1D13517 supports displays up to 960x540 (QHD) @ 24 bpp or 800x600 (SVGA) @ 24bpp, controlling a main the window and up to two Picture-in-Picture windows. Additionally, the S1D13517 is designed with a 2D Graphics Engine with Alpha Blending. The S1D13517 uses a double-buffer architecture to prevent any visual tearing during streaming video screen updates.

### ■ FEATURES

- Easy to use, Easy to connect
- External 16M-bit, 64M-bit or 128M-bit SDRAM
- High performance SDRAM controller
- 8/16-bit asynchronous indirect parallel interface (used for display or register data)
- Input data formats: RGB 8:8:8, RGB 5:6:5
- Active Matrix TFT interface: 18/24-bit interface
- Supports resolutions up to 960x540 or 800x600
- Software Power Save mode
- Main Display Window with two Picture-in-Picture windows
- 180° hardware rotation and mirror of display image
- Double-Buffer available to prevent image tearing during streaming input
- PWM output for LCD backlight control
- Internal programmable PLL
- SS (Spread spectrum) clock available
- General Purpose Output pins

### ■ SYSTEM BLOCK DIAGRAM



## S1D13517

### DESCRIPTION

#### Frame Buffer

- External 16M-bit, 64M-bit or 128M-bit SDRAM memory support
  - Maximum 90MHz SDRAM clock
  - 16-bit bus width
  - Maximum 16-Buffer separation available

#### Host Interface

- 8/16-bit asynchronous parallel interface (used for display or register data)
  - Indirect addressing Intel80 interface
  - Burst and rectangular write available for memory

#### Input Data Format

- RGB 8:8:8, RGB 5:6:5

#### Display Support

- Active Matrix TFT
  - 18/24-bit interface
- Supports resolution up to 960x560 (QHD)
  - HVGA, VGA, WVGA, SVGA

#### Power

- COREVDD 2.5 volts, PLLVDD 2.5 volts and IOVDD 3.3 volts

#### Display Features

- 24 bit-per-pixel (bpp) color depths
- Display window
- Two Picture-in-Picture windows
- 2D graphics engine (Alpha blending, Copy)
- 180° hardware rotation and mirror of display image.
- Double-Buffer available to prevent image tearing during streaming input
- Software Multi-Buffer available for simple animation
- TE (Tearing Effect) output

#### Clock Source

- Internal programmable PLL (Maximum 180MHz)
- Spread Spectrum clock available for PCLK and SDCLK (note: frequency: 31MHz to 80MHz)
- LCD pixel clock (Maximum PCLK = 45MHz)
- SDRAM clock (Maximum SDCLK = 90MHz)

#### Miscellaneous

- PWM output for LCD backlight control
- Software Power Save mode
- General Purpose Output pins are available (GPO[3:0])
- QFP15 128-pin package (16mm x 16mm x 1.7mm)

### CONTACT YOUR SALES REPRESENTATIVE FOR COMPREHENSIVE DESIGN TOOLS

- S1D13517 Technical Documentation
- CPU Independent Software Utilities
- S1D13517 Evaluation Boards
- Royalty Free source level driver code

#### Japan

Seiko Epson Corporation  
IC International Sales Group  
421-8, Hino, Hino-shi  
Tokyo 191-8501, Japan  
Tel: +81-42-587-5814  
Fax: +81-42-587-5117

#### North America

Epson Electronics America, Inc.  
2580 Orchard Parkway  
San Jose, CA 95131, USA  
Tel: +1-800-228-3964  
Fax: +1-408-922-0238

#### China

Epson (China) Co., Ltd.  
7F, Jinbao Bldg.  
No. 89 Jinbao St.  
Dongcheng District  
Beijing 100005, China  
Tel: +86-10-6410-6555  
Fax: +86-10-6410-7320

#### Taiwan

Epson Taiwan Technology & Trading Ltd.  
14F, No. 7  
Song Ren Road  
Taipei 110, Taiwan  
Tel: +886-2-8786-6688  
Fax: +886-2-8786-6660

#### Hong Kong

Epson Hong Kong Ltd.  
20/F, Harbour Centre  
25 Harbour Road  
Wanchai, Hong Kong  
Tel: +852-2585-4600  
Fax: +852-2827-4346

#### Europe

Epson Europe Electronics GmbH  
Riesstrasse 15  
80992 Munich, Germany  
Tel: +49-89-14005-0  
Fax: +49-89-14005-110

#### Singapore

Epson Singapore Pte., Ltd.  
1 HarbourFront Place  
#03-02 HarbourFront Tower One  
Singapore 098633  
Tel: +65-6586-5500  
Fax: +65-6271-3182

#### Korea

Seiko Epson Corp.  
Korea Office  
50F, LKI 63 Bldg.  
60 Yoido-dong, Youngdeungpo-Ku,  
Seoul, 150-763, Korea  
Tel: +82-2-784-6027  
Fax: +82-2-767-3677

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