

S1D13U11 USB Interface Graphics Controller

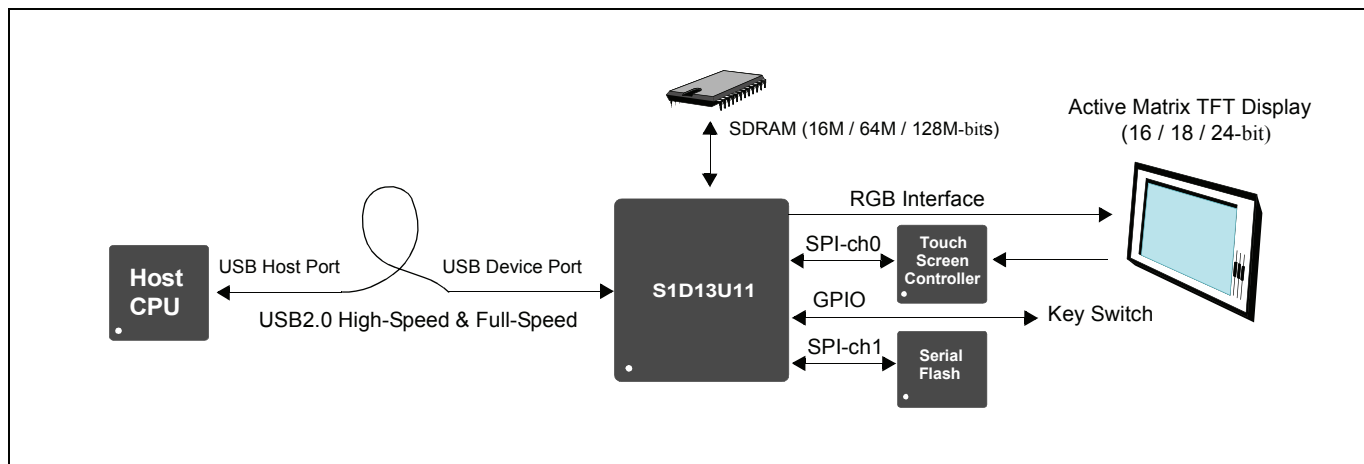
The S1D13U11 is a color LCD graphics controller with an external SDRAM display buffer. The S1D13U11 supports a USB2.0 High-speed device port interface while providing high performance bandwidth to external SDRAM, allowing for fast screen updates. The S1D13U11 supports displays up to 800x600@24bpp with added display functions such as Picture-in-Picture, Double-buffer and Display scroll.

Additionally the S1D13U11 supports I2C and two SPI serial interfaces. It can be connected to an external touch screen controller and serial flash ROM. The S1D13U11 is the best choice of LCD controller to connect between host CPU and LCD panel via the USB port.

■ FEATURES

- External 16/64/128M-bit SDRAM memory support
- USB2.0 High-speed device port (480Mbps)
- Embedded USB protocol sequencer
- High performance SDRAM controller
- Input data formats: RGB 8:8:8, RGB 5:6:5
- Active Matrix TFT interface: 16/18/24-bit interface
- Supports resolutions up to 800x600 @ 24bpp
- I2C master and two SPI master interface
- Main and two Picture-in-Picture display window
- Multi-buffer display or Double-buffer display
- PWM output for LED backlight control
- Buzzer output for touch screen input
- Internal 12M/24M oscillator and PLL
- 8x8 Hardware Key scan interface
- 1.8 volts and 3.3 volts power
- QFP20-144 (20mm x 20mm x 1.7mm)

■ SYSTEM BLOCK DIAGRAM



S1D13U11

■ DESCRIPTION

Host CPU Interface

- USB2.0 High-speed device port (1-port)
 - HS (480Mbps) and FS (12Mbps) transfer support
 - Embedded FS/HS termination
- Endpoint
 - Five embedded endpoint FIFO
- Embedded Protocol sequencer
 - 23 kinds of USB protocol command
 - Device class: Vender class
 - Protocol control data (need the download via USB port or external serial flash ROM)

Frame Buffer

- External 16M/64M/128M-bit SDRAM memory
 - Maximum 96MHz SDRAM clock
 - 16-bit bus width

Input Data Format

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

Display Support

- Active Matrix TFT
 - 16/18/24-bit interface
- Supports resolution up to 800x600 (SVGA)@24bpp
 - QVGA, WQVGA, HVGA, VGA, WVGA

Display Features

- 24 bit-per-pixel (bpp) or 16bpp color depths
- Two Picture-in-Picture window
- Software multi-buffer, Hardware double-buffer display
- Virtual display with smooth scroll

Peripherals

- I2C master interface
- Two SPI master interface
- Key scan interface (8x8, 8x4 or 8x2)
- PWM output for LED backlight control
- Buzzer output for touch screen input

Clock Source

- 12MHz or 24MHz X'tal oscillator
- Internal programmable PLL (Maximum 96MHz)
- LCD pixel clock (Maximum PCLK = 48MHz)
- SDRAM clock (Maximum SDCLK = 96MHz)

Miscellaneous

- USBVDD 3.3 volts, IOVDD 3.3 volts and CORE/PLLVD 1.8 volts
- QFP20 144-pin package (20mm x 20mm x 1.7mm)

CONTACT YOUR SALES REPRESENTATIVE FOR THESE COMPREHENSIVE DESIGN TOOLS

S1D13U11 Technical Hardware Manual

S1D13U11 Technical Software Manual

S5U13U11P00C100 Evaluation Board

Linux Sample Driver and Sample Programs

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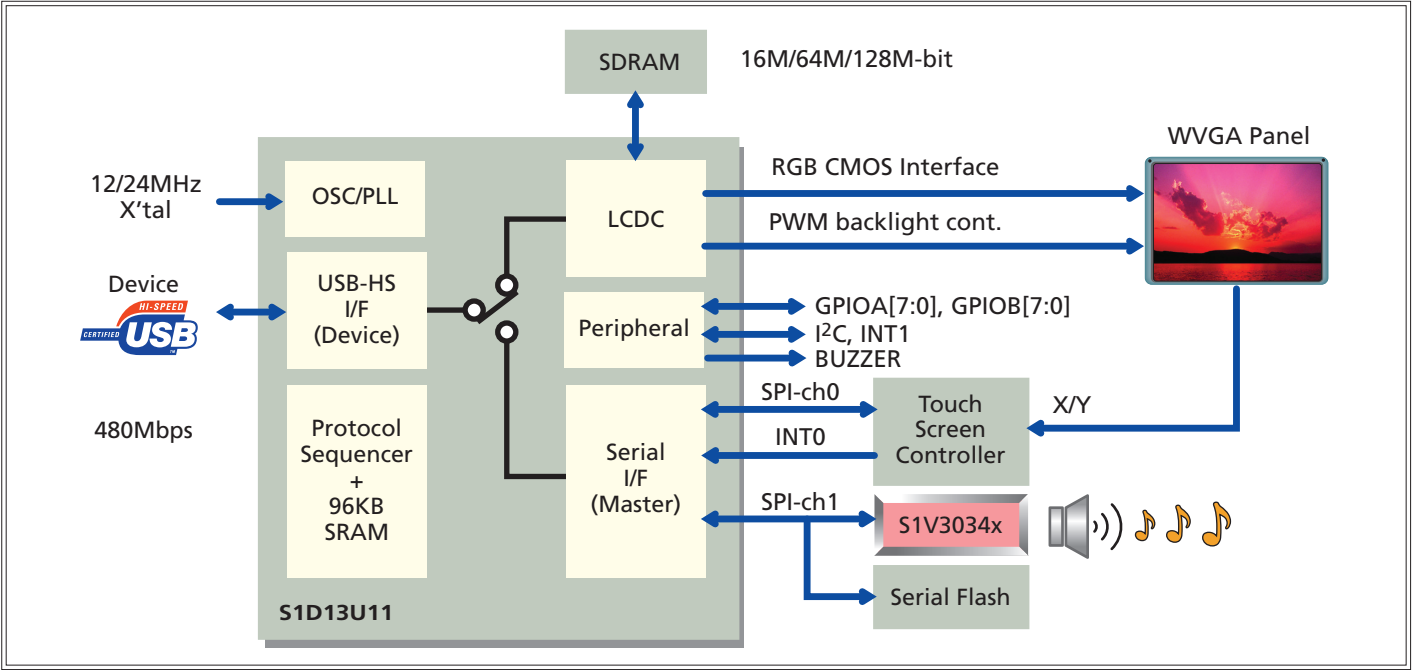
Epson semiconductor website: http://www.epson.jp/device/semicon_e/

■ USB Interface LCD Controller

An LCD controller allowing for reception of display data and transmission of touch-screen coordinate data at high speed via USB2.0-HS.
Most suitable for application to OA equipment such as multi-functional printers with long lengths of cabling between the host CPU and LCD panel, and to in-vehicle devices such as rear entertainment displays.

Product	CPU Interface Support	LCD Interface Support				Color Depth (Max.)	Internal Memory Capacity	External Memory Capacity	Supply Voltage		Additional Features	Package
		Monochrome STN	Color STN	TFT	Typical Resolution				Core	IO		
S1D13U11F00A	USB2.0 HS	n/a	n/a	18-bit / 24-bit	SVGA	16M colors	0	Up to 16MB SDRAM	1.65V to 1.95V	3.0V to 3.6V	PinP α-Blend	QFP20-144

■ S1D13U11 Block Diagram



■ S1D13U11 Evaluation Board (S5U13U11P00C100)

