S1D13700

S1D13700 Graphics LCD Controller w/ CGROM

The S1D13700 embedded memory graphics LCD controller can display both text and graphics on an LCD panel. The S1D13700 allows layered text and graphics, scrolling of the display in any direction, and partitioning of the display into multiple screens. It includes 32 KB of embedded SRAM display memory which is used to store text, character codes, and bit-mapped graphics. The S1D13700 handles display controller functions including: transferring data from the controlling microprocessor to the buffer memory, reading memory data, converting data to display pixels, and generating timing signals for the LCD panel.
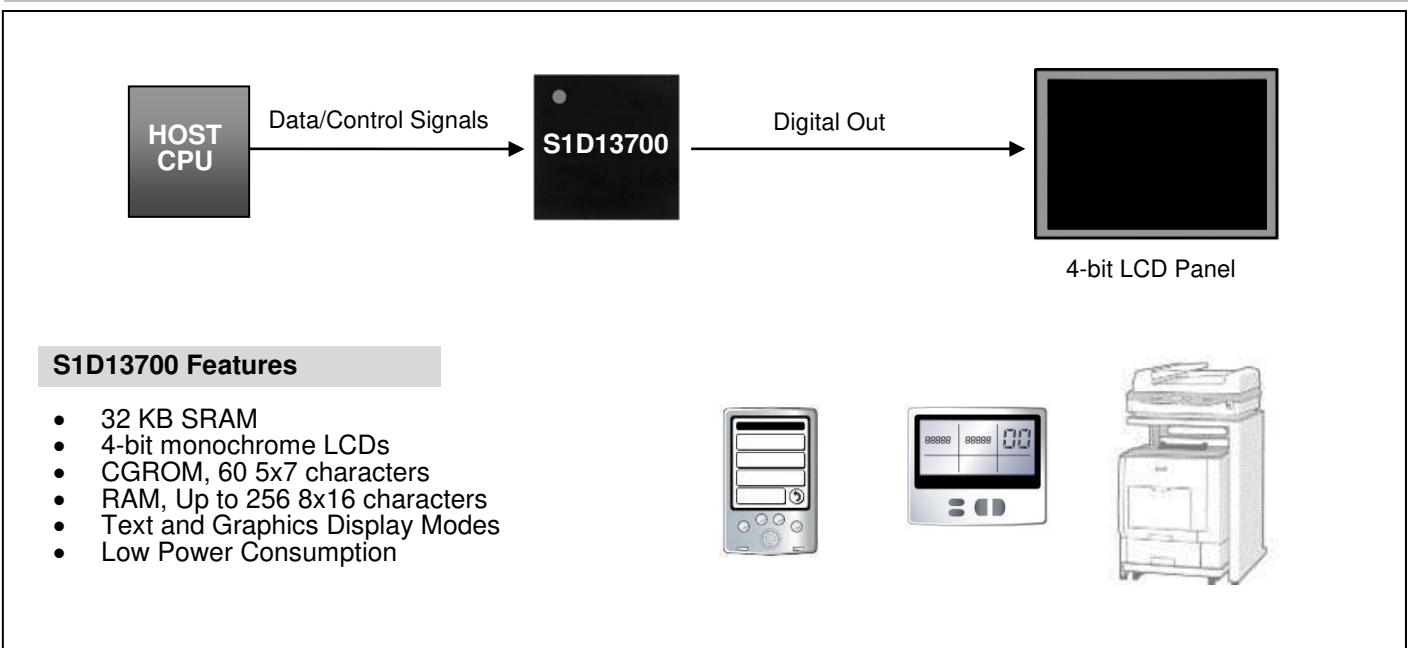
The S1D13700 is designed with an internal character generator which supports 160, 5x7 pixel characters in internal mask ROM (CGROM) and 64, 8x8 pixel characters in character generator RAM (CGRAM). When the CGROM is not used, up to 256, 8x16 pixel characters are supported in CGRAM.

Designed as a functional replacement to the SED1335, the S1D13700 has an expanded feature set which includes; direct support of the Motorola MC68K microprocessor family, embedded display buffer, increased clock speeds, increased grayscale depths, lower power technology and smaller packages.

FEATURES

- Embedded 32 KB display buffer
- Direct and indirect CPU interfaces
- 8-bit data bus width
- Supports 4-bit monochrome passive matrix LCDs
- Example Resolutions:
  - 640x240@1bpp
  - 320x240@2bpp
  - 240x160@4bpp
- Low power consumption

- Gray shade support for 1/2/4 bpp
- Text, graphics, and combined text/graphics display mode
- 60, 5x7 pixel characters in embedded CGROM
- Up to 256, 8x16 pixel characters in CGRAM
- Overlapping Screens (up to 3)
- Programmable Cursor
- Temperature range: -40° ~ 85°
- Package: TQFP13-64pin

SYSTEM BLOCK DIAGRAM

HOST CPU → Data/Control Signals → **S1D13700** → Digital Out → 4-bit LCD Panel

S1D13700 Features

- 32 KB SRAM
- 4-bit monochrome LCDs
- CGROM, 60 5x7 characters
- RAM, Up to 256 8x16 characters
- Text and Graphics Display Modes
- Low Power Consumption

S1D13700

DESCRIPTION

Display Buffer

- Embedded 32KB SRAM display buffer

CPU Interface

- 8-bit CPU data bus interface
- Direct address bus support for:
  - Generic (Z80/8080 family) bus interface
  - Motorola MC68K family bus interface
- Indirect direct address bus support for:
  - Generic (Z80/8080 family) bus interface
  - Motorola MC68K family bus interface
  - Motorola MC600 family bus interface

Display Support

- 4-bit monochrome passive matrix LCD interface
- Programmable display resolutions. Example resolutions:
  - 640x240@1bpp
  - 320x240@2bpp
  - 240x160@4bpp
- 1/2-duty to 1/256-duty LCD drive

Character Generation

- 60, 5x7 pixel characters in embedded mask-programmed character generator ROM
- Up to 256, 8x16 pixel characters in embedded character generator RAM

Display Modes

- Gray shade support for 1/2/4 bpp (up to 16 gray shades)
- Text, graphics, and combined text/graphics display mode
- Three overlapping screens in graphics mode
- Programmable cursor control (hardware cursor)
- Smooth horizontal and vertical scrolling of all or parts of the display

Power

- Software initiated power save mode
- Low power consumption
- Flexible power supply configuration:
  - COREVDD 3.0 to 3.6 volts
  - NIOVDD 3.0 to 5.5 volts (LCD interface)
  - HIOVDD 3.0 to 5.5 volts (CPU interface)

Clock Source

- Two terminal crystal or single oscillator input
- Input clock maximum of 60MHz

Package

- TQFP13-64pin

For more information on the S1D13700 and other Epson Display Controllers, visit the Epson Global website.

https://global.epson.com/products_and_drivers/semicon/products/display_controllers/

For Sales and Technical Support, contact the Epson representative for your region.

https://global.epson.com/products_and_drivers/semicon/information/support.html