S1D13700 Embedded Memory Graphics LCD Controller

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 32K bytes 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 S1D13305, 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

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 Address Bus support for:
    Generic (Z80/8080 family) bus interface
    Motorola MC68K family bus interface
    Motorola M6800 family bus interface

Memory Interface

- Embedded 32K byte SRAM display buffer

Display Support

- 4-bit monochrome LCD interface
- Programmable Display Resolutions:

    Typical resolutions include:
        640x240 at 1 bpp
        320x240 at 2 bpp
        240x160 at 4 bpp
- 1/2-duty to 1/256-duty LCD drive

Character Generation

- 160, 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 bit-per-pixel (up to 16 gray shades)
- Text, graphics, and combined text/graphics display modes
- Three overlapping screens in graphics mode
- Programmable cursor control (Hardware Cursor)
- Smooth horizontal and vertical scrolling of all or part of the display

Power

- Software initiated Power Save Mode
- Low power consumption
- Flexible Power Supply configuration:

    CORE V_{DD} 3.0 to 3.6 volts.
    NIO V_{DD} 3.0 to 5.5 volts (LCD interface).
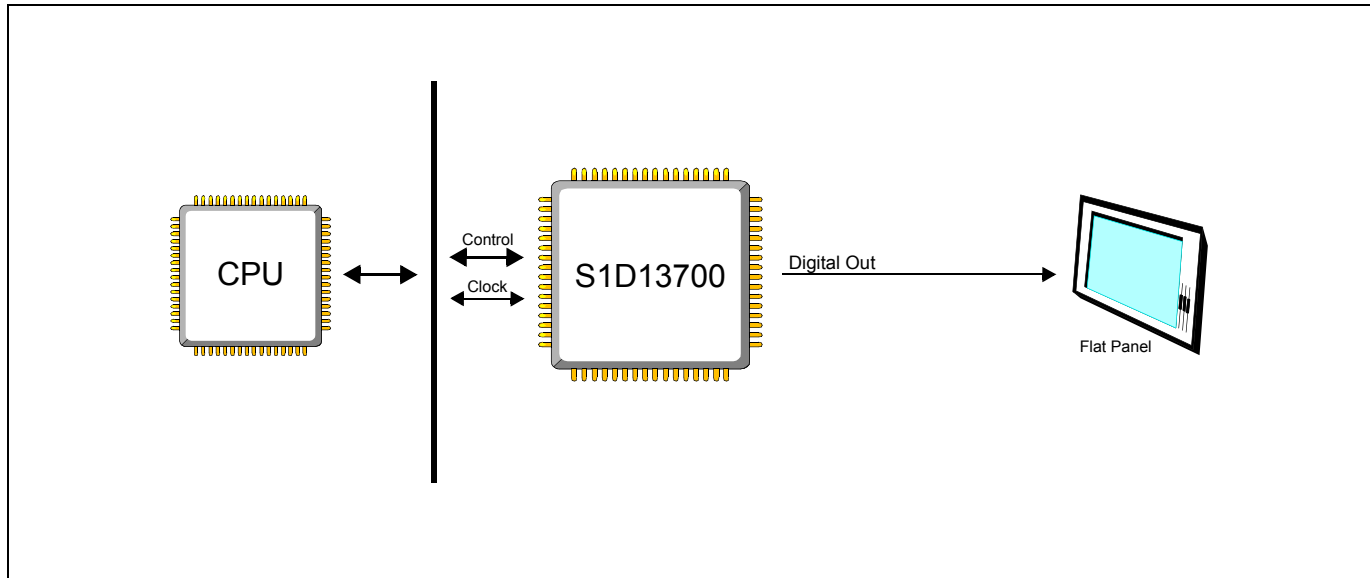   HIO V_{DD} 3.0 to 5.5 volts (CPU interface).

Clock Source

- Two terminal crystal or Single Oscillator input
    Input clock maximum of 60MHz

Package

- TQFP13-64pin

■ SYSTEM BLOCK DIAGRAM

CPU ←Control→ ←Clock→ S1D13700 ─Digital Out→ Flat Panel

CONTACT YOUR SALES REPRESENTATIVE FOR THESE COMPREHENSIVE DESIGN TOOLS:

- S1D13700 Technical Manual
- S1D13700 Evaluation Boards
- Software Utilities

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