HX8302A

396 channel, 65536 color TFT source driver with internal RAM

April 2003, Version 1.0

1. General Description

HX8302A is a 396-channel source driver LSI with internal RAM for maximum 132RGB-by-176-dot graphics on TFT displays in 65536 colors. It is for driving TFT color LCD displays in combination with the gate driver/power IC (HX8609A). With internal bit-operation functions, 16-bit high-speed bus interface, and high-speed RAM-write functions enable efficient data transfer and high-speed rewriting of data to the graphics RAM.

HX8302A has various functions for reducing the power consumption of an LCD system and has a low-voltage operation (1.8V min.) with an internal RAM to display a maximum of 132RGB-by-176-dot color. Since HX8302A incorporates a circuit that interfaces with the HX8609A, it can set instructions to HX8609A. In addition, moderate power control can be achieved by combining these hardware functions with software functions, such as a partial display, 8-color display mode, sleep and standby modes. This LSI is suitable for any medium-sized or small portable battery-driven product requiring long-term driving capabilities, such as digital cellular phones, bi-directional pagers, and small PDAs.

2. Features

- 132RGB x 176-dot graphics display LCD controller/driver for 65536 TFT colors (when used with HX8609A gate driver LSI).
- 16-/8-bit high-speed bus interface and serial data transfer interface.
- High-speed burst-RAM write function.
- Writing to a window-RAM address area by using a window-address function
- Bit-operation functions for graphics processing:
  - Write-data mask function in bit units
  - Logical operation in pixel unit and conditional write function
- Various color-display control functions:
  - 65536 possible colors can be displayed at the same time (gamma adjust function included).
- Vertical scroll display function in line units.
- Low-power consumption architecture supports:
  - Vcc = 1.8 to 3.3 V (corresponding low-voltage operation)
  - VDH = 4.5 to 5.5 V (low liquid crystal drive voltage)
  - Power-save functions such as the standby mode and sleep mode.
  - Partial LCD drive of two display windows in any position
  - Maximum 6-times step-up circuit for liquid crystal drive voltage (HX8609A)
- Built-in circuit for interfacing with the corresponding gate driver / power IC (HX8609A).
- Maximum 132RGB-by-176-dot display in combination with the gate driver / power supply IC.
- Internal RAM capacity: 46,464 bytes.
- 396-channel liquid crystal display driver embedded.
- n-line inversion AC liquid-crystal drive .
- Scan direction change of source driver.
- Internal oscillation and hardware reset.