National Semiconductor

PRELIMINARY
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FPD95220
320-Channel LTPS Dot Inversion Driver with Programmable Partial Display

General Description

The FPD95220 is a 320–channel LTPS dot inversion driver with Partial Display Memory, and an 18–bit RGB video interface. It provides 320 output source drivers with a 1:3 glass multiplex ratio. It includes a 77,112–bit memory for partial display modes, a timing controller with glass interface level-shifters, a DC V_{COM} driver and glass power supply circuits. The output format can be configured to drive arbitrary display resolutions up to 320 RGB columns.

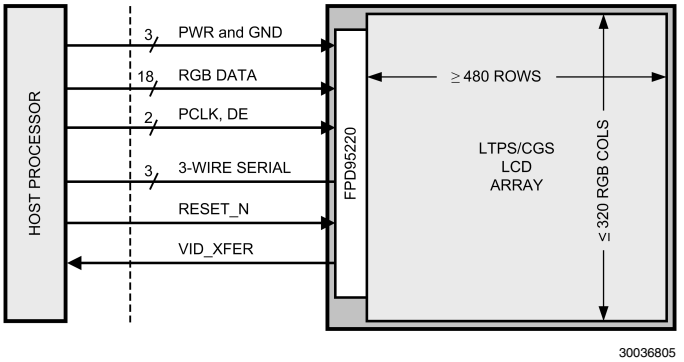
The on-chip Partial Display Memory is configurable in window size, location and color depth. This memory can be used to self-refresh a region of the display in a reduced power state. The FPD95220 device also includes independent RGB gamma curve adjustments as well as user-definable color palettes for 1–bit and 3–bit Partial Display modes.

A low-speed serial interface controls display operating modes and provides access to the Partial Display Memory. This interface can support both 8–bit and 9–bit protocols. A standard command set is supported to set display modes and operating parameters. Customized register profiles associated with commands are loaded from an on-chip EEPROM. Registers can also be directly accessed by using the Register Access Mode.

Features

- **Dot Inversion**
- Reduced audible and electrical noise for touch panel applications
- Improved image quality
- Supports pixel and sub-pixel inversion modes
- **Power Savings**
- Self-refreshed Partial Display Mode
- Charge-sharing power saving functions
- Backlight brightness PWM circuit
- **Standard Command Set**
- Registers initialized from on-chip EEPROM
- Command-triggered profiles can change register settings for modes/gamma settings
- Eliminates frequent host SW changes to update register settings
- 8 user-defined display configurations
- **Programmable Settings**
- Display resolution and glass signal timing
- Video interface timing auto-learning circuit
- VID_XFR output reduces tearing in partial mode
- Gamma curves and V_{COM} adjustment
- **Partial Display**
- Adjustable memory window size and location
- 1, 3, 12 or 18–bit color depth
- Partial window 2x upscale with border color
- Alpha blending, including transparent mode
- **Interfaces**
- Low-speed serial interface for commands, register access and partial memory access
- 18–bit RGB Video interface

System Diagrams



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National Semiconductor Americas Customer Support Center
Email: new.feedback@nsc.com
Tel: 1-800-272-9959

National Semiconductor Europe Customer Support Center
Fax: +49 (0) 180-530-85-86
Email: europe.support@nsc.com
Deutsch Tel: +49 (0) 69 9508 6208
English Tel: +49 (0) 870 24 0 2171
Français Tel: +33 (0) 1 41 91 8790

National Semiconductor Asia Pacific Customer Support Center
Email: ap.support@nsc.com

National Semiconductor Japan Customer Support Center
Fax: 81-3-5639-7507
Email: jpn.feedback@nsc.com
Tel: 81-3-5639-7560