

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.

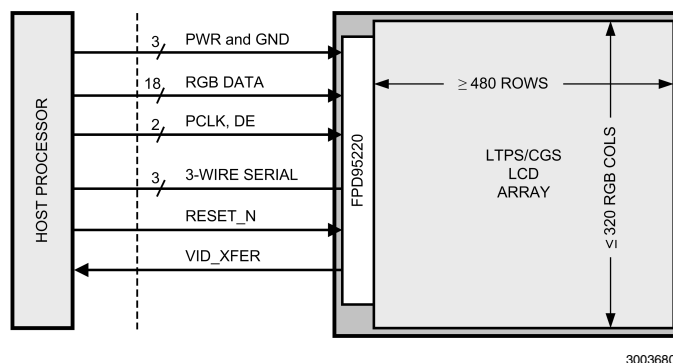
The on-chip Partial Display Memory is configurable in window size, location and color depth. This memory can be used to self-refresh a region of the display in a reduced power state. The FPD95220 device also includes independent RGB gamma curve adjustments as well as user-definable color palettes for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



Notes

THE CONTENTS OF THIS DOCUMENT ARE PROVIDED IN CONNECTION WITH NATIONAL SEMICONDUCTOR CORPORATION ("NATIONAL") PRODUCTS. NATIONAL MAKES NO REPRESENTATIONS OR WARRANTIES WITH RESPECT TO THE ACCURACY OR COMPLETENESS OF THE CONTENTS OF THIS PUBLICATION AND RESERVES THE RIGHT TO MAKE CHANGES TO SPECIFICATIONS AND PRODUCT DESCRIPTIONS AT ANY TIME WITHOUT NOTICE. NO LICENSE, WHETHER EXPRESS, IMPLIED, ARISING BY ESTOPPEL OR OTHERWISE, TO ANY INTELLECTUAL PROPERTY RIGHTS IS GRANTED BY THIS DOCUMENT.

TESTING AND OTHER QUALITY CONTROLS ARE USED TO THE EXTENT NATIONAL DEEMS NECESSARY TO SUPPORT NATIONAL'S PRODUCT WARRANTY. EXCEPT WHERE MANDATED BY GOVERNMENT REQUIREMENTS, TESTING OF ALL PARAMETERS OF EACH PRODUCT IS NOT NECESSARILY PERFORMED. NATIONAL ASSUMES NO LIABILITY FOR APPLICATIONS ASSISTANCE OR BUYER PRODUCT DESIGN. BUYERS ARE RESPONSIBLE FOR THEIR PRODUCTS AND APPLICATIONS USING NATIONAL COMPONENTS. PRIOR TO USING OR DISTRIBUTING ANY PRODUCTS THAT INCLUDE NATIONAL COMPONENTS, BUYERS SHOULD PROVIDE ADEQUATE DESIGN, TESTING AND OPERATING SAFEGUARDS.

EXCEPT AS PROVIDED IN NATIONAL'S TERMS AND CONDITIONS OF SALE FOR SUCH PRODUCTS, NATIONAL ASSUMES NO LIABILITY WHATSOEVER, AND NATIONAL DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY RELATING TO THE SALE AND/OR USE OF NATIONAL PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

LIFE SUPPORT POLICY

NATIONAL'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS PRIOR WRITTEN APPROVAL OF THE CHIEF EXECUTIVE OFFICER AND GENERAL COUNSEL OF NATIONAL SEMICONDUCTOR CORPORATION. As used herein:

Life support devices or systems are devices which (a) are intended for surgical implant into the body, or (b) support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in a significant injury to the user. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system or to affect its safety or effectiveness.

National Semiconductor and the National Semiconductor logo are registered trademarks of National Semiconductor Corporation. All other brand or product names may be trademarks or registered trademarks of their respective holders.

Copyright© 2007 National Semiconductor Corporation

For the most current product information visit us at www.national.com



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