

Integrated LCD Bias Power Supply with Level Shifter

Features

- 2.6V~5.5V Supply Range
- Current Mode Boost Regulator for AVDD
 - 0.1Ω/20V/3A Embedded NMOS switch
 - Fixed 1.2MHz Switching Frequency
 - Up to 85% Efficiency
 - 1% Output Regulation
- Voltage Mode Buck-Boost Regulator for VGOFF
 - Fixed 600kHz Switching Frequency
 - Up to 85% Efficiency
 - 1% Output Regulation
- Charge Pump Regulator for VGON
- 3-Channel Rail-to-Rail Unity-Gain Operational Amplifier
 - ±200mA Output Short Circuit Current
 - 20V/μs Slew Rate
 - 18MHz, -3dB Bandwidth
- Built-In Power On Sequence and Soft Start Function
- 7-Channel Level Shifter
 - +33V Highest Voltage Level
 - -30V Lowest Voltage Level
 - Maximum 1μs Rising/Falling Time
 - 300mA Peak Current
 - 15mA Continuous Current
 - Adjustable Gate Shading Function
- Opened Drain Pull High VGLC Signal
- Protections:
 - Input Under Voltage Lockout (UVLO)
 - Over Current Protection for AVDD (OCP)
 - Output Under Voltage Protection for AVDD, GON and GOFF (UVP)
 - Output Over Voltage Protection for AVDD, GON and GOFF (OVP)
 - Operational Amplifier Short Circuit Protection (SCP)
 - Over Temperature Protection (OTP)
- TQFN6x6-48L Package
- RoHS Compliant

Applications

- LCD TV Panel
- LCD Monitor Panel

Ordering Information

ORDER NUMBER	MARKING	TEMP. RANGE	PACKAGE (Green)
G2521RP1U	2521	-40°C to +85°C	TQFN6X6-48

Note: RP: TQFN6x6-48

1: Bonding Code

U: Tape & Reel

General Description

The G2521 includes a high-performance boost regulator, a buck-boost controller, a high voltage charge pump regulator, 3 VCOM buffers (unity-gain OPA), open-drain pull high VGLC signal generator and 7-channel level shifter with adjustable gate shading function for active-matrix thin-film transistor (TFT) liquid-crystal displays (LCDs).

The boost regulator provides the regulated supply voltage for the panel source driver ICs. It is a high switching frequency (1.2MHz) current-mode regulator with an integrated 20V/0.1Ω NMOS switch that allows the use of ultra small inductors and ceramic capacitors. It provides fast transient response to pulsed loading while achieving efficiency over 85%. The device can produce output voltage as high as 18V from an input as low as 2.8V.

A voltage mode buck-boost controller cooperates with external temperature sensor provide compensated gate-off voltage supply to the level shifters. While the charge pump controller regulates the external charge pump voltage source to supply for the level shifters.

The level shifters transform the logic-level control signals generated by the display timing controller (TCON) into the high-level signals needed by LCD panel. Each channel of level shifter output uses low impedance transistors to achieve fast rising and falling time, even when driving the capacitive loads present in LCD applications. Channel 1 to 6 supports gate voltage shading. They are organized in two groups, each with its own shading discharge resistor output. External R-C timer defines shading period through the DTS input.

The VCOM buffer can drive the LCD VCOM voltage that features high short-circuit current (200mA), fast slew rate (20V/μs), wide bandwidth (8MHz) and rail-to-rail input/output.

The G2521 features extensive protection functions that include UVLO, OCP, UVP, OVP, SCP and OTP. It is available in a TQFN6x6-48L package.

