

TFT LCD DC-DC Converter with Integrated Charge Pumps and OP-AMP

DESCRIPTION

The EUP2619 generates power supply rails for thin-film transistor (TFT) liquid-crystal display (LCD) panels in tablet PCs and notebooks operated from 2.5V to 5.5V input supply. The device integrates a step-up converter, positive and negative charge pumps, and a high speed V_{COM} buffer.

The external compensated step-up converter, providing the regulated supply voltage for the panel source driver ICs, features an internal power MOSFET and high frequency operation allowing to use small inductors and capacitors. The step up converter uses fixed-frequency peak current mode control architecture which provides fast load-transient response and easy compensation. A 2.8A peak current limit for the internal switch protects power supply fault condition.

The regulated positive and negative charge pump regulators generate the positive and negative supply rails for the TFT LCD gate resistive voltage-divider ICs.

The high speed V_{COM} buffer features 500mA short circuit current, 20MHz bandwidth, fast slew rate 45V/ μ s, and rail-to-rail inputs and outputs.

A built-in voltage detector generates a reset signal when the input voltage drops below 2.4V. The reset signal is active low and has a 120ms blanking time during power-on. The EUP2619 includes internal power-up sequencing, over/under voltage protections of the boost converter, and over temperature protection to ensure in safe operating.

The EUP2619 are available in a 16-pin 3mm \times 3mm TQFN package.

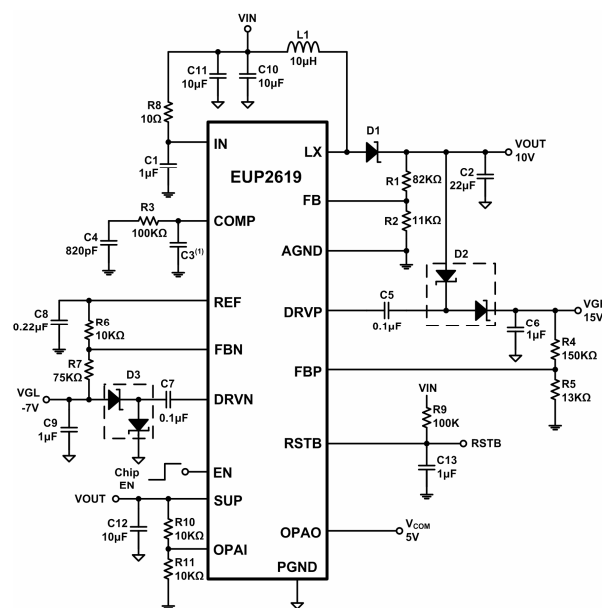
FEATURES

- 2.5V to 5.5V Input Supply Range
- 1.2MHz Current-Mode Step-Up Converter
 - Built-In 20V/2.8A, 0.16 Ω N-Channel MOSFET
 - High Efficiency Up to 90%
 - $\pm 1\%$ Accurate Output Voltage
 - Fast Transient Response to Pulse Load
 - Over-Current Protection
 - Output Under-Voltage Protection
- 600kHz Negative Charge Pump Driver for VGL
- 600kHz Positive Charge Pump Driver for VGH
- High Speed High Current 18V V_{COM} Buffer
 - ± 500 mA Output Short-Circuit Current
 - 45V/ μ s Slew Rate
 - 20MHz, -3dB Bandwidth
 - Rail-to-Rail Input and Output
- Power-On Sequence Control
- Thermal-Overload Protection
- 3mm \times 3mm TQFN-16 Package
- RoHS Compliant and 100% Lead (Pb)-Free Halogen-Free

APPLICATIONS

- Tablet PCs
- Notebook Displays

Typical Application Circuit



Note (1): C3 is an optional capacitor which avoids the noise disturbance

Figure 1.