Notebook and Tablet LCD Panel PMIC with AVDD Boost, VON Boost, Negative Charge Pump, Buck, LDO, VCOM Calibrator, Two OP-Amps, 4-Ch. Gamma Buffers and Level-shifter

Features

- 2.5 V to 6 V Input Supply Voltage Range
- High-Efficiency Step-Up Regulator
  . Peak-Current Mode Control
  . Built-in 15 V, 1.5 A, 250 mΩ MOSFET
  . High Performance Load / Line Regulation
- VON Step-Up Regulator
  . Internal Compensation for DCM
  . Temperature Compensated Output
  . Built-in 45 V, 1.2 A, 1.0 Ω MOSFET
- Internal Low Drop-Out Linear Regulator
- Negative Charge-Pump Regulator
- High-Efficiency Buck Converter for Logic
  . Internal Compensation
  . Built-in 8 V, 0.8 A, 600 mΩ MOSFETs
- Programmable VCOM Calibrator
  . 128-Step Adjustable Sink Current Output
  . I_2C Interface
- Dual High-Voltage Scan Driver
  . Output Charge Sharing
- Programmable 4-Channel Gamma Buffers
  . 9-bit Programmable Output Voltage
- High-Speed HAVDD & VCOM OP Amps
  . 15 MHz, -3 dB Bandwidth
  . 200 V / μs Slew Rate. 90 mA Output Current
- 10 bytes EEPROM for Programmable Control
- Protections
  . Thermal Shutdown
  . Overvoltage Protection / Over Current Protection
  . Diode Open Protection / Undervoltage Protection

Applications

- LCD Notebook and Tablet Panels

Description

The SM41NA consists of two high performance step-up regulators (an AVDD boost converter, a VON boost converter), a negative charge-pump regulator, high performance step-down regulator, an LDO, a VCOM calibrator, two high speed operational amplifiers (VCOM, H-AVDD), 4 channel gamma buffers and a high-voltage level shifting scan driver.

All output voltages are programmable using I_2C serial interface. The AVDD boost converter and H-AVDD operational amplifier provide the regulated supply voltages for the panel source driver ICs. The VON boost converter provides the regulated voltage for the positive scan-driver supply that can vary according to the temperature sensed by an external NTC thermistor. The negative charge pump regulator provides the negative voltage for the negative scan-driver supply. The buck converter and the LDO provide digital logic supply voltages for the system. The VCOM calibrator replaces mechanical potentiometers so that it significantly reduces labor costs, increases reliability and enables automation. The VCOM operational amplifier is designed to drive the LCD backplane (VCOM) with the capability of high current and wide bandwidth. 4 channel gamma buffers are also programmable using I_2C serial interface. The high-voltage level-shifting scan drivers are fitted for capacitive loads and work well with panels that contain row drivers on the panel glass.

The device is optimized for thin-film transistor (TFT) liquid-crystal display (LCD) applications.

Device Information

Part	Package	Size
SM41NA	46 QFN	6.5 mm x 4.5 mm