

Monitor LCD Panel PMIC with AVDD Boost, VGH Boost, Buck, Level-Shifter, Two Negative Charge-Pumps, GPM, VCOM Calibrator and OP-Amp

Features

- 4.0 V to 6.5 V Input Supply Voltage Range
- High-Efficiency Step-up Regulator for Source Driver
 - . Peak-Current Mode Control – Fast Transient
 - . Adjustable Switching Frequency
- High-Efficiency Step-up Regulator for Level-Shifter
 - . Voltage Mode Control
 - . Temperature-Compensated Output
- High-Voltage Level Shifter
 - . -15 V to 35 V Output Rails
 - . GPM Pulse Modulator
- Current Mode Step-down Regulator
- Two Negative Charge-Pump Regulators
- Reset for T-CON
- VCOM Calibrator
 - . 128-Step Adjustable Sink Current Output
 - . I2C Interface – Address : 0101000
- High-Speed OP-Amp
 - . 20 MHz, -3 dB Bandwidth
 - . 35 V / μ s Slew Rate
- Protections
 - . Thermal Shutdown
 - . Short Circuit Protection (by VAVDD and VGH)
 - . Over-Voltage Protection (by VAVDD, VGH and VFBB)
 - . Over-Load Protection (by VFBB, VFBN and VFBNUD)

Applications

- LCD TV and Monitor Panels

Description

The SM4045 consists of two high performance step-up regulators (an AVDD boost converter, a VGH boost converter), a high performance step-down regulator, two negative charge-pump regulators, a high-voltage level-shifting scan driver, a gate pulse modulator, a VCOM calibrator and a high-speed operational amplifier.

The AVDD boost converter provides the regulated supply voltage for the panel source driver ICs. The VGH boost converter provides the regulated voltage for the positive level-shifter supply that can vary according to the temperature sensed by an external NTC thermistor. The two negative charge-pump regulators provide the negative voltages for the negative level-shifter supply. 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 gate pulse modulator modulates the output voltage of the level shifter. The step-down DC-DC converter provides the logic voltage for the system. The VCOM calibrator replaces mechanical potentiometers so that it significantly reduces labor costs, increases reliability and enables automation.

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

Device Information

| Part | Package | Size |
|--------|---------|-------------|
| SM4045 | 56 QFN | 7 mm x 7 mm |

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