

Notebook and Tablet LCD Panel PMIC with AVDD Boost, VGH Boost, VGL Negative Charge-Pump, Two Bucks, LDO, HAVDD Linear Regulator, OP-Amp, VCOM Calibrator with Dual Banks, 14-Ch. Gamma Buffers with Dual Banks and GPM

Features

- 2.5 V to 7 V Input Supply Voltage Range
- Synchronous Boost Converter (AVDD)
 - . Internal Compensation Circuit
- Non-Synchronous Boost Converter (VGH)
 - . Temperature-Compensated Output.
- Negative Charge-Pump Regulator (VGL)
- Synchronous Buck Converter (12 Buck, 25 Buck)
 - . Voltage Mode Control with Feed-forward
- Low Dropout Regulator (18 LDO)
 - . Maximum 250 mA Output Current
- HAVDD Linear Regulator (HAVDD)
 - . Maximum ± 250 mA Output Current
- Programmable Digital VCOM Calibrator with 2-Banks
 - . 128-Step Adjustable Sink Current Output
 - . I2C interface – Address: 1001111x
- High-Speed OP-Amp
 - . 12 MHz -3 dB Bandwidth
 - . 40 V / μ s Slew Rate
 - . ± 175 mA Output Current
- Programmable 14-Channel Gamma Buffers with 2-Banks
 - . 10-bit Programmable Output Voltage
- Gate Pulse Modulator
- XAO Reset Signal
- T-con Reset Signal
- I2C Programmable EEPROMs for Configuration Settings
 - . I2C interface – Address: 1110100x

Applications

- LCD Notebook, Tablet and Monitor Panels

Description

The SM4405 consists of two high performance step-up regulators (an AVDD boost converter, a VGH boost converter), a VGL negative charge-pump regulator, two high performance step-down regulators, a 250 mA programmable LDO, a programmable HAVDD linear regulator, a digital VCOM calibrator with dual bank registers for a high speed VCOM operational amplifier, 14 channel gamma buffers with dual bank registers and a gate pulse modulator (GPM).

All output voltages are programmable using I2C serial interface. The AVDD boost converter provides the regulated supply voltage for the panel source driver ICs while the VGH boost converter provides the regulated voltage for the positive level shifter supply which can vary according to the temperature sensed by an external NTC thermistor. The negative charge pump regulator provides the negative voltage for the negative level shifter supply, and two buck converters and an LDO regulator supply the system's logic voltage. The gate pulse modulator modulates the output voltage of the level shifter.

The VCOM calibrator replaces mechanical potentiometers which significantly reduces labor costs, increases reliability, and enables automation. The high-speed op-amp is designed to drive the LCD backplane (VCOM) with the capability of high current and wide bandwidth. The 14 channel gamma buffers are also programmable using I2C serial interface. Reset functions are also included for reliable power sequence and panel drive. The device is optimized for thin-film transistor (TFT) liquid-crystal display (LCD) applications.

Device Information

Part	Package	Size
SM4405	63CSP	2.8 mm x 4.6 mm

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