

TV LCD Panel PMIC with AVDD Boost, HAVDD Buck, Buck, VGH regulator, VGL Buck-Boost, Positive/Negative Linear Regulator Controller, Dual Analog Switches, Three OP-Amps and Level-shifter

Features

- 8.7V to 14.5V Input Supply Voltage Range
- 750kHz Switching Frequency
- High-Efficiency Step-up Regulator
 - . Voltage Mode Control
 - . Built-In 20V, 3.3A, 0.15Ω MOSFET
- High-Voltage Step-down Regulator for Logic
 - . Peak-Current Mode Control
 - . Built-In 20V, 1.5A, 0.26Ω MOSFET
- Buck-boost Regulator
 - . Temperature-Compensated Output
 - . Peak-Current Mode Control
 - . Built-In 60V, 1.2A, 1Ω MOSFET
- Synchronous Step-down Regulator
 - . Voltage Mode Control
 - . Built-In 20V, 1.0A, 0.5Ω MOSFET
- Positive/Negative Linear Regulator Controller
 - . Uses External PNP/NPN Transistor
 - . Temperature-Compensated Output (positive only)
- Low Voltage Dual SPST Analog Switches
- High-Speed OP-Amp
 - . 15MHz -3dB Bandwidth
 - . 35V/s Slew Rate
 - . 100mA Output Current
- Dual High-Voltage Scan Driver
 - . -25V ~ 35V Output Rails
 - . Output Charge Sharing
- Protections
 - . Thermal Shutdown
 - . Boost Converter True Shutdown by External pMOS
 - . Over-Load or Short Circuit / Over-Voltage Protection

Applications

- LCD TV and Monitor Panels

Description

The SM4108 consists of four internal-switch regulators (a boost converter, a buck converter, a buck-boost converter and a synchronous buck converter), two linear regulator controllers (positive/negative), dual analog switches, three high-speed operational amplifiers and a high-voltage level shifting scan driver.

The main boost converter and the synchronous buck converter provide the regulated supply voltage for the panel source driver ICs. The buck converter provides the digital logic voltage for the system. The buck-boost converter provides a negative voltage for the negative scan-driver supply that can vary according to the temperature sensed by an external NTC thermistor. All of these converters feature high-efficiency and a fixed frequency operation. The high switching frequency of these converters makes it possible to use ultra-small inductors and ceramic capacitors.

The positive linear regulator controller with a charge pump doubler provides the regulated voltage for the positive scan-driver supply that can vary according to the temperature sensed by an external NTC thermistor. The serial-in shift register supply is derived linearly between the buck-boost converter's output and ground by the negative linear regulator controller.

The device includes dual analog switches to block or pass the I²C bus signals between TCON and EEPROM.

Three high-speed op-amps are designed to drive the LCD backplane (VCOM) with the capability of high current and wide bandwidth.

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. In order to reduce the power loss, the complementary outputs are designed to allow charge sharing during state changes.

Device Information

| Part | Package | Size |
|--------|---------|-------------|
| SM4108 | 88 QFN | 10mm x 10mm |

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