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MAX5961

0 to 16V, Quad, Hot-Swap Controller with 10-Bit Current and Voltage Monitor

Industry's First Quad, Hot-Swap Controller Operates Down to 0V and Integrates a Voltage and Current Monitor

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Status

Active: In Production.

Description

The MAX5961 0 to 16V, quad, hot-swap controller provides complete protection for systems with up to four distinct supply voltages. The device allows the safe insertion and removal of circuit cards into live backplanes. The MAX5961 is an advanced hot-swap controller that monitors voltage and current with an internal 10-bit ADC. The device provides two levels of overcurrent circuit-breaker protection; a fast-trip threshold for a fast turn-off, and a lower slow-trip threshold for a delayed turn-off. The maximum overcurrent circuit-breaker threshold range is set independently for each channel with a trilevel input (ILIM_) or by programming though an I²C interface.

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The internal 10-bit ADC is multiplexed to monitor the output voltage and current of each hot-swap channel. The total time to cycle through all the eight measurements is 100μs (typ). Each 10-bit value is stored in an internal circular buffer so that 50 past samples of each signal can be read back through the I²C interface at any time or after a fault condition.

The MAX5961 can be configured as four independent hot-swap controllers, hot-swap controllers operating in pairs, or as a group of four hot-swap controllers.

The device also includes five digital comparators per hot-swap channel to implement overcurrent warning, two levels of overvoltage detection, and two levels of undervoltage detection. The limits for overcurrent, overvoltage, and undervoltage are user-programmable. When any of the measured values violates the programmable limits, an external active-low ALERT signal is asserted. In addition to the active-low ALERT signal, depending on the selected operating mode, the MAX5961 can deassert a power-good signal and/or turn-off the external MOSFET.

The MAX5961 is available in a 48-pin thin QFN package and operates over the -40°C to +85°C extended temperature range.

An evaluation kit is available: MAX5961EVKIT

Key Features

- Four Independent Hot-Swap Controllers Protect from 0 to 16V (Provided IN ≥ 2.7V)
- 10-Bit ADC Monitors Voltage and Current of Each Channel
- Circular Buffer Stores 5ms of Current and Voltage Measurements
- Four Independent Internal Charge Pumps Generate n-Channel MOSFET Gate Drives
- Internal 500mA Gate Pulldown Current for Fast Shutdown
- VariableSpeed/BiLevel™ Circuit-Breaker Protection
- Alert Output Indicates Undervoltage Warning, Undervoltage Critical, Overvoltage Warning, Overvoltage Critical, and Overcurrent Warning for Each Channel
- Independent Power-Good Outputs
- Autoretry or Latched Fault Management
- 400kHz I²C Interface
- 7mm x 7mm 48-Pin TQFN Package

Applications/Uses

- ASICs
- Disk Drives
- PCI Express® Hot Plug
- Servers
- Storage Systems

Key Specifications: Hot Swap Controllers

Part Number	V_{IN} (V)	V_{IN} (V)	Low Volt.	High Volt.	Voltage Polarity	Type	Fault Condition Control	Channels	Package/Pins	Price
										See

	min	max								Notes
MAX5961	2.7	16	Yes	No	Positive	Positive, Low-Voltage	Programmable Latched Off or Periodic Retry	4	TQFN/48	$6.31 @1k

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