The LTC®4282 Hot Swap™ controller eases design of high power hot-pluggable boards by controlling two current-limited paths, halving the safe operating area (SOA) requirement for each path’s MOSFET. Further SOA savings are afforded with a staged start configuration employing a low SOA MOSFET in one path and low R_{DS(ON)} MOSFETs in the other path. An integrated analog-to-digital converter (ADC) reports board voltage, current, power and energy consumption through an I²C/SMBus digital interface. The internal EEPROM provides nonvolatile storage for register configuration and fault log data, speeding development and debug.

Features
- Enables Safe Board Insertion into Live Backplane
- I²C/SMBus Interface to Read Board Voltage, Current, Power and Energy Usage
- Internal EEPROM for Storing Configuration and Fault Log
- 12-/16-Bit ADC with < 0.7% Total Unadjusted Error
- Wide Operating Voltage Range: 2.9V to 33V

High Current Application Features
- Dual MOSFET Gate Drive and Current Sensing
- 12V Gate Drive for Lower MOSFET R_{DS(ON)}
- MOSFET Power Limiting with Current Foldback

Digital Features
- Programmable Current Limit and UV/OV/PG Thresholds
- Stores Minimum and Maximum Measurements
- Alerts When Programmed Thresholds Are Exceeded
- Three General Purpose Inputs/Outputs
- Continuously Monitors MOSFET Health
- 32-Pin (5mm x 5mm) QFN Package

Parallel Current Paths Ease MOSFET SOA Requirements for High Current Boards

Kilowatt Hot Swap/Circuit Breaker with Telemetry
LTC4282 Current Path Configurations

Matched Paths Share SOA

- Recommended for Above 50A Applications
- MOSFETs Selected for High SOA and Low $R_{DS(ON)}$
- Current Sharing Reduces MOSFET SOA Requirements by Half
- Long Fault Timer Rides Through Transients

High Stress Staged Start Rides Through Transients

- Recommended for Below 50A Applications
- Medium $R_{DS(ON)}$, High SOA Q1 Handles Inrush, Load Surges and $V_{IN}$ Steps
- Low $R_{DS(ON)}$ Q2 Bypasses Q1 In Normal Operation
- Long Fault Timer Rides Through Transients

Low Stress Staged Start for Lowest Cost

- Recommended for Above 50A Applications
- Small, Economical Q1 Trickle Charges Load Capacitance
- Low $R_{DS(ON)}$ Q2 Bypasses Q1 When GPIO1 Signals Power Good
- Short Fault Timer Disconnects on Overcurrent

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