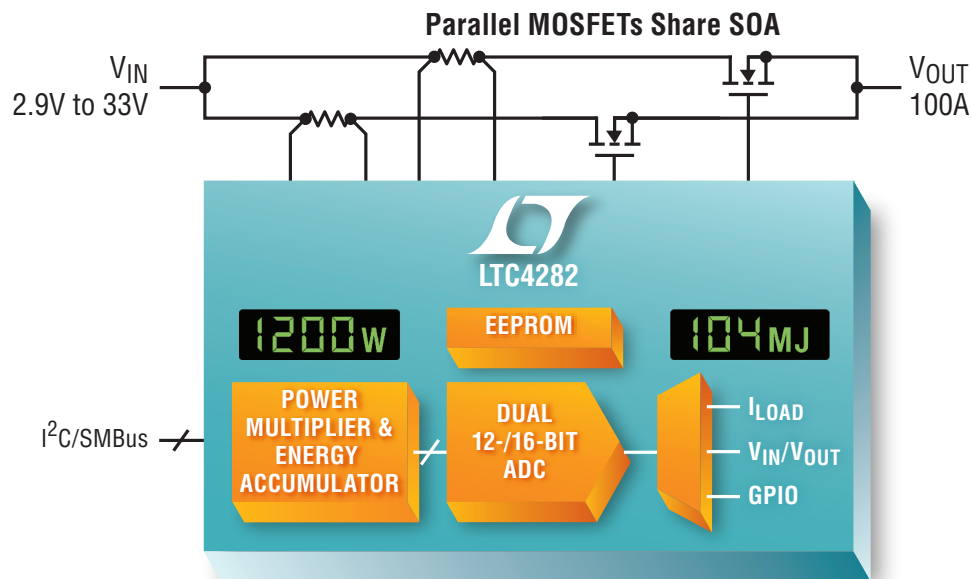


# Kilowatt Hot Swap/Circuit Breaker with Telemetry



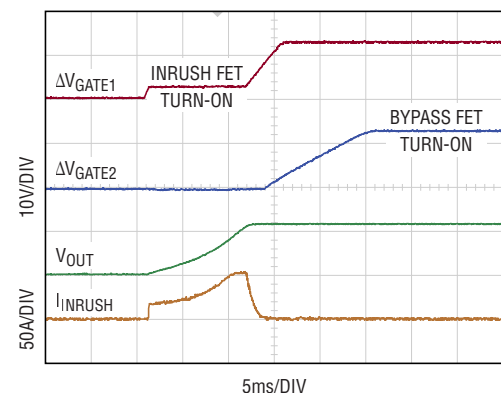
## Parallel Current Paths Ease MOSFET SOA Requirements for High Current Boards

The LTC<sup>®</sup>4282 Hot Swap<sup>™</sup> 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  $I^2C/SMBus$  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
- $I^2C/SMBus$  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 × 5mm) QFN Package

### Board Staged-Start Waveforms

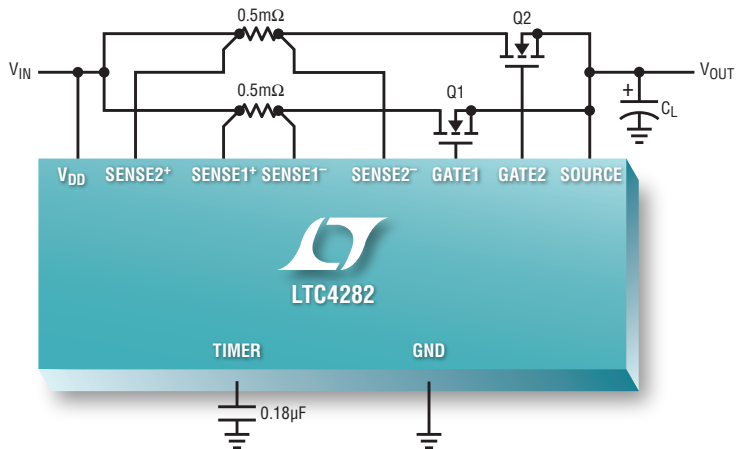


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# LTC4282 Current Path Configurations

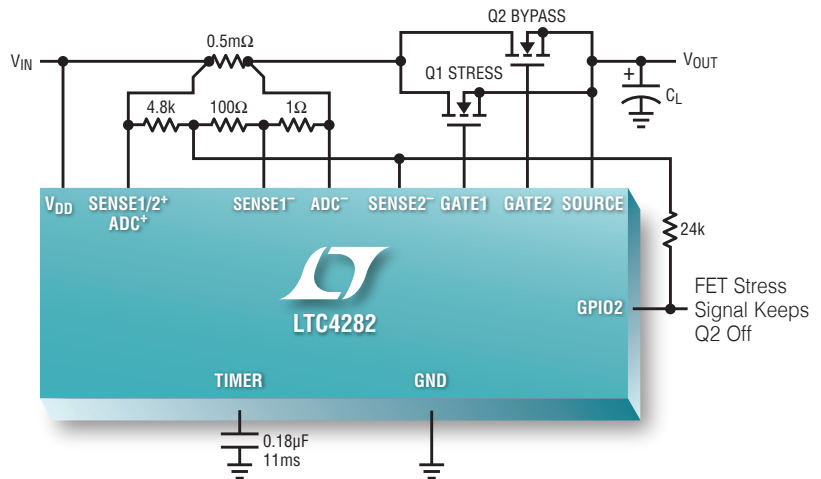
## Matched Paths Share SOA

- 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

