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SQJQ184ER Top-Side Cooled Automotive N-Channel 80 V MOSFET

Reduce PCB Temperature, Increase Power Density in Automotive Applications



ADVANTAGE



The SQJQ184ER provides an optimized solution for automotive designs that use a heatsink, helping reduce the temperature of the PCB and enabling energy efficient and reliable automotive electronics.

MARKETS AND APPLICATIONS



AUTOMOTIVE

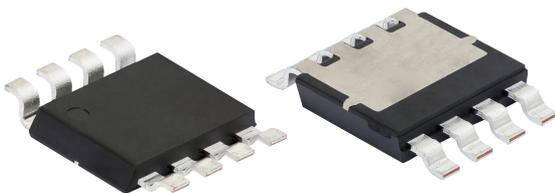
- 48 V systems
- Battery management
- Power steering
- Braking systems
- Motor drive control
- DC/DC converters
- On-board chargers
- Back-to-back switches

KEY PRODUCT FEATURES

- ✓ AEC-Q101 qualified
- ✓ Top-cooled feature optimized for heatsink mounting
- ✓ Very low on-resistance—maximum $R_{DS(ON)}$ of 1.4 mΩ
- ✓ Wire-free construction
- ✓ Improved efficiency and thermal transfer flow
- ✓ Gullwing leads optimized to achieve maximum relief for mechanical and thermal stresses

KEY PRODUCT BENEFITS

PCB temperature	↓
Adjacent devices temperature	↓
Overall costs	↓
PCB copper content	↓
On-resistance	↓
Power losses	↓
Mechanical and thermal stress	↓
Thermal efficiency	↑
Energy efficiency	↑
Current output	↑
Power density	↑
Board-level reliability	↑



RESOURCES



[Product Page](#)



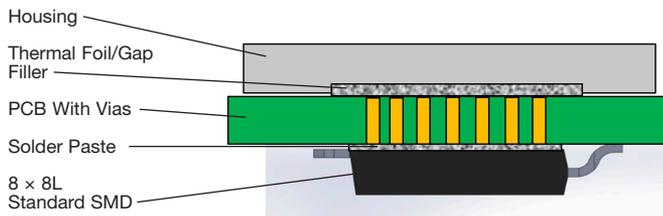
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ADDITIONAL BENEFITS

- Heat is directly dissipated to the heatsink, with no vias needed in the PCB area of the MOSFET
- Enables PCBs with less copper content and improves costs
- Improved ΔT allows for higher power output and power density
- PCB is no longer the dominant thermal path, and the remaining components can be rescaled down

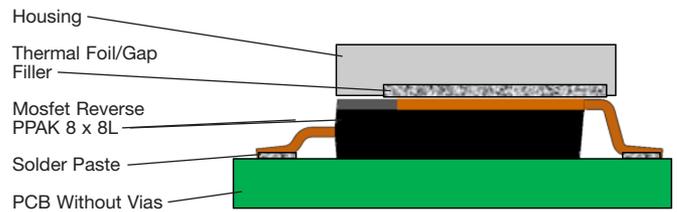
Thermal Management for Standard 8 × 8L

Use of Standard 8 × 8L package:
Cooling through PCB to housing

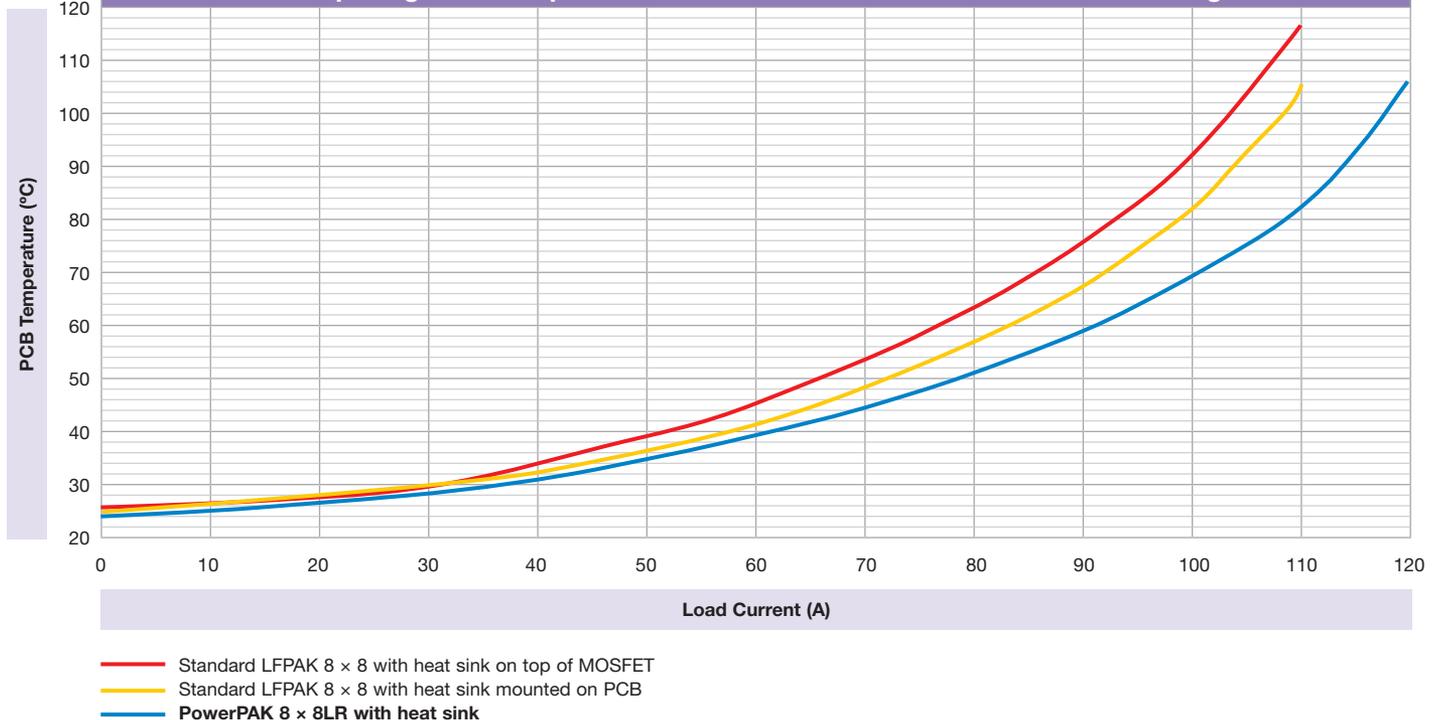


Thermal Management for “Reversed” 8 × 8LR

Use of Reverse 8 × 8LR package:
Top-side cooling to housing



Comparing PCB Temperatures: PowerPAK 8 × 8LR vs. Standard Package



The PCB featuring the PowerPAK 8 × 8LR offers lower temperature than a board populated by a standard 8 mm by 8 mm package with the exposed drain pad at the bottom side. All three test legs have airflow to promote thermal efficiency but with 110 A injected into the devices, the PCB with the PowerPAK 8 × 8LR has a 19 % cooler temperature measurement.