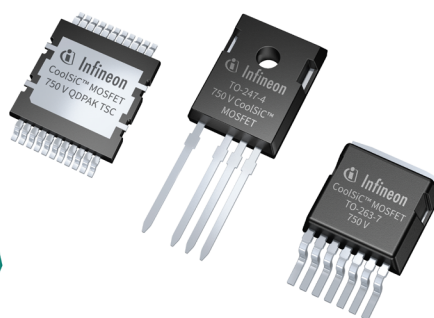


750V SiC MOSFETs Bring Performance and Reliability to your Applications

Lighter, smaller, and more efficient designs at reduced system costs for automotive and industrial applications

750 V SiC MOSFETs for Automotive and Industrial applications

- 8 mΩ - 140 mΩ $R_{DS(on)}$, typ. at 25°C
- Highly robust 750 V technology
- 100% avalanche-tested
- Integrated Kelvin source



Infineon's recently launched CoolSiC™ 750 V G1 MOSFETs add to the existing 650 V CoolMOS™ and 1200 V CoolSiC™ MOSFET portfolios. Their electrical performance enables designers to reach higher efficiencies in automotive and industrial applications like

- Automotive OBC, HV-LV DCDC converters
- Automotive static switches (eFuses, BMS)
- EV charging stations, wall-boxes
- Solid-state circuit breakers
- String PV inverters, energy storage systems

Infineon CoolSiC™ 750 V G1 MOSFET – built on the proven, highly reliable Infineon SiC technology, and in use for >20 years – is the most extensive, robust SiC portfolio available in the 600 V–750 V range for automotive and industrial applications that enables highly efficient systems.

Infineon's 750 V and 1200 V CoolSiC™ devices help EV makers create 11 and 22 kW bidirectional onboard chargers with increased efficiency, power density, and reliability. The devices leverage SiC characteristics to operate reliably at high temperatures (max T_j – 175°C). All devices use Infineon's proprietary .XT dieattach technology, delivering best-in-class thermal impedance for equivalent die sizes.

This technology provides very high robustness, especially against cosmic radiation, making it perfect for bus voltages >500 V. Thanks to their excellent immunity against spurious turn-ons, Infineon's CoolSiC™ 750 V G1 MOSFETs can be safely driven with zero-volt V_{gs} offstage voltage (unipolar gate driver), reducing system complexity, PCB area occupation, and BOM count. Their wide gatesource voltage rating (-5 V to 23 V, V_{gs} static) ensures compatibility with bipolar driving for increased design flexibility.

The devices feature a best-in-class $R_{DS(on)} \times Q_{fr}$ for superior efficiency in hardswitching half-bridges (CCM Totem Pole, 3-level). In softswitching topologies (LLC, CLLC, DAB, PSFB), excellent figures for $R_{DS(on)} \times Q_{oss}$ and $R_{DS(on)} \times Q_g$ enable higher switching frequencies.

This first-generation 750 V SiC family has a very granular portfolio with the $R_{DS(on)}$ (typical, at 25°C) between 8 mΩ and 140 mΩ. Among the three packages they come in (TO2474, D2PAK7, and QDPAK TSC), the topsidecooled QDPAK (released in JEDEC in 2023 and also available in 650 V CoolMOS™ CFD7A) helps maximize PCB space use, doubling power density, and enhancing thermal management via substrate thermal decoupling. Topsidecooled packages significantly reduce efforts in designing the cooling infrastructure, and are key to enabling power densities up to 4 kW/l, as Infineon demonstrated together with SAL in the "Tiny Power Box 1" cooperation project.

Together, all these features of the CoolSiC™ 750 V G1 MOSFET expedite the design process for futuristic applications (bidirectional charging or "V2X"). Vehicles charging appliances or powering construction equipment will be more feasible because of such devices.

For industrial applications such as EV charging, the new devices cut charging times and improve energy efficiency. PV inverter designs can be simpler and more robust, providing a trouble-free, longer lifetime. Finally, CoolSiC™ 750 V G1 enables designing solid-state circuit breakers and relays faster and with lower maintenance costs compared to mechanical- and thyristor-based counterparts.

With the launch of this new family, Infineon is very well positioned across all power semiconductor technologies (silicon, SiC, and GaN), and recommends the best fitting technology for each customer, depending on the specific requirements and topologies used. As an example, hybrid-systems combining SiC MOSFETs and Si SJ CoolMOS™ or CoolSiC Hybrid™ in Totem Pole PFC can be used to optimize onboard chargers in system costs. Infineon offers a matching gate driver portfolio, digital isolators, sensors, and microcontrollers to complement and complete the system offering.

Click [here](#) to find the full portfolio of HV SiC MOSFETs online.