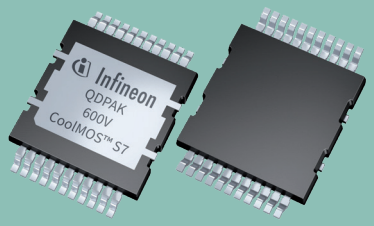


Product brief

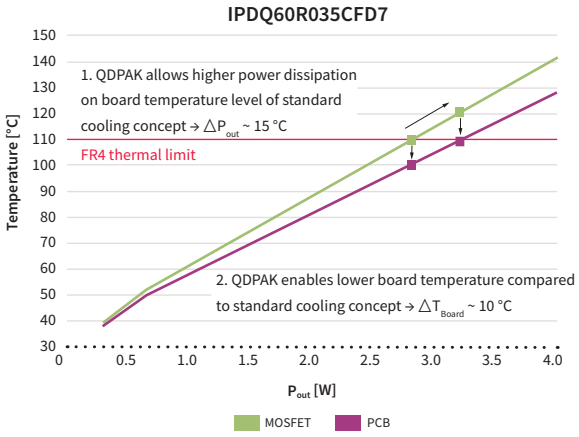
Quadruple DPAK (QDPAK) package

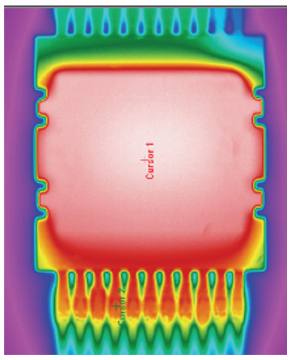
The top-side cooled SMD solution for demanding power applications

Infineon introduces the innovative QDPAK top-side cooled package, part of the HDSOP family, addressing the most demanding application requirements for increased power density and thermal handling. The QDPAK is a compact SMD, able to handle high current and reach a thermal performance comparable to a TO-247. The QDPAK allows leveraging the full advantages of an SMD, limiting the drawbacks like the heat spread through the PCB and enables high flexibility in PCB design.

Top-side cooling at a glance (HDSOP family)
In today's SMD-based designs, the output power is restricted by the thermal limit of the PCB material because the heat must be dissipated through the board. Thanks to the top-side cooling concept of the HDSOP family, the thermal decoupling of board and semiconductor is possible. This allows higher chip temperatures, higher power densities and improves system lifetime.

The most "powerful" SMD
QDPAK offers an optimized package technology that allows for bigger chip implementations reaching the lowest $R_{DS(on)}$ in the market. It opens the door for SMD packages to target the highest power systems thanks to its' intrinsic Kelvin source, high power dissipation capability, and innovative cooling concept.



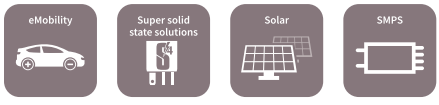


Key features

- Innovative top-side cooling concept
- Inbuilt 4th pin Kelvin source configuration
- Low parasitic inductances
- High current capability
- Thermal decoupling of board and semiconductor
- TCOB capability of > 2.000 cycles
- MSL1 compliant and total Pb-free
- > 120 mm² area for high power dissipation capability
- Creepage distance of 3.2 mm for HV applications

Key benefits

- Reduced parasitic reduces switching losses, improves efficiency and ease-of-use
- Enables higher power density solutions
- Extend SMD packaging concept to high power / high current domains
- Exceeding the highest quality standards
- Flexibility in PCB layout
- Enables high automation
- Overcome thermal PCB limits



www.infineon.com/S7
www.infineon.com/S7A

Quadruple DPAK (QDPAK) package

The top-side cooled SMD solution for demanding power applications

The inbuilt 4th pin Kelvin source configuration and very low parasitic source inductance support minimizing switching losses. The separate pin “source-sense” delivers undisturbed signals to the driver and therefore increases the ease–of–use level. The combination of this 4pin functionality together with Infineon’s latest SJ MOSFET and CoolSiC™ Schottky diode technologies ensures the highest efficiency levels and allows customers to reach the 80 PLUS® Titanium standard.

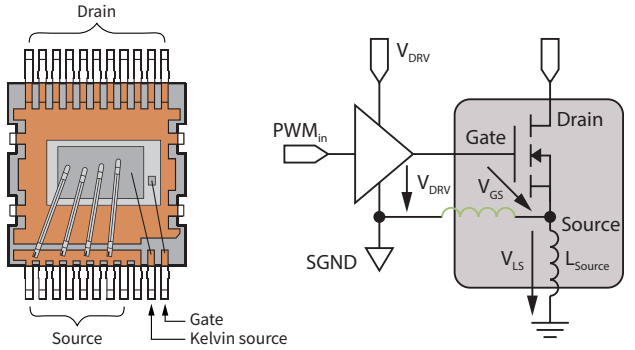
Mounting

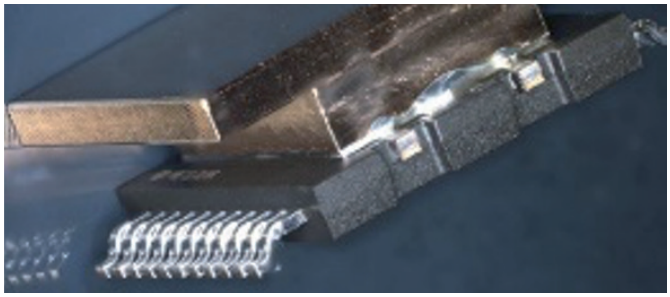
An example of such a heat sink could be a T-Shape, where the top-side of the heatsink can be isolated with a thin foil or kept in airflow from a fan un- insolated, depending on creepage and clearance requirements. Furthermore, the whole construction can be soldered on the backside of a PCB. Another solution is to use a common large heatsink to cool more devices in parallel and reach very high ampere values.

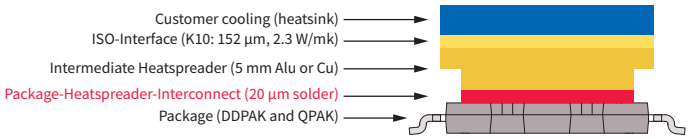
Availability

Infineon offers a broad range of top-side cooled devices for different technologies like the CoolMOS™ S7 product line, enabling a record low $R_{DS(on)}$ device of 10 mΩ.

4 pin Kelvin source capability







Product portfolio

$R_{DS(on)}$ max. [mΩ]	CoolMOS™ S7: Industrial grade	CoolMOS™ S7: Automotive grade	600V CoolMOS CFD7
	QDPAK		
10	IPDQ60R010S7	IPDQ60R010S7A	
15			IPDQ60R015CFD7*
20			IPDQ60R020CFD7*
25			IPDQ60R025CFD7*
35			IPDQ60R035CFD7*
45			IPDQ60R045CFD7*
55			IPDQ60R055CFD7*
75			IPDQ60R075CFD7*

* Coming soon

Published by
Infineon Technologies Austria AG
9500 Villach, Austria

Document number: B152-I1154-V1-7600-AP-EC-P
Date: 03 / 2021