

## Product brief

# Quadruple DPAK (QDPAK) package

The top-side cooled SMD solution for demanding power applications

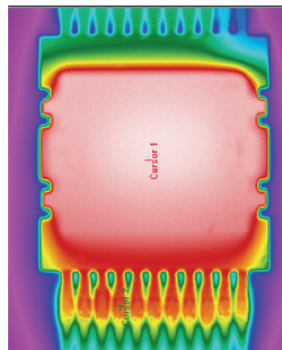
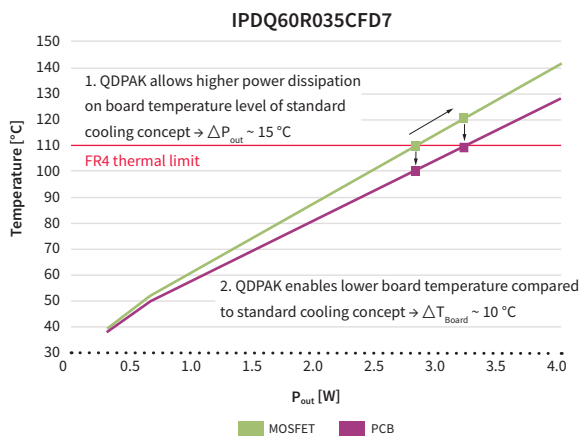
Infineon introduces the innovative QDPAK top-side cooled package, part of the HDSOP family, addressing the most demanding application requirements for increased power density and thermal handling. The QDPAK is a compact SMD, able to handle high current and reach a thermal performance comparable to a 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 4<sup>th</sup> 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 mm<sup>2</sup> 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



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The inbuilt 4<sup>th</sup> 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.

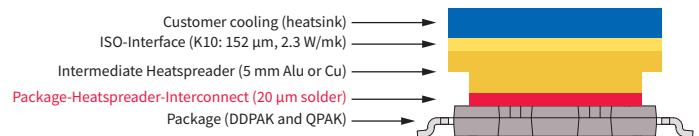
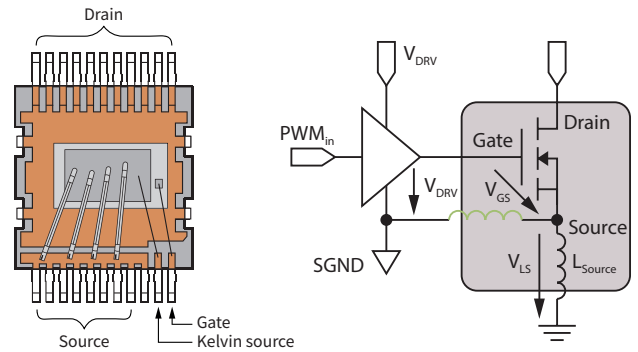
## Mounting

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- insulated, 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	IPDQ60R010STA	
15			IPDQ60R015CFD7*
20			IPDQ60R020CFD7*
25			IPDQ60R025CFD7*
35			IPDQ60R035CFD7*
45			IPDQ60R045CFD7*
55			IPDQ60R055CFD7*
75			IPDQ60R075CFD7*

\* Coming soon

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