

CoolMOS™ in ThinPAK 8x8

The new leadless SMD package for CoolMOS™

Infineon Technologies introduces the ThinPAK™ 8x8, a new leadless SMD package for HV MOSFETs. The new package has a very small footprint of only 64 mm² (vs. 150 mm² for the D²PAK) and a very low profile with only 1 mm height (vs. 4.4 mm for the D²PAK). This significantly smaller package size in combination with its benchmark low parasitic inductances can be used as a new and effective way to decrease system solution size in power-density driven designs.

The ThinPAK 8x8 package is characterized by a very low source inductance 2nH (vs. 6nH for D²PAK), separate driver source connection (clean gate signal) as well as a similar thermal performance as D²PAK. The package hence enables faster and thus more efficient switching of Power MOSFETs and is easier to handle in terms of switching behaviour and EMI.

Applications

- Servers
- Adapters
- UPS
- HID Lighting

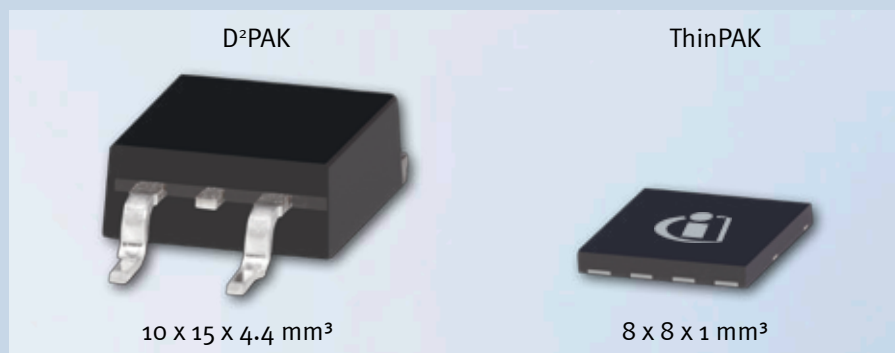
Features

- Small footprint (8x8 mm²)
- Low profile (1 mm)
- Low parasitic inductance
- Separate driver source pin
- RoHS compliant
- Halogen free mold compound

Benefits

- Reduced board space consumption
- Increased power density
- Short commutation loop
- Smooth switching waveform
- Easy to use products
- Environmentally friendly

Comparison between the standard SMD package D²PAK and the new leadless SMD package ThinPAK 8x8



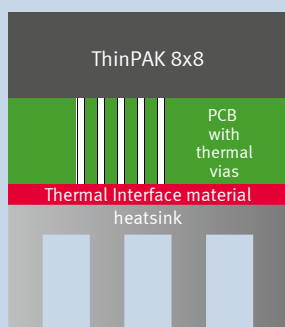
60 % footprint reduction - 80 % height reduction

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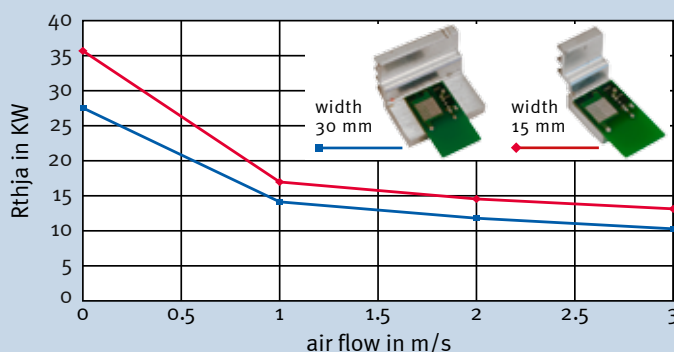
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ThinPAK 8x8 and thermal design

To achieve high power capability it is of significant importance to have a well designed thermal system. The recommended design is a thin PCB with many vias and a heatsink attached to the backside of the PCB. A high number of vias is needed to reduce the thermal conduction resistance through the board. To decrease the overall thermal resistance R_{thja} forced convection is beneficial. Thermal measurements show that with this system thermal resistances of 10 K/W and even lower can be achieved for typical applications. 10 K/W would allow for ~ 7 W for typical thermal boundary conditions ($T_{\text{ambient}} = 50^{\circ}\text{C}$, $T_{\text{max}} = 120^{\circ}\text{C}$).



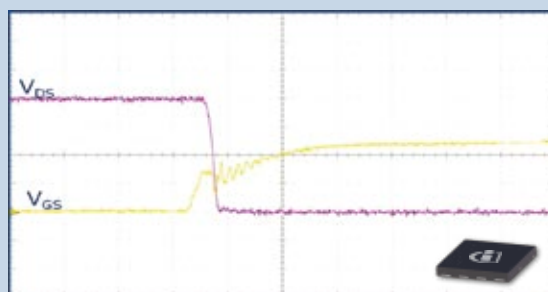
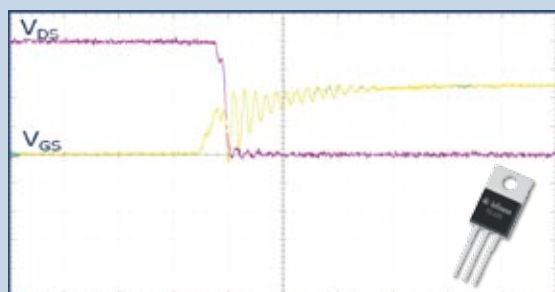
Thermal cooling system for ThinPAK 8x8



Measurement of the thermal resistance junction to ambient: R_{thja}

Electrical switching behaviour

A low inductive package shows lower ringing at the gate and results in a smooth switching waveform.



Switching waveform for TO-220 (left) and ThinPAK (right)

Product Portfolio for 600V CoolMOS™ CP in ThinPAK 8x8

Part Number	Maximum Ratings		$R_{DS(on)}$ (mOhm)		Qg (nC) typ.
	V_{DS} (V)	I_D (A)	Typ	Max.	
IPL60R199CP	600	16	180	199	32
IPL60R299CP	600	11	270	299	22
IPL60R385CP	600	9	350	385	17

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