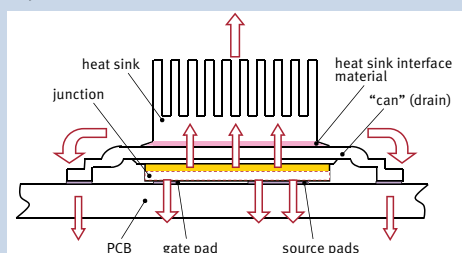


Leverage Your Performance With CanPAK™

Always a Step Ahead With OptiMOS™

Infineon expands its OptiMOS™ power MOSFET portfolio, introducing 60V to 150V products in the high performance package CanPAK™. Hence, the portfolio comprises 25V to 150V products. They are the best fit for a broad number of industrial applications like voltage regulators for servers, DC-DC converters, solar micro inverters, low voltage drives and synchronous rectification. With only 30mm² footprint, CanPAK™ M allows more than 50% space reduction on board compared to traditional DPAK and enables highest system power density. Featuring lowest gate charge and on-state resistance $R_{DS(on)}$, OptiMOS™ in CanPAK™ minimizes conduction and switching losses. In addition, the metal 'can' enables double-sided cooling along with almost no package parasitic inductances, leading to highest system efficiency.

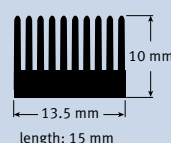
Top-side and double-sided cooling with CanPAK™



heat sink
surface area A: ~1700mm²
convection coefficient
still air: 10 $\frac{W}{m^2K}$

PCB
 R_{th_PCB} ~70K/W (measurement)
(6 layer PCB, 35μm, 200mm² Cu)

interface material
specific thermal conductivity 2.7W/mK
thickness: 0.5mm
 $R_{th_interface} = \text{thickness} / (\text{conductivity} \times \text{contact area})$
 $R_{th_interface}$ ~8K/W



Thermal resistance	DPAK	CanPAK™	Improvement
Package top side R_{th_top} [K/W]	55	1,5	97%
Interface material $R_{th_interface}$ [K/W]	8	8	
Heatsink $R_{th_heatsink}$ [K/W]	58	58	
Total resistance top side R_{th_top} [K/W]	121	67,5	44%
Package bottom R_{th_bottom} [K/W]	1	1	
PCB R_{th_PCB} [K/W]	70	70	
Total resistance bottom side R_{th_bottom} [K/W]	71	71	0%
Overall resistance R_{th_sum} [K/W]	45	35	23%

The CanPAK™ features a very low thermal resistance to the top side of the package (1.5K/W vs. 55K/W for the DPAK). Hence it is very well suited for special cooling systems. If using only the top side for cooling, this means for the calculated example an improvement of 44%, which is for a temperature delta between $T_{junction}$ and $T_{ambient}$ of 70°C a power difference of 0.45W (1W vs. 0.55W) compared to the DPAK. Using a double-sided cooling concept considering a cooling through the heatsink and the PCB the improvement results in ~20%.

Features

- Highly effective top-side cooling
- Very low package parasitics
- Ultra thin package (0.7mm)
- Best thermal behavior

Benefits

- Highest efficiency and power density
- Less device paralleling
- System cost improvement
- Lowest board space consumption
- No external snubber networks needed
- Minimized EMI
- Easy to design-in
- Environmentally friendly

Applications

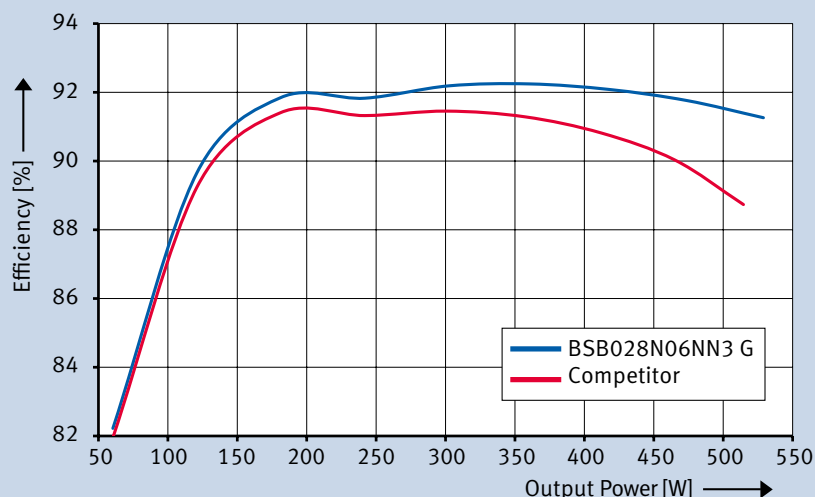
- Solar micro inverter
- Synchronous rectification
- VRM modules for server
- DC-DC converter
- Or-ing switch and circuit breaker
- Desktop PC
- Workstations and mainframes

Leverage Your Performance With CanPAK™

Always a Step Ahead With OptiMOS™

An example of an outstanding performance of OptiMOS™ 60V in CanPAK™ is demonstrated in the synchronous rectification stage of a server power supply. Improvement of 1% peak efficiency and >2% at full load over the next best competitor is achieved based on the same footprint.



Efficiency comparison of best-in-class OptiMOS™
60V in 600W/12V server SMPS vs. competitor



Server SMPS



Full CanPAK™ portfolio

		25V	30V	40V	60V	80V	100V	150V
 CanPAK™ M	N-channel	BSB008NE2LX 0.8mΩ	BSB012N03LX3 G 1.2mΩ	BSB014N04LX3 G 1.4mΩ	BSB028N06NN3 G 2.8mΩ	BSB044N08NN3 G 4.4mΩ	BSB056N10NN3 G 5.6mΩ	BSB165N15NZ3 G 15mΩ
		BSB012NE2LX 1.2mΩ	BSB017N03LX3 G 1.7mΩ	BSB015N04NX3 G 1.5mΩ				BSB280N15NZ3 G 28mΩ
		BSB013NE2LXI 1.3mΩ						
	P-channel		BSB027P03LX3 G 2.7mΩ					
			BSB029P03NX3 G 2.9mΩ					
 CanPAK™ S	N-channel	BSF030NE2LQ 3.0mΩ	BSF024N03LT3 G 2.4mΩ		BSF077N06NT3 G 7.7mΩ		BSF134N10NJ3 G 13.4mΩ	
			BSF050N03LQ3 G 5.0mΩ		BSF110N06NT3 11mΩ			

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