Product Brief

OptiMOS™ 5 25 V Power Block

Asymmetric Halfbridge Handles 50 A in a 30 mm² Footprint

OptiMOS™ 5 Power Block is a leadless SMD package in a 5.0x6.0 mm² package outline, including a low-side and a high-side MOSFET in a synchronous buck converter configuration. By replacing two separate discrete packages, such as SO8 or SuperSO8, with the OptiMOS™ 5 Power Block, customers can shrink their designs up to 85%. Standardizing power packages benefits the customer, as the number of different package outlines available in the market place is minimized.

Benchmark Efficiency and High Current Handling

OptiMOS™ 5 Power Block features Infineon's latest generation MOSFETs, which offer lowest on-state resistance ($R_{DS(on)}$) and Figure of Merits (Q_g, Q_{gd}). The source-down connection of the low-side MOSFET results in a big PGND pad which significantly improves the thermal junction to the board, simplifies layout options and reduces EMI. Together with OptiMOS™ Driver (PX3519, PX3517) and Controller family, Infineon offers an excellent discrete solution for low voltage DC/DC power conversion with a current handling up to 50 A and a superior peak efficiency of 95%. This solution allows engineers to optimize their designs by increasing switching frequency and power density as well as to improve the overall BOM costs.

Main Features

- 50 A max. average load current
- Source-down low-side MOSFET for better PCB cooling
- Internally connected low-side and high-side (lowest loop inductance)
- High-side Kelvin connection for more efficient driving

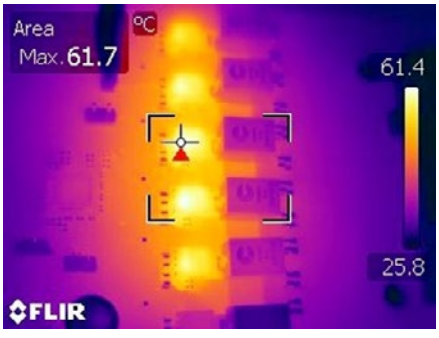
Key Benefits

- Compact and simplified layout for DC/DC converter
- Optimized layout with lowest loop inductivity and best thermal performance

Thermal infrared picture of a 5-phase board at 200 A output current

OptiMOS™ 5 25 V Power Block BSG0811ND reaches a maximum temperature of only 61.7 °C.

Conditions: 5 phases; V_{in} = 12 V; V_{out} = 1.8 V; L = 150 nH; f_{sw} = 430 kHz; Airflow = 300 lfm;



Applications

- Desktop and Server
- Single-phase and Mulitphase PoL
- CPU/GPU regulation in Notebooks and DDR Memory
- High Power Density Voltage Regulator

www.infineon.com/powerblock

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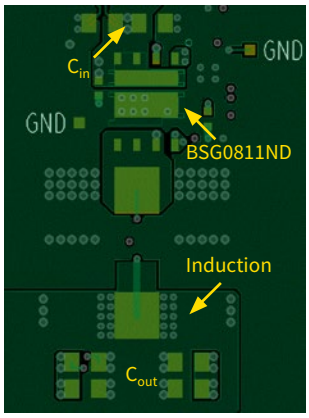
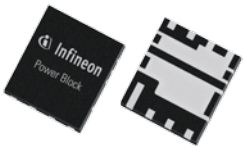
Easy and Compact Layout

Improved power loop (connection to input capacitors)
Direct PGND connection for better cooling.

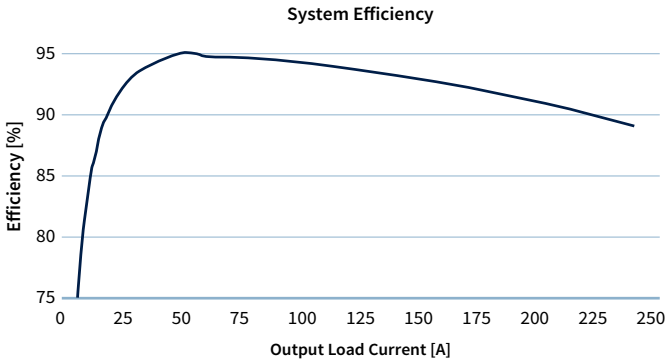


Top Layer Layout
Power Block



95% Peak Efficiency

Latest generation of OptiMOS™ 5 MOSFETs with low on-state resistance and optimized Figure of Merits provide a superior efficiency behavior over the whole load range.



BSG0811ND and PX3519 measurement on 5-phase board;
V_{in} = 12 V; V_{out} = 1.8 V; L = 150 nH; f_{sw} = 430 kHz; Airflow = 300 lfm;

Product Portfolio

Part Number	Schottky-like Diode [1]	BV_{DSS} (V)	$R_{DS(on)}$ @ V_{gs} = 4.5 max		$Q_{g\,tot}$ @ V_{gs} = 4.5 typ		Package Size	Sample Status
			High-Side	Low-Side	High-Side	Low-Side	W x L x T [mm³]	
BSG0810NDI [2]	Y	25	4	1.2	5.6	16	5.0x6.0x1.0	available
BSG0811ND	N	25	4	1.1	5.6	20	5.0x6.0x1.0	available
BSG0813NDI	Y	25	4	1.7	5.6	12	5.0x6.0x1.0	available

Part Number	Package	Max. Juncion Temperature	Boot to GND	Features	Sample Status
PX3517	3.0x3.0x0.9 mm³ TDSON-10	-25 °C to 125 °C	30	thermal warning	available
PX3519	3.0x3.0x0.9 mm³ VDSON-8	-25 °C to 125 °C	30	driver enable pin	available

[1] monolithic integrated Schottky-like diode
[2] release planned for Q3 2015

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