SOLUTION BRIEF

1.8 kW MV interleaved buck IBC discrete solution reference design

REF_1.8kW_BUCK_12V_Si

Power next-generation AI server architectures with Infineon's interleaved buck intermediate bus converter (IBC) 1.8 kW 48 V – 12 V discrete solution reference design, engineered for high TDP rails and extreme transient demands, delivering 1.8 kW continuous power. Built around a regulated 4:1 conversion ratio and a transformer-less topology, it reduces system complexity while achieving 1.7 times higher power density and approximately 40% lower $/kW versus industry-standard regulated solutions. Thanks to Infineon's XDP™ digital 16-phase controller, the solution scales seamlessly from 1 phase at 300 W to 16 phases at 4.8 kW. Featuring Infineon's 80 V OptiMOS™ MOSFETs, this silicon-based design achieves a peak efficiency of 97.3%.

The design can be implemented based on Infineon's OptiMOS™ Silicon or CoolGaN™ Gallium Nitride switches, thanks to common footprints across power devices, gate drivers, and controllers. This also enables second sourcing flexibility across the devices.

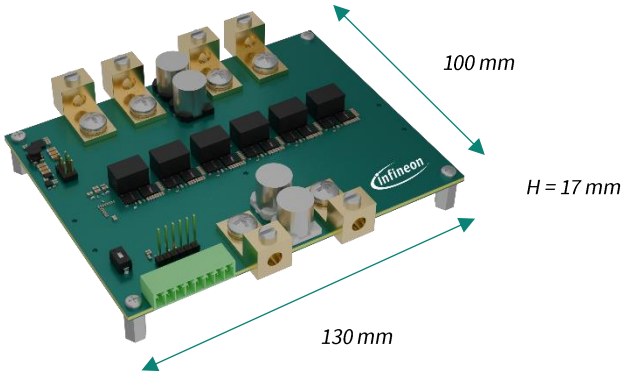
Key features

- Full Silicon implementation
- 1.8 kW TDP power delivery, with 3x TDP for 400 µs
- 97.3% peak efficiency using Si @VIN = 48 V
- Regulated 4:1 conversion ratio
- Design can be scaled to 16 phases with one controller from 300 W to 4.8 kW (300 W x 16)

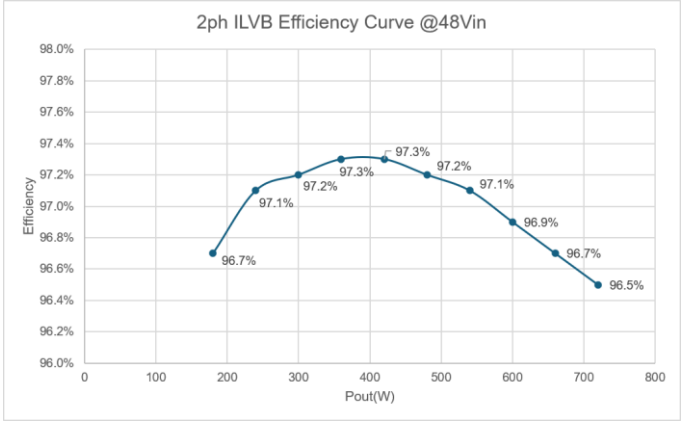
Key benefits

- Reduced complexity with transformer-less design
- 1.7 times higher density compared to industry standard regulated designs
- 40% less $/kW compared to industry standard
- Interoperability between Si and GaN as they support common footprint

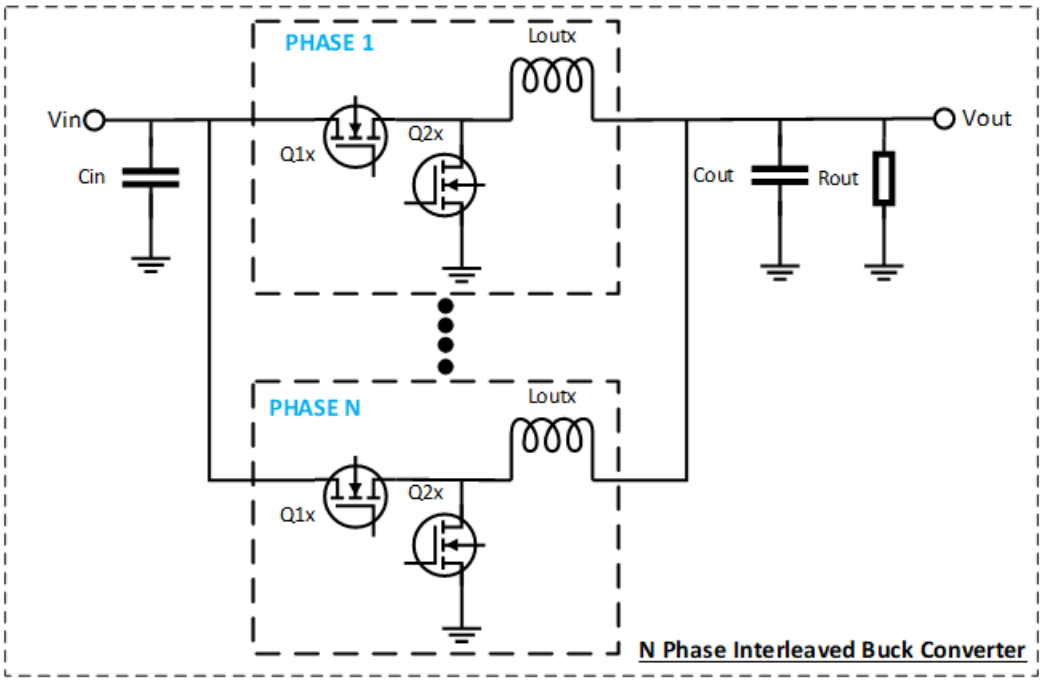
Photograph of the prototype



Measured efficiency versus output power



ILVB Block diagram



Highlighted key products

No.	Product Group	Part Number	Description
1	OptiMOS™ 6	ISC031N08NM6SC	High side 80 V 5x6 Si FET
2	OptiMOS™ 8	ISC016N08NM8SC	Low side 80 V 5x6 Si FET
3	EiceDRIVER™	2EDL900G3	EiceDRIVER™ 120 V Level shifter gate driver IC
4	XDP™	XDPE1A2G7C-0020	Digital dual loop 16-phase controller

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