SOLUTION BRIEF

1.8kW MV interleaved buck IBC discrete solution reference design

REF_1.8kW_BUCK_12V_GaN

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 100 V G5 CoolGaN™ switches, this GaN-based design achieves a peak efficiency of 97.7% which translates into a 0.5% efficiency increase compared to industry-standard designs.

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

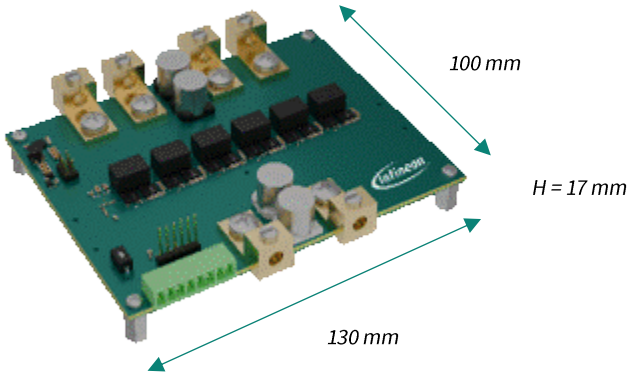
Key features

- Full GaN Implementation
- 1.8 kW TDP power delivery, with 3x TDP for 400 µs
- 97.7% peak efficiency using GaN @VIN = 48 V
- Regulated 4:1 conversion ratio
- Interoperability between Si and GaN as they support common footprint
- Design can be scaled to 16 phases with one controller from 300 W to 4.8kW (300 W x 16)

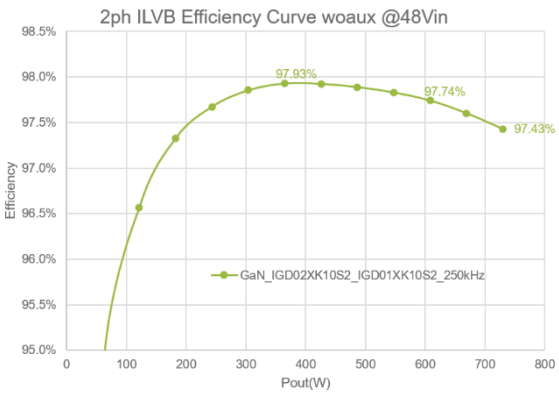
Key benefits

- Reduced complexity with transformer-less design
- 1.7 times higher density compared to Industry standard regulated designs
- 40% less $/kW compared to industry standard
- Efficiency with GaN is more than 0.5% higher than industry standard

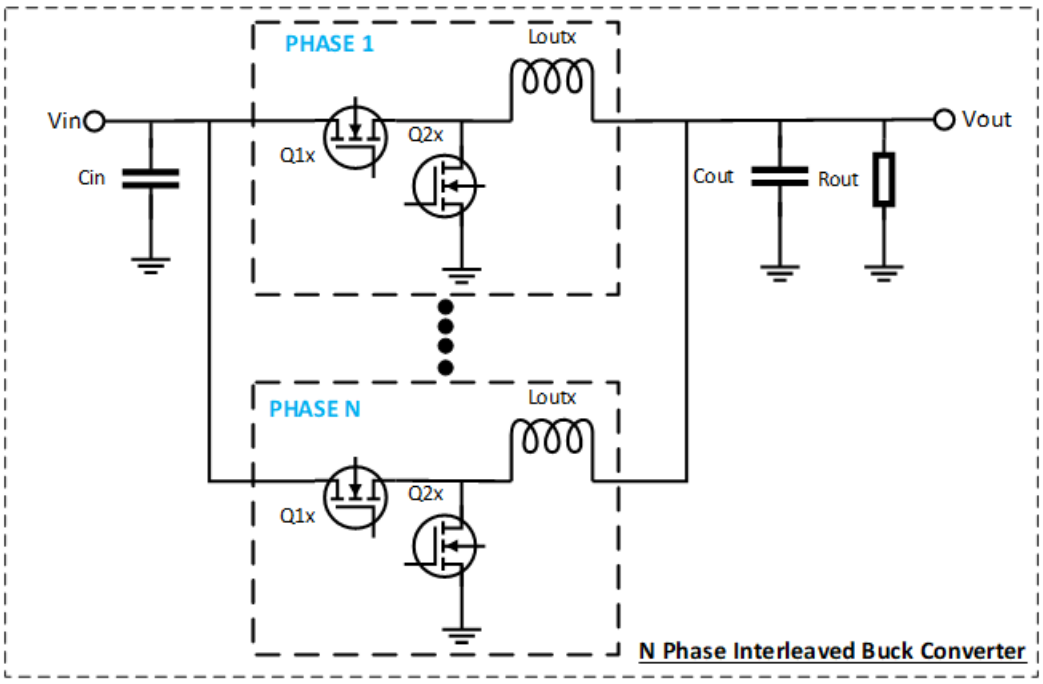
Photograph of the prototype



Measured efficiency versus output power



ILVB Block diagram



Highlighted key products

No.	Product Group	Part Number	Description
1	MV CoolGaN™	IGD02xK10S2	High side CoolGaN™ Transistor 100 V G5
2	MV CoolGaN™	IGD01xK10S2	Low side CoolGaN™ Transistor 100 V G5
3	EiceDRIVER™	2EDL901G3	EiceDRIVER™ 120 V Level shifter gate driver IC
4	XDP™	XDPE1A2G7C-0020	Digital dual loop 16-phase controller

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