SOLUTION BRIEF

6 kW 800 V-to-12 V IBC Discrete Solution Reference Design

REF_6KW_800V_12V_IBC

Power next-generation AI server architectures with Infineon's 6 kW high-voltage intermediate bus converter reference design. The discrete onboard solution provides direct, unregulated conversion from an 800 V or ±400 V distribution bus to 12 V, helping bring high-voltage power efficiently to board-level compute. Its stacked half-bridge LLC architecture combines 650 V CoolGaN™ power transistors on the primary side with 40 V OptiMOS™ 7 MOSFETs on the secondary side.

The reference design achieves up to 98.2% peak efficiency and 97.1% efficiency at full load in a compact 130 mm × 40 mm × 8 mm form factor. It delivers 6 kW thermal design power and supports short-duration peak loads of 10.8 kW for 400 µs and 9 kW for 50ms, addressing the fast and dynamic power demands of AI processors. Parallel operation enables scalable power delivery for higher power system requirements.

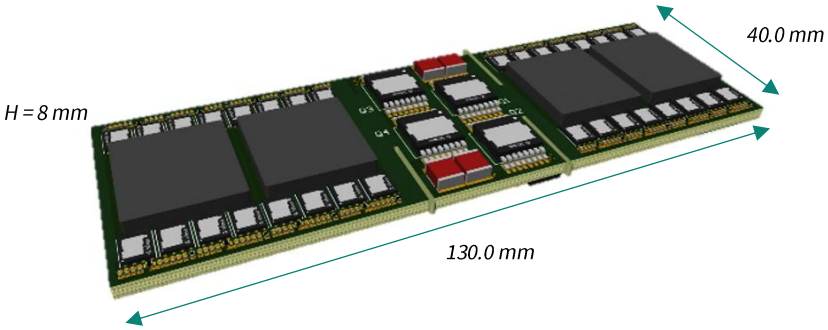
Key features

- Direct, unregulated 800 V or ±400 V-to-12 V conversion
- 6 kW thermal design power
- Short-duration peak capability of 10.8 kW for 400 µs; 9 kW for 50 ms
- 98.2% peak efficiency and 97.1% full-load efficiency
- Based on Infineon's 650 V CoolGaN™ power transistors on the primary and 40 V OptiMOS™ 7 MOSFETs on the secondary-side

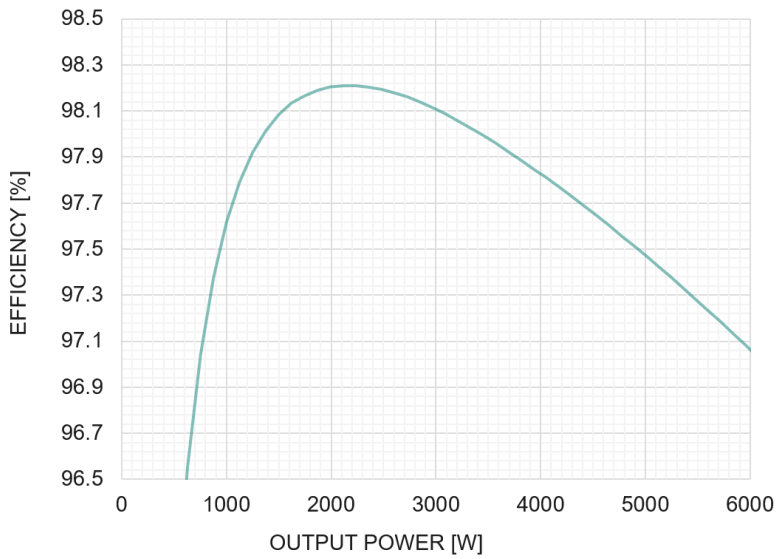
Key benefits

- Brings high-voltage distribution directly to board-level compute, reducing need for an intermediate conversion stage
- Maximizes usable compute power through high conversion efficiency
- Scales with platform power requirements through parallel operation

Board rendering

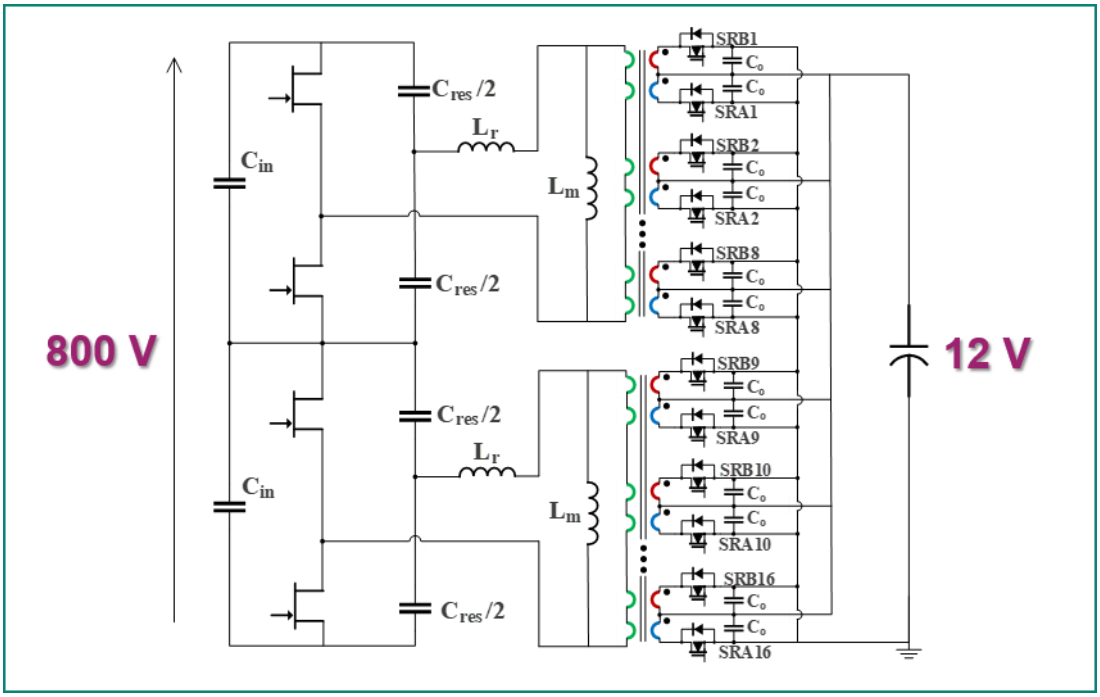


Measured efficiency versus output power



SOLUTION BRIEF

ISOP Half-bridge DCX diagram



Highlighted key products

No.	Product Group	Part Number	Description
1	HV CoolGaN™	IGLT65R025D2	CoolGaN™ Transistor 650 V G5
2	OptiMOS™	ISCH69N04LM7SC	40 V switching optimized power MOSFET in PQFN 5x6 Dual-Side Cooled (DSC) package
3	EiceDRIVER™	2EDR7259X	Robust, dual-channel, functional isolated MOSFET gate drivers with accurate and stable timing
4	EiceDRIVER™	2EDN7534G	EiceDRIVER™ 2EDN Gate Driver for MOSFETs and WBG switches
5	PSOC™	PSC3M5FDS2AFQ1	PSOC™ Control C3 ARM® Cortex®-M33 Microcontroller

Published by
Infineon Technologies AG
Am Campeon 1-15, 85579 Neubiberg
Germany

© 2026 Infineon Technologies AG
All rights reserved.

Public

Version: V1.0_EN
Date: 11/2026

Please note!
This Document is for information purposes only and any information given herein shall in no event be regarded as a warranty, guarantee or description of any functionality, conditions and/or quality of our products or any suitability for a particular purpose. With regard to the technical specifications of our products, we kindly ask you to refer to the relevant product data sheets provided by us. Our customers and their technical departments are required to evaluate the suitability of our products for the intended application.

We reserve the right to change this document and/or the information given herein at any time.

Additional information
For further information on technologies, our products, the application of our products, delivery terms and conditions and/or prices, please contact your nearest Infineon Technologies office (www.infineon.com).

Warnings
Due to technical requirements, our products may contain dangerous substances. For information on the types in question, please contact your nearest Infineon Technologies office.

Except as otherwise explicitly approved by us in a written document signed by authorized representatives of Infineon Technologies, our products may not be used in any life-endangering applications, including but not limited to medical, nuclear, military, life-critical or any other applications where a failure of the product or any consequences of the use thereof can result in personal injury.

Scan QR code and explore offering
www.infineon.com