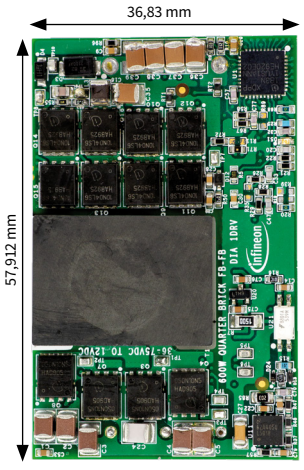
Solution brief

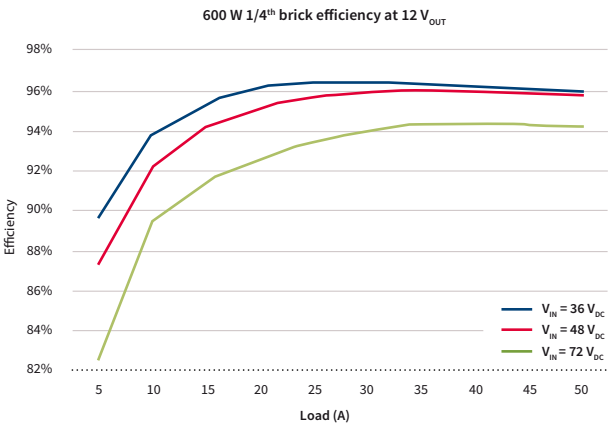
48–12 V fully regulated isolated 1/4th brick module using digital control

36-75 V input, 12 V output, 600 W, quarter brick with PMBus interface

The 600 W isolated 1/4th digital brick converter is a full-function digitally controlled power module solution from Infineon, designed to support telecom 12 V_{DC} intermediate bus applications. The output is fully isolated from the input, allowing versatile polarity configurations. This reference design implements secondary side digital control and hard switching full-bridge topology to deliver 12 V/600 W of output power and operate across a wide input voltage 36-72 V. The achieved power density is 22 W/cm^3 (360 W/in^3) with an impressive 96 percent efficiency. This superior performance is enabled by all-Infineon components including the XDPP1100* digital controller, OptiMOS™ 5, 6 families and EiceDRIVER™ isolated gate drivers. This design demonstrates the flexibility of digital control and enables firmware customization and differentiations by the module manufacturers.

This design showcases world's smallest fully programmable digital power controller XDPP1100* device from Infineon. This controller offers highly integrated digital control solution with superior AFE, digital state-machine and ARM® Cortex® M0 combined in a single chip. It also includes PMBus interface for system configure/control/monitoring. The XDPP1100* allows optimization of various parameters such as dynamic dead time to enhance efficiency over full load/temperature range. This design also features Infineon's OptiMOS™ 5 100 V, OptiMOS™ 6 40 V and the EiceDRIVER™ 2EDF7275K dual-channel isolated gate driver. Thanks to high driving current, excellent common mode rejection and fast signal propagation, 2EDF7275K is particularly well suited for driving medium-to-high voltage CoolMOS™ or OptiMOS™ in fast-switching power systems.





*Prototype

www.infineon.com/ref-600w-fbfb-xdpp1100

Key features

- Digital voltage mode control with flux balancing
- Fully programmable digital control based on 32-bit, ARM® Cortex®-M0
- Smooth pre-bias start-up
- Fast feed forward regulation to manage line transients
- 96% peak efficiency
- System configuration, monitor and control with PMBus 1.3 compliance
- Implements active current sharing
- Output voltage accuracy +/-1%
- Industry-leading power density for telecom and datacom: 360 W/in^3
- Telecom temperature range: -40°C – 125°C

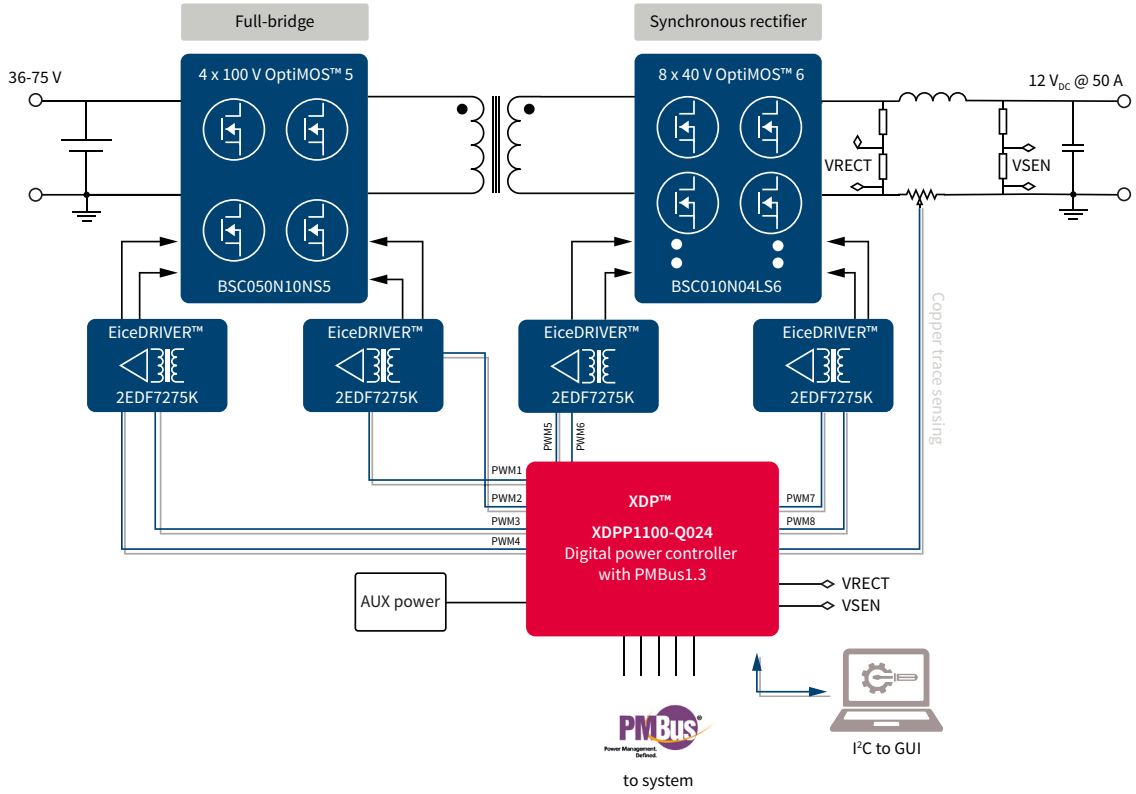
Key benefits

- Configurable with GUI support
- Allows FW based customization
- Accurate V/I/Temp monitoring
- Configurable output voltage
- Increase overall reliability
- High power density and reduced BOM with component integration
- Pre-programmed control providing the fastest time-to-market
- Provides future proof optimal solution via PMBus adjustments



High efficiency DC/DC 1/4th digital brick module

Isolated full-bridge and SR implementation



Ordering information

Design block	Digital power controller with PMBus	EiceDRIVER™ isolated dual-gate MOSFET driver	Full-bridge OptiMOS™ 5	Synchronous Rectifier OptiMOS™ 6
Package	40-VQFN	13-TFLGA	SuperSO8	SuperSO8
Product	XDPP1100-Q040*	2EDF7275K	BSC050N10NS5	BSC010N04LS6
Specifications	› 12x Digital PWMs › 3x VADC, 2x IADC, Temp ADC › Max frequency 2MHz › ARM® Cortex® M0 with 100MHz 32bit, 64kB OTP, 80kB ROM, 64kB RAM	› 4 A/8 A source/sink current › Up to 10 MHz frequency › 37 ns propagation delay with +7/-6 ns delay variance › 3 ns mismatch	› 100 V 5 mΩ › 49 nC Qg › SuperS08 package	› 40 V 1 mΩ › 76 nC Qg(sync) › SuperS08 package

*Prototype

**Some of the products may not be visible on our website. Please contact Infineon sales for more details.

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