

TDM22544D & TDM22545D

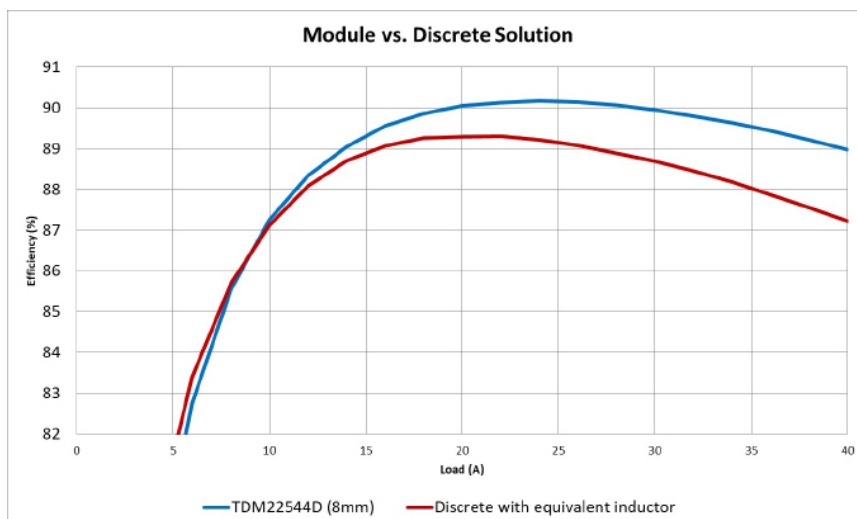
Dual-phase 120-A OptiMOS™ power module

TDM22544D and TDM22545D expand Infineon’s dual-phase power module family with two OptiMOS™ 6 power stages integrated with inductors and capacitors on a single substrate. This level of integration allows two phases of a multiphase buck regulator to be deployed in a 40% lower area compared to equivalent discrete solutions.

Infineon’s dual-phase modules utilize a proprietary inductor-on-top design for improved thermal and electrical performance yielding superior energy efficiency. This design minimizes current conduction loss while maximizing head-conduction to the top surface from the key heat-generating areas of the power stage below it, through the inductor.

Integrated power modules isolate the switch-node from the motherboard, improving signal integrity by eliminating switching voltages from the motherboard and protecting sensitive signals from noise-coupling. Integrating the switch-node also minimizes its parasitic impedances enabling more efficient operation at higher switching frequencies. Infineon dual-phase modules offer efficiency improvements up to 2% pt. or more compared to an equivalent discrete solution.

Moreover, with the switch-nodes isolated, the module can now be located under the processor. This minimizes the power distribution network (PDN) losses as the high current flows vertically through the thickness of the motherboard, instead of laterally traversing the package to the core. This reduces motherboard power losses by 90% or more.



Key features

Infineon’s smart OptiMOS™ 6 power stages modules

- 5.3uF input capacitors
- Bootstrap capacitors
- 70 A per phase thermally managed
- 120 A per phase peak
- 4.25 V to 16 V input voltage
- Current sensing and reporting at 8 uA/A
- 8 mV / C temperature analog output
- 0.225 V to 3 V output voltage range
- Operation up to 2 MHz
- Cycle-by-cycle over current protection (OCP) and flag

Key benefits

- High power density solution (>1A/mm²)
- Best-in-class TCO
- Simpler construction for high volume manufacturing
- Ease of use
- Improved thermal management & system efficiency
- Improved signal integrity
- Minimized PDN losses

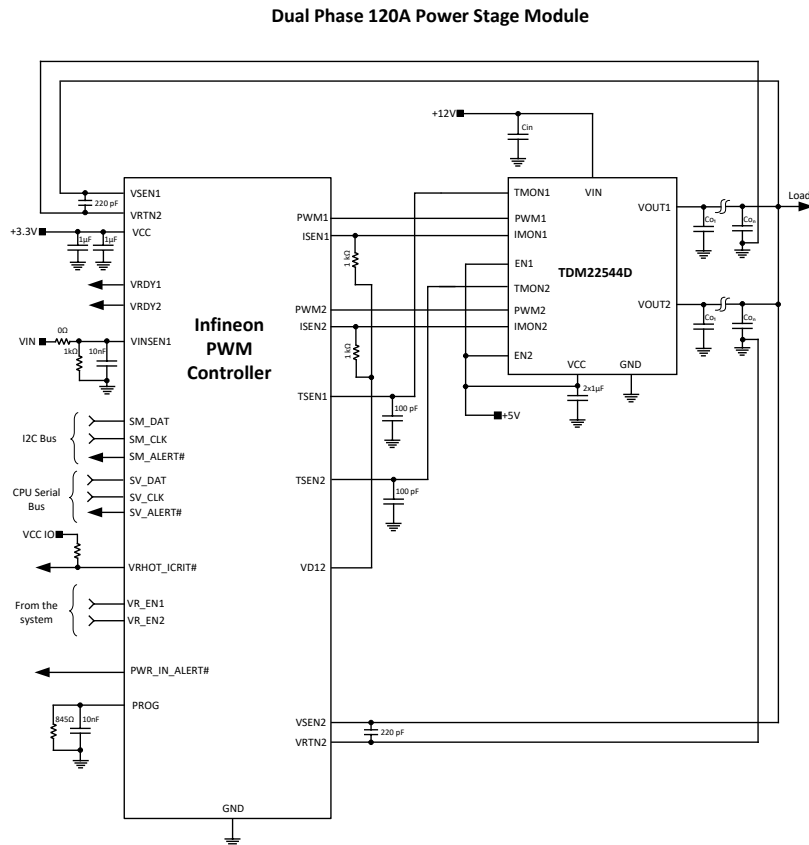
Potential applications

- Artificial intelligence accelerator cards
- CPU power
- FPGA power
- Telecom / datacenter

Powering a sustainable AI

Dual-phase power modules are critical to meet the power demands of high-power GPU systems by providing high power density and best in class efficiency without compromising signal integrity. By locating modules close to the processor and reducing PDN losses, achieving >2000 A becomes feasible. Improving power efficiency at the core yields significant energy savings at scale. Since typical deployments consist of ~100,000 processors, saving 130 W/processor translates into megawatts for a datacenter. This means millions of dollars saved over the system’s lifetime.

Solution block diagram



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