



Product brief

TDA21490

OptiMOS™ 5 90 A power stage

The TDA21490 power stage contains a low quiescent-current synchronous buck gate-driver IC, co-packaged with high-side and low-side MOSFETs. The package is optimized for PCB layout, heat transfer, driver/MOSFET control timing, and minimal switch node ringing. The gate driver and MOSFET combination enables higher efficiency at the lower output voltages required by cutting edge xPU, ASIC, SoC and DDR memory designs.

The TDA21490 internal MOSFET current sense algorithm with temperature compensation achieves superior current sense accuracy versus best-in-class controller-based inductor DCR sense methods. Protection includes cycle-by-cycle over-current protection with programmable threshold, V_{CC}/V_{DRV} UVLO protection, bootstrap capacitor under-voltage protection, phase fault detection, IC temperature reporting and thermal shutdown. The TDA21490 also features the auto-replenishment of the bootstrap capacitor to prevent over-discharging.

Operation at switching frequency as high as 1.5 MHz enables high-performance transient response, allowing reduction of output inductance and output capacitance values while maintaining industry-leading efficiency.

Target applications

- › Server and storage
- › Artificial Intelligence (AI)
- › Datacom
- › Telecom
- › High-end consumer

Key features

- › Output peak current capability of up to 90 A
- › Superior current sense (5 mV/A) accuracy
- › Input voltage (V_{IN}) range of 4.25 V to 16 V
- › V_{CC} and V_{DRV} supply of 4.25 V to 5.5 V
- › Output voltage range from 0.25 V up to 5.5 V
- › Output DC current capability of 70 A
- › 8-mV/°C temperature analog output
- › Extensive fault protection and communication to the controller
- › Auto-replenishment of the bootstrap capacitor
- › Common footprint (5x6 mm PQFN)

Key benefits

- › Reduced total cost of ownership (TCO)
 - Best-in-class efficiency
 - Long-term reliability with OptiMOS™ MOSFETs
- › Superior system performance with accurate output current telemetry
- › Faster diagnostics with accurate and fast fault protection
- › Deep-sleep mode for power saving



