

Reference Design for 150W Coolant Pump

Automotive 3-phase motor drive powered by 12V

The reference design for 150W coolant pump applications is capable to drive 12V BLDC motors with a nominal power of 150W. It is a reference for EMC, component optimization and thermally optimized PCB design. It offers easy start for prototyping due to various connectors. The reference design is equipped with Infineon MOSFETs and MOTIX™ MCU IC with CAN-FD.

- **TLE9893-2QKW62S:** This device is a part of the Embedded Power IC family and it is a fully integrated 3-phase BLDC motor driver, System-on-Chip (SoC) solution. It integrates an industry standard Arm® Cortex®-M3 core, enabling the implementation of advanced motor control algorithms. Integrated CAN-FD transceiver in the device facilitates faster and smoother communication along with a number of general-purpose I/Os.
- **IAUCN04S7N020D:** The new integrated half-bridge (5mm x 6mm) from Infineon is the innovative and cost-efficient package solution for motor drive & body applications. Using the integrated half-bridge, the PCB area is sizably reduced, as it provides enhanced routing for bridge applications. The newly designed half-bridge is based on the optimized OptiMOS™7 technology. The portfolio provides a wide RDS(ON) range from 0.42 mΩ to 3.0 mΩ and increased datasheet current rating of 175A.

Our 150W coolant pump reference design facilitates your design process with reduced effort to build and time-to-market.

Key features

- Up to 150 W power capability for 12V automotive coolant pump applications
- Optimized BOM and PCB size (ø60mm)
- Supply voltage range 7 V - 18 V
- Optimized thermal behavior
- SWD and tracebox port for debug connection
- External sensor, CAN, MON connectors
- High-temperature FR4 PCB with 1oz, 4-layer Copper
- Single-side component mounting

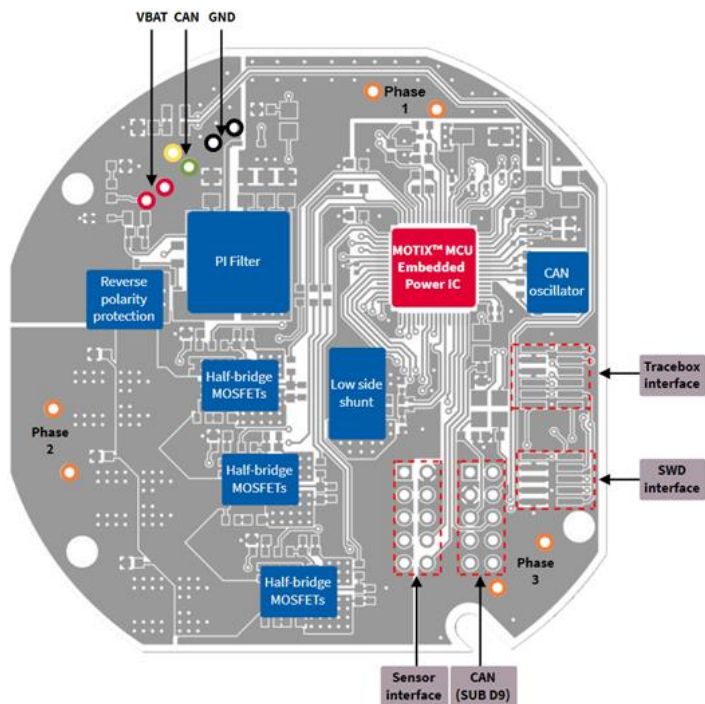
Key benefits

- Reduced Time to Market
- Minimal BOM and reduced PCB size
- State of the Art Components
- Scalability of the Device



Figure: Reference design for 150W coolant pump

Block diagram



Parametrics Table

Parametrics	REF_COOLANTPUMP150W
Input Type	DC
P _{out} (max)	150W
Qualification	Automotive
Supply Voltage (min – max)	7.0 V ≤ 12.0 V ≤ 18.0 V
Target Application	Coolant pumps; 150W BLDC motor for 12V applications
Topology	3-phase full-bridge



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