Design Guide: TIDA-010979

48V 1kW Robot Joint Motor Control With Industrial Communication Reference Design

Description

This reference design features TI Sitara™ MCU-AM261x devices handling an industrial Ethernet-connected motor drive. The design uses a 70mm diameter printed circuit board (PCB) to drive a humanoid robot joint (48V, 1kW Eyoubot motor). The design demonstrates a small form factor and simplified integrated platform. The platform includes a high-power density power stage using three DRV7167 half bridges GaN-FET, an accurate real-time control stage using AM2612 500MHz R5F core MCU and AMC0106 functionally isolated delta-sigma modulator, also high bandwidth communication operates with industrial Ethernet. This design passed all functional tests. System testing is in progress. The software and full design guide become available soon.

Resources

TIDA-010979	Design Folder
AM2612, DRV7167	Product Folder
AMC0106, DP83826A	Product Folder
AM261x Motor Control SDK	Tool Folder

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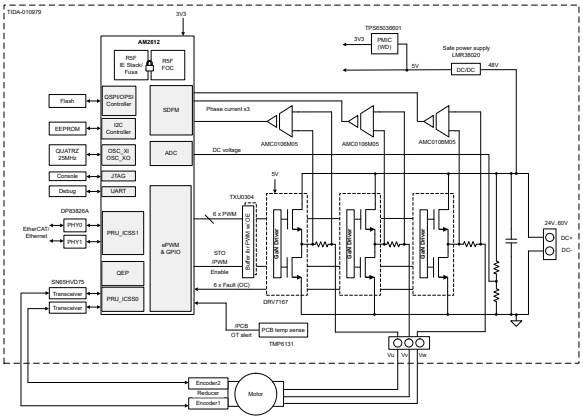
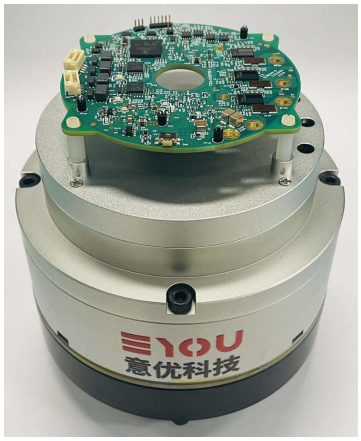
Features

- Compact design with highly integrated ICs facilitating a 70mm diameter PCB and a 15mm diameter through hole
- Supports multiprotocol industrial Ethernet communication and multiprotocol encoder interface
- Small form factor DRV7167 GaN half-bridge power stage enables high power density and easy PCB layout
- Precision phase current sense using 1mΩ shunt and the AMC0106M05 functional isolated modulator

Applications

- Humanoid robot motor drive
- Collaborative robot servo drive
- Mobile robot motor control
- Robot communication module
- Servo drive power stage module





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