1600W Brush-less Motor Power Driver Using IPM STK554U362

The compact motor drive power board is based on STK554U362A IPM module from ON semiconductor. It provides an affordable and easy-to-use solution for driving high power brushless servo, AC Motors, and DC Brushless motors in a wide range of applications such as power white goods, air conditioning, compressors, power fans, high-end power tools and 3-phase inverters for motor drives in general.

The IPM itself consists of short-circuit rugged IGBTs and a wide range of features like (UVP) under voltage protection, (OCP) Over current protection with fault detection output flag , embedded temperature sensor NTC.Internal Boost diodes are provided for high side gate boost drive.

The main characteristics of this project are its small size, minimal BOM and high efficiency. It consists of an interface circuit, bootstrap capacitors, fault event signal and temperature monitoring. It is designed to work in single or three shunt configuration and with dual current sensing options: using three dedicated on-board op-amps

Thanks to these advanced characteristics, the system can provide the fast and accurate current feedback conditioning necessary for field oriented control (FOC).

- Input voltage: 125 to 400 VAC
- Nominal power: up to 1600 W
- Nominal current: up to 10 A
- Input auxiliary voltage: up to 20 VDC
- Single- or three- shunt resistors for current sensing
- IPM temperature monitoring and protection
- Highly integrated device containing all High Voltage (HV) control from HV-DC to 3-phase outputs in a single small SIP module.
- Output stage uses IGBT/FRD technology and implements Under Voltage Protection (UVP) and Over Current Protection (OCP) with a Fault Detection output flag. Internal Boost diodes are provided for high side gate boost drive.
- 3 Independent shunt resistors and 3 X Channel signal condition amplifiers help to easy FOC based driver
- Header connector provided for inputs and logic supply input
- Externally accessible embedded thermistor for substrate temperature measurement.
- Single control power supply due to internal bootstrap circuit for high side pre-driver circuit.
- Externally accessible embedded thermistor for substrate temperature measurement.
- All control inputs and status outputs are at low voltage levels directly compatible with micro-controllers.

Note : Board also support STK554U392,STK554U3A2A-E