

# Motor Drive BoosterPack Quick Start Guide: BOOSTXL-DRV8301



Meet the Motor Drive BoosterPack based on the DRV8301 3-Phase Pre-Driver and CSD18533Q5A N-Channel NexFET™ Power MOSFETs. This BoosterPack provides a complete 3-phase drive stage in order to evaluate your motor applications!

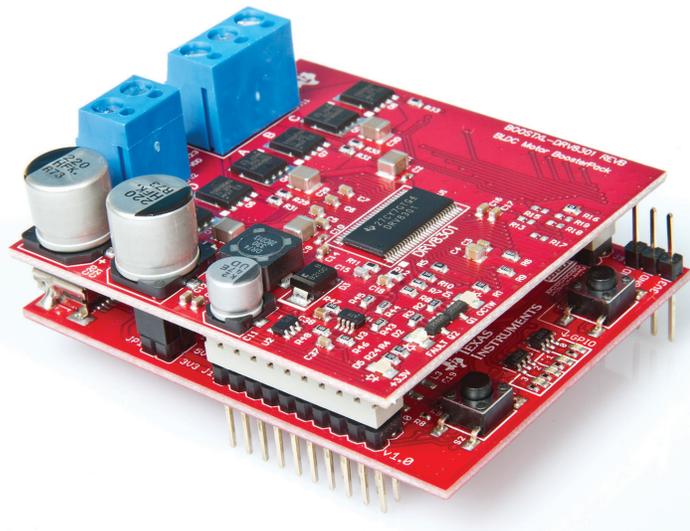


Figure 1: BOOSTXL-DRV8301 On Top LaunchPad

## 1. BoosterPack Features

- Complete 3-phase drive stage in a small form factor (2.2" x 2.3")
- Supports 6-24 V and up to 10 A RMS (14 A Peak)
- 6x CSD18533Q5A N-Channel NexFET Power MOSFETs (< 6.5 mΩ)
- Individual phase and DC bus voltage sense
- Low side current shunt sense on each phase
- Fully protected drive stage including short circuit, thermal, shoot-through, and under voltage protection
- Integrated 1.5 A step down buck converter
- Combine with compatible LaunchPad XL kits to create a complete 3-phase motor drive control platform
- Optimized for the Piccolo LAUNCHXL-F28027F LaunchPad to support the InstaSPIN™-FOC sensorless control solution

Visit [www.ti.com/drv8301-boosterpack](http://www.ti.com/drv8301-boosterpack) for more information concerning the Motor Drive BoosterPack

## 2. BoosterPack Pinout

The BOOSTXL-DRV8301 brings out a mixture of power, control, and feedback signals to the LaunchPad XL headers.

- DRV8301's onboard step down buck converter provides 3.3 V power to the LaunchPad
- Fault reporting through the nFAULT and nOCTW signals
- SPI interface to set device configuration, operating parameters, and read out diagnostic information
- Independent control through 3 or 6 PWM inputs
- Voltage sense for the DC bus and each phase output (6-24 V operation)
- Low side current shunt sensing on each phase (0-14 A peak operation)

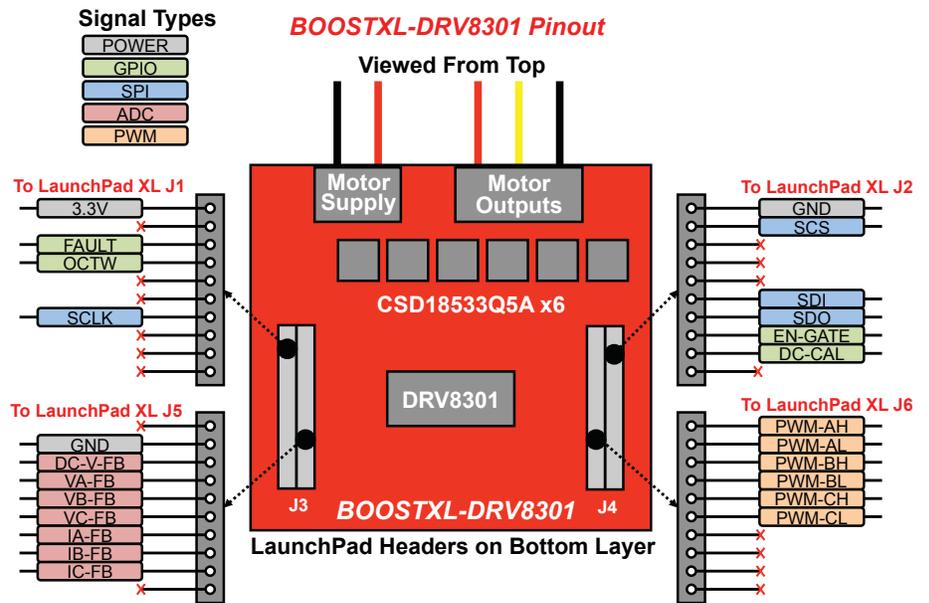


Figure 2: BOOSTXL-DRV8301 Pinout

## 3. Getting Started With Your BoosterPack

The Motor Drive BoosterPack is not a standalone evaluation kit and requires a compatible LaunchPad XL to provide the appropriate control signals. In addition to the Motor Drive BoosterPack and a compatible LaunchPad XL, you will require a 3-phase motor and sufficient power supply.

- I. Since the DRV8301 has an on board step down buck converter the Motor Drive BoosterPack has been designed to provide system power for the LaunchPad. Remove the appropriate jumper (JP1 OUT on LAUNCHXL-F28027F) on the LaunchPad to disconnect the controller and emulation power supplies. You also need to disconnect the controller and emulation UART through either the appropriate switch (S4 to OFF on LAUNCHXL-F28027F) or jumpers to ensure proper nFAULT and nOCTW reporting.
- II. Plug the Motor Drive BoosterPack onto the LaunchPad as shown in Figure 1. The terminal block headers should be oriented towards the USB connector.
- III. Connect your Three Phase motor to the terminal block header J11. The motor connections have been labeled with A, B, and C but can be connected in any order.
- IV. Connect your power supply, that will power the Motor Drive BoosterPack's DRV8301 3-Phase Pre-Driver and Drive Stage, to the terminal block header J2. The connections have been labeled PVDD and GND. For full performance ensure you can supply as much current as your motor may demand. The Motor Drive BoosterPack has a designed operating range from 6-24 V up to 10 A RMS (14 A Peak)\*.
- V. Enable your power supply.
- VI. Enable your control algorithm and spin that motor! The BOOSTXL-DRV8301 BoosterPack combined with a compatible LaunchPad XL will provide a complete motor drive and control evaluation platform. With the Piccolo LAUNCHXL-F28027F LaunchPad you can take full advantage of TI's InstaSPIN™-FOC sensorless control solution. To get started with <http://www.ti.com/instaspin-foc> download and run MotorWare (<http://www.ti.com/tool/motorware>), reviewing the LAUNCHXL and BOOSTXL resources.

\*At high currents the drive stage can increase to high temperatures

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