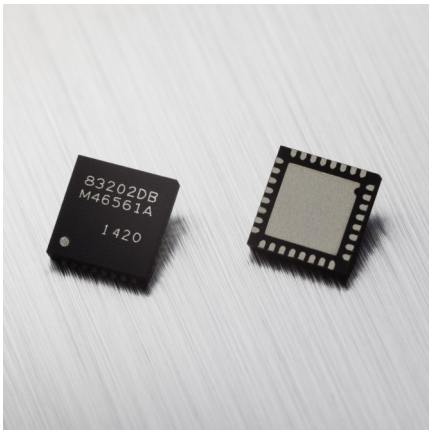
3-Phase Brush-Less DC Pre-Driver

The MLX83203 is a 3-phase pre-driver (also called 'bridge' or 'gate' driver) IC with integrated current sense amplifier. The device is used to drive brush-less DC motors in combination with a microcontroller and 6 discrete power N-FETs with gate charge up to 350nC at 20kHz. The IC supports 3x half bridge control in the supply range from 4.5V to 28V, by means of the integrated charge pump. The high side gate drivers are supplied via bootstrap circuits equipped with a trickle charge pump allowing 100% PWM operation. The device comprises various monitoring and protection features with a serial interface to the microcontroller for detailed diagnostics information. A fast, high-bandwidth, current sense amplifier with programmable gain and configurable offset is integrated. Customers can optimize the pre-driver operation to their requirement by end-of-line or in-application EEPROM programming.

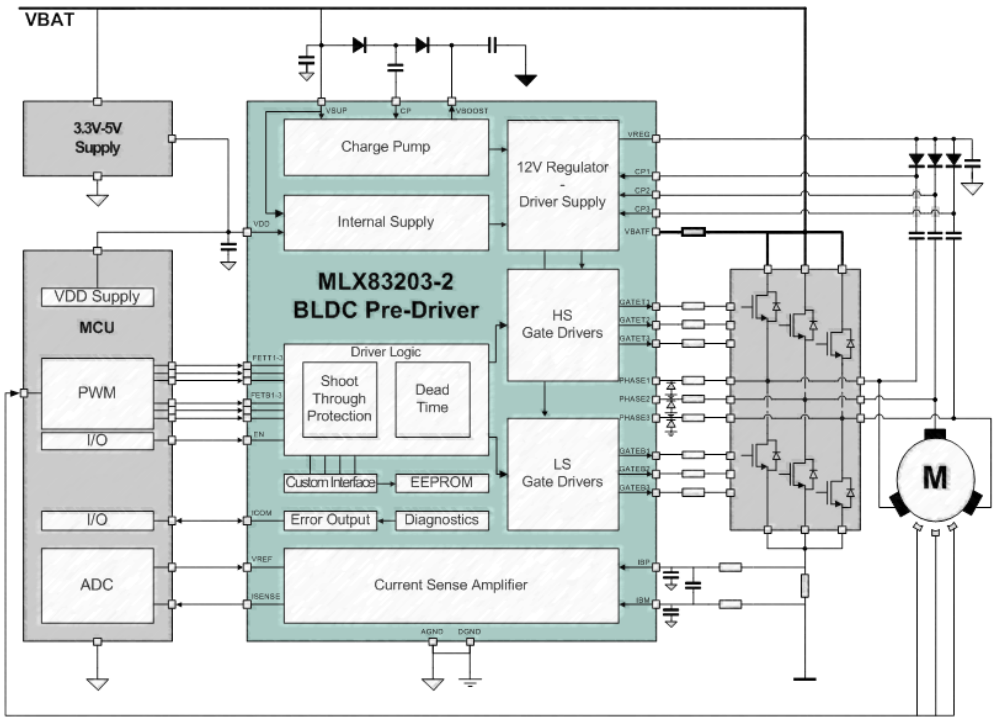
Key features

- ☑ Integrated charge pump supports 4.5V-28V operation, and supports reverse recovery N-FET
- ☑ Supports 3x half-bridge operation with N-FETs up to 350nC at 20kHz
- ☑ Integrated fast current sense amplifier with configurable gain and offset
- ☑ Extensive diagnostic & protection features, serial interface for detailed diagnostics feedback
- ☑ Customer configurable EEPROM via end-of-line or in-application programming
- ☑ Automotive qualified, AEC-Q100 grade 1 for junction temperature up to 150˚C
- ☑ Similar product for brushed DC motors MLX83100
- ☑ QFN32-EP package (5x5mm)

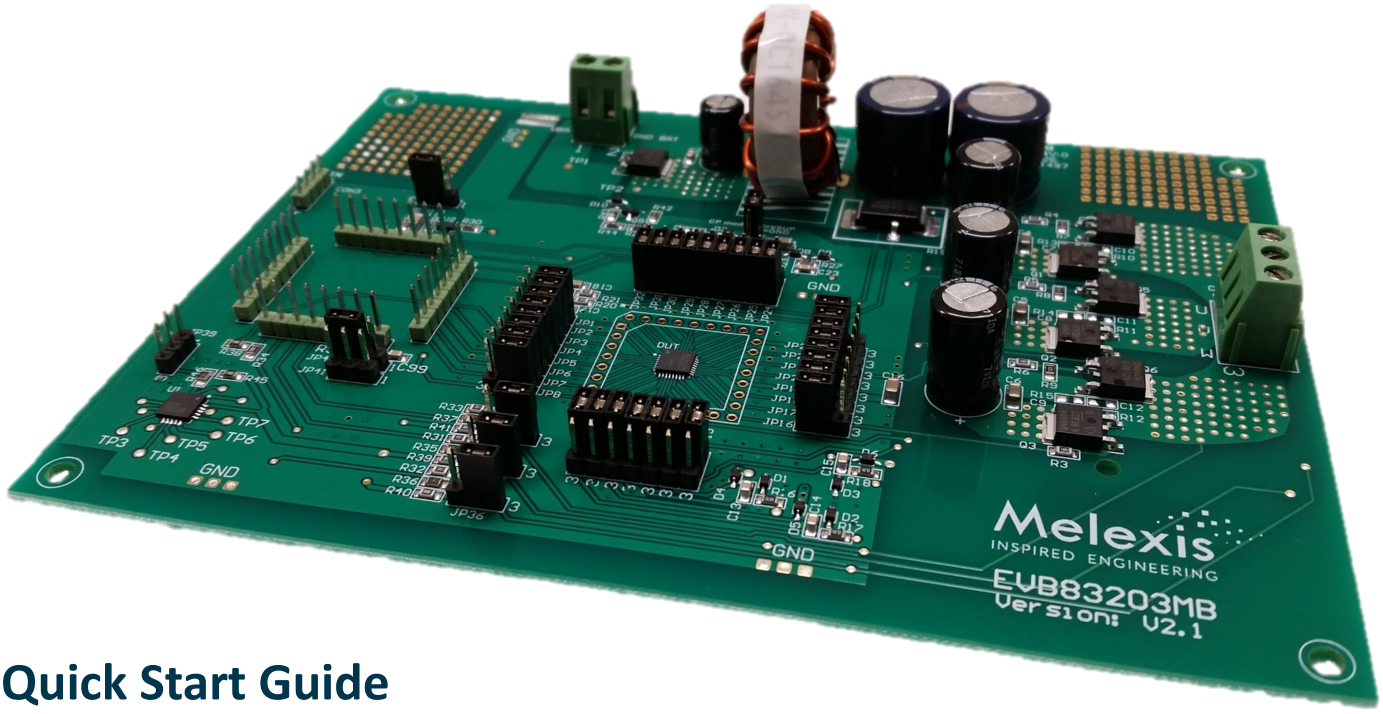


Key applications

- ☑ Automotive market
- ☑ Industrial & Robotics
- ☑ Power tools
- ☑ Fans & Blowers
- ☑ Water| Oil | Fuel pumps
- ☑ Servo motors
- ☑ Compressors



Evaluation Board BLDC Pre-Driver EVB83203



Quick Start Guide

- ☑ Connect power supply on top of PCB
- ☑ Connect brush-less DC motor on right of PCB
- ☑ Connect microcontroller to pin headers P1-P2-P3-P4
  - ☑ P4 : Supply for microcontroller
  - ☑ P2 : 3x downscaled back-EMF signals and current sense feedback compatible with 2.5V ADC, for sensor-less motor control/
  - ☑ P1 : Connection to MLX80051 LIN SBC
  - ☑ P3 : Control signals for pre-driver: 3x high-side & 3x low-side FET inputs, EN-input and ICOM feedback
- ☑ Check ICOM (CON1-pin11) diagnostics feedback and acknowledge all errors
- ☑ Pull EN (CON1-pin12) to VDD
- ☑ Let microcontroller drive 3x high-side & 3x low-side FET inputs depending on motor control algorithm
- ☑ **Brush-less DC motor can now be controlled by the MCU**
- ☑ For more detailed information visit www.melexis.com/product/MLX83203/