Smart Motor Drivers for Small Actuators

The MLX81310/15 is a highly integrated motor driver IC family for 12V automotive applications. It includes a Flash MCU with high-voltage analog periphery for smart motor driving in a very compact actuator module.
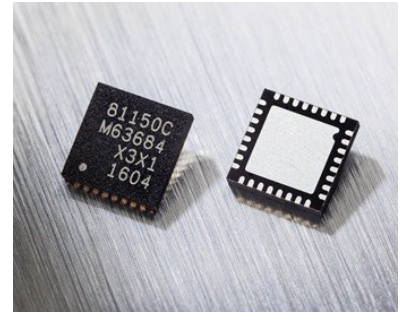
Benefits

- Very small pcb
- Easy LIN networking
- Efficient & silent motor drive
- Robust diagnostics & communication
- Failsafe operation in noisy & hot environment
- Future-proof IC family roadmap
- Drives DC, BLDC or Bipolar Stepper motors
- Available embedded software functions for:
    - Sensorless motor drive with BLDC & Stepper
    - Robust application diagnostics
    - ECU communication
    - Flash bootloading

- The MLX81310/15 target applications are small automotive actuator systems, such as **HVAC flaps (airco dampers), automatic air grille shutters, headlights, and small valves**.
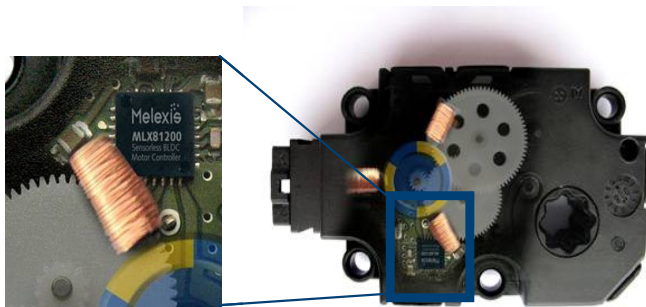
MLX813xx driving a small BLDC motor
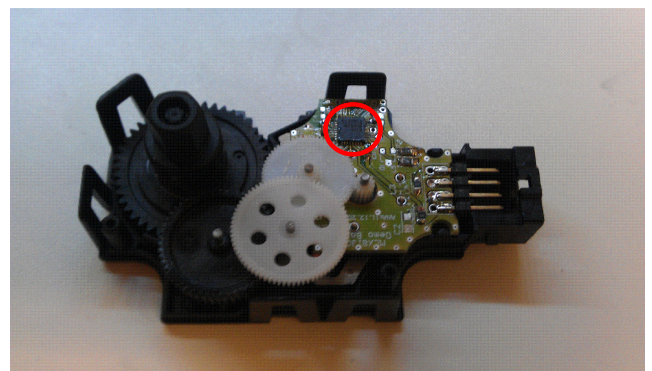
Compact PCB solution

Melexis

DC / BLDC / Stepper Motor Drivers
MLX81310/15

Features

Package: QFN32, 5x5 mm

- AEC-Q100 Grade1, up to 150C T-junction

Integrated Flash Microcontroller

- 32KB Flash, 2KB SRAM, 4x 128B EEPROM
- Lower-cost 32KB ROM for high-volume
- 16-bit application MCU + 4-bit communication MCU
- Fast 32-bit hardware multiplication and division
- Integrated RC clock oscillator & 32 MHz PLL
- Operating supply 5.5V...20V
- MCU control in 3.9V...28V range
- 10-bit ADC, 24 channels, automatic DMA storage
- 8x IO pins for Digital IO, ADC, Timer/Capture, SPI
- Sleep mode current < 30µA typical

Motor Control Peripherals

- On-chip halfbridge drivers
    - 81310: 4 drivers <0.5A motor current
    - 81315: 4 drivers <1 A motor current
- Up to 4x motor control PWM timers (mirror/edge)
- On-chip motor current sense with integrated opamp
- On-chip motor voltage sensing (phases & supply)
- Hardware + software diagnostic & protection
    - Over/UnderVoltage
    - OverTemperature
    - OverCurrent
   - FET open/short check

Communication

- Supports LIN 1.3, LIN 2.x, SAE J2602
- Supports PWM bidirectional communication
- Supports Auto-addressing for multiple modules
- Flash re-programming via LIN/PWM pin on module
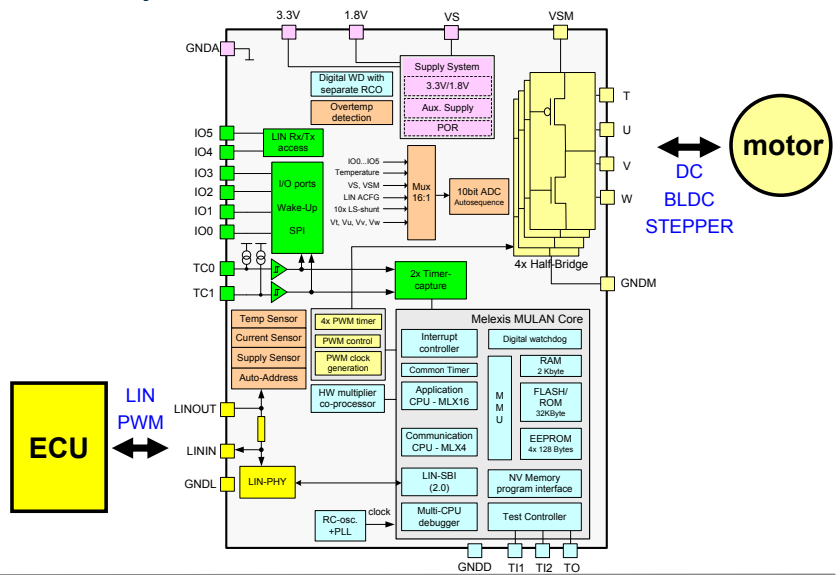- SPI option for sensor, CAN interface, diagnostic tool

Development support

- Demo starter solution for custom motor on request
- User control of Demo via PC + USB LIN Master
- Mini-MLX16 emulator for software development
- PTC04 rack for Production-Flash-Programming

MLX813xx block diagram
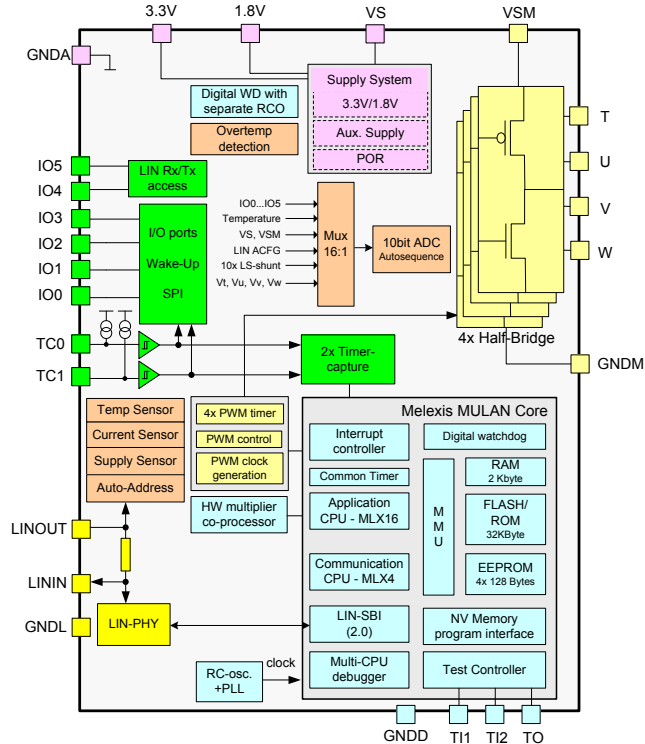
Compact interface with ECU & Motor