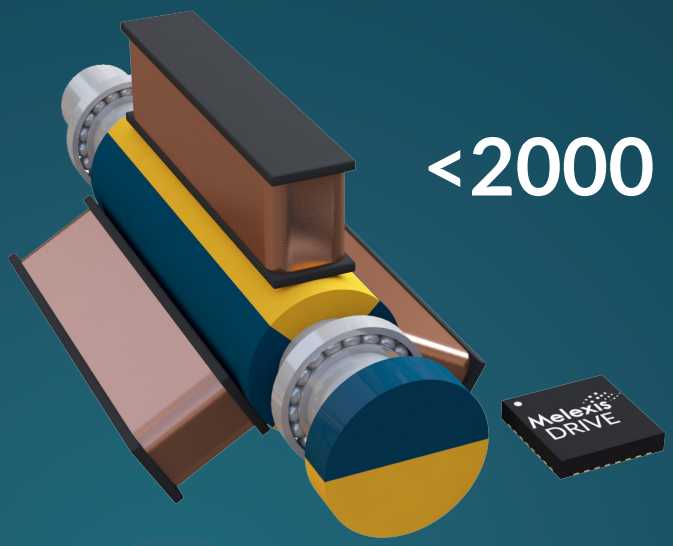
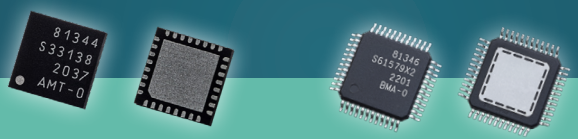
LIN MOTOR PRE-DRIVER

MLX81340-44-46

The MLX8134x is a gen-3 LIN pre-driver targeting automotive mechatronic applications up to 1000 W (12V) or up to 2000 V (48V). These all-in-one LIN pre-drivers enable small footprint applications to control DC and BLDC motors, and support sensored or sensorless field-oriented control (FOC) algorithms.



<2000 W



MD

Key features

- **Motor driver**
  - 3x PreDriver for DC or BLDC motor
  - Up to 200nC NFETs (2000 W) (46)
    - 700mApk typ. charge current
    - 1500mApk typ. discharge current
  - Up to 60nC NFETs (500 W) (40/44)
    - 300mApk typ. charge current
    - 500mApk typ. discharge current
  - Charge-pump for top-NFETs
  - V_{DS} protection for all NFETs
- **Microcontroller**
  - MLX16-FX, application CPU
  - MLX4, communication CPU
  - Programmable digital watch-dog
  - Interrupt controller
  - Common purpose timer
- **Memories split per CPU**
  - MLX16-FX memories:
    - Flash w/ ECC: 32KB (40) 64 KB (44/46)
    - ROM: 20 KB
    - RAM: 2KB (40) 4 KB (44/46)
    - EEPROM: 576 B
  - MLX4 memories:
    - ROM: 6 KB
    - RAM: 512 KB
- **Fast end-of-line programming via LIN pin** (64 KB Flash in < 4sec)
- **Pin-compatible family in QFN32**
  - MLX81340: 58KB Flash+ROM
  - MLX81344: 90KB Flash+ROM
  - MLX81346: 90KB Flash+ROM
- **Periphery**
  - Configurable RC-clock 12..32MHz
  - 12x general purpose IO's, digital, analog, 3x high-voltage IO's, 2x UART,SPI, I²C-slave
  - 2x high-side supply <50mA
  - 5x 16-bit motor PWM timers
  - 2x 16-bit timers
  - 12-bit ADC with < 1.2µs conversion time with 64 channels
  - Differential current sense amplifier with 8-bit programmable overcurrent
  - Temperature sensor, over-temperature detection
  - Over-current detection, over-voltage and under-voltage protection
- **Voltage regulators**
  - IC operating motor voltage VSM = 5.5V to 32V (60 V with MLX81346)
  - Operating voltage VS =5.5V to 32V*
  - Internal voltage regulators, directly powered from VS supply
  - Operation down to 3.5V with reduced analog characteristics, down to 3.0V without losing register content, down to 1.6V with intact RAM memory
  - Low standby current consumption of typ 25µA in sleep mode
  - Wake-up possible via LIN, external pins or internal wake-up timer
- **Bus interface**
  - LIN 2.x/SAE J2602 and ISO17987-4 compliant LIN slave
- **Automotive AEC-Q100 qualified**
- **Designed for safety applications according to ASIL B** (ISO 26262)
- **Maximum IC temperature** (with validated mission profile) Tj = 175°C

Applications - Automotive & beyond

- DC/BLDC HVAC blower, fans and pumps...
- DC/BLDC valves, window lift, seat...
- 12V-48V DC/BLDC engine cooling fans, pumps
- 12V-48V DC/BLDC positioning actuator
- 36-48V BLDC e-bikes, e-scooters

MLX81340	32KB Flash MCU, QFN32, <500 W
MLX81344	64KB Flash MCU, QFN32, <500 W
MLX81346	64KB Flash MCU, QFN32, <2000 W (48 V)

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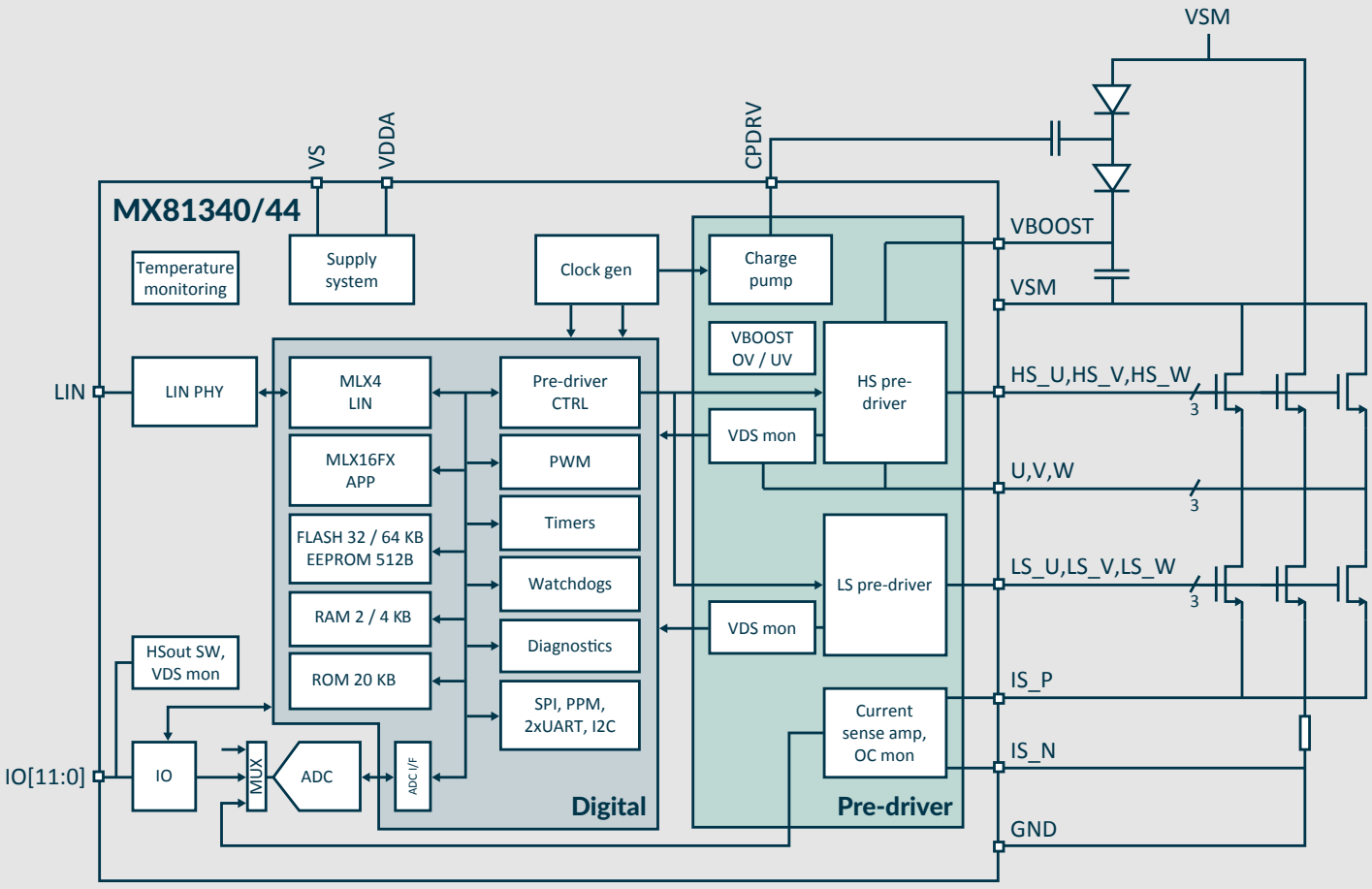
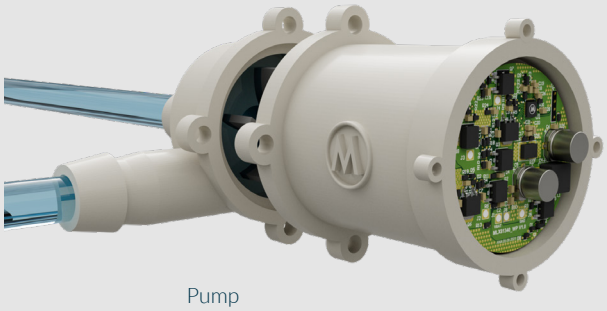
Block diagram

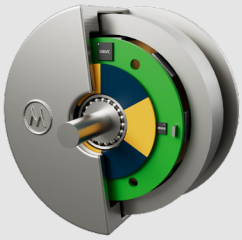


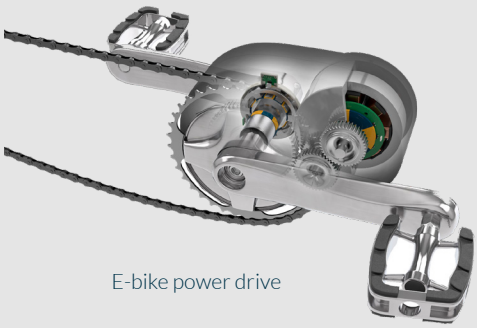
MLX81340/44 IC Block diagram with external power bridge (BLDC)

Engine cooling fan



Pump





E-bike power drive

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