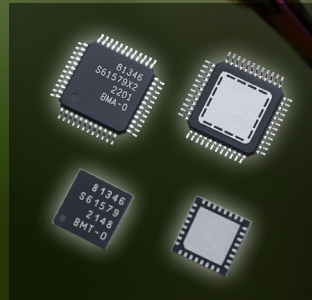


MLX81346

SMART LIN PRE-DRIVER FOR DC AND BLDC MOTORS (<2000 W)



The hummingbird's beating wings flap at extremely high frequencies, typically around 50 times per second. This allows it to fly at speeds exceeding 15 m/s, to fly backwards or to seemingly be suspended in the air in perfect balance. What better animal to reflect the motor/control driver and actuator capacities?

LIN MOTOR DRIVER FOR EXTERNAL NFETS <200nC CUTS COSTS IN AUTOMOTIVE MECHATRONIC APPLICATIONS

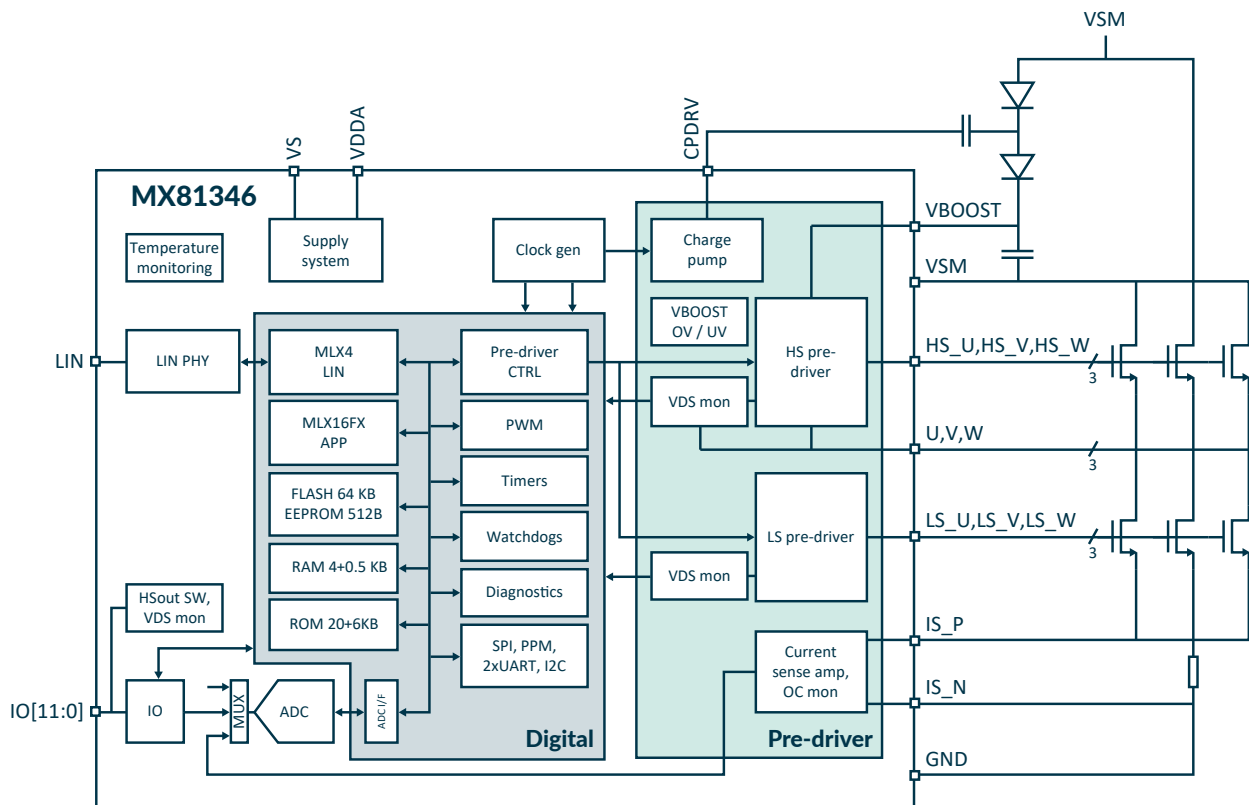
MLX81346

The MLX81346 complement the gen-3 LIN pre-driver for 12 V, 24 V and 48 V motors targeting automotive mechatronic applications up to 1000 W (12 V) or up to 2000 W (48 V). This all-in-one LIN pre-driver enables small-footprint applications to control DC and BLDC motors, and support sensed or sensorless field-oriented control (FOC) algorithms.

KEY FEATURES MLX81346

- ✓ **Motor driver**
 - 3x PreDriver for DC or BLDC motor
 - Up to 200nC NFETs (12-48V supply)
 - 0.7 A_{pk} typ. charge current
 - 1.5 A_{pk} 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:
 - MLX81346: 64 KB Flash with ECC
 - 20 KB ROM
 - 4 KB RAM
 - 576 B EEPROM
 - MLX4 memories:
 - 6 KB ROM
 - 512 KB RAM
- ✓ **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 60V
 - 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)**
T_j = 175°C

BLOCK DIAGRAM



MLX81346 IC Block diagram with external power bridge (BLDC)

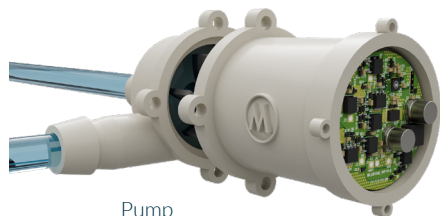
APPLICATION WITH DC AND BLDC MOTORS (<2000 W)

The MLX81346 pre-driver is well suited for

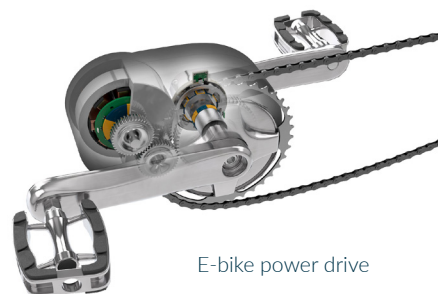
- ✓ 12V-48V DC/BLDC Engine Cooling Fans, Pumps, Compressors
- ✓ 12V-48V DC/BLDC Positioning Actuators, including Robotics
- ✓ 36V-48V BLDC e-bikes, e-scooters



Engine cooling fan



Pump



E-bike power drive

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