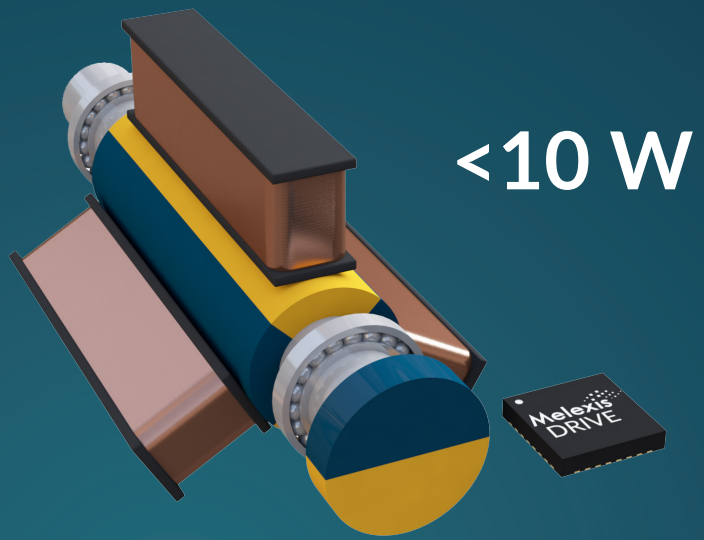


LIN MOTOR DRIVER

MLX81330-32-34

The MLX8133x is a gen-3 LIN driver for small motors targeting automotive mechatronic applications up to 10 W. These all-in-one LIN drivers enable small footprint applications to control small BLDC, stepper and DC motors, and support sensed or sensorless field-oriented control (FOC) algorithms.



Key features

✓ Motor driver

- Minimum discrete components
- Driver for DC/BLDC/Stepper motor
- $R_{on} = 3\Omega / 0.8\Omega$ typ. for 1 half-bridge + shunt
- 2x NFET for each half-bridge
- On-chip charge-pump for top-NFETs
- Vds protection for all NFETs

✓ Microcontroller

- MLX16-FX, application CPU
- MLX4, communication CPU
- 2x watch-dog
- +50 input interrupt controller
- Common purpose timer

✓ Memories split per CPU

- MLX16-FX memories:
 - 32 KB / 64 KB Flash with ECC
 - 8 KB / 10 KB ROM
 - 2 KB / 4 KB RAM
 - 512 B EEPROM
- MLX4 memories:
 - 6 KB ROM
 - 512 B RAM

✓ Drivers in SO8 and QFN24

Pin-compatible

- MLX81330 < 0.5A
- MLX81332 < 1A

✓ Driver in QFN32

Function-compatible MLX81332

- MLX81334 < 1A

✓ Periphery

- Configurable RC-clock 12..32 MHz
- 4x / x8 general purpose IO's, digital, analog, 1x high-voltage input, SPI, I2C-slave (+UART for MLX81332/34)
- 5x 16-bit motor PWM timers
- 2x 16-bit timers
- 10-bit ADC with < 6 μ s conversion time with multiple channels and different ADC references
- Differential current sense amplifier
- Temperature sensor, over-temperature detection
- Over-current detection, over-voltage and under-voltage protection

✓ Voltage regulators

- Internal voltage regulators, directly powered from 12V battery supply
- Operating voltage $V_s = 5.5V$ to 20V
- Operation down to 3.5V with reduced analog characteristics, down to 3V without losing register content, down to 1.5V with intact RAM memory
- Low standby current consumption of typ 25 μ A (max 50 μ A) 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)

$T_j = 175^\circ\text{C}$

Applications - Automotive

- Small Stepper / BLDC flap or valve, < 0.5 Apk (< 1 Apk) per phase
- Small DC flap / valve, or single-coil fan/pump, < 0.7 Apk (< 1.4 Apk)

MLX81330	32KB Flash MCU, QFN24, Motor drive < 0.5 A
MLX81332	32KB Flash MCU, QFN24, Motor drive < 1 A
MLX81334	64KB Flash MCU, QFN32, Motor drive < 1 A



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Block diagram

