

Product Brief

TLE986x Infineon® Embedded Power IC

2-phase motor driver with integrated ARM® Cortex®-M3 MCU

The TLE986x family is part of the Infineon® embedded power IC portfolio. The TLE986x is a single chip 2-phase motor driver that integrates the industry standard ARM® Cortex®-M3 core, enabling the implementation of advanced motor control algorithms. It includes four fully integrated NFET drivers optimized to drive a 2-phase motor via four external power NFETs, a charge pump enabling low voltage operation and programmable current along with current slope control for optimized EMC behavior. Its peripheral set includes a current sensor, a successive approximation ADC synchronized with the capture and compare unit for PWM control and 16-bit timers. A LIN transceiver is also integrated to enable communication to the device along with a number of general purpose I/Os. It includes an on-chip linear voltage regulator to supply external loads.

The TLE986x family offers scalability in terms of flash memory sizes and MCU system clock frequency supporting a wide range of motor control algorithms. It uses the same MCU and peripherals as the TLE987x family, 3-phase driver, enabling design synergies between DC and BLDC motor control applications.

It is a highly integrated automotive (grade-1 & grade-0) qualified device enabling cost and space efficient solutions for mechatronic DC motor drive applications such as sunroof, power window lifts, exhaust flaps and water valves lift.

Applications

- › Sunroof
- › Power window lift
- › Smart motor control via NFET H-bridge
- › Exhaust flaps
- › Water valves

Key features

- › ARM® Cortex®-M3 MCU
- › System clock up to 40 MHz
- › Up to 128 KB flash memory
- › 4 K EEPROM emulation
- › NFET drivers with charge pump
- › Current programmable NFET driver with patented slope control for optimized EMC behavior
- › Integrated LIN transceiver compatible with LIN standard 2.2 and SAE J2602
- › Support fast programming via LIN
- › Direct Memory Access (DMA)
- › 10-bit SAR ADC for sensing
- › Timers for PWM signal generation for 2-phase motor control
- › On chip oscillator & PLL
- › Current sense amplifier
- › Grade-1 & grade-0 qualification

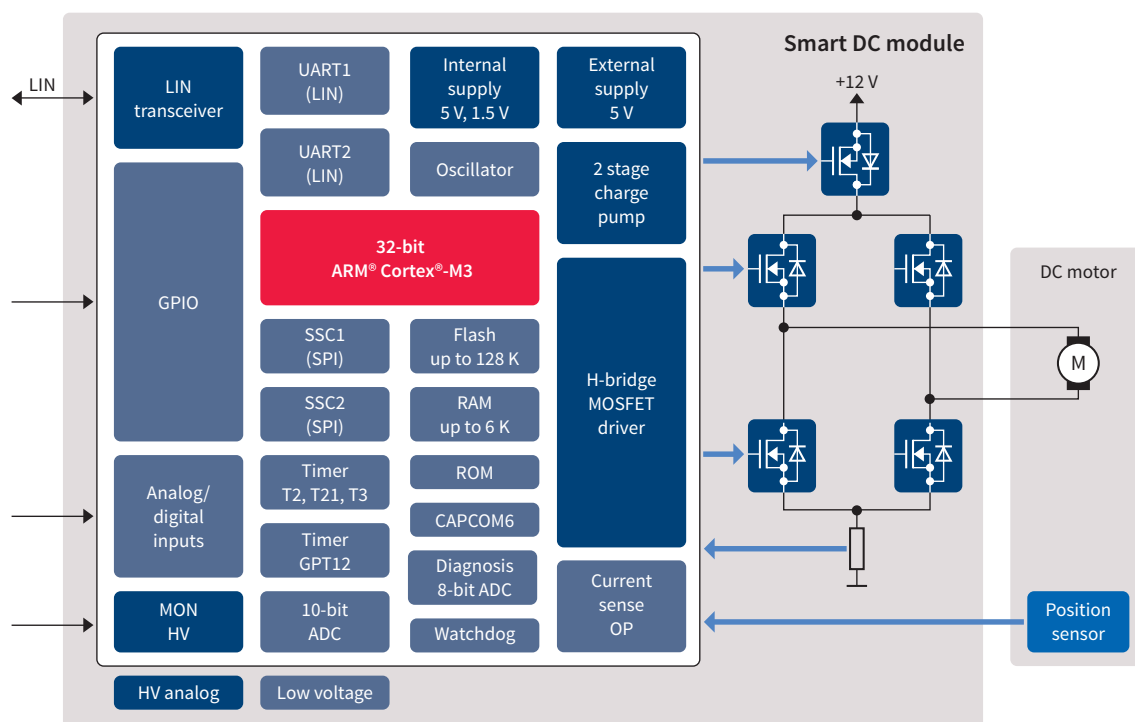
Key benefits

- › Complete system-on-chip for DC motor control
- › Minimum number of external components reduce BOM cost
- › VQFN package with 7 x 7 mm footprint enable PCB space saving

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Block diagram



Product summary

Product name	Frequency [MHz]	Interface	RAM [KB]	Flash [KB]	EEPROM emulation [KB]	OP-AMP	Low-side MOSFET drivers	High-side MOSFET drivers
TLE986x 32-bit μ C with 2-phase NFET gate driver for DC motors (grade-1, $T_j = 150^\circ\text{C}$)								
TLE9861QXA20	24	PWM	3	36	4	y	2	2
TLE9867QXA20	24	PWM + LIN	6	64	4	y	2	2
TLE9867QXA40	40	PWM + LIN	6	64	4	y	2	2
TLE9869QXA20	24	PWM + LIN	6	128	4	y	2	2
TLE986x 32-bit μ C with 2-phase NFET gate driver for DC motors (grade-0, $T_j = 175^\circ\text{C}$)								
TLE9867QXW20	24	PWM + LIN	6	64	4	y	2	2

Published by
Infineon Technologies AG
81726 Munich, Germany

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