

Product Brief

TLE987x Infineon® Embedded Power IC

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

The TLE987x family is part of the Infineon® embedded power IC portfolio. The TLE987x is a single chip 3-phase motor driver that integrates the industry standard ARM® Cortex® M3 core, enabling the implementation of advanced motor control algorithms such as field-oriented control. It includes six fully integrated NFET drivers optimized to drive a 3-phase motor via six 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 TLE987x family offers scalability in terms of flash memory sizes and MCU system clock frequency supporting a wide range of motor control algorithms, either sensor based or sensor-less. It uses the same MCU and peripherals as the TLE986x family, 2-phase driver, enabling design synergies between DC and BLDC motor control applications.

It is a highly integrated automotive qualified device enabling cost and space efficient solutions for mechatronic BLDC motor drive applications such as pumps and fans.

Applications

- › Fuel pump
- › HVAC blower
- › Engine cooling fan
- › Water pumps
- › High efficiency BLDC pumps and fans
- › Sensor-less and sensor-based BLDC motor applications controlled by the Local Interconnect Network (LIN) or PWM.

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 3-phase motor control
- › On chip oscillator & PLL

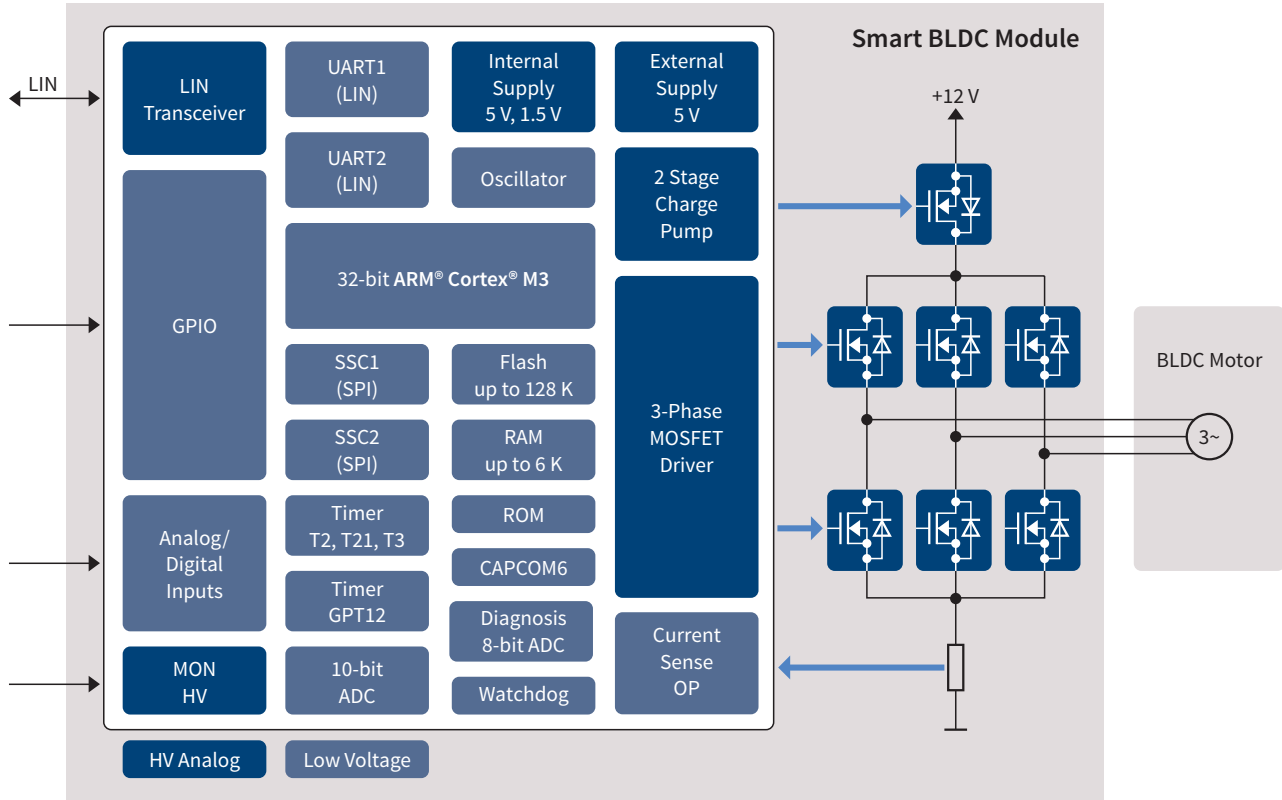
Key benefits

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

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Block Diagram



Product summary

TLE987x 32-bit μC with 3-phase MOSFET gate driver for BLDC motors								
Product name	Frequency [MHz]	Interface	RAM [KB]	Flash [KB]	EEPROM emulation [KB]	OP-AMP	Low-side MOSFET drivers	High-side MOSFET drivers
TLE9871QXA20	24	PWM	3	36	4	y	3	3
TLE9877QXA20	24	PWM + LIN	6	64	4	y	3	3
TLE9877QXA40	40	PWM + LIN	6	64	4	y	3	3
TLE9879QXA20	24	PWM + LIN	6	128	4	y	3	3
TLE9879QXA40	40	PWM + LIN	6	128	4	y	3	3

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