Product brief

MOTIX™ MCU
Embedded Power IC TLE984x

The MOTIX™ TLE984x product family integrates an ARM® Cortex®-M0 microcontroller core along with relay drivers, high side switches, LIN transceiver and a power supply system that enables the device to operate at the vehicle battery level.

Its peripheral set includes a 10-bit ADC with 13 multiplexed analog inputs to process up to 5 high-voltage monitoring Inputs, 6 low-voltage inputs and 2 high-voltage inputs for sensing the battery voltage and the supply of the device. It further includes an 8-bit ADC with 7 multiplexed inputs for voltage and temperature supervision. Its digital peripherals include a PWM signal generator unit and 16-bit timers along with a number of general purpose I/Os (serial interfaces and UARTs). It includes an on-chip linear voltage regulator to supply external loads.

The MOTIX™ TLE984x family concept offers scalability in terms of flash memory sizes ranging from 36 kB to 64 kB with pin-compatible devices. It is specifically designed to drive a wide range of LIN-slave motor control automotive applications via a relay or via a PN MOSFET half-bridge, such as window lifts, sunroofs, wipers, electric fans and pumps to name a few.

Key benefits
› **Enable cost and board space improvements** – Our system-on-chip solution integrates data processing, actuation and sensing. The chip comes in a leadless VQFN package with 7 x 7 mm footprint and enables PCB space saving. The MOTIX™ TLE984x family allows driving relays and MOSFETS at V_{BATT} ≥ 6 V without external components, providing a very cost-effective solution on a system level.
› **Enable high levels of system reliability** – Extensive diagnostics and protections are embedded within the system-on-chip, more than a discrete approach can offer. In addition, both the Embedded Power IC and the external MOFESTS can be protected.
› **Support multiple and flexible designs with minimal effort** – All MOTIX™ TLE984x devices are pin and software compatible, maximizing a single design through scalability.

Key features

› ARM® Cortex®-M0 MCU
› System clock up to 40 MHz
› Up to 64 kB flash memory
› Up to 4 kB RAM
› High-side & low-side switches with PWM capability
› 5 V power supply output
› Integrated LIN transceiver compatible with LIN standard 2.2 and SAE J2602-supports fast programming via LIN
› Measurement unit:
  – 8-bit ADC with 7 channels for voltage and temperature supervision
  – 10-bit ADC with 13 channels (6 analog inputs, 5 HV monitor inputs and battery sense)
  – On chip temperature and battery voltage measurement
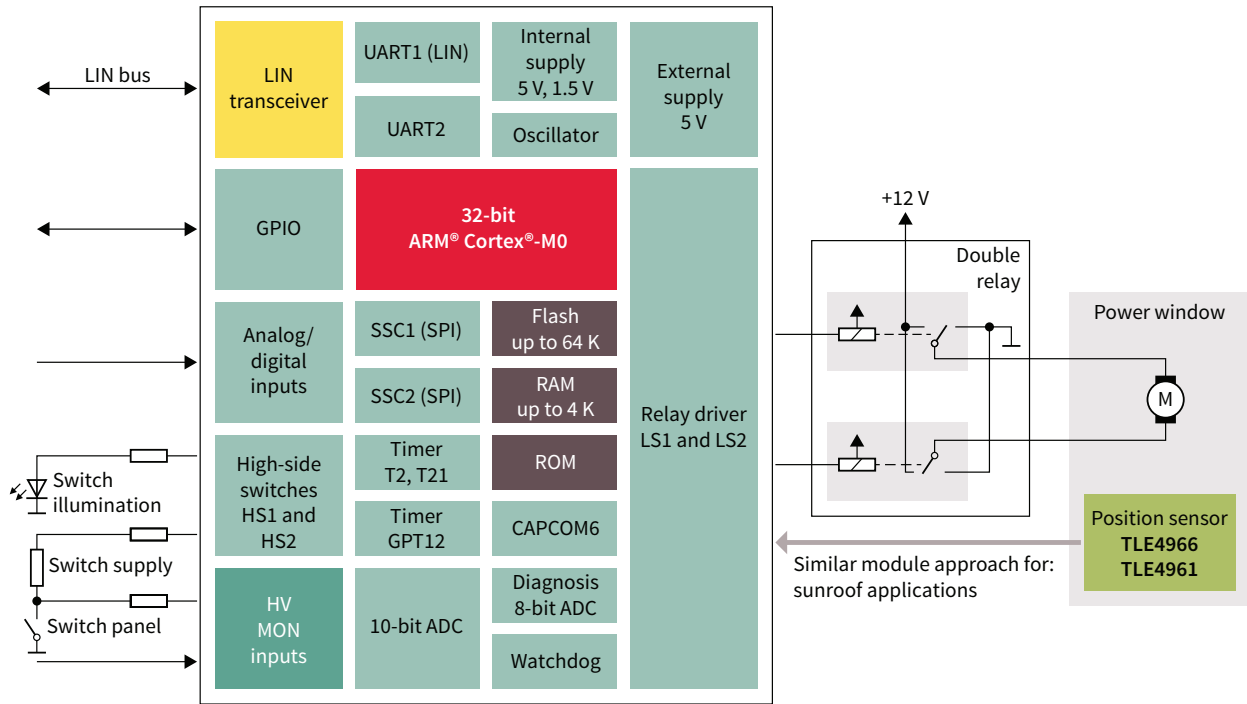› On chip oscillator & PLL
› AEC Q-100 qualified

Key applications

› Window lift
› Sunroof
› E-latch
› Relay-driven applications

AEC Qualified

RoHS

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MOTIX™ Embedded Power IC TLE984x

Relay driver ICs with integrated ARM® Cortex®-M0 MCU

Block diagram

Product overview
Relay driver ICs with integrated microcontroller

Product name	FLash [kB]	RAM [kB]	EEPROM in flash included [kB]	Freq (max) [MHz]	High-side switch	High-voltage monitor input	PN MOS driver
MOTIX™ TLE9842QX	36	2	4	25	1	4	No
MOTIX™ TLE9842-2QX	40	2	4	40	2	5	No
MOTIX™ TLE9843QX	48	4	4	25	1	4	No
MOTIX™ TLE9843-2QX	52	4	4	40	2	5	No
MOTIX™ TLE9844QX	64	4	4	25	1	4	No
MOTIX™ TLE9844-2QX	64	4	4	40	2	5	No

Half-bridge driver IC with integrated microcontroller

Product name	FLash [kB]	RAM [kB]	EEPROM in flash included [kB]	Freq (max) [MHz]	High-side switch	High-voltage monitor input	PN MOS driver
MOTIX™ TLE9845QX	48	4	4	40	2	5	Yes

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