



Product brief

TLE984x Infineon® Embedded Power IC

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

The 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 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 TLE984x family allows driving relays and MOSFETs at $V_{BATT} \geq 6\text{ V}$ without external components, providing a very cost effective solution on a system level.
- › **Enabling 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 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 and 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 and PLL
- › AEC-Q100 qualified

Key applications

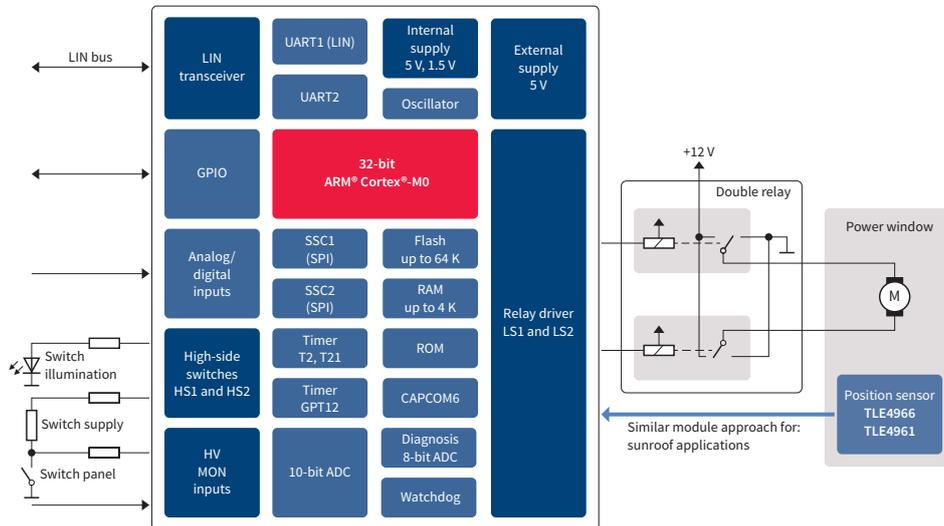
- › Window lift
- › Sunroof
- › Wiper
- › Electric fans
- › Electric pumps



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Application diagram: window lift



Product overview

Product name	Flash [kB]	RAM [kB]	EEPROM in flash included [kB]	Frequency (max) [MHz]	High-side switch	High-voltage monitor input	PN MOS driver
Relay driver IC with integrated microcontroller							
TLE9842QX	36	2	4	25	1	4	No
TLE9842-2QX	40	2	4	40	2	5	No
TLE9843QX	48	4	4	25	1	4	No
TLE9843-2QX	52	4	4	40	2	5	No
TLE9844QX	64	4	4	25	1	4	No
TLE9844-2QX	64	4	4	40	2	5	No
Half-bridge driver IC with integrated microcontroller							
TLE9845QX	48	4	4	40	2	5	Yes

Application kits and evaluation boards

Product name	Description
TLE9844-2QX Appkit	Relay driven DC motor application board
TLE9845QX Appkit PN	Unidirectional DC motor application board. Motor connected to GND.
TLE9845QX Appkit N	Unidirectional DC motor application board. Motor connected to V_{BAT} .
TLE984x EVALBOARD	Evaluation of all functions and peripherals of the TLE984x product family
TLE9845 EVALBOARD	TLE9845QX evaluation board with P-N-MOSFET half-bridge

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