



Product brief

TLE9243QK

Transmission power management IC



ISO 26262
compliant

The TLE9243QK is a power management IC including the complete power supply functionality as well as application specific features for transmission systems.

The power supply includes a buck and boost pre-regulator supplying post-regulators for microcontroller supply, communication supply and a precise voltage reference. In addition, two 5 V trackers are available to supply off-board sensors.

Beside the power supply functions, the TLE9243QK provides application-specific functionality - sensor interfaces for three channels including one 9 V LDO per channel as well as three channels to drive external n-channel power switches, including a charge pump which can also be used to supply an active reverse polarity protection circuitry.

The device supports different modes: standby, normal and after-run mode. The after-run mode with a stop counter function supports operations after power down.

The TLE9243QK comes with a window and functional watchdog, monitoring functions and different outputs for failure reactions and indications. It has been developed according to ISO 26262 targeting systems up to ASIL-D and supports an extended junction temperature range of up to 175°C.

Applications

- > Electro-hydraulically controlled automatic transmission systems
- > Electro-hydraulically and electro-mechanically controlled double clutch transmission system
- > Electro-hydraulically controlled continuous variable transmission systems



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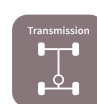


Key features

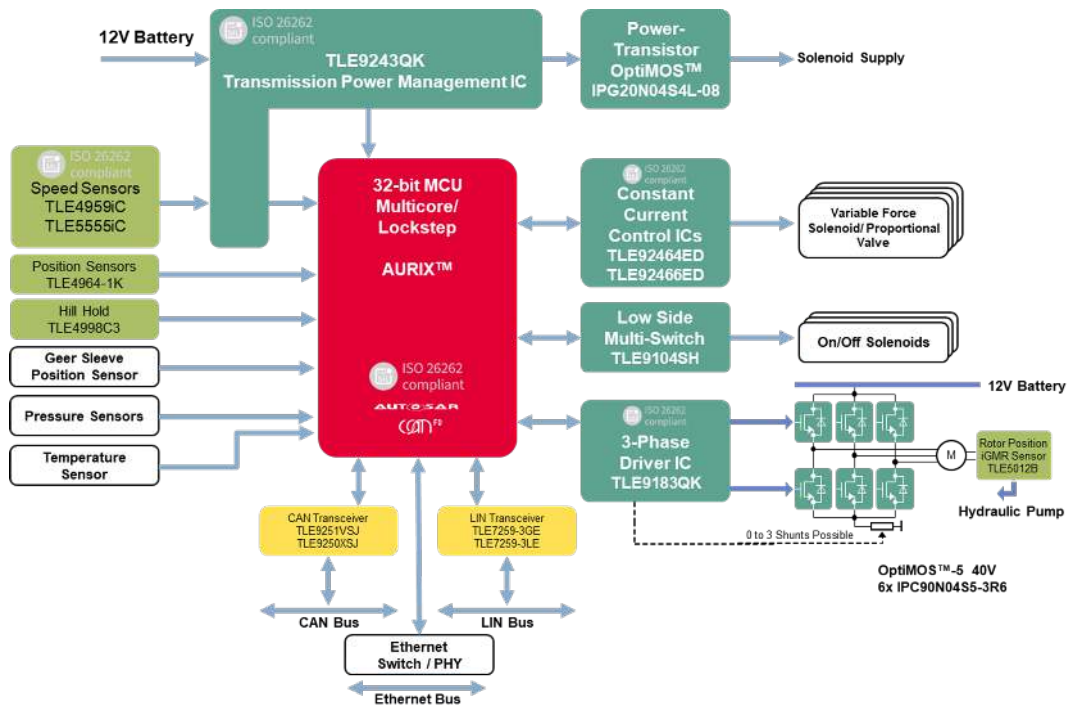
- > Serial step-up and step-down pre-regulator with wide input voltage range from 3.0 to 40 V
- > 5 V low drop voltage regulators for MCU and communication supply
- > 5 V high accuracy voltage reference
- > Two 5 V voltage trackers for sensor supply
- > Voltage, current, clock and temperature monitoring with reaction and indication functions
- > Configurable window and functional watchdog
- > 32-bit 10 MHz SPI with 8-bit CRC
- > Three high-side drivers to control external n-channel MOSFETs
- > Three 9 V low drop voltage regulators for wheel speed sensor supply
- > Three channel wheel speed sensor interface
- > Voltage battery switch to reduce quiescent current

Key benefits

- > Integrated transmission system specific features allowing system cost optimization
- > Developed acc. to ISO 26262 enabling systems up to ASIL D
- > AEC Q-100 Grade 0 qualified



Application diagram



Functional safety

The device is developed according to ISO 26262. The applied processes and provided documentation (Safety Manual, Safety Analysis Summary Report) supports ISO 26262 compliant development up to ASIL-D. Safety functions such as supply and microcontroller monitoring in combination with a separate path that controls up to three

external n-channel MOSFETs allows different safety concepts on TCU-level. In addition an embedded three channel sensor interface supports sensing functions up to ASIL-B.

All features are compatible to the Infineon’s AURIX™ family and are extended to support other microcontrollers as well.

Product overview

Product	Supply voltage range	Serial step-up and step-down pre-regulator	Step-up regulator switching frequency (typ)	Step-down regulator switching frequency (typ)	5 V MCU supply $I_{V_{CCU}}$ (max)	5 V sensor supply $I_{V_{SFBX}}$ (max)	5 V COM supply $I_{V_{COM}}$ (max)	5 V Ref supply $I_{V_{REF}}$ (max)	High side FET drivers	9 V WSS $I_{V_{WSS}}$ (max)	WSI	SPI	Window & functional watchdog
TLE9243QK	3–40 V	Yes	440 kHz	2.2 MHz	800 mA	2x 150 mA	240 mA	150 mA	3x	3x 50 mA	3x	Yes	Yes

WSS = Wheel Speed Sensor Supply WSI = Wheel Speed Sensor Interface TCU = Transmission Control Unit

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