

## 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.

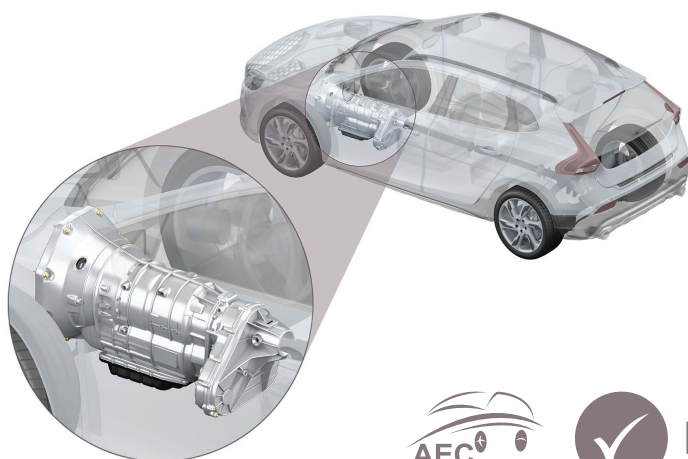
Beside the power supply functions, the TLE9243QK provides application-specific functionality - sensor interfaces for three channels including one 9 V LDO per channel as well as three channels to drive external n-channel power switches, including a charge pump which can also be used to supply an active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

### Key features

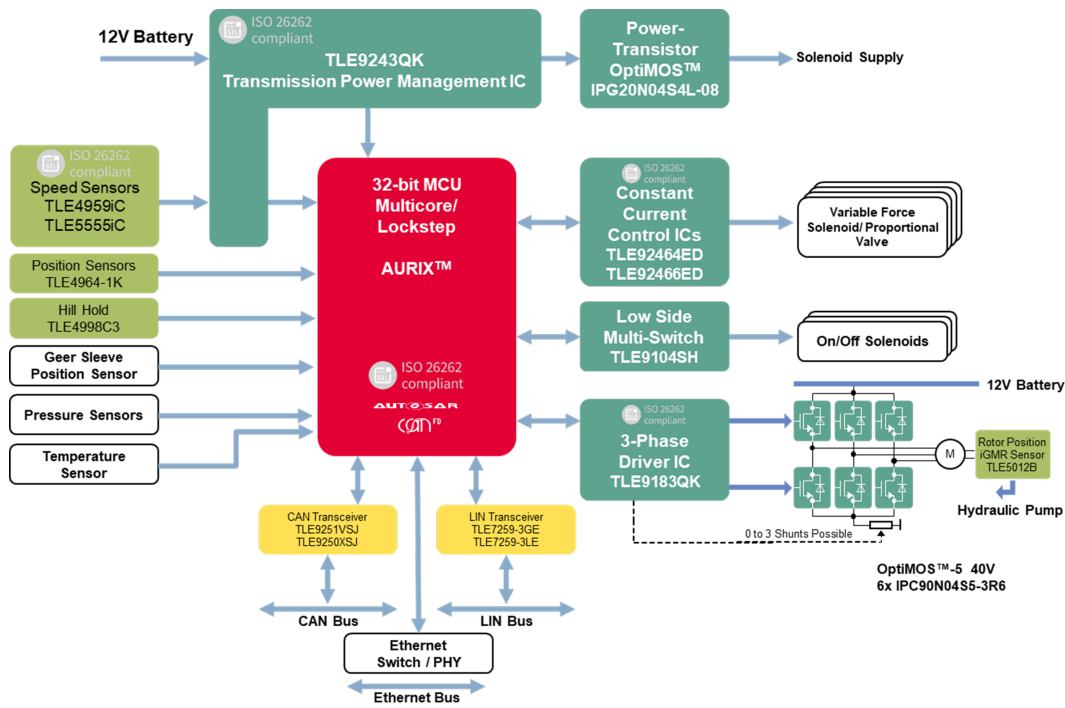
- > Serial step-up and step-down pre-regulator with wide input voltage range from 3.0 to 40 V
- > 5 V low drop voltage regulators for MCU and communication supply
- > 5 V high accuracy voltage reference
- > Two 5 V voltage trackers for sensor supply
- > Voltage, current, clock and temperature monitoring 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 $I_{V_{DCU}}$ (max)	5 V sensor supply $I_{V_{STRX}}$ (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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