



Infineon Solutions for Small Motor Applications

2-/4-Wheeler Vehicles & Tools

www.infineon.com/sev

Solutions for 2-/4-Wheeler – Electric Drive

e.g. Pedelec, eBike, eScooter, eKickboard, eCart, eBuggy, eQuad, ...

Motor Control	Battery Management	Lighting
<ul style="list-style-type: none">Voltage RegulatorsDriver ICs & MOSFETs3-phase driverXC800/XE166/XMC4000Hall Switches, Angle Sensors, Magnetic Speed Sensors	<ul style="list-style-type: none">XC800/XMC4000MOSFETsPROFET™OptiMOS™Current Sensor	<ul style="list-style-type: none">LED DriverLinear – DC/DC ConverterPROFET™/HITFET™AC/DC Driver
Communication	Battery Charger	Display
<ul style="list-style-type: none">CAN/LIN TransceiverEmbedded Power	<ul style="list-style-type: none">DC/DC Switching Power SuppliesAC/DC Switching Power Supplies	<ul style="list-style-type: none">XC800/XMC4000Backlight LED DriverLDO/Voltage RegulatorsDC/DC Converter



Solutions for 2-/4-Wheeler – Combustion Drive

e.g. Motorbikes, Trikes, Snow Mobiles & Jet Skis, Quads, Carts, ...

Board Computer/Cockpit	Fans & Pumps – Motor
<ul style="list-style-type: none">Power switchesLED driverMCUs + transceiverSupply ICsStepper driver	<ul style="list-style-type: none">MCUsSupply ICsMOSFETsSpeed PROFET™Motor bridgesBridge-driver ICsHall SwitchesAngle Sensors

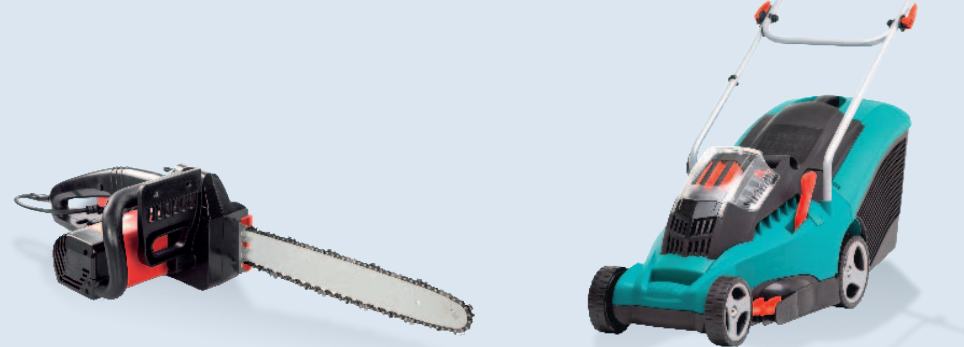
Front-/Tail-Light/Blinker	Engine Control Unit/ECU
<ul style="list-style-type: none">CAN/LIN TransceiverEmbedded Power	<ul style="list-style-type: none">MCUs + EMS + transceiverSupply ICsSwitchesMotor driverBAP/MAPMagnetic Speed SensorsMCUsTransceiversMOSFETs



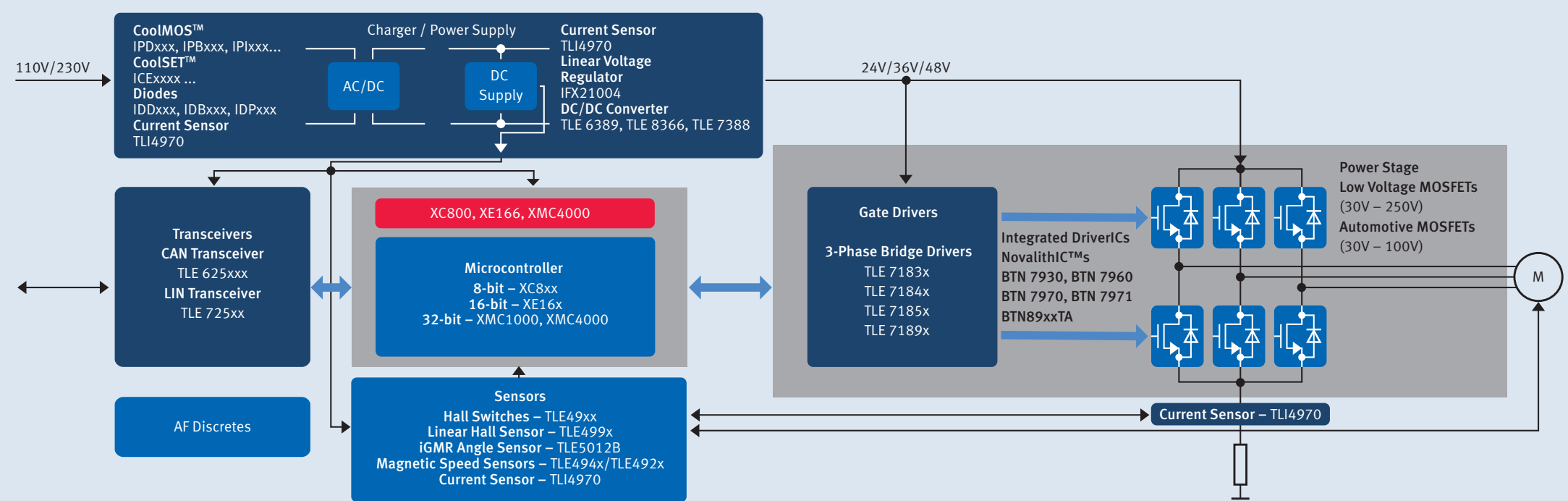
Solutions for Others – Combustion Drive

e.g. Leaf Blower, Motor Saw, ...

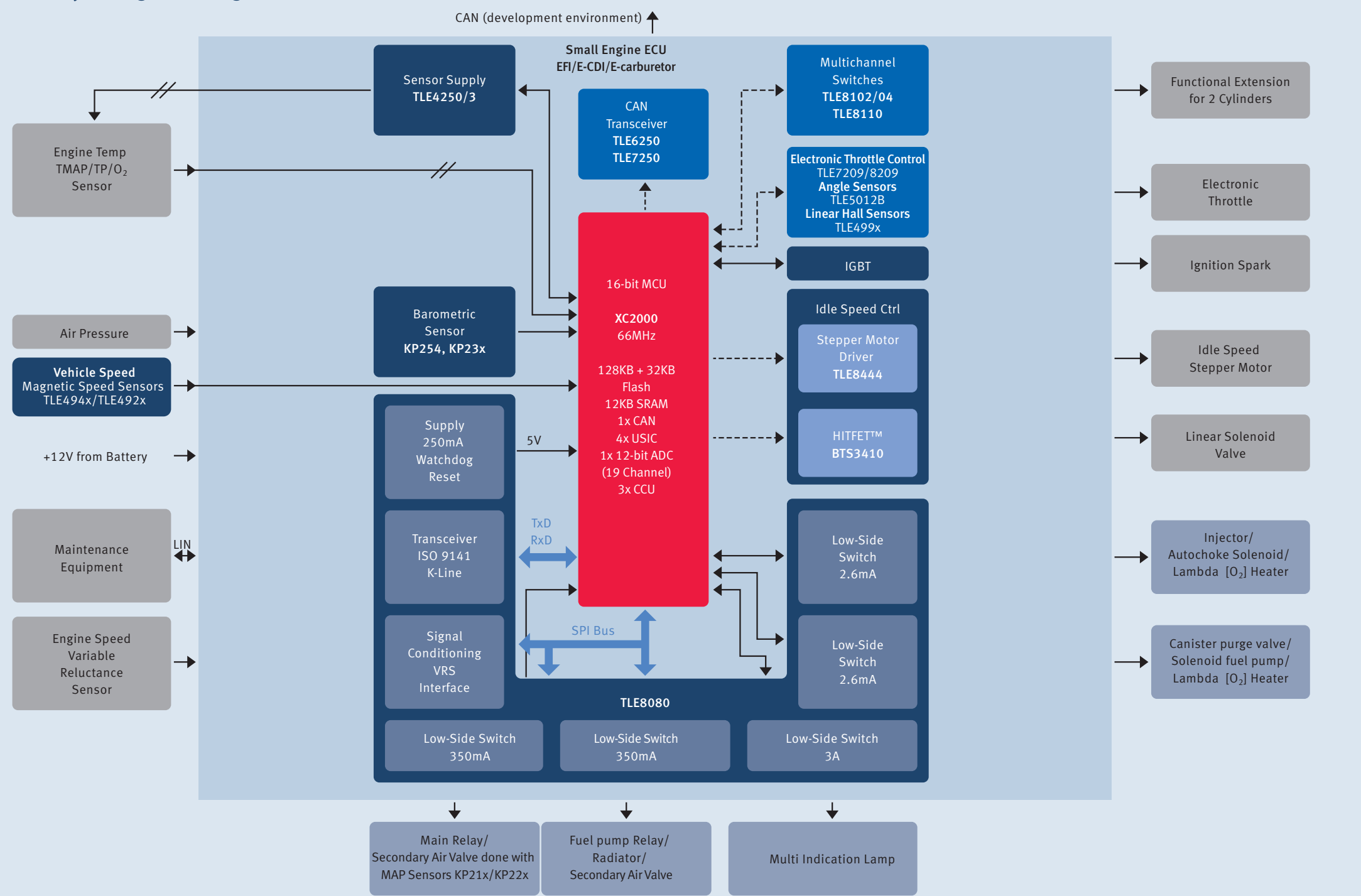
Engine Control Unit/ECU
<ul style="list-style-type: none">MCUs (XMC1000, XMC4000) + EMSSupply ICsHall SwitchesMagnetic Speed SensorsLow-Voltage MOSFETs



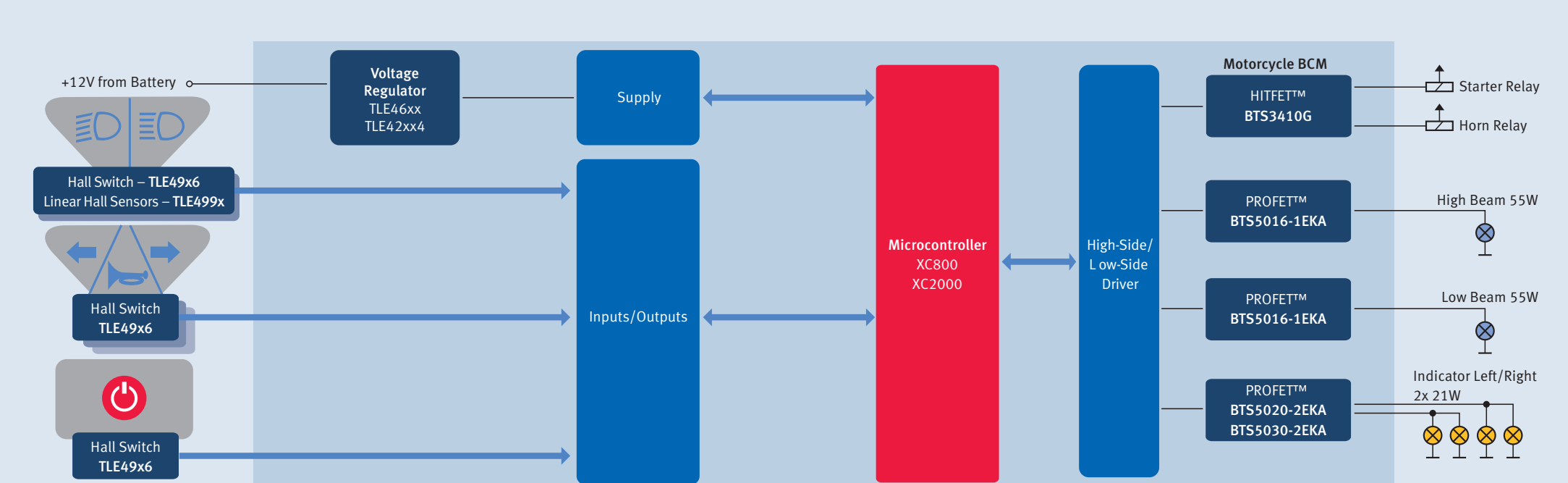
Small Electric Vehicles



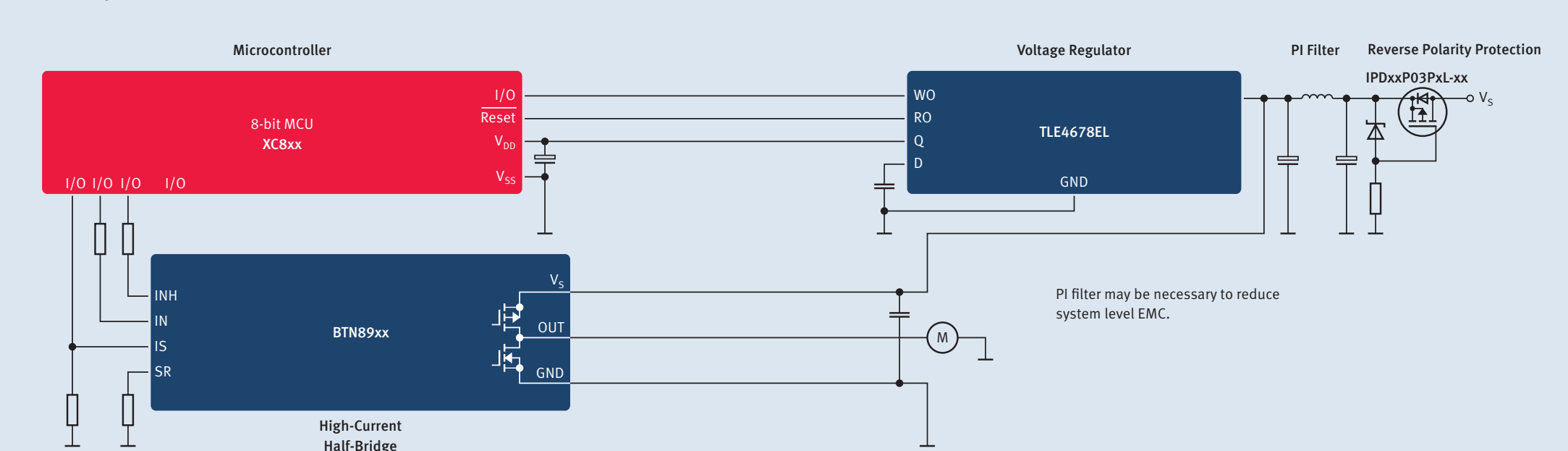
Motorcycle Engine Management



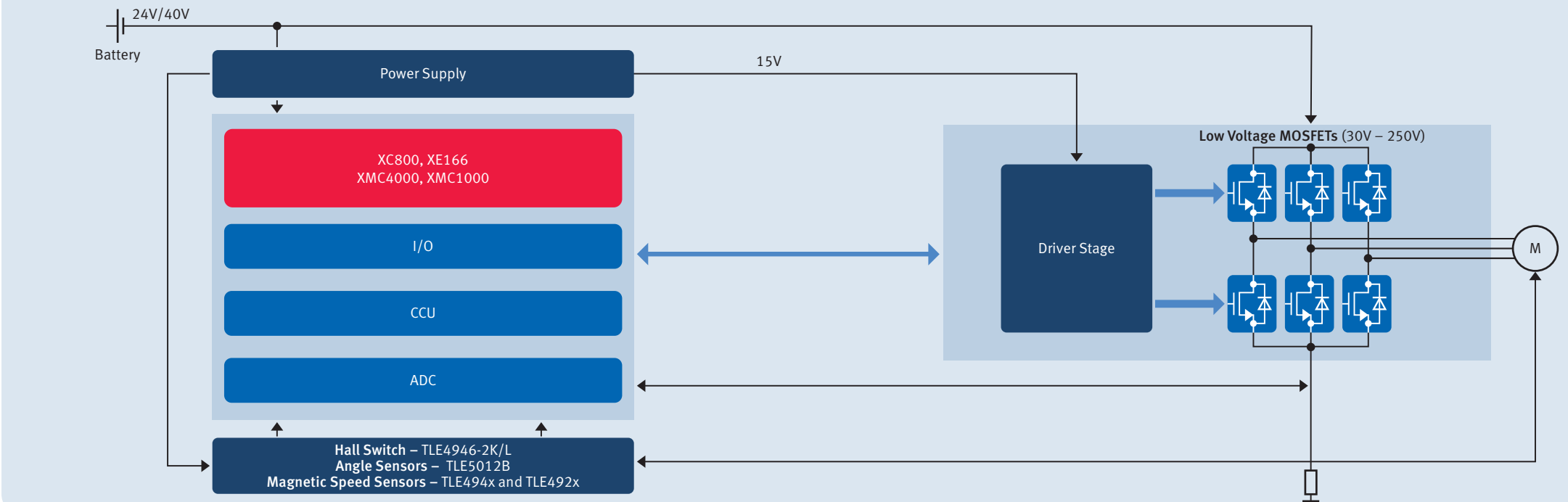
Small BCM for 2-wheelers



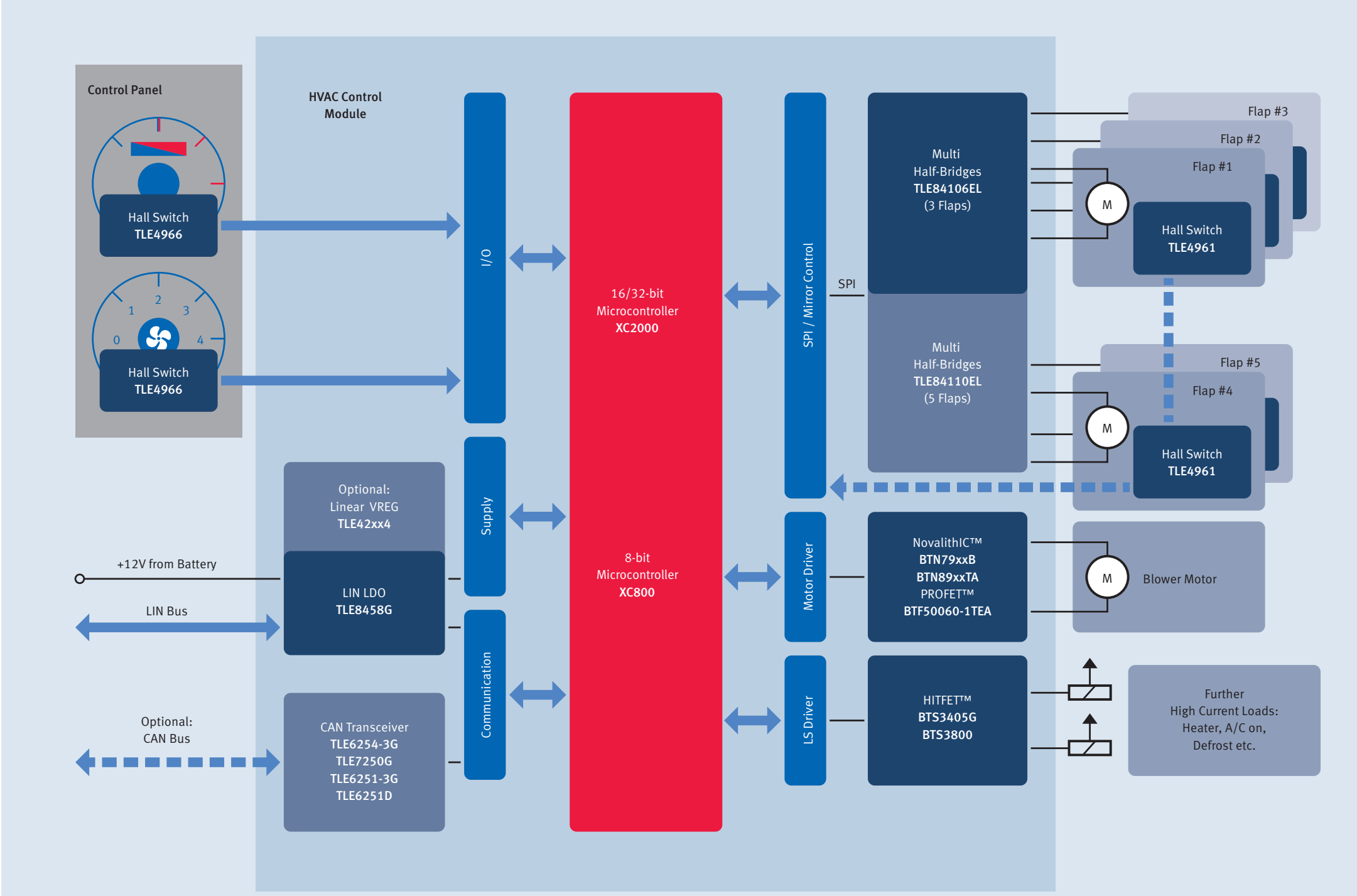
Fuel Pump



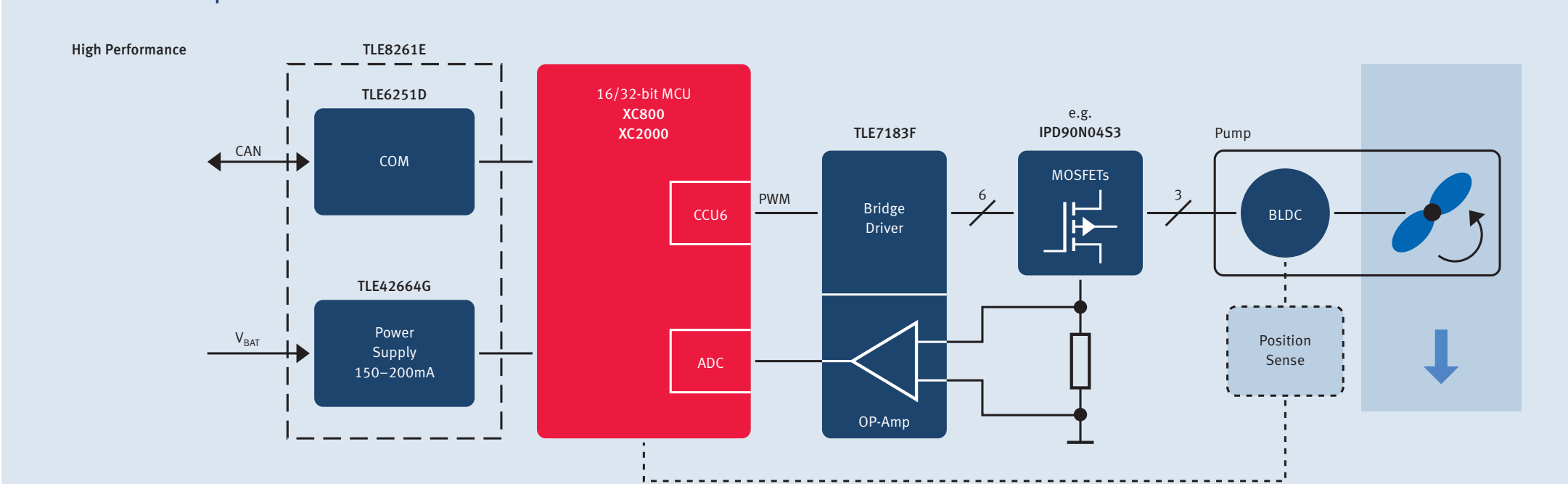
E-Bikes



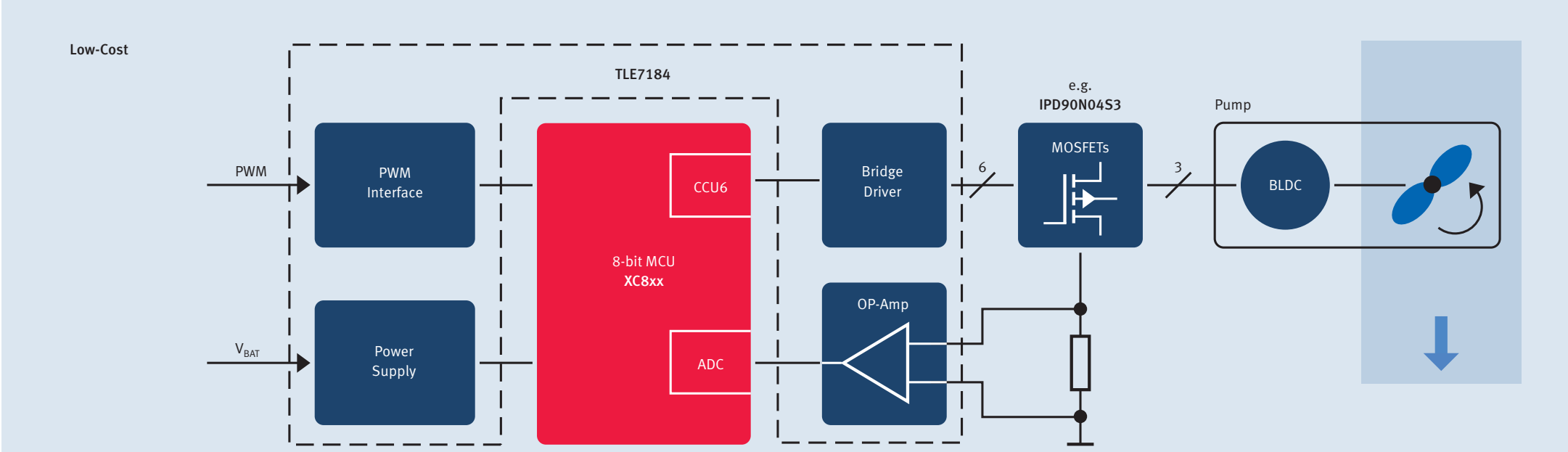
HVAC Control Module



Electric Water Pump



Low-Cost

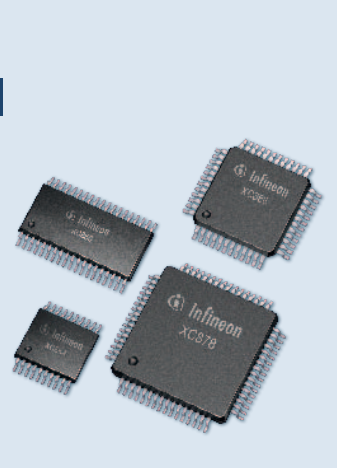


8-bit Microcontroller XC800 Family

Key Features

- Very well established 8051 core
- Dedicated motor control peripherals (powerful CCU6, fast & accurate ADC)
- Capacitive touch control functions
- System cost savings (embedded V_{DD}, EEPROM support, on-chip oscillator)
- Scalable product family
- Flash sizes from 4 KByte up to 64 KByte
- Temp Range -40 °C ... +150 °C
- 16-bit vector computer
- Free-of-charge tool chain (DAVE™)

Visit: www.infineon.com/XC800



16-bit Microcontroller XE166/XC2000 Family

Key Features

- Very well established C166 core
- Dedicated motor control peripherals (powerful CCU6, fast & accurate ADC)
- Safety features like MPU, ECC, redundant modules
- System cost savings (embedded V_{DD}, EEPROM support, on-chip oscillator)
- Scalable product family
- Flash sizes from 32 KByte up to 1.600 KByte
- Peripheral event controller
- 32-bit MAC unit
- Free-of-charge tool chain (DAVE™)

Visit: www.infineon.com/XE166

www.infineon.com/XC2000



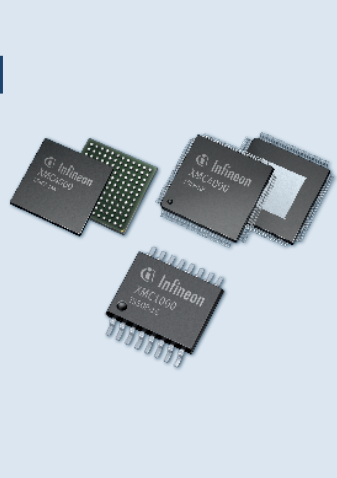
32-bit Microcontroller XMC4000/XMC1000 Family

Key Features

- ARM® Cortex™-M4 CPU/ARM® Cortex™-M0
- Floating point unit (on XMC4000 family)
- Flash sizes from 64 KByte up to 2.500 KByte/200kByte
- MPU, ECC
- Enhanced motor control peripherals (like CCU8, up to 4 independent 12-bit ADC)
- Communication like Ethernet, USB, UART, SPI, ...
- Integrated Posif
- Integrated Delta-Sigma-Demodulator
- Event request unit
- Free-of-charge tool chain (DAVE™ 3)

Visit: www.infineon.com/xmc1000

www.infineon.com/xmc4000

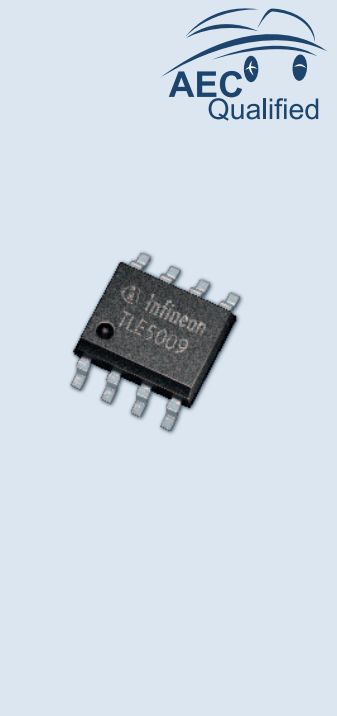


Angle Sensor Family
TLE5009/5012B

Key Features

- Integrated MR (magneto resistive) technology
- Full 360° angle (on XMC4000 family)
- Supply voltage 3.3 or 5.0V
- On chip temperature compensation
- Analog output with fixed max amplitude (TLE5009)
- Integrated angle calculation and calibration (TLE5012B)
- Multiple interfaces (HSM, IIF, SPI, SPC) for easy implementation (TLE5012B)
- Wide temperature range -40 °C ... +150 °C
- Automotive qualified
- 8-pin SMD package (PG-DSO-8)

Visit: www.infineon.com/angle-sensors



Rational Speed Sensor
TLE4921-5U

Key Features

- Dynamic differential Hall effect sensor
- Dynamic offset cancellation
- Good sensing performance and high sensitivity
- Well suited for harsh environments by its dynamic offset cancellation, EMI robustness, reverse polarity and overvoltage protection
- Flexible sensor module interface due to its configurability for two-wire and three-wire interfaces
- 40 °C ... +150 °C temperature range
- AEC-Q100 qualified

Visit: www.infineon.com/magnetic-sensors



Hall Switch Family TLE496x

Key Features

- Small current consumption (1.6mA)
- 3.0V or multi-topology LED drivers available to drive LEDs in boost (B2G), buck-boost (B2B) and SEPIC topology (max. 60V)
- Overvoltage capability up to 42V without external resistor
- Reverse polarity protection (-18V)
- Active error compensation
- High ESD performance up to 7kV HBM
- Automotive qualified
- Available in small SMD package SOT23 and leaded package

Visit: www.infineon.com/automotive-lighting

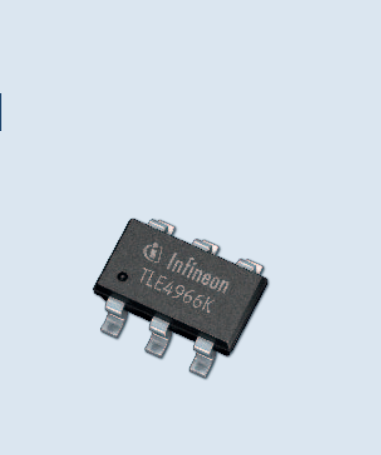


Double Hall Sensor for Direction Detection & Index Counting TLE4966

Key Features

- Two Hall probes with excellent matching thru fix Hall plate distance 1.45mm
- Integrated speed & direction detection
- Wide range of supply voltage from 2.7 – 18V
- Reliable switching even in harsh environments thru active error and stress compensation and compensation of temperature effects
- Automotive qualified
- 40 °C ... +150 °C operating range
- Available in package variety TSOP6-SMD package and leaded PG-SSO-4 package

Visit: www.infineon.com/hall-switches

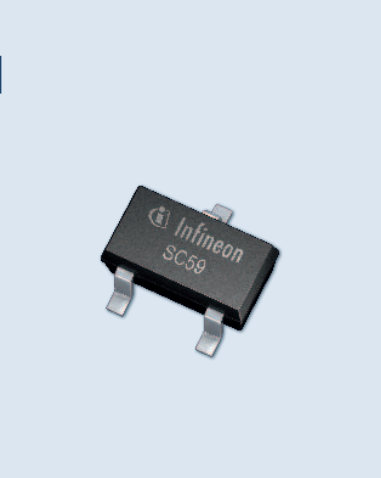


Low Power Hall Switch TLE4916-1K

Key Features

- Low power consumption (10µW)
- Min supply voltage of 2.4V
- High sensitivity and high stability of the magnetic switching points
- High resistance to the mechanical stress of active error compensation
- Extended temperature range (-40 °C ... +150 °C)
- Automotive qualified

Visit: www.infineon.com/hall-switches

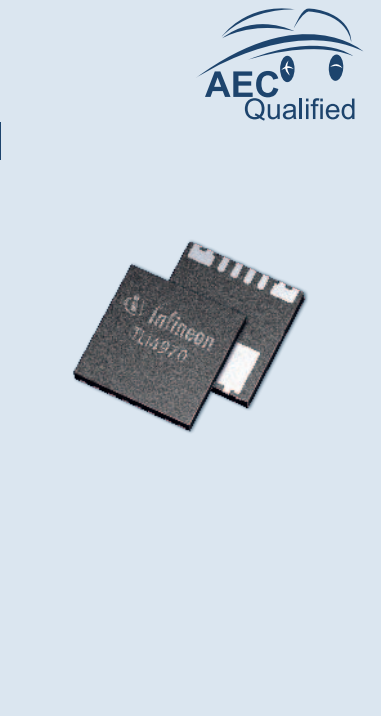


TLI4970 – Current Sensor

Key Features

- Galvanic isolated, low resistance measurement principle
- Coreless solution, hysteresis free
- Inherent suppression of stray magnetic field
- 16-bit internal resolution
- Update rate: 80kSPS
- Working voltage: 425Vrms
- Adjustable LP filter (0–10kHz)
- Configurable overcurrent comparator (allows 3µs quick system shut-off)
- Suitable for automotive, industrial and consumer applications
- Plug and play solution – no external calibration needed
- Long-term stability of output signal
- Leadless package (QFN-like) PG-TISON-8
- SMD mounting
- AEC-Q100 qualified
- Size in mm: (L,W,H) 7.0 x 7.0 x 1.0
- Weight: 0.2 g

Visit: www.infineon.com/tli4970



TLE4941plusC – Wheel Speed Sensor

Key Features

- Two-wire current interface: minimizes wiring
- Dynamic self-calibration principle: compensates offsets
- Single chip solution: ensures outstanding reliability
- High sensitivity: can be used for large airgap applications
- South and north pole preinduction possible: works for both encoders and tonewheels
- High resistance to piezo effects: suits sensor overmolding wide operating temperature range
- C type with 1.8nF overmolded capacitor: enhances EMC & microbreak resistance, without any external components
- AEC-Q100 qualified

Visit: www.infineon.com/magnetic-sensors

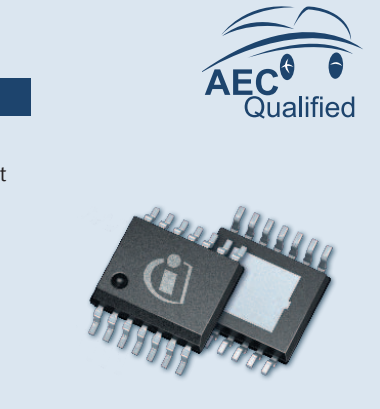


Power LED Drivers

Key Features

- Wide input voltage range from 4.5V to 45V
- Single or multi-topology LED drivers available to drive LEDs in boost (B2G), buck-boost (B2B) and SEPIC topology (max. 60V)
- Flexible switching frequency range: 100kHz to 500kHz (for EMC optimization)
- PWM and analog dimming feature to adjust average LED current
- TLD5045: high integration (power switch, sense resistor and fast freewheeling diode)
- Synchronization with external clock
- Very low shutdown quiescent current
- Device overtemperature protection

Visit: www.infineon.com/automotive-lighting

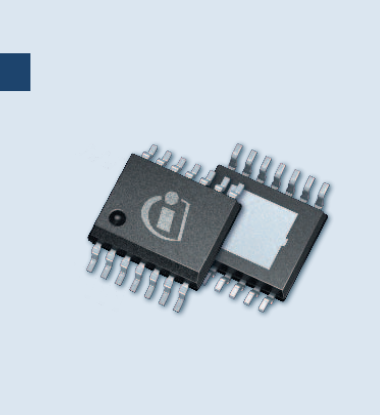


Auto LED Drivers

Key Features

- Dedicated feature-set optimized for automotive LED applications
- Stable current regulation to increase LED lifetime and protect against overvoltage
- Diagnostic functionality for detect failure modes
- Scalable device family selectable by output power class and feature-set
- AEC Q100 qualified
- Temperature range -40 °C ... +150 °C

Visit: www.infineon.com/automotive-leddrivers

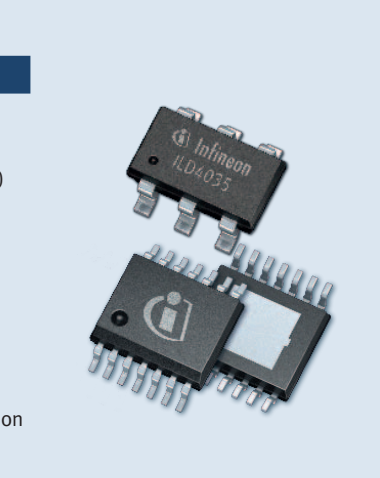


Linear LED Drivers

Key Features

- Basic features of BCR4xx and TLD12xx/ TLD13xx
 - Lowest external part count
 - Output current adjustable with external low power resistors (10–80mA)
 - Wide supply voltage range 5.5...40V
 - PWM via external PWM signal via EN or VS
- Optional features of TLD12xx/TLD13xx
 - N-1 detection functionality or open load and short circuit detection
 - Integrated PWM dimming engine to provide two LED brightness levels only with RC-network
 - Matrix setup with DC/DC buck or boost converter – Infineon® Dynamic Overhead Control
 - Integrated short circuit protection with high temperature current reduction

Visit: www.infineon.com/automotive-lighting

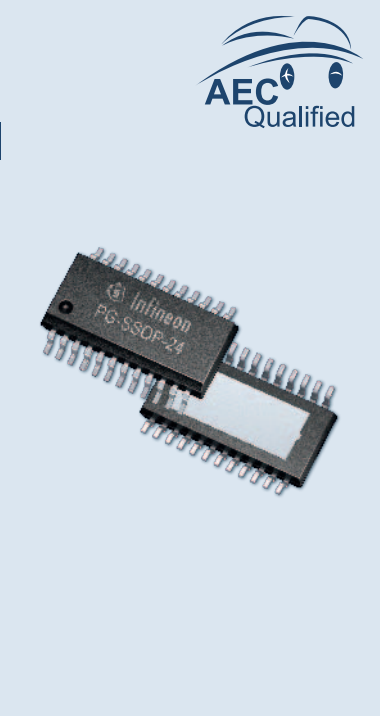


TLE8444SL – Quad Half-Bridge Driver IC for Bipolar Stepper and DC Motors

Key Features

- 4 Half-Bridge Power Outputs with
 - R_{DS(on)} = 0.60 (typ. @ T_J = 25 °C) per Half-Bridge
- PWM capability up to 10kHz
- Simple parallel interface control
- Error Flag Diagnosis
- Low current consumption in sleep mode (max 5µA)
- Overtemperature protection
- Open load detection
- Minimum Overcurrent Shutdown at 0.9A
- AEC qualified

Visit: www.infineon.com/bridges



Overview MOSFET Gate Drivers

Key Features

- For voltages up to 60V
 - H-Bridge driver TLE6282 (90V robust)
 - New B-6 driver upcoming 2013 (90V robust)
- For voltages up to 38V
 - B-6 driver + V_{DD} TLE7184
 - B-6 driver TLE7185

Visit: www.infineon.com/driver-ic



Infineon® Embedded Power ICs
LIN Relay Driver IC & 8-bit Microcontroller

Key Features

- Complete system-on-chip (SoC) solution
- 8051-based MCU up to 40MHz
- 36kB to 64kB Flash memory
- LIN transceiver compatible with LIN standards 1.3, 2.0, 2.1 and SAE J2602
- Integrated voltage regulator supplying internal and external circuits (5V) directly from battery
- Up to two protected high-side & two low-side switches with PWM for external motor control
- 10-bit ADC converter (8 channels) and 8-bit ADC Converter (10 channels)
- Intelligent power saving modes
- 5 High Voltage Monitor Pins
- 11 GPIOs

Visit: www.infineon.com/embeddedpower

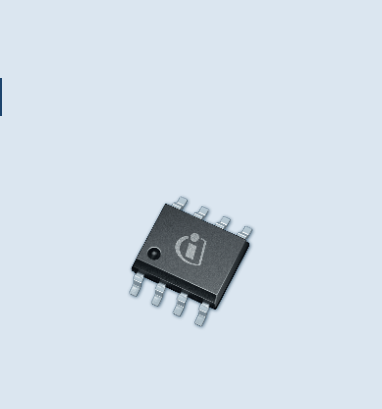


Industrial DC/DC Regulators and Controllers

Key Features

- High input voltage even up to 60V
- Output currents up to 2.3A
- Low current consumption
- Switching frequency at 370kHz
- Device protection features
- Enable feature
- Few external components required
- Temperature range -40 °C ... +125 °C
- Devices available in DS08 and DS014 packages

Visit: www.infineon.com/industrial-standard

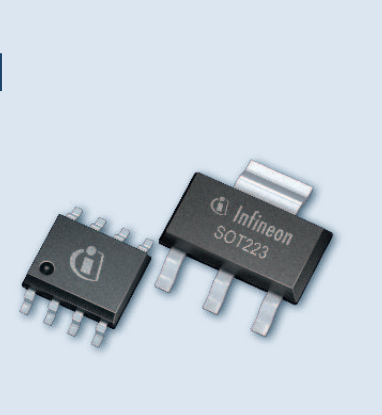


Commodity Linear Voltage Regulators and LDOs

Key Features

- High input voltage even up to 60V
- Output currents up to 1.5A
- Very low drop out voltage
- Low current consumption
- Low quiescent current
- Device protection features
- Temperature range -40 °C ... +125 °C
- Devices available in various packages, SCT595 up to TO220, as well leadless TSON
- Pin-to-pin compatible to industry standard parts

Visit: www.infineon.com/industrial-standard

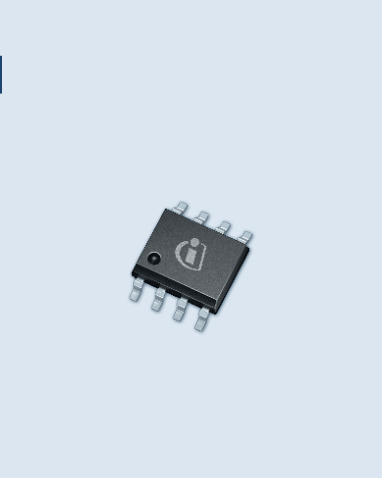


Automotive CAN and LIN Transceiver Families

Key Features

- CAN transceivers compliant to ISO 11898 standard
- Low power modes
- Remote wake up capability
- Support of failure conditions
- Low current consumption
- Protection features
- Excellent EMC performance and EMI robustness
- LIN transceiver for cost efficient and low data rate communication
- Device compatible to well known market established transceiver devices

Visit: www.infineon.com/industrial-standard

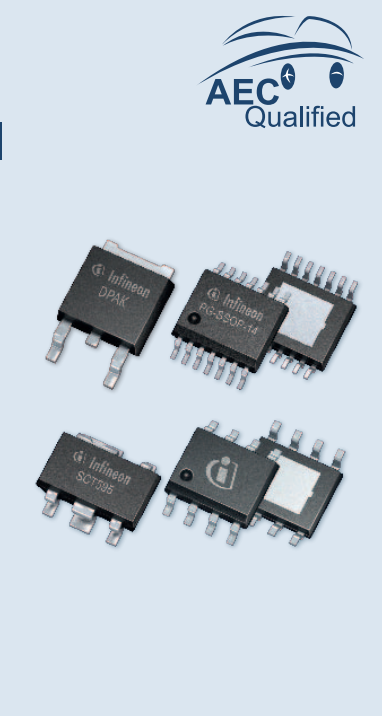


Automotive Linear Voltage Regulators

Key Features

- Largest portfolio of automotive voltage regulators
- Wide input voltage range from 3V to 45V
- Wide temperature range from -40 °C ... +150 °C
- Very low drop-out
- Small external components
- Optimized feature-sets for automotive applications:
 - Reset
 - Enable(Inhibit)
 - Watchdog
 - Early warning
- Various protection features
- Best in quality

Visit: www.infineon.com/voltage-regulator



Automotive DC/DC Converter

Key Features

- High-efficiency
- Wide supply voltage operation range
- Very low current consumption operation
- Output under-voltage reset with delay
- Overtemperature shutdown/protection
- Short-circuit protection
- Thermal enhanced exposed-pad packages

Visit: www.infineon.com/dcdc-converter



Low Voltage Power MOSFETs

Key Features

- OptiMOSTM the right switch for your drives application
- Industry's lowest R_{DS(on)} and high current capability
- Highest efficiency and power density
- Minimal device paralleling required
- Packages optimized for drives applications e.g. D²PAK 7pin and CanPAK™
- Reduced package parasitic
- Highest system reliability due to no hot spots
- Pressures requirements for cooling
- Leading in product quality and reliability

Visit: www.infineon.com/optimos



TLE7250G & TLE7250GVIO
Automotive Standard HS CAN Transceiver

Key Features

- Data transmission rates up to 1Mbaud
- TxD time-out functionality
- High immunity against electromagnetic interference (EMI)
- Very low electromagnetic emission (EME)
- Excellent ESD robustness (±8kV)
- Compliant to the German OEM hardware requirements specification V1.3 of May 2012
- Short circuit protection of bus lines to GND, battery and VCC
- Maximum CAN Bus short circuit current of only 100mA
- Low CAN Bus leakage current in power down mode
- Operating voltage down to 4.5V V_{CC}
- TLE7250G for 5V and TLE7250GVIO for 5V and 3.3V micro controller interfaces

Visit: www.infineon.com/transceivers

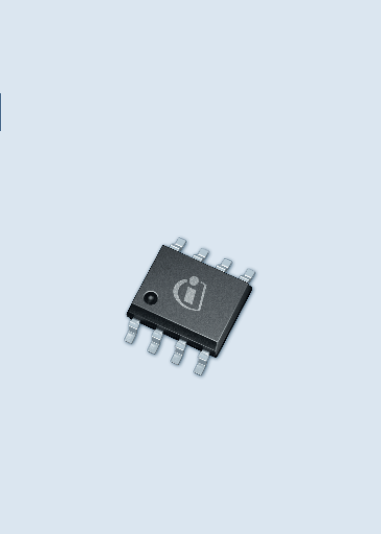


TLE6251D
Automotive Wake-Up-Capable HS CAN Transceiver

Key Features

- CAN data transmission rate up to 1 Mbaud
- TxD time-out functionality
- Wake up capability with V_{IO} supply only
- Very low quiescent current requirement
- No Bus load in stand-by mode
- Very low electromagnetic emission (EME)
- Extraordinary immunity (EMI) and ESD robustness
- Max. CAN Bus short circuit current of only 100mA
- Low power mode with remote wake-up via bus
- CAN short circuit protection to ground, battery and VCC
- Overtemperature protection
- Protected against automotive transients
- Operating voltage down to 4.5V V_{CC}
- Worldwide OEM approval status

Visit: www.infineon.com/transceivers

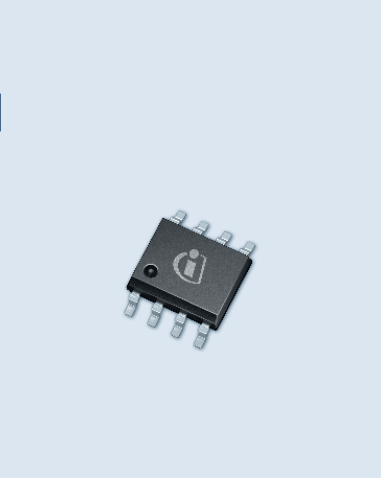


TLE7259-2GE
Automotive High End LIN Transceiver

Key Features

- Data transmission rate up to 20 kBaud
- Very high ESD robustness, ±11kV
- Optimized for low electromagnetic emission (EME)
- Optimized for high immunity against EMI
- Very low current consumption in sleep mode with wake-up functions (10µA)
- Bus short to VBAT protection, Bus short to GND handling
- Flash mode – fast Baud rate support for programming
- Control output (INH) for voltage regulator

Visit: www.infineon.com/transceivers

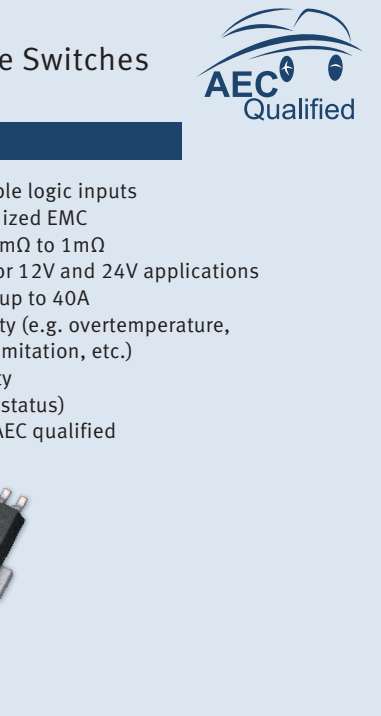


PROFET™+ 12V Smart High-Side Switches

Key Features

- Very low standby-current (0.5µA)
- 3.3V and 5V-compatible logic inputs
- ESD protection, optimized EMC
- Enhanced short-circuit operation 100k
- 100% scalability
- Pin-compatibility towards 24V
- Thermal shutdown with restart
- Voltage dependent current limitation
- Proportional load current sense
- Enhance killUS accuracy with calibration

Visit: www.infineon.com/profet



HITFET™ Protected Low-Side Switches

Key Features

- Overtemperature and overvoltage protection
- Current limitation and short circuit protection
- ESD protection
- R_{DS(on)} range from 800mΩ to 10mΩ
- Logic level input
- Status feedback via input pin
- Thermal shutdown with latch or auto-restart behavior
- Optimized switches for 12V and 24V applications
- RoHS compliant and AEC qualified

Visit: www.infineon.com/hitfet

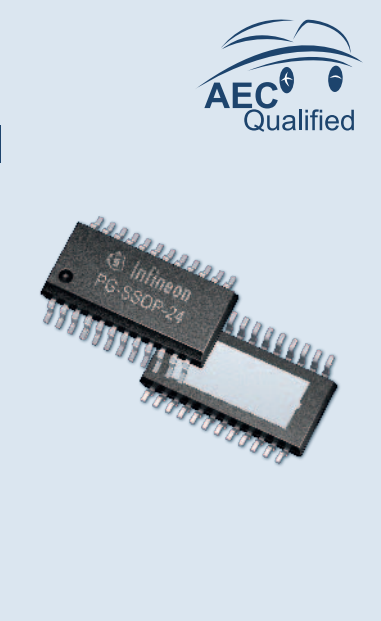


TLE8080:
EMS for 1–2 Cylinder Small Engines

Key Features

- Supply 5V (±2%, 250mA)
- Reset function/watch dog
- K-Line transceiver
- SPI interface/VR sensor interface
- 5x low-side drivers
 - 1x 300mA (max 3A)
 - 2x 300mA (max 350mA)
 - 2x 1.3A (max 2.6A)
- Protection/Diagnosis
- Overtemperature/overcurrent protection
- Open load in Off
- Diagnosis

Visit: www.infineon.com/motorcycle



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Where you need it. When you need it.

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Our global connection service goes way beyond standard switchboard services by offering qualified support on the phone. Call us!

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- China, mainland4001 200 951 (Mandarin/English)
- India000 800 4402 951 (English)
- USA1-866 951 9519 (English/German)
- Other countries00* 800 951 951 951 (English/German)
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