Two-Wheelers

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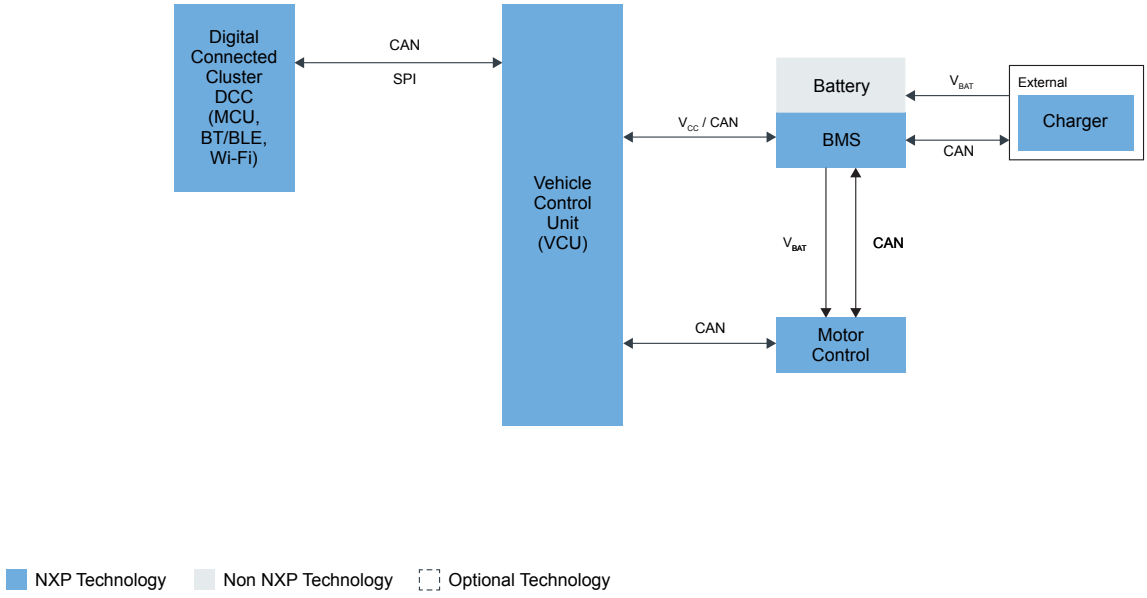
Electric two-wheelers (eScooters, eMotorcycles, eBikes) simplify mobility with features like automated locking, collision detection, and advanced instrumentation for HMI.

Two-wheelers are becoming safer, more affordable and environmentally friendly, with connectivity ensuring driver safety and monitoring battery health. These vehicles shape the future of mobility with smart connectivity, enhancing the electrified ecosystem and unlocking new mobility opportunities.

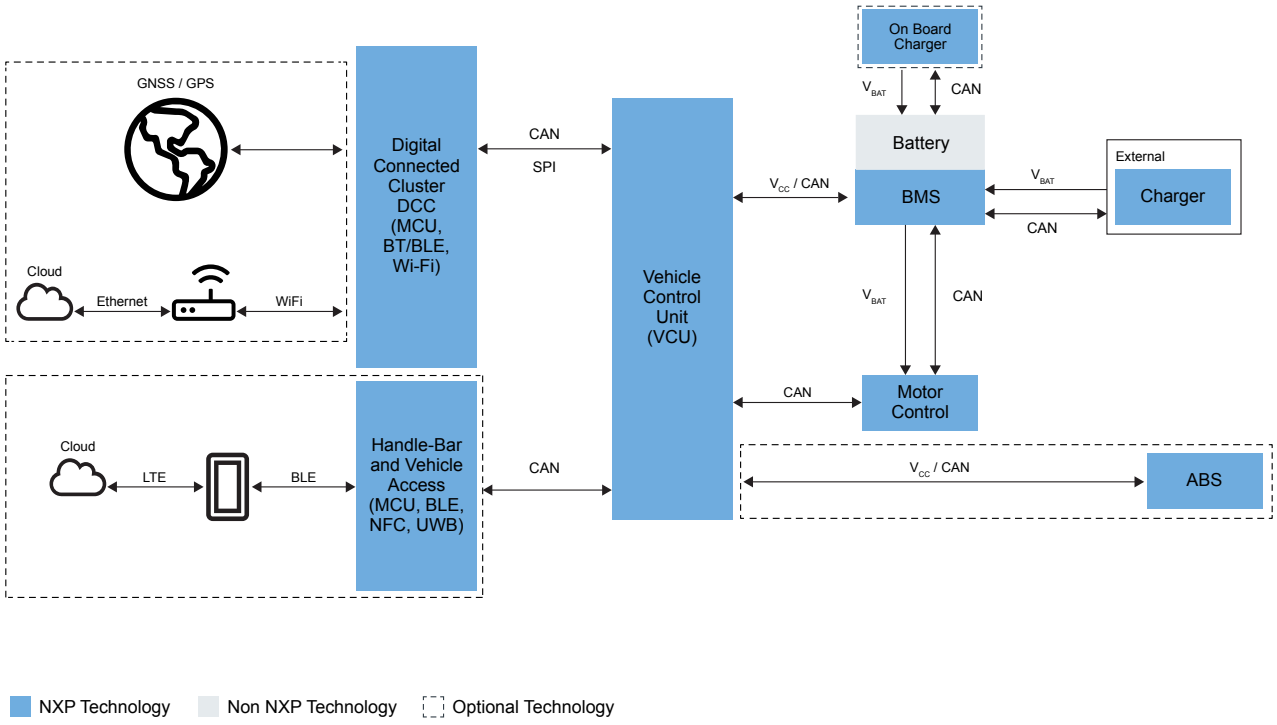
eMotorcycle/eScooter Low-End Block Diagram



Recommended Products for eMotorcycle/eScooter Low-End	
Digital Connected Cluster	• i.MX-RT1170: i.MX RT1170: 1 GHz Crossover MCU with Arm® Cortex® Cores • KW45: KW45: 32-Bit Bluetooth® 5.3 Long-Range MCUs with CAN FD and LIN Bus Options, Arm® Cortex®-M33 Core • TJA1042: High-Speed CAN Transceiver with Standby Mode • TJA1052IT: Galvanically-Isolated High-Speed CAN Transceiver • AW611: 2.4/5 GHz Dual-Band 1x1 Wi-Fi® 6 (802.11ax) + Bluetooth® 5.4 Automotive Solution • PF5020: Multi-Channel (5) PMIC for Automotive Applications – 4 High Power and 1 Low Power, Fit for ASIL B Safety Level • PF5103: Multi-Channel (5) PMIC for Automotive Applications: 3 LVBUCK and 2 LDO, Fit for ASIL B Safety Level
Vehicle Control Unit	• S32K3: S32K3 Microcontrollers for Automotive General Purpose • FS6500: Grade 1 and Grade 0 Safety Power System Basis Chip with CAN Flexible Data Transceiver • FS4500: Grade 1 and Grade 0 Safety Power System Basis Chip with CAN Flexible Data Transceiver • FS23: Safety System Basis Chip (SBC) Family with Power Management, CAN and LIN • FS26: Safety System Basis Chip with Low Power, for ASIL D Systems

	• UJA1169ATK: Mini High-Speed CAN System Basis Chip • TJA1042: High-Speed CAN Transceiver with Standby Mode • TJA1052IT: Galvanically-Isolated High-Speed CAN Transceiver • PCA85073A: Automotive Tiny Real-Time Clock/Calendar with Alarm Function and I²C-Bus • PCA2131: Nano-Power Highly Accurate RTC with Integrated Quartz Crystal for Automotive Applications • S32K1: S32K1 Microcontrollers for Automotive General Purpose
BMS	• MC33771C: 14-Channel Li-Ion Battery Cell Controller IC • MC33772C: 6-Channel Li-Ion Battery Cell Controller IC • MC33774: 18 Channel Li-Ion Battery Cell Controller IC ASIL D • S32K1: S32K1 Microcontrollers for Automotive General Purpose • S32K3: S32K3 Microcontrollers for Automotive General Purpose • FS6500: Grade 1 and Grade 0 Safety Power System Basis Chip with CAN Flexible Data Transceiver • FS4500: Grade 1 and Grade 0 Safety Power System Basis Chip with CAN Flexible Data Transceiver • FS23: Safety System Basis Chip (SBC) Family with Power Management, CAN and LIN • FS26: Safety System Basis Chip with Low Power, for ASIL D Systems • UJA1169ATK: Mini High-Speed CAN System Basis Chip • TJA1042: High-Speed CAN Transceiver with Standby Mode
Motor Control	• S32K1: S32K1 Microcontrollers for Automotive General Purpose • S32K3: S32K3 Microcontrollers for Automotive General Purpose • FS6500: Grade 1 and Grade 0 Safety Power System Basis Chip with CAN Flexible Data Transceiver • FS4500: Grade 1 and Grade 0 Safety Power System Basis Chip with CAN Flexible Data Transceiver • FS23: Safety System Basis Chip (SBC) Family with Power Management, CAN and LIN • FS26: Safety System Basis Chip with Low Power, for ASIL D Systems • TJA1042: High-Speed CAN Transceiver with Standby Mode • TJA1052IT: Galvanically-Isolated High-Speed CAN Transceiver
Charger	• TEA6017AT: Digital Configurable LLC and Multimode PFC Controller • TJA1042: High-Speed CAN Transceiver with Standby Mode • TJA1052IT: Galvanically-Isolated High-Speed CAN Transceiver • S32K1: S32K1 Microcontrollers for Automotive General Purpose • LPC550x: LPC550x/S0x: Baseline Arm® Cortex®-M33-Based Microcontroller Family • TEA2017: Digital Configurable LLC and Multimode PFC Controller

eMotorcycle/eScooter High-End and Mid-Range Block Diagram

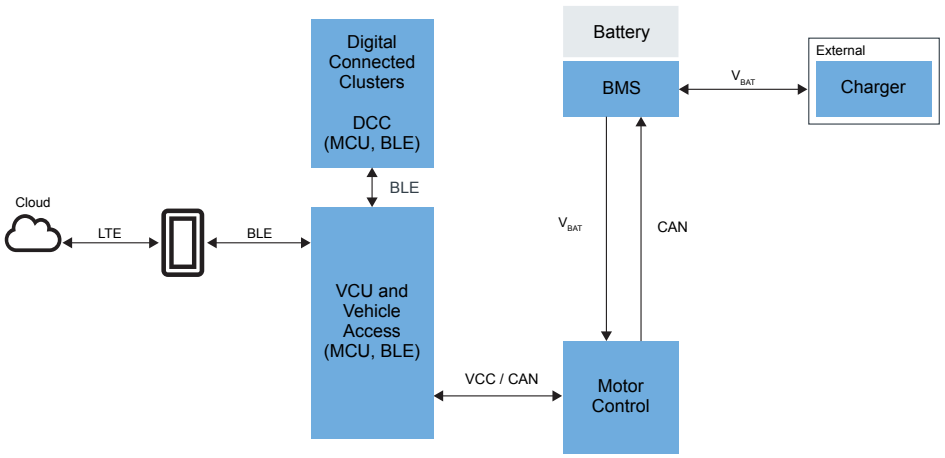


Recommended Products for eMotorcycle/eScooter High-End and Mid-Range	
Digital Connected Cluster	• i.MX8X: i.MX 8X Family – Arm® Cortex®-A35, 3D Graphics, 4K Video, DSP, Error Correcting Code on DDR • IMX8MPLUS: i.MX 8M Plus – Arm® Cortex®-A53, Machine Learning, Vision, Multimedia and Industrial IoT • i.MX93: i.MX 93 Applications Processor Family – Arm® Cortex®-A55, ML Acceleration, Power Efficient MPU • iMX95: i.MX 95 Applications Processor Family: High-Performance, Safety Enabled Platform with eIQ® Neutron NPU • PF81-PF82: 12-Channel Power Management Integrated Circuit (PMIC) for High-Performance Processing Applications • PF7100: 7-Channel Power Management Integrated Circuit for High Performance Applications, Fit for ASIL B Safety Level • PCA9452: PCA9452 Power Management IC for i.MX 93x Auto Processor • PF09: 9-Channel PMIC for High-Performance Applications, Fit for up to ASIL D • AW693: 2x2 Dual-Band (5-7 GHz), 1x1 (2.4 GHz) Concurrent Dual Wi-Fi 6/6E and Bluetooth 5.3 Combo Solution • KW45: KW45: 32-Bit Bluetooth® 5.3 Long-Range MCUs with CAN FD and LIN Bus Options, Arm® Cortex®-M33 Core • TJA1042: High-Speed CAN Transceiver with Standby Mode • TJA1052IT: Galvanically-Isolated High-Speed CAN Transceiver • NCJ29D5: Trimension™ NCJ29D5: UWB IC for Automotive Applications

Handle-Bar and Vehicle Access	• S12ZVL: S12ZVL Mixed-Signal MCU for Automotive and Industrial LIN Applications • S32K1: S32K1 Microcontrollers for Automotive General Purpose • KW45: KW45: 32-Bit Bluetooth® 5.3 Long-Range MCUs with CAN FD and LIN Bus Options, Arm® Cortex®-M33 Core • NCx3320: Automotive-Grade NFC Frontend IC • NCx3321: NFC Forum-Compliant Frontend IC with Superior RF Performance for Automotive • NCJ29D5: Trimension™ NCJ29D5: UWB IC for Automotive Applications • FS24: Safety Mini CAN FD SBC for Automotive Applications Fit for ASIL-B • NCJ37x: Automotive Secure Element with Passive NFC, I2C and SPI Interfaces
Vehicle Control Unit (VCU)	• S32K1: S32K1 Microcontrollers for Automotive General Purpose • S32K3: S32K3 Microcontrollers for Automotive General Purpose • FS6500: Grade 1 and Grade 0 Safety Power System Basis Chip with CAN Flexible Data Transceiver • FS4500: Grade 1 and Grade 0 Safety Power System Basis Chip with CAN Flexible Data Transceiver • FS23: Safety System Basis Chip (SBC) Family with Power Management, CAN and LIN • FS26: Safety System Basis Chip with Low Power, for ASIL D Systems • TJA1042: High-Speed CAN Transceiver with Standby Mode • TJA1052IT: Galvanically-Isolated High-Speed CAN Transceiver • TJA1152: Secure HS-CAN Transceiver with Standby Mode • PCA85073A: Automotive Tiny Real-Time Clock/Calendar with Alarm Function and I²C-Bus • PCA2131: Nano-Power Highly Accurate RTC with Integrated Quartz Crystal for Automotive Applications
On Board Charger	• MC56F83xxx: Performance Level Digital Signal Controllers, USB FS OTG, CAN FD • S32K39-37-36: S32K39/37/36 Microcontrollers for Electrification Applications • FS6500: Grade 1 and Grade 0 Safety Power System Basis Chip with CAN Flexible Data Transceiver • FS4500: Grade 1 and Grade 0 Safety Power System Basis Chip with CAN Flexible Data Transceiver • FS23: Safety System Basis Chip (SBC) Family with Power Management, CAN and LIN • FS26: Safety System Basis Chip with Low Power, for ASIL D Systems • TJA1042: High-Speed CAN Transceiver with Standby Mode • TJA1052IT: Galvanically-Isolated High-Speed CAN Transceiver
BMS	• MC33771C: 14-Channel Li-Ion Battery Cell Controller IC • MC33774: 18 Channel Li-Ion Battery Cell Controller IC ASIL D • MC33664: Isolated Network High-Speed Transceiver • MC33665A: General Purpose BMS Communication TPL Transceiver and CAN FD Gateway • MC33772C: 6-Channel Li-Ion Battery Cell Controller IC • S32K1: S32K1 Microcontrollers for Automotive General Purpose • S32K3: S32K3 Microcontrollers for Automotive General Purpose • FS6500: Grade 1 and Grade 0 Safety Power System Basis Chip with CAN Flexible Data Transceiver • FS4500: Grade 1 and Grade 0 Safety Power System Basis Chip with CAN Flexible Data Transceiver • FS23: Safety System Basis Chip (SBC) Family with Power Management, CAN and LIN • FS26: Safety System Basis Chip with Low Power, for ASIL D Systems • TJA1042: High-Speed CAN Transceiver with Standby Mode • TJA1052IT: Galvanically-Isolated High-Speed CAN Transceiver • TJA1152: Secure HS-CAN Transceiver with Standby Mode • NBP8-9x: Highly Integrated Battery Pressure Monitor Sensor
Motor Control	• TJA1042: High-Speed CAN Transceiver with Standby Mode • TJA1052IT: Galvanically-Isolated High-Speed CAN Transceiver • GD3160: Advanced High Voltage Isolated Gate Driver with Segmented Drive for SiC MOSFETs • GD3162: Advanced High Voltage Isolated Gate Driver with Dynamic Gate Strength Control • S32K1: S32K1 Microcontrollers for Automotive General Purpose • S32K3: S32K3 Microcontrollers for Automotive General Purpose • FS6500: Grade 1 and Grade 0 Safety Power System Basis Chip with CAN Flexible Data Transceiver • FS4500: Grade 1 and Grade 0 Safety Power System Basis Chip with CAN Flexible Data Transceiver • FS23: Safety System Basis Chip (SBC) Family with Power Management, CAN and LIN • FS26: Safety System Basis Chip with Low Power, for ASIL D Systems
Charger	• TJA1042: High-Speed CAN Transceiver with Standby Mode • TJA1052IT: Galvanically-Isolated High-Speed CAN Transceiver • MC56F83xxx: Performance Level Digital Signal Controllers, USB FS OTG, CAN FD • S32K39-37-36: S32K39/37/36 Microcontrollers for Electrification Applications • FS6500: Grade 1 and Grade 0 Safety Power System Basis Chip with CAN Flexible Data Transceiver • FS4500: Grade 1 and Grade 0 Safety Power System Basis Chip with CAN Flexible Data Transceiver • FS23: Safety System Basis Chip (SBC) Family with Power Management, CAN and LIN

	• FS26: Safety System Basis Chip with Low Power, for ASIL D Systems
ABS	• S32K1: S32K1 Microcontrollers for Automotive General Purpose • S32K3: S32K3 Microcontrollers for Automotive General Purpose • FS6500: Grade 1 and Grade 0 Safety Power System Basis Chip with CAN Flexible Data Transceiver • FS4500: Grade 1 and Grade 0 Safety Power System Basis Chip with CAN Flexible Data Transceiver • FS23: Safety System Basis Chip (SBC) Family with Power Management, CAN and LIN • FS26: Safety System Basis Chip with Low Power, for ASIL D Systems • TJA1042: High-Speed CAN Transceiver with Standby Mode • TJA1052IT: Galvanically-Isolated High-Speed CAN Transceiver • SB0400: Two-Wheel Antilock Braking (ABS) Controller for Motorcycles • SB0401: One-Wheel Antilock Braking (ABS) Controller for Scooter / Moped

eBike Low-End Block Diagram

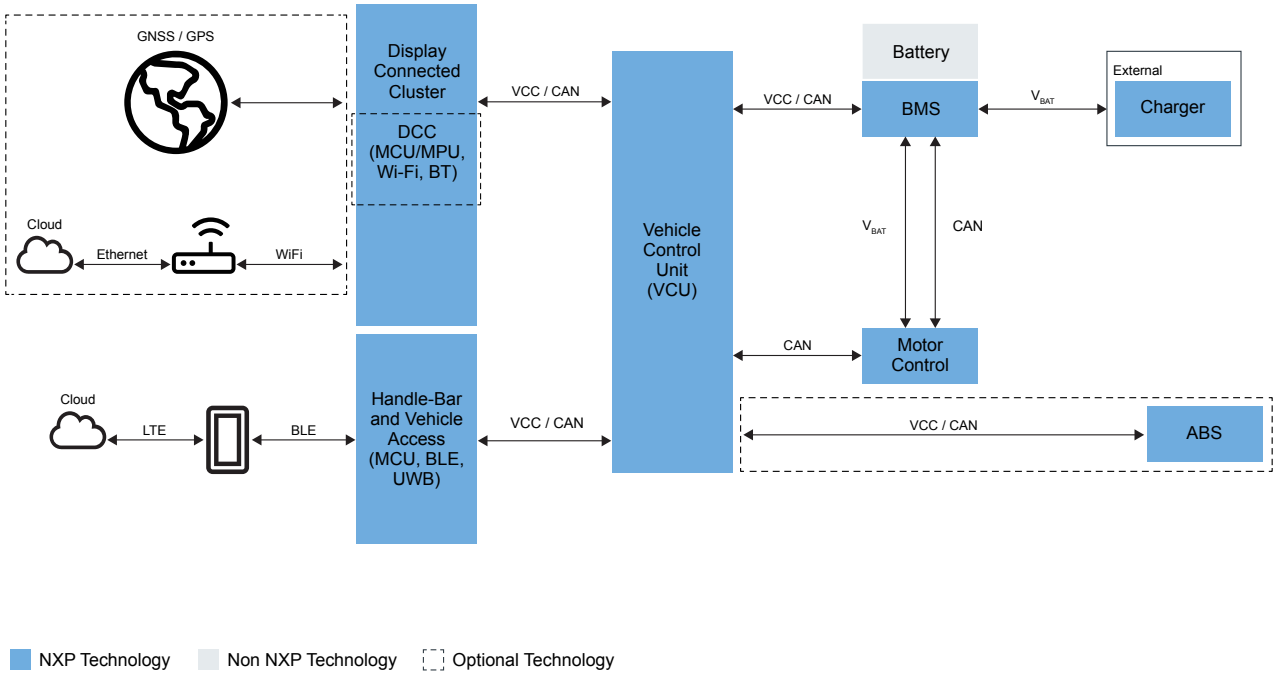


NXP Technology Non NXP Technology Optional Technology

Recommended Products for eBike Low-End

BLE	• KW45: KW45: 32-Bit Bluetooth® 5.3 Long-Range MCUs with CAN FD and LIN Bus Options, Arm® Cortex®-M33 Core • TJA1042: High-Speed CAN Transceiver with Standby Mode • NX5P3090UK: USB PD and Type-C Current-Limited Power Switch • LPC550x: LPC550x/S0x: Baseline Arm® Cortex®-M33-Based Microcontroller Family • MCX A14x/15x MCUs with Arm® Cortex® M33, Scalable Device Options, Low Power and Intelligent Peripherals • i.MX-RT1040: i.MX RT1040 Crossover MCU with Arm® Cortex®-M7 Core Operating Up to 600 MHz and Extended Temperature Range • i.MX-RT1060: i.MX RT1060: Crossover MCU with Arm® Cortex®-M7 • i.MX-RT1170: i.MX RT1170: 1 GHz Crossover MCU with Arm® Cortex® Cores • QN9090-30: QN9090/30: Bluetooth Low-Energy MCU with Arm®Cortex®-M4 CPU, Energy Efficiency, Analog and Digital Peripherals and NFC Tag Option
VCU	• KW45: KW45: 32-Bit Bluetooth® 5.3 Long-Range MCUs with CAN FD and LIN Bus Options, Arm® Cortex®-M33 Core • S32K1: S32K1 Microcontrollers for Automotive General Purpose • MCX-W72X: MCX W72x Secure and Ultra-Low-Power MCUs for Matter, Thread, Zigbee and Bluetooth LE • TJA1042: High-Speed CAN Transceiver with Standby Mode • NX5P3090UK: USB PD and Type-C Current-Limited Power Switch • i.MX-RT1040: i.MX RT1040 Crossover MCU with Arm® Cortex®-M7 Core Operating Up to 600 MHz and Extended Temperature Range • i.MX-RT1060: i.MX RT1060: Crossover MCU with Arm® Cortex®-M7 • QN9090-30: QN9090/30: Bluetooth Low-Energy MCU with Arm®Cortex®-M4 CPU, Energy Efficiency, Analog and Digital Peripherals and NFC Tag Option
BMS	• MC33771C: 14-Channel Li-Ion Battery Cell Controller IC • S32K3: S32K3 Microcontrollers for Automotive General Purpose • FS23: Safety System Basis Chip (SBC) Family with Power Management, CAN and LIN • TJA1042: High-Speed CAN Transceiver with Standby Mode • FXLS8967AF: ±2g/±4g/±8g/±16g, Low Power 12-bit Digital Accelerometer
Smart Charger	• S32K1: S32K1 Microcontrollers for Automotive General Purpose • TEA2017: Digital Configurable LLC and Multimode PFC Controller • TEA2206T: Active Bridge Rectifier Controller • TEA2096: Dual Synchronous Rectifier Controller • TJA1042: High-Speed CAN Transceiver with Standby Mode
Motor Control	• S32K1: S32K1 Microcontrollers for Automotive General Purpose • S32K3: S32K3 Microcontrollers for Automotive General Purpose • MCX-N94X-N54X: MCX N94x/54x Highly Integrated Multicore MCUs with On-Chip Accelerators, Intelligent Peripherals and Advanced Security • TJA1042: High-Speed CAN Transceiver with Standby Mode • HB2002: SPI-Programmable H-Bridge Brushed DC Motor Driver • FS23: Safety System Basis Chip (SBC) Family with Power Management, CAN and LIN • XS2410: Quad 100 mΩ / Dual 50 mΩ, 3.0 V to 60 V High-Side Switch • FXLS8967AF: ±2g/±4g/±8g/±16g, Low Power 12-bit Digital Accelerometer • NMH1000: NMH1000 Ultra-Low Power and Low-Voltage Magnetic Switch

eBike High-End and Mid-Range Block Diagram



Recommended Products for eBike High-End and Mid-Range	
WiFi, BT	• RW610: Wireless MCU with Integrated Radio: 1x1 Wi-Fi® 6 + Bluetooth® Low Energy 5.4 Radios • NX5P3090UK: USB PD and Type-C Current-Limited Power Switch • TJA1042: High-Speed CAN Transceiver with Standby Mode • IW611: 2.4/5#GHz Dual-band 1x1 Wi-Fi® 6 (802.11ax) + Bluetooth® 5.4 Solution • LPC550x: LPC550x/S0x: Baseline Arm® Cortex®-M33-Based Microcontroller Family • MCX A14x/15x MCUs with Arm® Cortex® M33, Scalable Device Options, Low Power and Intelligent Peripherals • i.MX-RT1040: i.MX RT1040 Crossover MCU with Arm® Cortex®-M7 Core Operating Up to 600 MHz and Extended Temperature Range • i.MX-RT1060: i.MX RT1060: Crossover MCU with Arm® Cortex®-M7 • i.MX-RT1170: i.MX RT1170: 1 GHz Crossover MCU with Arm® Cortex® Cores • IMX8MPLUS: i.MX 8M Plus – Arm® Cortex®-A53, Machine Learning, Vision, Multimedia and Industrial IoT • i.MX93: i.MX 93 Applications Processor Family – Arm® Cortex®-A55, ML Acceleration, Power Efficient MPU

ABS	• S32K3: S32K3 Microcontrollers for Automotive General Purpose • TJA1042: High-Speed CAN Transceiver with Standby Mode • SB0401: One-Wheel Antilock Braking (ABS) Controller for Scooter / Moped
Handle Bar Switch	• TJA1042: High-Speed CAN Transceiver with Standby Mode • MCX-W72X: MCX W72x Secure and Ultra-Low-Power MCUs for Matter, Thread, Zigbee and Bluetooth LE • KW45: KW45: 32-Bit Bluetooth® 5.3 Long-Range MCUs with CAN FD and LIN Bus Options, Arm® Cortex®-M33 Core • SR150: Trimension™ SR150: Secure UWB Solution for IoT Devices • SE051W: EdgeLock® SE051W: Secure Element for Secure UWB Ranging in IoT • NCx3320: Automotive-Grade NFC Frontend IC
VCU	• LPC550x: LPC550x/S0x: Baseline Arm® Cortex®-M33-Based Microcontroller Family • S32K3: S32K3 Microcontrollers for Automotive General Purpose • i.MX93: i.MX 93 Applications Processor Family – Arm® Cortex®-A55, ML Acceleration, Power Efficient MPU • S32K1: S32K1 Microcontrollers for Automotive General Purpose • i.MX-RT1170: i.MX RT1170: 1 GHz Crossover MCU with Arm® Cortex® Cores • i.MX8M: i.MX 8M Family - Arm® Cortex®-A53, Cortex-M4, Audio, Voice, Video • TJA1042: High-Speed CAN Transceiver with Standby Mode
Motor Control	• FXLS8967AF: ±2g/±4g/±8g/±16g, Low Power 12-bit Digital Accelerometer • TJA1042: High-Speed CAN Transceiver with Standby Mode • MCX-N94X-N54X: MCX N94x/54x Highly Integrated Multicore MCUs with On-Chip Accelerators, Intelligent Peripherals and Advanced Security • S32K3: S32K3 Microcontrollers for Automotive General Purpose • NMH1000: NMH1000 Ultra-Low Power and Low-Voltage Magnetic Switch • XS2410: Quad 100 mΩ / Dual 50 mΩ, 3.0 V to 60 V High-Side Switch • FS23: Safety System Basis Chip (SBC) Family with Power Management, CAN and LIN • HB2002: SPI-Programmable H-Bridge Brushed DC Motor Driver
BMS	• S32K3: S32K3 Microcontrollers for Automotive General Purpose • FS23: Safety System Basis Chip (SBC) Family with Power Management, CAN and LIN • TJA1042: High-Speed CAN Transceiver with Standby Mode • FXLS8967AF: ±2g/±4g/±8g/±16g, Low Power 12-bit Digital Accelerometer
Charger	• TEA2017: Digital Configurable LLC and Multimode PFC Controller • TEA2206T: Active Bridge Rectifier Controller • TEA2096: Dual Synchronous Rectifier Controller • TJA1042: High-Speed CAN Transceiver with Standby Mode • S32K1: S32K1 Microcontrollers for Automotive General Purpose • LPC550x: LPC550x/S0x: Baseline Arm® Cortex®-M33-Based Microcontroller Family

View our complete solution for Two-Wheelers.

Note: The information on this document is subject to change without notice.