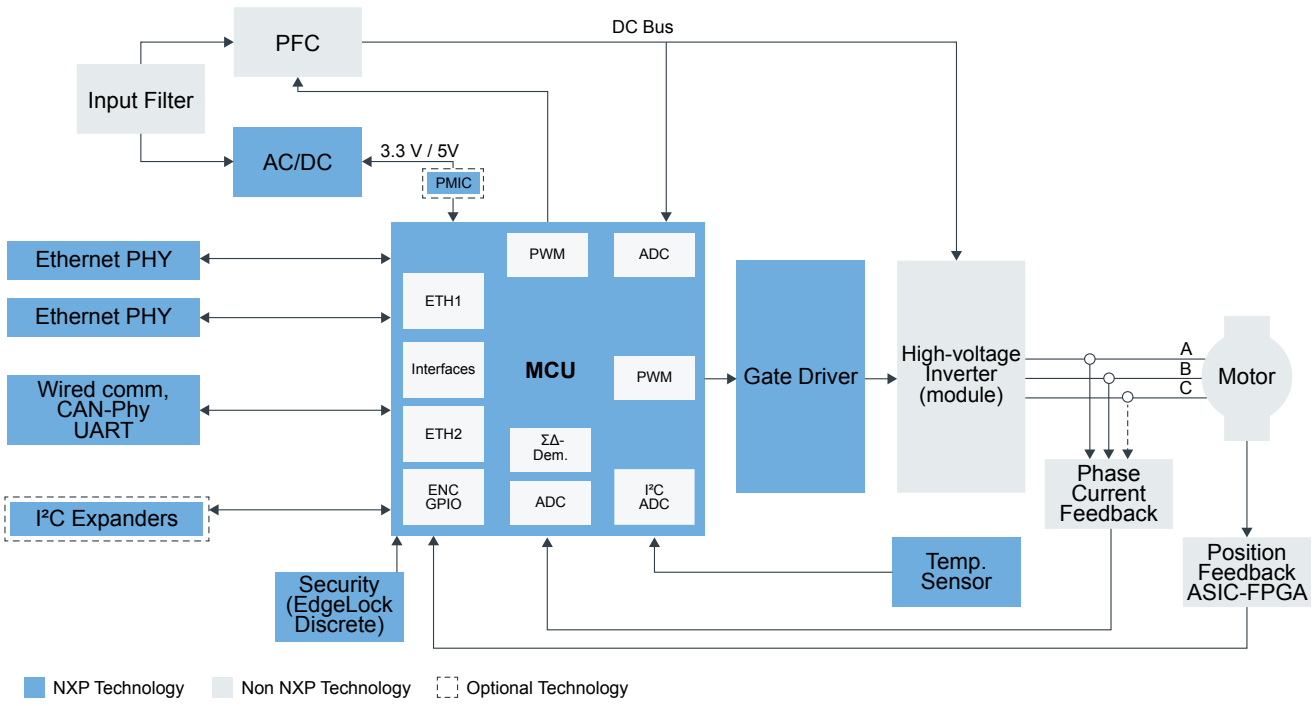
Motor Drives

Last Updated: May 9, 2023

Motor drives precisely control speed and positioning to conserve energy and increase the lifespan of electric motors, which uses a foundation of secure edge processing, high-efficiency power management ICs, RTCs, thermal-efficient power drivers with current monitoring capability, USB and CAN transceivers, and voltage level translators.

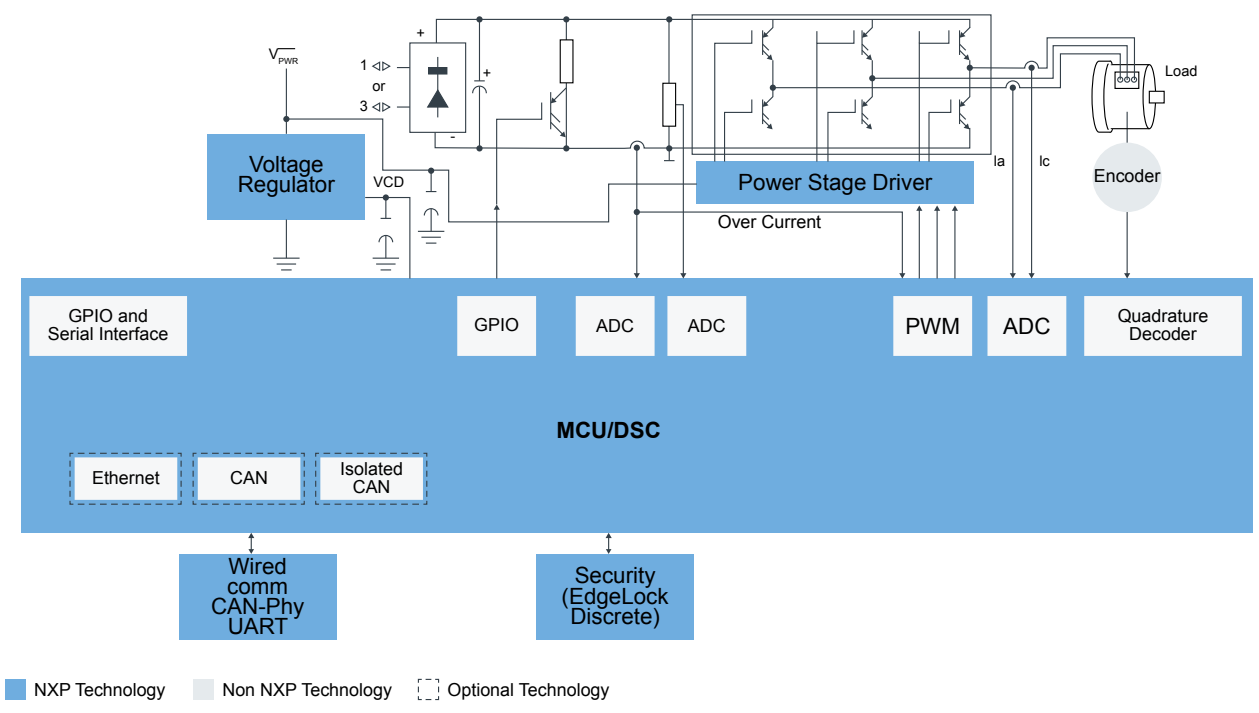
Servo Motor Drive Block Diagram



Recommended Products for Servo Motor Drive	
Microcontroller (MCU)	• MCX-A14X-A15X: MCX A14x/15x MCUs with Arm® Cortex® M33, Scalable Device Options, Low Power and Intelligent Peripherals • MCX-N94X-N54X: MCX N94x/54x Highly Integrated Multicore MCUs with On-Chip Accelerators, Intelligent Peripherals and Advanced Security • i.MX RT Crossover MCUs: i.MX RT Crossover MCUs • MPC5775B-E: MPC5775B and MPC5775E Microcontrollers for Battery Management Systems (BMS) and Inverter Applications
AC/DC	• AC-DC Solutions: AC-DC Solutions • TEA19363LT: GreenChip SMPS Primary Side Control IC with QR/DCM Operation and Active x-Capacitor Discharge
Wired Interfaces	• CAN Transceivers: CAN Transceivers • UARTs: UARTs • I2C, SPI, I3C Interface Devices: I2C, SPI, I3C Interface Devices
I2C Expanders	• I2C-Bus Repeaters/Hubs/Extenders: I2C-Bus Repeaters/Hubs/Extenders • PCAL9722: 22-Bit SPI I/O Expander with Agile I/O Features • PCAL9714: 14-Bit SPI I/O Expander with Agile I/O Features

	• PCAL6416A: Low-Voltage Translating 16-Bit I²C-Bus/SMBus I/O Expander
Gate Driver	• GD3162: Advanced High Voltage Isolated Gate Driver with Dynamic Gate Strength Control • GD3160: Advanced High Voltage Isolated Gate Driver with Segmented Drive for SiC MOSFETs • GD3100: Advanced High Voltage Isolated Gate Driver for IGBT and SiC MOSFETs • GD3000: 3-Phase Brushless Motor Pre-Driver
Temperature sensor	• P3T1035xUK: I3C, I2C-Bus, ±0.5 °C Accuracy, Digital Temperature Sensor • P3T2030xUK: I3C, I2C-Bus, 2.0 °C Accuracy, Digital Temperature Sensor • I3C/I²C Digital Temp. Sensors: I3C/I2C Digital Temperature Sensors • PCT2075: I²C-Bus Fm+, 1 Degree C Accuracy, Digital Temperature Sensor and Thermal Watchdog
PMIC	• PMICs and SBCs: Power Management Integrated Circuits (PMICs) and System Basis Chips (SBCs) • UJA1169ATK: Mini High-Speed CAN System Basis Chip
Ethernet PHY	• Ethernet : Ethernet
Security (EdgeLock Discrete)	• SE050: EdgeLock® SE050: Plug and Trust Secure Element Family – Enhanced IoT security with high flexibility • Authentication: IoT Secure Elements and Authenticators

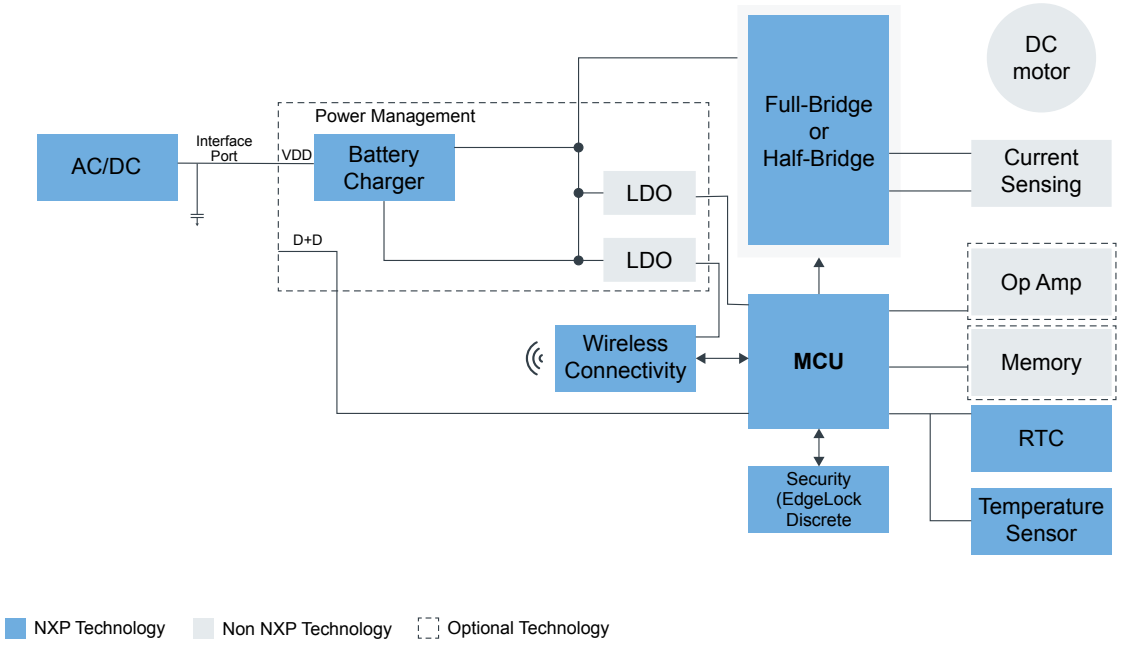
AC and VFD Block Diagram



Recommended Products for AC and VFD	
Controllers (MCU)	• MCX-A14X-A15X: MCX A14x/15x MCUs with Arm® Cortex® M33, Scalable Device Options, Low Power and Intelligent Peripherals • MCX-N94X-N54X: MCX N94x/54x Highly Integrated Multicore MCUs with On-Chip Accelerators, Intelligent Peripherals and Advanced Security • i.MX RT Crossover MCUs: i.MX RT Crossover MCUs • KV Series Arm Cortex-M4/M0+/M7: KV Series: Real-Time Motor Control and Power Conversion MCUs Based on Arm® Cortex®-M0+/M4/M7 • KE Series Arm Cortex-M4/M0+: Kinetis® E Series: 5V, Robust Microcontrollers (MCUs) Based on Arm® Cortex®-M0+/M4 Core

	• LPC553x: LPC553x/S3x: Advanced Analog Arm®Cortex®-M33-Based MCU Family • MCX Arm Cortex-M: MCX Industrial and IoT Microcontrollers • S32K Auto General-Purpose MCUs: S32K Automotive General-Purpose Microcontrollers • Digital Signal Controllers: Digital Signal Controllers
Voltage Regulator	• Power Management: Power Management • PF5020: Multi-Channel (5) PMIC for Automotive Applications – 4 High Power and 1 Low Power, Fit for ASIL B Safety Level • PF1550: PMIC with 1A Li+ Linear Battery Charger for Low Power Processor Systems
Power Stage Driver	• GD3162: Advanced High Voltage Isolated Gate Driver with Dynamic Gate Strength Control • GD3160: Advanced High Voltage Isolated Gate Driver with Segmented Drive for SiC MOSFETs • GD3100: Advanced High Voltage Isolated Gate Driver for IGBT and SiC MOSFETs • GD3000: 3-Phase Brushless Motor Pre-Driver • MC34937: Three Phase Field Effect Transistor Pre-driver
Driver	• GD3162: Advanced High Voltage Isolated Gate Driver with Dynamic Gate Strength Control • GD3160: Advanced High Voltage Isolated Gate Driver with Segmented Drive for SiC MOSFETs • GD3100: Advanced High Voltage Isolated Gate Driver for IGBT and SiC MOSFETs • GD3000: 3-Phase Brushless Motor Pre-Driver
Wired Interfaces	• CAN Transceivers: CAN Transceivers • Ethernet : Ethernet • UARTs: UARTs • I^2C, SPI, I3C Interface Devices: I^2C, SPI, I3C Interface Devices
Security (EdgeLock Discrete)	• SE050: EdgeLock® SE050: Plug and Trust Secure Element Family – Enhanced IoT security with high flexibility

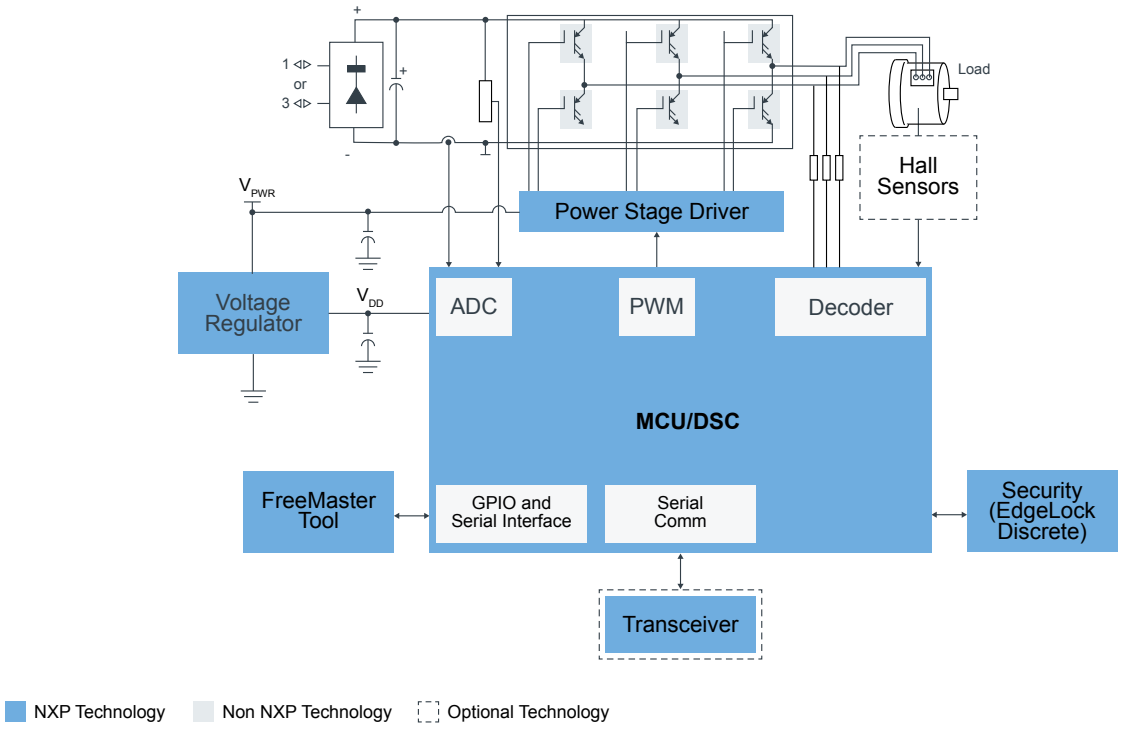
Portable Brushed DC Motor Block Diagram



Recommended Products for Portable Brushed DC Motor	
MCU	• MCX-A14X-A15X: MCX A14x/15x MCUs with Arm® Cortex® M33, Scalable Device Options, Low Power and Intelligent Peripherals • MCX-N94X-N54X: MCX N94x/54x Highly Integrated Multicore MCUs with On-Chip Accelerators, Intelligent Peripherals and Advanced Security

	• KE Series Arm Cortex-M4/M0+: Kinetis® E Series: 5V, Robust Microcontrollers (MCUs) Based on Arm® Cortex®-M0+/ M4 Core • MCX Arm Cortex-M: MCX Industrial and IoT Microcontrollers • LPC800 Arm Cortex-M0+ : LPC800 Series: Low-Cost Arm® Cortex®-M0+-Based MCUs
AC/DC	• AC-DC Solutions: AC-DC Solutions • TEA19363LT: GreenChip SMPS Primary Side Control IC with QR/DCM Operation and Active x-Capacitor Discharge
Battery Charger	• Battery Chargers: Battery Chargers • MC34671: 600 mA Single-Cell Li-Ion / Li-Polymer Battery Charger
Security (EdgeLock Discrete)	• SE050: EdgeLock® SE050: Plug and Trust Secure Element Family – Enhanced IoT security with high flexibility • Authentication: IoT Secure Elements and Authenticators
Temperature Sensor	• P3T1035xUK: I3C, I2C-Bus, ±0.5 °C Accuracy, Digital Temperature Sensor • P3T2030xUK: I3C, I2C-Bus, 2.0 °C Accuracy, Digital Temperature Sensor • I3C/I²C Digital Temp. Sensors: I3C/I2C Digital Temperature Sensors • PCT2075: I²C-Bus Fm+, 1 Degree C Accuracy, Digital Temperature Sensor and Thermal Watchdog
Full-Bridge	• BLDC, H-Bridge, Stepper: BLDC, H-Bridge and Stepper Motor Drivers
Full-Bridge or Half-Bridge	• MC33926: H-Bridge, Brushed DC Motor Driver, 5-28 V, 5 A, 20 kHz • HB2000: SPI Programmable 10 A H-Bridge Brushed DC Motor Driver • BLDC, H-Bridge, Stepper: BLDC, H-Bridge and Stepper Motor Drivers
RTC	• Real-Time Clocks: Real-Time Clocks
Wi-Fi	• Wireless Connectivity: Wireless Connectivity

Brushless DC Motor (BLDC) Control Block Diagram



Recommended Products for Brushless DC Motor (BLDC) Control	
MCU/DSC	• MCX-A14X-A15X: MCX A14x/15x MCUs with Arm® Cortex® M33, Scalable Device Options, Low Power and Intelligent Peripherals • MCX-N94X-N54X: MCX N94x/54x Highly Integrated Multicore MCUs with On-Chip Accelerators, Intelligent Peripherals and Advanced Security • S32M2: S32M2 Integrated Solution for 12V Motor Control • KV Series Arm Cortex-M4/M0+/M7: KV Series: Real-Time Motor Control and Power Conversion MCUs Based on Arm® Cortex®-M0+/M4/M7 • KE Series Arm Cortex-M4/M0+: Kinetis® E Series: 5V, Robust Microcontrollers (MCUs) Based on Arm® Cortex®-M0+/M4 Core • Digital Signal Controllers: Digital Signal Controllers • LPC5500 Arm Cortex-M33: LPC5500 Series: Arm® Cortex®-M33 Based Microcontroller Series for Mass Market, Leveraging 40nm Embedded Flash Technology • MCX Arm Cortex-M: MCX Industrial and IoT Microcontrollers • S32K Auto General-Purpose MCUs: S32K Automotive General-Purpose Microcontrollers
Power Stage Driver	• GD3162: Advanced High Voltage Isolated Gate Driver with Dynamic Gate Strength Control • GD3160: Advanced High Voltage Isolated Gate Driver with Segmented Drive for SiC MOSFETs • GD3100: Advanced High Voltage Isolated Gate Driver for IGBT and SiC MOSFETs • GD3000: 3-Phase Brushless Motor Pre-Driver • MC33937: 3-Phase Field Effect Transistor Pre-Driver
Voltage regulator	• Power Management: Power Management
Software	• FreeMASTER Run-Time Debugging Tool • RTCESL: Real Time Control Embedded Software Motor Control and Power Conversion Libraries • Model-Based Design Toolbox (MBDT)
Transceiver	• CAN Transceivers: CAN Transceivers • CAN with Flexible Data Rate: High Speed CAN with Flexible Data Rate (CAN FD) • CAN Signal Improvement: CAN Signal Improvement Capability (SIC) • Secure CAN Transceivers: Secure TJA115x CAN Transceiver Family

Security (EdgeLock Discrete)	• SE050: EdgeLock® SE050: Plug and Trust Secure Element Family – Enhanced IoT security with high flexibility

View our complete solution for Motor Drives.

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