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
- MPC5775B-E: MPC5775B and MPC5775E Microcontrollers for Battery Management Systems (BMS) and Inverter Applications

**AC/DC**
- AC-DC Solutions
- TEA19363LT: GreenChip SMPS Primary Side Control IC with QR/DCM Operation and Active x-Capacitor Discharge

**Wired Interfaces**
- CAN Transceivers
- UARTs
- I²C, SPI, I3C Interface Devices

**I²C Expanders**
- 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
**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
- LMX RT Crossover MCUs: LMX 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
| **Voltage Regulator** | • **Power Management**: Power Management  
• PFS020: 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  
• \(^2\)C, SPI, I3C Interface Devices: \(^2\)C, 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

![Portable Brushed DC Motor Block Diagram](image)

### 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 |
<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>AC/DC</td>
<td>• AC-DC Solutions: AC-DC Solutions</td>
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<tr>
<td></td>
<td>• TEA19363LT: GreenChip SMPS Primary Side Control IC with QR/DCM Operation and Active x-Capacitor Discharge</td>
</tr>
<tr>
<td>Battery Charger</td>
<td>• Battery Chargers: Battery Chargers</td>
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<tr>
<td></td>
<td>• MC34671: 600 mA Single-Cell Li-Ion / Li-Polymer Battery Charger</td>
</tr>
<tr>
<td>Security (EdgeLock Discrete)</td>
<td>• SE050: EdgeLock® SE050: Plug and Trust Secure Element Family – Enhanced IoT security with high flexibility</td>
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<tr>
<td></td>
<td>• Authentication: IoT Secure Elements and Authenticators</td>
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<tr>
<td>Temperature Sensor</td>
<td>• P3T1035xUK: I3C, I²C-Bus, ±0.5 °C Accuracy, Digital Temperature Sensor</td>
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<td></td>
<td>• P3T2030xUK: I3C, I²C-Bus, 2.0 °C Accuracy, Digital Temperature Sensor</td>
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<td></td>
<td>• I3C/I²C Digital Temp. Sensors: I3C/I²C Digital Temperature Sensors</td>
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<td></td>
<td>• PCT2075: PC-Bus Fn+, 1 Degree C Accuracy, Digital Temperature Sensor and Thermal Watchdog</td>
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<td>Full-Bridge</td>
<td>• BLDC, H-Bridge, Stepper: BLDC, H-Bridge and Stepper Motor Drivers</td>
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<tr>
<td>Full-Bridge or Half-Bridge</td>
<td>• MC33926: H-Bridge, Brushed DC Motor Driver, 5-28 V, 5 A, 20 kHz</td>
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<td></td>
<td>• HB2000: SPI Programmable 10 A H-Bridge Brushed DC Motor Driver</td>
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<tr>
<td></td>
<td>• BLDC, H-Bridge, Stepper: BLDC, H-Bridge and Stepper Motor Drivers</td>
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<tr>
<td>RTC</td>
<td>• Real-Time Clocks: Real-Time Clocks</td>
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<tr>
<td>Wi-Fi</td>
<td>• Wireless Connectivity: Wireless Connectivity</td>
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</tbody>
</table>

**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 Core
- 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
View our complete solution for Motor Drives.

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