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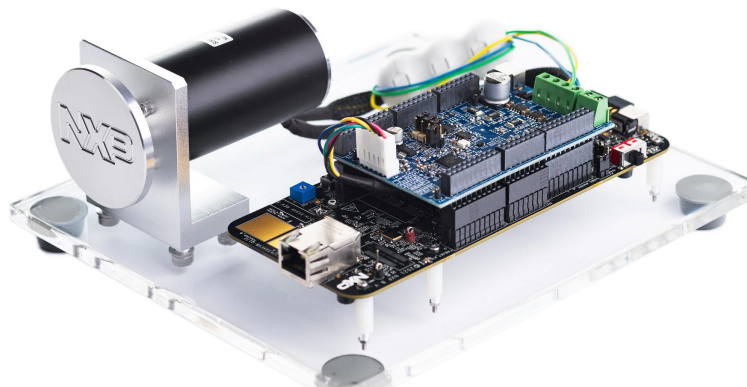
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# S32K344 Brushless Direct Current and Permanent Magnet Synchronous Motor Control Development Kit

MCSPT1AK344 [Receive alerts ⓘ](#)

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The MCSPTE1AK344 is a development kit engineered for Brushless Direct Current (BLDC) motor control, targeting Heating, Ventilation and Air Conditioning (HVAC) or electric pumps, and 3-phase Permanent Magnet Synchronous Motor (PMSM) control, targeting active suspension, electric powertrain, eTurbo or belt start generator.

Based on the 32-bit Arm® Cortex®-M7 S32K3 microcontroller and the GD3000 pre-driver, the MCSPTE1AK344 enables rapid prototyping and evaluation of BLDC and PMSM control applications without having to wait for the final hardware design.

The MCSPTE1AK344 application software leverages the Automotive Math and Motor Control Library (AMMCLib) set plus Real-Time Drivers (RTD) software package to provide a complete reference implementation for both 3-phase BLDC and PMSM motor control.

The RTD software allows building motor control applications for both AUTOSAR® and non-AUTOSAR environments.

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DESIGN FILES SOFTWARE

## Product Details

Select a section:

Block Diagram | Supported Devices | Features | Applications

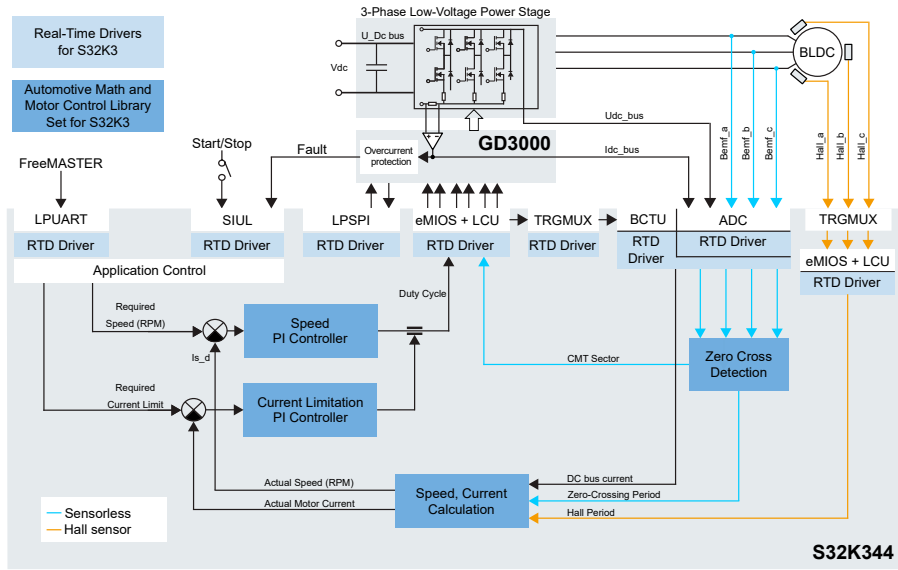
### Block Diagram

Choose a diagram:

MCSPTE1AK344 BLDC DEVELOPMENT KIT MCSPTE1AK344 PMSM DEVELOPMENT KIT

MCSPTE1AK344 BLDC Development Kit

# MCSPT1AK344 BLDC Development Kit



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## Supported Devices

### Power Management

- BLDC, H-Bridge, Stepper
- **GD3000** (/products/power-management/motor-and-solenoid-drivers/bldc-h-bridge-stepper/3-phase-brushless-motor-pre-driver:GD3000): 3-Phase Brushless Motor Pre-Driver

- Safety SBCs
- **FS26** (/products/power-management/pmics-and-sbcs/safety-sbcs/safety-system-basis-chip-with-low-power-fit-for-asil-d:FS26): Safety System Basis Chip with Low Power Fit for ASIL D

### Processors and Microcontrollers

- K2x / KS2x USB
- **K26\_180** (/products/processors-and-microcontrollers/arm-microcontrollers/general-purpose-mcus/k-series-arm-cortex-m4/k2x-ks2x-usb/kinetis-k26-180-mhz-dual-high-speed-full-speed-usbs-2mb-flash-microcontrollers-mcus-based-on-arm-cortex-m4-core:K26\_180): Kinetis® K26-180 MHz, Dual High-Speed & Full-Speed USBs, 2MB Flash Microcontrollers (MCUs) based on Arm® Cortex®-M4 Core

- S32K Auto General-Purpose MCUs
- **S32K3** (/products/processors-and-microcontrollers/s32-automotive-platform/s32k-auto-general-purpose-mcus/s32k3-microcontrollers-for-automotive-general-purpose:S32K3): S32K3 Microcontrollers for Automotive General Purpose

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## Features

### Hardware Features

- S32K3X4EVB-Q172 (/products/no-longer-manufactured/s32k3x4-q172-general-purpose-development-board:S32K3X4EVB-Q172): S32K344 evaluation board with Ethernet, LIN and CAN connectivity support
- DEVKIT-MOTORGD (/design/development-boards/automotive-development-platforms/hardware-tools-accessories/motor-control-shield-for-devkit:DEVKIT-MOTORGD) (integrated motor control shield compatible): up to 12 V/5 A 3-phase power stage board based on SMARTMOS™ GD3000 pre-driver with condition monitoring and fault detection
- Low-Cost PM motor—3-phase PM motor equipped with Hall sensor, 24 VDC, 9000 RPM, 95 W, 42BLY3A78-24110
- USB cable
- 12 VDC power supply

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### Software Features

- Automotive Motor Control Algorithms:
  - Field-oriented control (FOC) with field weakening for sinusoidal motor type (PMSM)
  - Six-step commutation control for trapezoidal motor type (BLDC)
- Automotive Math and Motor Control Library (AMMCLib (/design/development-boards/motor-control-development-solutions/automotive-math-and-motor-control-library-ammclib:AMMCLIB)): Control algorithm built on blocks of precompiled software library

- FreeMASTER (</design/software/development-software/freemaster-run-time-debugging-tool:FREEMASTER>) and Motor Control Application Tuning (MCAT (</design/software/development-software/motor-control-application-tuning-mcat-tool:MCATSW>)) tool: Application tuning and variables tracking at different levels of the control structure
- S32 Design Studio for S32 Platform (</design/software/development-software/s32-design-studio-ide/s32-design-studio-for-s32-platform:S32DS-S32PLATFORM>) IDE and S32K3 Real Time Drivers (</design/automotive-software-and-tools/real-time-drivers-rtd:AUTOMOTIVE-RTD>) (RTD): Example software created in the S32DS built on S32K3 RTD
- Examples built on RTD high-level API (AUTOSAR and non-AUTOSAR applications) or low-level API (non-AUTOSAR)

### Motor Control Capabilities

- Low voltage 3-phase permanent magnet motor (BLDC or PMSM)
- 10 – 18 V, up to 100 W
- Current sensor: Single, dual and triple shunt current sensing
- Position sensor: Hall/encoder/sensorless
- 42BLY3A78-24110: 3-phase BLDC motor, 24 V, 95 W, 9000 rpm, 6 A, 2 pole pairs

### Power supply

- GST60A12-P1J: 12 V, 5A + universal AC plug adapter

### Interfaces

- On-board CAN
- On-board LIN
- On-board Ethernet (RJ45 connector)
- On-board S32K3 debug interface (including serial communication)
- JTAG debug interface

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## Applications

### Automotive

Electric Pumps (</applications/automotive/body-and-comfort/electric-pumps:ELECTRIC-PUMPS>)

Hybrid Electric Vehicle (HEV) Applications (</applications/automotive/powertrain-vehicle-dynamics/electrification/hybrid-electric-vehicle-hev-applications:HEV-APPLICATIONS>)

### Industrial

Brushless DC Motor (BLDC) Control (</applications/industrial/aerospace-and-mobile-robotics/brushless-dc-motor-bldc-control:BRUSHLESS-DC-MOTORS>)

Permanent Magnet Synchronous Motor (PMSM) (</applications/industrial/aerospace-and-mobile-robotics/pmsm:PMSM-MOTORS>)