3 Phase Motor Controller

Features

- Control and drive of a three phase brushless motor (BLDC), a three phase stepper motor or two conventional DC motors.
- Integrated three half bridge driver with a maximum phase current of 600mA (RMS) per each phase. Boost mode up to 1A peak.\(^1\)
- Integrated measurement system for motor current and voltage (phase and supply)
- Monitor and diagnosis features:
  - Under/Over-voltage, over-current, over-temperature
  - Short circuit and open load detection
- Smart supply block for 12V automotive boardnet
  - Configurable low supply voltage (<7V) operation
  - 30µA sleep mode current (25°C typ.)
- Area and power optimized 32bit ARM® Cortex®-M0\(^2\)
  - 32 KByte OTP, 256 Byte customer EEPROM
  - 24 KByte SysROM\(^3\) for LIN protocol and bootloader
- Serial interface for fast end-of-line programming
- Support of external sensor by
  - 5V/20mA supply voltage
  - Data interfaces (analog/digital GPIOs, SPI)
- LIN 2.2 autobaud interface and auto-addressing (compatible to LIN 2.0 and 1.3 and SAE-J2602-2), LIN 2.2 SNPD
- Operating range of -40°C to +150°C junction temperature

General Description

The E523.42 is a highly integrated motor controller for 12V automotive application. The device combines a 32bit ARM® Cortex®-M0 microcontroller and a high-voltage analog motor driver in a small footprint leadless package. This device drives a three phase brushless motor (BLDC), a three phase stepper motor or two conventional DC motors. The combination of a microcontroller and an integrated power stage provides a cost-optimized system for low to medium power actuator and fan applications.

The integrated measurement system provides all input signals to realize a sensorless close loop commutation and provides a complete set of monitor and diagnosis features. For outstanding absolute positioning requirements external sensors are supported by providing supply voltage and various data interfaces (analog/digital GPIOs, SPI).

A serial interface supports fast end-of-line OTP firmware programming. The LIN 2.2 interface with autobaud and auto-addressing functionality enables the integration into existing LIN bus systems.

Ordering Information

<table>
<thead>
<tr>
<th>Ordering-No.:</th>
<th>TempMin</th>
<th>Range</th>
<th>Package</th>
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<tbody>
<tr>
<td>E52342A61C</td>
<td>-40°C</td>
<td>to +125°C</td>
<td>QFN32L5</td>
</tr>
</tbody>
</table>

Applications

- Three motor (BLDC), a three phase stepper motor or two conventional DC motors
- Sensorless motion detection

Typical Application Circuit
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