

Analog and Mixed-Signal Fact Sheet

MC33927

Three-phase field effect transistor pre-driver

Applications

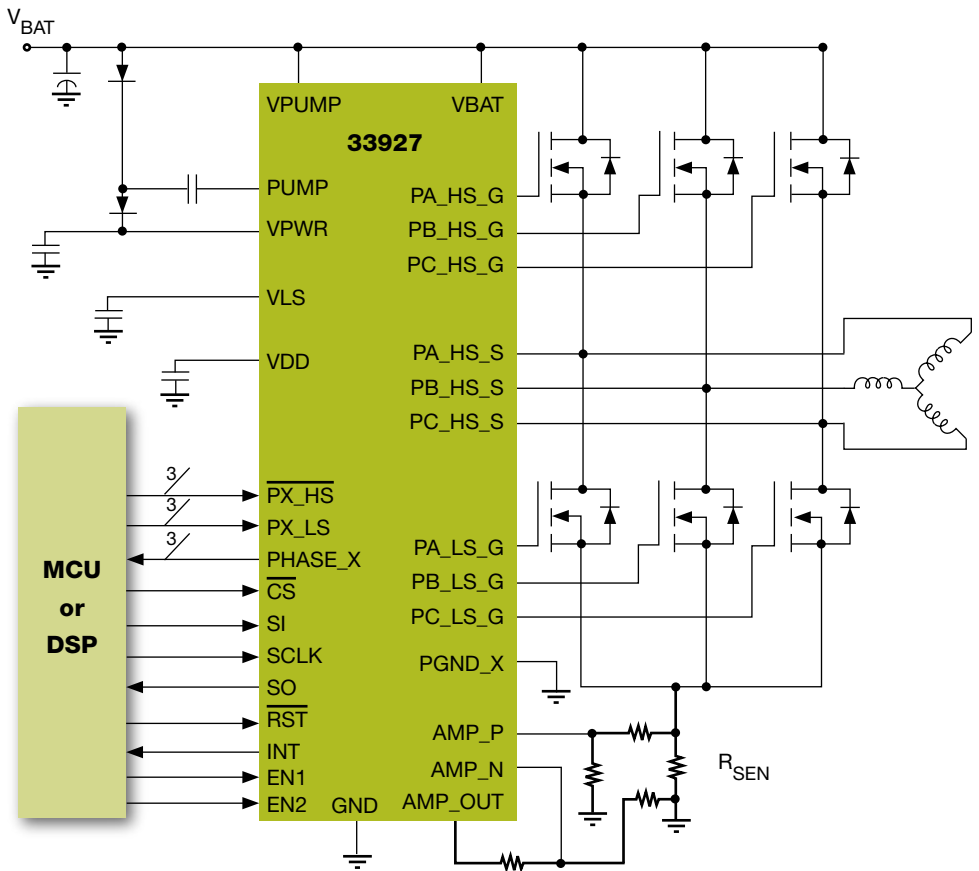
- Automotive systems
- Cooling fan
- Water pump
- Actuator controls
- Fuel pump
- Electro-hydraulic and electric power steering
- Engine control
- Motor control

Overview

Automotive system performance continues to increase significantly. Semiconductor components continue to meet this challenge. The MC33927 device is a field effect transistor (FET) pre-driver designed to drive three-phase motor control configurations with stable digital accuracy. It is easily configured for systems driving brushless DC (BLDC), permanent magnet (PM) or switched reluctance (SR) motors with or without sensors. Typical applications include the cooling fan, water pump, fuel pump, electro-hydraulic and electric power steering.

The MC33927 device is extremely flexible and offers precise and complete control of speed, torque and power. It collects the

Simplified Application Drawing



logic and functions required to control and protect a DC motor with up to three phases. With its flexible configurability, the operation range is from below 6V to over 55V system voltage. The versatile SPI programming interface gives the user fine control of phase timing, programmable protection and detailed diagnostics. No other device is as well suited for fractional to integral horse power motor control and places as much control in the hands of the user.

The IC interfaces to a 5.0V or 3.0V MCU via six direct input control signals, an SPI port for device setup and asynchronous reset, enable and interrupt signals.

Features

- Designed for 8.0V to 40V operation
- Extended operating range from 6.0V to 58V covers 12V, 24V and 42V systems by design
- 1.0A gate drive capability with protection
- Protection against reverse charge injection from C_{GD} and C_{GS} of external FETs
- Charge pump to support full FET drive at low battery voltages
- Programmable dead time via the SPI port
- Simultaneous output capability via safe SPI command

Benefits

- Precise, complete control of speed, torque and power
- Explicit control of each driver
- Ideally suited for microcontroller interfacing
- Increased diagnostic and fault reporting that protect the driver and load
- Highly integrated solution
- Robust solution for harsh environment
- Improved reliability

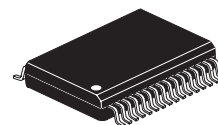
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Orderable Part

Part Number	Temp. Range	Package
MCZ33927EK/R2	-40°C to +125°C	54 SOICW-EP

Parametric Table

Performance	Typical Values
Operating voltage	6.0V to 58V
PWM frequency	DC to ≥ 20 kHz
Gate drive capability	1.0A
Control/communication	SPI and parallel
FET drivers	6



EK suffix (Pb-FREE)
54-pin SOICW-EP
98ASA99334D

Documentation

Document Number	Type	Description
MC33927	Data sheet	Presents the specifications for this product
SG1002	Selector guide	Analog and Power Management device comparison
SG187	Selector guide	Automotive device comparison
AN2409	Application note	Small outline integrated circuit - fine pitch package (SOIC)

Development Tools

Part Number	Description
KIT33927EKEVBE	Evaluation board to demonstrate the key features of MC33927

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