



Analog, Mixed Signal and Power Management

MC33932

Dual 5A Throttle Control H-Bridge Power Integrated Circuit

Overview

The MC33932 is a monolithic H-bridge power IC in a robust thermally enhanced package. The MC33932 has two independent monolithic H-bridge power ICs in the same package. They are designed primarily for automotive electronic throttle controls, but are applicable to low voltage DC servo motor control applications.

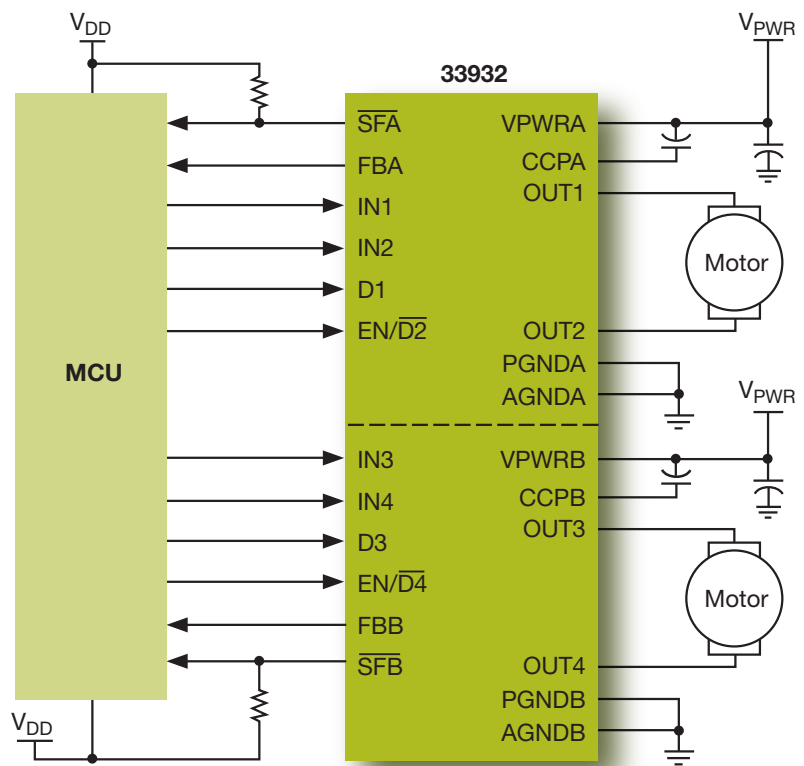
Each H-bridge in the MC33932 is able to control inductive loads with currents up to 5.0 A peak. RMS current capability is subject to the degree of heatsinking provided to the device package. Internal peak-current limiting (regulation) is activated at load currents above $6.5 A \pm 1.5 A$. The MCU can pulse width modulate the load through the MC33932 at frequencies up to 11 kHz. A load current feedback feature provides a proportional (0.24 percent of the load current) current output suitable for monitoring by a microcontroller's A/D input. A Status Flag output reports under-voltage, over-current and over-temperature fault conditions.

Two independent inputs provide polarity control of two half-bridge totem-pole outputs. Two independent disable inputs are provided to force the H-bridge outputs to tri-state (high-impedance off-state).

Applications

- Electronic throttle control
- DC motor control
- Industrial motors and actuators

MC33932 Simplified Application Block Diagram



Features

- 8.0 V to 28 V continuous operation (transient operation from 5.0 V to 40 V)
- 3.0 V and 5.0 V TTL/CMOS logic compatible inputs
- Two independent H-bridge drivers
- Over-current limiting (regulation) via internal constant-off-time PWM
- Output short-circuit protection (short to V_{PWR} or GND)
- Temperature-dependant current-limit threshold reduction
- All inputs have an internal source/sink to define the default (floating input) states
- Sleep mode with current draw < 50 μ A (each half with inputs floating or set to match default logic states)

Benefits

- Robust solution for harsh environments
- Compact, easy-to-use package
- Protected against common failure conditions

Freescale Semiconductor is a leading provider for over 25 years of high-performance products that use SMARTMOS™ technology that combines digital, power and standard analog functions. The company supplies analog and power management ICs for the automotive, consumer, networking and industrial markets. Freescale's analog and power ICs complement our broad portfolio of microcontrollers, microprocessors, ZigBee® technology, digital signal processors, sensors, development tools and support to offer system solutions to customers.

Ordering Information

Part Number	Temp. Ranges (T_A)	Package
MC33932VW	-40 °C to + 125 °C	44-pin HSOP
MC33932EK	-40 °C to + 125 °C	54-pin SOICW-EP

Note: Add R2 Suffix for Tape and Reel

Performance

Parametric	Typical Values
H-bridge outputs	4
Outputs $R_{DS(ON)}$	120 m Ω
PWM	11 KHz
ESD	2 KV
Control/communication	Parallel
Operating voltage	8 V to 28 V

Development Tools

Part Number	Description
KIT33932VWEVBE	Evaluation Kit - 33932VW, Dual 5.0 A Throttle Control H-Bridge
KIT33932EKEVBE *	Evaluation Kit - 33932EK, Dual 5.0 A Throttle Control H-Bridge

* Contact Freescale Sales

Documentation

Document Number	Title	Description
MC33932	5.0 A Throttle Control H-Bridge	Datasheet
SG1002	Analog, Mixed-Signal and Power Management	Selector Guide
SG187	Automotive device comparison	Selector Guide
AN2388	Heatsink Small Outline Package (HSOP)	Application Note
AN2409	Small Outline Integrated Circuit - Fine Pitch Package (SOIC)	Application Note



98ASA99334D
54-PIN SOICW-EP
exposed heatsink



98ARH98330A
44-PIN HSOP
exposed/protruding heatsink

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