freescale Analog

Analog Solutions—Robust Reliable Performance

MC34931

5A H-bridge power integrated circuit

Overview

The MC34931 is a monolithic H-bridge power IC in a robust, thermally enhanced package, one that provides ultra-low thermal resistance. Automatic thermal back-off ensures high availability operation in demanding high-current, high-temperature industrial applications. It is designed primarily for DC brushed and servo motor driver applications.

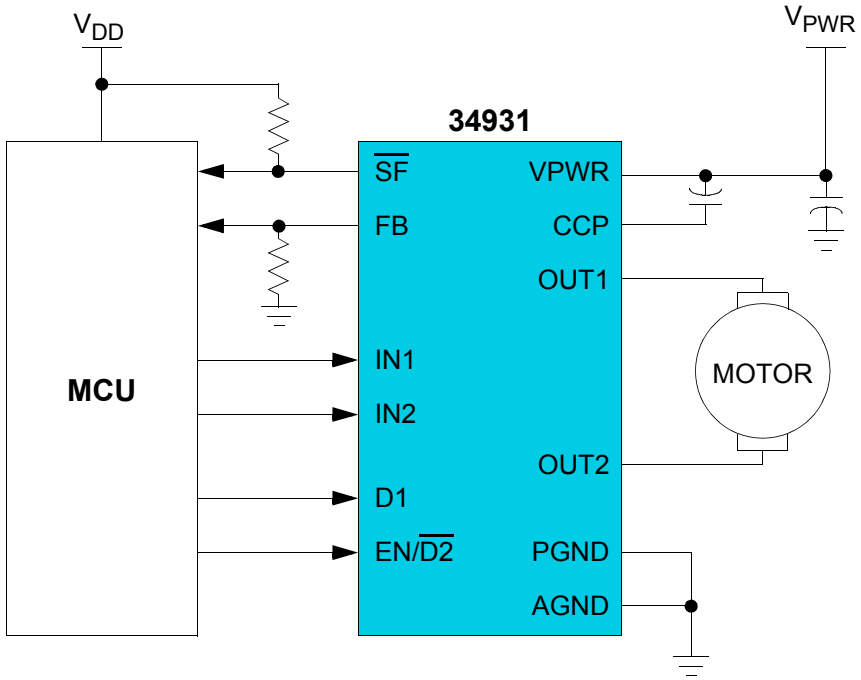
The MC34931 H-bridge is able to control inductive loads with currents up to 5.0 A peak. RMS current capability is subject to the degree of heat sinking provided to the device package. Internal peak-current limiting (regulation) is activated at load currents above 6.5 A ± 1.5 A. The MCU can pulse width modulate the load through the MC34931 at frequencies up to 20 kHz. A load current feedback feature provides a proportional (0.24% 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. The disable inputs are provided to force the H-bridge outputs to tri-state (high-impedance off-state).

Target Applications

- DC motor control
- DC brushed and servo motor driver
- 3D printers
- Factory automation
- POS, ATM, vending kiosks
- Robotics
- Medical pumps and valves
- Ticketing, toll systems

Simplified Applications Drawing



Freescale: A Leader in Analog Solutions

Expanding on more than 30 years of innovation, Freescale is a leading provider of high-performance products that use SMARTMOS technology combining digital, power and standard analog functions. Freescale supplies analog and power management ICs that are advancing the consumer, industrial and networking markets. Analog solutions interface with real-world signals to control and drive complete embedded systems.

32-PIN SOICW-EP
98ARL10543D

Product Differentiation

Features	Benefits
Robust thermally enhanced SOIC package	Choice between smaller footprint or visual fillet inspection
Load current mirroring provides a proportional current output (0.24% of the load current)	Provides feedback to a microcontroller for control or protection
Temperature-dependant current-limit threshold reduction	Maintains operation at reduced current for continuous operation
Automatic maximum current regulation via pre-determined MOSFET shut-off times	Reduces safety and reliability risks
Integrated fault detection and interrupt flag for under-voltage, over-current, and over-temperature	Saves board space over discrete solution
Sleep mode with < 20 µA current draw (each half with inputs floating or set to match default logic states)	Reduces power consumption
3.0 and 5.0 V TTL/CMOS logic compatible inputs	Design flexibility
5.0 to 36 V continuous operation (transient operation from 5.0 to 40 V)	Wide range of applications

Performance

Performance	Typical values
Outputs	2
R_{DSON} at 25 ºC	120 mΩ
Operating voltage	5.0 to 36 V
PMW MC34931EK	11 kHz (max)
PMW MC34931SEK	20 kHz (max)
ESD	±2000 V
Control/communication	Parallel

Documentation

Freescale Document Number	Title	Description
MC34931	5.0 A H-Bridge	Data sheet
SG1002	Analog Product Selector Guide	Selector guide
SG200	Analog and Power Management Industrial Selector Guide	Selector guide
AN2409	Small Outline Integrated Circuit (SOIC)—Fine Pitch Package	Application note

For more information, please visit freescale.com/analog

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