

L99SM81V

Automotive Stepper Motor Driver



Programmable stepper motor driver with microstepping and stall detection for increased efficiency and accuracy

The L99SM81V is an automotive-grade driver IC for two-phase bipolar stepper motors. An internal PWM control module and integrated current-sense circuitry regulate the motor current automatically. The integrated SPI interface offers great flexibility, making it possible for an external microcontroller to adjust device parameters, control operating modes and read out diagnostic information. Various protection mechanisms and full diagnostics are available for higher system reliability.

KEY FEATURES

- Programmable step mode, from full step to 1/16 microstepping
- Fully integrated motor current regulation and decay modes
- Sensorless stall detection
- Integrated 5V voltage regulator with short-circuit protection
- SPI interface and programmable I/Os
- Low quiescent current

KEY BENEFITS

- Smoother motor operation
- Number of external components minimized
- Configurability and flexibility
- Extensive application protection and diagnostics
- Energy efficiency

KEY APPLICATIONS

- Headlight position adjustment
- Head-up displays
- Throttle valve control
- General-purpose stepper motor applications



DEVICE DESCRIPTION

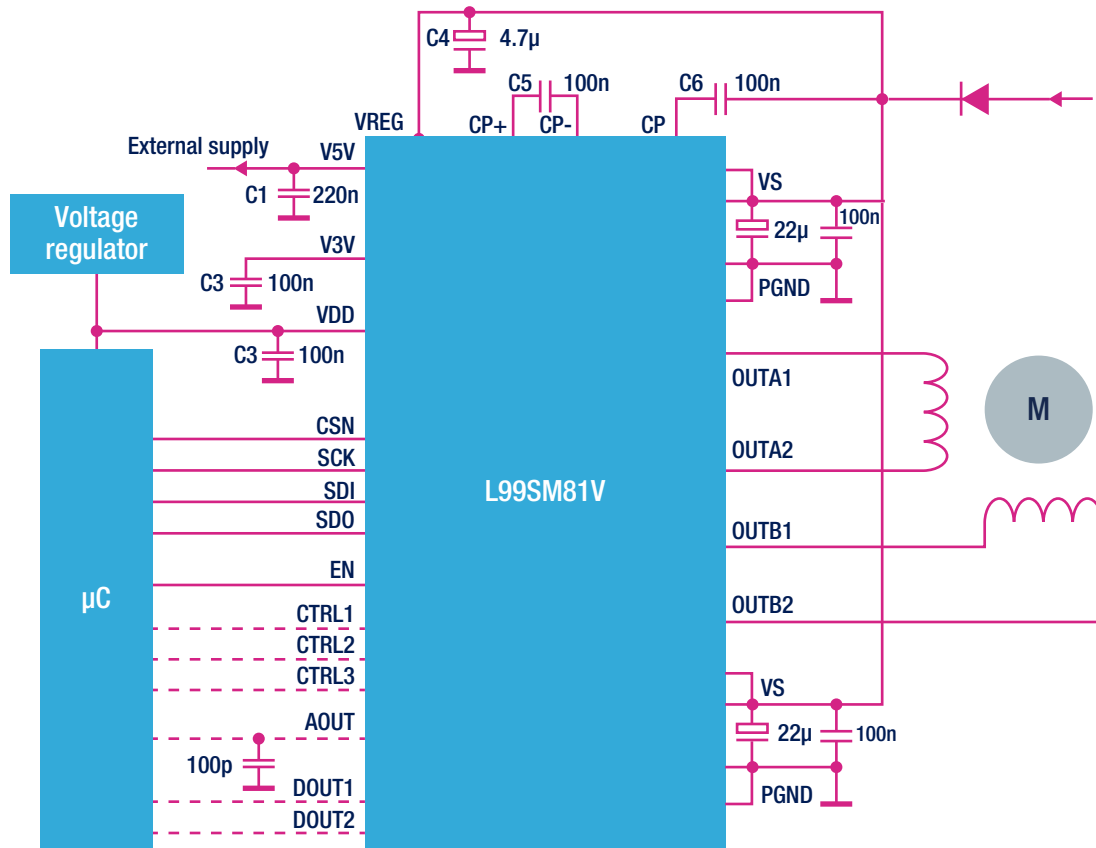
The L99SM81V is a highly flexible solution for driving bipolar stepper motors. A fully integrated PWM control loop regulates the motor current without the need for external components. High-resolution microstepping ensures smoother motor operation. Several device and application parameters can be adjusted via the SPI interface, such as the motor current amplitude, PWM frequency,

step resolution, current decay mode, EMC countermeasures and stall detection algorithm. Moreover, the function of digital I/Os can be programmed for more flexible and reliable application control. Extensive diagnostic information is also available via the SPI.

The integrated 5V regulator (capable of up to 50 mA) can be used to supply external

sensors and is protected against short-circuits. In addition, the integrated charge pump can be used to drive an external MOSFET for reverse-battery protection. The device also features very low quiescent current in order to maximize energy efficiency.

SIMPLIFIED APPLICATION BLOCK DIAGRAM



- - - - Optional connection

PRODUCT TABLE

Part Number	Operating voltage range	Peak output current	Temperature range	PCB	$R_{thj-amb}^*$	Package
L99SM81VQ6TR	6 to 28 V	1.35 A	-40 to +125 °C	36 mm ²	23 °C/W	QFN40L
L99SM81VYTR	6 to 28 V	1.35 A	-40 to +125 °C	105 mm ²	17 °C/W	PowerSS0-36

*Device soldered on a 2s2p thermally enhanced PCB.



© STMicroelectronics - June 2018 - Printed in United Kingdom - All rights reserved
The STMicroelectronics corporate logo is a registered trademark of the STMicroelectronics group of companies
All other names are the property of their respective owners

