



ON Semiconductor®

STR-LV8548MC-GEVB

Test Report



Table of Contents

INTRODUCTION.....	3
Features.....	3
Applications.....	3
Block Diagram.....	4
Board Picture	4
SYSTEM PERFORMANCE.....	5
DC Motor.....	5
Stepper Motor.....	7
Over Current Protection.....	8

Introduction

The STR-LV8548MC-GEVB utilizes two LV8548MC chips to drive a pair of DC motors (only 1 included in kit) and a stepper motor (included in kit). The LV8548MC is a 2-channel, forward/reverse motor driver IC with low saturation voltage. It is optimal for motor drive in 12V system products and can drive either two DC motors, one DC motor using parallel connection, or it can drive a stepper motor in full-step or half-step.

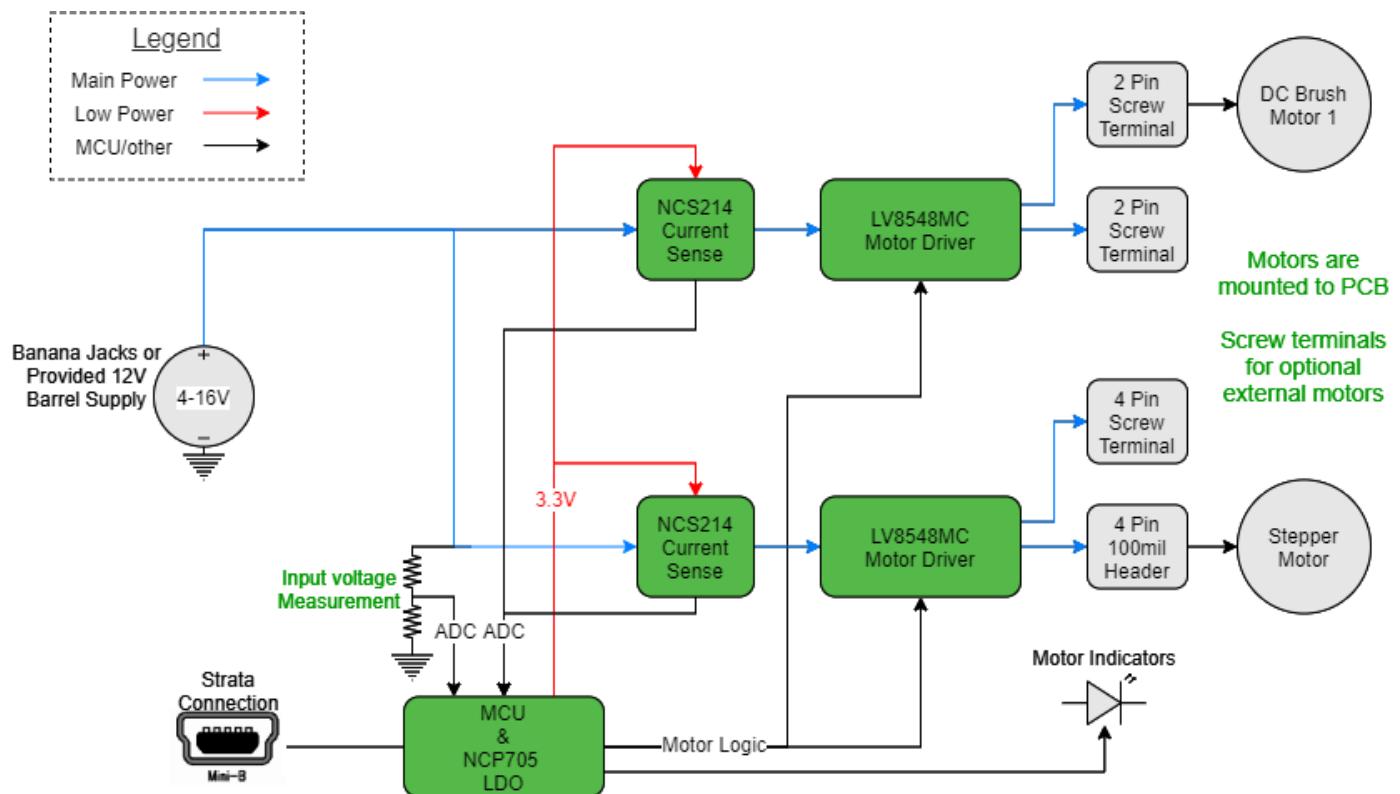
Features

- Input Operating Voltage: 4V to 16V
- Max Input Voltage: 20V
- Max Output Current: 1A
- Standby Current Consumption: 0A
- Integrated Brake

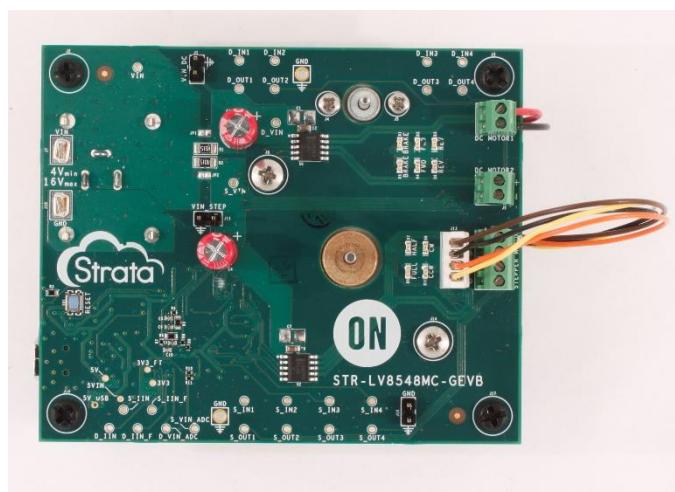
Applications

- In-home Appliances
- Consumer Electronics
- Industrial
- Computing
- Point of Sale

Block Diagram



Board Picture



System Performance

DC Motor

The DC motor controls allow changing direction, PWM mode, and duty cycle. *Start* will run the motor at your current settings, *Brake* will set both motor inputs high, and *Standby* leaves both motor inputs open. The images below show the motor driven forward and reverse in both PWM Modes (on \leftrightarrow off and on \leftrightarrow brake) at a 75% duty cycle. While it is not recommended to change the direction while the motor is running, a short 10ms brake is inserted between the change of direction. This 10 ms braking period is also present when switching between PWM modes.



Figure 1 – DC Motor, Forward, On \leftrightarrow Off , 75% Duty



Figure 2 – DC Motor, Reverse, On \leftrightarrow Off, 75% Duty



Figure 3 – DC Motor, Forward, On↔Brake, 75% Duty



Figure 4 – DC Motor, Reverse, On↔Brake, 75% Duty

Note: Included reference motor cannot start at low duty cycles – approx. 20%.

Stepper Motor

The stepper motor controls allow changing excitation method (full-step and half step), direction (clockwise and counterclockwise), step angle (included motor is 7.5°), motor speed in units of steps per second or rotations per minute, and transfer time in units of seconds, steps, or degrees. *Start* will run the motor at your current settings, *Hold* is enabled automatically when the motor stops running, and *Free* leaves all motor inputs open. The images below show the stepper driven in full-step and half-step excitation methods. **Warning:** Due to holding current, attention must be given to heat generation in the motor.



Figure 5 – Stepper, 4 Steps, Full-step



Figure 6 – Stepper Motor, 8 steps, Half-step

Over Current Protection

A software OCP is enabled by default for this board to trip at 1A and samples the ADC every 50ms. A slight blanking period at the beginning of commands avoids false trips due to inrush current. Figure 7 shows the DC motor responding to an OCP event while running. Figure 8 shows the stepper motor responding to an OCP event with software OCP feature disabled. Note that the stepper motor halts all telemetry during run-time causing the OCP function to pause then restart operation after motor completes its motion.



Figure 7 – Overcurrent Condition with Software OCP Enabled

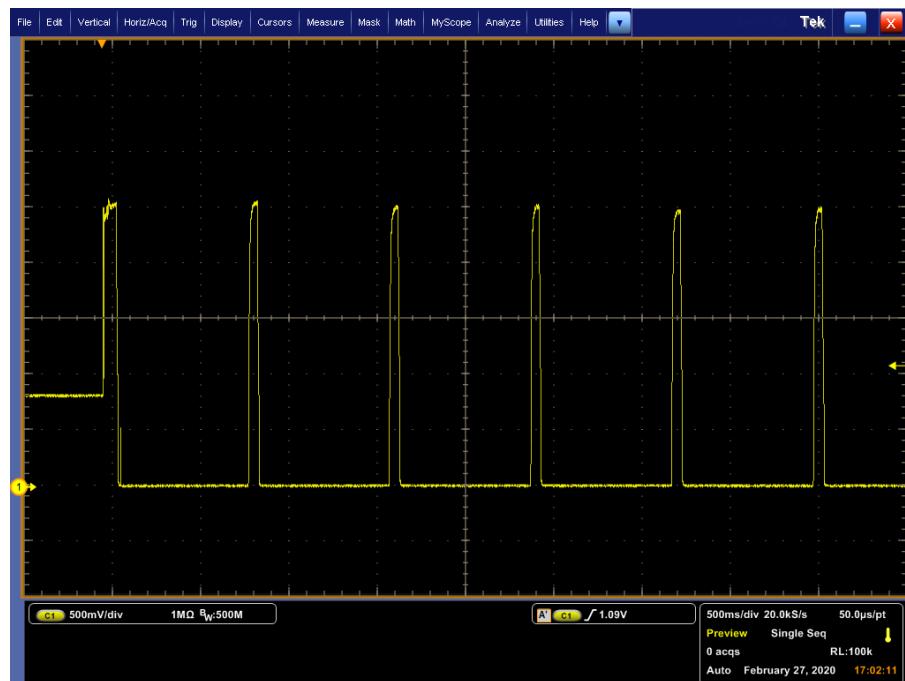


Figure 8 – Overcurrent Condition with Software OCP Disabled

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