AN3094
Application note

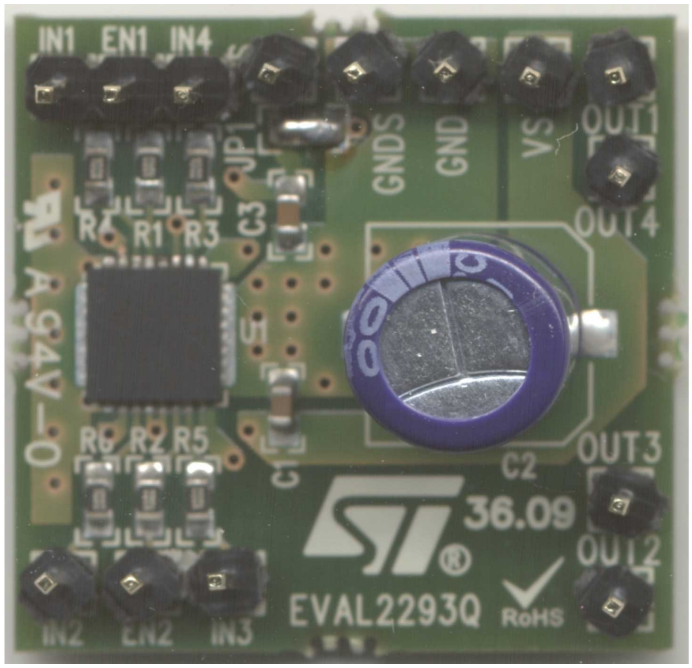
EVAL2293Q demonstration board

Introduction

This application note describes the EVAL2293Q demonstration board for the L2293Q push-pull four channel driver with integrated diodes. The L2293Q is designed to drive inductive loads such as DC and stepping motors, or relays and solenoids. The board implements a typical application which can be used as a reference design to drive two-phase bipolar stepper motors with currents up to 0.6 A DC, multiple DC motors and a wide range of inductive loads.

Housed in a QFN 5 x 5 mm 32-lead package, the small footprint of the L2293Q makes the PCB very compact (24.5 x 24.5 mm).

Figure 1. EVAL2293Q demonstration board



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1 Demonstration board description

Figure 2. L2293Q block diagram

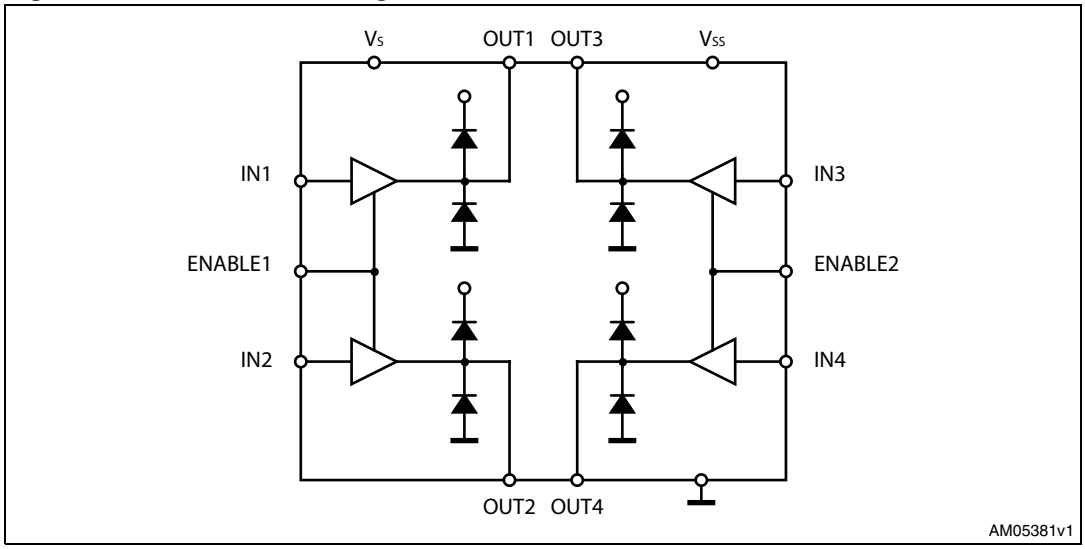
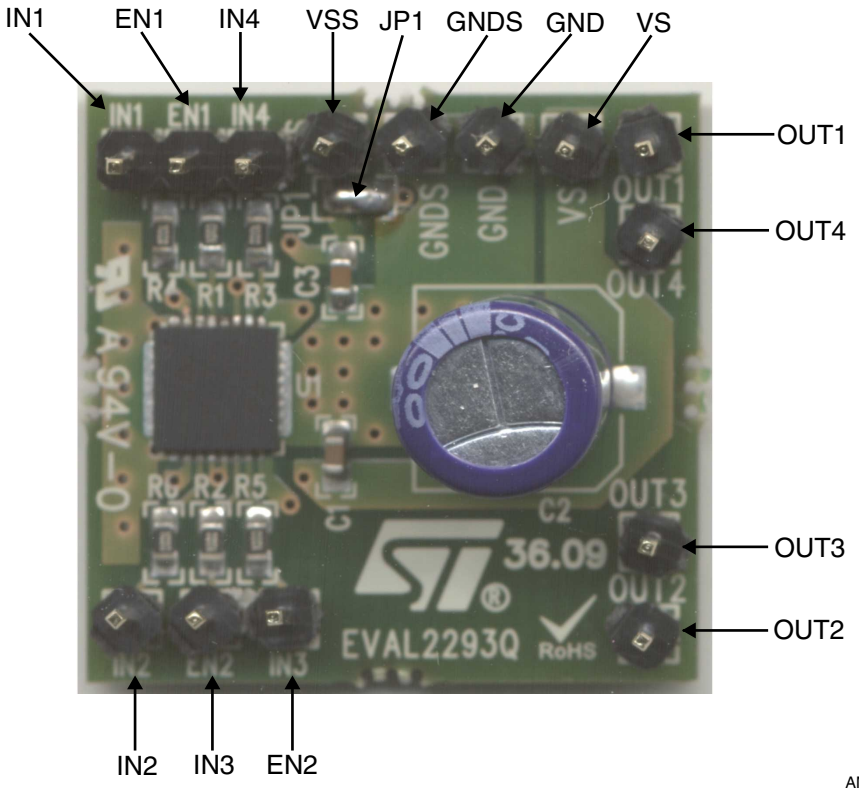


Table 1. EVAL2293Q: pin description

Name	Type	Function
VS	Power supply	Supply voltage for the power output stages
GND	Ground	Power ground terminal
VSS	Power supply	Supply voltage for the logic blocks. It is connected to VS through the closed jumper JP1
GNDS	Ground	Signal ground terminal
IN1	Logic input	Bridge 1 logic input 1
IN2	Logic input	Bridge 1 logic input 2
EN1	Logic input	Bridge 1 enable (active high). When LOW, switches off the output 1 and 2 power transistors
IN3	Logic input	Bridge 2 logic input 1
IN4	Logic input	Bridge 2 logic input 2
EN2	Logic input	Bridge 2 enable (active high). When LOW, switches off the output 3 and 4 power transistors
OUT1	Output	Output 1
OUT2	Output	Output 2
OUT3	Output	Output 3
OUT4	Output	Output 4

Figure 3. EVAL2293Q demonstration board pin location



The logic and power voltage supply pins are connected through jumper JP1 (normally closed). If VS and VSS need to be supplied with different voltage values, JP1 should be opened and the supply to each should be provided separately through external terminals.

The INx input pins drive the corresponding half-bridge. When a low logic level is applied, the low side power switch is turned on, whereas a high logic level turns on the high side switch.

Pins EN1 and EN2 are used to disable the bridges and put the output pins in a high impedance status. The output stages integrate freewheeling diodes.

Table 2 below summarizes the electrical specifications of the application, *Figure 3* shows the electrical schematic and *Table 3* provides the component list.

Table 2. EVAL2293Q: electrical specification (recommended values)

Parameter	Value
Supply voltage range (VS)	VSS to 36 V
Logic supply voltage range (VSS)	2.8 (1) to 36 V
RMS output current rating (OUTx)	Up to 0.6 A
Switching frequency	Up to 50 kHz
Input and enable voltage range	0 to +5 V
Operating temperature range	-20 (1) to +125 °C
L2293Q thermal resistance junction-to-ambient	42 °C/W

1. Please refer to the L2293Q datasheet for additional details

Figure 4. EVAL2293Q demonstration board electrical schematic

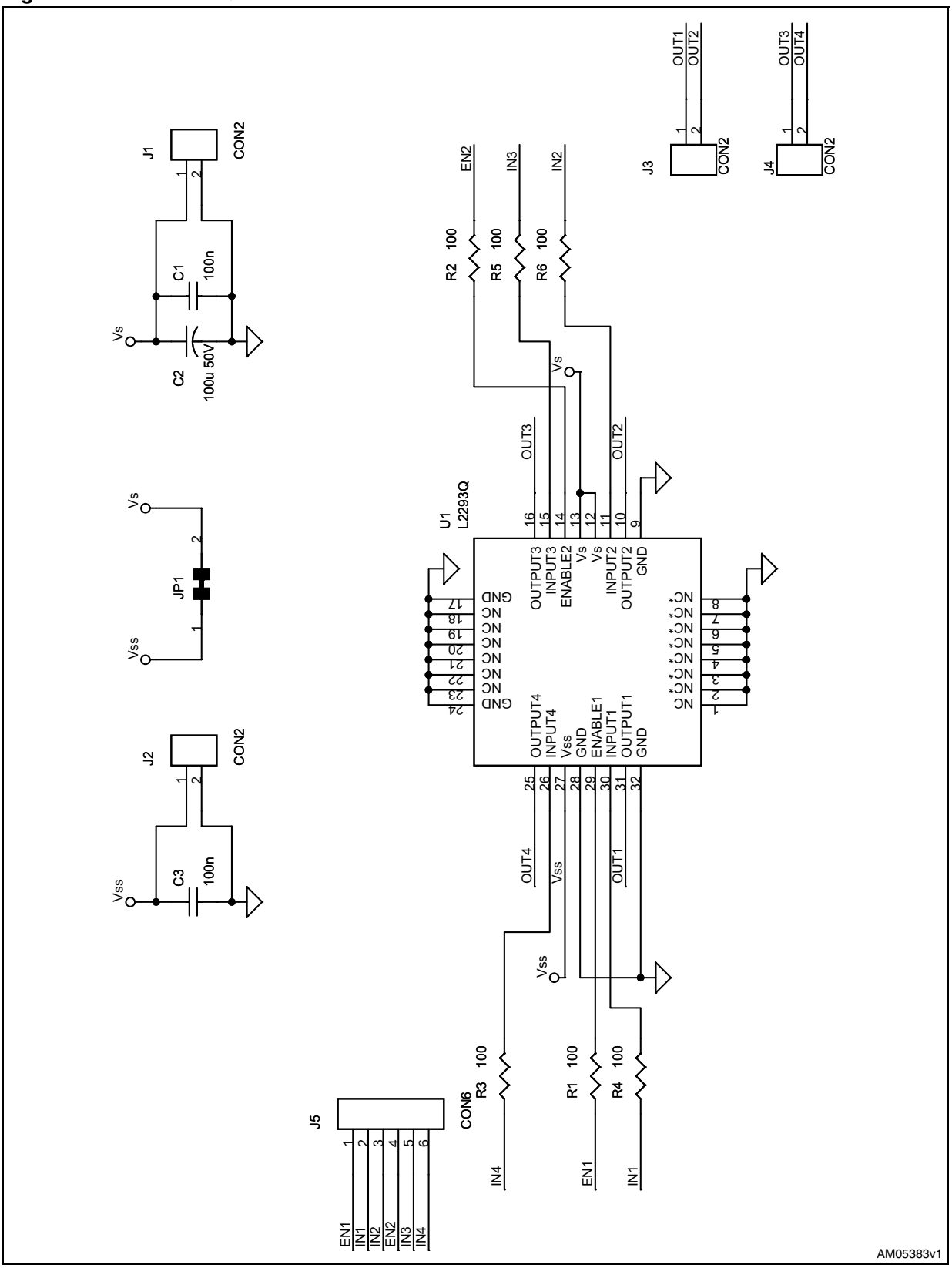


Table 3. EVAL2293Q component list

Reference	Value	Description
C1, C3	100 nF/50 V	Capacitor
C2	100 µF/50 V	Capacitor
R1, R2, R3, R4, R5, R6	100 Ω	Resistor
U1	L2293Q	Dual full bridge in VFQFPN5x5 package

Figure 5. EVAL2293Q component placement

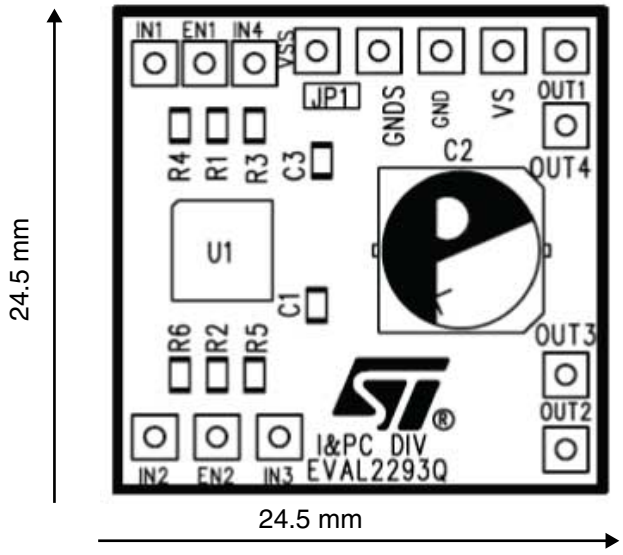


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Figure 6. EVAL2293Q top layer layout

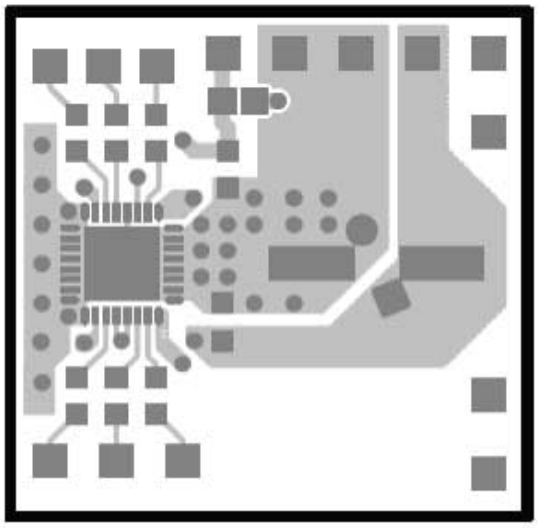

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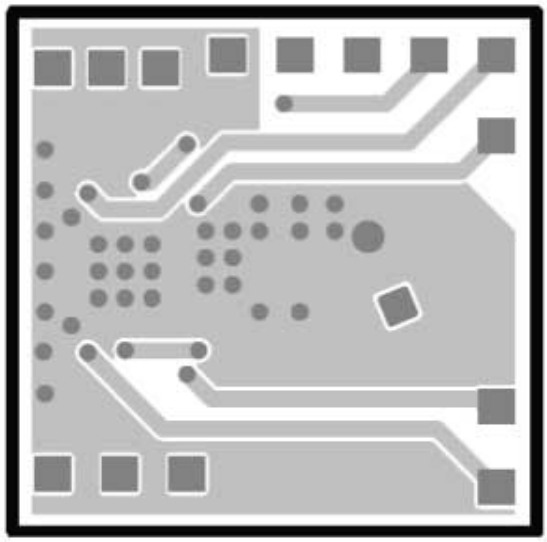
Figure 7. EVAL2293Q bottom layer layout



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2 Revision history

Table 4. Document revision history

Date	Revision	Changes
06-May-2010	1	Initial release.