L293D Motor Driver

Tested By
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High Level

Motor A Truth Table

Inputs			Outputs	
Pin 1 (EN)	Pin 2 (Controls pin 3 state)	Pin 7 (Controls pin 6 state)	Pin 3 (MotorA+ Pin)	Pin 6 (MotorA- Pin)
OFF	OFF	OFF	HIGH Z	HIGH Z
OFF	OFF	ON	HIGH Z	HIGH Z
OFF	ON	OFF	HIGH Z	HIGH Z
OFF	ON	ON	HIGH Z	HIGH Z
ON	OFF	OFF	OFF	OFF
ON	OFF	ON	OFF	ON
ON	ON	OFF	ON	OFF
ON	ON	ON	ON	ON

Motor B Truth Table

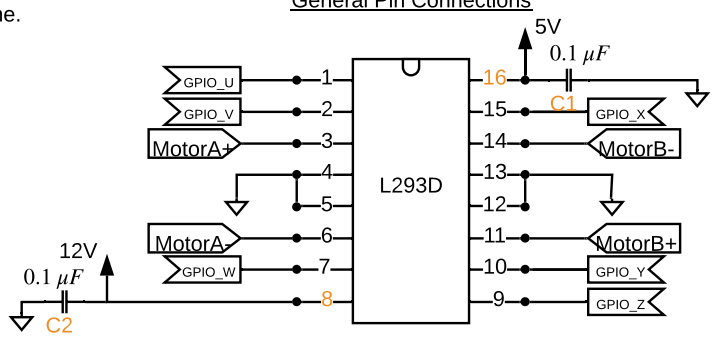
Inputs			Outputs	
Pin 9 (EN)	Pin 10 (Controls pin 11 state)	Pin 15 (Controls pin 14 state)	Pin 14 (MotorB+ Pin)	Pin 11 (MotorB- Pin)
OFF	OFF	OFF	HIGH Z	HIGH Z
OFF	OFF	ON	HIGH Z	HIGH Z
OFF	ON	OFF	HIGH Z	HIGH Z
OFF	ON	ON	HIGH Z	HIGH Z
ON	OFF	OFF	OFF	OFF
ON	OFF	ON	OFF	ON
ON	ON	OFF	ON	OFF
ON	ON	ON	ON	ON

Confirm direction of motor spin after wiring.

Low Level

Back emf is handled in driver.
Motor A and motor B can work at the same time.

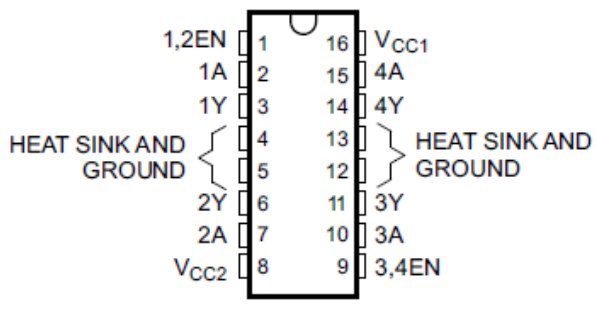
General Pin Connections



C1 and C2 AC bypass caps should be placed as close as possible to IC pins 8 and 16 respectively.
Pin 16 must be at 5V (Internal logic voltage).
Pin 8 must not exceed 36V.
600 mA current MAX per motor (both motors can be on at 600mA for a max of 1.2 A).

5 Pin Configuration and Functions

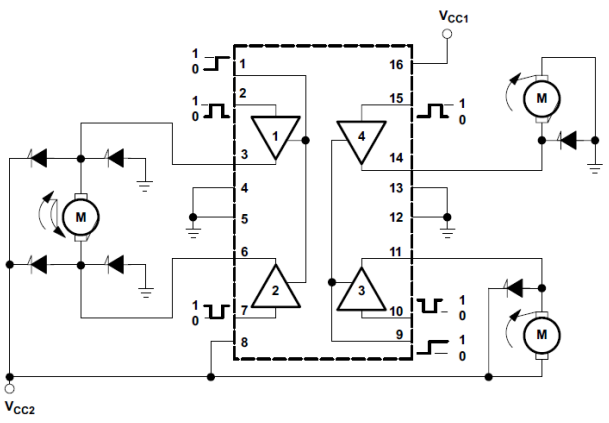
NE Package
16-Pin PDIP
Top View



Pin Functions

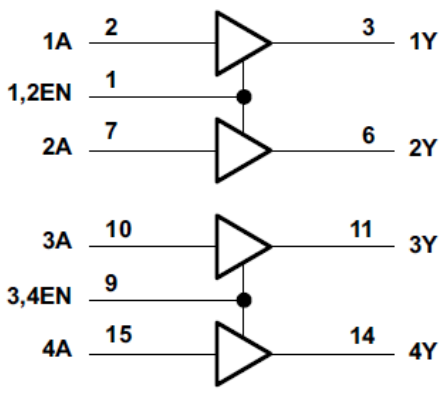
PIN		TYPE	DESCRIPTION
NAME	NO.		
1,2EN	1	I	Enable driver channels 1 and 2 (active high input)
<1:4>A	2, 7, 10, 15	I	Driver inputs, noninverting
<1:4>Y	3, 6, 11, 14	O	Driver outputs
3,4EN	9	I	Enable driver channels 3 and 4 (active high input)
GROUND	4, 5, 12, 13	—	Device ground and heat sink pin. Connect to printed-circuit-board ground plane with multiple solid vias
V_{CC1}	16	—	5-V supply for internal logic translation
V_{CC2}	8	—	Power VCC for drivers 4.5 V to 36 V

8.2 Functional Block Diagram



Output diodes are internal in L293D.

Logic Diagram



6.1 Absolute Maximum Ratings

over operating free-air temperature range (unless otherwise noted)(1)

	MIN	MAX	UNIT
Supply voltage, V_{CC1} (2)		36	V
Output supply voltage, V_{CC2}		36	V
Input voltage, V_I		7	V
Output voltage, V_O	–3	V_{CC2} + 3	V
Peak output current, I_O (nonrepetitive, t ≤ 5 ms): L293	–2	2	A
Peak output current, I_O (nonrepetitive, t ≤ 100 µs): L293D	–1.2	1.2	A
Continuous output current, I_O: L293	–1	1	A
Continuous output current, I_O: L293D	–600	600	mA
Maximum junction temperature, T_J		150	°C
Storage temperature, T_{stg}	–65	150	°C

(1) Stresses beyond those listed under *Absolute Maximum Ratings* may cause permanent damage to the device. These are stress ratings only, which do not imply functional operation of the device at these or any other conditions beyond those indicated under *Recommended Operating Conditions*. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
(2) All voltage values are with respect to the network ground terminal.

6.3 Recommended Operating Conditions

over operating free-air temperature range (unless otherwise noted)

			MIN	NOM	MAX	UNIT
	Supply voltage	V_{CC1}	4.5		7	V
		V_{CC2}	V_{CC1}		36	
V_{IH}	High-level input voltage	V_{CC1} ≤ 7 V	2.3		V_{CC1}	V
		V_{CC1} ≥ 7 V	2.3		7	V
V_{IL}	Low-level output voltage		–0.3(1)		1.5	V
T_A	Operating free-air temperature		0		70	°C

(1) The algebraic convention, in which the least positive (most negative) designated minimum, is used in this data sheet for logic voltage levels.