DESCRIPTION

The AD8815 is one channel H-Bridge driver IC, it provides integrated motor-driver solution for toys, robotics, consumer products and other low voltage or battery-powered motion control applications.

The AD8815 maximum operational voltage is 25.0V. It can supply up to 1.5A of output continuous current and 3.5A of output peak current. There is internal shutdown function for over-temperature protection and over-current protection (I_{OCP} = 4.5 A).

Package material is Pb-Free Product & RoHS compliant for the purpose of environmental protection and for sustainable development of the earth.

The AD8815 is available in SOP8 Package.

ORDERING INFORMATION

Package Type	Part Number	
SOP8 SPQ: 4,000psc/Reel	M8	AD8815M8R
		AD8815M8VR
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products		

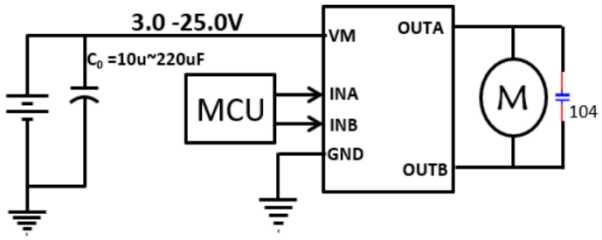
FEATURES

- Operating Voltage Range up to 25V
- Maximum Continuous Current Output up to 1.5A
- Low $RDS_{(ON)}$ for Highly Efficient H-Bridge Output.
- Support PWM Control
- Over Current Protection
- Over Temperature Protection
- Low Standby Current
- Low Quiescent Current
- Available in SOP8 Package

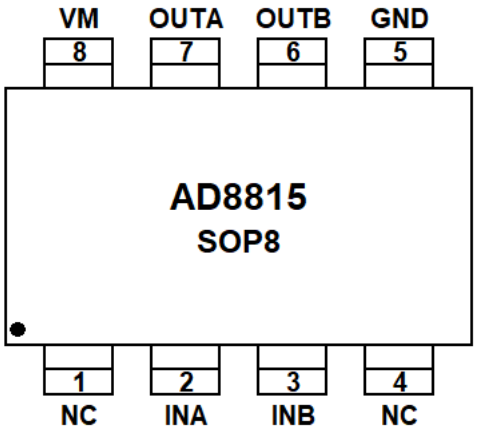
APPLICATION

- Robotics (R/C servo, Sweeping robot)
- Toys (R/C car, R/C aircraft)
- Any relevant DC motor applications

TYPICAL APPLICATION



PIN DESCRIPTION



SOP8, M8

Top View

Pin #	Symbol	Type	Function
1	NC	NC	No Connection
2	INA	I	Input INA
3	INB	I	Input INB
4	NC	NC	No Connection
5	GND	P	Ground
6	OUTB	O	Output OUTB
7	OUTA	O	Output OUTA，Connection 0.1uF between OUTA and OUTB
8	VM	P	Power Supply for H-Bridge，Connection 10uF or bigger capacitor between VDD and GND

ABSOLUTE MAXIMUM RATINGS

T_A = 25°C, unless otherwise specified.

Parameter	Symbol	Min	Max	Unit
Power Supply	VM	-0.30	30	V
Input Logic	INA, INB	-0.30	7	V
ESD (HBM)	VM, IN1, IN2, OUTA, OUTB	4	-	kV
Operation Temp.	T_J	-40	150	℃
Storage Temp.	T_{stg}	-65	150	℃
Thermal Resistance	θ_{JA}	-	160	℃/W
Recommended Operating Conditions				
Power Supply	VM	3	25	V
Input Logic	INA, INB	0	5	V
Output Contiguous Current *	I_{OUTA}, I_{OUTB}	0	1.50	A

Stress beyond above listed “Absolute Maximum Ratings” may lead permanent damage to the device. These are stress ratings only and operations of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

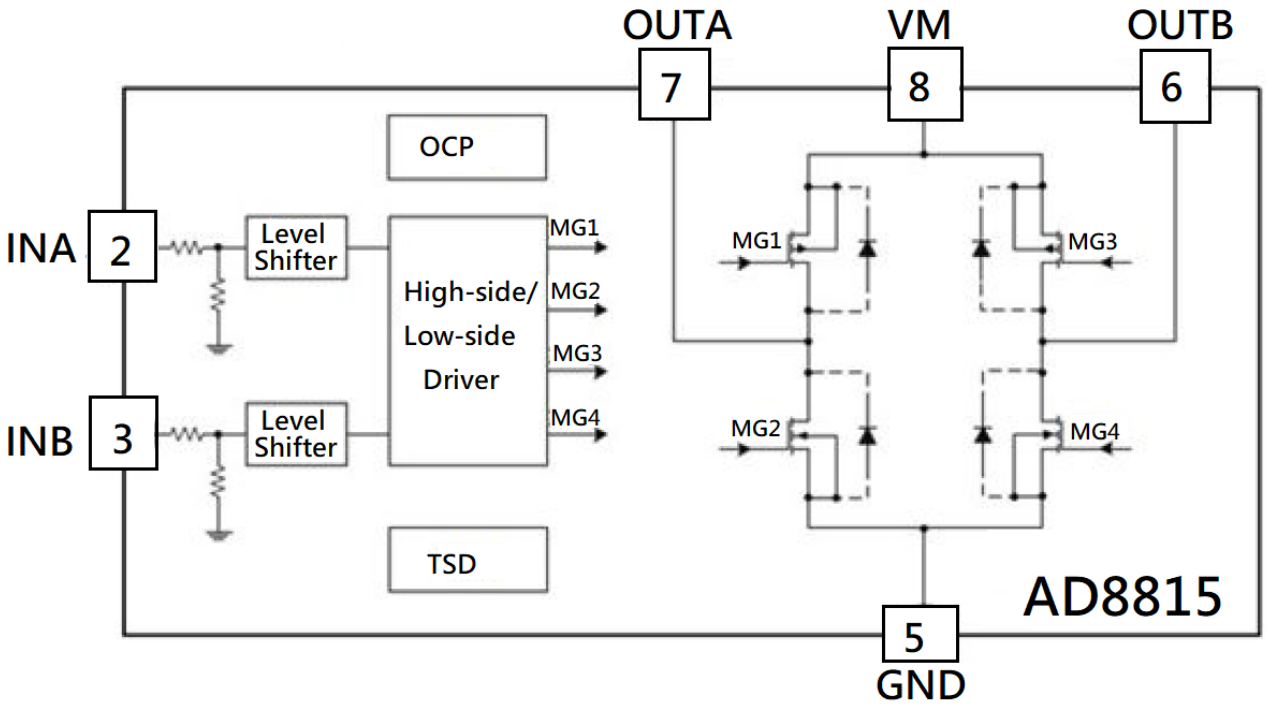
* Using 25mm^2 FR4 Signal layer PCB (1 oz) under VM=7.2V test.

ELECTRICAL CHARACTERISTICS

V_M=7.20V, T_A=25°C, R_{LOAD}=20, unless otherwise noted

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
H-BRIDGE FETS						
On Resistance	R_{DSON}	I_{OUT}=1A	-	0.35	-	Ω
INA / INB						
Input High Level Voltage	V_{INH}	-	1.50	-	5	V
Input Low Level Voltage	V_{INL}	-	0	-	0.70	V
Pulldown Resistance	R_{PD}	-	-	100	200	KΩ
SUPPLY CURRENT						
Standby Current	I_{VM_OFF}	INA=INB=0	-	1.50	10	uA
Operation Current	I_{VM_ON}	-	-	2	4	mA
THERMAL PROTECTION						
Thermal Shutdown Protection	T_{OTSD}	-	-	160	-	℃
Thermal Shutdown hysteresis	T_{HYS}	-	-	50	-	

BLOCK DIAGRAM

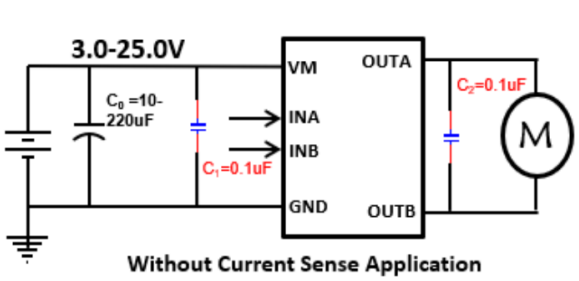


Input-Output Logical Tables

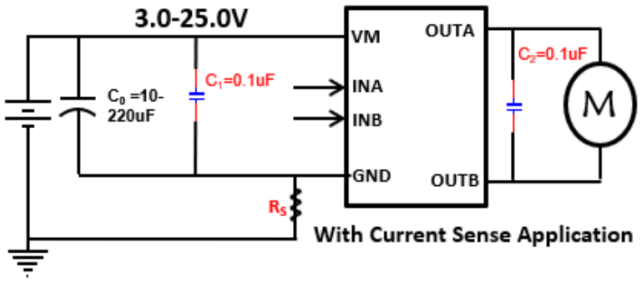
IN1	IN2	OUT1	OUT2	Function	Current
L	L	Hi-Z	Hi-Z	Stop	I_{VM_OFF}
H	L	H	L	Forward	I_{VM_ON}
L	H	L	H	Reverse	I_{VM_ON}
H	H	L	L	Brake	I_{VM_ON}

DETAILED INFORMATION

Typical Application



Without Current Sense Application



With Current Sense Application

1. This simplified schematic is only as reference in DC motor driver application.
2. C0，C1: Power supply VM pin capacitor:
   1) The capacitor can reduce the power spike when the motor is in motion. To avoid the IC directly damaged by the VM peak voltage. It also can stabilize the power supply voltage and reduce its ripples.
   2) The C0 capacitor can compensate power when motor starts running.
   3) The capacitor value determines the stability of the VM during motor in motion. If the large voltage power or a heavy loading motor is used, then a larger capacitor would be needed.
   4) On the PCB configuration, the C0，C1 must be mounted as close as possible to VM pin .
3. C2：The across-motor capacitor
   1) The C2 capacitors can reduce the power spike of motor in start running. A 0.1μF capacitor is recommended.
   2) The C2 capacitor must be added to the general application.
4. RS： The sense resistor in current sense application
   1) Need to sense output current, the RS is recommended to added between IC GND and PCB ground.
   2) The C0, C1 negative terminal is recommend connection to IC GND.

Operating Mode Descriptions

H-Bridge basic operating mode：

A) Stop mode

Definition：When INA=INB= L, then OUTA=OUTB=Hi-Z

B) Forward mode

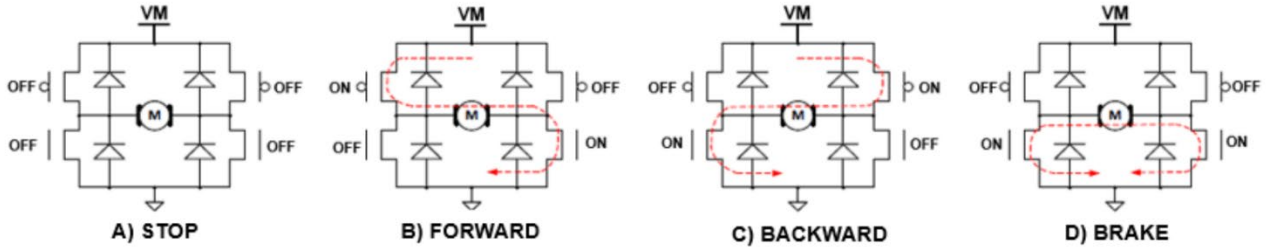
Definition：When INA=H, INB=L, then OUTA=H, OUTB=L

C) Reverse mode

Definition：When INA=L, INB=H, then OUTB=H, OUTA=L

D) Brake mode

Definition：When INA=INB= H，then OUTA=OUTB=L



Protection Mechanisms Descriptions

1) Over-current protection (OCP)

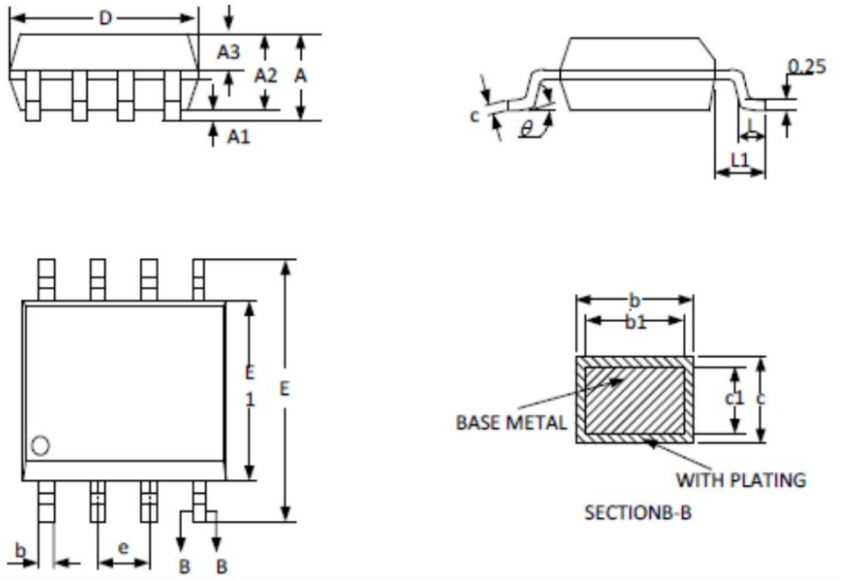
While the IC conducts a large current, 4.5A (Typ.), the internal over-current protection function will be triggered. The device enters protection mode of auto-recover to avoid damaging IC and system.

2) Over-temperature protection

If the IC junction temperature exceeds 180 °C (Typ.), the internal over-temperature protection function will be triggered, partial FETs in the H-bridge are disabled, that will ensure the safety of customers' products. If the IC junction temperature falls to 120 °C(Typ.), the IC resumes automatically.

PACKAGE INFORMATION

Dimension in SOP8 (Unit: mm)



Symbol	Min.	Max.
A	-	1.770
A1	0.080	0.280
A2	1.200	1.600
A3	0.550	0.750
b	0.390	0.480
b1	0.380	0.430
c	0.210	0.260
c1	0.190	0.210
D	4.700	5.100
E	5.800	6.200
E1	3.700	4.100
e	1.270 BSC.	
L	0.500	0.800
L1	1.050 BSC.	
θ	0°	8°

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