Electronic Blood Pressure Monitor Drive Circuit

Description

The HY607 is an integrated driving solution designed for electronic blood pressure monitors, low-voltage relays, and other motion control applications powered by low voltage. This circuit integrates two ground-connected NMOS power transistors and flyback diodes, capable of driving two unidirectional motors, solenoid valves, and relays.

It integrates highly reliable power switching transistors and operates within a VCC voltage range of 1.0 to 9.0V.

The two channels are designed with different current driving capabilities: Channel 1 has a driving capacity of 200mA, while Channel 2 can drive up to 600mA. Additionally, the two channels can be connected in parallel to support a driving capability of 800mA.

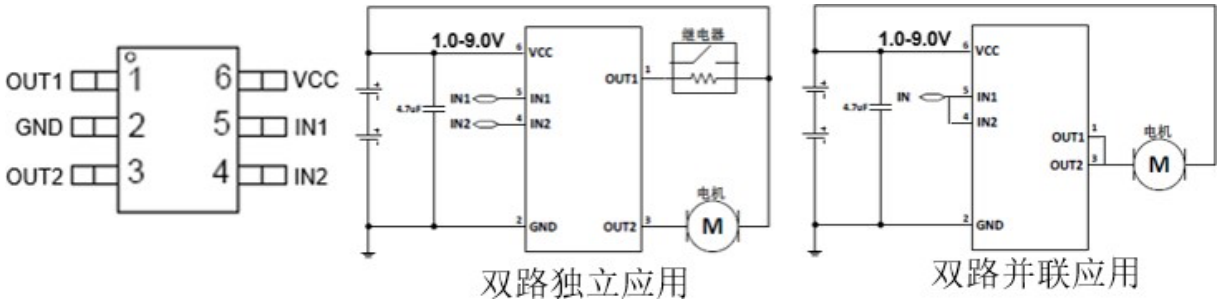
Features

- Operating voltage range: 1.0-9.0V
- Supports driving a 600mA unidirectional DC motor on one channel
- Supports driving a 200mA solenoid valve on one channel
- Supports a parallel driving capability of 800mA across two channels
- Integrated flyback diode
- Integrated pull-down resistor
- SOT23-6 package

Application

- Electronic blood pressure monitor
- 6V relay drive
- Small appliances

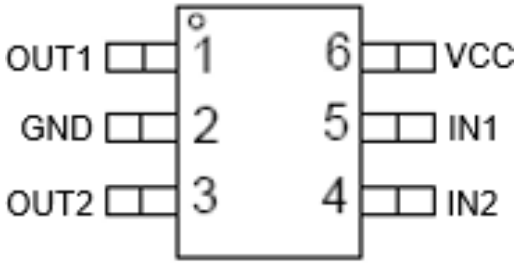
Package and Application Circuit



Order

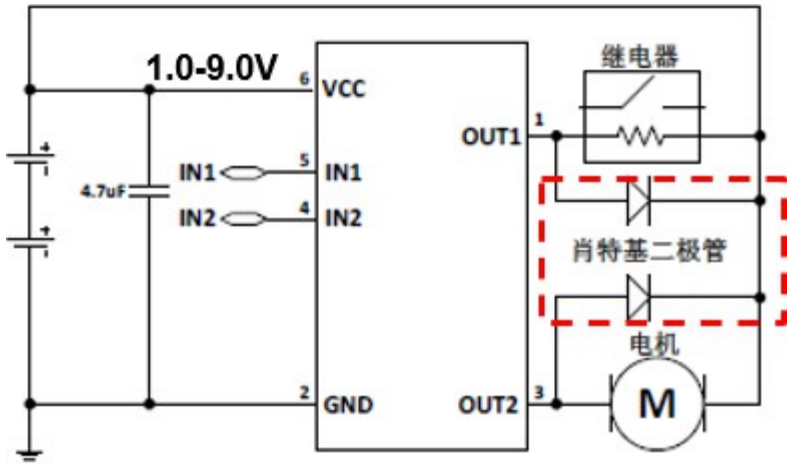
Part number	Package	Quantity	Operating temperature
HY607	SOT23-6	3000	-40~85℃

Pin Description



NO.	NAME	TYPE	DESCRIPTION
1	OUT1	O	Output pin1
2	GND	P	Ground
3	OUT2	O	Output pin2
4	IN1	I	Input pin1
5	IN2	I	Input pin2
6	VCC	P	Power supply A capacitor of 10μF or greater is required to be connected between VCC and GND.

Precautions



1. The 4.7μF capacitor should be placed as close to the IC as possible. This capacitor helps to mitigate voltage spikes at the VCC port generated by inductive loads during the flyback phase, enhancing circuit reliability. It only improves reliability and does not affect normal operation.
2. It is strictly forbidden to short-circuit the output port directly to the power port, as this will cause the chip to burn out.
3. Strictly control the maximum continuous working current at the OUT1 and OUT2 ports to avoid chip damage due to overheating.
4. The built-in flyback diode in the circuit is designed to handle peak high currents but not continuous high currents. If the flyback diode is conducting high current only for a small portion of the operating cycle, the HY607 does not require an external Schottky diode.
5. When the input signal is a high-frequency PWM signal, the flyback current through the diode may not reduce significantly during the NMOS transistor's off-time, meaning the flyback diode is in continuous high-current mode. In this case, an external Schottky diode is required at the HY607's output to support the flyback process. Without the external Schottky diode, the built-in flyback diode in the HY607 is likely to burn out due to overcurrent.

Absolute Maximum Ratings

Parameter		Min.	Max.	Unit
Power	VCC	-0.3	10.0	V
Input power	IN1, IN2	-0.3	5.0	
Electrostatic Protection (Human Body Model)	VCC, IN1, IN2, OUT1, OUT2	2		kV
Operating temperature	TJ	-40	150	℃
Storage temperature	Tstg	-65	150	
Thermal Resistance	θJA		260	℃/W

Recommended Operating Conditions

Parameter		Min.	Max.	Unit
Power	VCC	1.0	9.0	V
Input power	IN1, IN2	0	VCC	
Continuous Output Current	IOUT1	0	0.3	A
Continuous Output Current	IOUT2	0	0.8	A

Electrical Characteristics（VCC=6.0V, TA=25° C, RLOAD=20）

Parameter		Test Condition	Min.	Type	Max.	Unit
MOS On-Resistance						
OUT1 R_DS(on)	R_{DSON1}	VIN1=6.0V, IOUT1=0.3A		0.35	0.60	Ω
OUT2 R_DS(on)	R_{DSON2}	VIN2=6.0V, IOUT2=0.8A		0.40	0.60	
IN1/IN2						
High level input vol.	V_{INH}		2.0		VCC	V
Low level input vol.	V_{INL}		0		0.3	
Pull-down resistor	R_{PD}			20	50	KΩ
Operating current						
Standby current	ICC	IN1=IN2=0		0	10	uA
Flyback Diode Forward Voltage Drop						
OUT1 flyback diode	V_{F1}	IOUT1 sinks a current of 0.2A		0.82		V
OUT2 flyback diode	V_{F2}	IOUT2 sinks a current of 0.5A		0.90		

Package & Dimension

SOT23-6