

Energy Release Management Chip

GENERAL DESCRIPTION

JY01PL is an Energy Release Management Chip (ERMC) specifically designed for motor drive circuits. Its primary function is to monitor the power supply voltage and directly drive a MOSFET to dissipate excess electrical energy when the voltage exceeds a preset threshold, thereby protecting the motor drive circuit and peripheral devices from damage caused by high-voltage surges generated during motor braking.

With its simplified application design and stable operation, JY01PL has been widely adopted in various brushless DC motor drive control systems.

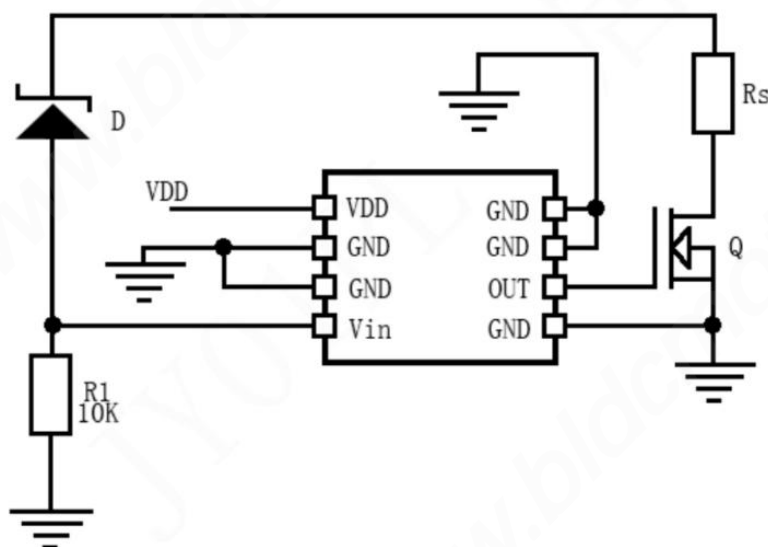
FEATURES

- Typical Operating Voltage: 12V
- Quiescent Current Consumption: 0.1-1mA
- Input Current: $\leq 50\text{nA}$
- Maximum Output Current: 280mA
- Package Type: SOP-8

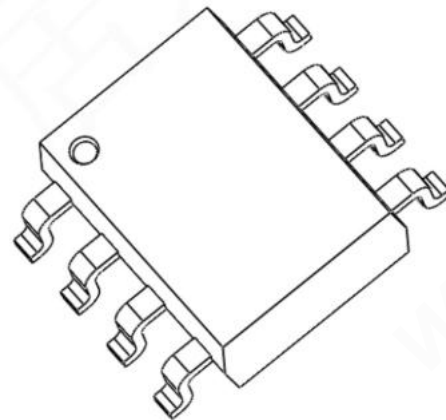
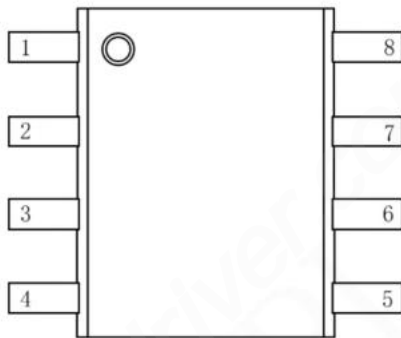
APPLICATIONS

- Brushless Motor (BLDC)
- Energy Recovery Management and Control Circuit (ERMCC)

Typical Application Diagram



Package and Pin Function



SOP-8

Pin Number	Pin Name	Pin Function
1	VDD	Voltage input
2,3,5,7,8	GND	Ground
4	VIN	Overvoltage Signal Input Terminal: Release Threshold 2.2V / Recovery Threshold 1.8V
6	OUT	Output Terminal: Generates HIGH level when $V_{in} > 2.2V$, returns to LOW level when $V_{in} < 1.8V$

Note: When the voltage at Pin 4 (V_{in}) falls below the internal reference voltage, the comparator outputs a LOW level, resulting in a LOW state at the OUT terminal. This turns off the power transistor Q. Once V_{in} exceeds the internal reference voltage, the comparator outputs a HIGH level, driving OUT to HIGH and activating Q. This allows the power supply to form a discharge path through the load resistor R_s to the negative terminal, promptly dissipating the electrical energy generated by the motor, thereby protecting the circuit and peripheral devices.

The internal block diagram of the chip reveals two resistors on the comparator, forming a feedback network with approximately 10% ratio. This configuration introduces controlled hysteresis, resulting in a trip voltage of $\sim 2.2V$ and a return voltage of $\sim 1.8V$. Mastering these characteristics of JY01PL enables flexible application in diverse scenarios.

Selection Guidelines for Energy Dissipation Components

1. MOSFET (Q) Selection:

- Use the same specifications as the motor drive MOSFET (e.g., V_{DS} , $R_{DS(on)}$, Q_g).

2. Resistor (Rs) Selection:

- Current through Rs \leq MOSFET rated current.
- Resistance value $> 0 \Omega$ (non-zero impedance required).

3. Resistor Power Rating:

- Determine through maximum braking frequency testing.
- Prioritize higher power ratings for safety margins.

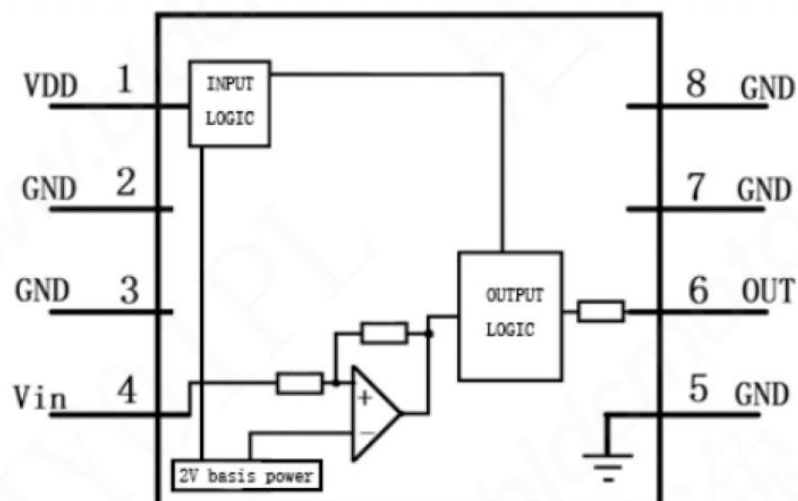
Absolute Maximum Ratings

Definition	Limit Value	Units
Input Voltage VDD	8-15	V
Output Voltage OUT	< 280	mA
Working Temp.	-40-125	$^{\circ}\text{C}$
Storage Temp.	-55-150	$^{\circ}\text{C}$

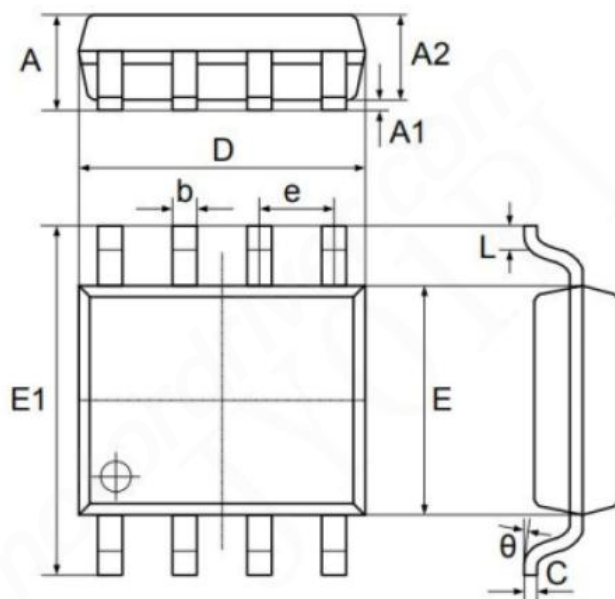
Notice:

Exceeding the "Absolute Maximum Ratings" may cause permanent damage to the chip. The listed limits represent extreme thresholds—operating under such conditions does not guarantee performance specifications. Prolonged operation near these limits will degrade chip reliability.

Functional Block Diagram



Package Dimension Diagram



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.370	1.670	0.056	0.068
A1	0.070	0.170	0.003	0.007
A2	1.300	1.500	0.053	0.061
b	0.306	0.506	0.013	0.021
C	0.203 TYP.		0.008 TYP.	
D	4.700	5.100	0.192	0.208
E	3.820	4.020	0.156	0.164
E1	5.800	6.200	0.237	0.253
e	1.270 TYP.		0.050 TYP.	
L	0.450	0.750	0.018	0.306
θ	0°	8°	0°	8°