



Product Introduction

JSM3144 is a unipolar Hall switch chip with high voltage resistance and high sensitivity, which is designed by bipolar semiconductor technology.

The chip is composed of voltage stabilizing unit, Hall voltage generator, differential amplifier circuit, temperature compensation circuit and Open collector output circuit. Working mode: input Magnetic flux density and output digital voltage signal. Provide TO92S inline packaging, SMT SOT23-3L packaging, and all packaging meets RoHS standards.



SOT23-3L



TO92S

Function

- ◆ Micro structure
- ◆ Open collector output
- ◆ ESD: $\pm 4\text{kV}$
- ◆ High sensitivity: 60/40Gs (typical value)
- ◆ Wide voltage range: 3.0V~60V
- ◆ Operating temperature range: $-40^{\circ}\text{C}\sim 125^{\circ}\text{C}$

Application

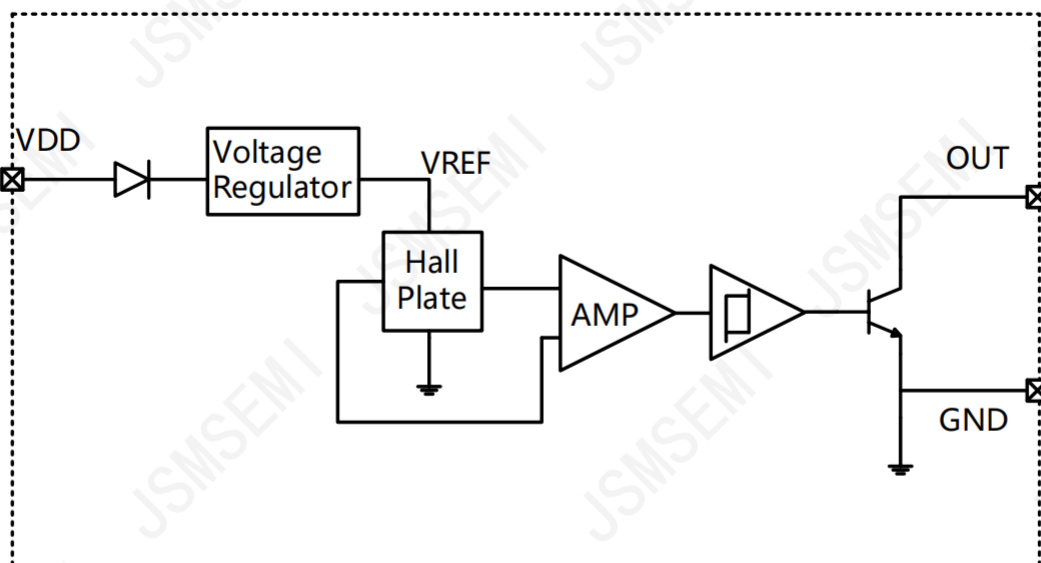
- ◆ Brushless motor commutation
- ◆ Flow sensor
- ◆ Position sensor
- ◆ Speedsensor
- ◆ Distance sensor

Product packaging

Part No.	Packages	Temperature range	Packing
JSM3144EUA	TO92S	$-40^{\circ}\text{C}\sim 150^{\circ}\text{C}$	1000/bag
JSM3144ESO	SOT23-3L	$-40^{\circ}\text{C}\sim 150^{\circ}\text{C}$	3000/reel



Functional Block Diagram

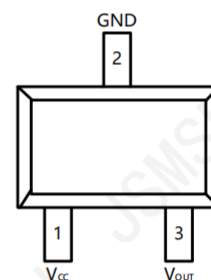


6. Pin information

No.	Name	Functions
1	V _{CC}	Power supply
2	GND	Ground
3	V _{OUT}	Output

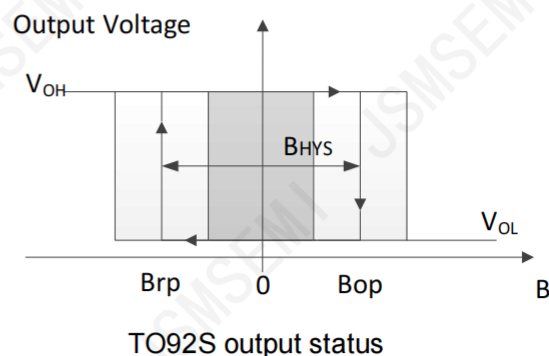
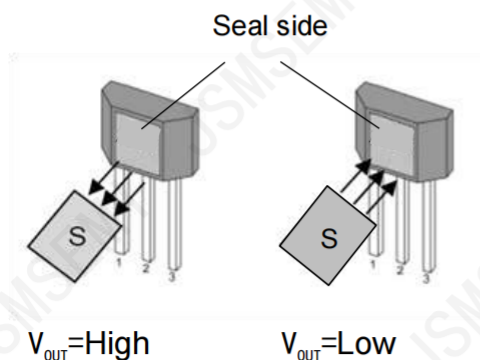


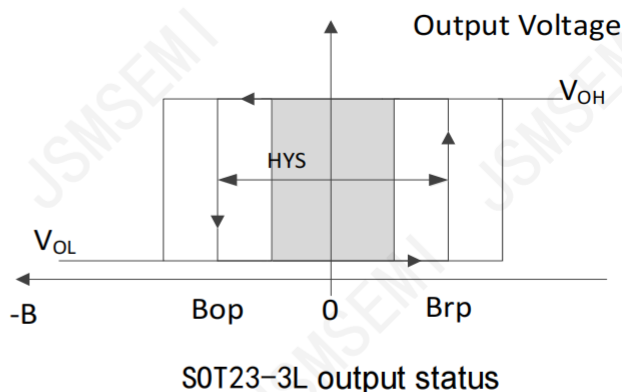
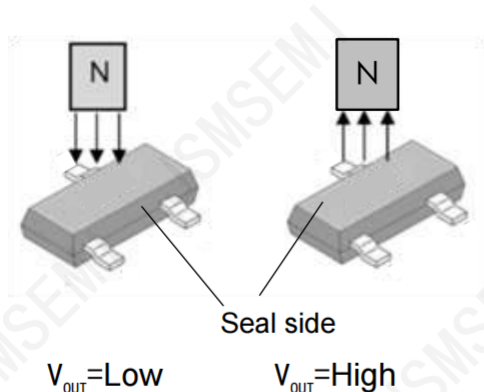
TO92S



SOT23-3L

7. Magnetoelectric conversion characteristics





8. Limit parameter

Parameters	Symbols	Min	Max	Units
Power supply voltage	V_{CC}	-0.3	60	V
Output voltage	V_{OUT}	-0.5	60	V
Output current	I_{OUT}	0	40	mA
Operating temperature	T_J	-40	125	°C
storage temperature	T_{STG}	-50	165	°C

The absolute maximum rating is the limit value that a chip can withstand, and exceeding this value may cause permanent damage to the chip.

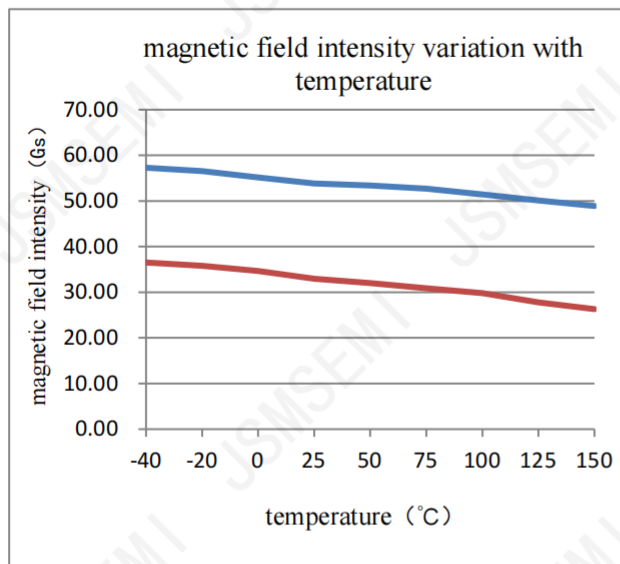
9. Electromagnetic characteristics

Parameters	Symbols	Test conditions	Min	Typ	Max	Units
Electrical performance						
Power supply voltage	V_{CC}		3.5		40	V
Power supply current	I_{CC}	$V_{CC} = 5V$		6	9	mA
Output leakage current	I_{le}				10	uA
Output voltage	V_{SAT}	$I_{OUT} = 20mA$, on-state			0.4	V
Output current	I_{OUT}				30	mA
Output Rise Time	T_R	$C_L = 20pF$			1.0	us
Output Fall Time	T_F	$C_L = 20pF$			1.5	us
Magnetic performance						
operating point	B_{op}	$C_L = 20pF$	30	60	80	Gs
release point	B_{rp}		10	40	60	Gs
return difference	B_{HYS}	$ B_{op} - B_{rp} $	10	20	40	Gs

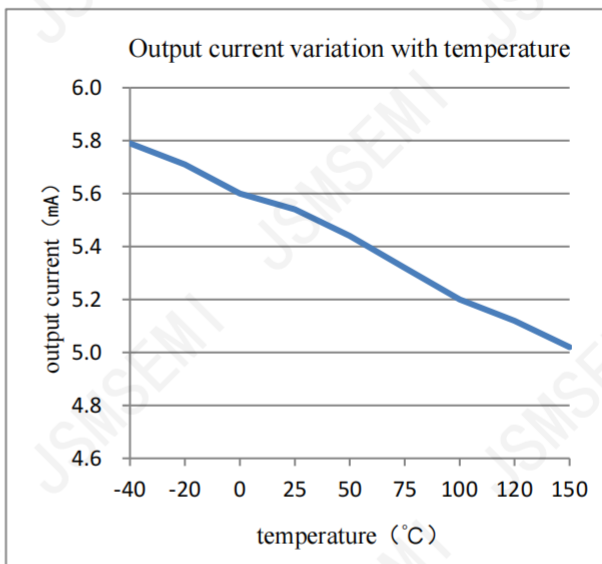


10. Temperature Performance

$V_{CC}=5V$, Bop and Brp Characteristic Performance

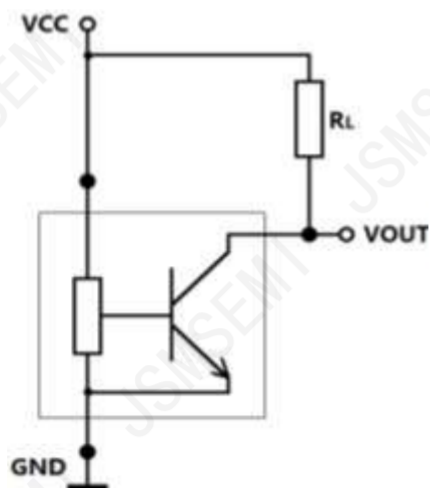


$V_{CC}=5V$, operating current Characteristic Performance

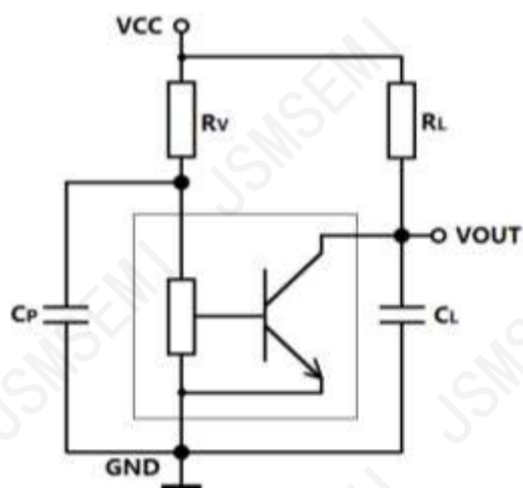


11. Application Circuit

The typical application circuit is shown in the following figure: Application circuit 1, where $R_L=4.7k\Omega$, which can be applied to most circuits. Application circuit 2, where $R_V=100\Omega$, $C_P=4.7nF$, $R_L=4.7k\Omega$, $C_L=1nF$, is suitable for circuits with interference or radiation interference on power supply lines. It is recommended to connect there sistor R_V and two capacitors C_P and C_L in series in the circuit, and place there sistor and capacitor compnnts as close to the chip as possible.



Typical Application Circuit 1

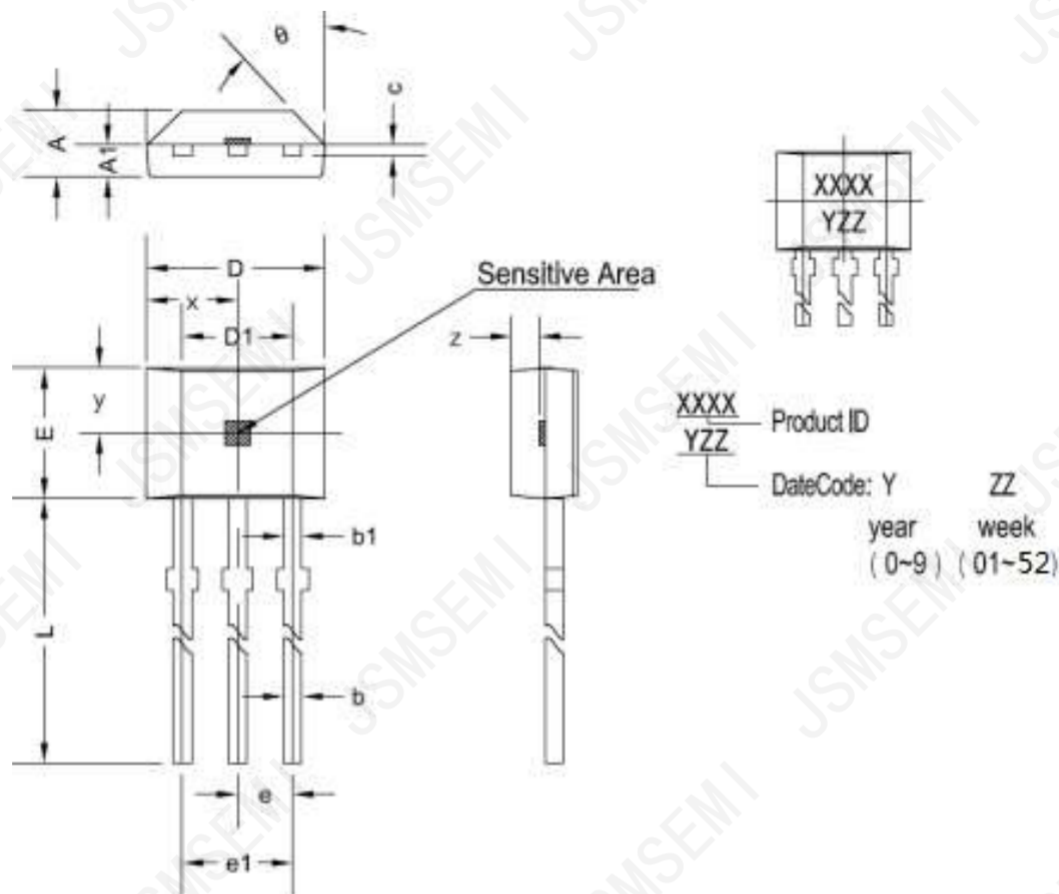


Typical Application Circuit 2



Package Material Information

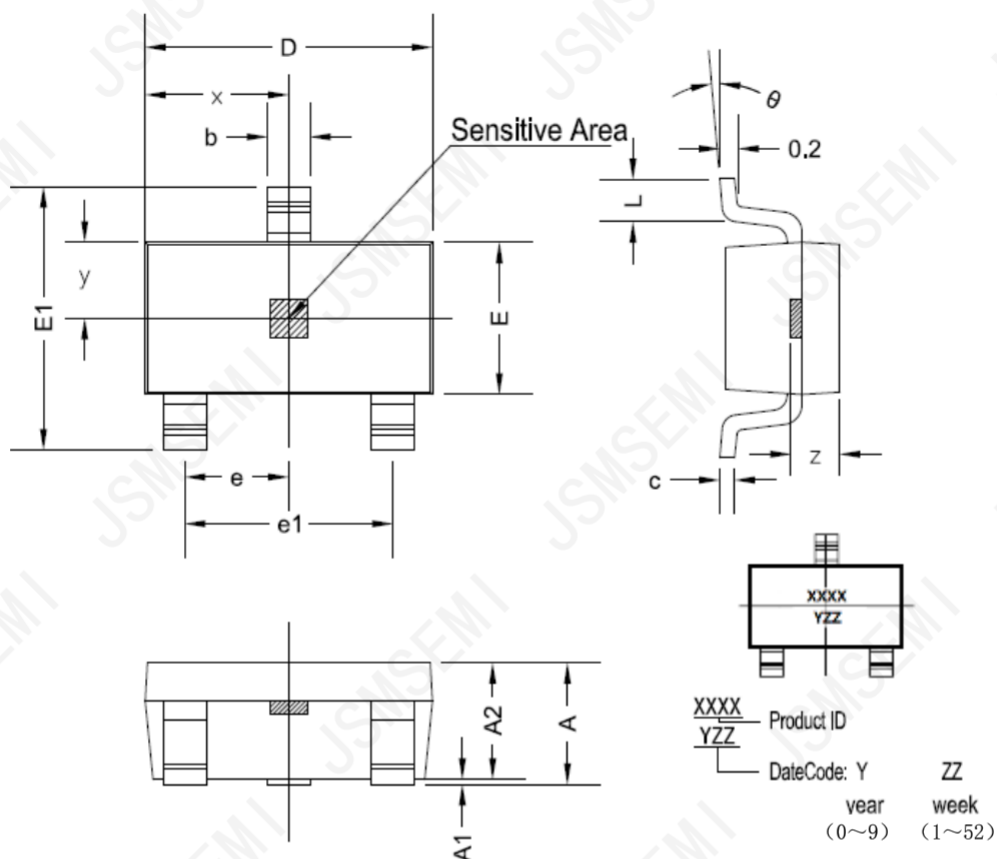
TO92S Package Size



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	1.420	1.670	0.056	0.066
A1	0.660	0.860	0.026	0.034
b	0.350	0.560	0.014	0.022
b1	0.400	0.550	0.016	0.022
C	0.360	0.510	0.014	0.020
D	3.900	4.200	0.154	0.165
D1	2.970	3.270	0.117	0.129
E	2.900	3.280	0.114	0.129
e	1.270TYP		0.050TYP	
e1	2.440	2.640	0.096	0.104
L	13.500	15.500	0.531	0.610
x	2.025TYP		0.080TYP	
y	1.545TYP		0.061TYP	
z	0.500TYP		0.020TYP	
θ	45°TYP		45°TYP	



SOT23-3L Package Size



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950TYP		0.037TYP	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
x	1.460TYP		0.057TYP	
y	0.800TYP		0.032TYP	
z	0.600TYP		0.024TYP	
θ	0°	8°	0°	8°



Notes

- ◆ Hall chips are sensitive devices, and electrostatic protection measures should be taken during use, installation, and storage.
- ◆ During installation and use, mechanical stress applied to the device casing and leads should be minimized as much as possible.
- ◆ It is recommended that the welding temperature should not exceed 350 °C and the duration should not exceed 5 seconds.
- ◆ To ensure the safety and stability of Hall chips, it is not recommended to use them beyond the parameter range for a long time.