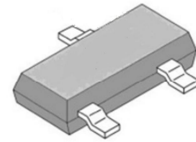


Omnipolar Hall-effect Sensor

PRODUCT DESCRIPTION

The MS451/MS451S is omnipolar hall switch circuit, which could make the digital switch response to north pole and south polar. In applications, because it has no require for the polarity of magnetic field, integration is convenient and system cost is reduced. DC operating voltage ranges from 3V to 36V. The MS451/MS451S integrates hall unit and consists of voltage regulator, hysteresis comparator and output-stage circuit. The MS451/MS451S is especially suitable for rotation detection and motor control.


TO_92S

TSOT23_3L

FEATURES

- Small Outline Package
- Omnipolar Magnetic Field Sensing, Wide Application Range, Specially Suitable for Motion Control and Closing Position Detection Applications
- Internal 3V Regulator, Reduce Power Dissipation
- Integrated Reverse Voltage Protection
- Current Sink Output Mode
- Wide Temperature Range: -40°C to 120°C

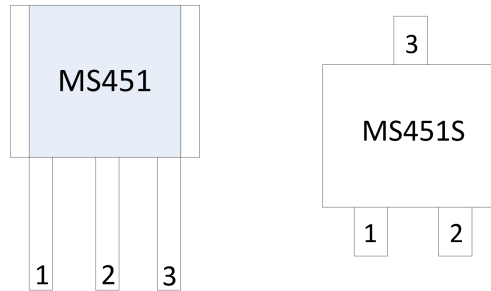
APPLICATIONS

- Speed and Rotation Detection
- Direction Sensing for Printer Head
- Position Detection for Liquid Level

PRODUCT SPECIFICATION

Part Number	Package	Marking
MS451	TO_92S	MS451
MS451S	TSOT23_3L	451

PIN CONFIGURATION



PIN DESCRIPTION

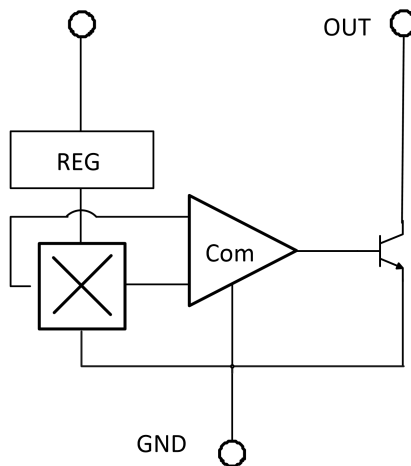
MS451

Pin	Name	Type	Description
1	VDD	-	Power Supply
2	GND	-	Ground
3	OUT	O	Output

MS451S

Pin	Name	Type	Description
1	VDD	-	Power Supply
2	OUT	O	Output
3	GND	-	Ground

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Any exceeding absolute maximum rating application causes permanent damage to device. Because long-time absolute operation state affects device reliability. Absolute ratings just conclude from a series of extreme tests. It doesn't represent chip can operate normally in these extreme conditions.

Parameter	Symbol	Range	Unit
Power Supply	VDD	-0.5 ~ +60	V
Output Voltage	VO	-0.5 ~ +60	V
Operating Temperature	Topr	-40 ~ +120	°C
Storage Temperature	Tstg	-40 ~ +150	°C
Output Driving Current	IOUT	40	mA

RECOMMENDED OPERATING CONDITIONS

Operating Power Supply

Parameter	Symbol	Range			Unit
		Min	Norm	Max	
Power Supply	VDD	3		36	V

ELECTRICAL CHARACTERISTICS

Unless otherwise noted, Ta = 25°C ±2°C.

Current Consumption

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Operating Power Supply Current	ICC	OUT=H		2.9	6	mA

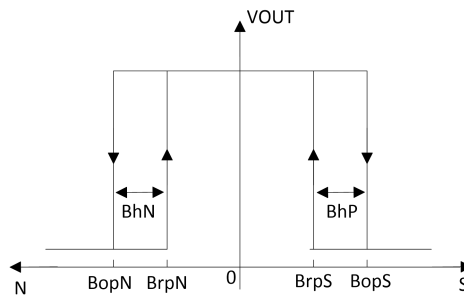
Output Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Output Current	Iout				20	mA
Output Leakage Current	Ileak	Gauss<Brp+ or Gauss>Brp-			10	μA
Output Saturation Voltage Drop	Isat	Iout=20mA, Gauss>Bop+ or Gauss<Bop-			0.4	V
Rise Time	Tr				1.5	us
Fall Time	Td				1.5	us

Magnetic Field Characteristic

Parameter	Symbol	Condition	Min	Typ	Max	Unit
North Operating Point	Bop+		30	50	135	Gauss
South Operating Point	Bop-		-135	-50	-30	Gauss
North Release Point	Brp+		10	30	120	Gauss
South Release Point	Brp-		-120	-30	-10	Gauss
Magnetic Field Hysteresis	Bhys		5	20	80	Gauss

Characteristic Curve



Characteristic Curve of the Magnetic Field for the MS451/MS451S, Omnipolar Hall

Classification Information

A Classification:

70G ≤ Bop+ ≤ 120G and (-120G) ≤ Bop- ≤ (-70G)

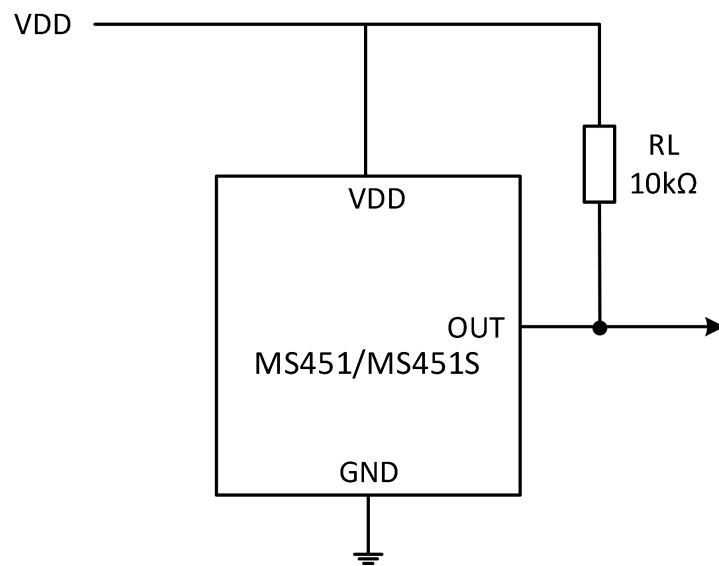
B Classification:

35G ≤ Bop+ ≤ 70G and (-70G) ≤ Bop- ≤ (-35G)

C Classification:

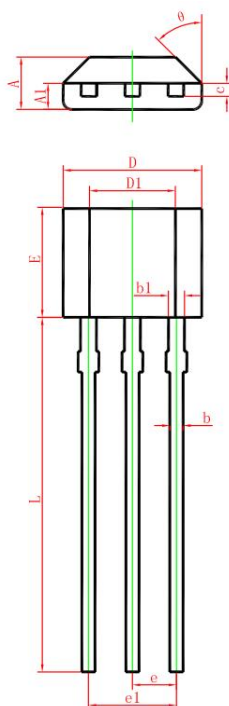
120G ≤ Bop+ ≤ 135G and (-135G) ≤ Bop- ≤ (-120G)

TYPICAL APPLICATION DIAGRAM



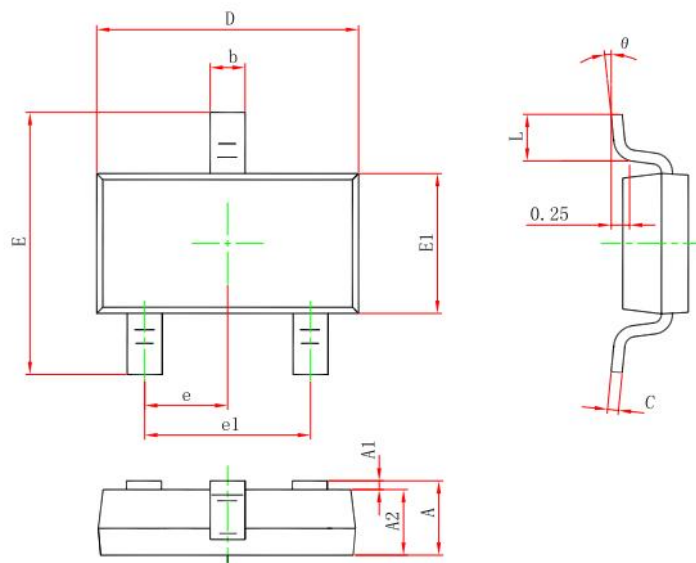
PACKAGE OUTLINE DIMENSIONS

TO_92S (4.1x1.27x0.86)



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	1.420	1.620	0.056	0.064
A1	0.660	0.860	0.026	0.034
b	0.350	0.480	0.014	0.019
b1	0.400	0.550	0.016	0.022
c	0.360	0.510	0.014	0.020
D	3.900	4.100	0.154	0.161
D1	2.280	2.680	0.090	0.106
E	3.050	3.250	0.120	0.128
e	1.270 TYP.		0.050 TYP.	
e1	2.440	2.640	0.096	0.104
L	15.100	15.500	0.594	0.610
θ	45° TYP		45° TYP	

TSOT23_3L (3.02x1.7x0.9)



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	---	0.900	---	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b	0.350	0.500	0.014	0.020
c	0.080	0.200	0.003	0.008
D	2.820	3.020	0.111	0.119
E1	1.600	1.700	0.063	0.067
E	2.650	2.950	0.104	0.116
e	0.95(BSC)		0.037(BSC)	
e1	1.90(BSC)		0.075(BSC)	
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

MARKING and PACKAGING SPECIFICATIONS**1. Marking Drawing Description**

MS451 XXXX	451 XXXX
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Product Name : MS451, 451

Product Code : XXXX

2. Marking Drawing Demand

Laser printing, contents in the middle, font type Arial.

3. Packaging Specifications

Device	Package	Piece/Bag	Bag/Box	Piece/Box	Box/Carton	Piece/Carton
MS451	TO_92S	1000	10	10000	10	100000
MS451S	TSOT23_3L	3000	10	30000	4	120000

STATEMENT

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- The process of improving product is endless. And our company would sincerely provide more excellent product for customer.



MOS CIRCUIT OPERATION PRECAUTIONS

Static electricity can be generated in many places. The following precautions can be taken to effectively prevent the damage of MOS circuit caused by electrostatic discharge:

1. The operator shall ground through the anti-static wristband.
2. The equipment shell must be grounded.
3. The tools used in the assembly process must be grounded.
4. Must use conductor packaging or anti-static materials packaging or transportation.



+86-571-89966911



Rm701, No.9 Building, No. 1 WeiYe Road, Puyan Street, Binjiang District, Hangzhou, Zhejiang



[http:// www.relmon.com](http://www.relmon.com)