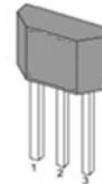


SD1881

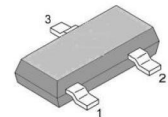
FEATURES

- ✧ Wide operating voltage range: 3.3V to 26V
- ✧ Built-in reverse voltage protecting capability
- ✧ BCD process technology
- ✧ Enhanced sensitivity: will operate from 35 Gauss typical, at 25°C
- ✧ Packages: SOT-23-3L and TO-92S packages
- ✧ RoHS-compliant material meets directive 2011/65/EU

PACKAGES

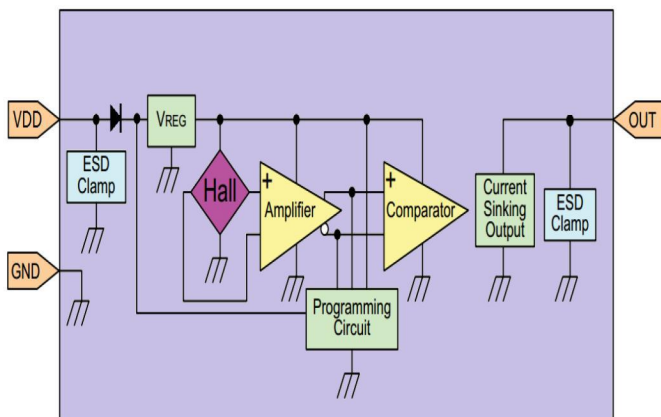


TO-92S



SOT-23 -3L

Functional Block Diagram



APPLICATIONS

- ✧ Speed and RPM sensing
- ✧ Electric window lift
- ✧ Flow-rate sensing
- ✧ Brushless dc motor
- ✧ Robotics control
- ✧ Medication dispense control

DESCRIPTION

The SD1881S and SD1881T are small, versatile digital Hall effect devices that are operated by the magnetic field from a permanent magnet or an electromagnet, designed to respond to alternating North and South poles.

These latching sensor ICs have enhanced sensitivity, which often allows for the use of less expensive magnets.

These sensor ICs are available in two package styles, the SD1881S in the subminiature SOT-23-3L surface mount package and the SD1881T in the leaded, flat TO-92S package.

Its 3V capability allows for use in low voltage applications, promoting energy efficiency.

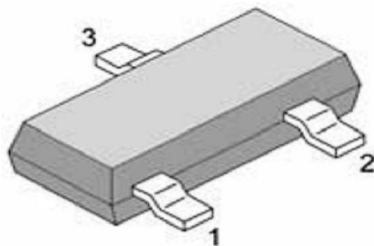
SD1881

1. Packaging Series

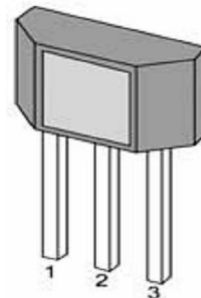
Part Number	Marking ID	Description
SD1881S	U18	SOT-23-3L package, tape and reel packing (3000 units per reel)
SD1881T	U18	Flat, TO-92S package, bulk packing (1000 units per bag)

2. Pin Definitions and Descriptions

SD1881S	SD1881T	Name	Type	Function
1	1	VDD	Supply	Supply Voltage pin
2	3	OUT	Output	Open-Drain Output pin
3	2	GND	Ground	Ground pin



SOT-23-3L



TO-92S

3. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Units
Supply Voltage	V_{DD}	-	28	V
VDD Reverse Voltage VDD	V_{RDD}	-	-28	V
Supply Current	I_{DD}	-	20	mA
Output Voltage	V_{OUT}	-0.3	28	V
Output Current	I_{OUT}	-	25	mA
Operating Ambient Temperature	T_A	-40	125	°C
Storage Temperature	T_S	-50	150	°C
Magnetic Flux	B	No Limit		Gauss

SD1881

4. ESD Protections

Parameter	Value	Unit
HBM (human body mode, C=100pF, R=1.5 kohm)	+/-4000	V

5. Function Description

The SD1881S/SD1881T exhibits latch magnetic switching characteristics. Therefore, it requires both south and north poles to operate properly.

The device behaves as a latch with symmetric operating and release switching points ($B_{OP}=|B_{RP}|$).

This means magnetic fields with equivalent strength and opposite direction drive the output high and low.

Removing the magnetic field ($B \rightarrow 0$) keeps the output in its previous state. This latching property defines the device as a magnetic memory.

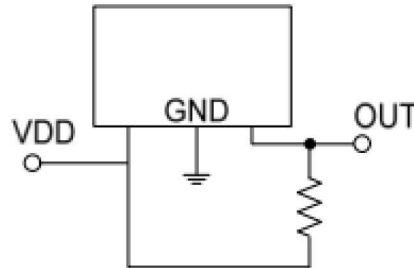
A magnetic hysteresis B_{Hyst} keeps B_{op} and B_{rp} separated by a minimal value. This hysteresis prevents output oscillation near the switching point.

6. Parameters Specification (At 3.3V to 26V supply, 20mA load, $T_A = -40^{\circ}\text{C}$ to 125°C .)

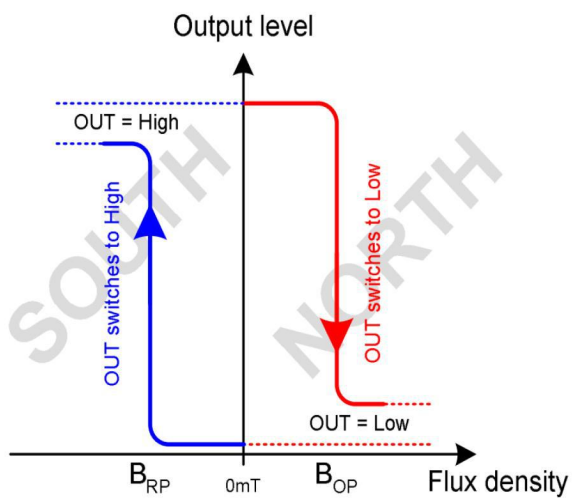
Symbol	Parameter	Test Condition	Min	Typ.	Max	Units
V_{DD}	Supply voltage	-40°C to 125°C	3.3	-	26	V
I_{DD}	Supply Current	$V_{DD} = 12\text{V}$	-	3.0	8	mA
V_{DSon}	Output saturation voltage	at 20mA, Gauss >120	-	-	0.4	V
I_{OFF}	Output Leakage Current	$B < -120\text{GS}$	-	-	10	uA
T_R	Output rise time	$V_{DD} = 12\text{V}$ at 25°C $C_L = 20\text{ pF}$	-	-	1.5	uS
T_F	Output fall time	$V_{DD} = 12\text{V}$ at 25°C $C_L = 20\text{ pF}$	-	-	1.5	uS
B_{OP}	Magnetic operating point	-40°C to 125°C	5	35	60	Gauss
B_{RP}	Magnetic release point	-40°C to 125°C	-60	-35	-5	Gauss
B_{HYST}	Magnetic hysteresis window	$T_A = 25^{\circ}\text{C}$ $ B_{OP} - B_{RP} $	-	70	-	Gauss
T	Operating temperature	-	-40	-	125	$^{\circ}\text{C}$
T_S	Storage temperature:	-	-50	-	150	$^{\circ}\text{C}$

SD1881

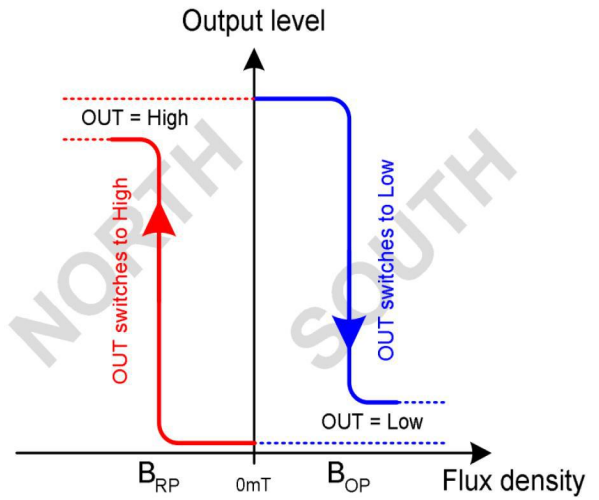
7. Typical Application Circuit



8. Typical Output Waveform



SOT-23-3L

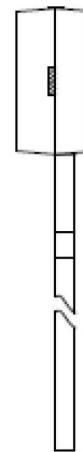
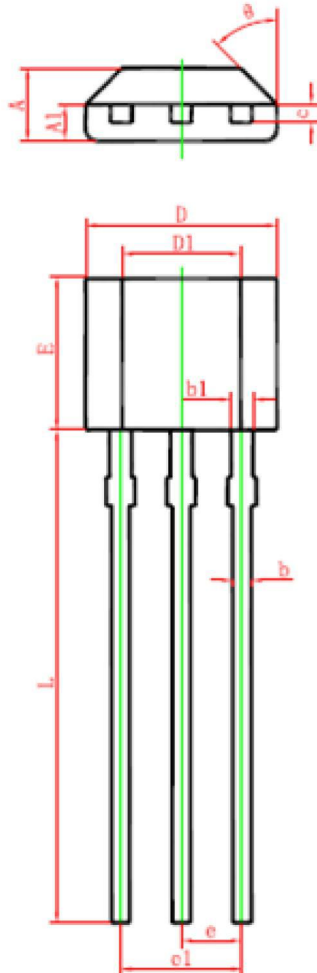


TO-92S

SD1881

9. Package Information

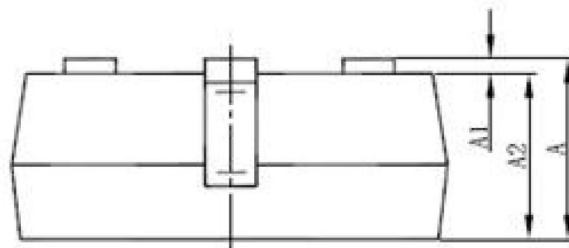
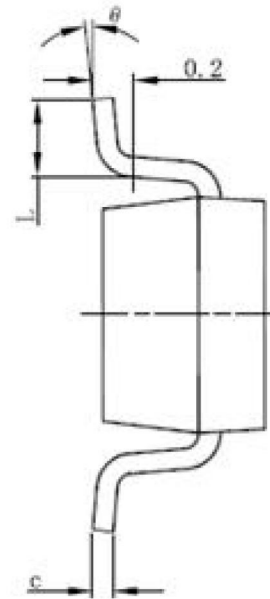
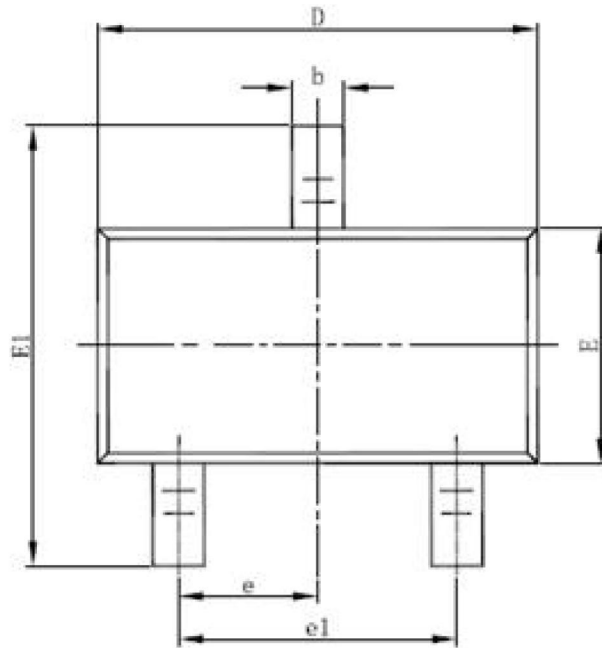
PACKAGE DESIGNATOR TO-92S



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.	

SD1881

PACKAGE DESIGNATOR SOT-23-3L



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	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°