SH258 Micro-power High Sensitivity Omni-polar Hall Switch

SH258 is a micro-power high sensitivity omni-polar Hall switch designed in advanced CMOS technology. The following are integrated on a single silicon chip: awake/sleep timing controller, Hall voltage generator, offset canceller, chopper stabilized small-signal amplifier, Schmitt trigger, and open-drain output. The consumption current values (average) are made to reduce sharply by intermittent operation.

Features Typical Applications

- High sensitivity (3mT typ.)
- Low power consumption for battery-powered applications (5μA avg.)
- Open-drain output
- High ESD Protection, HBM>±4kV min.

Typical Applications

- Solid-state switch
- Lid close sensor for battery powered devices
- Magnet proximity sensor for reed switch replacement in low duty cycle applications

Order Information

Order No.	Part No.	Temperature	Package	—	Packing
SH258EUA	SH258	E	UA		
SH258EST-TR	SH258	E	ST	—	TR

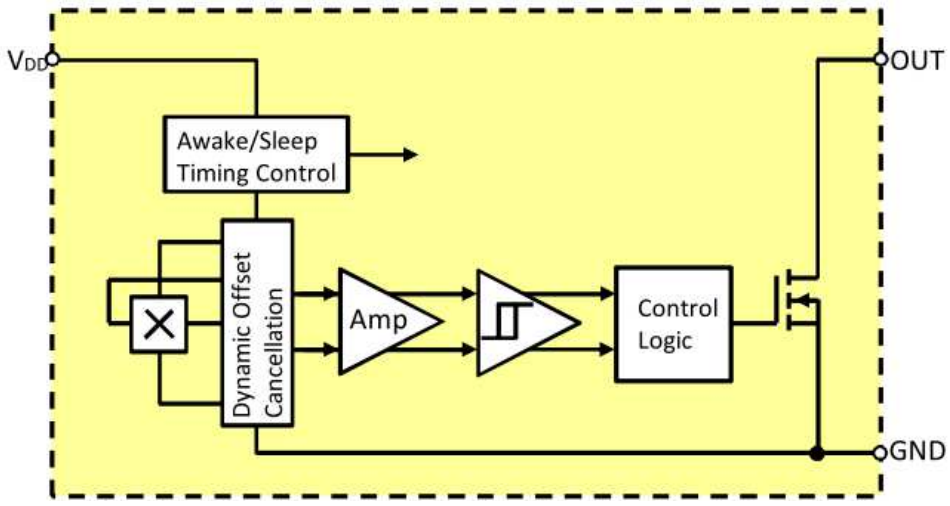
Legend:

Temperature Code: E (-40℃～85℃)

Package Code: UA (TO92S), ST (TSOT23)

Packing Code: Brank (Balk, 500pcs/Bag), TR (Tape & Reel, 3,000pcs/Reel)

Functional Block Diagram



Absolute Maximum Ratings (T_A=25℃)

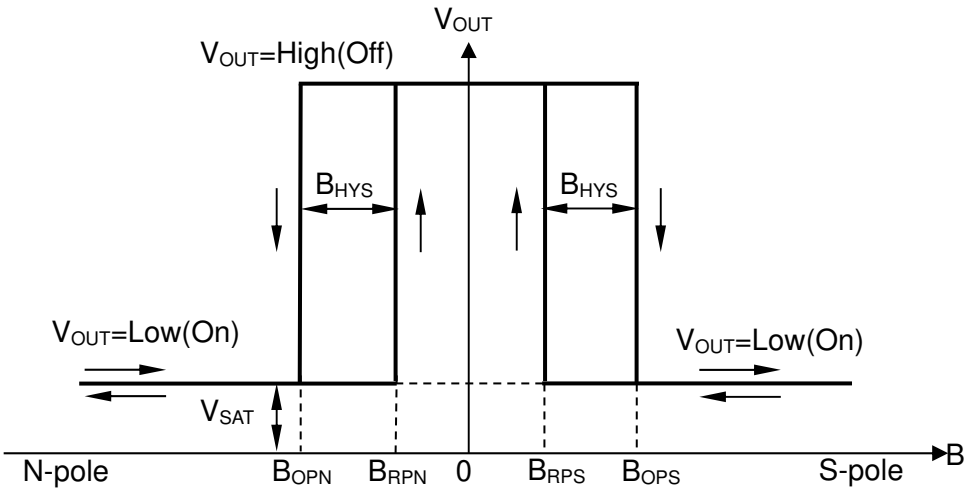
Parameter	Symbol	Value Min	Value Max	Unit
Supply Voltage	V_{DD}	-0.3	6	V
Output Voltage	V_{OUT}	-0.3	6	V
Output Current	I_{SINK}	-	10	mA
Operating Temperature Range (E)	T_A	-40	85	℃
Storage Temperature Range	T_S	-55	150	℃
Maximum Junction Temperature	T_J		150	℃
Power Dissipation (UA/ST)	P_D		606/400	mW

Electrical Characteristics (T_A=25℃, V_{DD}=3V)

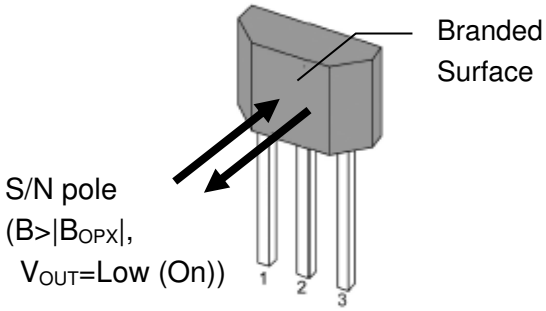
Parameter	Test Condition	Symbol	Value Min	Value Typ	Value Max	Unit
Supply Voltage		V_{DD}	1.7	-	5.5	V
Consumption Current (Avg.)	V_{OUT}=High	I_{DD}	-	5	10	μA
Output Saturation Voltage	V_{OUT}=Low, I_{SINK}=5mA	V_{SAT}	-	-	0.2	V
Output Leakage Current	V_{OUT}=High (5.5V)	I_{LEAK}	-	-	1	μA
Awake mode time		t_{AW}	-	40	80	μs
Sleep mode time		t_{SL}	-	40	80	ms

Magnetic Characteristics (T_A=25℃, V_{DD}=3V)

Parameter	Test Condition	Symbol	Value Min	Value Typ	Value Max	Unit
Operate Point	S pole to branded side	B_{OPS}	2	-	5.5	mT
	N pole to branded side	B_{OPN}	-5.5	-	-2	mT
Release Point	S pole to branded side	B_{RPS}	1	-	4.5	mT
	N pole to branded side	B_{RPN}	4.5	-	-1	mT
Hysteresis	$\lvert B_{OPX} - B_{RPX} \rvert$	B_{HYS}	-	1	-	mT

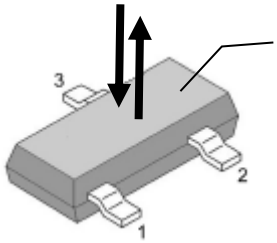


Switching Characteristics



UA-package

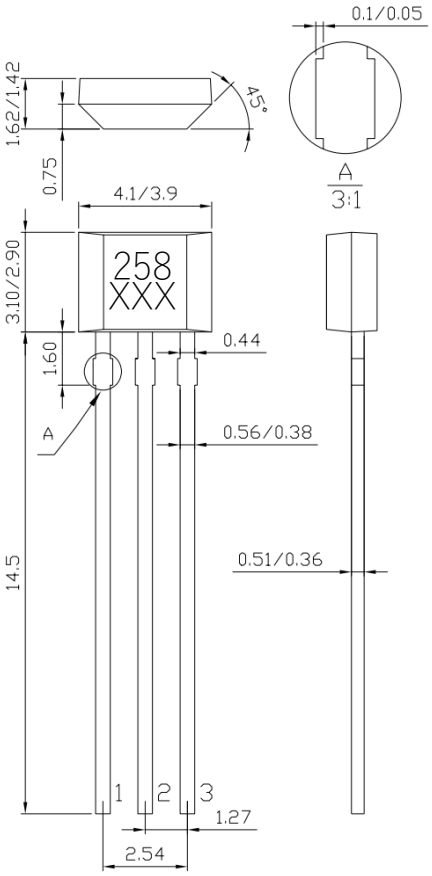
S/N pole (B>|B_{OPX}|, V_{OUT}=Low (On))



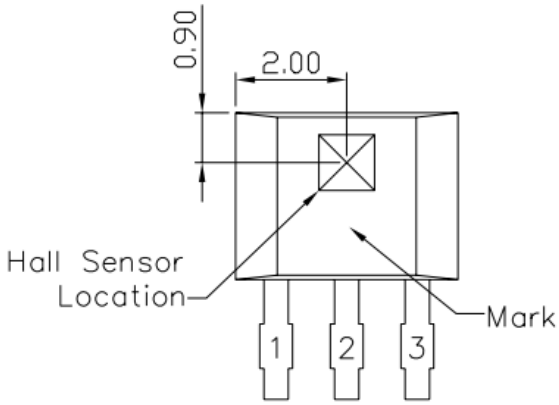
ST-package

Sensor Location, Package Dimension and Marking

UA-package: TO92S



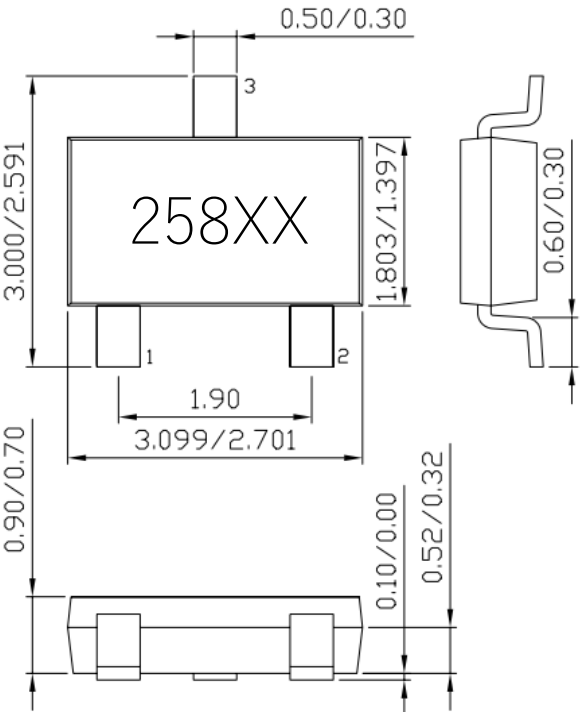
Hall sensor location



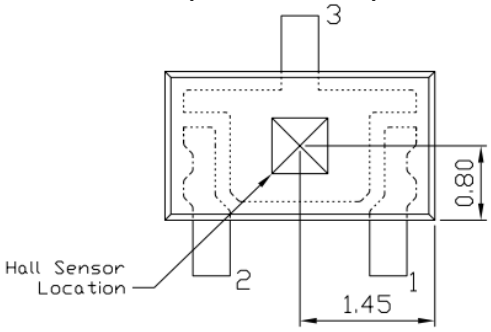
NOTES:

1. Controlling dimension: mm;
2. Leads must be free of flash and plating voids.
3. Do not bend leads within 1 mm of lead to package interface.
4. PINOUT:
   Pin 1 VDD
   Pin 2 GND
   Pin 3 Output

ST-package: TSOT23
(Top View)



Hall sensor location
(Bottom View)



NOTES:

1. PINOUT:
   Pin 1 VDD
   Pin 2 Output
   Pin 3 GND
2. Controlling dimension: mm;
3. Lead thickness after solder plating will be 0.254 maximum