



### General Description

The HS517R Omnipolar Hall effect sensor IC is fabricated from mixed signal CMOS technology. It incorporates advanced chopper-stabilization techniques to provide accurate and stable magnetic switch points.

The circuit design provides an internally controlled clocking mechanism to cycle power to the Hall element and analog signal processing circuits. This serves to place the high current-consuming portions of the circuit into a “Sleep” mode. Periodically the device is “Awakened” by this internal logic and the magnetic flux from the Hall element is evaluated against the predefined thresholds. If the flux density is above or below the B<sub>OP</sub>/B<sub>RP</sub> thresholds then the output transistor is driven to change states accordingly. While in the “Sleep” cycle the output transistor is latched in its previous state. The design has been optimized for service in applications requiring extended operating lifetime in battery powered systems.

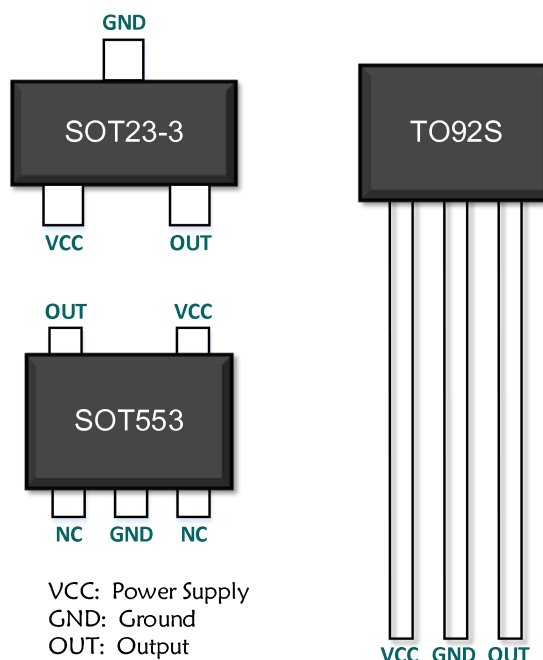
The output transistor of the HS517R will be latched on (BOP) in the presence of a sufficiently strong South or North magnetic field facing the marked side of the package. The output will be latched off (BRP) in the absence of a magnetic field. It incorporates advanced chopper-stabilization techniques to provide accurate and stable magnetic switch points.

### Features

- ❖ CMOS output
- ❖ Micropower consumption for battery powered applications
- ❖ Output switches with absolute value of North or South pole from magnet
- ❖ Operation down to 1.6V
- ❖ High sensitivity for direct reed switch replacement applications
- ❖ Ultra Low power consumption at 3uA (Avg)
- ❖ High ESD Protection, HMB > ±8KV( min )

### Applications

- ❖ Solid state switch
- ❖ Handheld Wireless Handset Awake Switch
- ❖ Lid close sensor for battery powered devices
- ❖ Magnet proximity sensor for reed switch replacement in low duty cycle application

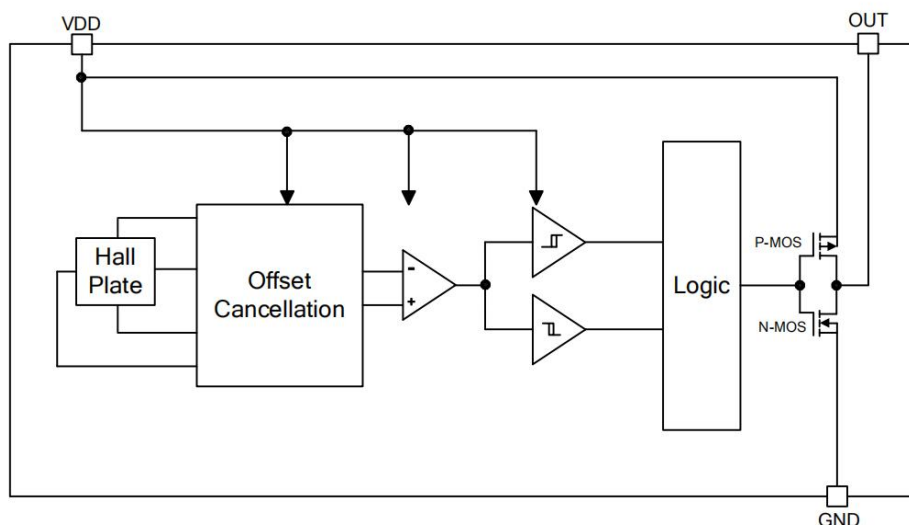




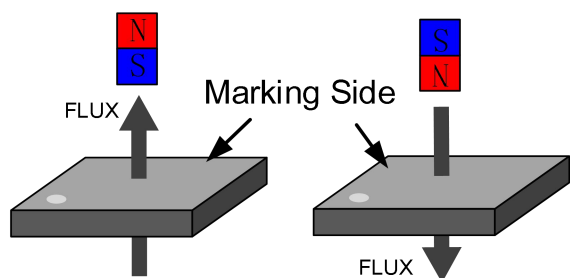
## HS517R

## Omnipolar CMOS Output Hall Effect Switch

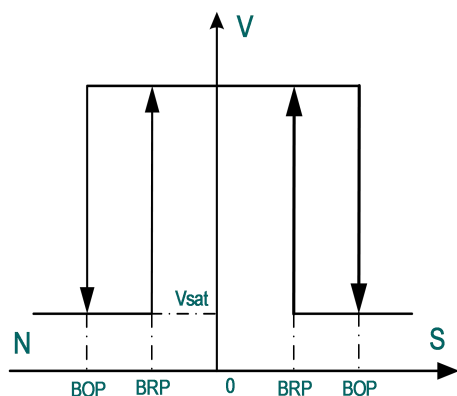
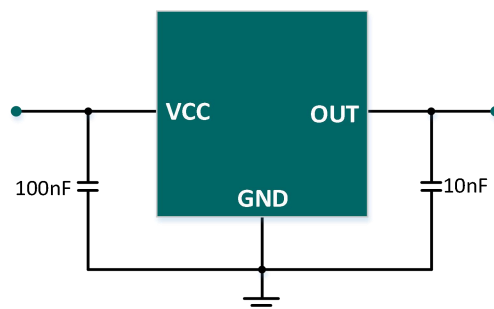
### Block Diagram



### Magnetic Flux Density



### Application Circuit



### Magnetic Characteristics

Parameter	Min	Typ	Max	Unit
Operate point	±26	±33	±38	GS
Release point	±16	±23	±28	
Hysteresis		10		



# HS517R

## Omnipolar CMOS Output Hall Effect Switch

### Absolute Maximum Ratings

Parameter	Rate	Unit
supply voltage	6	V
Output voltage	6	V
Magnetic flux density	Unlimited	
Output current	5	mA
Operating Temperature Range	-40 to 85	°C
Storage temperature range	-65 to 150	°C
Maximum Junction Temp	125	°C

### Recommended Operating Conditions

Parameter	Condition	Rating	Unit
Supply Voltage		1.8-5.0	V

### Electrical Specifications

Parameter	Condition	Min	Typ	Max	Unit
Supply Voltage		1.6		5.5	V
Supply Current	Sleep		1.6	7	uA
	Awake		2	3	mA
	Average		3	10	uA
Output Low Voltage	I <sub>out</sub> =1mA			0.2	V
Output High Voltage	I <sub>out</sub> =1mA	V <sub>dd</sub> -0.2			V
Output Rise Time			0.5		uS
Output Fall Time			0.5		uS
Awake Time			50	80	uS
Sleep Time			200	80	mS
Duty Cycle			-		%

### Ordering Information

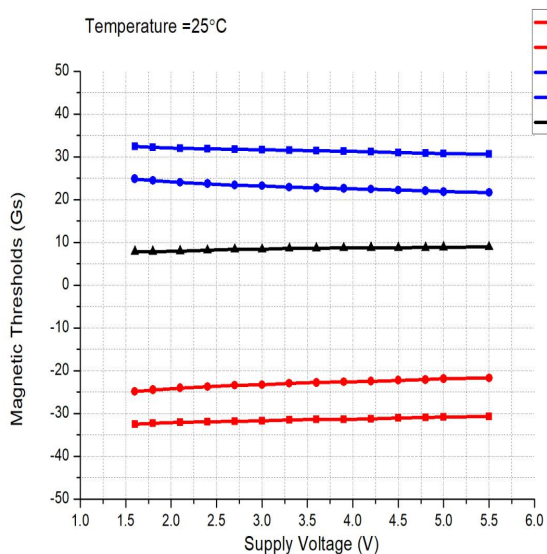
Part Number	Operating Temperature	Package	MOQ
HS517REUA	-40°C TO 85°C	BAG	1000
HS517REST	-40°C TO 85°C	TAPE	3000
HS517RESS	-40°C TO 85°C	TAPE	3000



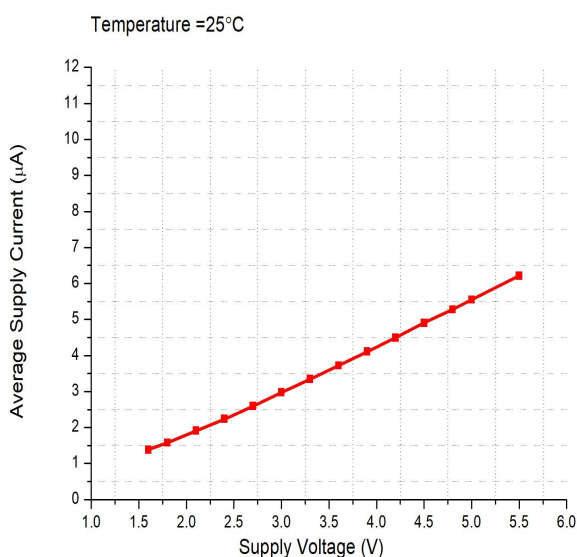
# HS517R

## Omnipolar CMOS Output Hall Effect Switch

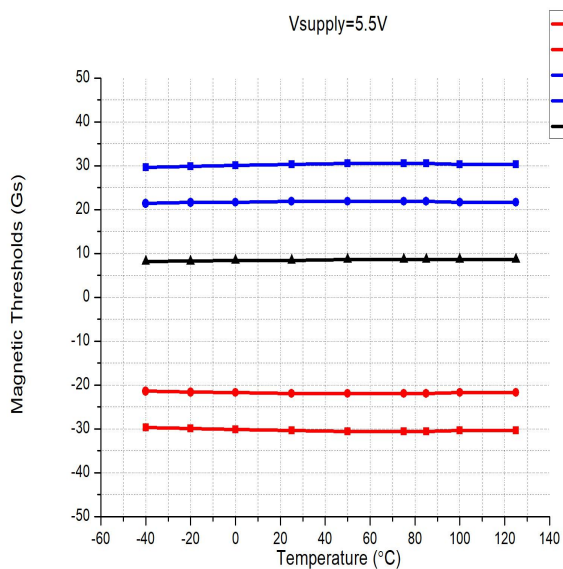
### Performance Characteristics



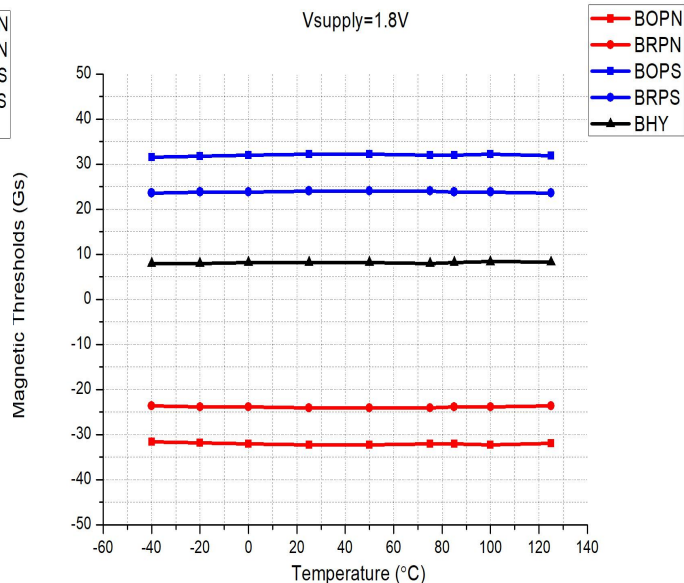
Gauss VS VCC



ICC(Averager) VS VCC



Guss VS TEMP  
@VCC=5.5V



Guss VS TEMP  
@VCC=1.8V

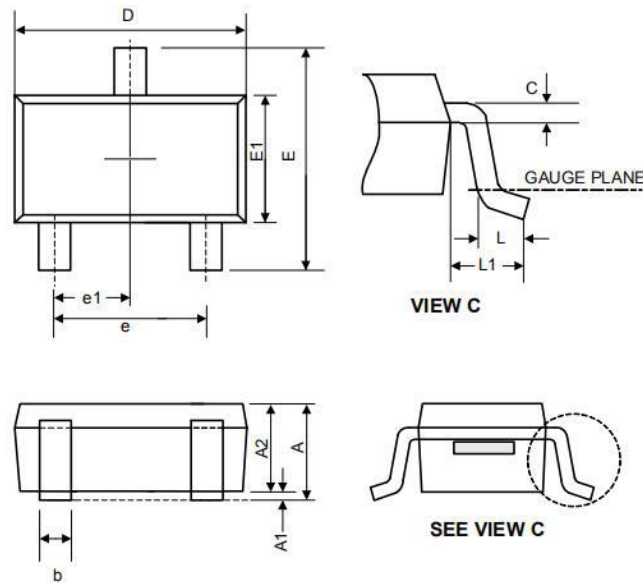


# HS517R

## Omnipolar CMOS Output Hall Effect Switch

Package

SOT23-3L



Symbol	Dimensions in Millimeters			Dimensions in Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	-	-	1.45	-	-	0.057
A1	0	0.08	0.15	-	-	0.006
A2	0.9	1.1	1.3	0.035	0.043	0.051
b	0.3	0.4	0.5	0.012	0.016	0.02
C	0.08	0.15	0.22	0.003	0.006	0.009
D	2.7	2.9	3.1	0.106	0.114	0.122
E	2.6	2.8	3	0.102	0.11	0.118
E1	1.4	1.6	1.8	0.055	0.063	0.071
L	0.3	0.45	0.6	0.012	0.018	0.024
L1	0.5	0.6	0.7	0.02	0.024	0.028
e	1.9 BSC			0.075 BSC		
e1	0.95 BSC			0.037 BSC		

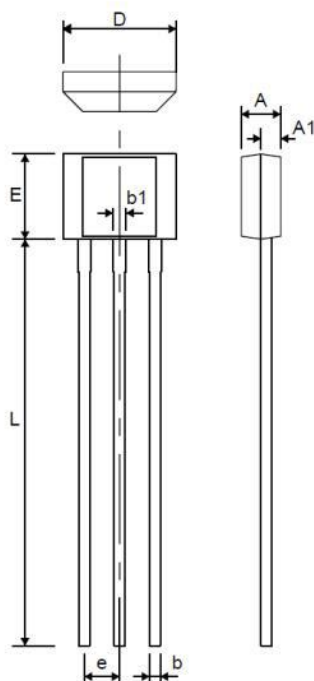
JEDEC outline: NA



**HS517R**

Omnipolar CMOS Output Hall Effect Switch

SIP-3L



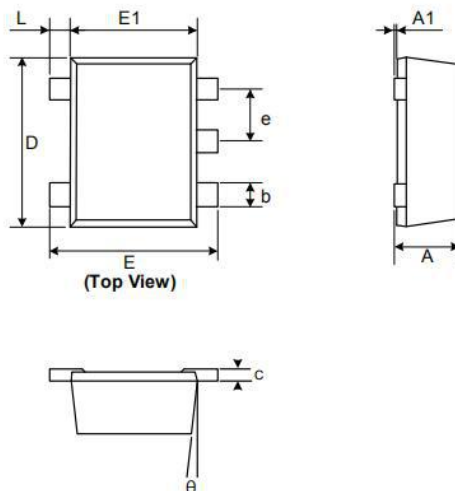
Symbol	Dimensions in Millimeters			Dimensions in Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	1.20	1.48	1.76	0.047	0.058	0.069
A1	0.75 REF.			0.030 REF.		
b	0.33	0.38	0.43	0.013	0.015	0.017
b1	0.40	0.45	0.50	0.016	0.018	0.020
D	3.90	4.10	4.30	0.154	0.161	0.169
e1	1.27 BSC			0.050 BSC		
E	2.80	3.00	3.20	0.110	0.118	0.126
L	13.60	14.60	15.60	0.535	0.575	0.614



# HS517R

## Omnipolar CMOS Output Hall Effect Switch

SOT553



Symbol	Dimensions in Millimeters			Dimensions in Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	0.525	0.563	0.600	0.021	0.022	0.024
A1	0.000	0.025	0.050	0.000	0.001	0.002
e	0.450	0.500	0.550	0.018	0.020	0.022
c	0.090	0.125	0.160	0.004	0.005	0.006
D	1.500	1.600	1.700	0.059	0.063	0.067
b	0.170	0.220	0.270	0.007	0.009	0.011
E1	1.100	1.200	1.300	0.043	0.047	0.051
E	1.500	1.600	1.700	0.059	0.063	0.067
L	0.100	0.200	0.300	0.004	0.008	0.012
θ	7° REF.			7° REF.		