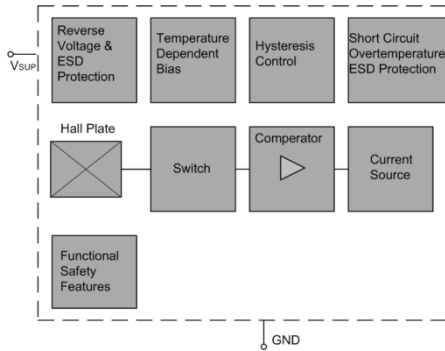


HS-3511-05-0300



Product image serves as example only.

### Block Diagram



## HS-3511-05-0300

Unipolar 2 - Wire  
Flatpack Hall Effect Sensor

### Features

- › Compact size
- › Various switching sensitivities
- › Customized types available

### Approvals



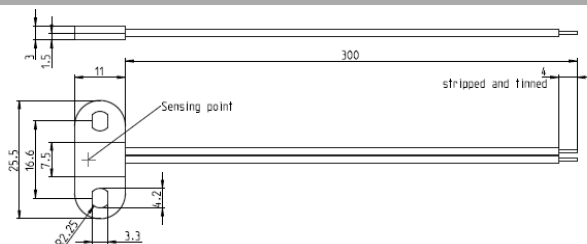
### Absolute Maximum Ratings

Stresses beyond those listed in the "Absolute Maximum Ratings" may cause permanent damage to the device  
Functional operation of the device at these conditions is not implied. Exposure to the absolute rating conditions for extended periods will affect device reliability

Symbol	Parameter	wire colour	Min.	Max.	Unit	Conditions
V <sub>SUP</sub>	Supply voltage	red	- 18		V	t < 1000 h <sup>1)</sup>
			-	28	V	t < 96 h <sup>1)</sup>
			-	32	V	t < 5 min <sup>1)</sup>
			-	40	V	t < 5 x 400 ms <sup>1)</sup> with series resistor R <sub>v</sub> > 100 Ohm
V <sub>OUT</sub>	Output voltage	red	- 0.5		V	t < 1000 h <sup>1)</sup>
			-	28	V	t < 96 h <sup>1)</sup>
			-	32	V	t < 5 min <sup>1)</sup>
			-	40	V	t < 5 x 400 ms <sup>1)</sup> with series resistor R <sub>v</sub> > 100 Ohm
I <sub>O</sub>	Output current	red	-	65	mA	
I <sub>OR</sub>	Reverse output current	red	- 50		mA	

<sup>1)</sup> No cumulative stress All voltages listed are referenced to ground (GND)

### Dimensions



### Wire Assignment

Name	Function	Cable colour
V <sub>SUP</sub>	Supply voltage and output	red
GND	Ground	black

HS-3511-05-0300

└── wire length [mm]

### Environmental Characteristics

Operating temperature	°C	- 20 to + 85
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### Material Information

	Material	Colour
Housing	PA6	black
Cable	UL1007/1569, AWG 24	red, black
Potting compound	Epoxy	black

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Unipolar 2 - Wire  
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### Characteristics

At recommended operation conditions if not otherwise specified in the column "Conditions".

Typical characteristics for  $T_J = 25\text{ }^\circ\text{C}$  and  $V_{SUP} = 12\text{ V}$

Symbol	Parameter	wire colour	Min.	Typ.	Max.	Unit	Conditions
<b>Supply</b>							
$I_{SUPlo}$	Low supply current	red	2		5	mA	
$I_{SUPlo}$	High supply current	red	12		17	mA	
$I_{SUPhi}$	Reverse current	red			1	mA	for $V_{SUP} = -18\text{ V}$
<b>Output</b>							
$t_f$	Output fall time <sup>1)</sup>				1	$\mu\text{s}$	<sup>1)</sup> $V_{SUP} = 12\text{ V}$ ;
$t_r$	Output rise time				1	$\mu\text{s}$	
$t_d$	Delay time <sup>1)</sup>			16		$\mu\text{s}$	
$t_{samp}$	Output refresh period		1.6	2	2.66	$\mu\text{s}$	
$t_{en}$	Enable time of output after settling of $V_{SUP}$			50		$\mu\text{s}$	$V_{SUP} = 12\text{ V}$ $B > B_{on} + 2\text{ mT}$ or $B < B_{off} - 2\text{ mT}$

### Power-on-self-test

Self test can be triggered externally; details on request

<sup>1)</sup> Guaranteed by design

### Recommended Operating Conditions

Symbol	Parameter	wire colour	Min.	Max.	Unit	Conditions
$V_{SUP}$	Supply voltage	red	3.0	24	V	

### Magnetic Characteristics Overview

Symbol	Parameter	wire colour	Min.	Typ.	Max.	Unit	Conditions
$B_{ONth}$	ON threshold range <sup>1)</sup>	-	-30		30	mT	
$B_{OOth}$	OFF threshold range <sup>1)</sup>	-	-30		30	mT	
$B_{th}$	Adjustable step size <sup>2)</sup>	-		0.5		mT	
$T_C$	Temperatur compensation of magnetic thresholds <sup>3)</sup>	-	0		-3000	ppm/K	

<sup>1)</sup> Available range

<sup>2)</sup> Small steps at small values, bigger steps at higher values. May not be undercut

<sup>3)</sup> Different temperature compensation available on request

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Magnetic Characteristics

Switching Type	Temp. koef. of magnetic thresh. TC [ppm/K]	On point $B_{ON}$			Off point $B_{OFF}$			Hysteresis $B_{HYS}$ <sup>1)</sup>		
		[mT]			[mT]			[mT]		
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.
unipolar	0	4.3	6.0	7.7	2.9	4.1	6.1	-	1.9	-
		A	B	C	D	E	F			

<sup>1)</sup> The hysteresis is the difference between the switching points  $B_{HYS} = B_{ON} - B_{OFF}$

Magnetic Approach (for example)

unipolar type

The diagrams illustrate three ways a magnetic bar can approach the sensor's sensing point (marked with an asterisk):

- frontal:** A bar with North (N) and South (S) poles approaches from the left. The sensor is OFF until it reaches the sensing point, then turns ON.
- slide by:** A bar approaches from the left, passes the sensing point, and then moves away. The sensor is ON during the approach and OFF during the retreat.
- turning:** A bar approaches from the left and then rotates around the sensing point. The sensor is ON during the approach and OFF during the retreat.

The current consumption graph shows the sensor's power state as a function of magnetic field strength (B). The current is at a low level ( $I_{DDlow}$ ) until the field reaches  $B_{OFF}$ , where it jumps to a high level ( $I_{DDhigh}$ ) at  $B_{ON}$ . The hysteresis  $B_{HYS}$  is the difference between  $B_{ON}$  and  $B_{OFF}$ . Points A, B, and C are marked on the high-current plateau.

\* Sensing point

Off-center position of sensing point

