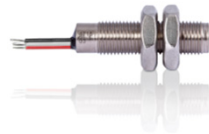


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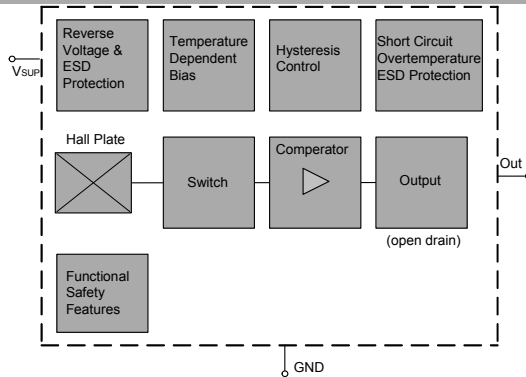


Product image serves as example only.

## HS-2210M-03-0300

Unipolar 3 - Wire  
Hall Effect Sensor M10 thread

### Block Diagram



### Features

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

### Approvals

RoHS

REACH

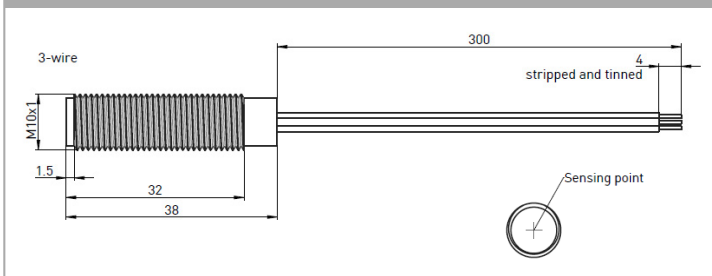
### Absolute Maximum Ratings

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	white	- 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	white	-	65	mA	
I <sub>OR</sub>	Reverse output current	white	- 50		mA	

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

### Dimensions



### Wire Assignment

Name	Function	Cable colour
VSUP	Supply voltage	red
OUT	Output	white
GND	Ground	black

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\_\_\_\_\_ wire length [mm]

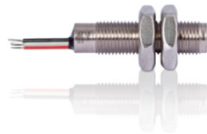
### Material Information

	Material	Colour
Housing	Nickel plated brass	nickel
Cable	UL1007/1569, AWG 24	red, white, black
Potting compound	Epoxy	black

### Environmental Characteristics

Operating temperature	°C	- 20 to + 85
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Hall Effect Sensor M10 thread

### Characteristics

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

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

Symbol	Parameter	wire colour	Min.	Typ.	Max.	Unit	Conditions
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### Supply

$I_{SUP}$	Supply current	red		1.6	2.4	mA	
$I_{SUPHi}$	Reverse current				1	mA	for $V_{SUP} = -18\text{ V}$

### Output

$V_{ol}$	Port low output voltage	white		0.13	0.4	V	$I_o = 20\text{ mA}$
					0.5	V	$I_o = 25\text{ mA}$
$t_f$	Output fall time <sup>1)</sup>				1	$\mu\text{s}$	<sup>1)</sup> $V_{SUP} = 12\text{ V}$ ;
$t_r$	Output rise time				1	$\mu\text{s}$	$R_L = 820$ ; $C_L = 20\text{ pF}$
$t_d$	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 $B < B_{off} - 2\text{ mT}$

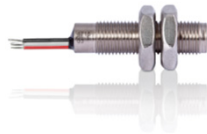
### Power-on-self-test

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	2.7	24	V	
$V_{OUT}$	Output voltage	white		24	V	
$I_{OUT}$	Output current	white		25	mA	

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Unipolar 3 - Wire  
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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

Magnetic Characteristics

Switching Type	Temp. coeff. of magnetic thresh. TC [ppm/K]	On point $B_{ON}$			Off point $B_{OFF}$			Hysteresis $B_{HYS}$ <sup>1)</sup>		
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.
bipolar	0	tbd. A	5.5 B	tbd. C	tbd. D	3.5 E	tbd. F	-	2.0	-

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

Magnetic Approach (for example)

