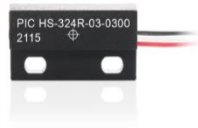


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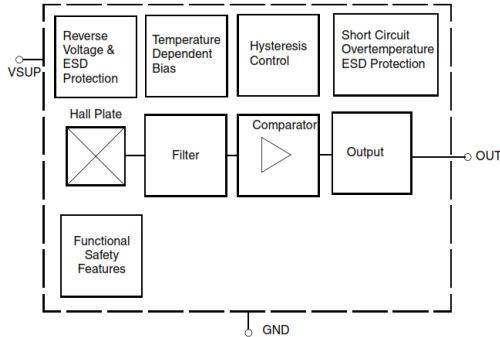


Product image serves as example only.

# HS-324R-03-0300

Unipolar 3 - Wire  
Flatpack Hall Effect Sensor

## Block Diagram



## Features

- Customized types available
- Operates with magnetic fields up to 12 kHz
- Open drain output
- Compact size

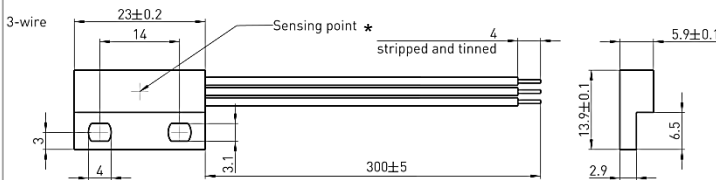
## Approvals



## Recommended Operating Conditions

Symbol	Parameter	Min.	Typ.	Max.	Unit	Conditions
V <sub>SUP</sub>	Supply voltage	2,7	–	24	V	
V <sub>OUT</sub>	Output voltage	–	–	24	V	
I <sub>OUT</sub>	Output current	–	–	25	mA	

## Dimensions



\* other positions on request

## Wire Assignment

Name	Function	Cable colour
V <sub>SUP</sub>	Supply Voltage	red
OUT	Output	white
GND	Ground	black

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 wire length (mm)

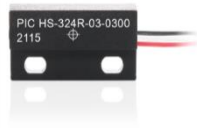
## Material Information

	Material	Colour
Housing	ABS	black
Cable	UL 1007 AWG 24	red, white, black
Potting	Epoxy	black

## Environmental Characteristics

Operating temperature	°C	- 20 to + 85
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**HS-324R-03-0300**

 Unipolar 3 - Wire  
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**Characteristics**

Symbol	Parameter	Min.	Typ.	Max.	Unit	Conditions
<b>Supply</b>						
$V_{UV}$	Undervoltage threshold	2	–	2,7	V	
$I_{SUP}$	Supply current	1,1	1,6	2,4	mA	
$I_{SUPR}$	Reverse current	–1	–	–	mA	for $V_{SUP} = -18$ V
<b>Port Output</b>						
$V_{ol}$	Port low output voltage	–	0,13	0,4	V	$I_o = 20$ mA
		–	–	0,5	V	$I_o = 25$ mA
$I_{oleak}$	Output leakage current	–	0,1	10	$\mu$ A	
$t_f$	Output fall time <sup>1)</sup>	–	–	1	$\mu$ s	$V_{SUP} = 12$ V; $R_L = 820$ $\Omega$ ; $C_L = 20$ pF
$t_r$	<sup>1)</sup>	–	–	1	$\mu$ s	
$B_{noise}$	Effective noise of magnetic switching points (RMS) <sup>2)</sup>	–	72	–	$\mu$ T	For square wave signal with 12 kHz
$t_j$	Output jitter (RMS) <sup>1)</sup>	–	$\pm 0.58$	$\pm 0.72$	$\mu$ s	For square wave signal with 1 kHz. Jitter is evenly distributed between $-1$ $\mu$ s and $+1$ $\mu$ s
$t_d$	Delay time <sup>2),3)</sup>	–	16	21	$\mu$ s	
$t_{samp}$	Output refresh period <sup>2)</sup>	1,6	2,2	3	$\mu$ s	
$t_{en}$	Enable time of output after exceeding of $V_{UV}$ <sup>4)</sup>	20	50	60	$\mu$ s	$V_{SUP} = 12$ V $B > B_{on} + 2$ mT or $B < B_{off} - 2$ mT

- 1) Characterized on small sample size, not tested
- 2) Guaranteed by design
- 3) Systematic delay between magnetic threshold reached and output switching
- 4) If power-on self-test is executed,  $t_{en}$  will be extended by power-on self-test period

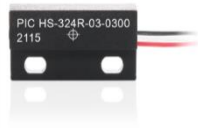
**Absolute Maximum Ratings**

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	Min.	Max.	Unit	Conditions
$V_{SUP}$	Supply voltage	–18	28	V	$t < 96$ h <sup>1)</sup>
		–	32	V	$t < 5$ min <sup>1)</sup>
		–	40	V	$t < 10 \times 400$ ms "Load-Dump" <sup>1)</sup> with series resistor $R_V > 100$ $\Omega$ .
$V_{OUT}$	Output voltage	–0.5	28	V	$t < 96$ h <sup>1)</sup>
$I_o$	Output current	–	65	mA	
$I_{OR}$	Reverse output current	–50	–	mA	

- 1) No cumulative stress

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## HS-324R-03-0300

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### Magnetic Characteristics

Parameter	On point $B_{ON}$			Off point $B_{OFF}$			Hysteresis $B_{HYS}$			Unit
	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
<b>TJ</b>										
-40 °C	4,4	6,1	7,6	2,4	4	5,7	-	2,1	-	mT
25 °C	3,8	5,5	7,1	2,1	3,7	5,5	-	1,8	-	mT
170 °C	3	5	6,7	1,8	3,6	5,5	-	1,4	-	mT

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

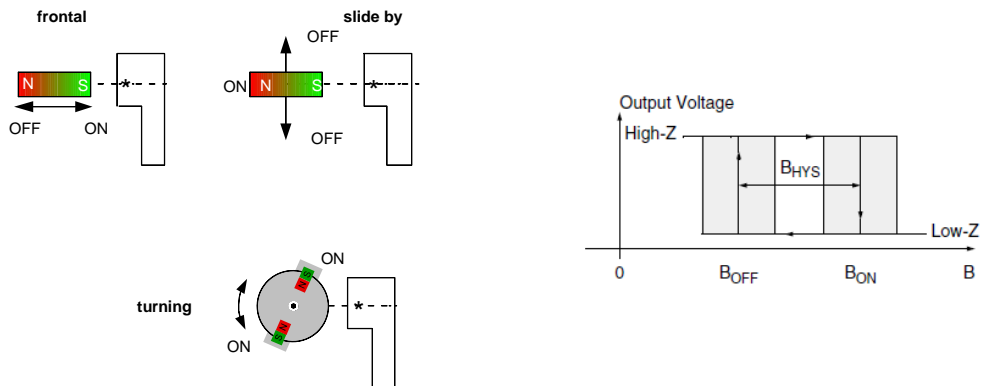
Note: The output turns to Low-Z with the magnetic south pole on the top side of the package and turns into High-Z if the magnetic field is removed.

The sensor does not respond to the magnetic north pole on the top side of the package.

For correct function in the application, the sensor requires only the magnetic south pole on the top side of the package.

### Magnetic Approach (for example)

#### unipolar type



★ Sensing point