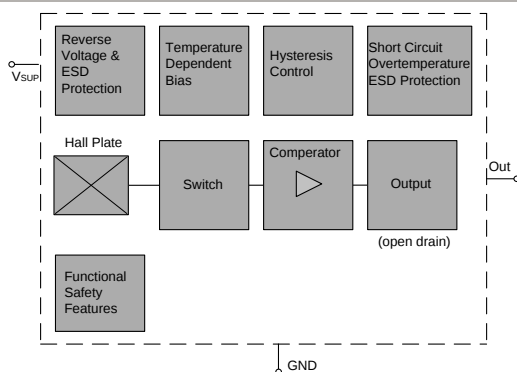


HS-3511-03-0300



Product image serves as example only.

## Block Diagram



## HS-3511-03-0300

Unipolar 3 - Wire

Flatpack Hall Effect Sensor

## Features

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

## Approvals



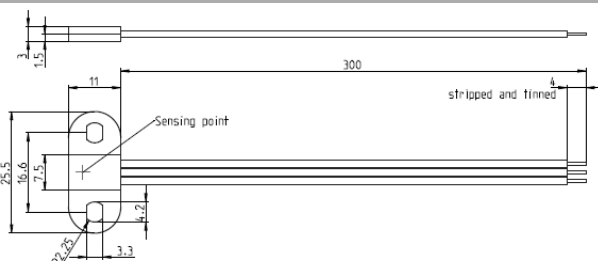
## Absolute Maximum Ratings

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><br>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><br>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



## Environmental Characteristics

|                       |    |              |
|-----------------------|----|--------------|
| Operating temperature | °C | - 20 to + 85 |
|-----------------------|----|--------------|

## Wire Assignment

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

HS-3511-03-0300

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

## Material Information

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

HS-3511-03-0300



**HS-3511-03-0300**

**Unipolar 3 - Wire**  
Flatpack Hall Effect Sensor

## 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> |                                                   |             |      |      |      |               |                                                                                             |
| $I_{SUP}$     | Supply current                                    | red         |      | 1.6  | 2.4  | mA            |                                                                                             |
| $I_{SUPHi}$   | Reverse current                                   |             |      |      | 1    | mA            | for $V_{SUP} = -18\text{ V}$                                                                |
| <b>Output</b> |                                                   |             |      |      |      |               |                                                                                             |
| $V_{ol}$      | 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> $V_{SUP} = 12\text{ V}$ ;<br>$R_L = 820\text{ }\Omega$ ; $C_L = 20\text{ pF}$ |
| $t_r$         | Output rise time                                  |             |      |      | 1    | $\mu\text{s}$ |                                                                                             |
| $t_d$         | Delay time <sup>1)</sup>                          |             |      | 16   |      | $\mu\text{s}$ |                                                                                             |
| $t_{smp}$     | Output refresh period                             |             | 1.6  | 2    | 2.66 | $\mu\text{s}$ |                                                                                             |
| $t_{en}$      | Enable time of output after settling of $V_{SUP}$ |             |      | 50   |      | $\mu\text{s}$ | $V_{SUP} = 12\text{ V}$<br>$B > B_{on} + 2\text{ mT}$ or $B < B_{off} - 2\text{ mT}$        |

## Power-on-self-test

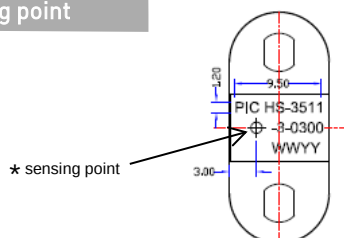
Self test can be triggered externally; details on request

<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   |            |

## Off-center position of sensing point



HS-3511-03-0300



**HS-3511-03-0300**

**Unipolar 3 - Wire**  
Flatpack Hall Effect Sensor

### Magnetic Characteristics Overview

| Symbol      | Parameter                                                     | wire colour | Min. | Typ. | Max.   | Unit  | Conditions |
|-------------|---------------------------------------------------------------|-------------|------|------|--------|-------|------------|
| $B_{ONth}$  | ON threshold range <sup>1)</sup>                              | -           | - 30 |      | 30     | mT    |            |
| $B_{OFFth}$ | OFF threshold range <sup>1)</sup>                             | -           | - 30 |      | 30     | mT    |            |
| $B_{th}$    | Adjustable step size <sup>2)</sup>                            | -           |      | 0.5  |        | mT    |            |
| $T_c$       | Temperature 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

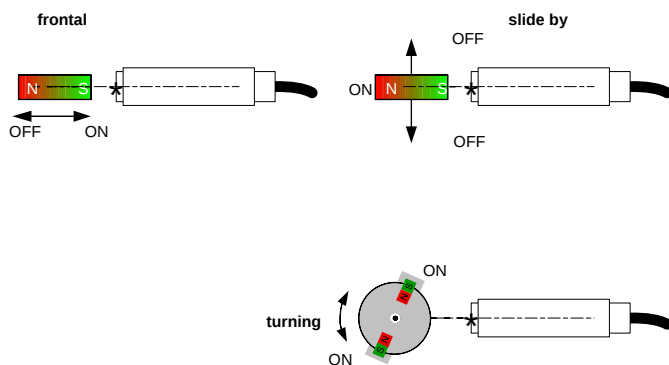
### Magnetic Characteristics

| Switching Type | Temp. coeff. of magnetic thresh.<br><br>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. |
| unipolar       | -1000                                              | tbd.              | 5.5  | tbd. | tbd.                | 3.5  | tbd. | -                                  | 2.0  | -    |
|                |                                                    | 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



★ Sensing point

