

## HS-2210M-04-0300



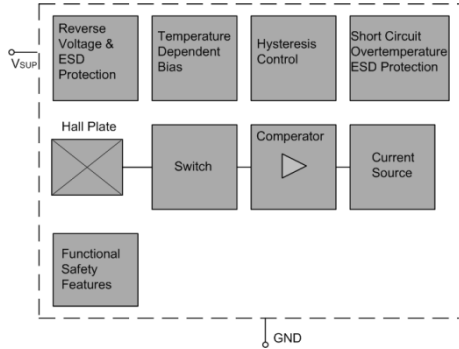
Product image serves as example only.

## HS-2210M-04-0300

Latching 2 - Wire

Hall Effect Sensor M10 thread

### Block Diagram



### Features

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

### Approvals



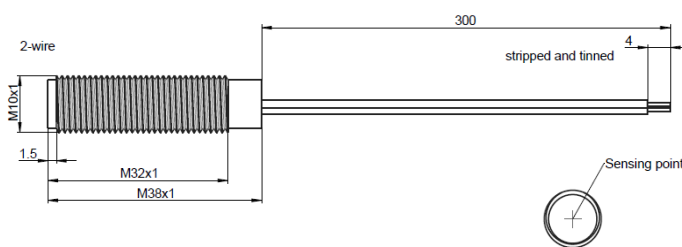
### Absolute Maximum Ratings

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         | 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><br>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 | red          |
| GND              | Ground         | black        |

HS-2210M-04-0300  
 wire length [mm]

### Environmental Characteristics

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

### Material Information

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

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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         | 5    |      | 7    | 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    | $\mu\text{s}$ | 1) $V_{SUP} = 12\text{ V}$ ;   |
| $t_r$         | 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  |      | 2.66 | $\mu\text{s}$ |  |
| $t_{en}$      | 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         | 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. koeff. of magnetic thresh.<br>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. |
| latching       | 0  | tbd.              | 12.0 | tbd. | tbd.                | - 12.0 | tbd. | -                                  | 24.0 | -    |
|                |  | 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)

**latching type**

frontal

side by

turning

\* Sensing point

Current consumption