Differential Magnetoresistive Sensor CY-DMR-01H

Features
- Sensing over wide rotation speed range
- Robust metallic or plastic housing
- Signal amplitude is speed independent
- Biasing magnet built in
- Best suited for harsh environments

Typical applications
- Speed detection
- Position detection
- Rotation detection
- Angle encoder
- Linear position sensing

The differential magnetoresistive sensor CY-DMR-01H consists of two series coupled magnetoresistors (D-type InSb/NiSb semiconductor resistors whose value can be magnetically controlled), which are mounted onto an insulated ferrite substrate. The sensor is encapsulated in a metallic or plastic package and has 3 connection terminals. The basic resistance of the total system is 2 x 600Ω. A permanent magnet, which supplies a biasing magnetic field, is fixed on the base of the sensor.

Case Style A: Ø8.5x6.5mm

Dimensions in mm

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>V+ power supply (+5V)</td>
</tr>
<tr>
<td>2</td>
<td>Output signal</td>
</tr>
<tr>
<td>3</td>
<td>GND</td>
</tr>
</tbody>
</table>

Markt Schwabener Str. 8
D-85464 Finsing
Germany

Tel.: +49 (0)8121 – 2574100
Fax: +49 (0)8121 – 2574101
Email: info@cy-sensors.com
http://www.cy-sensors.com
Case Style B:  Ø10x10mm

Specifications

- Maximum power supply $V_{\text{max}}$ 10V DC
- Nominal power supply 5V DC
- Total resistance $R_{1-3}$ ($\delta = \infty$, IsmA, $t=25{^\circ}\text{C}$) 900 $\Omega$ – 1600 $\Omega$
- Center symmetry $M=100\%$ ($R_{1-2}/R_{2-3}/R_{1-2}$ ($\delta = \infty$) $\leq 10\%$
- Offset voltage (at $V_{\text{in}}$ and $\delta = \infty$) $\leq 130$ mV
- Open circuit output voltage $V_{\text{out pp}}$ (at $V_{\text{in}}$ and $\delta = 0.15$ mm) $\geq 900$ mV
- Cut-off frequency $>20$ kHz
- Operating temperature $-30{^\circ}\text{C} \sim +100{^\circ}\text{C}$
- Storage temperature $-40{^\circ}\text{C} \sim +100{^\circ}\text{C}$

Standard target object: 1.8x5x4mm (1.8x5mm face moves in the sensing direction of the sensor).

Part number

<table>
<thead>
<tr>
<th>Part number</th>
<th>Case style</th>
<th>Outline</th>
<th>Cross reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>CY-DMR-01H-A</td>
<td>A</td>
<td>Ø8.5x6.5mm</td>
<td>Infineon FP212D250-22</td>
</tr>
<tr>
<td>CY-DMR-01H-B</td>
<td>B</td>
<td>Ø10x10mm</td>
<td>Infineon FP210D250-22</td>
</tr>
</tbody>
</table>
Measurement Arrangement

A measuring bridge is used for applications of the magnetoresistive sensor CY-DMR-01H. The resistances $R_{2-3}$ and $R_{1-2}$ of the sensor are changed by approaching a small soft iron part (standard target object) close to it. As result an output voltage change of measuring bridge is caused by the resistance change (see below).

To convert small distance into a proportional electric signal, one can use a small soft iron part with definite width (e.g. $b=1.8\text{mm}$) to move over the face of the sensor. A linear signal up to 1.5mm can be obtained in this way. The sinusoidal signal gives a voltage output proportional to the distance in the zero crossover range.