ChenYang
Technologies GmbH & Co. KG

Differential Magnetoresistive Sensor CY-DMR-02

Features

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

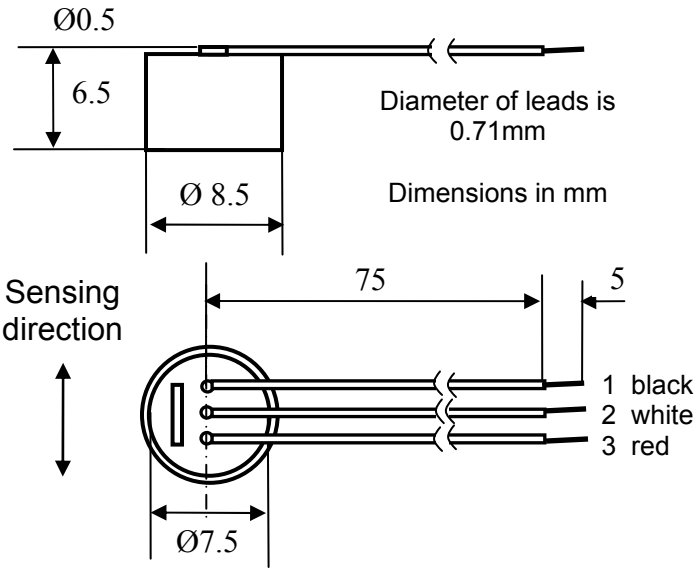
Typical applications

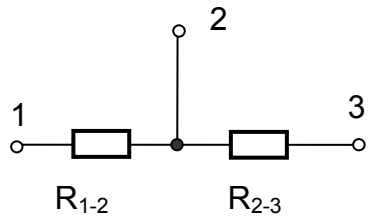
- Speed detection
- Position detection
- Rotation detection
- Angle encoder
- Linear position sensing

The differential magnetoresistive sensor CY-DMR-02 consists of two series coupled magneto resistors (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 package and has 3 connection terminals. The basic resistance of the total system is 2x100Ω. A permanent magnet, which supplies a biasing magnetic field, is fixed on the base of the sensor.

Outlines

Case Style A: Ø8.5x6.5mm

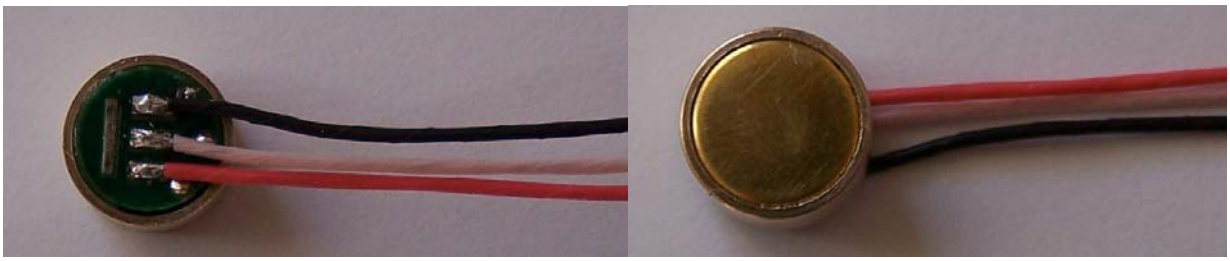




3: V+ power supply (+5V)

2: Output signal

1: GND



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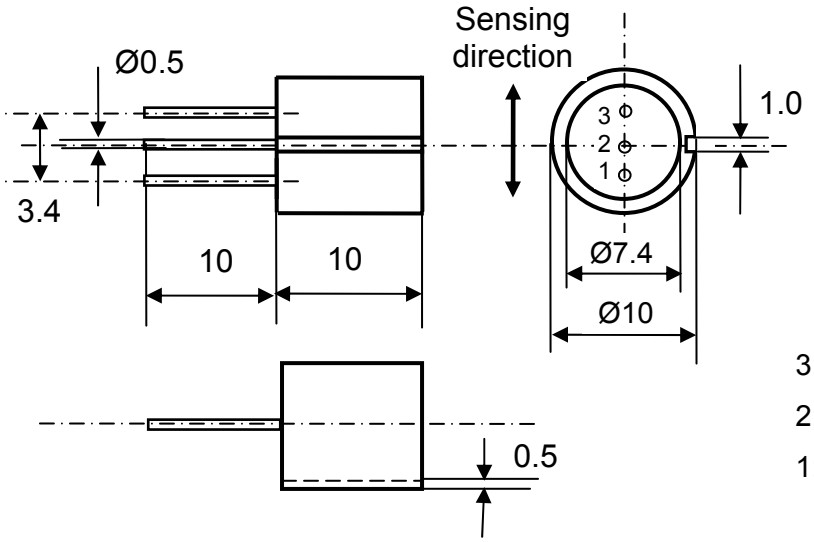
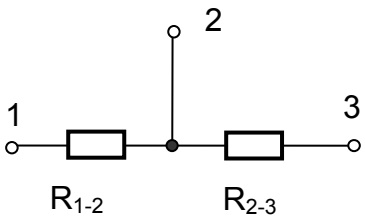
Case Style B: Ø10x10mm

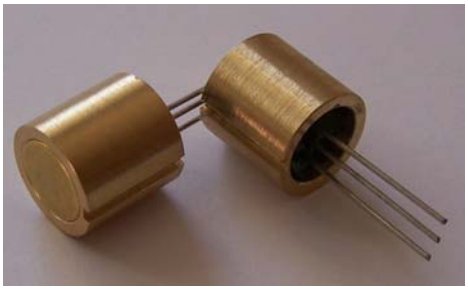




3: V+ power supply (+5V)

2: Output signal

1: GND



Part number

Part number	Case style	Outline	**Cross reference**
CY-DMR-02-A	A	Ø8.5x6.5mm	Infineon FP212L100-22
CY-DMR-02-B	B	Ø10x10mm	Infineon FP210L100-22

Specifications

Maximum power supply V_{max}	10V DC
Nominal power supply	5V DC
Total resistance R_{1-3} ($\delta=\infty$, I≤mA, t=25°C)	220 Ω – 660 Ω
Center symmetry M=100% (R_{1-2}-R_{2-3})/R_{1-2} ($\delta=\infty$)	≤10%
Offset voltage (at Vin and $\delta=\infty$)	≤ 130mV
Open circuit output voltage $V_{out\ pp}$ (at Vin and δ=0.15mm)	≥1000mV
Cut-off frequency	20kHz
Operating temperature	-30°C ~ +70°C
Storage temperature	-40°C ~ +85°C

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

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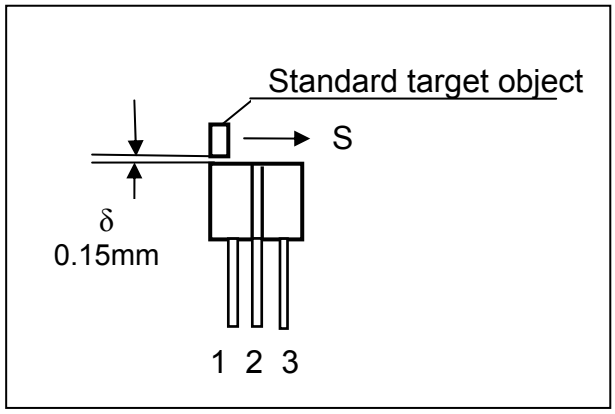
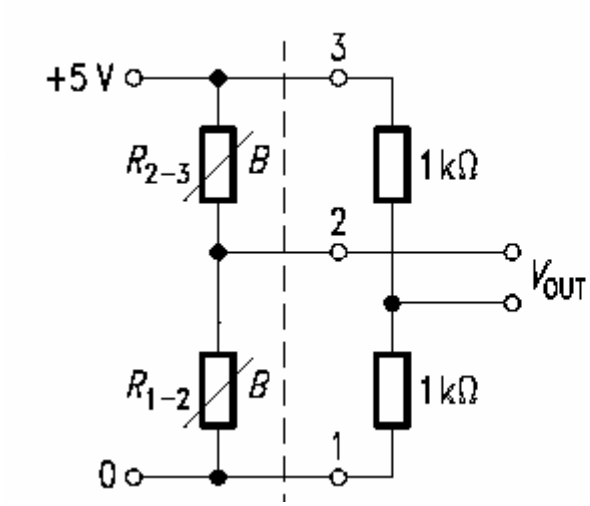
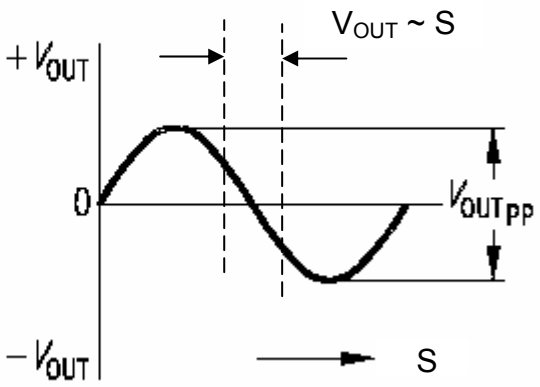
Measurement Arrangement

A measuring bridge is used for applications of the magnetoresistive sensor CY-DMR-02. The resistance of the sensor is 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=1.8mm) 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 region.

For digital revolution counting, the sensor should be actuated by a magnetic soft iron tooth wheel. The tooth spacing should correspond to about twice of the magneto resistor intercenter space i.e. 2x1.6mm.

The two resistors of the sensor are supplemented by two additional resistors in order to obtain the sensor output voltage as a bridge voltage V_{OUT}. The output voltage V_{OUT} without excitation is then 0V because the offset is compensated by the bridge circuit.

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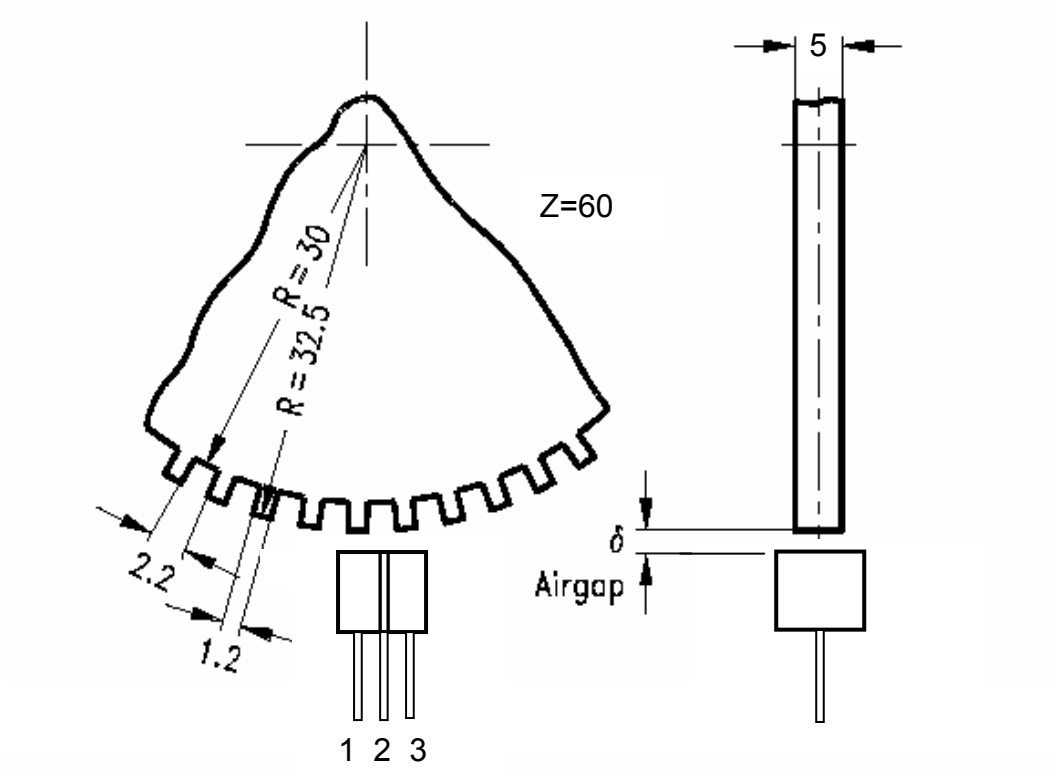

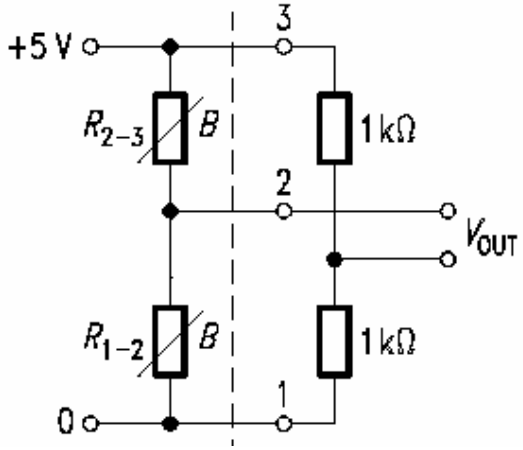

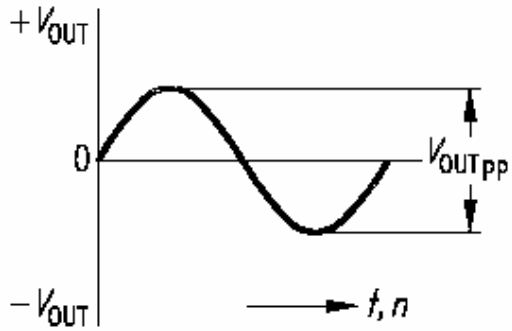

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