

### General Description

OIM4C is a magneto resistive position sensor, based on the *Anisotropic Magneto Resistance* (AMR) effect in a plastic FR4 package with glob top hard black resin.

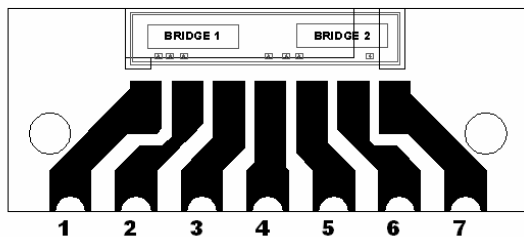
When the device is moved along a magnetic scale with a N\S pole pitch of 5 mm the two Wheatstone bridges generate differential sinusoidal output voltage signals ( PSIN - NSIN and PCOS - NCOS) phase-shifted at 90°. One sine\cosine cycle averaged using a pair of N\S poles is thus produced for a pole width.

The amplitude of the differential output voltages are largely independent of the magnetic field strength and thus not sensitive to changes in distance.

The absolute magnetic field strength must be large enough for the sensor to go into saturation and for the magnetization of resistor stripes to assume the direction of the outer magnetic fields.

### Applications

- Linear position sensing
- Length measuring systems
- Non-contact location of motional objects
- Proximity detection
- Valve positioning
- Angular position measurements



### Features

- Magneto resistive position sensor
- Strong field sensor for 5 mm N/S pole pitch
- One sine/cosine cycle per pole width
- High interpolation due to a sine signal with few harmonics
- Low saturation field strength
- High amplitude consistency with changes in distance
- Resistant to strong magnetic fields
- Not sensitive to external homogenous magnetic fields

### Pin Functions

No.	Name	Function
1	SIN +	Output Sine +
2	COS +	Output Cosine +
3	GND	Ground
4	V <sub>CC</sub>	Power supply both bridges
5	NC	Not connected
6	SIN -	Output Sine -
7	COS -	Output Cosine -

### Ordering Information

OIM4C 5 mm pitch magnetic sensor

**ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	Min	Max	Unit
V <sub>BRIDGE</sub>	Supply voltage to bridge	-10	10	V
V <sub>PIN</sub>	Voltage at PSIN, NSIN, PCOS, NCOS	-10	10	V
I <sub>BRIDGE</sub>	Supply current to bridge	-11	11	mA
I <sub>PIN</sub>	Current in PSIN, NSIN, PCOS, NCOS	-11	11	mA
T <sub>A</sub>	Operating Temperature Range	-25	100	°C
T <sub>S</sub>	Storage Temperature	-40	100	°C

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rated conditions for extended periods may affect device reliability.

**ELECTRICAL CHARACTERISTICS**

T<sub>A</sub> = -40 ... 100°C, V<sub>BRIDGE</sub> = 5V ± 10%, I<sub>H<sub>EXT</sub></sub> > 25kA/m at the bottom edge of the sensor, unless otherwise noted.

Symbol	Parameter	Conditions	T [°C]	Min	Typ	Max	Unit
V <sub>BRIDGE</sub>	Permissible Supply Voltage V <sub>SIN</sub> V <sub>COS</sub>	V <sub>BRIDGE</sub> = V <sub>SIN</sub> = V <sub>COS</sub>		-10		10	V
I <sub>BRIDGE</sub>	Supply Current in V <sub>BRIDGE</sub>	PSIN, NSIN, PCOS, NCOS		4		10	mA
R <sub>BRIDGE</sub>	Sensor Resistance (sin and cos bridge)		25°C	1	1.5	2	KΩ
TCR <sub>BRIDGE</sub>	Bridge Resistance Temperature Drift			0.29	0.33	0.37	% / K
V <sub>PK</sub>	Amplitude of Differential Output Voltages			8		20	mV / V
TC (V <sub>a</sub> )	Amplitude Temperature Drift			-0.37	-0.33	-0.29	% / K
V <sub>OS</sub>	Offset Voltage	H <sub>EXT</sub> =0 kA/m at the bottom edge of the sensor		-3		3	mV / V
TC (V <sub>OS</sub> )	Offset Voltage Temperature Drift			-3		3	μV/VK
V <sub>REL</sub>	Relative Change in Amplitude	Distance bottom edge of the sensor to the magnetic scale: 0...1.5 mm		-5		5	%
AA <sub>abs</sub>	Absolute Angle Accuracy	Without offset voltage, distance bottom edge of the sensor to the magnetic scale: 0.5mm		-1		1	DEG

**MECHANICAL DIMENSIONS**

Units=mm Mechanical tolerance=±/0.2mm Die positioning tolerance=±/0.030mm

