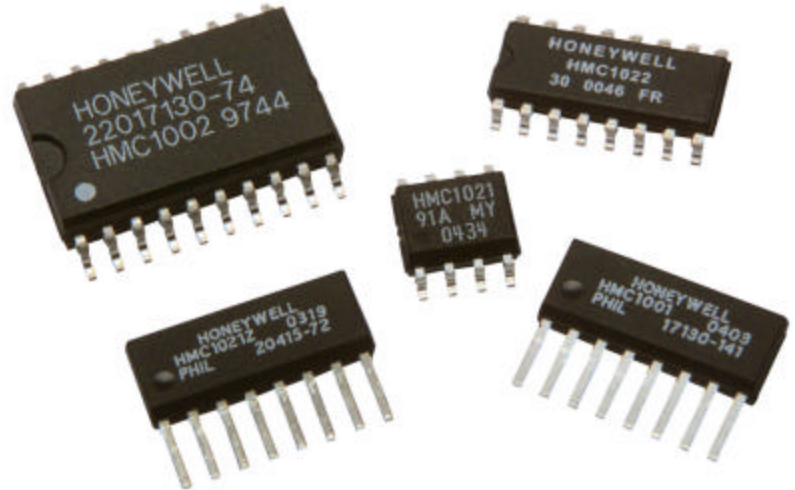


# 1- and 2-Axis Magnetic Sensors

## HMC1001/1002/1021/1022

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The Honeywell HMC100x and HMC102x magnetic sensors are one and two-axis surface mount sensors designed for low field magnetic sensing. By adding supporting signal processing, cost effective magnetometers or compassing solutions are enabled. These small, low cost solutions are easy to assemble for high volume OEM designs. Applications for the HMC100x and HMC102x sensors include Compassing, Navigation Systems, Magnetometry, and Current Sensing.



The HMC100x and HMC102x sensors utilize Honeywell's Anisotropic Magneto-resistive (AMR) technology that provides advantages over coil based magnetic sensors. They are extremely sensitive, low field, solid-state magnetic sensors designed to measure direction and magnitude of Earth's magnetic fields, from tens of micro-gauss to 6 gauss. Honeywell's Magnetic Sensors are among the most sensitive and reliable low-field sensors in the industry.

Honeywell continues to maintain product excellence and performance by introducing innovative solid-state magnetic sensor solutions. These are highly reliable, top performance products that are delivered when promised. Honeywell's magnetic sensor solutions provide real solutions you can count on.

## FEATURES

- ▶ Surface Mount 1 and 2-Axis Sensors
- ▶ Low Cost
- ▶ 4-Element Wheatstone Bridges
- ▶ Low Voltage Operations (2.0V)
- ▶ Available in Tape & Reel Packaging
- ▶ Patented Offset and Set/Reset Straps
- ▶ Wide Field Range (up to +/-6 Oe)

## BENEFITS

- ▶ Easy to Assemble & Compatible with High Speed SMT Assembly
- ▶ Designed for High Volume, Cost Effective OEM Designs
- ▶ Low Noise Passive Element Design
- ▶ Compatible for Battery Powered Applications
- ▶ High Volume OEM Assembly
- ▶ Stray Magnetic Field Compensation
- ▶ Sensor Can Be Used in Strong Magnetic Field Environments

# HMC1001/1002/1021/1022

## HMC1001/1002 SPECIFICATIONS

Characteristics	Conditions*	Min	Typ	Max	Units
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### Bridge Elements

Supply	Vbridge (Vb) referenced to GND	-	5.0	12	Volts
Resistance	Bridge current = 10mA per bridge	600	850	1200	ohms
Operating Temperature	Ambient	-55		150	°C
Storage Temperature	Ambient, unbiased	-55		175	°C
Field Range	Full scale (FS) – total applied field	-2		+2	gauss
Linearity Error	Best fit straight line ± 1 gauss ± 2 gauss		0.1 1.0	0.5 2.0	%FS
Hysteresis Error	3 sweeps across ±2 gauss		0.05	0.10	%FS
Repeatability Error	3 sweeps across ±2 gauss		0.05	0.10	%FS
S/R Repeatability	Output variation after alternate S/R pulses Vb = 5V, I <sub>SR</sub> = 3A			100	µV
Bridge Offset	Offset = (OUT+) – (OUT-) Field = 0 gauss after Set pulse, Vb = 8V	-60	-15	+30	mV
Sensitivity	Set/Reset Current = 3A	2.5	3.2	4.0	mV/V/gauss
Noise Density	@ 1Hz, Vb=5V		29		nV/sqrt Hz
Resolution	10Hz Bandwidth, Vb=5V		27		µgauss
Bandwidth	Magnetic signal (lower limit = DC)		5		MHz
Disturbing Field	Sensitivity starts to degrade. Use S/R pulse to restore sensitivity.	5			gauss
Sensitivity Tempco	T <sub>A</sub> = -40 to 125°C, Vb=8V T <sub>A</sub> = -40 to 125°C, I <sub>bridge</sub> =5mA	-0.32	-0.30 -0.06	-0.28	%/°C
Bridge Offset Tempco	T <sub>A</sub> = -40 to 125°C, No Set/Reset T <sub>A</sub> = -40 to 125°C, With Set/Reset		±0.03 ±0.001		%/°C
Bridge Ohmic Tempco	T <sub>A</sub> = -40 to 125°C		0.25		%/°C
Cross-Axis Effect	Cross field = 1 gauss, Happlied = ±1 gauss With set/reset		±3 ±0.5		%FS
Max. Exposed Field	No perming effect on zero reading			10000	gauss

### Set/Reset Straps

Resistance	Measured from S/R+ to S/R-		1.5	1.8	ohms
Current	0.1% duty cycle, or less, 2µsec current pulse	2.0	3.0	5	Amp
Resistance Tempco	T <sub>A</sub> = -40 to 125°C		0.37		%/°C

### Offset Straps

Resistance	Measured from OFF+ to OFF-		2.5	3.5	ohms
Offset Constant	DC Current Field applied in sensitive direction	46	51	56	mA/gauss
Resistance Tempco	T <sub>A</sub> = -40 to 125°C		0.39		%/°C

\* Tested at 25°C except stated otherwise.