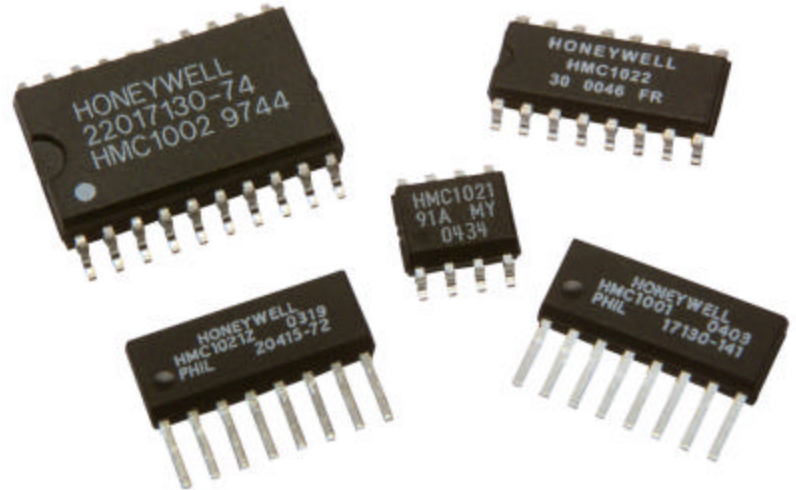


# 1- and 2-Axis Magnetic Sensors

## 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 Magnetostrictive (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      |
|------------------------|---|-------|-----------------|------------|------------|
| <b>Bridge Elements</b> |   |       |                 |            |            |
| 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<br>± 1 gauss<br>± 2 gauss  |       | 0.1<br>1.0      | 0.5<br>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<br>Vb = 5V, I <sub>SR</sub> = 3A                    |       |                 | 100        | µV         |
| Bridge Offset          | Offset = (OUT+) – (OUT-)<br>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.<br>Use S/R pulse to restore sensitivity.                         | 5     |                 |            | gauss      |
| Sensitivity Tempco     | T <sub>A</sub> = -40 to 125°C, Vb=8V<br>T <sub>A</sub> = -40 to 125°C, I <sub>bridge</sub> =5mA | -0.32 | -0.30<br>-0.06  | -0.28      | %/°C       |
| Bridge Offset Tempco   | T <sub>A</sub> = -40 to 125°C, No Set/Reset<br>T <sub>A</sub> = -40 to 125°C, With Set/Reset    |       | ±0.03<br>±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<br>With set/reset                                    |       | ±3<br>±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<br>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.