

# Humidity Sensors

## Humidity Sensor

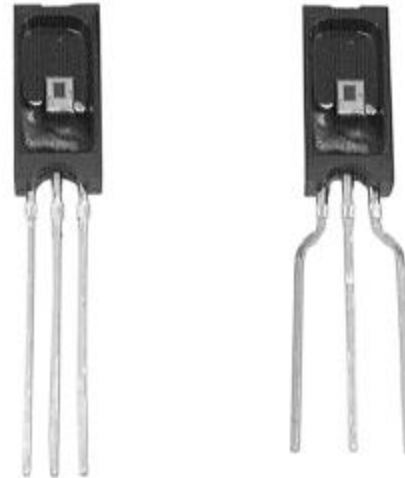
# HIH-3610 Series

### FEATURES

- Molded thermoset plastic housing with cover
- Linear voltage output vs %RH
- Laser trimmed interchangeability
- Low power design
- High accuracy
- Fast response time
- Stable, low drift performance
- Chemically resistant

### TYPICAL APPLICATIONS

- Refrigeration
- Drying
- Metrology
- Battery-powered systems
- OEM assemblies



The HIH-3610 Series humidity sensor is designed specifically for high volume OEM (Original Equipment Manufacturer) users. Direct input to a controller or other device is made possible by this sensor's linear voltage output. With a typical current draw of only 200  $\mu$ A, the HIH-3610 Series is ideally suited for low drain, battery operated systems. Tight sensor interchangeability reduces or eliminates OEM production calibration costs. Individual sensor calibration data is available.

The HIH-3610 Series delivers instrumentation-quality RH (Relative Humidity) sensing performance in a low cost, solderable SIP (Single In-line Package). Available in two lead spacing configurations, the RH sensor is a laser trimmed thermoset polymer capacitive sensing element with on-chip integrated signal conditioning. The sensing element's multilayer construction provides excellent resistance to application hazards such as wetting, dust, dirt, oils, and common environmental chemicals.

### **⚠ WARNING**

#### **PERSONAL INJURY**

- DO NOT USE these products as safety or emergency stop devices, or in any other application where failure of the product could result in personal injury.

**Failure to comply with these instructions could result in death or serious injury.**

### **⚠ WARNING**

#### **MISUSE OF DOCUMENTATION**

- The information presented in this product sheet is for reference only. Do not use this document as system installation information
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

**Failure to comply with these instructions could result in death or serious injury.**

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HH-3610 Series

**TABLE 1: PERFORMANCE SPECIFICATIONS**

Parameter	Condition
RH Accuracy <sup>(1)</sup>	±2% RH, 0-100% RH non-condensing, 25 °C, V <sub>supply</sub> = 5 Vdc
RH Interchangeability	±5% RH, 0-60% RH; ±8% @ 90% RH typical
RH Linearity	±0.5% RH typical
RH Hysteresis	±1.2% RH span maximum
RH Repeatability	±0.5% RH
RH Response Time, 1/e	15 sec in slowly moving air at 25 °C
RH Stability	±1% RH typical at 50% RH in 5 years
<b>Power Requirements</b>	
Voltage Supply	4 Vdc to 5.8 Vdc, sensor calibrated at 5 Vdc
Current Supply	200 µA at 5 Vdc
<b>Voltage Output</b>	
	V <sub>out</sub> = V <sub>supply</sub> (0.0062(Sensor RH) + 0.16), typical @ 25 °C (Data printout option provides a similar, but sensor specific, equation at 25 °C.)
V <sub>supply</sub> = 5 Vdc	0.8 Vdc to 3.9 Vdc output @ 25 °C typical
Drive Limits	Push/pull symmetric; 50 µA typical, 20 µA minimum, 100 µA maximum Turn-on ≤ 0.1 sec
<b>Temperature Compensation</b>	
	True RH = (Sensor RH)/(1.093-0.0021T), T in °F True RH = (Sensor RH)/(1.0546-0.00216T), T in °C
Effect @ 0% RH	±0.007 %RH/°C (negligible)
Effect @ 100% RH	-0.22% RH/°C (<1% RH effect typical in occupied space systems above 15 °C (59 °F))
<b>Humidity Range</b>	
Operating	0 to 100% RH, non-condensing <sup>(1)</sup>
Storage	0 to 90% RH, non-condensing
<b>Temperature Range</b>	
Operating	-40 °C to 85 °C (-40 °F to 185 °F)
Storage	-51 °C to 125 °C (-60 °F to 257 °F)
Package <sup>(2)</sup>	Three pin, solderable SIP in molded thermoset plastic housing with thermoplastic cover
Handling	Static sensitive diode protected to 15 kV maximum

**Notes:**

1. Extended exposure to ≈90% RH causes a reversible shift of 3% RH.
2. This sensor is light sensitive. For best results, shield the sensor from bright light.



# Humidity/Moisture Sensors

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HIH-3610 Series

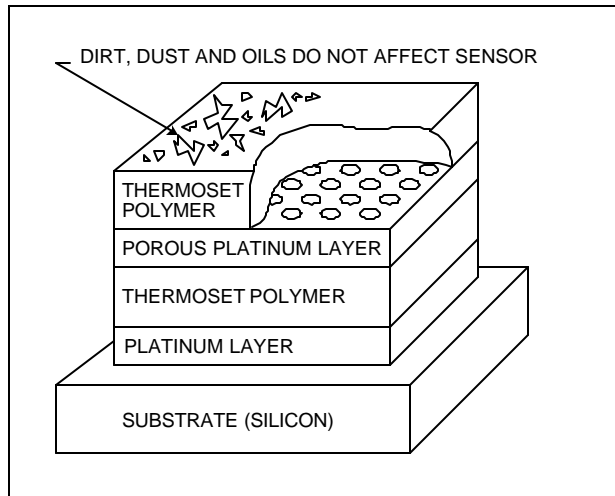
### FACTORY CALIBRATION

HIH-3610 sensors may be ordered with a calibration and data printout (Table 2). See order guide on back page.

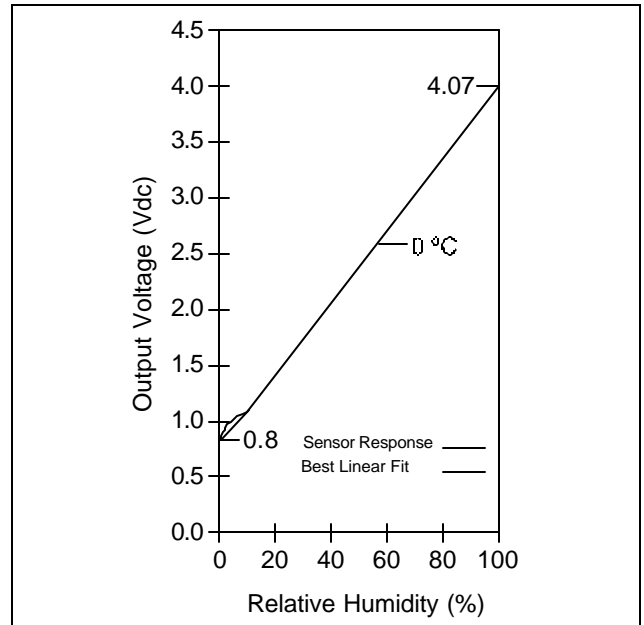
**TABLE 2: EXAMPLE DATA PRINTOUT**

<b>Model</b>	<b>HIH-3610-001</b>
Channel	92
Wafer	030996M
MRP	337313
Calculated values at 5 V	
V <sub>out</sub> @ 0% RH	0.958 V
V <sub>out</sub> @ 75.3% RH	3.268 V
Linear output for 2% RH accuracy @ 25 °C	
Zero offset	0.958 V
Slope	30.680 mV/%RH
RH	$(V_{out}-\text{zero offset})/\text{slope}$ $(V_{out}-0.958)/0.0307$
Ratiometric response for 0 to 100% RH	
V <sub>out</sub>	V <sub>supply</sub> (0.1915 to 0.8130)

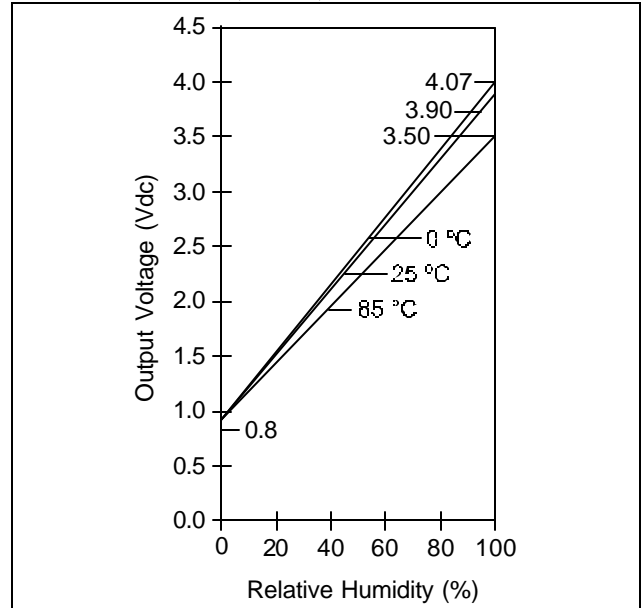
**FIGURE 1: RH SENSOR CONSTRUCTION**



**FIGURE 2: OUTPUT VOLTAGE VS RELATIVE HUMIDITY AT 0 °C**



**FIGURE 3: OUTPUT VOLTAGE VS RELATIVE HUMIDITY AT 0 °C, 25 °C, 85 °C**



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