

## HIH-4602-L Series Humidity Sensors

### DESCRIPTION

HIH-4602-L Series Relative Humidity (RH) sensors are designed to deliver RH sensing in a rugged, low-cost slotted TO-5 can.

The laser-trimmed, thermoset polymer capacitive sensing elements have on-chip integrated signal conditioning, helping to reduce product development times.

### FEATURES

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- Near linear voltage output vs %RH
- Laser-trimmed interchangeability
- Enhanced accuracy, fast response
- Chemically resistant
- Stable, low drift performance
- Built-in static protection
- TO-5 can



A typical current draw of only 200  $\mu$ A allows use in battery-powered systems.

HIH-4602-L-CP sensors include a calibration and data printout to allow individually matched downstream electronics and  $\pm 3.5$  %RH total accuracy.

### POTENTIAL APPLICATIONS

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- Refrigeration
- Drying
- Meteorology
- Battery-powered systems
- OEM (Original Equipment Manufacturer) assemblies

# HIH-4602-L Series

**Table 1. Performance Specifications (At 5 Vdc supply and 25 °C [77 °F] unless otherwise noted.)**

Parameter	Minimum	Typical	Maximum	Unit	Specific Note
Interchangeability (first order curve)	–	–	–	–	–
0% RH to 59% RH	-5	–	5	% RH	–
60% RH to 100% RH	-8	–	8	% RH	–
Accuracy (best fit straight line)	-3.5	–	+3.5	% RH	1
Hysteresis	–	3	–	% RH	–
Repeatability	–	±0.5	–	% RH	–
Settling time	–	–	70	ms	–
Response time (1/e in slow moving air)	–	30	–	s	–
Stability (at 50% RH in one year)	–	1.2	–	% RH	–
Voltage supply	4	–	5.8	Vdc	–
Current supply	–	200	500	µA	–
Output voltage temp. coefficient at 50% RH, 5 V	–	-4	–	mV/°C	–
Voltage output (1st order curve fit)	$V_{OUT} = (V_{SUPPLY})(0.0062(\text{sensor RH}) + 0.16)$ , typical at 25 °C				2
Temperature compensation	True RH = (sensor RH)/(1.0546-0.00216T), T in °C				
Operating temperature	-40[-40]	See Figure 1.	85[185]	°C[°F]	–
Operating humidity	0	See Figure 1.	100	% RH	3
Storage temperature	-40[-40]	See Figure 2.	125[257]	°C[°F]	–
Storage humidity	See Figure 2.			% RH	3

**Specific Notes:**

1. Applies to HIH-4602-L-CP only.
2. Device is calibrated at 5 Vdc and 25 °C.
3. Non-condensing environment.

**General Notes:**

- Sensor is ratiometric to supply voltage.
- Extended exposure to ≥90% RH causes a reversible shift of 3% RH.
- Sensor is light sensitive. For best performance, shield sensor from bright light.

**Factory Calibration Data**

HIH-4602-L-CP Sensors include a calibration and data printout. See Table 2.

**Table 2. Example Data Printout**

Model	HIH-4602-L-CP
Channel	92
Wafer	030996M
MRP	337313
Calculated values at 5 V	
V <sub>OUT</sub> at 0% RH	0.958 V
V <sub>OUT</sub> at 75.3% RH	3.268 V
Linear output for 3.5% RH accuracy at 25 °C	
Zero offset	0.958 V
Slope	30.680 mV/%RH
RH	(V <sub>OUT</sub> - zero offset)/slope (V <sub>OUT</sub> - 0.958)/0.0307
Ratiometric response for 0% RH to 100% RH	
V <sub>OUT</sub>	V <sub>SUPPLY</sub> (0.1915 to 0.8130)



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Figure 1. Operating Environment (Non-condensing environment.)

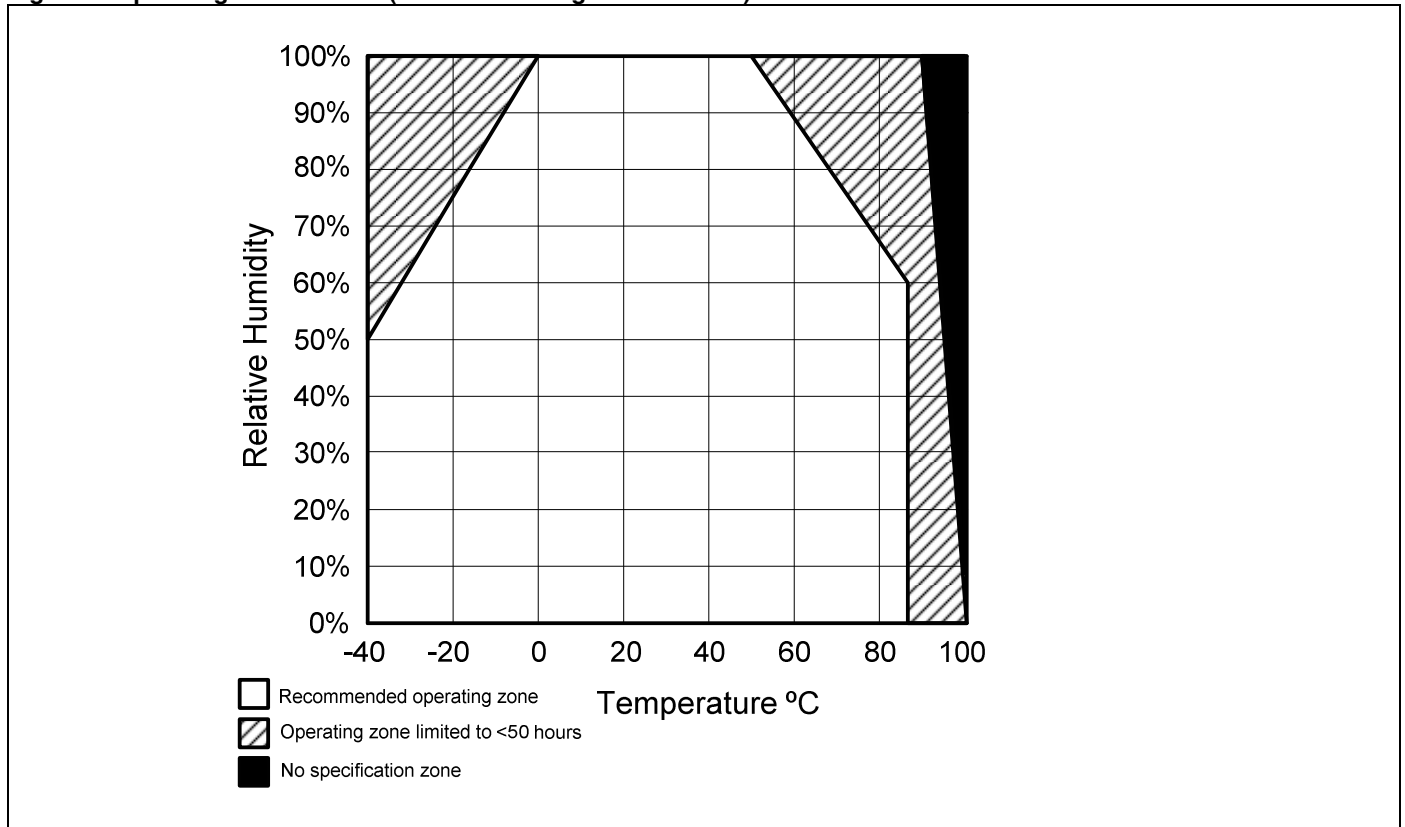
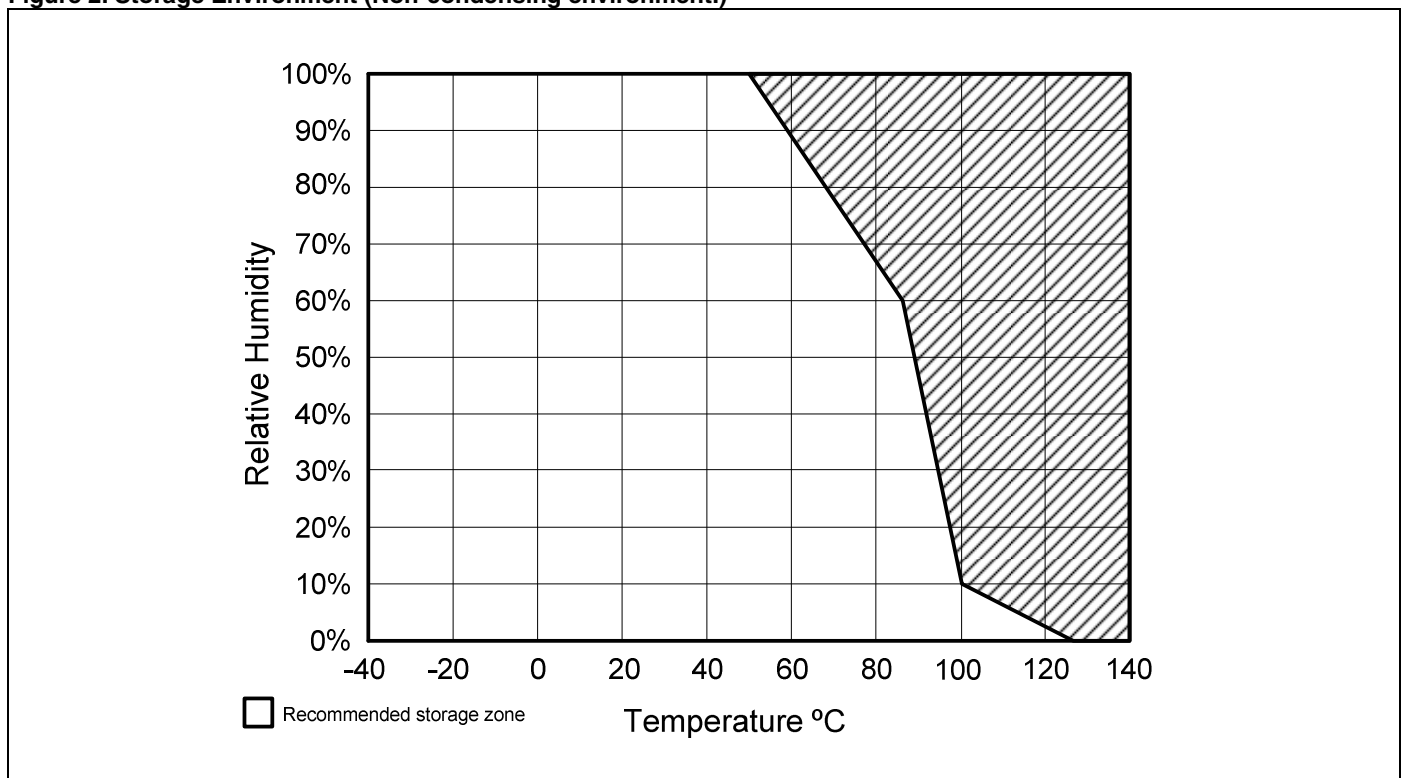


Figure 2. Storage Environment (Non-condensing environment.)



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Figure 3. Typical Output Voltage vs Relative Humidity (At 5 V and 25 °C.)

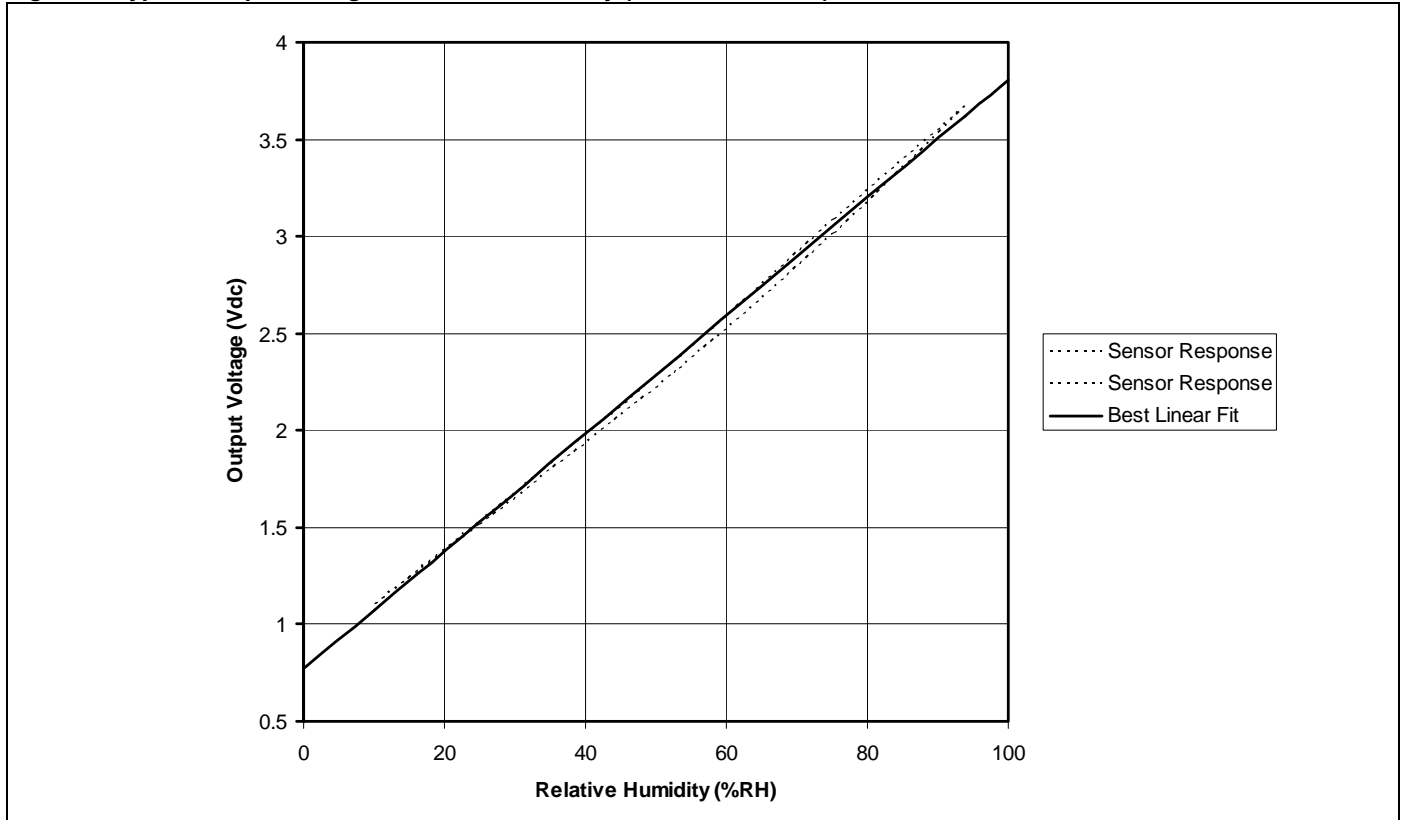
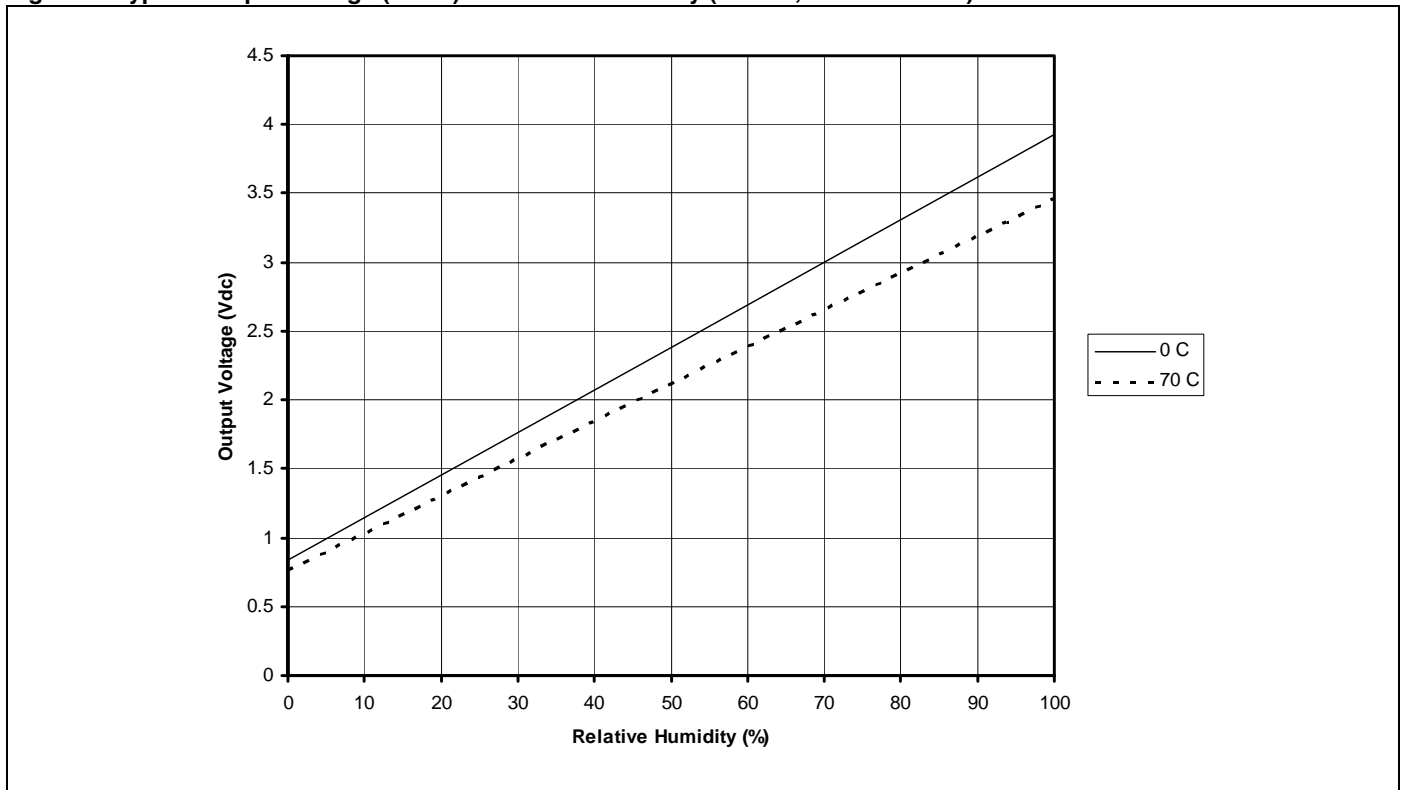
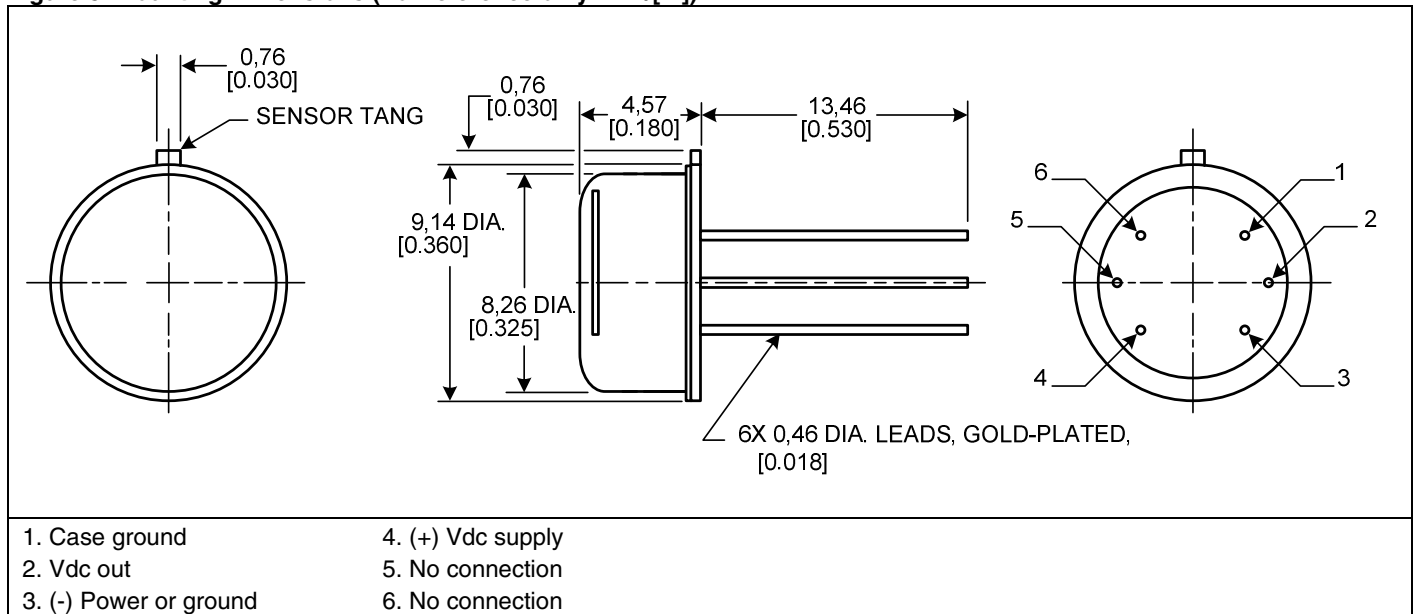


Figure 4. Typical Output Voltage (BFSL) vs Relative Humidity (At 0 °C, 70 °C and 5 V.)



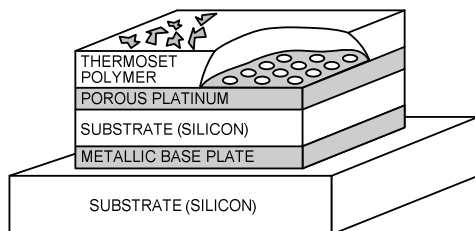
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**Figure 5. Mounting Dimensions (For reference only. mm/[in])**



**Figure 6. RH Sensor Construction**

Sensor construction consists of a planar capacitor with a second polymer layer to protect against most dirt/dust particles, oils and other hazards.



**Figure 7. Typical Application Circuit**

