

# T9600

## The Fully Calibrated Humidity and Temperature Module



### Features

- Ready to install package
- Simultaneous relative humidity and temperature outputs
- Precision accuracy  $\pm 2\%$  RH,  $\pm 0.6^\circ\text{C}$
- Resolution 0.4% RH
- Factory calibrated, ready to use
- Supply voltage: 3.0V to 5.5V
- Low current: 0.5mA@5V, 25°C
- Conformal coated PCB for corrosion protection
- Included filter to protect humidity element
- RoHS CE compliant



## T9600—The Fully Calibrated Humidity and Temperature Sensor

The T9600 series humidity sensor by GE offers a new standard in the field of accurate relative humidity measurement. Based on a capacitive polymer sensing technology, this device offers signal conditioning and temperature compensation for a single SoC (System-on-Chip) solution. The device is very simple to use, fully tested and calibrated for accuracy on delivery—no further calibration is needed. T9600 can be incorporated into an OEM solution to meet customer specifications. The measurement is accurate to  $\pm 2\%$  from 20% to 80% RH and  $\pm 3\%$  across the entire humidity range. Long term stability is excellent. The temperature accuracy is  $\pm 1^\circ\text{C}$  from  $0^\circ\text{C}$  to  $+70^\circ\text{C}$ . Dual outputs provide humidity and temperature as 0V to 1V, or available with digital output (the ZACwire one-wire interface).

### Accurate, Repeatable Humidity and Temperature Measurement

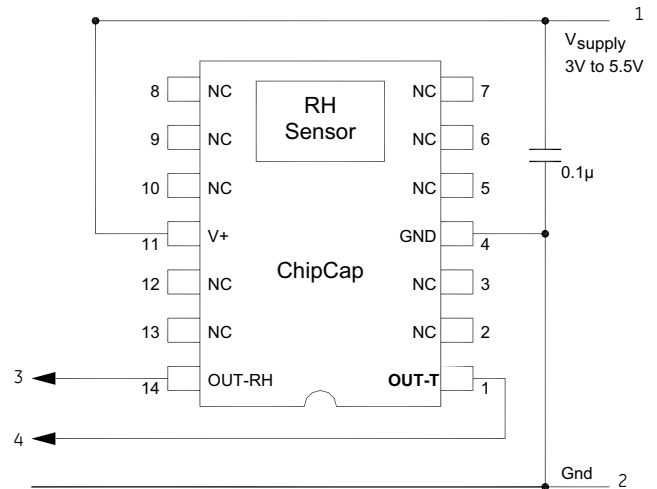
T9600 provides either analog or digital interfaces in a single package. The package is highly resistant to chemical vapors and other contaminants. T9600 sensors are precalibrated and offer high interchangeability. They also fully recover from condensing environments and may be used across a wide range of both temperature and relative humidity ranges.

T9600 relative humidity sensors change capacitance in direct proportion to ambient relative humidity. An internal solid-state band gap provides temperature measurement. This integral design reduces overall cost and complexity and improves reliability.

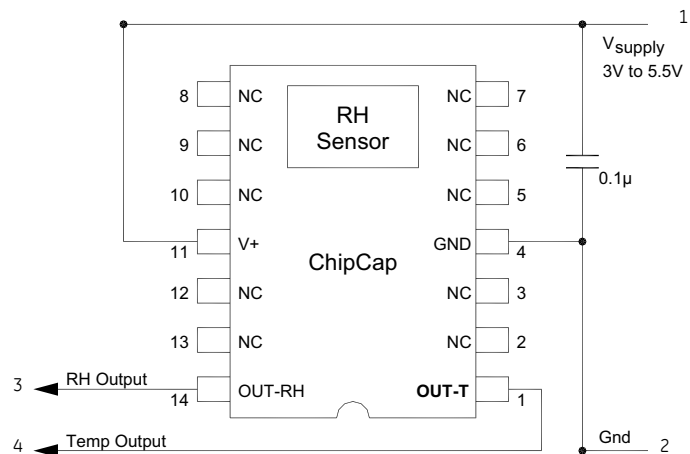
## Small Package for OEM Assembly

T9600 contains the entire signal conditioning circuitry on a single silicon die. The sensor and circuitry are integrated into a small footprint package, ready for OEM integration.

Digital Interface



Analog Interface



### Linear mode:

$$\%RH = V_{out} * 100$$

$$T_c = V_{out} * 200 - 50$$

# T9600 Specifications

## Relative Humidity

### RH Sensor

Planar Capacitive Polymer

### RH Range

0 to 100% RH

### RH Accuracy @ 25°C

±2% from 20% to 80%

±3% from 0% to 20% and 80% to 100%

### RH Resolution

0.4% RH

## Temperature

### Temperature Sensor

Integral band gap PTAT

### Operating Temperature

-20°C to 80°C

### Storage Temperature

-40°C to 80°C

### Temperature Accuracy

±0.6°C at 25°C

### Temperature Resolution

0.2°C

## Power Supply

### Voltage Supply

3 to 5.5 VDC

### Current Consumption

500 microamps @ 5 VDC, 25°C

### Reverse Polarity Protection

12.5 VDC — continuous with 100µA current

15 VDC — 60 seconds

## Outputs

### RH Voltage Output

(Linear, 0-1V, 0 - 100% RH)

$V_{out} = 0.01(RH)$

### Temperature Voltage Output

(Linear, 0-1V, -50 to 150°C)

$V_{out} = (0.005T \text{ } ^\circ\text{C}) + 0.25$

### RH Digital Output

Manchester 8-bit encoded

### Temperature Digital Output

Manchester 10-bit encoded

### Warranty

1 year

*Note: Manchester coding (also known as Phase Encoding, or PE) is a line code in which the encoding of each data bit has at least one transition and occupies the same time. It therefore has no DC component, and is self-clocking,*

# Environmental

## Operating Temperature Range

-20°C to 80°C

## Operating RH Range

0 to 100 % RH, non-condensing

# Packaging

## ESD

Handle according to IPC-A-610C Standard

## Flammability Rating

UL 94V-0 for enclosure and connector material

UL 1581 VW-1 for cable

## Pin Connection

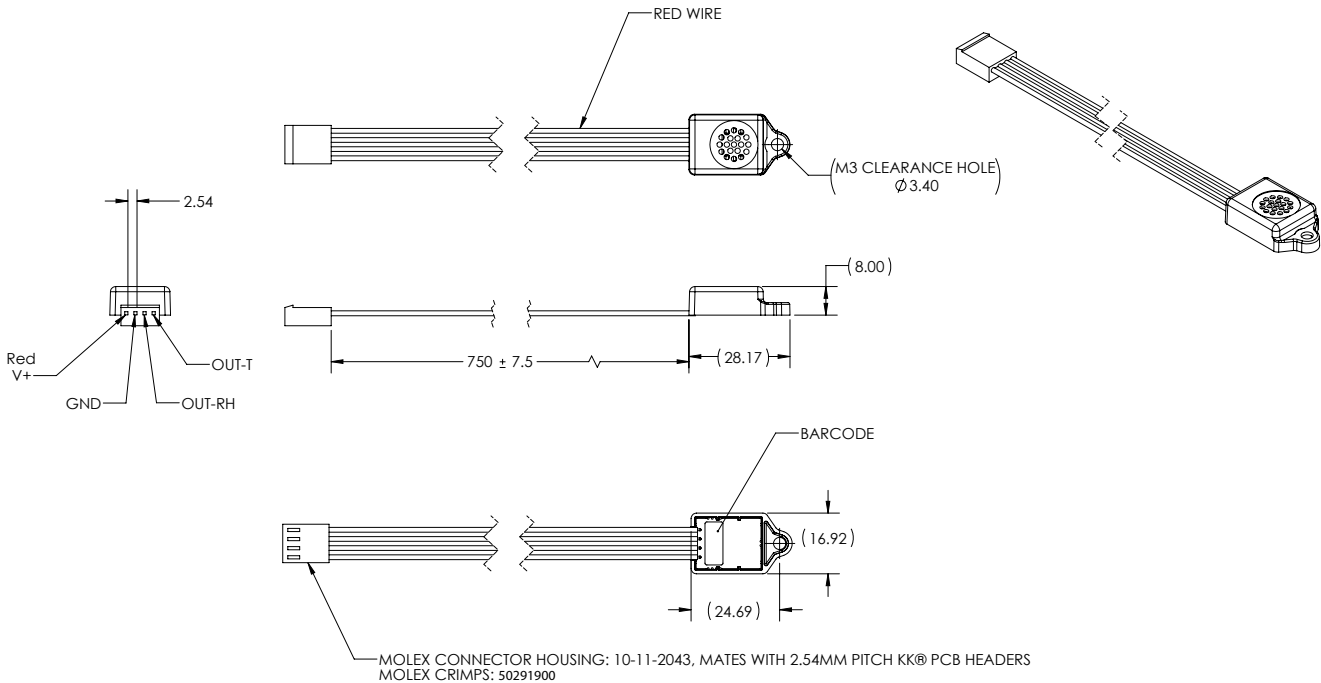
- 1 V+
- 2 GND
- 3 OUT - RH
- 4 OUT - T

# Ordering Information

Model	Part Description
T9600-L	ChipCap RH and Temperature Sensor, 0-1VDC Linear Output
T9600-D	ChipCap RH and Temperature Sensor, Digital Output

Absolute Maximum Ratings					
Symbol	Parameter	Min.	Max.	Units	Notes
Vdd	DC Supply Voltage	-0.3	6	V	
Vio	Voltage at all Analog and Digital I/O pins	-0.3	Vdd + 0.3	V	
Ta	Ambient Temperature (operation)	-40	80	°C	
Tstrg	Storage Temperature	-40	80	°C	

Recommended Operation Conditions					
Symbol	Parameter	Min.	Typ.	Max.	Units Notes
Vdd	Analog DC Supply	3	5	5.5	V
Idd	Supply Current		550		µA 25°C
Vss	Analog Ground		0.0		V
To	Ambient Temperature	-20	27	80	°C
Cvdd	Included Capacitance between Vdd and Vss	100	220	470	nF
C <sub>LD</sub>	Digital Output Load (only capacitive, no resistive)			100	pF
C <sub>LA</sub>	Analog Output Load Capacitance			5	nF
R <sub>LA</sub>	Analog Output Load Resistance	5			KΩ



Measurements in metric



www.ge-mcs.com

920-579A