

GE Infrastructure Sensing

Features

- Interchangeability better than 3% RH
- Survives condensation
- Temperature coefficient less than 0.05% RH/°F
- Linearity better than 2%
- Simple signal conditioning circuitry
- Innovative packaging for improved performance
- Economical
- Alternative mounting configurations
- Calibrated or uncalibrated versions

The GE General Eastern G-CAP2 capacitive relative humidity sensor is a low-cost, polymer capacitive-based sensor, factory calibrated to within ± 1 picofarad (pF). The result is an RH sensing element with uniform response characteristics and interchangeability of better than 3% RH. In contrast, competitive RH sensors vary by as much as 40% from unit to unit. These wide variations require time-consuming calibration that impacts manufacturing costs and scheduling. For this reason, the G-CAP2 is ideally suited for high volume applications, reducing the time required for final assembly and production calibration. For customers with calibration capabilities, an economical, uncalibrated version of the G-CAP2 is offered in various capacitance ranges. The G-CAP2 sensor is easily integrated with simple low-cost circuitry.

G-CAP2™ General Eastern Relative Humidity Sensor

G-CAP2 is a GE General Eastern product. GE General Eastern has joined other GE high-technology sensing businesses under a new name—GE Infrastructure Sensing.



GE Infrastructure Sensing

Performance

The unique properties of the G-CAP2's humidity-sensing polymer film allows the sensor to operate and survive when exposed to 100% RH condensing environments. These environments will often affect other sensors, leading to an increased drift rate and potential sensor failure. The G-CAP2 sensor offers low drift performance, typically less than 1% per year. As a result, Original Equipment Manufacturers (OEMs) can anticipate fewer failures and lower costs associated with replacement sensors and calibration services.

The G-CAP2 sensor also features a negligible temperature coefficient of less than 0.05% RH/°F (°C), ensuring accurate and reliable operation in applications where the final product will be exposed to wide temperature ranges.

Applications

Ideally suited for high-volume OEM applications, the G-CAP2 sensor can be used in automotive applications, data loggers, consumer appliances, HVAC controls, and medical instrumentation.

Sensing Element

The sensing element consists of a proprietary electrode metallization deposited over the humidity-sensitive polymer. This allows for rapid diffusion of water vapor, which accelerates desorption and makes recalibration easy. The properties of the film allow the sensor to survive total immersion in water with no loss of accuracy.

Sensor Enclosure

Unlike competitive designs where electrical contacts are made on active sensing surfaces, the G-CAP2's contacts are terminated on nonactive electrodes. This feature ensures continued performance and reliability without degradation of active sensor electrodes.

Assured Accuracy

Every G-CAP2 sensor is measured and verified in a controlled, NIST-traceable RH environment. Calibration chambers, equipment, facilities and processes are in compliance with MIL-STD 45662/A, Nuclear Regulation 10CFR Part 21 and ISO9001.

Custom-Designed OEM Applications

Depending on your requirements, GE Infrastructure Sensing can provide the G-CAP2 RH sensor with custom-designed, calibrated signal conditioning electronics to meet your specific application.

Evaluation Kit

GE offers a G-CAP2 relative humidity sensor evaluation kit. This kit includes five G-CAP2 sensors and a PC board with a 0 to 5 volt output. The PC board features plug-in connectors that allow an engineer to evaluate each G-CAP2 sensor without the need to design and build special test circuits. The kit includes full documentation that offers helpful hints on how to devise some simple tests.



G-CAP2 Specifications

Performance

Operating Ranges

Humidity: 0% to 100% RH

Temperature: -40°F to +185°F (-40°C to 85°C)

Capacitance

148 pF \pm 1 pF at 77°F (25°C), 0% RH,
10 kHz, 1 VRMS (calibrated version only)

Frequency Range

1 kHz to 1 MHz

Temperature Coefficient

<0.05% RH/°F (°C)

Long-Term Stability

<1% drift per year, typical

Hysteresis

Less than 2% RH @ 77°F (25°C), 25% to 80% RH

Sensor Interchangeability

Better than \pm 3% RH (calibrated version only)

Maximum Voltage

1.0 VAC

Time Response

75 seconds typical

120 seconds maximum

63% change for a 25% to 75% step change

150 LFM air flow

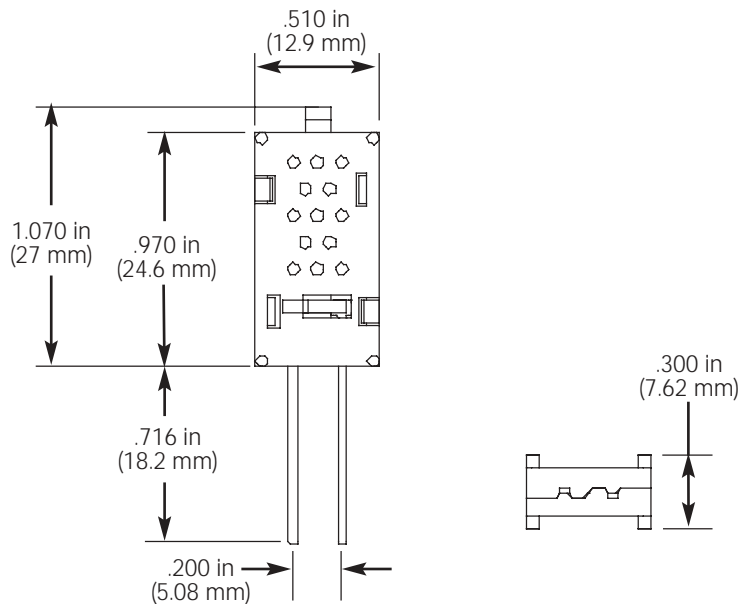
Mechanical

Assembly

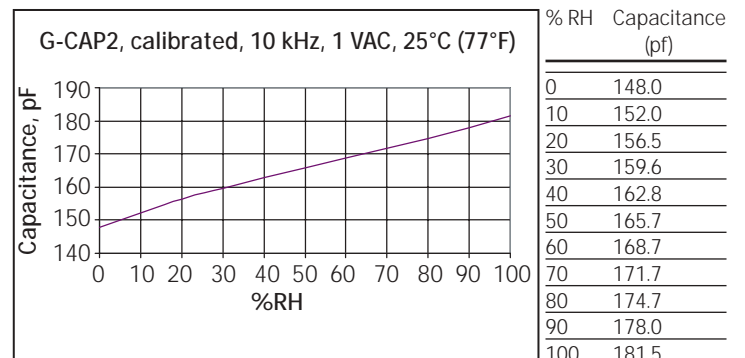
Hand soldering, no clean flux 398°F (203°C), 20 seconds maximum

Lead Strength

2 lb (0.9 kg) pull test with no damage



Response Curve



Typical sensor characteristics (calibrated version only)

Material

Case

PBT plastic, 15% glass fill

Black: calibrated

White: uncalibrated

Pins

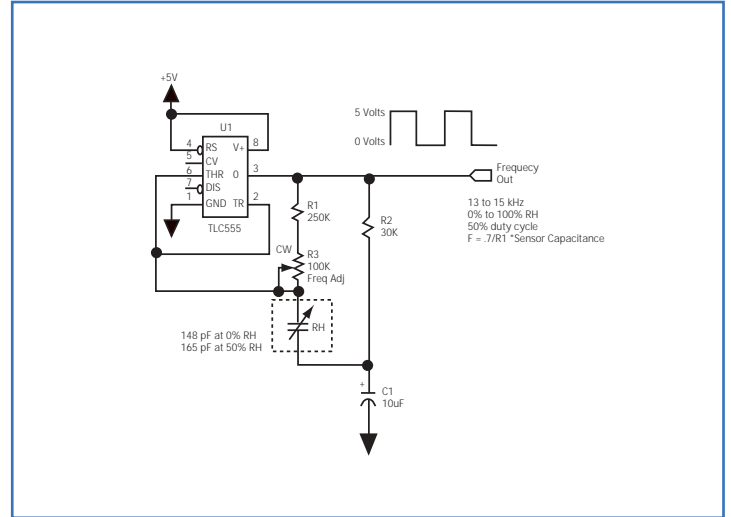
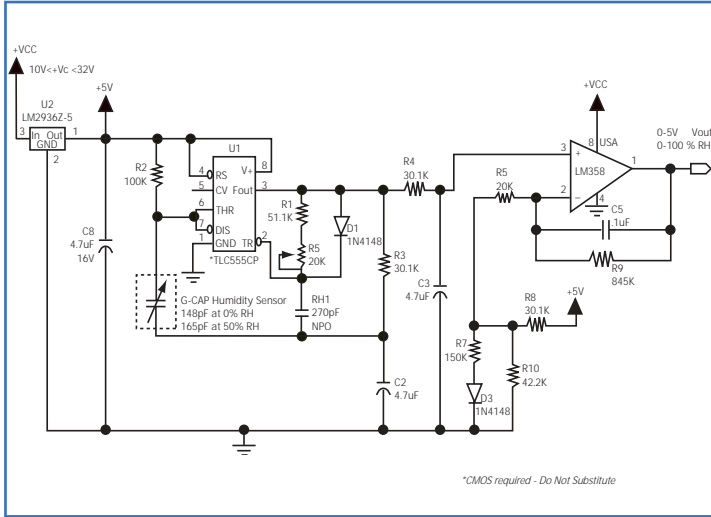
Copper alloy with .00001 in (.00025 mm) minimum tin plate

GE Infrastructure Sensing

Applications

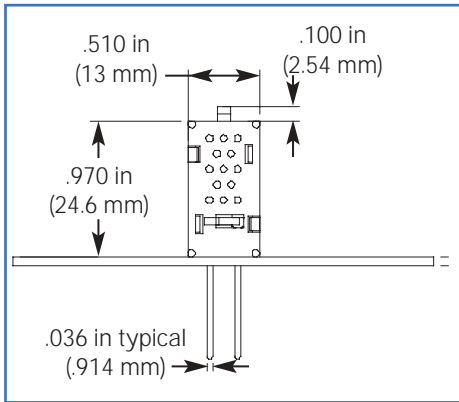
Circuit for converting %RH to voltage out

Circuit for converting %RH to frequency out

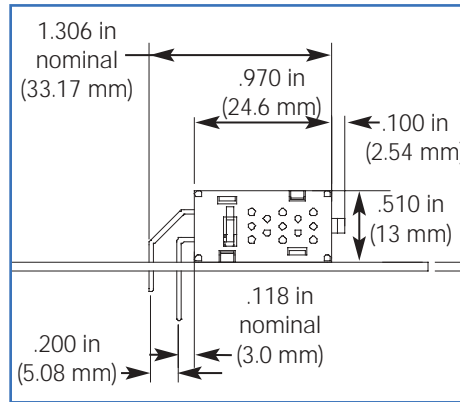


Dimensions

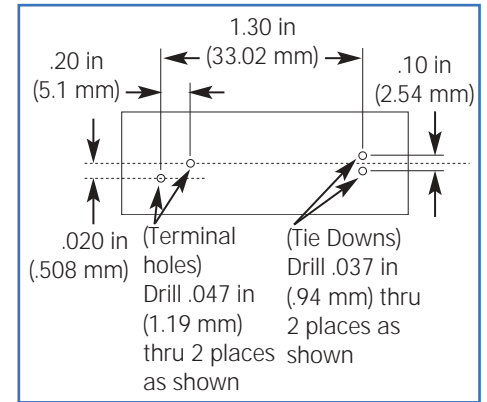
Vertical mount



Side mount



Recommended PCB hole pattern



Lead reforming by the user may cause sensor failure.

Ordering Information

Configuration Calibration

- S Side mount
- V Vertical mount
- C Calibrated
- U Uncalibrated



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