

# Relative Humidity & Temperature Digital Sensors

**CS114** – Digital Relative Humidity & Temperature Sensor  
**CS124** – Digital Relative Humidity, Temperature & Aux 12-Bit Sensor Input

The CS114 and CS124 are the first of ChipSensors family of digital relative humidity and temperature sensors. The CS114 integrates temperature and humidity sensor elements, an analog-to-digital converter, signal processing, calibration data, and an I<sup>2</sup>C interface all in a single chip. Additionally, the CS124 includes a differential 12-bit auxiliary ADC for interfacing to an external light, pressure, or bridge sensor.

The CS114 and CS124 are individually factory calibrated for both temperature and humidity with calibration data stored in on-chip non-volatile memory. This ensures that the sensors are fully interchangeable, without any recalibration or software changes.

Patent-pending use of industry-standard-CMOS low-K dielectrics enables the CS114 and CS124 to achieve excellent long term stability, low drift and very high immunity to contaminants.

These sensors offer low power, high accuracy, and stable calibrated solutions making them ideal for applications ranging from automotive, industrial HVAC systems to environmental sensors and cost sensitive remote data-logging applications.

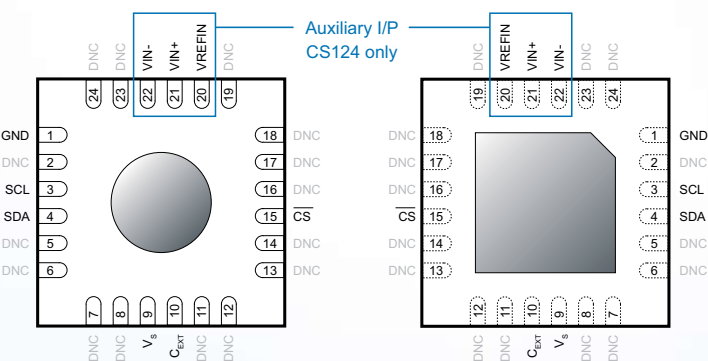


Fig 1: Top View & Bottom View of CS114, CS124 in QFN Package

## Features

### High Accuracy:

±2.0% RH from 20% to 80% RH  
 ± 0.5°C Temperature Accuracy

### Wide Measurement range:

- 40 °C to + 125 °C - Temperature Range  
 0% to 100% RH - Humidity Range

### Fully Compliant I<sup>2</sup>C Interface:

Slave Address 0x20

### Auxiliary 12-Bit Sensor Input: CS124 only

### Low Power Consumption:

400µA during conversion  
 1 µA average @ 1 sample/min

### Low Voltage Supply: 1.8V to 3.6V

### Small Package: 4mm x 4mm QFN

## User Benefits

**Long Term Stability:** Low-drift due to ChipSensors patent-pending use of low-K dielectrics and proprietary sensing structures

**Reliability:** Excellent long term reliability and immunity to contaminant, due to ChipSensors proprietary sensing structures

**Digital Output:** "Plug and Play" sensor to digital

**No Calibration Required:** Each sensor is individually factory calibrated during chip production



Fig 2: 4mm x 4mm QFN Sensor Package

# Functional Block Diagram, Application Circuit

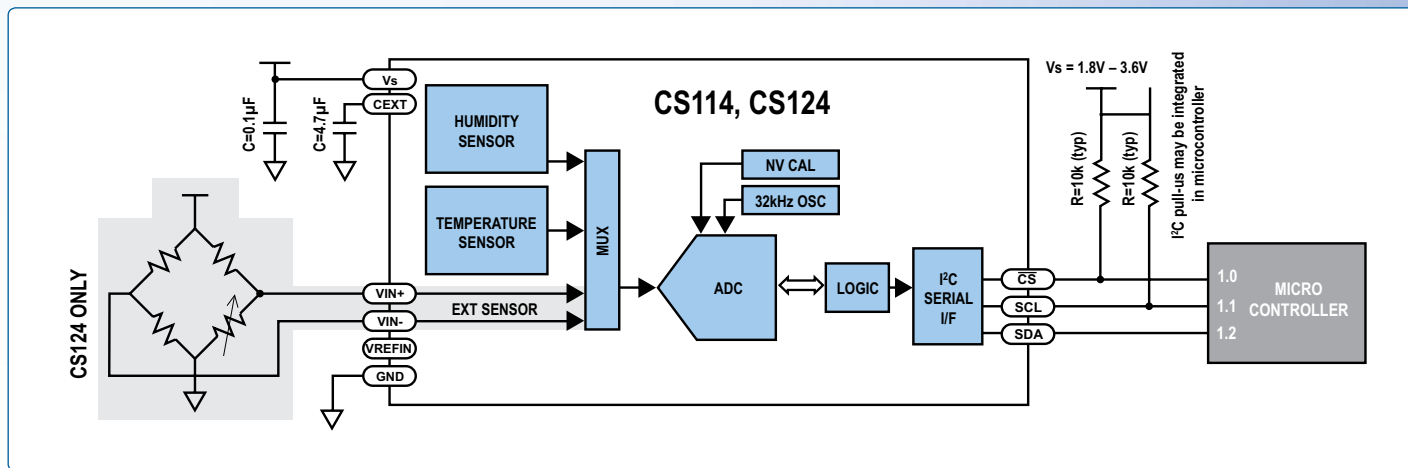


Fig 3: Application Circuit Diagram - CS114, CS124

## Accuracy Specifications

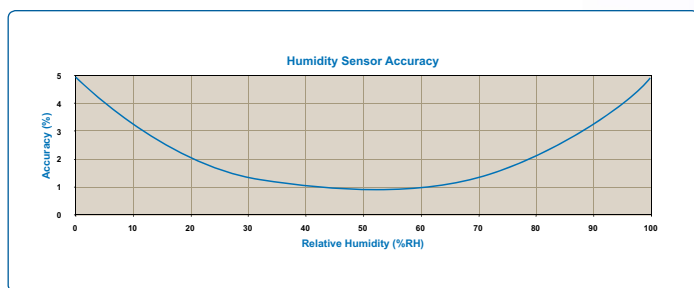


Fig 4: Humidity Sensor Accuracy (typ) over the operational humidity range

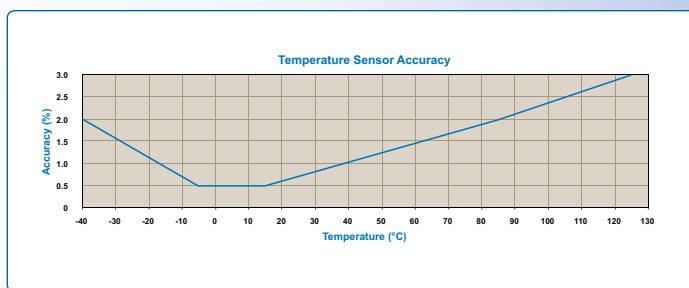


Fig 5: Temperature Sensor Accuracy (typ) over the operational temperature range

## Related Information

Document Type	Code	Details
Datasheet	CS114	Digital Relative Humidity & Temperature Sensor
Datasheet	CS124	Digital Relative Humidity & Temperature Sensor & Auxiliary Sensor I/P
Application Note	AN001	Understanding Humidity
Application Note	AN002	High Accuracy Humidity Measurement with CS114
Application Note	AN003	Minimizing Power Consumption using the CS114
Application Note	AN004	Applications Interfacing to the Aux Sensor Input - CS124

Evaluation Tools	Code	Details
Evaluation/Prototype Board	CS114-Eval	Evaluation Kit for the CS114 including Demonstration Software



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Evaluation Kit for the CS114 including Demonstration Software