

ChipCap 2™ Demo Board

Features

- CC2D23 Humidity/Temp Sensor
- Quick Test Ability
- SMD Device on a PCB
- Easy to connect Pins
- Supply Voltage 3.3 V +0.5V



Introduction:

The ChipCap 2 demo board is designed to expedite the process of prototyping the capabilities of the ChipCap 2 series of humidity/temperature sensors. While there are twelve different version of the ChipCap 2 family, the sensor technology used to monitor humidity and temperature, are the same for every device. The ChipCap 2 board uses the most popular version of the ChipCap 2, part number CC2D23. The CC2D23 sensor operates from 3.3 V power, is a 2% accurate, and the output is digital I2C. (Other versions of the ChipCap 2 have 3% accurate analog outputs and have a sleep mode. See the ChipCap 2 datasheet for details by [clicking here.](#))

This interface guide will address the function of the pins on the demo board. The actual communication with the Chipcap 2 via I2C is left to GE's application note, The ChipCap2 Application guide. This application note can be accessed by [clicking here.](#) This application note shows complete timing and communication guidelines.

Schematic and Board Pin Out:

The Chipcap 2 sensor was designed in a small, 6mm x 4mm, surface mount package. Surface mount devices can often be problematic to quickly and easily test as connection issues are always difficult to overcome. The CC2 demo board solves this problem by mounting the Chipcap sensor on printed circuit board and bringing the pins to easy test points to connect. The simple sensor schematic is shown in Figure I.

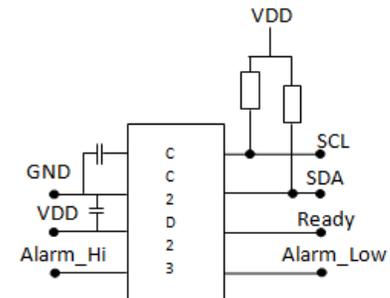


Figure I

VDD and Ground are decoupled by a 220nF capacitor, and the Ground pin is decoupled by 100nF capacitor. Two 5K ohms pull-up resistors are included between ChipCap 2 and any MCU.

ChipCap 2 is to be operated from a 3.3V+0.5V power supply. The output pins can be accessed thru the 6 x 0.100, headers, JP1. The pin out for JP1 the CC2 Demo Board is shown on Table 1:

JP1	Description
VDD	Supply voltage (3.3+0.5V)
Gnd	Ground supply
Alarm-Hi	High alarm output
Alarm-Low	Low alarm output
SCL	I2C clock
SDA	I2C data
Ready	Ready signal (conversion complete output)

Table 1 – PCB Pin out

Serial Clock & Data Test Points (SDA, SCL)

The sensor's data is transferred in and out through the SDA pad, while the communication between ChipCap 2 and the Microcontroller (MCU) is synchronized through the SCL pad. ChipCap 2 has an internal temperature compensated oscillator that provides time base for all operation, and uses an I²C-compatible communication protocol with support for 100 KHz to 400 KHz bit rates, external pull-up resistors (5K ohms) are included to pull the drive signal high; they can be included in the I/O circuits of microcontroller.

Alarm Pins (Alarm Low, Alarm High)

The alarm output can be used to monitor whether the sensor reading has exceeded or fallen below pre-programmed values. The alarm can be used to drive an open-drain load connected to VDD, or it can function as a full push-pull driver. If a high voltage application is required, external devices can be controlled with the Alarm pins. (The two alarm outputs can be used simultaneously and these alarms can be used in combination with the I2C.)

Mounting Consideration

To maximize the performance of ChipCap 2, it is important to plan an appropriate location of the sensor at the design stage. Airflow and proper exposure to ambient air must be secured for ChipCap 2 to ensure expected performance. Airflow holes must NOT be blocked. Any heat generating parts near ChipCap 2 will distort the proper measurement of relative humidity and temperature reading, and heat generating parts should be avoided or measures should be taken to prevent heat transfer.

Within the normal range, ChipCap 2 performs in a stable manner. Prolonged exposures to conditions outside normal range, especially at humidity over 90%RH, may temporarily offset the RH signal up to $\pm 3\%$ RH. When it returns to the normal range, it will gradually recover back to the calibration state.