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BREAKOUT MODULE FOR SI7005 TEMPERATURE AND HUMIDITY SENSOR

Posted on March 5, 2014 | by R-B | 4 comments |

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The Si7005 is a digital relative humidity and temperature sensor from Silicon Labs. It integrates fully factory-calibrated humidity and temperature sensor elements with an analog to digital converter, signal processing and an I2C host interface in a single monolithic CMOS sensor IC. The Si7005 is available in a "*non hand-assembly-friendly*" 4×4 mm QFN package, which requires reflow soldering to mount it on a PCB. This breadboard friendly breakout board is designed to make your prototype project with the Si7005 sensor much easier. It can be used with PIC, Arduino, or any other microcontroller development platform through an I2C bus. The power supply and I2C signal pins are accessible through breadboard friendly 0.1" pitch header pins. Note that the Si7005 sensor is not 5.0V tolerant. It must be operated at 2.1-3.6V power supply.
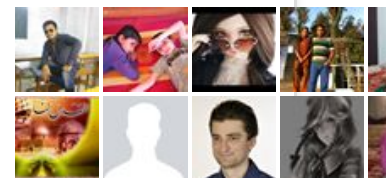
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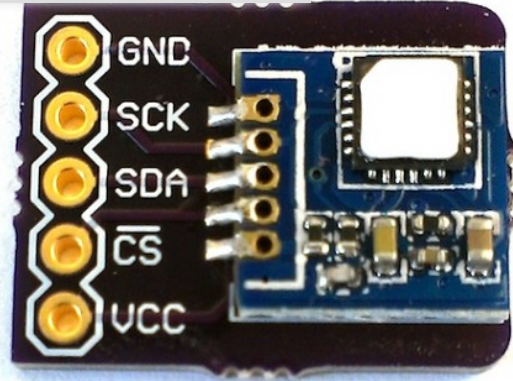
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Si7005 breakout board

The Si7005 datasheet describes the features of this low-power sensor device and its applications in more details.

Features

- Relative Humidity Sensor
  - ± 4.5 % RH (maximum @ 0–80% RH)
- Temperature Sensor
  - ±0.5 ℃ accuracy (typical)
  - ±1 ℃ accuracy (maximum @ 0 to 70 ℃)
- 0 to 100% RH operating range
- −40 to +85 ℃ (GM) or 0 to +70 ℃ operating range (FM)
- Wide operating voltage range (2.1 to 3.6 V)
- Low Power Consumption
  - 240 µA during RH conversion
- I^{2}C host interface
- Integrated on-chip heater
- 4x4 mm QFN package
- Excellent long term stability
- Factory calibrated
- Optional factory-installed cover
  - Low-profile
  - Protection during reflow
  - Excludes liquids and particulates (hydrophobic/oleophobic)

Applications

- Industrial HVAC/R
- Thermostats/humidistats
- Respiratory therapy
- White goods
- Micro-environments/data centers
- Automotive climate control and de-fogging
- Asset and goods tracking

Key features of Si7005 sensor

Si7005 can be interfaced with an Arduino board using the Jonas Bo Jalling's Si7005 library. Make sure your Arduino board is running at 3.3V as the Si7005 sensor is not 5.0V tolerant.

SERIAL 7-SEGMENT LED DISPLAYS

7-segment LED displays are fun way of displaying numeric sensor readings in Arduino or any other microcontroller-based projects. The downside is they are resource hungry and requires lots of I/O pins and CPU time for

Si7005 breakout board is only 0.7"x0.5" in dimensions

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I tested this sensor module with Crowduino (an Arduino Duemilanove clone with Atmega328) using the Jonas Bo Jalling's Si7005 Arduino library, and it worked like a charm. Crowduino has an on-board power select switch to chose the supply voltage for operation between 3.3V and 5.0V. I chose it to operate at 3.3V. Pins 1 (GND) and 4 (CS) of the Si7005 breakout board are connected to the ground terminal of Crowduino. Similarly, pins 2 (SCK), 3 (SDA), and 5 (VCC) are connected to A5, A4, and 3.3V power supply of Crowduino, respectively. The setup is shown below. The Crowduino board reads the sensor outputs and sends them to PC through USB-UART bridge at 9600 baud rate. The sampling interval is 1 sec.
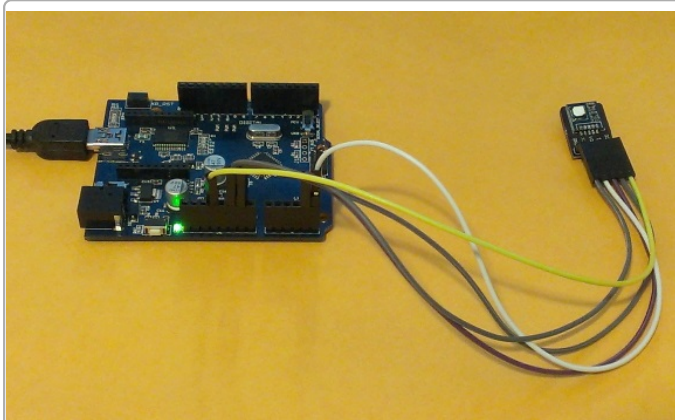
Si7005 and Arduino

Download the Arduino sketch

The temperature and relative humidity can be seen on the Arduino IDE's serial monitor window.

continuously displaying the readings. We have designed varieties of 7-segment displays that support SPI interface and allows you an easy control of every LED segments using only 3 I/O pins of your MCU.

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```
Temperature (C)= 22.84
Humidity (%)= 29.45
Temperature (C)= 22.84
Humidity (%)= 29.45
Temperature (C)= 22.81
Humidity (%)= 29.39
Temperature (C)= 22.84
Humidity (%)= 29.40
Temperature (C)= 22.84
Humidity (%)= 29.40
Temperature (C)= 22.84
Humidity (%)= 29.34
Temperature (C)= 22.81
Humidity (%)= 29.39
Temperature (C)= 22.81
Humidity (%)= 29.39
Temperature (C)= 22.81
Humidity (%)= 29.22
Temperature (C)= 22.81
Humidity (%)= 29.33
Temperature (C)= 22.84
Humidity (%)= 29.18
Temperature (C)= 22.81
Humidity (%)= 29.39
Temperature (C)= 22.81
Humidity (%)= 29.44
Temperature (C)= 22.84
Humidity (%)= 29.45
```

Serial data received by PC from Arduino

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If you are interested, you can buy the Si7005 breakout board for only $9.50 $8.50 (introductory price) from our Tindie store.
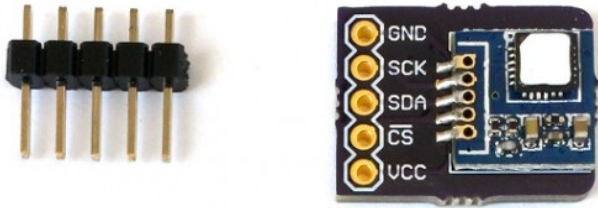
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4 COMMENTS

Marc   April 2, 2014 7:24 am

Hi! Would you mind writing the software for pic microcontroller? thank you very much! 😃

Have a good day!

Reply

Hector Segura   March 7, 2014 9:27 pm

I live in Peru. Elecrow is not showing this, only Tindie is. So a little help from you, how to obtain one? Am I toooooo late? Thank you v.m.

Reply

Bronson   March 6, 2014 9:50 am

Just making sure, your $8.50 breakout board includes the Si7005 already soldered on?

Reply

R-B   March 6, 2014 9:55 am

That is correct. It is an introductory price and won't last very long.

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