

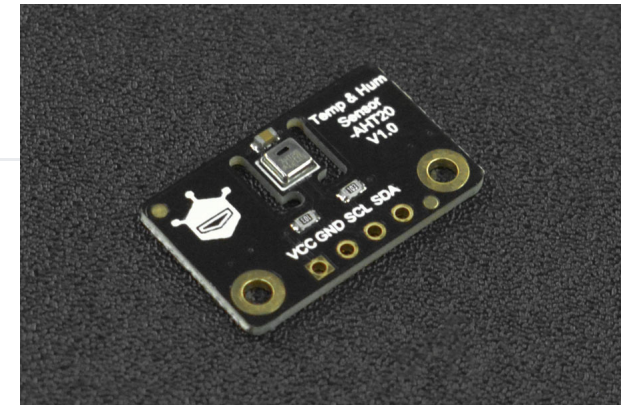
SKU:SEN0527 (<https://www.dfrobot.com/product-2603.html>)

Introduction
Features
Applications
Pinout
Specification
Dimension Diagram
Tutorial
API Function
More Documents
FAQ

(<https://www.dfrobot.com/product-2603.html>)

Introduction

The AHT20 is a high-precision but low-cost temperature and humidity sensor, which is equipped with an improved MEMS semiconductor capacitive humidity sensor element. It features standard I2C interface and a wide voltage supply of 2V - 5V. And with simple peripheral circuit, it performs stably even in harsh environments in the measuring range of -40 - +85°C. This sensor can be widely used for measuring the environmental temperature and humidity of home electronic equipment, the temperature and humidity of automobiles and so on.



Features

- Digital output, I2C interface
- Excellent long-term stability
- Quick response and strong anti-interference ability

Applications

- HVAC
- Dehumidifier
- Testing and Inspection Equipment
- Consumer Appliances

- Automobiles
- Automatic Control
- Data Loggers
- Weather Stations

Introduction

Features

Applications

Pinout

Specification

Dimension Diagram

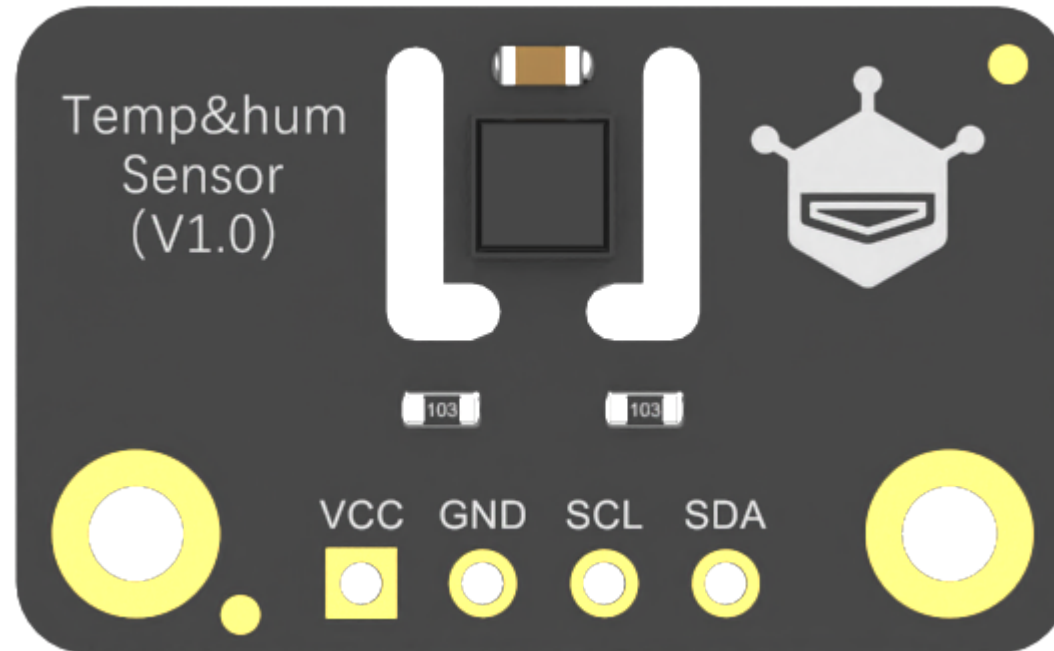
Tutorial

API Function

More Documents

FAQ

Pinout



Pin	Function	Description
VCC	+	Power Supply: DC 2V~5V
GND	-	--
SCL	I2C Clock Line	--

Pin	Function	Description
SDA	I2C Data Line	--

[Introduction](#)[Features](#)[Applications](#)[Pinout](#)[Specification](#)[Dimension Diagram](#)[Tutorial](#)[API Function](#)[More Documents](#)[FAQ](#)

Specification

Module Parameters

- Operating Voltage: DC2V~5V
- Output Signal: I2C
- I2C Address: 0x38
- Dimension: 30mm×20.5mm/1.18×0.81"

AHT20 Chip Parameters

Relative Humidity

- Resolution: 0.024 %RH
- Accuracy Error: ±2% RH
- Repeatability: ±0.1 %RH
- Hysteresis: ±1 %RH
- Non-linear: ±0.1 %RH
- Response Time: 8S
- Operating Range: 0~100 %RH
- Long-term Drift: < 0.5 %RH/yr

Temperature

- Resolution: 0.01°C

>

- Introduction
- Features
- Applications
- Pinout
- Specification
- Dimension Diagram
- Tutorial
- API Function
- More Documents
- FAQ

- Accuracy Error: $\pm 0.3^{\circ}\text{C}$
- Repeatability: $\pm 0.1^{\circ}\text{C}$
- Hysteresis: $\pm 0.1^{\circ}\text{C}$
- Response Time: minimum 5S, maximum 30S
- Operating Range: $-40^{\circ}\text{C}\sim 85^{\circ}\text{C}$
- Long-term Drift: $< 0.04^{\circ}\text{C}/\text{yr}$



Dimension Diagram

[Introduction](#)

[Features](#)

[Applications](#)

[Pinout](#)

[Specification](#)

[Dimension Diagram](#)

[Tutorial](#)

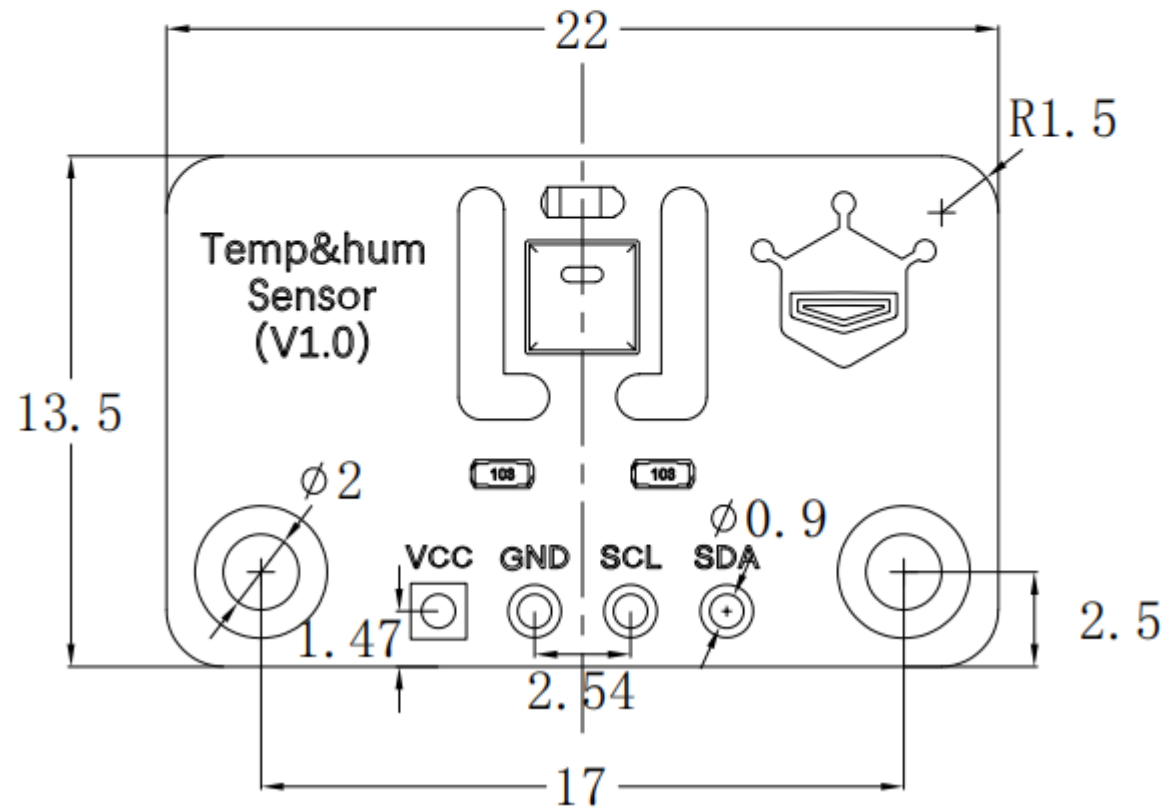
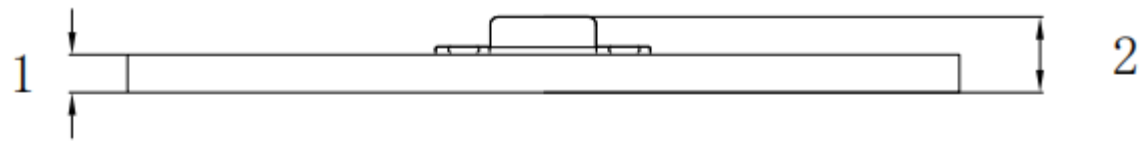
[API Function](#)

[More Documents](#)

[FAQ](#)



- Introduction
- Features
- Applications
- Pinout
- Specification
- Dimension Diagram
- Tutorial
- API Function
- More Documents
- FAQ



- Introduction
- Features
- Applications
- Pinout
- Specification
- Dimension Diagram
- Tutorial
- API Function
- More Documents
- FAQ



Tutorial

Hardware Requirement

- DFRduino UNO R3 (<https://www.dfrobot.com/product-838.html>) (or similar) x 1
- SEN0527 Fermion: AHT20 Temperature and Humidity Sensor x 1
- M-M/F-M/F-F Jumper wires

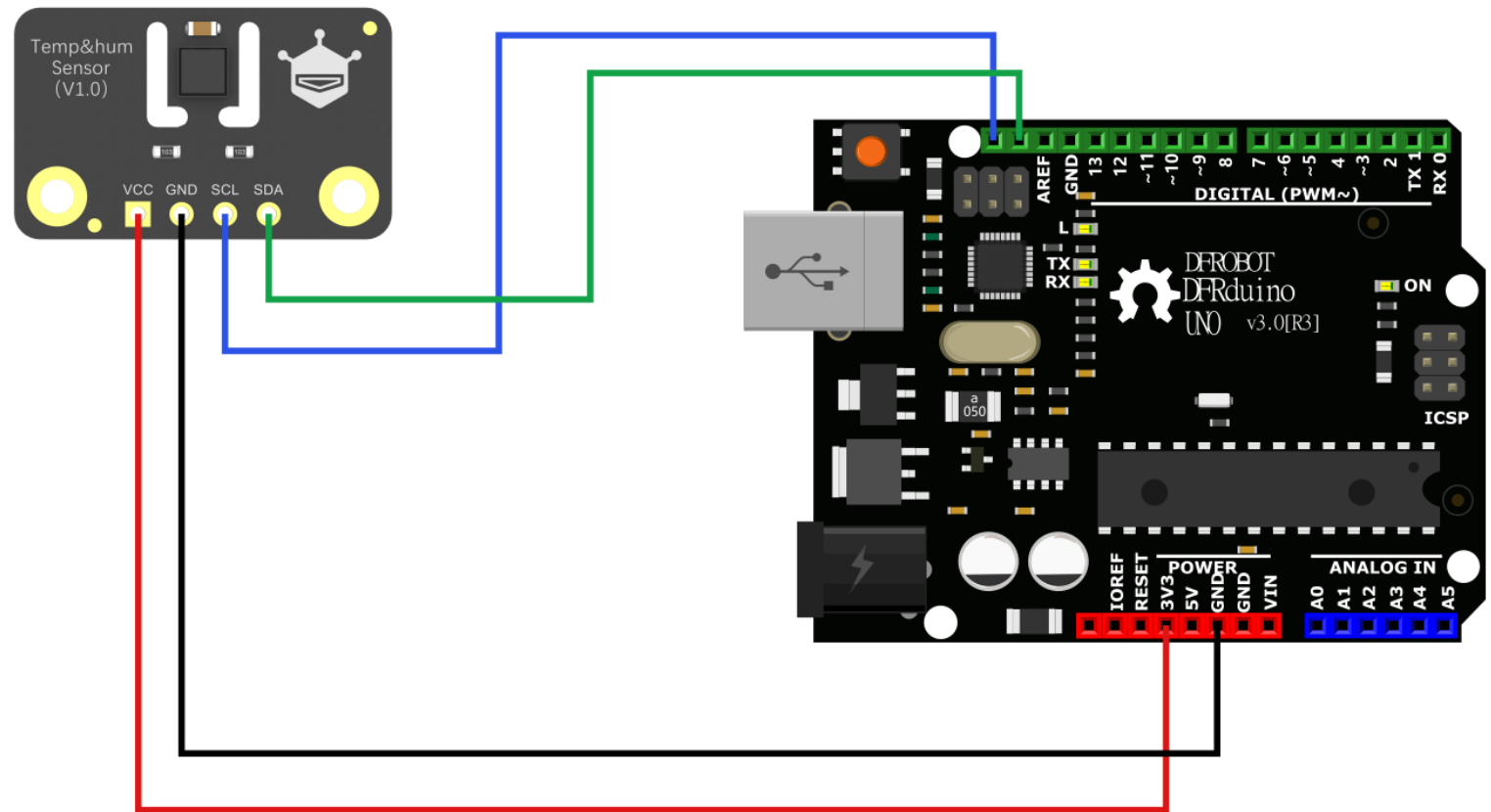
Software Requirement

- Arduino IDE (<https://www.arduino.cc/en/Main/Software>)
- Download and install the **DFRobot_AHT20 Library** (https://github.com/cdjq/DFRobot_AHT20) (About how to install the library? (<https://www.arduino.cc/en/Guide/Libraries#.UxU8mdzF9H0>))

Connection Diagram

- Introduction
 - Features
 - Applications
 - Pinout
 - Specification
 - Dimension Diagram
 - Tutorial
 - API Function
 - More Documents
 - FAQ
-

>



UNO Board: 3V3 - connect to - AHT20:VCC
 UNO Board: GND - connect to - AHT20:GND
 UNO Board: SCL - connect to - AHT20:SCL
 UNO Board: SDA - connect to - AHT20:SDA

Sample Code

The following code will read the measured values from the AHT20 temperature and humidity sensor and print them through the serial port.

- Introduction
- Features
- Applications
- Pinout
- Specification
- Dimension Diagram
- Tutorial
- API Function
- More Documents
- FAQ

>

```
#include "DFRobot_AHT20.h"

DFRobot_AHT20 aht20;

void setup(){
  Serial.begin(115200);
  uint8_t status;
  while((status = aht20.begin()) != 0){
    Serial.print("AHT20 sensor initialization failed. error status : ");
    Serial.println(status);
    delay(1000);
  }
}

void loop(){
  if(aht20.startMeasurementReady(/* crcEn = */true)){
    Serial.print(aht20.getTemperature_C());
    Serial.print(" C, ");
    // Get temp in Fahrenheit (F)
    Serial.print(aht20.getTemperature_F());
    Serial.print(" F\t");
    Serial.print(aht20.getHumidity_RH());
    Serial.println(" %RH");
    delay(5000);
  }
}
```

Result

As shown in the figure below, the temperature values in °C and °F, and humidity values are displayed in the serial monitor.

COM6

	20.71 C, 69.28 F	39.57 %RH
Introduction	20.72 C, 69.30 F	39.55 %RH
Features	20.74 C, 69.34 F	39.53 %RH
Applications	20.77 C, 69.38 F	39.47 %RH
Pinout	20.77 C, 69.38 F	39.55 %RH
Specification	20.74 C, 69.32 F	39.54 %RH
Dimension Diagram	20.72 C, 69.29 F	39.55 %RH
Tutorial	20.73 C, 69.31 F	39.54 %RH
API Function	20.76 C, 69.36 F	39.52 %RH
More Documents	20.74 C, 69.33 F	39.46 %RH
FAQ	20.77 C, 69.39 F	39.49 %RH
>	20.77 C, 69.39 F	39.36 %RH
	20.81 C, 69.47 F	39.24 %RH
	20.83 C, 69.50 F	39.18 %RH

API Function

Introduction

Features

Applications

Pinout

Specification

Dimension Diagram

Tutorial

API Function

More Documents

FAQ

```
/**
 * @fn DFRobot_AHT20
 * @brief DFRobot_AHT20 constructor
 * @param wire TwoWire class object reference
 * @return NONE
 */
DFRobot_AHT20(TwoWire &wire = Wire);
/**
 * @fn begin
 * @brief Initialize AHT20 sensor
 * @return Init status value
 * @retval 0    Init succeeded
 * @retval 1    _pWire is NULL, please check if the constructor DFRobot_AHT20 has correctl
 * @retval 2    Device is not found, please check if the connection is correct
 * @retval 3    If the sensor init fails, please check if there is any problem with the se
 */
uint8_t begin();
/**
 * @fn reset
 * @brief Sensor soft reset, restore the sensor to the initial status.
 * @return NONE
 */
void reset();
/**
 * @fn startMeasurementReady
 * @brief Start measurement and determine if it's completed.
 * @param crcEn Whether to enable check during measurement
 * @n    false Measure without check (by default)
 * @n    true  Measure with check
```

- Introduction
- Features
- Applications
- Pinout
- Specification
- Dimension Diagram
- Tutorial
- API Function
- More Documents
- FAQ

>

```

* @return Whether the measurement is done
* @retval true If the measurement is completed, call a related function such as get* to o
* @retval false If the measurement failed, the obtained data is the data of last measureme
*/
bool startMeasurementReady(bool crcEn = false);
/**
* @fn getTemperature_F
* @brief Get ambient temperature, unit: Fahrenheit (F).
* @return Temperature in F
* @note AHT20 can't directly get the temp in F, the temp in F is calculated according to
* @n Users must call the startMeasurementReady function once to start the measurement befo
* @n otherwise what they obtained is the initial data or the data of last measurement.
*/
float getTemperature_F();
/**
* @fn getTemperature_C
* @brief Get ambient temperature, unit: Celsius (°C).
* @return Temperature in °C, it's normal data within the range of -40-85°C, otherwise it's w
* @note Users must call the startMeasurementReady function once to start the measurement b
* @n otherwise what they obtained is the initial data or the data of last measurement.
*/
float getTemperature_C();
/**
* @fn getHumidity_RH
* @brief Get ambient relative humidity, unit: %RH.
* @return Relative humidity, range 0-100
* @note Users must call the startMeasurementReady function once to start the measurement b
* @n otherwise what they obtained is the initial data or the data of last measurement
*/
float getHumidity_RH();

```

Introduction
Features
Applications
Pinout
Specification
Dimension Diagram
Tutorial
API Function
More Documents
FAQ

More Documents

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SEN0527-Circuit Diagram SCH.pdf

(<https://dfimg.dfrobot.com/nobody/wiki/adda98fc407766181b58dc5a38c99436.pdf>)

FAQ

For any questions, advice or cool ideas to share, please visit the **DFRobot Forum**

(<https://www.dfrobot.com/forum/>).

 **Get Fermion: AHT20 Temperature and Humidity Sensor** (<https://www.dfrobot.com/product-2603.html>) from DFRobot Store or **DFRobot Distributor**. (<https://www.dfrobot.com/distributor>)

Turn to the Top