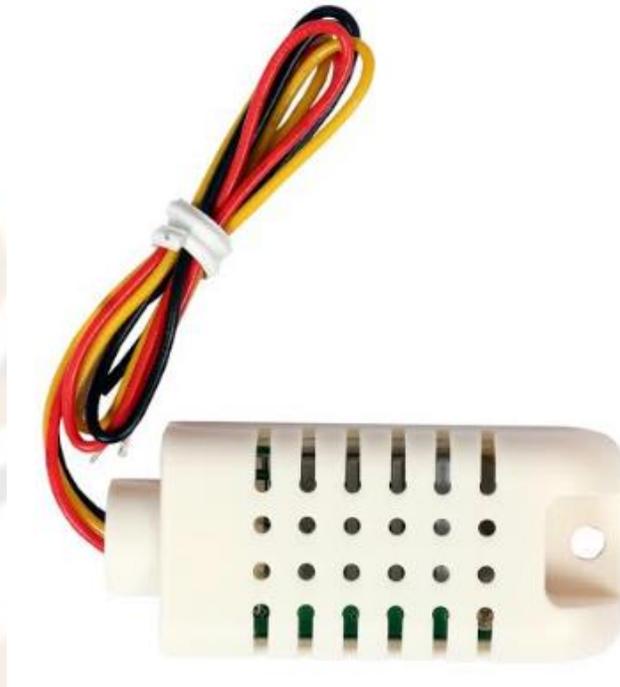# AM2302 Temperature And Humidity Sensor

The AM2302 is a wired version of the DHT22, in a large plastic body. It is a basic, low-cost digital temperature and humidity sensor. It uses a capacitive humidity sensor and a thermistor to measure the surrounding air, and spits out a digital signal on the data pin (no analog input pins needed). Its fairly simple to use, but requires careful timing to grab data.

FEATURES:

- High precision
- Capacitive type
- Full range temperature compensated
- Relative humidity and temperature measurement
- Calibrated digital signal
- Outstanding long-term stability
- Extra components not needed

- Long transmission distance, up to 100 meters
- Low power consumption
- 4 pins packaged and fully interchangeable

SPECIFICATIONS:

- Model: AM2302
- Power supply: 3.3-5.5V DC
- Output signal: digital signal via 1-wire bus
- Sensing element: Polymer humidity capacitor
- Operating range: humidity 0-100%RH; temperature -40~80Celsius
- Accuracy: humidity +-2%RH(Max +-5%RH); temperature +-0.5Celsius
- Resolution or sensitivity: humidity 0.1%RH; temperature 0.1Celsius
- Repeatability: humidity +-1%RH; temperature +-0.2Celsius
- Humidity hysteresis: +-0.3%RH
- Long-term Stability: +-0.5%RH/year
- Interchangeability: fully interchangeable

**ELECTRICAL CONNECTION DIAGRAM:**
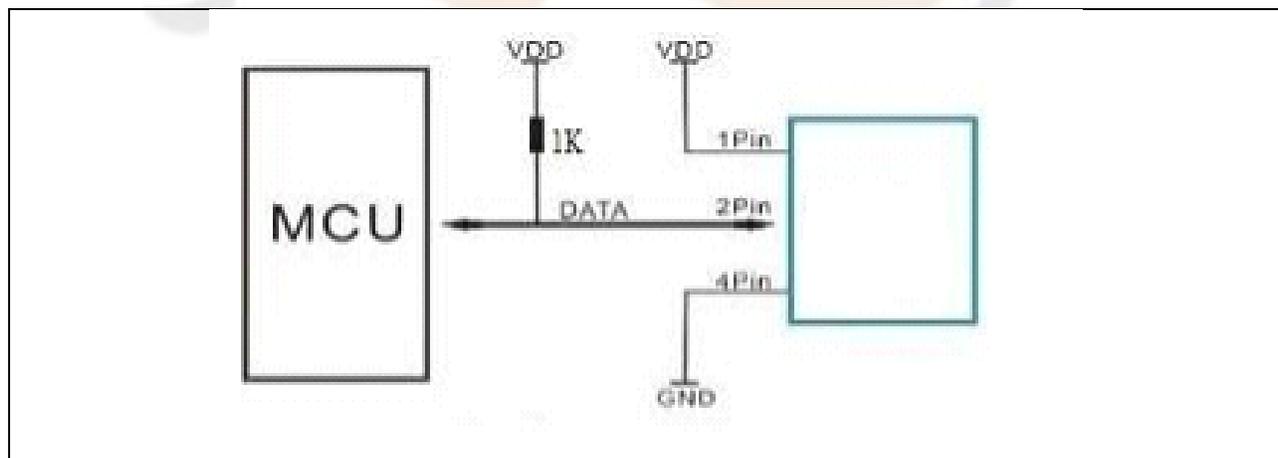
- **Power and Pins:**

  Power's voltage should be 3.3-5.5V DC. When power is supplied to sensor, don't send any instruction to the sensor within one second to pass unstable status. One capacitor valued 100nF can be added between VDD and GND for wave filtering.

- **Communication and signal:**

  1-wire bus is used for communication between MCU and AM2302. When MCU send start signal, AM2302 change from standby-status to running-status. When MCU finish sending the start signal, AM2302 will send response signal of 40-bit data that reflect the relative humidity and temperature to MCU. Without start signal from MCU, AM2302 will not give response signal to MCU. One start signal for one response data from AM2302 that reflect the relative humidity and temperature. AM2302 will change to standby status when data collecting finished if it don't receive start signal from MCU again. See below figure for overall communication process, the interval of whole process must beyond 2 seconds.
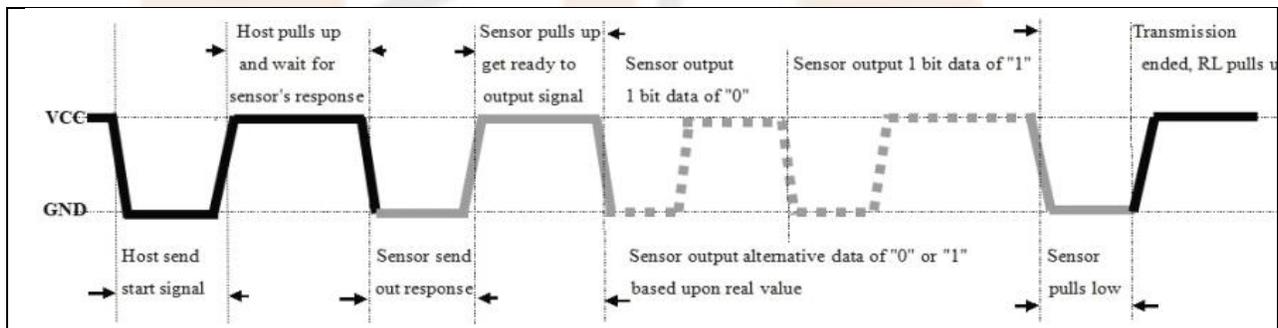
1) Step 1: MCU send out start signal to AM2302 and AM2302 send response signal to MCU Data-bus's free status is high voltage level. When communication between MCU and AM2302 begins, MCU will pull low data-bus and this process must beyond at least 1~10ms to ensure AM2302 could detect MCU's signal, then MCU will pulls up and wait 20-40us for AM2302's response. When AM2302 detect the start signal, AM2302 will pull low the bus 80us as response signal, then AM2302 pulls up 80us for preparation to send data. See below figure:
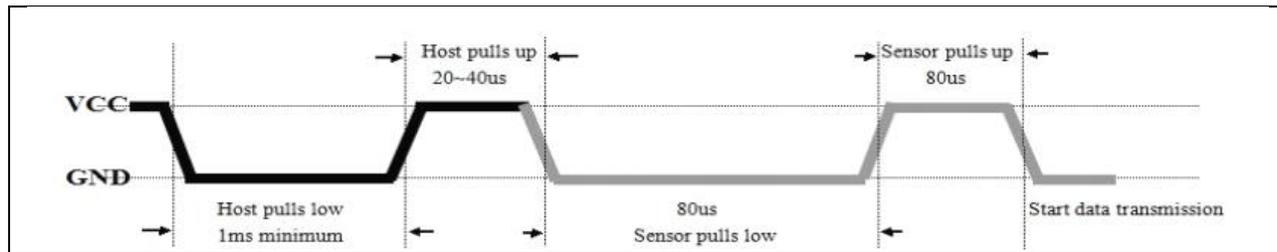
2) Step 2: AM2302 send data to MCU When AM2302 is sending data to MCU, every bit's transmission begin with low-voltage-level that last 50us, the following high-voltage-level signal's length decide the bit is "1" or "0". See below figures:
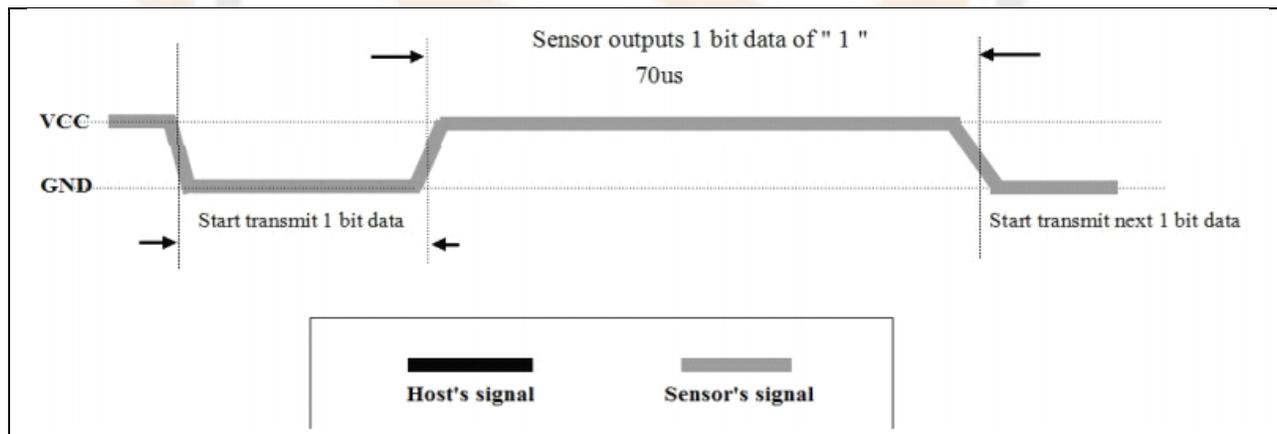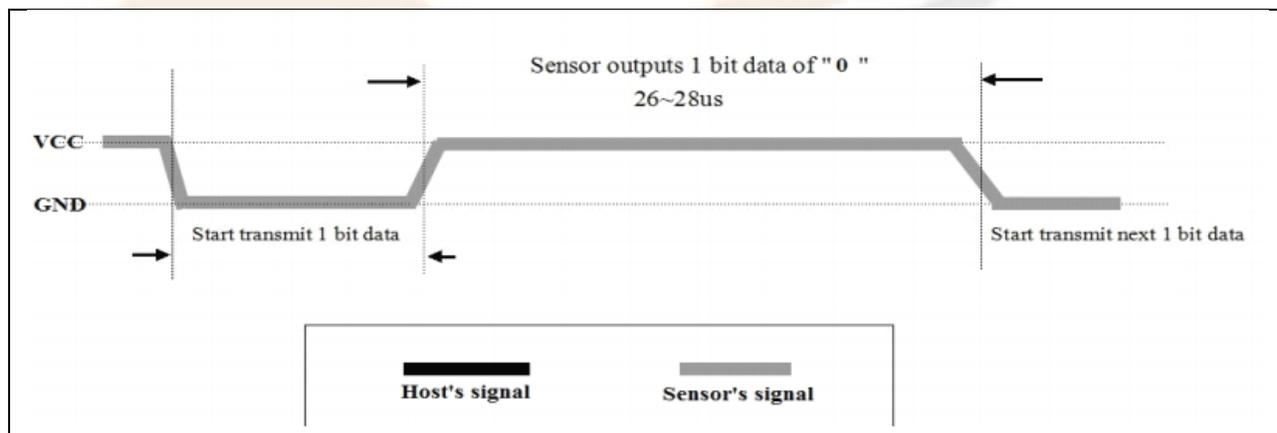
PIN FUNCTION:

Pin No	Pin Name	Description
1	Vcc	Power supply 3.5V to 5.5V
2	Data	Outputs both Temperature and Humidity through serial Data
3	NC	No Connection and hence not used
4	Ground	Connected to the ground of the circuit

- Red wire: power supply

- Black wire: GND

- Yellow wire: Data output

APPLICATIONS:

- Measure temperature and humidity
- Local Weather station
- Automatic climate control
- Environment monitoring

PACKAGE INCLUDES:

1x AM2302 Digital Temperature and Humidity Sensor