AOSONG

Your specialist in innovating humidity & temperature sensors

Digital relative humidity & temperature sensor AM2305

1. Feature & Application:

*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
*Three-core shielded cable as outgoing line

2. Description:

AM2305 output calibrated digital signal. It applys exclusive digital-signal-collecting-technique and humidity sensing technology, assuring its reliability and stability. Its sensing elements is connected with 8-bit single-chip computer.

Every sensor of this model is temperature compensated and calibrated in accurate calibration chamber and the calibration-coefficient is saved in type of programme in OTP memory, when the sensor is detecting, it will cite coefficient from memory.

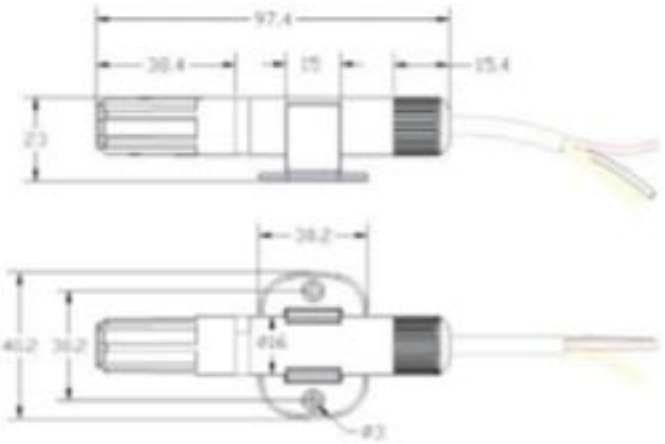
Small size & low consumption & long transmission distance(100m) enable AM2305 to be suited in all kinds of harsh application occasions.

3. Technical Specification:

Model	AM2305	
Power supply	3.3-5.5V DC	
Output signal	digital signal via Aosong 1-wire bus	
Sensing element for RH	Polymer humidity capacitor	
Sensing element for T	Apply Dallas DS18B20 for detecting temperature	
Operating range	humidity 0-100%RH;	temperature -40~80Celsius
Accuracy	**humidity +-2%RH**(Max +-5%RH);	temperature +-0.3Celsius
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

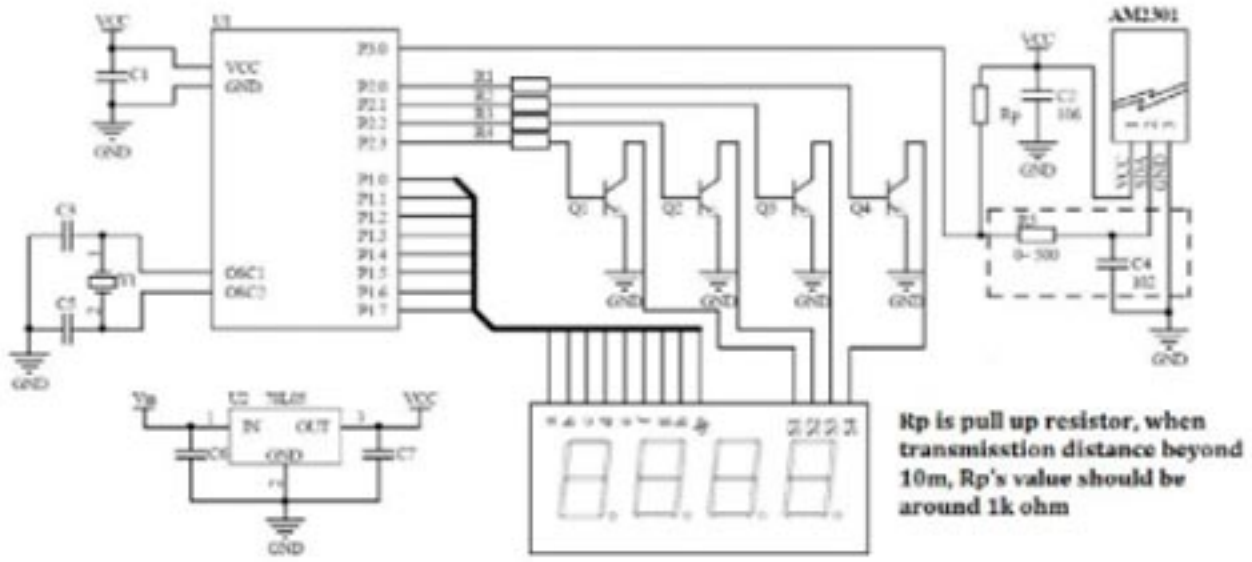
4. Dimensions: (unit----mm)



5. Electrical connection diagram:

Pin	Function
1	Red wire----power supply
2	Yellow wire--signal
3	Black wire---GND

*Three-core shielded cable as outgoing line, the three cores are red wire, yellow wire, black wire.



6. Operating specifications:

(1) 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.

(2) Communication and signal

Aosong 1-wire bus is used for communication between MCU and AM2305. (Aosong 1-wire bus is specially designed by Aosong Electronics Co., Ltd. , it's different from Maxim/Dallas 1-wire bus, so it's incompatible with

Dallas 1-wire bus.)

Illustration of Aosong 1-wire bus:

DATA=16 bits RH data+16 bits Temperature data+8 bits check-sum

Example: MCU has received 40 bits data from AM2305 as

0000 0010 1000 1100	0000 0001 0101 1111	1110 1110
16 bits RH data	16 bits T data	check sum

Here we convert 16 bits RH data from binary system to decimal system,

0000 0010 1000 1100 → 652

Binary system Decimal system

RH=652/10=65.2%RH

Here we convert 16 bits T data from binary system to decimal system,

0000 0001 0101 1111 → 351

Binary system Decimal system

T=351/10=35.1℃

When highest bit of temperature is 1, it means the temperature is below 0 degree Celsius.

Example: 1000 0000 0110 0101, T= minus 10.1℃

16 bits T data

Sum=0000 0010+1000 1100+0000 0001+0101 1111=1110 1110

Check-sum=the last 8 bits of Sum=1110 1110

When MCU send start signal, AM2305 change from standby-status to running-status. When MCU finishs sending the start signal, AM2305 will send response signal of 40-bit data that reflect the relative humidity and temperature to MCU. Without start signal from MCU, AM2305 will not give response signal to MCU. One start signal for one response data from AM2305 that reflect the relative humidity and temperature. AM2305 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.**