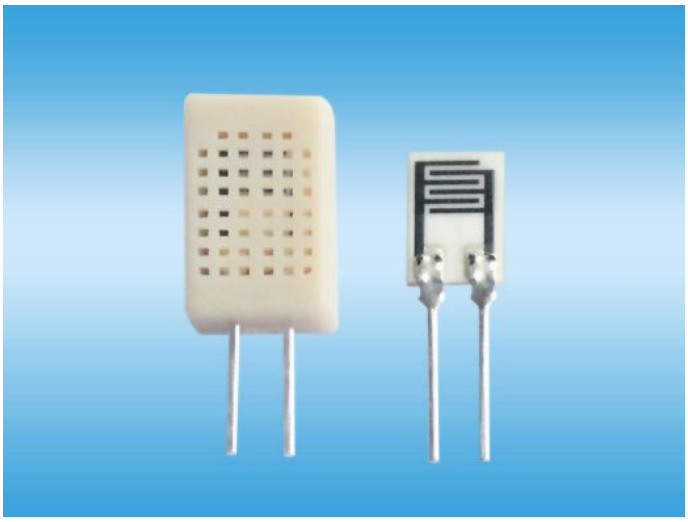
Humidity Sensitive Resistor

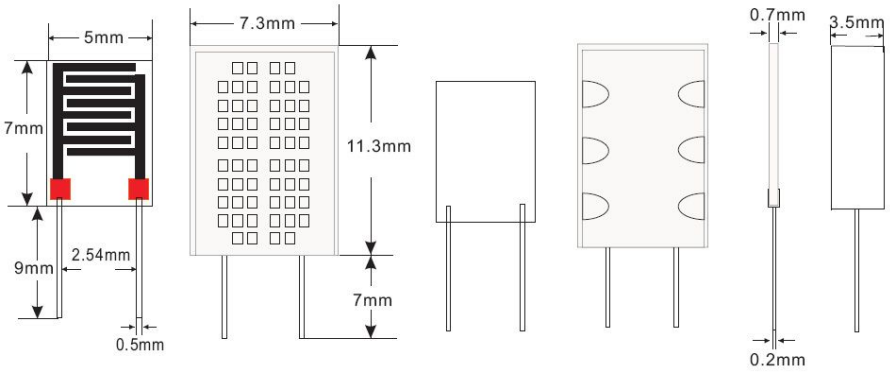
HR202L Product Manual



1. Product Overview

HR202L humidity resistance is the use of a new type of organic polymer materials moisture sensitive components, with a sense of wide humidity range, fast response, strong anti-pollution, no heat cleaning and long-term stable and reliable performance, and many other features.

2. Dimensions（unit: mm）



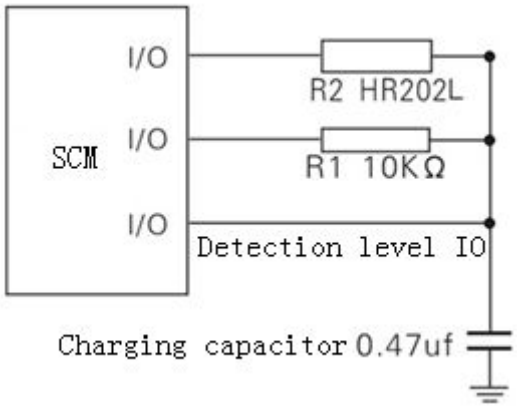
3. Applications

Display for temperature and humidity meter, temperature and humidity gift table, atmospheric environmental monitoring, industrial process control, agriculture, measuring instruments and other applications.

4. Product Highlights

Compact and handsome appearance, good long-term stability, wide temperature and humidity measuring range, high and low temperature and humidity measurement accuracy.

5. Circuit



6. Parameters

Fixed Voltage: 1.5V AC (Max,Sine wave)
Fixed power: 0.2mW (Max,Sine wave)
Operating Frequency: 500Hz~2kHz
Temperature: 0~60℃
Humidity: 95%RH 以下（Non-condensing）
Wet hysteresis difference: ≤2%RH
Response time：Hygroscopic, ≤20S；De Wet≤40S

Stability: ≤1%RH/year
Humidity detection accuracy: ≤±5%RH

Relative humidity
Conditions：at25℃ 1kHz 1V AC ((Sine wave)
Humidity: 60%RH
Central value: 31 KΩ
Impedance values range: 19.8~50.2 KΩ
Humidity detection accuracy: ±5%RH

7. Standard test conditions

The atmosphere, the temperature 25 ℃, the number of measured frequency 1kHz, the measured voltage 1V AC (sine) as a reference. Characteristic measurement, the humidity sensor in the first pre-determined 25 ℃ / 0% RH of the drying air for 30 minutes, and means for generating the humidity Humidity 60% RH, a humidity sensor into the measured impedance value after 15 minutes.
Measurement apparatus:
Split humidity generator: AHR－1Type
LCR bridge: TH2810A
Measured by line:A shielded cable
Stability Test:

Number	Project	Test methods	Specification Value
1	Pin strength	0.5kg lead Rally 10 seconds	No damage, lead off, the electrical characteristics of normal
2	Impact resistance	Hard texture board 1m height repeated three times natural fall	No damage, lead off, the electrical characteristics of normal
3	Shock resistance	Frequency Number 10 ~ 55Hz, amplitude 1.5mm(10 ~ 55Hz ~ 10Hz) direction of the X-Y-Z 2 hours each vibration test	No damage, lead off, the electrical characteristics of normal
4	Heat resistance	Temperature 80 ℃, humidity of 30% RH In air for 1000 hours, following	± 5% RH or less
5	Cold	Temperature 10 ℃, humidity 70% RH In air for 1000 hours, following	± 5% RH or less
6	Moisture resistance	Temperature 40 ℃, humidity 90% RH In air for 1000 hours, following	± 5% RH or less
7	Temperature cycling	To stand at 0 ℃ 30 minutes and then transferred for 30 minutes at 50 ℃, Then put 0 ℃ under 30 minutes, 5 cycles	± 5% RH or less
8	Humidity cycling	25 ℃, allowed to stand at 30% RH 30 minutes. For 30 minutes and then transferred to 90% RH,then placed under 30% RH 30 minutes, the cycle five times.	± 5% RH or less
9	Resistant to organic solvents	Organic solvents at room temperature Ethanol gas 30 minutes Acetone gas 30 minutes	± 5% RH or less
10	Place power	General indoor (normal temperature and humidity) 1kHz,5Vp-p square wave connection 1000 hours placement.	± 5% RH or less

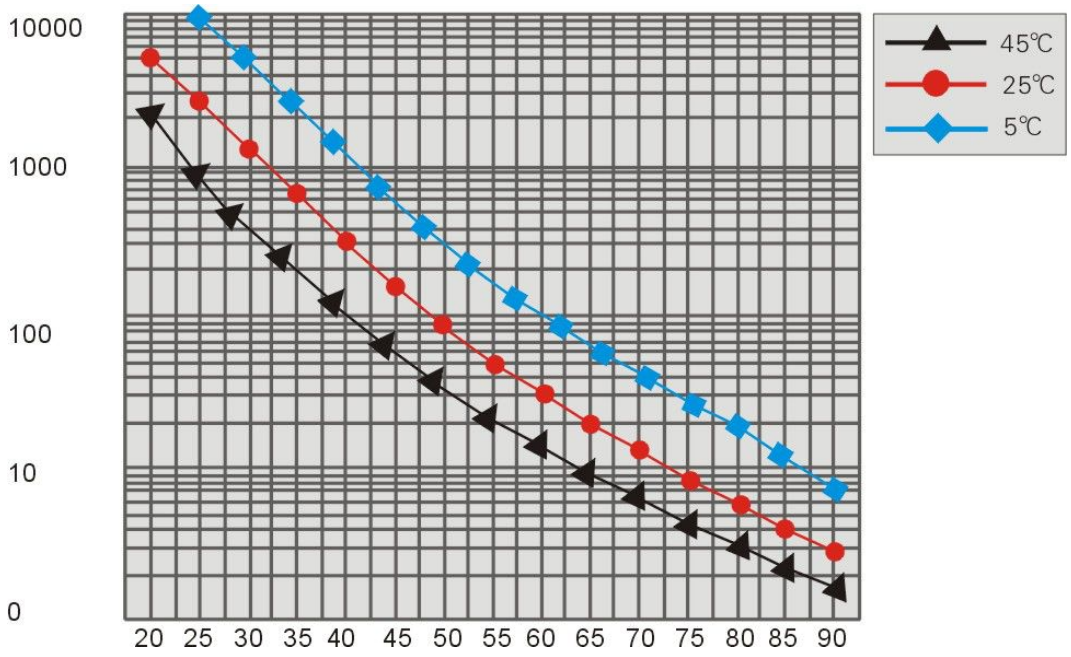
Size 60% RH humidity value as a reference the amount of change.

After the completion of each test, a humidity sensor placed in the normal room temperature and humidity for 24 hours in air, the amount of change measured with a moisture.

8. Relative humidity - impedance characteristics

	0℃	5℃	10℃	15℃	20℃	25℃	30℃	35℃	40℃	45℃	50℃	55℃	60℃
20%RH				10M	6.7 M	5.0 M	3.9 M	3.0 M	2.4 M	1.75 M	1.45 M	1.15 M	970K
25%RH		10 M	7.0 M	5.0 M	3.4 M	2.6 M	1.9 M	1.5 M	1.1 M	880K	700K	560K	450K
30%RH	6.4 M	4.6 M	3.2 M	2.3 M	1.75 M	1.3 M	970K	740K	570K	420K	340K	270K	215K
35%RH	2.9 M	2.1 M	1.5 M	1.1 M	850K	630K	460K	380K	280K	210K	170K	150K	130K
40%RH	1.4 M	1.0 M	750K	540K	420K	310K	235K	190K	140K	110K	88K	70K	57K
45%RH	700K	500 K	380 K	280 K	210 K	160 K	125 K	100 K	78 K	64 K	50 K	41 K	34 K
50%RH	370 K	260 K	200 K	150 K	115 K	87 K	69 K	56 K	45 K	38 K	31 K	25 K	21 K
55%RH	190 K	140 K	110 K	84 K	64 K	49 K	39 K	33 K	27 K	24 K	19.5 K	17 K	14 K
60%RH	105 K	80 K	62 K	50 K	39 K	31 K	25 K	20 K	17.5 K	15 K	13 K	11 K	9.4 K
65%RH	62 K	48 K	37 K	30 K	24 K	19.5 K	16 K	13 K	11.5 K	10 K	8.6 K	7.6 K	6.8 K
70%RH	38 K	30 K	24 K	19 K	15.5 K	13 K	10.5 K	9.0 K	8.0 K	7.0 K	6.0 K	5.4 K	4.8 K
75%RH	23 K	18 K	15 K	12 K	10 K	8.4 K	7.2 K	6.2 K	5.6 K	4.9 K	4.2 K	3.8 K	3.4 K
80%RH	15.5 K	12.0 K	10.0 K	8.0 K	7.0 K	5.7 K	5.0 K	4.3 K	3.9 K	3.4 K	3.0 K	2.7 K	2.5 K
85%RH	10.5 K	8.2 K	6.8 K	5.5 K	4.8 K	4.0 K	3.5 K	3.1 K	2.8 K	2.4 K	2.1 K	1.9 K	1.8 K
90%RH	7.1 K	5.3 K	4.7 K	4.0 K	3.3 K	2.8 K	2.5 K	2.2 K	2.0 K	1.8 K	1.55 K	1.4 K	1.3 K

9. Electrical impedance R（KΩ）



10. Sample Code

```
/**********************
SCM: SN8P2501B
Crystal oscillator:Built-in16M 4Divide
Subroutine Description:
__interrupt IntIn()   Timer interrupt function
StartOneTImeSample(void)   To perform a detecting operation
**********************/
typedef struct
{
    unsigned char u8WihtchIOCharge;
    unsigned long u16ChargeTimeIo;    //Charging time fixed resistor
    unsigned long u16ChargeTimeHumi;  //Humidity resistance charging time
    }ChargeTyPe;

#define   CHARGE_HUMIDITY_IO_HIGH()          FP21 = 1
#define   CHARGE_HUNIDITY_IO_LOW()            FP21 = 0

#define   CHARGE_IO_HIGH()                                      FP20 = 1
#define   CHARGE_IO_LOW()                                     FP20 = 0

#define   CHARGE_IO_HI()                                       P2M = 0X00
#define   F_data                                                        20

__interrupt IntIn()
{
      WDTR = 0X5A;    //Watchdog
          T0C = F_data;
          m_st_ChargeType.u8WihtchIOCharge++;

          if(m_st_ChargeType.u8WihtchIOCharge&0x80)   //Hygristor charge
           {
                    if(m_st_ChargeType.u8WihtchIOCharge >= 0x84)   //Low pulse ratio of 3:
1
                     {
                            CHARGE_HUNIDITY_IO_LOW();
                            m_st_ChargeType.u8WihtchIOCharge = 0x80;
                     }
                    else if(m_st_ChargeType.u8WihtchIOCharge >= 0x81)
                     {
                            CHARGE_HUMIDITY_IO_HIGH();
                    }
           }

    else
        {
                    if(m_st_ChargeType.u8WihtchIOCharge == 0x01)//Standard Charging
                      {
                            CHARGE_IO_HIGH();
                      }
                    else if(m_st_ChargeType.u8WihtchIOCharge == 0x04)//Low pulse ratio of
3: 1
                      {
                            CHARGE_IO_LOW();
                            m_st_ChargeType.u8WihtchIOCharge = 0x00;
                      }
          }
```

```
    m_st_ChargeType.u16ChargeTimeIo++;
        FT0IRQ = 0;   //clear t0 irq flag
    }
    void StartOneTImeSample(void)
    {
            CHARGE_IO_HI();  //P1 port into input  As a high-impedance
            m_st_ChargeType.u16ChargeTimeIo = 0;    /// Variable initialization
               if(m_st_ChargeType.u8WihtchIOCharge&0x80)
                 {
                        FP21M = 1;    //Output
                        CHARGE_HUNIDITY_IO_LOW();
                 }
              else
                {
                        FP20M = 1;   //Output
                        CHARGE_IO_LOW();
                }
             delay1N(2);                //Stable delay waiting for port
            T0C = F_data;                   //Remember to load the new values
            FT0ENB = 1;//               //Open Timer  Automatic measurement
            while(1)
             {
                    if(FP22)                //Charge detection threshold
                      {
                           FT0ENB = 0;//  Threshold to, off timer
                           if(m_st_ChargeType.u8WihtchIOCharge&0x80)//Charging time record
humidity sensitive resistor
                                {
                                        m_st_ChargeType.u16ChargeTimeHumi =
m_st_ChargeType.u16ChargeTimeIo;
                                }
                              break;
                      }
              }
            P2M = 0X23;
            P2 = 0X00;//Discharge
             FP22M = 1;
            FP22 = 0;
             delay1N(100);
             FP22M = 0;
       }
```

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