

# HSM-20G HUMIDITY SENSOR MODULE

The module of HSM-20G is essential for those applications where the relative humidity can be converted to standard voltage output.

## 1. Applications

- 🕒 **Humidifiers & dehumidifiers**
- 🕒 **Air-conditioner**
- 🕒 **Humidity data loggers**
- 🕒 **Automotive climate control**
- 🕒 **Other applications**

## 2. Specifications

Characteristics		HSM-20G
Input voltage range		DC 5.0±0.2V
Output voltage range		DC 1.0—3.0 V
Measurement Accuracy		±5% RH
Operating Current (Maximum)		2mA
Storage RH Range		0 to 99% RH
Operating RH Range		20 to 95% (100% RH intermittent)
Transient Condensation		< 3%RH
Temperature Range	Storage	-20℃ to 70℃
	Operating	0℃ to 50℃
Hysteresis (RH @ 25℃)		MAX 2%RH
Long Term Stability(typical drift per year)		±1.5%
Linearity		Linearity
Time Response(63% step change)		1 min
Dimensions(L*W)		34mm*22mm

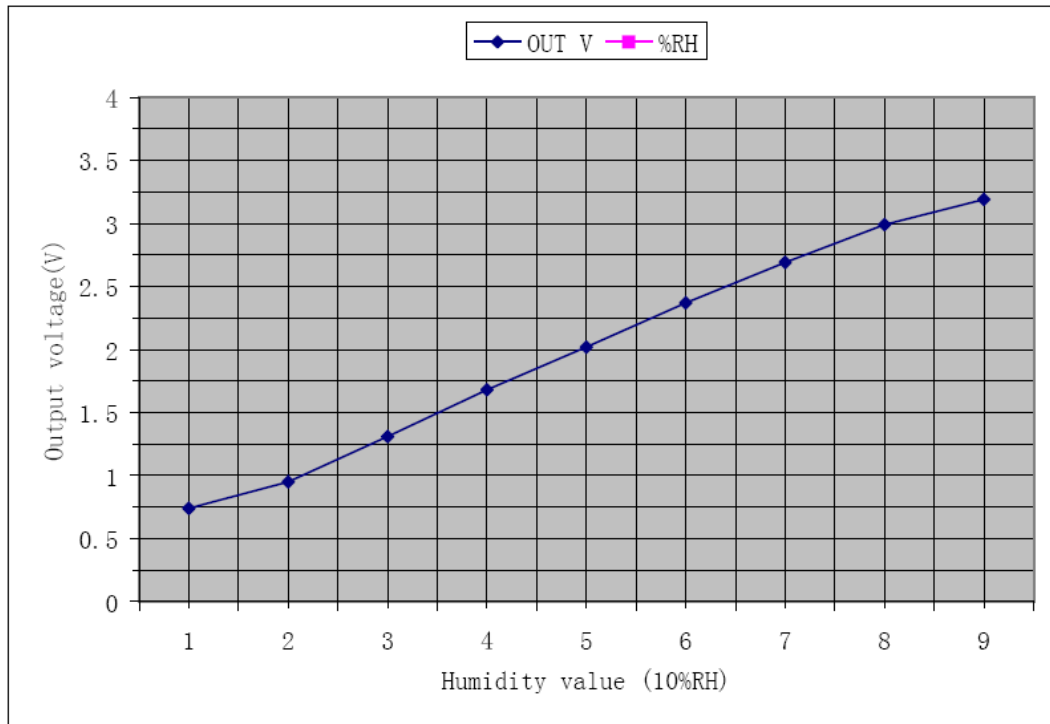
### 3. Reliability Test

No	Item	Method	Requirement
1	Impact test	To drop module 3 times at random on to a hard wooden plate from 1 meter above high	No breakage, nor racks Should be electrically normal
2	Vibration test	Vibration test in X-Y-Z axis for 30 min .under 10 – 55Hz frequency, 1.5mm (10-55-10Hz)	Within $\pm$ 5%RH
3	Heat Resistance	To leave module in an ambient of 55°C and 30%RH max. for 48 hours.	Within $\pm$ 5%RH
4	Cool Resistance	To leave module in an ambient of -10°C and 30%RH max. for 48 hours.	Within $\pm$ 5%RH
5	Humidity Resistance	To leave in an ambient of 40°C and 95%RH for 48 hours.	Within $\pm$ 5%RH
6	Temperature cycle test	5 cycles. 1 cycle stands for leaving module under -10°C for next 1 hour. Then, leave it another 1 hour, and lower temp. to -10°C for next 1 hour.	Within $\pm$ 5%RH

#### Remark :

- All standard figures are based on humidity variation under 60%RH (at 25 °C)
- Upon completion of all test, module will be left over under nominal environment
- And humidity for 24 hours.

#### 4. Typical Response of HSM-20G at 25 °C



#### STANDARD CHARACTERISTICS

%RH	10	20	30	40	50	60	70	80	90
OutputV	0.74	0.95	1.31	1.68	2.02	2.37	2.69	2.99	3.19

## 5.0 Temperature Output Signal (HSM—20G)

$R(25^{\circ}\text{C}) = 47\text{k}\Omega \pm 1\%$ ,  $B(25/85) = 3950 \pm 1\%$

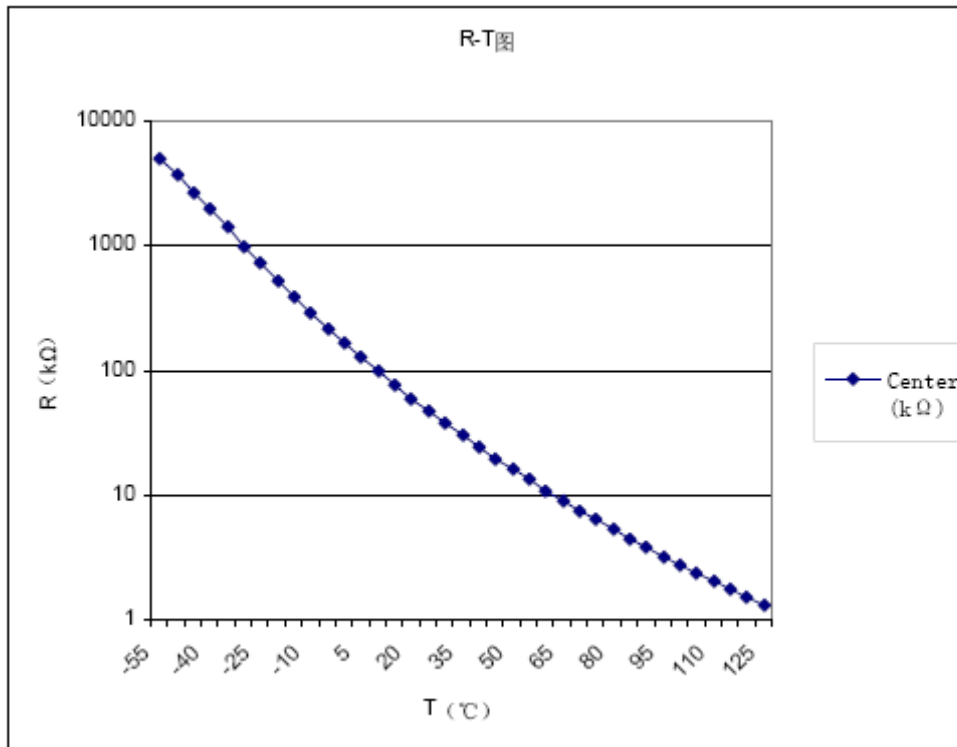
Temperature( $^{\circ}\text{C}$ )	0	10	20	25	30	40	50	60
Resistance( $\text{k}\Omega$ )	158.02	94.82	58.92	47.00	37.78	24.92	16.86	11.69

### •Temperature Dependence (Reference)

$\pm 5\%$  RH(V in=5V DC, 40~80%RH, Temp Range 10~40 $^{\circ}\text{C}$  (based on 25 $^{\circ}\text{C}$ ))

### •Voltage Dependence (Reference)

$\pm 5\%$  RH(V in=5V DC, 40~80%RH, Voltage Range 4.75~5.25V (based on 5V DC))



## 5. 1 Temperature Output Signal (HSM—20G)

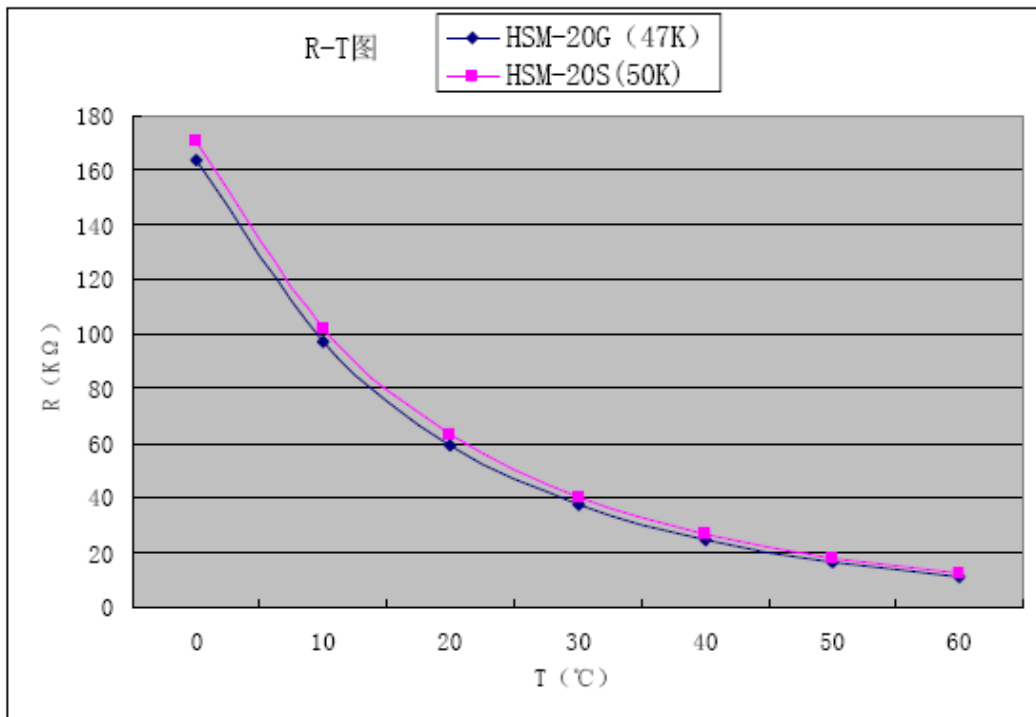
$R(25^{\circ}\text{C}) = 47\text{k}\Omega \pm 1\%$ ,  $B(25/85) = 3950 \pm 1\%$

Temperature( $^{\circ}\text{C}$ )	0	10	20	25	30	40	50	60
Resistance( $\text{k}\Omega$ )	158.02	94.82	58.92	47.00	37.78	24.92	16.86	11.69

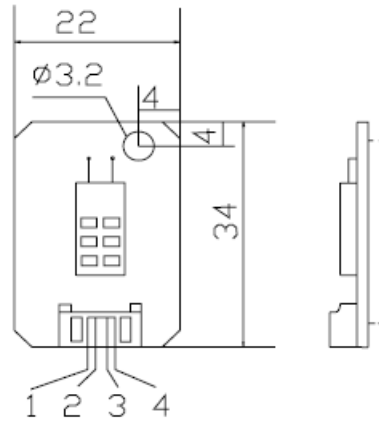
## 5. 2 Temperature Output Signal (HSM-20S)

$R(25^{\circ}\text{C}) = 50\text{k}\Omega \pm 1\%$ ,  $B(25/85) = 4000 \pm 1\%$

Temperature( $^{\circ}\text{C}$ )	0	10	20	25	30	40	50	60
Resistance( $\text{k}\Omega$ )	170.70	101.78	62.86	50.00	40.08	26.30	17.71	12.21



## 6. Dimensions (For Reference only)



Pin	Function
1	Temperature Output
2	GND
3	Humidity Output
4	Vcc (+5.0V)

## 7. Recommended Circuit

