

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	

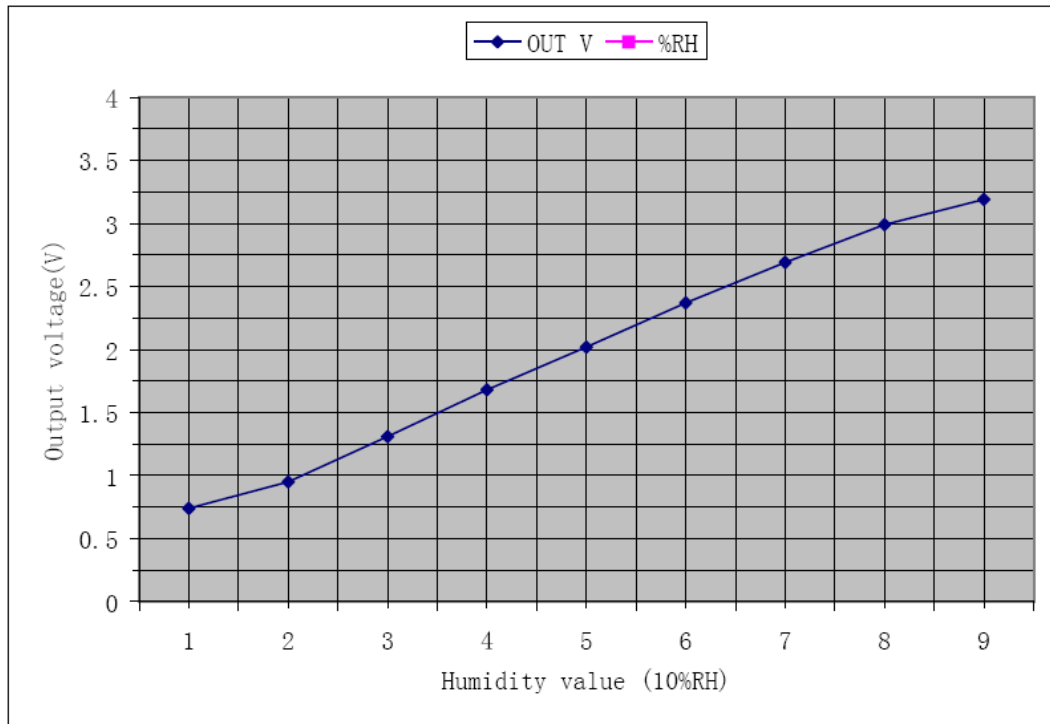
3. Reliability Test

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 – 55 Hz frequency, 1.5 mm (10-55-10 Hz)	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)

$R(25^{\circ}\text{C}) = 47\text{k}\Omega \pm 1\%$, $B(25/85) = 4150 \pm 1\%$

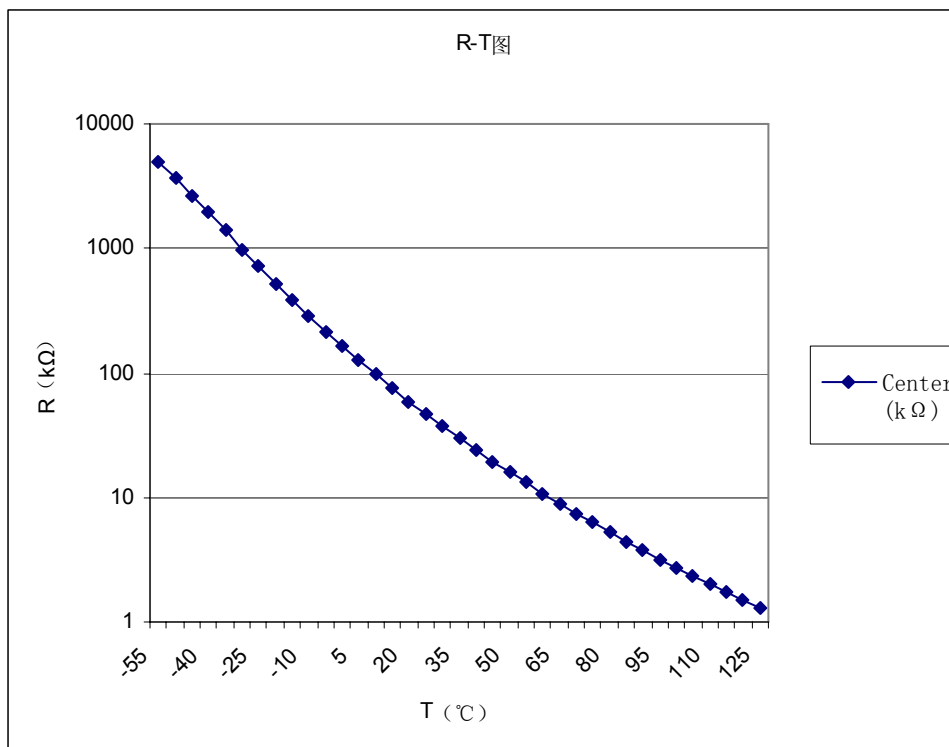
Temperature($^{\circ}\text{C}$)	0	10	20	25	30	40	50	60
Resistance($\text{k}\Omega$)	163.81	97.10	59.42	47.00	37.43	24.19	16.01	10.83

•Temperature Dependence (Reference)

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

•Voltage Dependence (Reference)

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



5.1 Temperature Output Signal (HSM—20G)

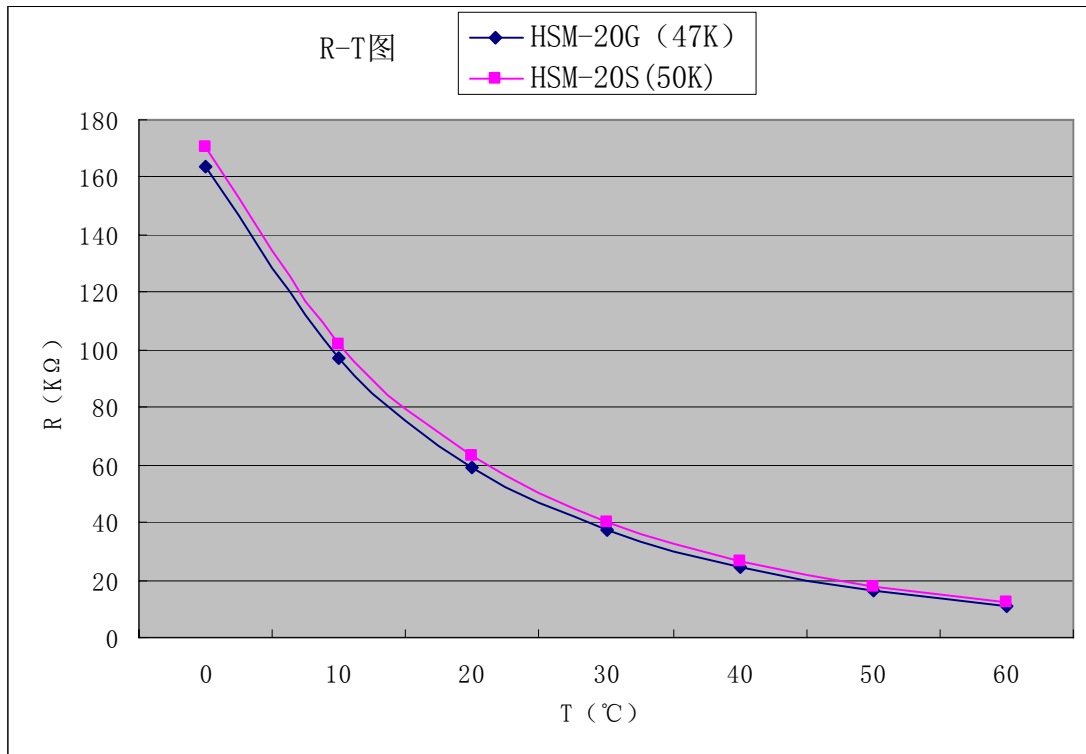
$$R(25^{\circ}\text{C}) = 47\text{k}\Omega \pm 1\%, B(25/85) = 4150 \pm 1\%$$

Temperature($^{\circ}\text{C}$)	0	10	20	25	30	40	50	60
Resistance($\text{k}\Omega$)	163.81	97.10	59.42	47.00	37.43	24.19	16.01	10.83

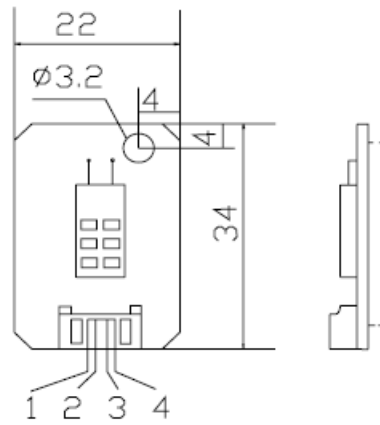
5.2 Temperature Output Signal (HSM-20S)

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

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

