

HSM-20R HUMIDITY SENSOR MODULE

The module of HSM-20R 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

SPECIFICATIONS		HSM-20R
Input voltage range		DC 5.0±0.2 V
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

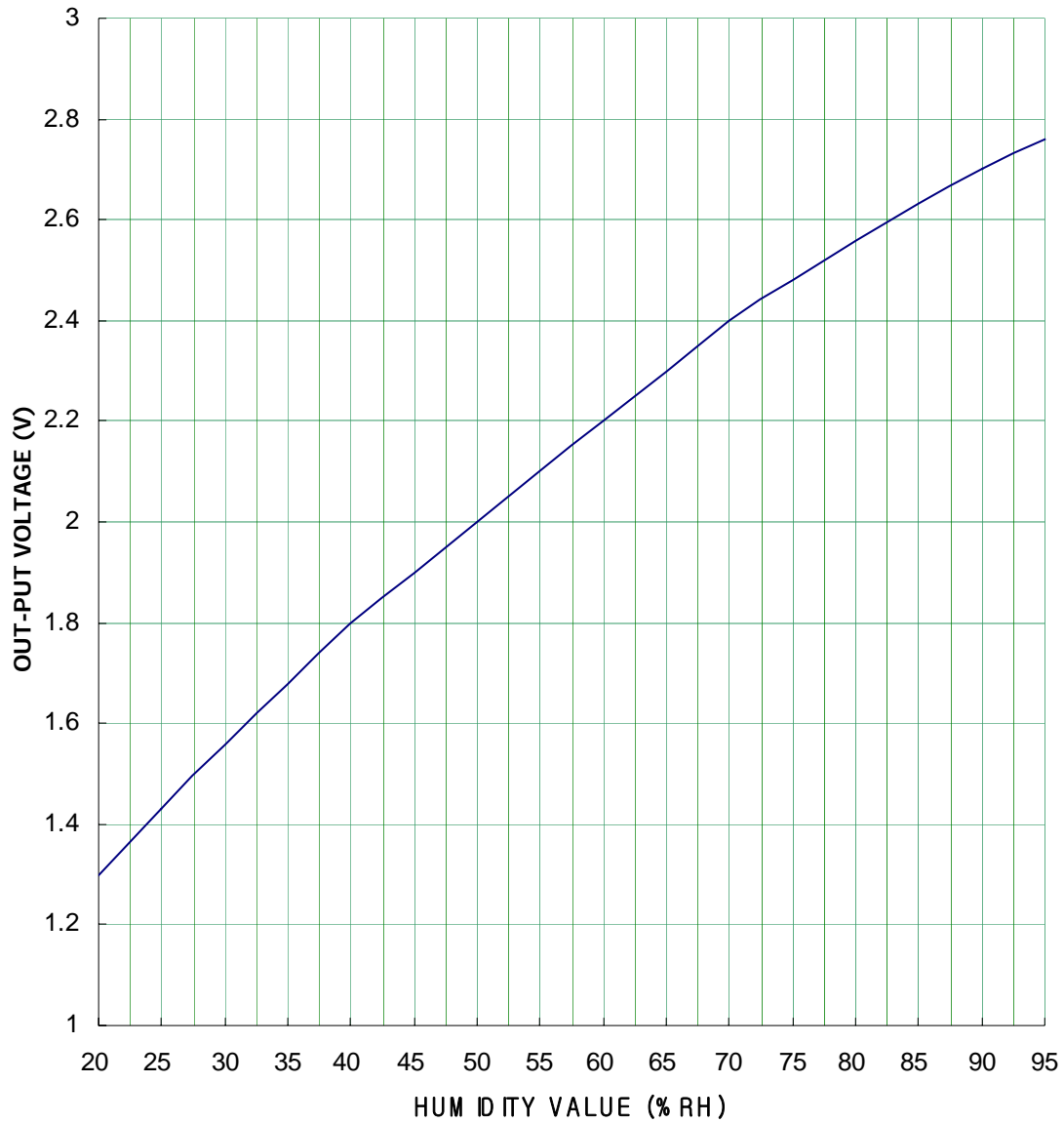
3. Reliability Test

No	Item	Method	Requirement
1	Impact test	To drop module 3times at random on to a hard wooden plate from 1meter above high	No breakge, nor racks Should be electrically normal
2	Vibration test	Vibration test in X-Y-Z axis for 30min .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 48hours.	Within $\pm 5\%$ RH
4	Cool Resistance	To leave module in an ambient of -10 °C and 30%RH max. for 48hours.	Within $\pm 5\%$ RH
5	Humidity Resistance	To leave in an ambient of 40 °C and 95%RH for 48hours.	Within $\pm 5\%$ RH
6	Temperature cycle test	5cycles.1cycle stands for leaving module under -10 °C for next 1hour. Then ,leave it another 1hours ,and lower temp. to -10 °C for next 1hour.	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 24hours.

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



STANDARD CHARACTERISTICS

%RH	20	25	30	35	40	45	50	55	60
Output(V)	1.30	1.43	1.56	1.68	1.80	1.90	2.00	2.10	2.20
%RH	65	70	75	80	85	90	95		
Output(V)	2.30	2.40	2.48	2.56	2.63	2.70	2.76		

5. Temperature Output Signal

$$R(25^{\circ}\text{C}) = 10\text{k}\Omega \pm 1\%, B(25/85) = 3435 \pm 1\%$$

$$V_t = V_{cc} * R_1 / (R + R_1); \rightarrow R = (V_{cc} - V_t) R_1 / V_t ; \rightarrow T$$

R: Resistance of Thermistor

V_t: Temperature Output Voltage; R₁=10kΩ

V_{cc}: Input voltage

•Temperature Output Signal :

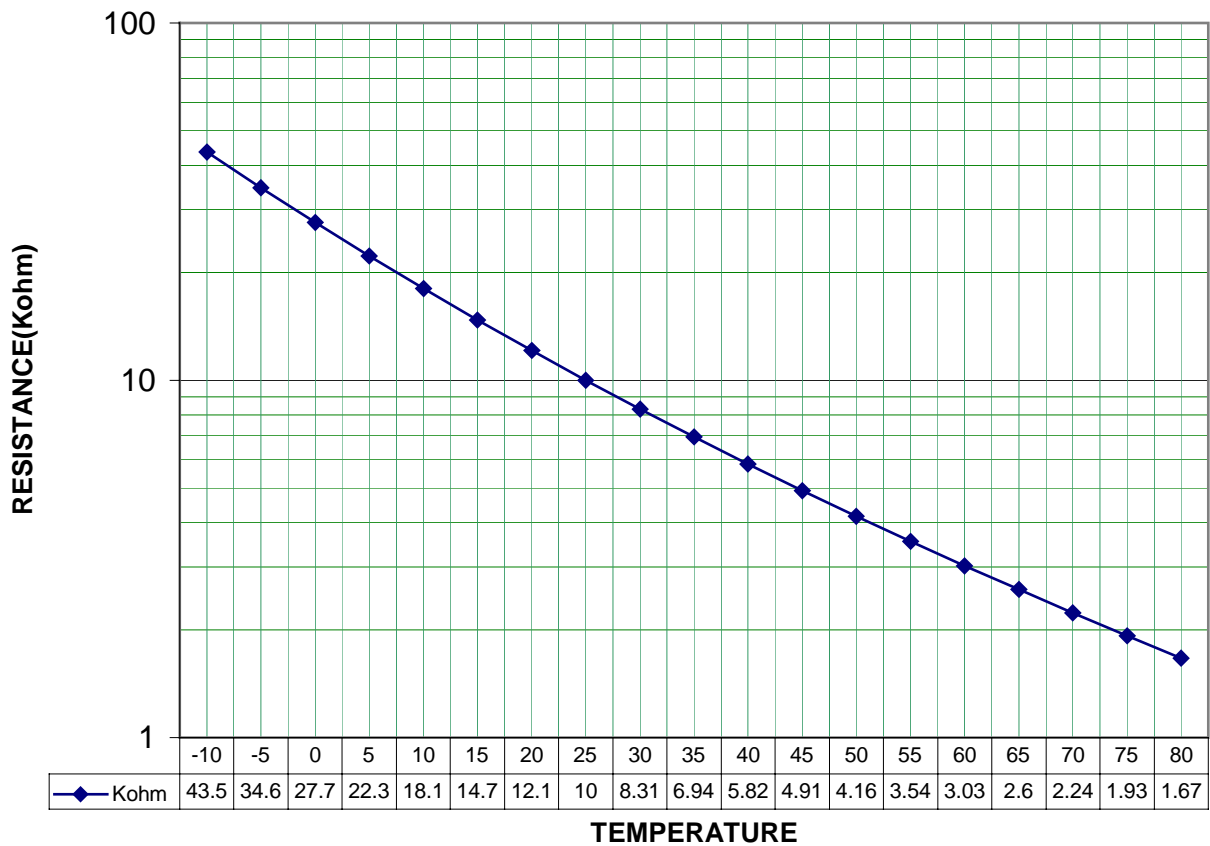
Temperature(°C)	0	10	20	25	30	40	50	60
Resistance(kΩ)	27.66	18.07	12.11	10.00	8.307	5.824	4.164	3.028

•Temperature Dependence (Reference)

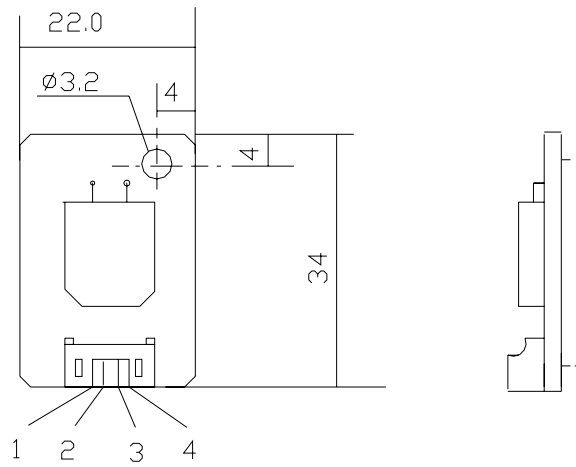
; ± 5% RH (V_{in}=5V DC, 40~80%RH,
Temp Range 10~40°C (based on 25°C))

•Voltage Dependence (Reference)

; ± 5% RH (V_{in}=5V DC, 40~80%RH,
Voltage Range 4.75~5.25V (based on 5V DC))



6. Dimensions (For Reference only)



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

7. Recommended Circuit

