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		±3% 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°C to 70°C
	Operating	0°C to 50°C
Hysteresis (RH @ 25°C)		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

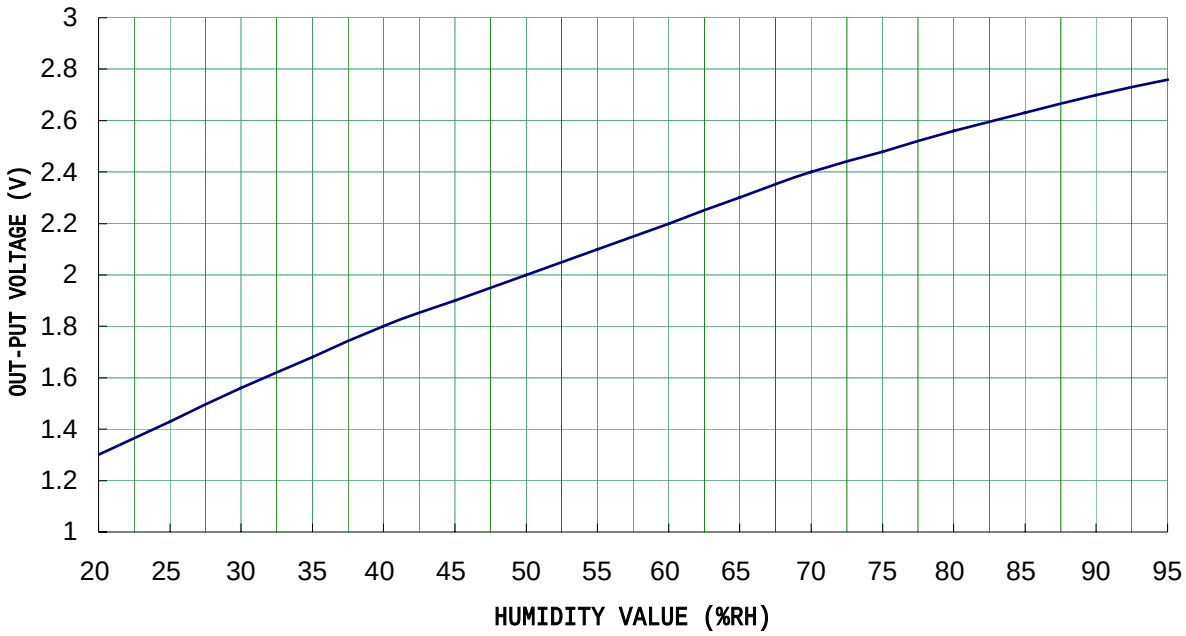
3.Reliability Test

No	Item	Method	Requirment
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, 1.5 mm (10-55-10Hz)	Within ±5%RH
3	Heat Resistance	To leave module in an ambient of 55℃ and 30%RH max. for 48hours.	Within ±5%RH
4	Cool Resistance	To leave module in an ambient of-10℃ and 30%RH max. for 48hours.	Within ±5%RH
5	Humidity Resistance	To leave in an ambient of 40℃ and 95%RH for 48hours.	Within ±5%RH
6	Temperature cycle test	5cycles.1cycle stands for leaving module under -10℃ for next 1hour. Then ,leave it another 1hours ,and lower temp. to-10℃ for next 1hour.	Within ±5%RH

Remark :

- All standard figures are based on humidity variation under 60%RH (at 25 ℃)
- 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 ℃



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		

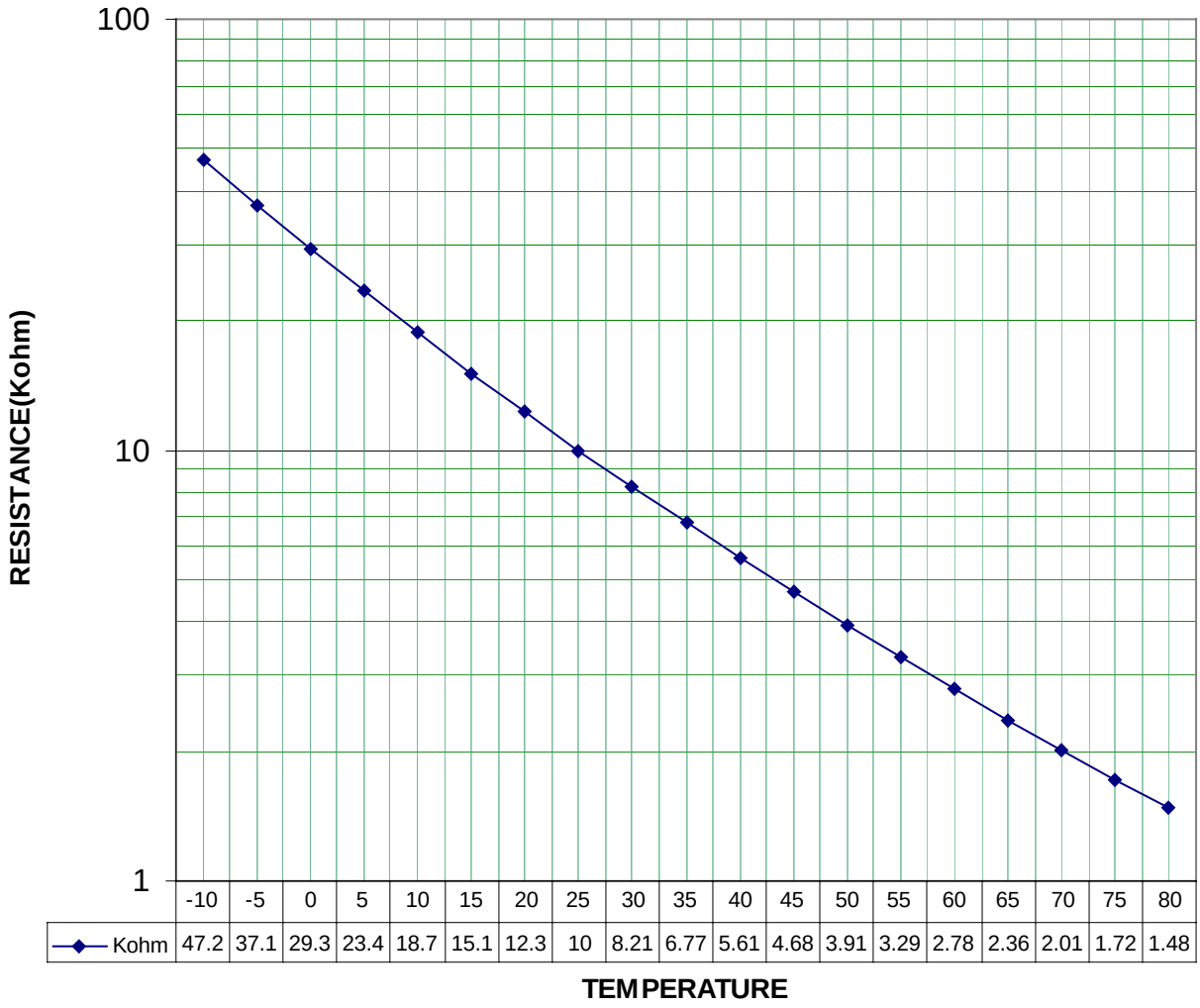
5. Temperature Output Signal

Vt=Vcc*R1/(R+R1);→ R=(Vcc-Vt)R1/Vt→ T
Vt: Temperature Output Voltage; R1=10kΩ
R: Thermistor of LNSK16F103F Resistance
R(25℃) = 10kΩ ± 1%, B(25/85) = 3435 ±1%
·Temperature Output Signal ; “LNSK16F103F”

Temperature(℃)	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10
Resistance(kΩ)	200.8	152.9	117.2	90.51	70.40	55.14	43.51	34.57	27.66	22.28	18.07
Temperature(℃)	15	20	25	30	35	40	45	50	55	60	65
Resistance(kΩ)	14.74	12.11	10.00	8.307	6.938	5.824	4.913	4.164	3.543	3.028	2.597
Temperature(℃)	70	75	80	85	90	95	100	105	110	115	120
Resistance(kΩ)	2.235	1.930	1.671	1.452	1.264	1.104	0.996	0.848	0.746	0.657	0.581

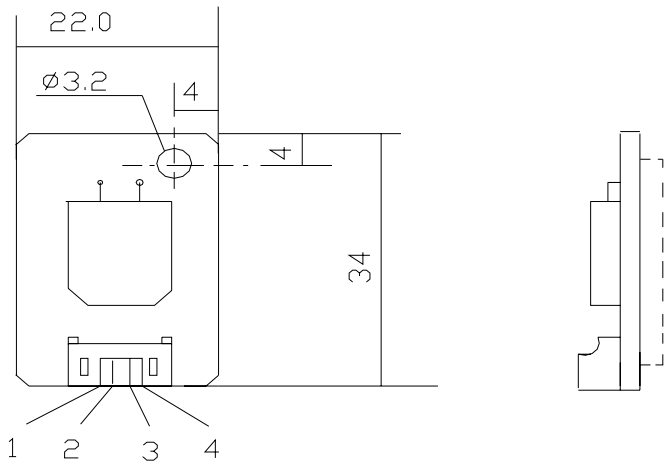
·Temperature Dependence (Reference)
; ± 5% RH(V in=5V DC, 40~80%RH,
Temp Range 10~40℃ (based on 25℃))

·Voltage Dependence (Reference)
; ± 5% RH(V in=5V DC, 40~80%RH,
Voltage Range 4.75~5.25V (based on 5V DC))



	-10	-5	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80
Kohm	47.2	37.1	29.3	23.4	18.7	15.1	12.3	10	8.21	6.77	5.61	4.68	3.91	3.29	2.78	2.36	2.01	1.72	1.48

6.Dimensions(For Reference only)



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

7. Recommended Circuit