

TEMPERATURE AND HUMIDITY MODULE

HTF 3130

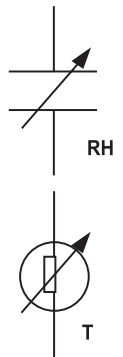
Based on the rugged HTS2030SMD humidity sensor, HTF3130 is a dedicated **humidity and temperature transducer** designed for OEM applications where a reliable and accurate measurement is needed. It features a very small size for easy, cost-effective mechanical mounting. Direct interface with a micro-controller is made possible with the module's linear **frequency output**.

MAIN FEATURES

- One of the smallest humidity / temperature modules on the market.
- Stable,proportional frequency output from 0 to 99% RH.
- Calibrated within +/- 3% RH @ 55% RH at 5.00 VDC.
- High quality thermistor
- Stable characteristics with temperature.
- High reliability and long term stability.

HUMIDITY SENSOR SPECIFIC FEATURES

- Instantaneous de-saturation after long periods in saturation phase.
- Fast response time.
- High resistance to chemicals.
- Not affected by water immersion.
- Patented solid polymer structure.

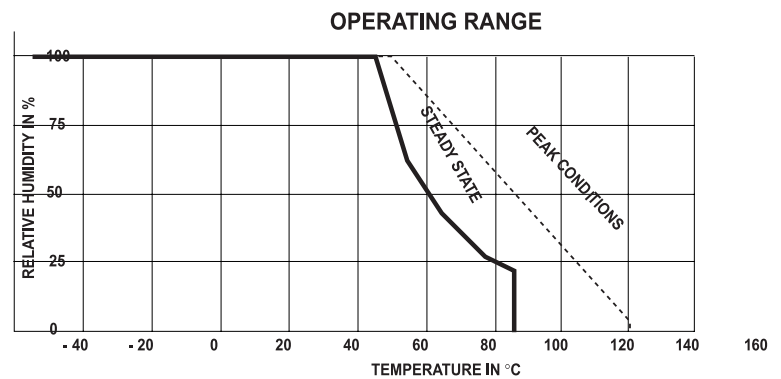


TEMPERATURE SENSOR SPECIFIC FEATURES

- 10 K +/- 3% NTC temperature sensor
- Stable
- High sensitivity

MAXIMUM RATINGS

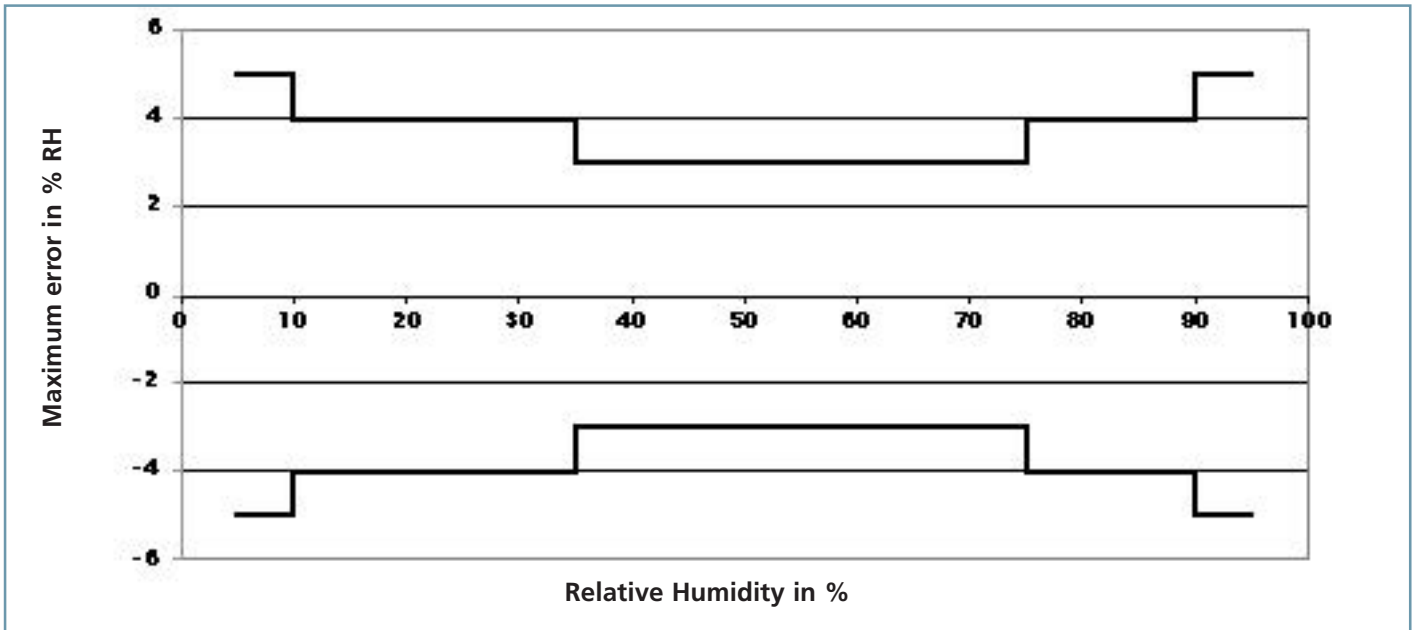
Ratings	Symbol	Value	Unit
Storage Temperature	Tstg	-40 to 105	°C
Storage Humidity Range	RHstg	0 to 100	% RH
Supply Voltage (Peak)	Vs	16	Vdc
Humidity Operating Range	RH	0 to 99	% RH
Temperature Operating Range	Ta	-40 to 85	°C



CHARACTERISTICS

Humidity sensor (Ta = 25°C, Vs = 5.00Vdc, R_L > 100 KΩ unless otherwise stated)

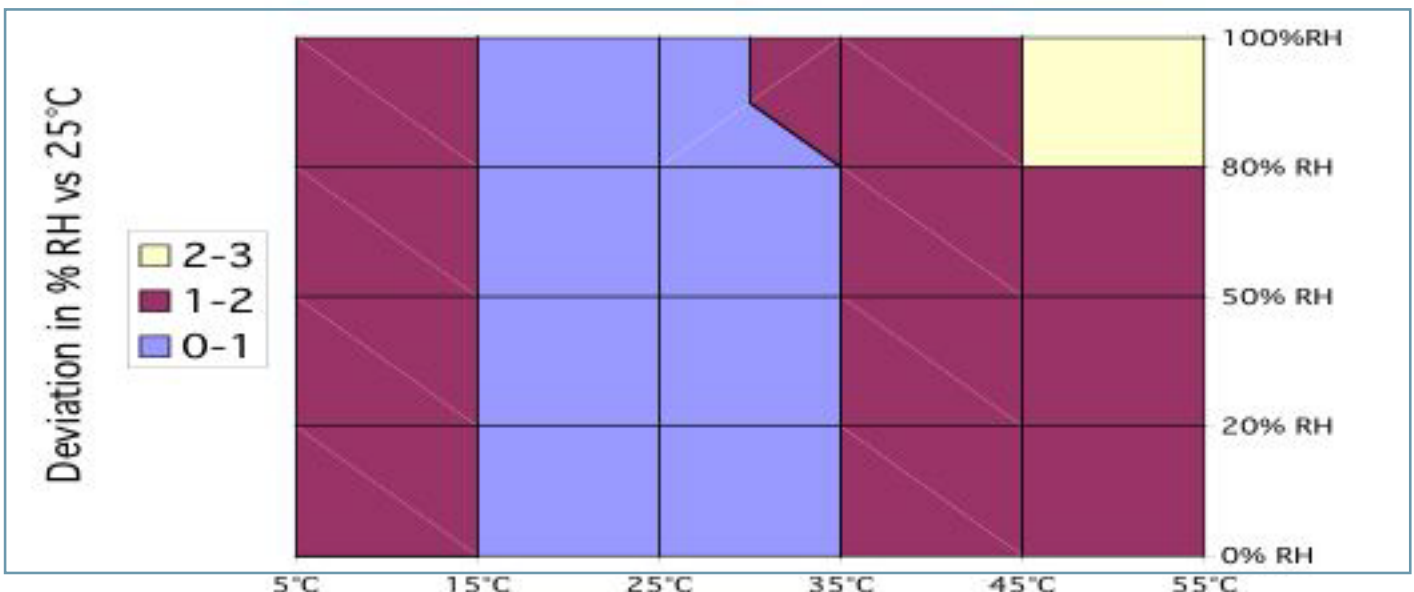
Characteristics	Symbol	Min.	Typ.	Max.	Unit.
Humidity metrology range	RH	10		95	% RH
Relative Humidity accuracy (10 to 95 % RH)	RH		+/- 3	+/- 5	% RH
Voltage supply	Vs	4	5.00	16	Vdc
Nominal output @ RH = 55 % and 5.00VDC	Fout	6560	6600	6640	Hz
Current consumption	Ic			0.1	mA
Voltage supply influence (4 to 7 VDC)	RH		+/-1		% RH
Averaged Sensitivity from 33 % to 75 % RH	ΔFout / Δ RH	-10	- 11	-12	Hz/% RH
Sink current capability	Is		100		μA
Recovery time after 150 hours of condensation	t		10		s
Humidity Hysteresis			+/-1.5		% RH
Long term stability			0.5		% RH/yr
Time constant (33 to 76% RH, static, @63 %)	τ		10		s

Relative Humidity Accuracy of HTF 3130 @ 25°C


Modeled Signal output : $F_{out} = 7314 - 16.79 \cdot RH + 0.0886RH^2 - 0.000358RH^3$ with F_{out} in Hz and RH in %

Typical response look-up table (Polynomial Reference curve)

RH (%)	0	5	10	15	20	25	30	35	40	45	50
Fout (Hz)			7155	7080	7010	6945	6880	6820	6760	6705	6650
RH (%)	55	60	65	70	75	80	85	90	95	100	
Fout (Hz)	6600	6550	6500	6450	6400	6355	6305	6260	6210		

Temperature influence on HTF3130 humidity measurement


Calibration data are traceable to NIST standards through CETIAT laboratory.

CHARACTERISTICS

Temperature sensor (Ta = 25°C)

Characteristics	Symbol	Min.	Typ.	Max.	Unit.
Nominal resistance @ 25°C			10		kΩ
Beta value : B25/100	B	3600	3730	3800	
Temperature measuring range	Ta	- 40		85	°C
Nominal Resistance Tolerance at 25°C	Rn		2	3	%
B value tolerance	B		3		%
Response Time	τ		10		s

Typical temperature output

Depending on the needed temperature measurement range and associated accuracy, we suggest two methods to access to the NTC resistance values.

$$R_T = R_N * e^{B \left(\frac{1}{T} - \frac{1}{T_N} \right)}$$

- R_T NTC resistance in Ω at temperature T in K
- R_N NTC resistance in Ω at rated temperature in K
- T, T_N Temperature in K
- B B value, material-specific constant of the NTC thermistor
- e Base of natural logarithm (e = 2.71828)

The actual characteristic of an NTC thermistor can, however, only be roughly described by the exponential relation, as the material parameter B in reality also depends on temperature. So this approach is only suitable for describing a restricted range around the rated temperature or resistance with sufficient accuracy.

② For practical applications a more precise description of the real R/T curve may be required. Either more complicated approaches (e.g. the Steinhart-Hart equation) are used or the resistance/temperature relation as given in tabulated form. The below table has been experimentally determined with utmost accuracy for temperature increments of 1 degree.

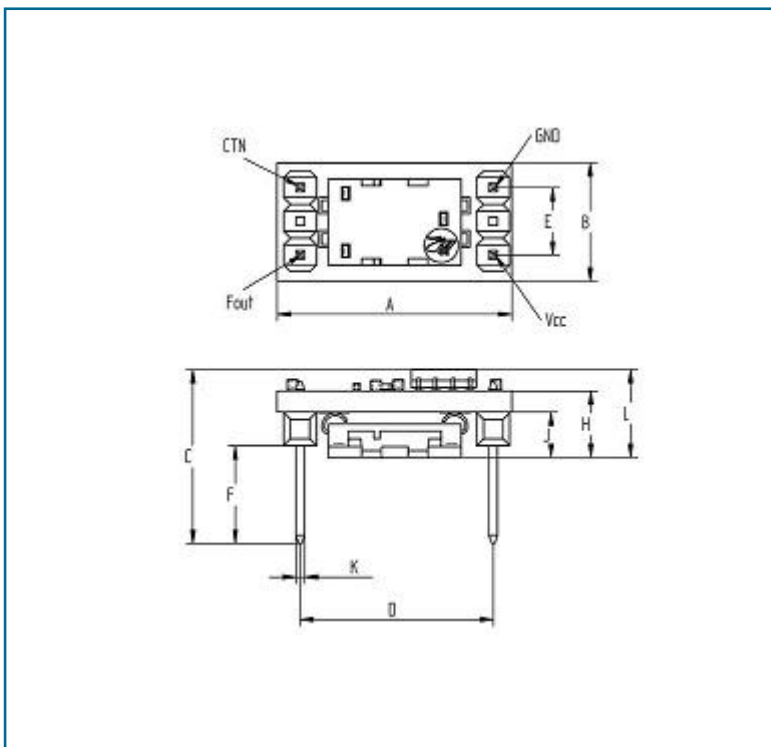
Temperature °C	Resistance (ohm)	Max. Deviation	Temperature °C	Resistance (ohm)	Max. Deviation	Temperature °C	Resistance (ohm)	Max. Deviation	Temperature °C	Resistance (ohm)	Max. Deviation
-40	262960	35403	-2	33100	2230	26	9600	300	54	3360	213
-38	232539	30358	-1	31557	2078	27	9218	300	55	3237	208
-36	206064	26075	0	30029	1932	28	8853	299	56	3126	204
-34	182852	22416	1	28627	1799	29	8506	297	57	3019	200
-32	162498	19290	2	27299	1675	30	8178	296	58	2917	197
-30	144790	16636	3	26042	1560	31	7866	294	59	2819	193
-28	129054	14343	4	24852	1452	32	7568	292	60	2720	189
-26	115243	12383	5	23773	1355	33	7283	290	61	2629	185
-24	103115	10705	6	22708	1261	34	7011	287	62	2542	182
-22	92354	9257	7	21698	1174	35	6734	284	63	2458	178
-20	82923	8020	8	20739	1093	36	6484	281	64	2378	175
-19	78581	7463	9	19829	1017	37	6244	278	65	2304	171
-18	74497	6947	10	18959	946	38	6015	275	66	2229	168
-17	70655	6468	11	18128	879	39	5796	271	67	2158	165
-16	67039	6023	12	17338	817	40	5575	267	68	2089	161
-15	63591	5606	13	16588	759	41	5373	264	69	2022	158
-14	60381	5222	14	15876	705	42	5180	260	70	1960	155
-13	57356	4865	15	15207	654	43	4995	257	71	1898	152
-12	54503	4533	16	14569	607	44	4817	253	72	1839	149
-11	51813	4225	17	13962	563	45	4636	248	73	1782	146
-10	49204	3932	18	13384	522	46	4473	245	74	1727	143
-9	46767	3662	19	12834	484	47	4316	241	75	1673	140
-8	44467	3411	20	12280	447	48	4166	237	77	1573	135
-7	42296	3177	21	11777	413	49	4021	233	79	1480	130
-6	40247	2960	22	11297	382	50	3874	229	81	1390	124
-5	38279	2756	23	10840	353	51	3737	225	83	1310	119
-4	36455	2568	24	10404	325	52	3606	221	85	1235	115
-3	34731	2393	25	10000	300	53	3481	217			

QUALIFICATION PROCESS

Resistance to physical and chemical stresses

- **HTF3130** has passed through qualification processes of HUMIREL including vibration, shock, storage, high temperature and humidity, ESD.
- Additional tests under harsh chemical conditions demonstrate good operation in presence of salt atmosphere, SO₂ (0.5%), H₂S (0.5%), O₃, NO_x, NO, CO, CO₂, Softener, Soap, Toluene, acids (H₂SO₄, HNO₃, HCl), HMDS, Insecticide, Cigarette smoke, a non exhaustive list.
- **HTF3130** is not light sensitive.

PACKAGE OUTLINE HTF3130



Dim	A	B	C	D	E	F	G
Min	17.5	8.5	12.7	14.37	4.88	6.9	
Max	18.5	9.5	13.7	14.77	5.28	7.9	

Dim	J	H	L	K
Min	2.4	4.0	5.4	0.5
Max	3.4	5.0	6.8	0.7

Dimensions in millimeters

Connector type : upon request, customized connectors are available to be mated with your female connector or PCB

ORDERING INFORMATION : HPP808D033

HTF3130 : Humidity Frequency output + NTC (Temperature direct output)

HUMIREL WEB SITE

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