

■ High temperature, high sensitivity, glass encapsulated thermistor

# NT Thermistor

Semitec's glass encapsulated NT-4 series thermistor features high heat resistance and high sensitivity. Compared with conventional thermistors, the NT-4 thermistors are smaller, faster in response, and more reliable which makes them suitable for various applications.

■ Product number explanation



■ Dimensions



■ Applications

3D printers, HVAC equipment, water heaters, microwave ovens, home appliances, hybrid vehicles, fuel cell vehicles, automotive, medical, disaster prevention, security, office automation

■ Specifications

Product number	Rated zero-power resistance <sup>1</sup>			B value temperature C <sub>(100,000)</sub>	B value <sup>2</sup>	Operating temperature range (°C)
	Temperature	Resistance	Resistance tolerance			
502NT-4-R025H39G	25 °C	5 kΩ	± 3% <sup>3</sup>	25/85	3964 K ± 2%	- 50 to 300
852NT-4-R050H34G	50 °C	3.485 kΩ		0/100	3450 K ± 2%	
103NT-4-R025H34G	25 °C	10 kΩ		25/85	3435 K ± 2%	
103NT-4-R025H41G	25 °C	10 kΩ		25/85	4126 K ± 2%	
203NT-4-R025H42G	25 °C	20 kΩ		25/85	4282 K ± 2%	
493NT-4-R100H40G	100 °C	3.3 kΩ		0/100	3970 K ± 2%	
503NT-4-R025H42G	25 °C	50 kΩ		25/85	4288 K ± 2%	
104NT-4-R025H42G	25 °C	100 kΩ		25/85	4267 K ± 2%	
104NT-4-R025H43G	25 °C	100 kΩ		25/85	4390 K ± 2%	
204NT-4-R025H43G	25 °C	200 kΩ		25/85	4338 K ± 2%	
234NT-4-R200H42G	200 °C	1 kΩ		100/200	4537 K ± 2%	
504NT-4-R025H45G	25 °C	500 kΩ		25/85	4526 K ± 2%	
105NT-4-R025H46G	25 °C	1000 kΩ		25/85	4608 K ± 2%	

\* Dissipation factor: 0.8 mw / °C • Thermal time constant<sup>4</sup>: approx. 6 s • Rated power at 25 °C: 4 mW  
<sup>1</sup>: Rated zero-power resistance at each temperature  
<sup>2</sup>: B value calculated from rated zero-power resistance at each temperature  
<sup>3</sup>: If your application requires other tolerance values please contact SEMITEC sales staff.  
<sup>4</sup>: Time required to reach 63.2% of temperature difference. Measured with sensor suspended in mid-air.

■ Reliability data

Item	Test conditions	Criteria
Resistance to soldering heat	10 s at 260 °C (wave soldering)	ΔR ± 3%, ΔB ± 1% and visual inspection
	3.5 s at 350 °C (soldering iron)	
Solderability	2 s at 245 °C Flux material: Rosin 25%, ethyl alcohol 75%	More than 90% soldered
Tensile strength (lead wire)	10 s at 1 N (horizontal pull)	ΔR ± 3%, ΔB ± 1% and visual inspection
Termination bending	0.5 N, two times, 90°	
Free fall	Three times natural fall to a maple board from 1 m height.	
Voltage proof	500 V AC for one minute	Less than 1 mA
Insulation resistance	500 V DC	Over 100 MΩ
Dry heat	1000 hours at 300 °C	ΔR ± 3%, ΔB ± 1%
Damp heat (under electrical load)	1000 hours at 85 °C and 85% humidity Electrical load: 0.1 mA DC	
Temperature cycle (thermal shock)	100 cycles as below: 1. - 30 °C for 3 minutes in fluid 2. 150 °C for 3 minutes in fluid	

■ Resistance / temperature characteristics

Temperature (°C)	502NT-4-R025H39G	852NT-4-R050H34G	103NT-4-R025H34G	103NT-4-R025H41G	203NT-4-R025H42G	493NT-4-R100H40G	503NT-4-R025H42G	104NT-4-R025H42G	104NT-4-R025H43G	204NT-4-R025H43G	234NT-4-R200H42G	504NT-4-R025H45G	105NT-4-R025H46G
-50	339.5	346.8	394.7	830.9	1931	3376	3576	8887	10090	19040	17900	52600	110900
-30	92.34	106.1	122.0	207.7	459.2	885.4	965.0	2156	2353	4524.0	4633.0	12290	25610
-10	28.48	38.02	44.09	60.87	129.3	275.5	302.8	623.2	657.0	1284.0	1393.0	3396	6979
0	16.64	23.92	27.86	34.85	72.67	162.2	175.2	354.6	368.1	724.5	804.8	1887	3849
10	10.06	15.49	18.13	20.65	42.33	98.65	104.0	208.8	213.5	423.0	479.2	1084	2195
25	5.000	8.487	10.00	10.00	20.00	49.41	50.00	100.0	100.0	200.0	232.1	500.0	1000
40	2.649	4.899	5.806	5.166	10.10	26.23	25.42	50.90	49.90	100.6	119.0	245.2	484.7
50	1.790	3.485	4.144	3.437	6.613	17.70	16.69	33.45	32.42	65.72	78.46	157.3	308.4
60	1.238	2.524	3.011	2.341	4.440	12.20	11.19	22.48	21.54	43.89	52.84	103.1	200.7
80	0.6306	1.391	1.668	1.159	2.138	6.134	5.343	10.80	10.13	20.81	25.39	47.24	90.54
85	0.3591	1.209	1.451	0.9843	1.803	5.222	4.494	9.094	8.486	17.48	21.38	39.31	75.08
100	0.3455	0.8104	0.9754	0.6189	1.112	3.300	2.741	5.569	5.122	10.61	13.06	23.27	43.96
120	0.2014	0.4952	0.5920	0.3525	0.6175	1.882	1.498	3.058	2.763	5.759	7.130	12.23	22.78
140	0.1238	0.3108	0.3679	0.2121	0.3631	1.127	0.8635	1.770	1.574	3.301	4.098	6.787	12.48
160	0.07968	0.2000	0.2365	0.1339	0.2245	0.7057	0.5225	1.074	0.9414	1.985	2.466	3.957	7.188
180	0.05341	0.1325	0.1568	0.08811	0.1448	0.4592	0.3296	0.6793	0.5873	1.244	1.544	2.406	4.322
200	0.03708	0.09036	0.1068	0.06015	0.09698	0.3092	0.2158	0.4452	0.3804	0.8098	1.000	1.519	2.703
220	0.02656	0.06329	0.07467	0.04239	0.06713	0.2145	0.1459	0.3016	0.2549	0.5442	0.6674	0.9937	1.750
240	0.01956	0.04543	0.05345	0.03072	0.04784	0.1529	0.1016	0.2104	0.1760	0.3765	0.4574	0.6712	1.168
260	0.01477	0.03337	0.03907	0.02285	0.03499	0.1117	0.07261	0.1507	0.1250	0.2676	0.3210	0.4663	0.8019
280	0.01141	0.02506	0.02912	0.01743	0.02619	0.08336	0.05319	0.1105	0.09101	0.1950	0.2302	0.3317	0.5651
300	0.00900	0.01919	0.02209	0.01361	0.02003	0.06345	0.03981	0.08278	0.06772	0.1452	0.1683	0.2410	0.4074

■ Caution

- When soldering make sure to have a minimum distance from the glass encapsulated sensor head of 5 mm.
- When working the lead wire make sure to fix the wire at a minimum distance from the glass encapsulated sensor head of 5 mm.

Unit: kΩ