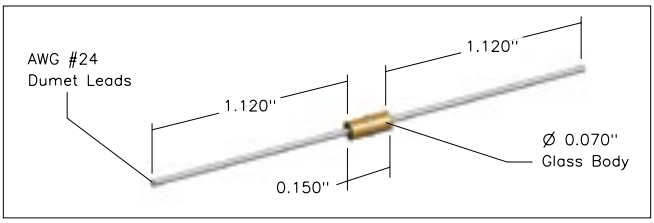
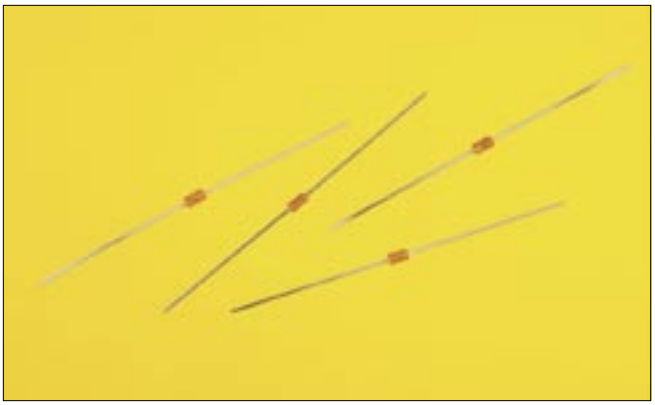
ADVANCED THERMAL PRODUCTS, Inc.

NTC Thermistor
GLASS ENCAPSULATED STYLE

Features

- Low Cost, High Reliability
- High Temperature Operation (up to 300°C)
- Glass to Metal Hermetic Seal
- Values from 2kΩ to 1 MegΩ
- Tin or Unplated Dumet Leads (solderable and weldable)
- Time Constant: 8 sec. (nom.)
- Dissipation Factor: 2mW/°C (nom.)





Glass Encapsulated Style

ATP Standard Values

R_{25} (Ω)	Part Number	Material*
2,000	E2003	Q
3,000	E3003	U
5,000	E5003	U
5,000	E5003	A
10,000	E1004	A
20,000	E2004	A
30,000	E3004	A
50,000	E5004	A
100k	E1005	M
200k	E2005	R
1 Meg	E1006	V

TYPES OF THERMISTOR TOLERANCES

Point Matched:
Thermistor resistance value is specified at one temperature (25°C standard). Tolerance is given as ± % of nominal resistance.

STANDARDS Code	Tolerance
-1	± 1%
-2	± 2%
-5	± 5%
-10	± 10%

Curve Matched:**

Thermistor accuracy guaranteed over a temperature range (0°C to 70°C standard). Often called interchangeable thermistors, these sensors allow direct replacement without the need for recalibration.

Code	Accuracy
-A3	± 1.0°C
-B3	± 0.5°C

* See R/T Tables on opposite page.

**Contact factory to determine which parts are offered with curve matching.

Thermistors listed on this sheet are primarily intended for use in probes & assemblies manufactured by ATP, Inc.

[ ] [ ] — [ ] — [ ] — [S1]

Basic P/N | Material | Tol. Code | Point-match Temperature (°C) (only used if other than 25°C) | For unplated leads only

Examples:

E5003A-2..... Curve "A" Material, 5kΩ ± 2% at 25°C

E1004A-B3 ..... Curve "A" Material, 10kΩ at 25°C with ± 0.5°C accuracy from 0°C to 70°C

E2005R-5-200 ..... Curve "R" Material, 200kΩ at 25°C with tolerance rating of ± 5% at 200°C

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ATP Resistance vs. Temperature Conversion Table Glass Encapsulated Thermistor

Material	Q	U	A	M	R	V
Beta ($\beta_{25/85}$)	3528	3480	3992	4008	4240	4557
Temp. Coef. @25˚C (α_{25})	-3.94	-3.82	-4.42	-4.45	-4.64	-4.99
Resistance Ratio R_0/R_{50}	7.09	6.81	9.22	9.11	10.30	12.34
Temperature (˚C)	R_T/R_{25}	R_T/R_{25}	R_T/R_{25}	R_T/R_{25}	R_T/R_{25}	R_T/R_{25}
-50	40.73	38.00	71.08	66.86	83.31	120.70
-40	22.31	20.96	35.11	33.54	40.38	54.79
-30	12.70	12.04	18.25	17.64	20.57	26.30
-20	7.485	7.167	9.922	9.689	10.95	13.27
-10	4.558	4.410	5.620	5.528	6.065	7.000
0	2.859	2.794	3.302	3.266	3.485	3.844
10	1.843	1.819	2.002	1.992	2.069	2.189
20	1.219	1.214	1.251	1.250	1.266	1.289
25	1.000	1.000	1.000	1.000	1.000	1.000
30	0.8250	0.8283	0.8045	0.0852	0.7955	0.7816
40	0.5710	0.5773	0.5306	0.5314	0.5100	0.4873
50	0.4035	0.4103	0.3583	0.3585	0.3350	0.3116
60	0.2905	0.2967	0.2472	0.2469	0.2280	0.2039
70	0.2129	0.2182	0.1739	0.1732	0.1567	0.1363
80	0.1587	0.1629	0.1246	0.1237	0.1097	0.0929
85	0.1378	0.1415	0.1061	0.1052	0.0920	0.0773
90	0.1201	0.1234	0.0908	0.0898	0.0751	0.0645
100	0.0922	0.0947	0.0672	0.0661	0.0565	0.0456
110	0.0718	0.0735	0.0504	0.0494	0.0414	0.0327
120	0.0567	0.0578	0.0384	0.0374	0.0308	0.0238
125	0.0506	0.0515	0.0337	0.0327	0.0267	0.0204
130	0.0453	0.0459	0.0296	0.0287	0.0232	0.0176
140	0.0366	0.0369	0.0231	0.0222	0.0177	0.0131
150	0.0299	0.0299	0.0182	0.0174	0.0137	0.0099
160	0.0246	0.0244	0.0145	0.0138	0.0106	0.0076
170	0.0205	0.0202	0.0116	0.0110	0.0084	0.0059
180	0.0173	0.0168	0.0094	0.0089	0.0067	0.0046
190	0.0146	0.0140	0.0077	0.0072	0.0053	0.0036
200	0.0125	0.0118	0.0064	0.0059	0.0040	0.0029
225	0.0088	0.0080	0.0041	0.0037	0.0026	0.0017
250	0.0064	0.0056	0.0027	0.0024	0.0017	0.0010
275	0.0049	0.0040	0.0019	0.0017	0.0011	0.0007
300	0.0038	0.0030	0.0013	0.0012	0.0008	0.0004

This R/T Conversion Table is provided for reference only. ATP uses the Steinhart-Hart equation to calculate the nominal Rt/R_{25} value. 1°C tables are available upon request.

- **Rt/R_{25}** - The ratio of the thermistor resistance at any temperature divided by its' resistance at 25°C. For example, if you select a 10kΩ at 25°C thermistor in Material "A", you can calculate its' nominal resistance at 100°C to be 10,000 x .0672 = 672Ω.

- **α_{25}** - Negative Temperature Coefficient of Resistance at 25˚C expressed in %/˚C. This is the percentage change in thermistor resistance for a 1°C change in its' body temperature at 25°C. α is particularly useful in calculating the required resistance tolerance necessary to guarantee sensor accuracy. α at temperatures other than 25˚C is available upon request as tables in 1˚C increments.

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