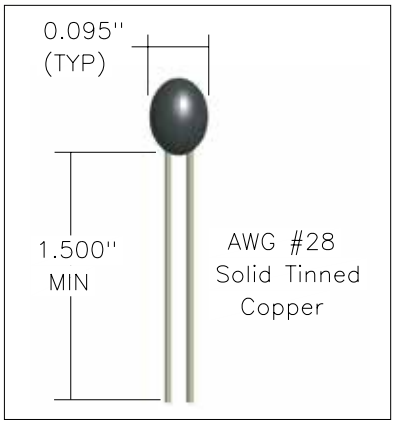
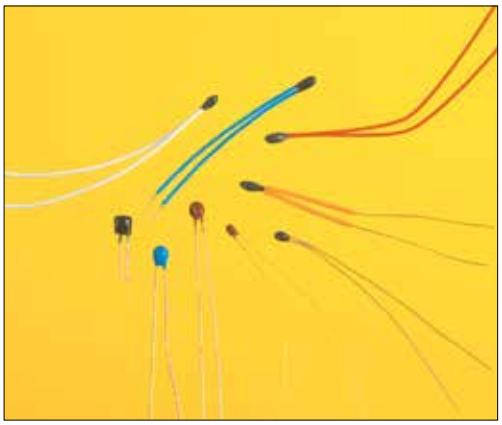
# Coated Chip Style

measurement SPECIALTIES™

**Features:**

- Very fast response time
- -50°C to 150°C operation
- Epoxy or phenolic resin coatings
- Values from 100Ω to 1 MegΩ
- Bare or insulated lead wires
- Time Constant: 10 sec. (max.)
- Dissipation Factor: 1 mW/°C (nom.)



*Coated Chip Style*

## MS Standard Values

| $R_{25}$ (Ω) | Part Number | Material* | TYPES OF THERMISTOR TOLERANCES | STANDARDS Code | STANDARDS Tolerance |
|---|---|---|---|---|---|
| 100 | A1002 | K | **Point Matched:** Thermistor resistance value is specified at one temperature (25°C standard). Tolerance is given as ± % of nominal resistance. | -1 | ± 1% |
| 500 | A5002 | K | | -2 | ± 2% |
| 1,000 | A1003 | K | | -5 | ± 5% |
| 1,000 | A1003 | Z | | -10 | ± 10% |
| 3,000 | A3003 | Z | | | |
| 5,000 | A5003 | Z | **Curve Matched:**** | **Code** | **Accuracy** |
| 10,000 | A1004 | Z | 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. Other temperature ranges available. Maximum operating temperature for curve matched thermistors is 105°C. | -A3 | ± 1.0°C |
| 10,000 | A1004 | C | | | |
| 20,000 | A2004 | C | | -B3 | ± 0.5°C |
| 30,000 | A3004 | D | | | |
| 50,000 | A5004 | D | | -C3 | ± 0.2°C |
| 100k | A1005 | D | | | |
| 250k | A2505 | H | | | |
| 500k | A5005 | H | | | |
| 1 Meg | A1006 | H | | | |

* See R/T Tables on page 59.

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

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

Examples:

A1003K-2..... Curve "K" Material, 1000Ω ± 2% at 25°C

A1004Z-C3 ..... Curve "Z" Material, 10kΩ at 25°C with ± 0.2°C accuracy from 0°C to 70°C

A5005H-5-150 ..... Curve "H" Material, 500kΩ at 25°C with tolerance rating of ± 5% at 150°C

# MS Resistance vs. Temperature Conversion Table Coated Chip NTC Thermistor

| Material | | K | | | C | | | Z | | | D | | | H | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Temp. Coef. @25˚C ($\alpha_{25}$) | | -3.9%/˚C | | | -4.0%/˚C | | | -4.4%/˚C | | | -4.7%/˚C | | | -5.3%/˚C | | |
| Resistance Ratio $R_0/R_{50}$ | | 6.93 | | | 7.58 | | | 9.07 | | | 10.45 | | | 14.09 | | |
| Beta ($\beta_{25/85}$) | | 3498 | | | 3694 | | | 3976 | | | 4262 | | | 4851 | | |
| Temperature (˚F) | (˚C) | $\frac{R_t}{R_{25}}$ | α (%/˚C) | Curve Dev. | $\frac{R_t}{R_{25}}$ | α (%/˚C) | Curve Dev. | $\frac{R_t}{R_{25}}$ | α (%/˚C) | Curve Dev. | $\frac{R_t}{R_{25}}$ | α (%/˚C) | Curve Dev. | $\frac{R_t}{R_{25}}$ | α (%/˚C) | Curve Dev. |
| -58 | -50 | 39.46 | 6.2 | 8.2 | 44.20 | 6.3 | 4.3 | 66.75 | 7.1 | 5.5 | 83.47 | 7.4 | 7.0 | 110.1 | 7.4 | 17.4 |
| -40 | -40 | 21.68 | 5.8 | 6.8 | 23.99 | 5.9 | 3.6 | 33.56 | 6.6 | 4.3 | 40.70 | 6.9 | 5.1 | 55.50 | 7.2 | 15.6 |
| -22 | -30 | 12.38 | 5.4 | 5.6 | 13.53 | 5.6 | 2.9 | 17.67 | 6.2 | 3.5 | 20.78 | 6.5 | 4.1 | 28.40 | 7.0 | 14.6 |
| -4 | -20 | 7.329 | 5.1 | 4.4 | 7.894 | 5.2 | 2.3 | 9.697 | 5.8 | 2.7 | 11.07 | 6.1 | 3.2 | 14.65 | 6.8 | 13.7 |
| 14 | -10 | 4.482 | 4.8 | 3.3 | 4.755 | 4.9 | 1.7 | 5.530 | 5.4 | 2.0 | 6.124 | 5.7 | 2.4 | 7.609 | 6.4 | 11.7 |
| 32 | 0 | 2.825 | 4.5 | 2.3 | 2.949 | 4.6 | 1.2 | 3.265 | 5.1 | 1.4 | 3.510 | 5.4 | 1.6 | 4.094 | 6.0 | 9.9 |
| 50 | 10 | 1.830 | 4.2 | 1.2 | 1.879 | 4.4 | 0.7 | 1.990 | 4.8 | 0.8 | 2.078 | 5.1 | 1.0 | 2.277 | 5.7 | 8.2 |
| 68 | 20 | 1.216 | 4.0 | 0.3 | 1.227 | 4.1 | 0.2 | 1.249 | 4.5 | 0.3 | 1.267 | 4.8 | 0.3 | 1.306 | 5.4 | 6.6 |
| 77 | 25 | 1.000 | 3.9 | 0.0 | 1.000 | 4.0 | 0.0 | 1.000 | 4.4 | 0.0 | 1.000 | 4.7 | 0.0 | 1.000 | 5.3 | 5.9 |
| 86 | 30 | 0.8270 | 3.7 | 0.6 | 0.8196 | 3.9 | 0.2 | 0.8056 | 4.3 | 0.3 | 0.7943 | 4.5 | 0.3 | 0.7709 | 5.1 | 5.2 |
| 104 | 40 | 0.5747 | 3.5 | 1.4 | 0.5594 | 3.7 | 0.6 | 0.5325 | 4.0 | 0.7 | 0.5106 | 4.3 | 0.9 | 0.4674 | 4.9 | 3.7 |
| 122 | 50 | 0.4074 | 3.3 | 2.2 | 0.3893 | 3.5 | 1.0 | 0.3601 | 3.8 | 1.2 | 0.3360 | 4.1 | 1.4 | 0.2905 | 4.6 | 2.4 |
| 140 | 60 | 0.2942 | 3.2 | 3.0 | 0.2760 | 3.4 | 1.3 | 0.2487 | 3.6 | 1.6 | 0.2259 | 3.9 | 1.9 | 0.1848 | 4.4 | 1.1 |
| 158 | 70 | 0.2161 | 3.0 | 3.6 | 0.1990 | 3.2 | 1.7 | 0.1752 | 3.4 | 2.0 | 0.1550 | 3.7 | 2.3 | 0.1202 | 4.2 | 0.0 |
| 176 | 80 | 0.1612 | 2.9 | 4.3 | 0.1458 | 3.0 | 2.0 | 0.1256 | 3.2 | 2.3 | 0.1084 | 3.5 | 2.7 | 0.07980 | 4.0 | 1.0 |
| 185 | 85 | 0.1401 | 2.8 | 4.6 | 0.1255 | 3.0 | 2.2 | 0.1071 | 3.2 | 2.5 | 0.09121 | 3.4 | 2.9 | 0.06550 | 3.9 | 1.5 |
| 194 | 90 | 0.1221 | 2.7 | 4.9 | 0.1084 | 2.9 | 2.3 | 0.09162 | 3.1 | 2.7 | 0.07710 | 3.3 | 3.1 | 0.05400 | 3.8 | 2.1 |
| 212 | 100 | 0.09375 | 2.6 | 5.5 | 0.08169 | 2.8 | 2.5 | 0.06787 | 2.9 | 3.0 | 0.05574 | 3.2 | 3.5 | 0.03720 | 3.6 | 3.1 |
| 230 | 110 | 0.07292 | 2.5 | 6.1 | 0.06238 | 2.6 | 2.8 | 0.05102 | 2.8 | 3.3 | 0.04092 | 3.0 | 3.9 | 0.02618 | 3.5 | 4.0 |
| 248 | 120 | 0.05738 | 2.3 | 6.7 | 0.04822 | 2.5 | 3.0 | 0.03887 | 2.7 | 3.6 | 0.03047 | 2.9 | 4.2 | 0.01860 | 3.3 | 4.9 |
| 257 | 125 | 0.05112 | 2.3 | 6.9 | 0.04258 | 2.5 | 3.1 | 0.03409 | 2.6 | 3.8 | 0.02642 | 2.8 | 4.5 | 0.01580 | 3.2 | 5.3 |
| 266 | 130 | | | | 0.03770 | 2.4 | 3.3 | 0.02999 | 2.5 | 3.9 | 0.02299 | 2.8 | 4.8 | 0.01340 | 3.2 | 5.8 |
| 284 | 140 | | | | 0.02979 | 2.3 | 3.5 | 0.02342 | 2.4 | 4.1 | 0.01756 | 2.6 | 5.4 | 0.00980 | 3.1 | 6.6 |
| 302 | 150 | | | | 0.02377 | 2.2 | 3.7 | 0.01849 | 2.3 | 4.4 | 0.01357 | 2.5 | 6.1 | 0.00730 | 2.9 | 7.3 |

This R/T Conversion Table is provided for reference only. MS 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 "Z", you can calculate its' nominal resistance at 100°C to be 10,000 x .06787 = 678.7Ω.

- **α** - Negative Temperature Coefficient of Resistance expressed in %/°C. This is the percentage change in thermistor resistance for a 1°C change in its body temperature. α is particularly useful in calculating the required resistance tolerance necessary to guarantee sensor accuracy. For example, a Material "C" thermistor has an α of -3.5%/°C at 50°C. If you require a sensor that is accurate to within ± 2.0°C at 50°C, the thermistor must have a resistance tolerance of ± 2.0°C x 3.5%/°C= ± 7.0%.

- **Curve Dev.** — Applies to thermistors that are point matched at 25°C. The Curve Dev. (%) must be added to the thermistor tolerance at 25°C to calculate the total tolerance or maximum deviation at any temperature. Curve Dev. accounts for the curve variance that occurs within any given batch or lot of thermistors. For example, if you specify a Material "Z" device with a ± 5% tolerance at 25°C, it will have a total tolerance at 80°C of (± 5%) +(±2.3%)= ±7.3%.

Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

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- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

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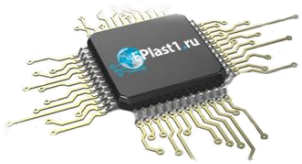
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.




**Как с нами связаться**

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