

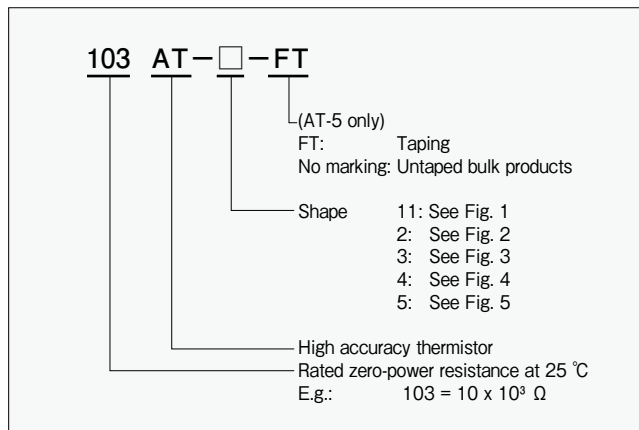
High accuracy thermistor

AT Thermistor

The AT series thermistor features high accuracy with tight resistance and B-value tolerances ($\pm 1\%$).

- Features:
- Uniform shape facilitates automated assembly
 - Long term reliability
 - Five different standard shapes available

Product number explanation



Applications

Office automation, measuring instruments, controllers, mobile devices, battery chargers, battery packs, fan motors, home electronics, HVAC equipment, solar systems, security, thermometers, automotive, vending machines, refrigerated display cases, agricultural equipment

Dimensions

Fig. 1

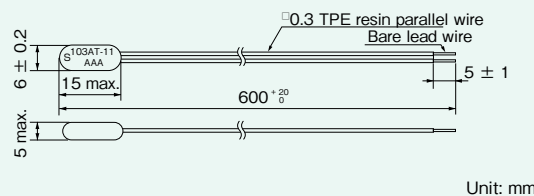


Fig. 2

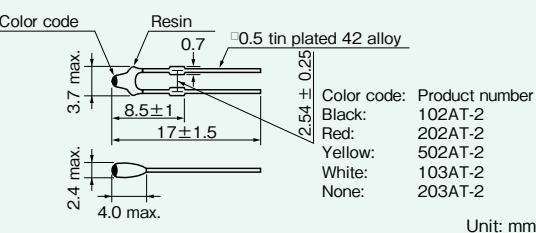


Fig. 3

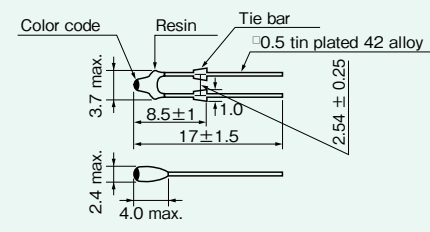


Fig. 4

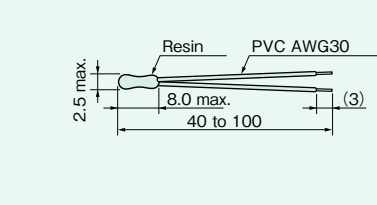
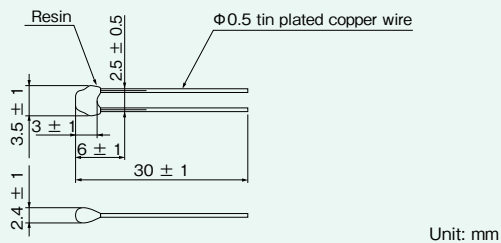


Fig. 5



Specifications

| Product number | R ₂₅ ¹ | R ₂₅ tolerance | B value ² | Dissipation factor (mw / °C) | Thermal time constant (s) ³ | Rated power at 25 °C (mW) | Operating temperature range (°C) |
|----------------|------------------------------|---------------------------|----------------------|------------------------------|--|---------------------------|----------------------------------|
| 102AT-11 | 1.00 kΩ | ± 1% | 3100 K ± 1% | approx. 2.6 | approx. 75 | 13 | - 50 to 90 |
| 202AT-11 | 2.00 kΩ | | 3182 K ± 1% | | | | |
| 502AT-11 | 5.00 kΩ | | 3324 K ± 1% | | | | |
| 103AT-11 | 10.0 kΩ | | 3435 K ± 1% | | | | |
| 203AT-11 | 20.0 kΩ | | 4013 K ± 1% | | | | |
| 102AT-2 | 1.00 kΩ | | ± 1% | 3100 K ± 1% | approx. 2.0 | approx. 15 | - 50 to 90 |
| 202AT-2 | 2.00 kΩ | | | 3182 K ± 1% | | | |
| 502AT-2 | 5.00 kΩ | | | 3324 K ± 1% | | | |
| 103AT-2,3 | 10.0 kΩ | | | 3435 K ± 1% | | | |
| 203AT-2 | 20.0 kΩ | | | 4013 K ± 1% | | | |
| 103AT-4 | 10.0 kΩ | | | 3435 K ± 1% | approx. 10 | - 30 to 90 | |
| 103AT-5 | 10.0 kΩ | 3435 K ± 1% | | approx. 2.5 | approx. 15 | 12.5 | - 50 to 110 |

¹: Rated zero-power resistance at 25 °C ²: B value calculated from rated zero-power resistance at 25 °C and 85 °C

³: 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 | AT-2, 3, 4 | 10 s at 260 °C or 3.5 s at 350 °C | ΔR, ΔB ± 1% |
| | AT-5 | 5 s at 260 °C or 1.5 s at 350 °C | |
| Solderability | AT-2, 3 | 2 s at 245 °C. Flux material: Rosin 25%, ethyl alcohol 75%. | More than 90% soldered |
| | AT-4, 5 | 2 s at 235 °C. Flux material: Rosin 25%, ethyl alcohol 75%. | |
| Tensile strength (lead wire) | AT-11 | 10 s at 30 N (horizontal pull) | ΔR, ΔB ± 1% and visual inspection |
| | AT-2, 3 | A load of 2 N is applied to the wire terminations in vertical direction for 10 s (see Fig. 1) | |
| | AT-4 | 60 s at 5 N (horizontal pull) | |
| | AT-5 | A load of 2 N is applied to the wire terminations in vertical direction for 3 s (see Fig. 1) | |
| Termination bending | AT-11 | 5 N, ten times, 90° | ΔR, ΔB ± 1% and visual inspection |
| | AT-2, 3 | One time, 90° | |
| | AT-4 | 1 N, five times, 90° | |
| | AT-5 | 2.5 N, two times, 90° | |
| Free fall | AT-11, 2, 3 | Three times natural fall to a maple board from 1 m height. | Less than 1 mA |
| | AT-4 | Three times natural fall to a maple board from 0.75 m height. | |
| | AT-5 | One time natural fall to a maple board from 1 m height. | |
| Voltage proof | AT-11, 2, 3, 5 | 1000 V AC for one minute | Over 100 MΩ |
| | AT-4 | 100 V DC for one second | |
| Insulation resistance | AT-11, 2, 3, 5 | 500 V DC | ΔR, ΔB ± 1% |
| | AT-4 | 100 V DC | |
| Dry heat | AT-11 | 1000 hours at 105 °C (90 °C ⁴) | ΔR, ΔB ± 1% |
| | AT-2, 3, 5 | 1000 hours at 110 °C (90 °C ⁴) | |
| | AT-4 | 1000 hours at 90 °C | |
| Damp heat (under electrical load) | AT-11 | 1000 hours at 70 °C and 90% humidity Electrical load: 1 mA DC | ΔR, ΔB ± 1% |
| | AT-2, 3, 4, 5 | 1000 hours at 40 °C and 90% humidity Electrical load: 1 mA DC | |
| Temperature cycle (thermal shock) | AT-11 | 100 cycles as below: 1. - 55 °C for 30 minutes 3. 85 °C for 30 minutes 2. Room temperature for 3 minutes 4. Room temperature for 3 minutes | ΔR, ΔB ± 1% |
| | AT-2, 3 | 100 cycles as below: 1. - 30 °C for 30 minutes 3. 90 °C for 30 minutes 2. Room temperature for 3 minutes 4. Room temperature for 3 minutes | |
| | AT-4 | 100 cycles as below: 1. - 20 °C for 30 minutes 3. 70 °C for 30 minutes 2. Room temperature for 1 minute 4. Room temperature for 1 minute | |
| | AT-5 | 100 cycles as below: 1. - 30 °C for 30 minutes 3. 90 °C for 30 minutes 2. Room temperature for 3 minutes 4. Room temperature for 3 minutes | |

⁴: Conditions for 102AT-11, 202AT-11, 102AT-2, 202AT-2

Resistance / temperature characteristics

| Temperature (°C) | Product number | | | | |
|--------------------|----------------|--------|--------|--------|--------|
| | 102AT | 202AT | 502AT | 103AT | 203AT |
| - 50 | 24.46 | 55.66 | 154.6 | 329.5 | 1253 |
| - 40 | 14.43 | 32.34 | 88.91 | 188.5 | 642.0 |
| - 30 | 8.834 | 19.48 | 52.87 | 111.3 | 342.5 |
| - 20 | 5.594 | 12.11 | 32.44 | 67.77 | 190.0 |
| - 10 | 3.651 | 7.763 | 20.48 | 42.47 | 109.1 |
| 0 | 2.449 | 5.114 | 13.29 | 27.28 | 64.88 |
| 10 | 1.684 | 3.454 | 8.840 | 17.96 | 39.71 |
| 20 | 1.184 | 2.387 | 6.013 | 12.09 | 24.96 |
| 25 | 1.000 | 2.000 | 5.000 | 10.00 | 20.00 |
| 30 | 0.8486 | 1.684 | 4.179 | 8.313 | 16.12 |
| 40 | 0.6189 | 1.211 | 2.961 | 5.827 | 10.65 |
| 50 | 0.4587 | 0.8854 | 2.137 | 4.160 | 7.181 |
| 60 | 0.3446 | 0.6587 | 1.567 | 3.020 | 4.943 |
| 70 | 0.2622 | 0.4975 | 1.168 | 2.228 | 3.464 |
| 80 | 0.1999 | 0.3807 | 0.8835 | 1.668 | 2.468 |
| 85 | 0.1751 | 0.3346 | 0.7722 | 1.451 | 2.096 |
| 90 | 0.1536 | 0.2949 | 0.6771 | 1.266 | 1.788 |
| 100 | | | 0.5265 | 0.9731 | 1.315 |
| 110 | | | 0.4128 | 0.7576 | 0.9807 |
| B _{25/85} | 3100 K | 3182 K | 3324 K | 3435 K | 4013 K |

Unit: kΩ

Caution

AT-2, 3, 5

- When bending the lead wires using for example a radio plier make sure to have a minimum distance from the sensor head of 3 mm.
- Do not apply a mechanical load of more than 2 N in the way depicted in Fig. 1 below. The variation of the load direction should be less than 0.3 mm (see Fig. 2).

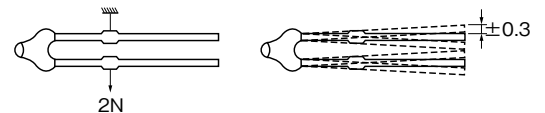


Fig. 1

Fig. 2

- When soldering make sure to have a minimum distance of 5 mm (8.5 mm), use a soldering iron with 50 W and solder for maximum 7 (2) seconds at 340 °C (350 °C). If you plan to cut the lead wire shorter than the above minimum distance please contact us.

The values in brackets are for AT-5.

Taping dimensions

