



# THE DATASHEET OF 103AP-2



## Very high accuracy thermistor

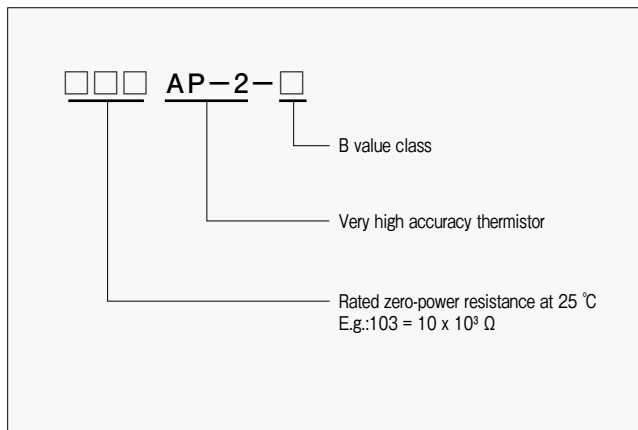
# AP Thermistor

The AP series thermistor features an even higher accuracy than our high accuracy AT thermistors and is suitable for many applications.

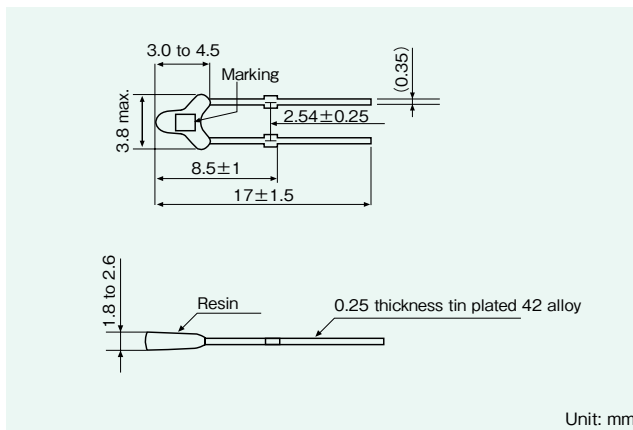
Features: - Very high accuracy with tight  $R_{25}$  and  $B_{25/85}$  tolerances ( $\pm 0.5\%$ )

- High accuracy over a wide temperature range: 0.5% resistance tolerance from  $-60\text{ }^{\circ}\text{C}$  to  $+80\text{ }^{\circ}\text{C}$

### Product number explanation



### Dimensions



### Applications

Mobile devices, battery chargers, battery packs, fan motors, automotive, office automation, home electronics, security, thermometers, measuring instruments, etc.

### Specifications

Product number	$R_{25}$ <sup>1</sup>	$R_{25}$ tolerance	B value <sup>2</sup>	Dissipation factor (mw / °C)	Thermal time constant (s) <sup>3</sup>	Rated power at 25 °C (mW)	Operating temperature range (°C)
202AP-2	2.00 kΩ	± 0.5%	3976 K ± 0.5%	approx. 1.2	approx. 15	6	- 60 to 150
232AP-2	2.252 kΩ		3976 K ± 0.5%				
502AP-2	5.00 kΩ		3976 K ± 0.5%				
103AP-2	10.0 kΩ		3435 K ± 0.5%				
103AP-2-A			3976 K ± 0.5%				
203AP-2	20.0 kΩ		3976 K ± 0.5%				
503AP-2	50.0 kΩ		4220 K ± 0.5%				
104AP-2	100 kΩ		4261 K ± 0.5%				
204AP-2	200 kΩ		4470 K ± 0.5%				

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

<sup>3</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 or 3.5 s at 340 °C	$\Delta R$ , $\Delta B \pm 0.5\%$ and visual inspection
Solderability	2 s at 245 °C Flux material: Rosin 25%, ethyl alcohol 75%	More than 90% soldered
Tensile strength (lead wire)	A load of 2 N is applied to the wire terminations in vertical direction for 10 s. (See Fig. 1)	$\Delta R$ , $\Delta B \pm 0.5\%$ and visual inspection
Termination bending	The lead wire is bent to an angle of 90 °C and then back into the original position.	
Free fall	Three times natural fall to a maple board from 1 m height.	Less than 1 mA
Voltage proof	1000 V AC for one minute	
Insulation resistance	500 V DC	Over 100 MΩ
Dry heat	1000 hours at 150 °C	$\Delta R$ , $\Delta B \pm 0.5\%$
Damp heat (under electrical load)	1000 hours at 40 °C and 90% humidity Electrical load: 1 mA DC	
Temperature cycle (thermal shock)	100 cycles as below: 1. - 60 °C for 30 minutes 2. Room temperature for 3 minutes 3. 150 °C for 30 minutes 4. Room temperature for 3 minutes	

### Caution

- 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.

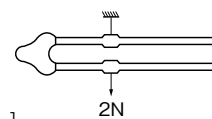


Fig. 1

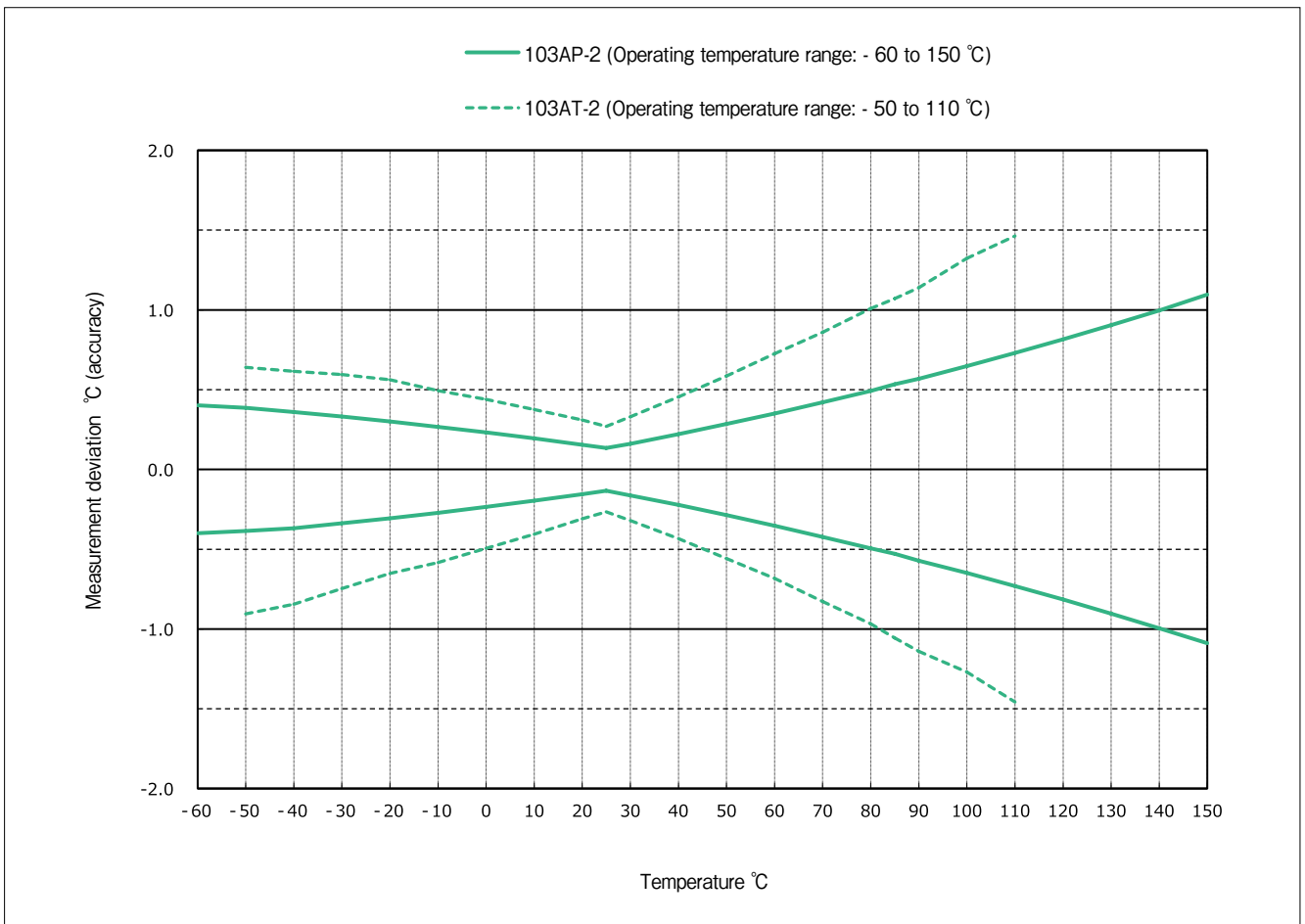
- When soldering make sure to have a minimum distance of 5 mm, use a soldering iron with 50 W and solder for maximum seven seconds at 340 °C. If you plan to cut the lead wire shorter than the above minimum distance please contact us.

## ■ Resistance / temperature characteristics

Temperature (°C)	Product number								
	202AP-2	232AP-2	502AP-2	103AP-2	103AP-2-A	203AP-2	503AP-2	104AP-2	204AP-2
-60	207.1	233.2	560.2	600.6	1202	2497	7940	15510	
-50	102.6	115.5	273.7	326.9	583.4	1211	3729	7339	17830
-40	53.94	60.73	142.2	187.4	301.2	624.9	1868	3702	8750
-30	29.69	33.44	77.18	110.9	162.3	335.8	975.9	1943	4461
-20	17.07	19.22	43.61	67.64	90.85	187.2	528.7	1056	2359
-10	10.16	11.44	25.55	42.39	52.76	108.1	296.7	593.7	1291
0	6.261	7.050	15.46	27.25	31.64	64.39	171.9	344.5	730.6
10	3.922	4.417	9.648	17.95	19.56	39.53	102.8	205.9	426.2
20	2.491	2.804	6.186	12.09	12.43	24.94	63.14	126.4	255.6
25	2.000	2.252	5.000	10.00	10.00	20.00	50.00	100.0	200.0
30	1.615	1.818	4.066	8.314	8.096	16.14	39.83	79.59	157.4
40	1.070	1.205	2.725	5.829	5.394	10.69	25.75	51.32	99.36
50	0.7237	0.8149	1.846	4.162	3.671	7.237	17.01	33.79	64.10
60	0.4994	0.5624	1.270	3.022	2.546	4.998	11.48	22.72	42.26
70	0.3513	0.3956	0.8884	2.229	1.783	3.516	7.905	15.57	28.42
80	0.2515	0.2832	0.6314	1.669	1.265	2.516	5.539	10.86	19.47
85	0.2142	0.2412	0.5355	1.451	1.071	2.142	4.669	9.124	16.23
90	0.1831	0.2062	0.4558	1.266	0.9098	1.830	3.949	7.697	13.57
100	0.1354	0.1525	0.3339	0.9737	0.6635	1.352	2.859	5.540	9.616
110	0.1017	0.1145	0.2480	0.7576	0.4903	1.012	2.098	4.040	6.905
120	0.07730	0.08710	0.1867	0.5961	0.3670	0.7675	1.562	2.989	5.033
130	0.05960	0.06710	0.1422	0.4741	0.2780	0.5889	1.179	2.240	3.719
140	0.04650	0.05230	0.1097	0.3808	0.2130	0.4570	0.8998	1.698	2.782
150	0.03660	0.04130	0.08550	0.3087	0.1650	0.3584	0.6946	1.301	2.105
B <sub>25/85</sub>	3976 K	3976 K	3976 K	3435 K	3976 K	3976 K	4220 K	4261 K	4470 K



Unit: kΩ

## ■ Measurement accuracy comparison graph



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