

Figure 1 The physical photo of ATH10K1R0

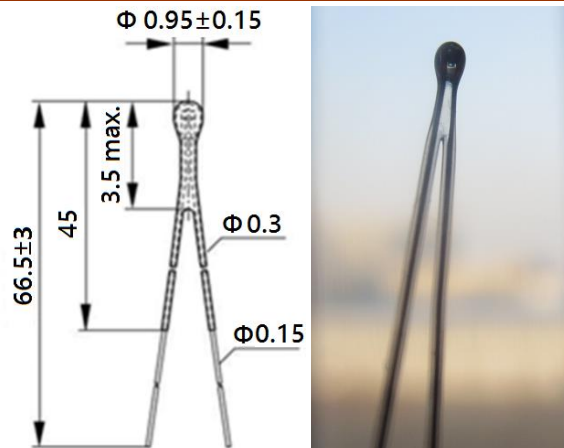


Figure 2. Side View of ATH10K1R0

**MAIN FEATURES**

- Glass Encapsulated for Long Term Stability & Reliability
- High Stability: <0.1°C/Y
- Small Size:  $\phi 0.95\text{mm} \times 1.4\text{mm}$
- High Resistance Accuracy: 1%
- Quick Response Time: 4s in still air
- Wide Temp. Range:  $-55^{\circ}\text{C}$  to  $250^{\circ}\text{C}$
- 100 % Lead (Pb)-free and RoHS Compliant

**APPLICATIONS**

Temperature sensing for laser diodes, optical components, industrial process control, etc., where high temperature sensitivity, long term stability, and/or high temperature sensing are required.

**DESCRIPTION**

The ATH10K1R0 series thermistor is encapsulated by glass, with two coated leads. The glass ensures long term stability, and coated leads prevent them from shorting with each other.

Comparing with conventional epoxy encapsulated thermistors, ATH10K1R0 features smaller size, quicker response time, better long term stability, and wider temperature range. The ATH10K1R0 is sealed between the head and leads, it can work up to  $250^{\circ}\text{C}$  temperature liquid resistant.

**SPECIFICATIONS**

Parameters	Value
Nominal Resistance @ $25^{\circ}\text{C}$	$10\text{K} \pm 1\%$
B Value @ $25^{\circ}\text{C} / 85^{\circ}\text{C}$	$3478\text{K} \pm 1\%$
B Value @ $0^{\circ}\text{C} / 100^{\circ}\text{C}$	$3450\text{K} \pm 1\%$
B Value @ $25^{\circ}\text{C} / 100^{\circ}\text{C}$	$3492\text{K} \pm 1\%$
Thermistor Diameter	$0.95 \pm 0.15\text{mm}$
Thermistor Length	$1.4 \pm 0.4\text{mm}$
Bare Lead Diameter	$0.15\text{mm}$
Coated Lead Diameter	$0.3\text{mm}$
Lead Length	$66.5 \pm 3\text{mm}$
Dissipation Factor	$0.5\text{mW/K}$
Heat Capacity	$2\text{mJ/K}$
Maximum Power @ $25^{\circ}\text{C}$	$18\text{mW}$
Insulation resistance	$\geq 100\text{ M}\Omega$
Test voltage	$500\text{V DC}$
Resistance tolerance	$\pm 1\%$
Rated temperature	$25^{\circ}\text{C}$
Time Constant	$4\text{s}$ (in still air @ $5\sim 25^{\circ}\text{C}$ )
Operation Temperature Range	$-55^{\circ}\text{C}$ to $300^{\circ}\text{C}$



APPLICATION

When sensing a liquid temperature, dip the sensor at an appropriate depth into the liquid, make sure that the bare lead will not get wet by the liquid sensed. If longer lead wires are required, contact us, custom length leads can be made, provided there is enough volume to make this effort worth doing.

When sensing solid block, drill a hole on the object for which the temperature needs to be measured and use thermally conductive epoxy to pot the thermistor inside the hole. The hole diameter should be between 1.4mm to 1.6mm and the depth should between 2.5 to 3mm. When a deeper hole is needed, drill a 2 stage hole to prevent air bobbles trapped inside the potting epoxy which would cause temperature measurement errors and longer response time. Figure 3 shows the section view of the 2 stage hole.

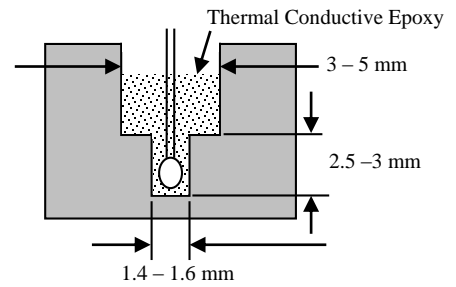


Figure 3. Section View of the 2 Stage Hole

To further avoid the air bubbles, use thin epoxy, vibrate the assembly before curing, and cure the epoxy inside the mounting hole at high temperature, 80°C to 150°C, depending on the epoxy used and the maximum temperature the assembly components can stand.

Resistance Temperature Characteristics

Table 1.

T (°C)	R_nom [kΩ]	T (°C)	R_nom [kΩ]	T (°C)	R_nom [kΩ]	T (°C)	R_nom [kΩ]
-55.0	526.24	35.0	6.8954	125.0	0.51794	215.0	0.094181
-50.0	384.52	40.0	5.7703	130.0	0.46259	220.0	0.087144
-45.0	284.01	45.0	4.8525	135.0	0.4142	225.0	0.080751
-40.0	211.94	50.0	4.1	140.0	0.37179	230.0	0.074933
-35.0	159.72	55.0	3.4798	145.0	0.33451	235.0	0.069631
-30.0	121.49	60.0	2.9663	150.0	0.30166	240.0	0.064791
-25.0	93.246	65.0	2.5392	155.0	0.27264	245.0	0.060366
-20.0	72.181	70.0	2.1824	160.0	0.24694	250.0	0.056316
-15.0	56.332	75.0	1.883	165.0	0.22414	255.0	0.052602
-10.0	44.308	80.0	1.6307	170.0	0.20385	260.0	0.049193
-5.0	35.112	85.0	1.4174	175.0	0.18577	265.0	0.046059
0.0	28.024	90.0	1.2362	180.0	0.16961	270.0	0.043173
5.0	22.52	95.0	1.0818	185.0	0.15514	275.0	0.040514
10.0	18.216	100.0	0.94973	190.0	0.14216	280.0	0.03806
15.0	14.827	105.0	0.8364	195.0	0.13049	285.0	0.035793
20.0	12.142	110.0	0.73881	200.0	0.11999	290.0	0.033696
25.0	10.000	115.0	0.6545	205.0	0.11051	295.0	0.031753
30.0	8.2818	120.0	0.58144	210.0	0.101942	300.0	0.029952



**ORDERING INFORMATION**

Table 2. Part Number of the Thermistors

Part #	Description
ATH10K1R0	High stability miniature 1mm glass thermistor with insulation coating

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