

Figure 1 The physical photo of ATH10K1R0

**MAIN FEATURES**

- Glass Encapsulated for Long Term Stability & Reliability
- Completely sealed for corrosive liquid sensing
- High Stability: <math><0.1^{\circ}\text{C}/\text{Y}</math>
- Small Size:  $\phi 1.0\text{mm} \times 1.4\text{mm}$
- 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, corrosive liquid, and/or high temperature sensing are required.

**DESCRIPTION**

The ATH10K1R0 series thermistor is encapsulated by glass then coated with high temperature plastic. The glass ensures long term stability, the plastic provide corrosion resistance and electrical insulation to prevent the leads 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 sensing tip, it can work up to  $250^{\circ}\text{C}$  temperature liquid resistant.

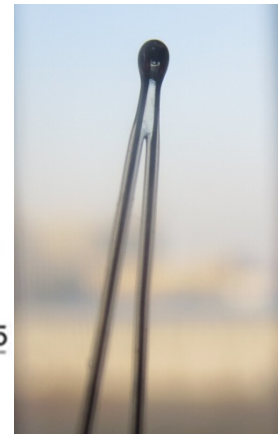
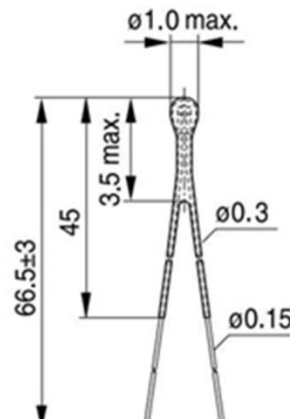


Figure 2. Side View of ATH10K1R0

**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	$1.0 \pm 0.1\text{mm}$
Thermistor Length	$1.4 \pm 0.4\text{mm}$
Bare Lead Diameter	0.15mm
Coated Lead Diameter	0.3mm
Lead Length	$66.5 \pm 3\text{mm}$
Dissipation Factor	0.5mW/K
Heat Capacity	2mJ/K
Maximum Power @ $25^{\circ}\text{C}$	18mW
Insulation resistance	$\geq 100\text{ M}\Omega$
Test voltage	500V DC
Resistance tolerance	$\pm 1\%$
Rated temperature	$25^{\circ}\text{C}$
Time Constant	4s (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 be 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.

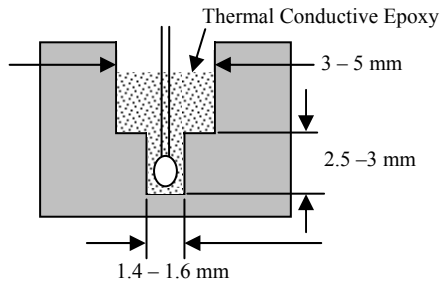


Figure 3. Section View of the 2 Stage Hole

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 <sub>nom</sub> [KΩ]	α (%/K)	T (°C)	R <sub>nom</sub> [KΩ]	α (%/K)	T (°C)	R <sub>nom</sub> [KΩ]	α (%/K)	T (°C)	R <sub>nom</sub> [KΩ]	α (%/K)
-55.0	526.24	6.4	35.0	6.8954	3.6	125.0	0.51794	2.3	215.0	0.094181	1.6
-50.0	384.52	6.2	40.0	5.7703	3.5	130.0	0.46259	2.2	220.0	0.087144	1.5
-45.0	284.01	6.0	45.0	4.8525	3.4	135.0	0.4142	2.2	225.0	0.080751	1.5
-40.0	211.94	5.8	50.0	4.1	3.3	140.0	0.37179	2.1	230.0	0.074933	1.5
-35.0	159.72	5.6	55.0	3.4798	3.2	145.0	0.33451	2.1	235.0	0.069631	1.5
-30.0	121.49	5.4	60.0	2.9663	3.2	150.0	0.30166	2.0	240.0	0.064791	1.4
-25.0	93.246	5.2	65.0	2.5392	3.1	155.0	0.27264	2.0	245.0	0.060366	1.4
-20.0	72.181	5.0	70.0	2.1824	3.0	160.0	0.24694	2.0	250.0	0.056316	1.4
-15.0	56.332	4.9	75.0	1.883	2.9	165.0	0.22414	1.9	255.0	0.052602	1.4
-10.0	44.308	4.7	80.0	1.6307	2.8	170.0	0.20385	1.9	260.0	0.049193	1.3
-5.0	35.112	4.6	85.0	1.4174	2.8	175.0	0.18577	1.8	265.0	0.046059	1.3
0.0	28.024	4.4	90.0	1.2362	2.7	180.0	0.16961	1.8	270.0	0.043173	1.3
5.0	22.52	4.3	95.0	1.0818	2.6	185.0	0.15514	1.8	275.0	0.040514	1.3
10.0	18.216	4.2	100.0	0.94973	2.6	190.0	0.14216	1.7	280.0	0.03806	1.2
15.0	14.827	4.1	105.0	0.8364	2.5	195.0	0.13049	1.7	285.0	0.035793	1.2
20.0	12.142	3.9	110.0	0.73881	2.5	200.0	0.11999	1.7	290.0	0.033696	1.2
25.0	10.000	3.8	115.0	0.6545	2.4	205.0	0.11051	1.6	295.0	0.031753	1.2
30.0	8.2818	30.0	120.0	0.58144	2.3	210.0	0.101942	1.6	300.0	0.029952	1.2

ORDERING INFORMATIONS

Table 2. Part Number of the Thermistors

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

Table 3. Unit Price

Quantity	1 - 9	10 - 49	50 - 199	200 - 499	≥500
ATH10K1R0	\$3.10	\$2.90	\$2.75	\$2.60	\$2.45



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