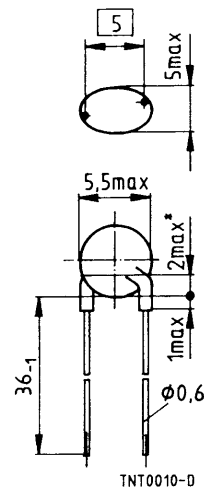


**Applications**

- Temperature compensation
- Temperature measurement
- Temperature control

**Features**

- Wide resistance range
- Cost-effective
- Lacquer-coated thermistor disk
- Tinned copper leads
- Marked with resistance and tolerance
- Available on tape (PU: 1500 pcs)



TNT0010-D

\*May be free of lacquer

Dimensions in mm  
Approx. weight 0,4 g

|  |                |                       |      |
|--|----------------|-----------------------|------|
| Climatic category (IEC 68-1)           |                | 55/125/21             |      |
| Max. power at 25 °C                    | $P_{25}$       | 450                   | mW   |
| Resistance tolerance                   | $\Delta R/R_N$ | $\pm 5 \%, \pm 10 \%$ |      |
| Rated temperature                      | $T_N$          | 25                    | °C   |
| B value tolerance                      | $\Delta B/B$   | $\pm 3 \%$            |      |
| Dissipation factor (in air)            | $\delta_{th}$  | approx. 7,5           | mW/K |
| Thermal cooling time constant (in air) | $\tau_c$       | approx. 20            | s    |
| Heat capacity                          | $C_{th}$       | approx. 150           | mJ/K |

| Type        | $R_{25}$<br>Ω | No. of R/T<br>characteristic | $B_{25/100}$<br>K | Ordering code |
|-------------|---------------|------------------------------|-------------------|---------------|
| K 164/15/+  | 15            | 1203                         | 2900              | B57164-K150-+ |
| K 164/22/+  | 22            | 1203                         | 2900              | B57164-K220-+ |
| K 164/33/+  | 33            | 1203                         | 2900              | B57164-K330-+ |
| K 164/47/+  | 47            | 1302                         | 3000              | B57164-K470-+ |
| K 164/68/+  | 68            | 1303                         | 3050              | B57164-K680-+ |
| K 164/100/+ | 100           | 1305                         | 3200              | B57164-K101-+ |
| K 164/150/+ | 150           | 1305                         | 3200              | B57164-K151-+ |
| K 164/220/+ | 220           | 1305                         | 3200              | B57164-K221-+ |
| K 164/330/+ | 330           | 1306                         | 3450              | B57164-K331-+ |
| K 164/470/+ | 470           | 1306                         | 3450              | B57164-K471-+ |
| K 164/680/+ | 680           | 1307                         | 3560              | B57164-K681-+ |

| Type          | $R_{25}$<br>$\Omega$ | No. of $R/T$<br>characteristic | $B_{25/100}$<br>K | Ordering code |
|---------------|----------------------|--------------------------------|-------------------|---------------|
| K 164/1 k/+   | 1 k                  | 1011                           | 3730              | B57164-K102-+ |
| K 164/1,5 k/+ | 1,5 k                | 1013                           | 3900              | B57164-K152-+ |
| K 164/2,2 k/+ | 2,2 k                | 1013                           | 3900              | B57164-K222-+ |
| K 164/3,3 k/+ | 3,3 k                | 4001                           | 3950              | B57164-K332-+ |
| K 164/4,7 k/+ | 4,7 k                | 4001                           | 3950              | B57164-K472-+ |
| K 164/6,8 k/+ | 6,8 k                | 2903                           | 4200              | B57164-K682-+ |
| K 164/10 k/+  | 10 k                 | 2904                           | 4300              | B57164-K103-+ |
| K 164/15 k/+  | 15 k                 | 1014                           | 4250              | B57164-K153-+ |
| K 164/22 k/+  | 22 k                 | 1012                           | 4300              | B57164-K223-+ |
| K 164/33 k/+  | 33 k                 | 1012                           | 4300              | B57164-K333-+ |
| K 164/47 k/+  | 47 k                 | 4003                           | 4450              | B57164-K473-+ |
| K 164/68 k/+  | 68 k                 | 2005                           | 4600              | B57164-K683-+ |
| K 164/100 k/+ | 100 k                | 2005                           | 4600              | B57164-K104-+ |
| K 164/150 k/+ | 150 k                | 2005                           | 4600              | B57164-K154-+ |
| K 164/220 k/+ | 220 k                | 2007                           | 4830              | B57164-K224-+ |
| K 164/330 k/+ | 330 k                | 2006                           | 5000              | B57164-K334-+ |
| K 164/470 k/+ | 470 k                | 2006                           | 5000              | B57164-K474-+ |

+ : J for  $\Delta R/R_N = \pm 5\%$   
K for  $\Delta R/R_N = \pm 10\%$

### Reliability data

| Test                                  | Standard    | Test conditions   | $\Delta R_{25}/R_{25}$ (typ.) | Remarks           |
|---------------------------------------|-------------|---|-------------------------------|-------------------|
| Storage in dry heat                   | IEC 68-2-2  | Storage at upper category temperature<br>$T: 125\text{ }^\circ\text{C}$<br>$t: 1000\text{ h}$                                     | < 3 %                         | No visible damage |
| Storage in damp heat, steady state    | IEC 68-2-3  | Temperature of air: $40\text{ }^\circ\text{C}$<br>Relative humidity of air: 93 %<br>Duration: 21 days                             | < 3 %                         | No visible damage |
| Rapid temperature cycling             | IEC 68-2-14 | Lower test temperature: $-55\text{ }^\circ\text{C}$<br>Upper test temperature: $125\text{ }^\circ\text{C}$<br>Number of cycles: 5 | < 3 %                         | No visible damage |
| Endurance                             |             | $P_{\max}$ : 450 mW<br>Duration: 1000 h   | < 3 %                         | No visible damage |
| Long-term stability (empirical value) |             | Temperature: $125\text{ }^\circ\text{C}$<br>Duration: 10 000 h  | < 5 %                         | No visible damage |

# Standardized R/T Characteristics

| Number | 2101                          |                 | 2901                          |                 | 2903                          |                 | 2904                          |                 |
|--------|-------------------------------|-----------------|-------------------------------|-----------------|-------------------------------|-----------------|-------------------------------|-----------------|
|        | $B_{25/100} = 4100 \text{ K}$ |                 | $B_{25/100} = 3760 \text{ K}$ |                 | $B_{25/100} = 4200 \text{ K}$ |                 | $B_{25/100} = 4300 \text{ K}$ |                 |
|        | $R_T/R_{25}$                  | $\alpha (\%/K)$ | $R_T/R_{25}$                  | $\alpha (\%/K)$ | $R_T/R_{25}$                  | $\alpha (\%/K)$ | $R_T/R_{25}$                  | $\alpha (\%/K)$ |
| -55,0  | 104,09                        | 7,5             | 63,969                        | 6,7             | 120,03                        | 7,7             | 121,46                        | 7,4             |
| -50,0  | 72,101                        | 7,2             | 46,179                        | 6,4             | 82,380                        | 7,4             | 84,439                        | 7,2             |
| -45,0  | 50,572                        | 7,0             | 33,738                        | 6,2             | 57,248                        | 7,2             | 59,243                        | 7,1             |
| -40,0  | 35,898                        | 6,7             | 24,927                        | 6,0             | 40,255                        | 7,0             | 41,938                        | 6,9             |
| -35,0  | 25,774                        | 6,5             | 18,611                        | 5,8             | 28,627                        | 6,7             | 29,947                        | 6,7             |
| -30,0  | 18,707                        | 6,3             | 14,033                        | 5,6             | 20,577                        | 6,6             | 21,567                        | 6,6             |
| -25,0  | 13,720                        | 6,1             | 10,679                        | 5,4             | 14,876                        | 6,4             | 15,641                        | 6,3             |
| -20,0  | 10,163                        | 5,9             | 8,1980                        | 5,3             | 10,880                        | 6,1             | 11,466                        | 6,2             |
| -15,0  | 7,5998                        | 5,7             | 6,3123                        | 5,2             | 8,0808                        | 5,9             | 8,4510                        | 6,0             |
| -10,0  | 5,7351                        | 5,5             | 4,9014                        | 5,1             | 6,0612                        | 5,8             | 6,2927                        | 5,9             |
| -5,0   | 4,3657                        | 5,4             | 3,8210                        | 4,9             | 4,5649                        | 5,6             | 4,7077                        | 5,7             |
| 0,0    | 3,3511                        | 5,2             | 3,0027                        | 4,7             | 3,4708                        | 5,4             | 3,5563                        | 5,5             |
| 5,0    | 2,5929                        | 5,1             | 2,3801                        | 4,6             | 2,6625                        | 5,2             | 2,7119                        | 5,3             |
| 10,0   | 2,0216                        | 4,9             | 1,9000                        | 4,5             | 2,0599                        | 5,1             | 2,0860                        | 5,1             |
| 15,0   | 1,5878                        | 4,8             | 1,5257                        | 4,3             | 1,6069                        | 4,9             | 1,6204                        | 5,0             |
| 20,0   | 1,2558                        | 4,6             | 1,2330                        | 4,3             | 1,2631                        | 4,8             | 1,2683                        | 4,8             |
| 25,0   | 1,0000                        | 4,5             | 1,0000                        | 4,1             | 1,0000                        | 4,6             | 1,0000                        | 4,7             |
| 30,0   | 0,80145                       | 4,4             | 0,81679                       | 4,0             | 0,79593                       | 4,5             | 0,79420                       | 4,6             |
| 35,0   | 0,64632                       | 4,2             | 0,67166                       | 3,9             | 0,63796                       | 4,4             | 0,63268                       | 4,5             |
| 40,0   | 0,52433                       | 4,1             | 0,55527                       | 3,8             | 0,51467                       | 4,2             | 0,50740                       | 4,3             |
| 45,0   | 0,42781                       | 4,0             | 0,46095                       | 3,8             | 0,41887                       | 4,1             | 0,41026                       | 4,2             |
| 50,0   | 0,35099                       | 3,9             | 0,38459                       | 3,7             | 0,34272                       | 4,0             | 0,33363                       | 4,1             |
| 55,0   | 0,28949                       | 3,8             | 0,32184                       | 3,6             | 0,28081                       | 3,9             | 0,27243                       | 4,0             |
| 60,0   | 0,23998                       | 3,7             | 0,27068                       | 3,5             | 0,23141                       | 3,8             | 0,22370                       | 3,9             |
| 65,0   | 0,19992                       | 3,6             | 0,22907                       | 3,3             | 0,19211                       | 3,7             | 0,18459                       | 3,8             |
| 70,0   | 0,16733                       | 3,5             | 0,19468                       | 3,2             | 0,16027                       | 3,6             | 0,15305                       | 3,7             |
| 75,0   | 0,14070                       | 3,4             | 0,16607                       | 3,1             | 0,13421                       | 3,5             | 0,12755                       | 3,6             |
| 80,0   | 0,11882                       | 3,3             | 0,14221                       | 3,1             | 0,11288                       | 3,4             | 0,10677                       | 3,5             |
| 85,0   | 0,10077                       | 3,3             | 0,12218                       | 3,0             | 0,095326                      | 3,3             | 0,089928                      | 3,4             |
| 90,0   | 0,085806                      | 3,2             | 0,10533                       | 2,9             | 0,080828                      | 3,2             | 0,076068                      | 3,3             |
| 95,0   | 0,073354                      | 3,1             | 0,09123                       | 2,8             | 0,068916                      | 3,2             | 0,064524                      | 3,3             |
| 100,0  | 0,062947                      | 3,0             | 0,079284                      | 2,8             | 0,058989                      | 3,1             | 0,054941                      | 3,2             |
| 105,0  | 0,054214                      | 3,0             | 0,069062                      | 2,7             | 0,050701                      | 3,0             | 0,047003                      | 3,1             |
| 110,0  | 0,046858                      | 2,9             | 0,060340                      | 2,7             | 0,043735                      | 3,0             | 0,040358                      | 3,0             |
| 115,0  | 0,040638                      | 2,8             | 0,052886                      | 2,6             | 0,037778                      | 2,9             | 0,034743                      | 3,0             |
| 120,0  | 0,035361                      | 2,8             | 0,046482                      | 2,5             | 0,032736                      | 2,8             | 0,030007                      | 2,9             |
| 125,0  | 0,030866                      | 2,7             | 0,040985                      | 2,5             | 0,028513                      | 2,7             | 0,026006                      | 2,8             |
| 130,0  | 0,027027                      | 2,6             | 0,036233                      | 2,5             | 0,024912                      | 2,7             | 0,022609                      | 2,8             |
| 135,0  | 0,023735                      | 2,6             | 0,032101                      | 2,4             | 0,021804                      | 2,6             | 0,019720                      | 2,7             |

## Standardized R/T Characteristics

| Number                 | 2101                          |                 | 2901                          |                 | 2903                          |                 | 2904                          |                 |
|------------------------|-------------------------------|-----------------|-------------------------------|-----------------|-------------------------------|-----------------|-------------------------------|-----------------|
|                        | $B_{25/100} = 4100 \text{ K}$ |                 | $B_{25/100} = 3760 \text{ K}$ |                 | $B_{25/100} = 4200 \text{ K}$ |                 | $B_{25/100} = 4300 \text{ K}$ |                 |
| $T (^{\circ}\text{C})$ | $R_T/R_{25}$                  | $\alpha (\%/K)$ | $R_T/R_{25}$                  | $\alpha (\%/K)$ | $R_T/R_{25}$                  | $\alpha (\%/K)$ | $R_T/R_{25}$                  | $\alpha (\%/K)$ |
| 140,0                  | 0,020904                      | 2,5             | 0,028510                      | 2,4             | 0,019136                      | 2,6             | 0,017251                      | 2,6             |
| 145,0                  | 0,018463                      | 2,5             | 0,025373                      | 2,3             | 0,016848                      | 2,5             | 0,015139                      | 2,6             |
| 150,0                  | 0,016351                      | 2,4             | 0,022633                      | 2,3             | 0,014872                      | 2,5             | 0,013321                      | 2,5             |
| 155,0                  | 0,014518                      | 2,4             | 0,020231                      | 2,3             | 0,013165                      | 2,4             | 0,011754                      | 2,5             |
| 160,0                  | 0,012923                      | 2,3             | 0,018121                      | 2,2             | 0,011686                      | 2,4             | 0,010399                      | 2,4             |
| 165,0                  | 0,011532                      | 2,3             | 0,016262                      | 2,2             | 0,010400                      | 2,3             | 0,0092238                     | 2,4             |
| 170,0                  | 0,010315                      | 2,2             | 0,014621                      | 2,1             | 0,0092790                     | 2,3             | 0,0082017                     | 2,3             |
| 175,0                  | 0,0092480                     | 2,2             | 0,013170                      | 2,1             | 0,0082997                     | 2,2             | 0,0073104                     | 2,3             |
| 180,0                  | 0,0083098                     | 2,1             | 0,011883                      | 2,1             | 0,0074419                     | 2,2             | 0,0065312                     | 2,3             |