

# NTC Thermistor : TGM Series



## Glass Encapsulated Type for Temperature Sensing/Compensation

### ■ Features

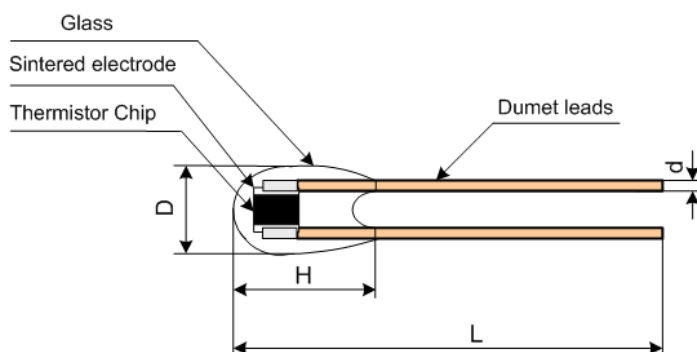
1. RoHS compliant
2. Glass-encapsulated and heat-resistive
3. Body size:  $\Phi 2.5\text{mm}$
4. Operating temperature range:  $-40^{\circ}\text{C} \sim +250^{\circ}\text{C}$
5. Agency recognition: UL / cUL



### ■ Recommended Applications

1. Home appliances
2. Automotive electronics

### ■ Structure and Dimensions



(Unit: mm)

| Series | D             | H             | L         | d               |
|--------|---------------|---------------|-----------|-----------------|
| TGMA   | $2.5 \pm 0.2$ | $3.8 \pm 0.5$ | $\geq 40$ | $0.30 \pm 0.02$ |

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## ■ Electrical Characteristics

| Part No.         | Zero Power Resistance | B Value           | RT Curve | Max. Power Dissipation at 25°C | Dissipation Factor | Thermal Time Constant | Operating Temperature Range | Safety Approvals |                       |
|------------------|-----------------------|-------------------|----------|--------------------------------|--------------------|-----------------------|-----------------------------|------------------|-----------------------|
|                  | (KΩ)                  |                   |          | (K)                            |                    |                       |                             | --               | P <sub>max</sub> (mW) |
| TGMAA503F3993DA6 | R100=3.3K±2%          | B0/100=3970±3%    | A        | 7                              | Approx. 1.4        | Approx. 14            | -40 ~ +250                  | √                | √                     |
| TGMAA503F3993DA5 | R100=3.3K±3%          |                   |          |                                |                    |                       |                             | √                | √                     |
| TGMAA503F3993DA1 | R100=3.3K±5%          |                   |          |                                |                    |                       |                             | √                | √                     |
| TGMAA503G4013DA1 | R25=50K±2%            |                   |          |                                |                    |                       |                             | √                | √                     |
| TGMAA503H4013DA1 | R25=50K±3%            |                   |          |                                |                    |                       |                             | √                | √                     |
| TGMAA503J4013DA1 | R25=50K±5%            |                   |          |                                |                    |                       |                             | √                | √                     |
| TGMAA104G4113DA1 | R25=100K±2%           | B100/200=4300±3%  | B        |                                |                    |                       |                             | √                | √                     |
| TGMAA104H4113DA1 | R25=100K±3%           |                   |          |                                |                    |                       |                             | √                | √                     |
| TGMAA104J4113DA1 | R25=100K±5%           |                   |          |                                |                    |                       |                             | √                | √                     |
| TGMAA104F4113DA2 | R200=0.55K±2%         |                   |          |                                |                    |                       |                             | √                | √                     |
| TGMAA104F4113DA3 | R200=0.55K±3%         |                   |          |                                |                    |                       |                             | √                | √                     |
| TGMAA104F4113DA5 | R200=0.55K±5%         |                   |          |                                |                    |                       |                             | √                | √                     |
| TGMAA103G39HAD   | R25=10K±2%            | B25/85= 3975±1.5% | C        | √                              | √                  |                       |                             |                  |                       |
| TGMAA103H39HAD   | R25=10K±3%            |                   |          | √                              | √                  |                       |                             |                  |                       |
| TGMAA103J39HAD   | R25=10K±5%            |                   |          | √                              | √                  |                       |                             |                  |                       |

Note 1: Special specifications are available upon request.

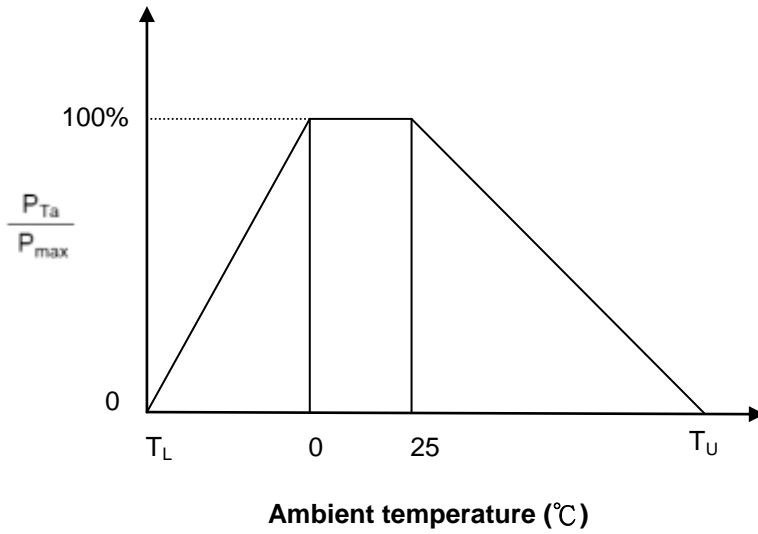
Note 2: UL/cUL File No: E138827

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## Max. Power Dissipation Derating Curve



$T_U$  : Maximum operating temperature (°C)

$T_L$  : Minimum operating temperature (°C)

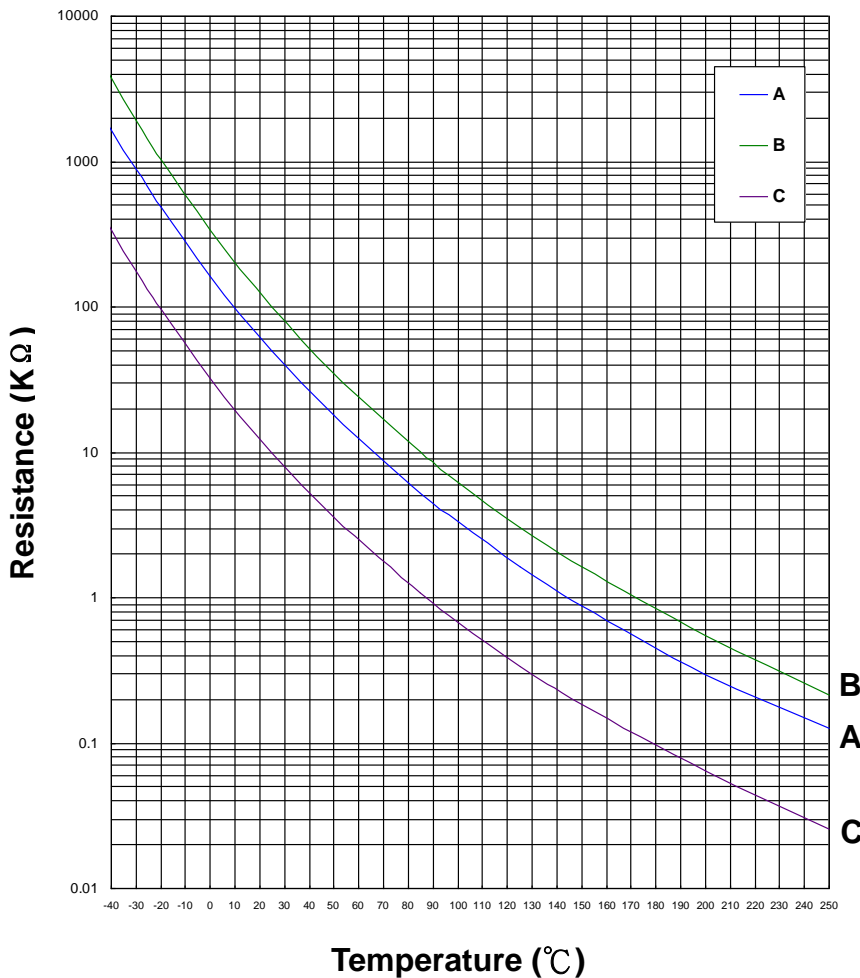
For example:

Ambient temperature ( $T_a$ ) = 60°C

Maximum operating temperature ( $T_U$ ) = 200°C

$P_{Ta} = (T_U - T_a) / (T_U - 25) \times P_{max} = 80\% P_{max}$

## R-T Characteristic Curves (representative)



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### ■ Reliability

| Item                        | Standard                         | Test conditions / Methods   | Specifications   |                                  |                  |   |             |            |   |                  |           |   |             |            |   |                  |           |  |
|-----------------------------|----------------------------------|---|--|----------------------------------|------------------|---|-------------|------------|---|------------------|-----------|---|-------------|------------|---|------------------|-----------|--|
| High Temperature Storage    | IEC 60068-2-2                    | $T_U \pm 5^\circ\text{C}$ , 1000 $\pm$ 24 hrs   | No visible damage<br>$ \Delta R_{25}/R_{25}  \leq 5\%$ |                                  |                  |   |             |            |   |                  |           |   |             |            |   |                  |           |  |
| Damp Heat, Steady State     | IEC 60068-2-78                   | $40 \pm 2^\circ\text{C}$ , 90~95% RH, 1000 $\pm$ 24 hrs   | No visible damage<br>$ \Delta R_{25}/R_{25}  \leq 3\%$ |                                  |                  |   |             |            |   |                  |           |   |             |            |   |                  |           |  |
| Rapid Change of Temperature | IEC 60068-2-14                   | The conditions shown below shall be repeated 5 cycles.<br><table border="1"><thead><tr><th>Step</th><th>Temperature (<math>^\circ\text{C}</math>)</th><th>Period (minutes)</th></tr></thead><tbody><tr><td>1</td><td><math>T_L \pm 5</math></td><td><math>30 \pm 3</math></td></tr><tr><td>2</td><td>Room temperature</td><td><math>5 \pm 3</math></td></tr><tr><td>3</td><td><math>T_U \pm 5</math></td><td><math>30 \pm 3</math></td></tr><tr><td>4</td><td>Room temperature</td><td><math>5 \pm 3</math></td></tr></tbody></table> | Step   | Temperature ( $^\circ\text{C}$ ) | Period (minutes) | 1 | $T_L \pm 5$ | $30 \pm 3$ | 2 | Room temperature | $5 \pm 3$ | 3 | $T_U \pm 5$ | $30 \pm 3$ | 4 | Room temperature | $5 \pm 3$ | No visible damage<br>$ \Delta R_{25}/R_{25}  \leq 3\%$ |
| Step                        | Temperature ( $^\circ\text{C}$ ) | Period (minutes)  |  |                                  |                  |   |             |            |   |                  |           |   |             |            |   |                  |           |  |
| 1                           | $T_L \pm 5$                      | $30 \pm 3$  |  |                                  |                  |   |             |            |   |                  |           |   |             |            |   |                  |           |  |
| 2                           | Room temperature                 | $5 \pm 3$   |  |                                  |                  |   |             |            |   |                  |           |   |             |            |   |                  |           |  |
| 3                           | $T_U \pm 5$                      | $30 \pm 3$  |  |                                  |                  |   |             |            |   |                  |           |   |             |            |   |                  |           |  |
| 4                           | Room temperature                 | $5 \pm 3$   |  |                                  |                  |   |             |            |   |                  |           |   |             |            |   |                  |           |  |
| Max. Power Dissipation      | IEC 60539-1<br>4.26.3            | $25 \pm 5^\circ\text{C}$ , Pmax. X 1000 $\pm$ 24 hrs  | No visible damage<br>$ \Delta R_{25}/R_{25}  \leq 5\%$ |                                  |                  |   |             |            |   |                  |           |   |             |            |   |                  |           |  |

### ■ Warehouse Storage Conditions of Products

- Storage Conditions :
  1. Storage Temperature:  $-10^\circ\text{C}$  ~  $+40^\circ\text{C}$
  2. Relative Humidity:  $\leq 75\%$ RH
  3. Keep away from corrosive atmosphere and sunlight.
- Period of Storage : 1 year