



Data sheet

Brief Introduction :

Temperature compensation NTC thermistor MF11 series is in resin coated pin wire form and has higher temperature coefficient, it can be widely applied in temperature compensation of many semiconductor and ICs that have temperature coefficient and require temperature compensation, to reach stability in wider temperature range.

Product Application :

1. Temperature compensation for computation equipment
2. Temperature compensation for electronic circuit
3. Temperature compensation for instrument loop, integrated circuit, crystal oscillator
4. Common precise temperature control

Main parameter:

Rated power $\leq 0.5W$

Measured power $\leq 0.1mW$

Operating temperature range $-55^{\circ}C \sim +125^{\circ}C$

Rated zero power resistance $R_{25} (\Omega)$

R_{25} resistance tolerance (%)

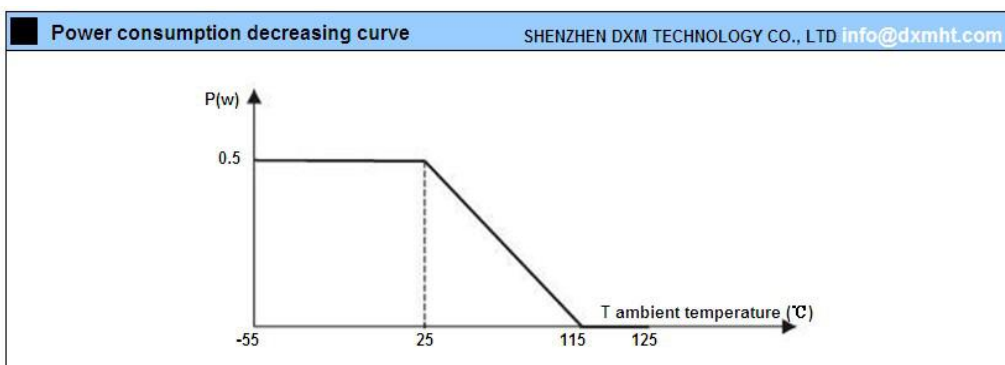
B value $(25/50^{\circ}C) / (K)$

Time constant $\leq 30S$

Dissipation factor $(mW/^{\circ}C)$

Advantages:

1. Good consistency
2. Wide resistance range: $0.01 \sim 200K\Omega$
3. Resistance tolerance can reach $\pm 5\%$
4. Small rated power: $0.5W$
5. Wide operating temperature range: $-55 \sim +125^{\circ}C$
6. Cost-effective

**Dimension(Unit: mm)::****Dimension**SHENZHEN DXM TECHNOLOGY CO., LTD info@dxmht.com

| Lead wire type | Straight | In-formed |
|-------------------|----------|-----------|
| Dimension (in:mm) | | |

Marking of Part Number:

| | | | |
|------|-----|---|---|
| MF11 | 103 | J | S |
| 1 | 2 | 3 | 4 |

1. NTC thermistor for temperature compensation MF11 Series
2. Resistance R 25: R 25: $22R \sim 22\Omega$ $103 \sim 10K\Omega$
3. Tolerance: J- $\pm 5\%$ K- $\pm 10\%$ L- $\pm 15\%$ M- $\pm 20\%$
4. Wire shape: S-Straight, U-In-formed



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Specification&Part no.:

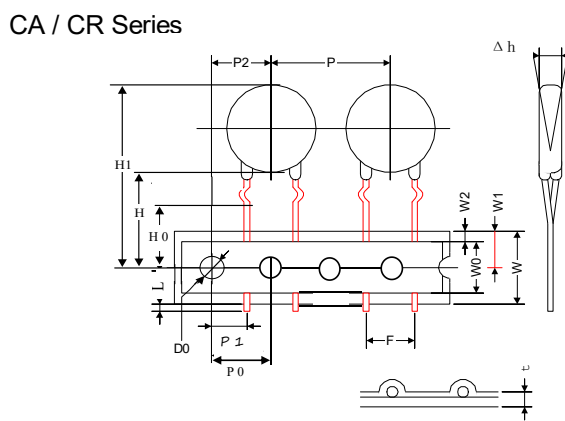
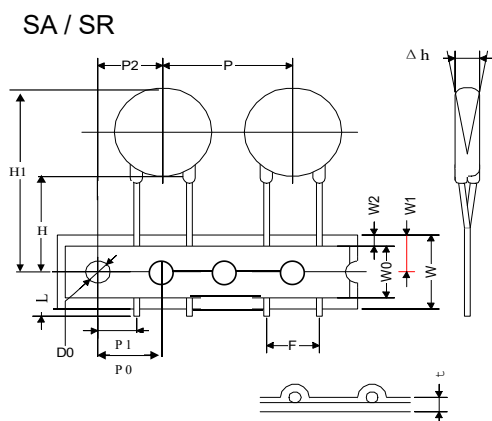
| Item | Part No. | Resistance @25 °C | | B Value | | Operating Temperature (°C) | Thermal Time Constant (S) | Dissipation Factor (mW/°C) |
|------|----------|------------------------|----------------|-------------|----------------|----------------------------|---------------------------|----------------------------|
| | | (R 25) Resistance (KΩ) | Tolerance (±%) | B Value (K) | Tolerance (±%) | | | |
| 1 | MF11-□□□ | 3.3~33 | 5,10,20 | 2700 | 5 | -55~+125 | ≤30 In still air | ≥6.0 In still air |
| 2 | | 6.8~68 | | 2830 | | | | |
| 3 | | 15~150 | | 2950 | | | | |
| 4 | | 33~330 | | 3100 | | | | |
| 5 | | 68~680 | | 3250 | | | | |
| 6 | | 150~1500 | | 3400 | | | | |
| 7 | | 330~3300 | | 3570 | | | | |
| 8 | | 680~6800 | | 3740 | | | | |
| 9 | | 1500~15000 | | 3900 | | | | |
| 10 | | 3300~33000 | | 4050 | | | | |
| 11 | | 6800~68000 | | 4250 | | | | |
| 12 | | 15000~150000 | | 4450 | | | | |
| 13 | | 33000~330000 | | 4670 | | | | |
| 14 | | 68000~680000 | | 4800 | | | | |
| 15 | | 150000~2000000 | | 5050 | | | | |

Note: First □ for filling in resistance @25 °C, Second □ for filling in °C resistance tolerance code name, Third □ for filling in wire shape.

Packing method

Packing Specifications

Ammo & Reel Packing Dimension

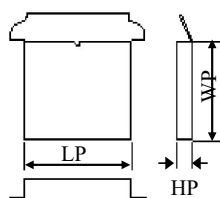


Unit: mm

| Symbol | P | P0 | P1 | P2 | F | W | W0 | W1 |
|--------|----------|----------|----------|----------|---------|----------|----------|---------|
| D14 | 25.4±1.0 | 12.7±1.0 | 8.95±0.7 | 12.7±1.3 | 7.5±0.5 | 18.0±1.0 | 12.5max. | 9.0±0.5 |
| Symbol | W2 | H | H0 | H1 | Δh | L | D0 | t |
| D14 | 3.0max. | 20.0±2.0 | 16.0±1.0 | 40.0max. | 0±2 | 1.0max. | 4.0±0.2 | 0.6±0.3 |

Ammo & Reel Packing Dimension

Ammo & Reel Box



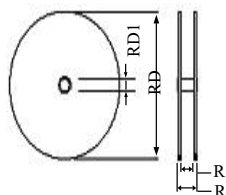
| | |
|-----------------|--------------------------|
| Symbol | Ammo |
| LP : | 335 mm |
| WP : | 243 mm |
| HP : | 50 mm |
| Carton : | 355 mm * 260 mm * 537 mm |

| | |
|---------------|-------|
| Symbol | Reel |
| LP : | 345mm |



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Reel



| | |
|----------|--------------------------|
| WP : | 345mm |
| HP : | 65mm |
| RD : | 340 mm |
| RD1 : | 30 ± 0.5 mm |
| RW : | 51mm |
| RW1 : | 56mm |
| Carton : | 360 mm * 360 mm * 480 mm |

Electrical properties and requirements

| Item | Description | Test Condition Description | Requirement |
|------|------------------------------|--|---------------------------|
| 1 | Zero Power Resistance | At 25°C, the measured resistance value can be neglected compared to the general tolerance | See Electrical Parameters |
| 2 | B-value | $B = \frac{T_1 * T_2}{T_2 - T_1} * \ln \left(\frac{R_1}{R_2} \right)$ <p>The B value can be calculated using the zeropower resistance value at 25°C and 50°C. The equation is as above.</p> | See Electrical Parameters |
| 3 | Thermal Dissipation Constant | The ratio of the change of the dissipation power to the corresponding change of the temperature at specified temperature. The unit is: mw/°C | See Electrical Parameters |
| 4 | Thermal Time Constant | Under zero power condition, thermal time constant is the time required by a thermistor that its body temperature reach 63.2% of the difference between its initial and final temperature. | See Electrical Parameters |
| 5 | Operating Temperature | Allowable temperature range while the thermistor work continuously for long time | -40-+125°C |
| 6 | Storage conditions | -10°C ~ 40°C RH≤75% | -10°C ~ 40°C |

Reliability Test

Mechanical Ratings

| Test Parameter | Test Condition / Description | Performance Requirements | | Standard |
|------------------------------|---|--|---------|-------------------------------------|
| | | Diameter | Loading | |
| Terminal Pull Strength | After gradually applying the load specified below and keeping the unit fixed for 10±1 seconds, the terminal shall be visually examined for any damage. | 0.3<d ≤ 0.5 | 0.5 Kg | No visible damage IEC 60068-2-21 |
| | | 0.6mm | 1.0 Kg | |
| | | 0.8mm | 1.0 Kg | |
| | | 1.0mm | 2.0 Kg | |
| Terminal Bending Strength | The unit shall be secured with its terminal kept vertical and the weight specified below be applied in the axial direction. The terminal shall gradually be bent by 90° in one direction, then 90° in the opposite direction, and again back to the original position. The damage of the terminal shall be visually examined. | 0.3<d ≤ 0.5 | 0.25 Kg | No visible damage IEC 60068-2-21 |
| | | 0.6mm | 0.5 Kg | |
| | | 0.8mm | 0.5 Kg | |
| | | 1.0mm | 1.0 Kg | |
| Resistance to Soldering Heat | Immerse the lead of the resistor into tin liquor of 260±3°C for 10± 1 sec., the distance from the liquor surface to the resistor is 6mm. Then resume to the original state. | No visible damage. The max change ratio of the resistance is within±15% | | IEC 60068-2-20 |
| Solderability | Immerse the lead into tin liquor of 245 ± 3 °C , for 3 ± 0.3 sec. The temperature of immerse welding: 245 ± 3 °C, The temperature of hand welding: 245 ± 3 °C(5s) | The covered surface area should be above 95% | | IEC 60068-2-20 |
| Vibration | The Specimen shall be vibrated by its lead wires with a total amplitude of 1.5mm and a varying frequency of 10~55~10HZ(each minutes) for a period of 2 hours respectively in each X,Yand Z directions. | No visible damage △VB/VB% ≤ ±5% | | |



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| ENVIRONMENTAL RATINGS | | | | | | | |
|-----------------------------------|--|-----------|--|--|--|----------------|--------------|
| High Temperature Storage | In a drying oven without load. Ambient temp: $125 \pm 5^\circ\text{C}$; period: 1000 ± 24 hours | | | No visible damage $\Delta R_{25}/R_{25}$ $\leq 5\%$ | IEC 600068-2-2 | | |
| Dry Heat Loading | The specimen shall be applied continuously the maximum allowable voltage at the specified conditions for specified period and then stored at room temperature and normal humidity over 2 hours. Thereafter, the change of Vb and mechanical damage shall be examined. Ambient temp: $125 \pm 5^\circ\text{C}$; Period: 1000 ± 24 hours. | | | $\Delta VB/VB\% \leq \pm 10\%$ | | | |
| Damp Heat Loading | The specimen shall be applied continuously the maximum allowable voltage at the specified conditions for specified period and then stored at room temperature and normal humidity over 2 hours. Thereafter, the change of Vb and mechanical damage shall be examined. Ambient condition: $40 \pm 2^\circ\text{C}$, 90 to 95%R.H. ; period: 1000 ± 24 hours | | | No visible damage $\Delta R_{25}/R_{25}$ $\leq 3\%$ | IEC 60068-2-78 | | |
| Rapid Change of Temperature Cycle | Condition the specimen to each temperature form step 1 to step 4 in this order for the period shown in the table of specifications. The change of Vb and mechanical damage shall be examined after 2 hours. | | The conditions shown below shall be repeated 5 cycles. | | No visible damage $\Delta R_{25}/R_{25}$ $\leq 3\%$ | IEC 60068-2-14 | |
| | | | Step | Temp $^\circ\text{C}$ | | | Period(min.) |
| | | | 1 | -30 ± 5 | | | 30 ± 3 |
| | | | 2 | Room Temp | | | 5 ± 3 |
| | | | 3 | 125 ± 5 | | | 30 ± 3 |
| 4 | Room Temp | 5 ± 3 | | | | | |
| Max. Power Dissipation | $25 \pm 5^\circ\text{C}$, Pmax. , 1000 ± 24 hrs | | | No visible damage $\Delta R_{25}/R_{25}$ $\leq 5\%$ | IEC 60539-1 4.26.3 | | |
| Insulation Test | 1000 VDC , 1 min | | | $\geq 500 \text{ M}\Omega$ | MIL-STD-202F -Method 302 | | |

Packing Quantity

| Type | Body diameter | Packaging Quantities |
|------|---------------------|----------------------|
| Reel | $\geq 9.0\text{mm}$ | 1000PCS |
| | $< 9.0\text{mm}$ | 1500PCS |
| Amm | $\geq 12\text{mm}$ | 500PCS |
| | $< 12\text{mm}$ | 1250PCS |
| Bulk | $\geq 12\text{mm}$ | 500PCS |
| | $< 12\text{mm}$ | 1000PCS |

Storage Conditions of thermistor :

- Storage Temperature : $-10 \sim +40^\circ\text{C}$
- Relative humidity : $\leq 75\%RH$
- Thermistors must be kept away from sunlight and stored in a non-corrosive atmosphere.

Thermistor Period of Storage : 1 year