

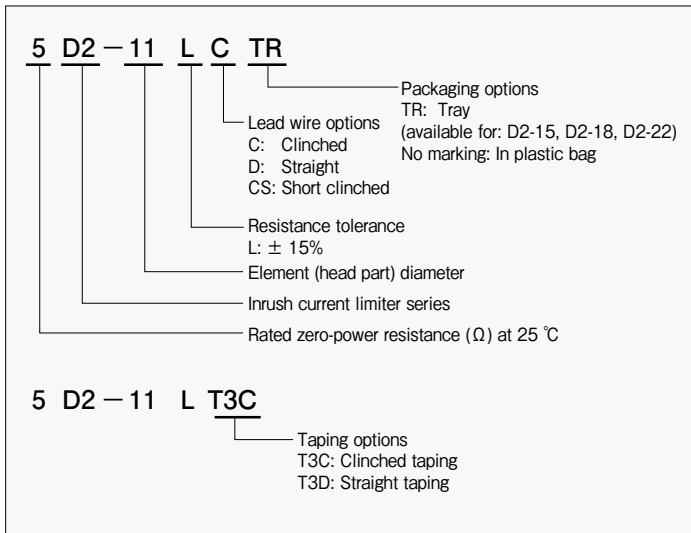
■ Inrush current limiter

Power Thermistor

Power thermistors utilize the self heating characteristic of NTC thermistors which causes a significant decrease in resistance in a short time. Power thermistors can be used instead of inrush current limiting resistors. Power thermistors have the advantage that their resistance decreases through self heating which reduces power loss and results in energy savings.
UL1434 File No. E92669 (1D2-22 excluded) certified.



■ Product number explanation



■ Applications

Switching power supplies, adapters, LCD TVs, plasma TVs, air conditioners, DVD players, audio equipment, LCD projectors, copiers, PCs, printers, office automation equipment, gaming machine power supplies

■ Dimensions



(1): Do not apply force to the lead wire legs from the side as this may damage the power thermistor.

| | D | T | H | H0 | d | Lead wire diameter |
|-------|-----------|---------------------|-----------|-----------|---------|--------------------|
| D2-05 | 8.5 max. | 7.0 max. | 11.5 max. | 15.5 max. | 5.0 ± 1 | Φ 0.8 |
| D2-07 | 11.0 max. | 9.0 max. | 13.0 max. | 16.0 max. | | |
| D2-08 | 10.0 max. | 7.0 max. | 13.0 max. | 17.0 max. | | |
| D2-10 | 13.0 max. | 9.0 max. | 17.0 max. | 19.5 max. | | |
| D2-11 | 11.5 max. | 8.0 max. | 15.0 max. | 18.5 max. | 7.5 ± 1 | |
| D2-13 | 14.5 max. | 8.0 max. | 18.0 max. | 21.5 max. | | |
| D2-14 | 17.0 max. | 9.0 max. | 21.0 max. | 22.5 max. | | |
| D2-15 | 16.5 max. | 8.0 max. | 20.0 max. | 23.0 max. | 10 ± 1 | Φ 1.0 (Φ 0.8) |
| D2-18 | 19.5 max. | 8.0 max. | 23.0 max. | 26.0 max. | | |
| D2-22 | 23.0 max. | 8.5 max. (8.0 max.) | 26.5 max. | 29.5 max. | | |

1: D2-22

Unit: mm

■ Taping dimensions



| | P | P0 | P1 | W | W0 | W1 | W2 | H1 | H2 | L | F1 | Φ D0 | t | t1 | Δh | |
|-------|------------|------------|------------|-----------------------|-----------|---------|------------|--------------|----------|---|-----------|-----------|-----------|----------|---------|--|
| D2-05 | 15.0 ± 1.0 | 15.0 ± 0.3 | 5.0 ± 0.7 | 17.5 to 19.0 min. 5.0 | 9.0 ± 0.5 | max.3.0 | 16.0 ± 0.5 | 19.0 to 21.5 | max. 1.0 | | 5.0 ± 0.5 | 4.0 ± 0.2 | 0.6 ± 0.3 | max. 1.5 | 0 ± 2.0 | |
| D2-07 | | | | | | | | | | | | | | | | |
| D2-08 | | | | | | | | | | | | | | | | |
| D2-10 | | | | | | | | | | | | | | | | |
| D2-11 | 30.0 ± 1.0 | | 3.75 ± 0.7 | | | | | | | | 7.5 ± 0.5 | | | | | |
| D2-13 | | | | | | | | | | | | | | | | |
| D2-14 | | | | | | | | | | | | | | | | |

• MOQ: 1000 pcs.

Unit: mm

Specifications

| Product number | Zero-power resistance at 25 °C (± 15%) | B value ¹ | Max. current at 25 °C | Residual resistance (Ω) | Thermal time constant ² (s) | Dissipation factor (mW / °C) | Operating temp. range (°C) | Max. capacitance | | | | Energy surge capacity (J) |
|----------------|---|----------------------|--------------------------|----------------------------|---|---------------------------------|-------------------------------|------------------|-------|-------|-------|------------------------------|
| | | B _{25/85} | | | | | | AC | | | | |
| | | (± 5%) | | | | | | 100 V | 120 V | 220 V | 240 V | |
| (Ω) | (K) | (A) | (Ω) | (s) | (mW / °C) | (°C) | 100 V | 120 V | 220 V | 240 V | (J) | |
| 5D2-05 | 5.0 | 2650 | 2.0 | 0.48 | 20 | 15 | - 50 to 150 | 860 | 600 | 170 | 150 | 4.3 |
| 10D2-05 | 10.0 | 2700 | 1.0 | 0.91 | 20 | 7 | - 50 to 150 | 860 | 600 | 170 | 150 | 4.3 |
| 20D2-05 | 20.0 | 2800 | 0.3 | 1.66 | 20 | 1 | - 50 to 150 | 860 | 600 | 170 | 150 | 4.3 |
| 5D2-07 | 5.0 | 2800 | 3.0 | 0.36 | 35 | 30 | - 40 to 160 | 400 | 260 | 80 | 60 | 1.9 |
| 8D2-07 | 8.0 | 2800 | 2.0 | 0.58 | 41 | 30 | - 40 to 160 | 560 | 360 | 110 | 90 | 2.6 |
| 10D2-07 | 10.0 | 2800 | 2.0 | 0.72 | 45 | 30 | - 40 to 160 | 680 | 470 | 140 | 110 | 3.3 |
| 12D2-07 | 12.0 | 2900 | 1.7 | 0.78 | 41 | 30 | - 40 to 160 | 380 | 260 | 80 | 60 | 1.9 |
| 16D2-07 | 16.0 | 2900 | 2.0 | 1.04 | 45 | 30 | - 40 to 160 | 800 | 530 | 160 | 130 | 3.8 |
| 22D2-07 | 22.0 | 2900 | 1.0 | 1.43 | 50 | 30 | - 40 to 160 | 960 | 630 | 190 | 150 | 4.5 |
| 5D2-08 | 5.0 | 2700 | 3.0 | 0.35 | 35 | 22 | - 50 to 170 | 1260 | 880 | 260 | 220 | 6.3 |
| 10D2-08 | 10.0 | 2800 | 2.0 | 0.63 | 35 | 17 | - 50 to 170 | 1260 | 880 | 260 | 220 | 6.3 |
| 15D2-08 | 15.0 | 2800 | 2.0 | 0.94 | 35 | 26 | - 50 to 170 | 2880 | 2000 | 590 | 500 | 14.0 |
| 20D2-08 | 20.0 | 2900 | 1.0 | 1.13 | 35 | 8 | - 50 to 170 | 2880 | 2000 | 590 | 500 | 14.0 |
| 2D2-10 | 2.0 | 2800 | 5.0 | 0.15 | 50 | 32 | - 40 to 160 | 640 | 1100 | 330 | 270 | 7.9 |
| 3D2-10 | 3.0 | 2800 | 4.0 | 0.22 | 53 | 32 | - 40 to 160 | 720 | 1170 | 350 | 290 | 8.4 |
| 5D2-10 | 5.0 | 2900 | 4.0 | 0.33 | 53 | 32 | - 40 to 160 | 440 | 970 | 290 | 240 | 7.0 |
| 8D2-10 | 8.0 | 2900 | 3.0 | 0.52 | 70 | 32 | - 40 to 160 | 560 | 1070 | 320 | 260 | 7.7 |
| 10D2-10 | 10.0 | 2900 | 3.0 | 0.65 | 75 | 32 | - 40 to 160 | 1640 | 1100 | 330 | 270 | 7.9 |
| 12D2-10 | 12.0 | 3000 | 1.8 | 0.71 | 53 | 32 | - 40 to 160 | 830 | 580 | 170 | 140 | 4.1 |
| 16D2-10 | 16.0 | 3000 | 1.6 | 0.94 | 70 | 32 | - 40 to 160 | 830 | 580 | 170 | 140 | 4.1 |
| 2D2-11 | 2.0 | 2650 | 5.0 | 0.15 | 40 | 26 | - 50 to 170 | 2700 | 1880 | 550 | 470 | 13.0 |
| 3D2-11 | 3.0 | 2650 | 4.0 | 0.22 | 40 | 24 | - 50 to 170 | 4830 | 3360 | 990 | 840 | 24.0 |
| 4D2-11 | 4.0 | 2700 | 4.0 | 0.28 | 40 | 31 | - 50 to 170 | 2880 | 2000 | 590 | 500 | 14.0 |
| 5D2-11 | 5.0 | 2700 | 4.0 | 0.35 | 40 | 39 | - 50 to 170 | 2700 | 1880 | 550 | 470 | 13.0 |
| 8D2-11 | 8.0 | 2800 | 3.0 | 0.50 | 40 | 31 | - 50 to 170 | 2700 | 1880 | 550 | 470 | 13.0 |
| 10D2-11 | 10.0 | 2800 | 3.1 | 0.63 | 40 | 42 | - 50 to 170 | 2880 | 2000 | 590 | 500 | 14.0 |
| 12D2-11 | 12.0 | 2800 | 2.0 | 0.75 | 40 | 21 | - 50 to 170 | 4030 | 2800 | 830 | 700 | 20.0 |
| 15D2-11 | 15.0 | 2950 | 2.5 | 0.80 | 40 | 34 | - 50 to 170 | 2880 | 2000 | 590 | 500 | 14.0 |
| 16D2-11 | 16.0 | 2950 | 2.5 | 0.86 | 40 | 37 | - 50 to 170 | 2880 | 2000 | 590 | 500 | 14.0 |
| 20D2-11 | 20.0 | 3000 | 2.0 | 1.02 | 40 | 28 | - 50 to 170 | 2880 | 2000 | 590 | 500 | 14.0 |
| 1D2-13 | 1.0 | 2650 | 6.0 | 0.06 | 55 | 12 | - 50 to 200 | 860 | 600 | 170 | 150 | 4.3 |
| 2D2-13 | 2.0 | 2700 | 6.0 | 0.10 | 55 | 21 | - 50 to 200 | 860 | 600 | 170 | 150 | 4.3 |
| 4D2-13 | 4.0 | 2800 | 5.0 | 0.18 | 55 | 24 | - 50 to 200 | 860 | 600 | 170 | 150 | 4.3 |
| 4.7D2-13 | 4.7 | 2900 | 5.0 | 0.18 | 55 | 26 | - 50 to 200 | 2700 | 1880 | 550 | 470 | 13.0 |
| 5D2-13 | 5.0 | 2900 | 5.0 | 0.19 | 55 | 27 | - 50 to 200 | 2700 | 1880 | 550 | 470 | 13.0 |
| 8D2-13 | 8.0 | 3000 | 4.0 | 0.27 | 25 | 25 | - 50 to 200 | 2880 | 2000 | 590 | 500 | 14.0 |
| 10D2-13 | 10.0 | 3050 | 4.0 | 0.32 | 55 | 29 | - 50 to 200 | 2880 | 2000 | 590 | 500 | 14.0 |
| 12D2-13 | 12.0 | 3000 | 4.0 | 0.41 | 55 | 37 | - 50 to 200 | 4830 | 3360 | 990 | 840 | 24.0 |
| 15D2-13 | 15.0 | 3050 | 3.0 | 0.48 | 55 | 25 | - 50 to 200 | 4830 | 3360 | 990 | 840 | 24.0 |
| 16D2-13 | 16.0 | 3050 | 3.0 | 0.51 | 55 | 26 | - 50 to 200 | 4830 | 3360 | 990 | 840 | 24.0 |
| 2D2-14 | 2.0 | 2800 | 5.0 | 0.15 | 90 | 36 | - 40 to 160 | 4200 | 2890 | 860 | 720 | 20.8 |
| 3D2-14 | 3.0 | 2900 | 5.0 | 0.20 | 80 | 36 | - 40 to 160 | 3080 | 2110 | 630 | 520 | 15.2 |
| 4D2-14 | 4.0 | 2900 | 5.0 | 0.26 | 95 | 36 | - 40 to 160 | 3400 | 2350 | 700 | 580 | 16.9 |
| 5D2-14 | 5.0 | 2900 | 4.0 | 0.33 | 110 | 36 | - 40 to 160 | 3600 | 2480 | 740 | 620 | 17.9 |
| 8D2-14 | 8.0 | 3000 | 2.5 | 0.47 | 80 | 36 | - 40 to 160 | 1390 | 970 | 280 | 240 | 6.9 |
| 10D2-14 | 10.0 | 3000 | 2.2 | 0.59 | 95 | 36 | - 40 to 160 | 1790 | 1240 | 370 | 310 | 8.9 |
| 12D2-14 | 12.0 | 3000 | 2.0 | 0.71 | 105 | 36 | - 40 to 160 | 2190 | 1520 | 450 | 380 | 10.9 |
| 16D2-14 | 16.0 | 3000 | 1.8 | 0.94 | 115 | 36 | - 40 to 160 | 2790 | 1940 | 570 | 480 | 13.9 |
| 1D2-15 | 1.0 | 2650 | 8.0 | 0.06 | 70 | 22 | - 50 to 200 | 6910 | 4800 | 1420 | 1200 | 34.0 |
| 1.5D2-15 | 1.5 | 2650 | 8.0 | 0.08 | 70 | 29 | - 50 to 200 | 6910 | 4800 | 1420 | 1200 | 34.0 |
| 2D2-15 | 2.0 | 2700 | 8.0 | 0.10 | 70 | 37 | - 50 to 200 | 6910 | 4800 | 1420 | 1200 | 34.0 |
| 3D2-15 | 3.0 | 2800 | 7.0 | 0.13 | 70 | 36 | - 50 to 200 | 4030 | 2800 | 830 | 700 | 20.0 |
| 4D2-15 | 4.0 | 2800 | 7.0 | 0.18 | 70 | 48 | - 50 to 200 | 4030 | 2800 | 830 | 700 | 20.0 |
| 4.7D2-15 | 4.7 | 2900 | 6.0 | 0.18 | 70 | 37 | - 50 to 200 | 4030 | 2800 | 830 | 700 | 20.0 |
| 5D2-15 | 5.0 | 2900 | 6.0 | 0.19 | 70 | 39 | - 50 to 200 | 4030 | 2800 | 830 | 700 | 20.0 |
| 8D2-15 | 8.0 | 3000 | 5.0 | 0.27 | 70 | 39 | - 50 to 200 | 4030 | 2800 | 830 | 700 | 20.0 |
| 10D2-15 | 10.0 | 3000 | 5.0 | 0.34 | 70 | 49 | - 50 to 200 | 5760 | 4000 | 1190 | 1000 | 28.0 |
| 12D2-15 | 12.0 | 3050 | 5.0 | 0.39 | 70 | 54 | - 50 to 200 | 5760 | 4000 | 1190 | 1000 | 28.0 |
| 15D2-15 | 15.0 | 3100 | 4.0 | 0.45 | 70 | 41 | - 50 to 200 | 5760 | 4000 | 1190 | 1000 | 28.0 |
| 16D2-15 | 16.0 | 3100 | 4.0 | 0.48 | 70 | 44 | - 50 to 200 | 5760 | 4000 | 1190 | 1000 | 28.0 |
| 4D2-18 | 4.0 | 2900 | 8.0 | 0.16 | 90 | 59 | - 50 to 200 | 6910 | 4800 | 1420 | 1200 | 34.0 |
| 5D2-18 | 5.0 | 2950 | 8.0 | 0.18 | 90 | 66 | - 50 to 200 | 6910 | 4800 | 1420 | 1200 | 34.0 |
| 8D2-18 | 8.0 | 3050 | 6.0 | 0.26 | 90 | 53 | - 50 to 200 | 6910 | 4800 | 1420 | 1200 | 34.0 |
| 10D2-18 | 10.0 | 3100 | 6.0 | 0.30 | 90 | 62 | - 50 to 200 | 6910 | 4800 | 1420 | 1200 | 34.0 |
| 47D2-18 | 47.0 | 3450 | 2.0 | 0.94 | 90 | 21 | - 50 to 200 | 6910 | 4800 | 1420 | 1200 | 34.0 |
| 1D2-22 | 1.0 | 2900 | 12.0 | 0.04 | 125 | 32 | - 50 to 200 | 8200 | - | 1700 | - | 41.0 |
| 3D2-22 | 3.0 | 2800 | 8.0 | 0.13 | 130 | 48 | - 50 to 200 | 12600 | 8800 | 2610 | 2200 | 63.0 |
| 4D2-22 | 4.0 | 2900 | 8.0 | 0.16 | 130 | 59 | - 50 to 200 | 12600 | 8800 | 2610 | 2200 | 63.0 |
| 6D2-22 | 6.0 | 3000 | 6.0 | 0.21 | 130 | 43 | - 50 to 200 | 12600 | 8800 | 2610 | 2200 | 63.0 |

¹: In part reference values ²: Reference values

Reliability data

| Item | Test conditions | Criteria |
|-----------------------------------|--|------------------------|
| Resistance to soldering heat | 10 s at 260 °C 5 s at 350 °C | ΔR ± 15% |
| Solderability | 3 s at 245 °C Flux material: Rosin 25%, ethyl alcohol 75% | More than 95% soldered |
| Tensile strength (lead wire) | A load of 10 N is applied to the wire terminations in vertical direction for 10 s. | ΔR ± 15% |
| Voltage proof | 1000 V AC for one minute | Less than 1 mA |
| Insulation resistance | 500 V DC | Over 100 MΩ |
| Dry heat | 1000 hours at max. operating temperature for each product number | ΔR ± 20% |
| Damp heat | 1000 hours at 40 °C and 90% humidity | |
| Temperature cycle (thermal shock) | 10 cycles as below: 1. - 40 °C for 30 minutes 2. Room temperature for 5 minutes 3. 160 °C for 30 minutes 4. Room temperature for 5 minutes | ΔR ± 15% |
| Electrical load | Max. current for 1000 h at 25 °C room temperature | ΔR ± 20% |

Caution

- When force is applied to the lead wire the leg connections may break or chipping may occur.
- May get hot during use. When designing the environment around the power thermistor be especially careful with lead wire connections, materials used in the direct vicinity and the layout of other electrical components.
- Do not use two or more power thermistors in a row.