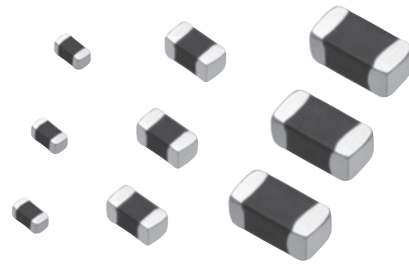


Multilayer NTC Thermistors

Series: **ERTJ**



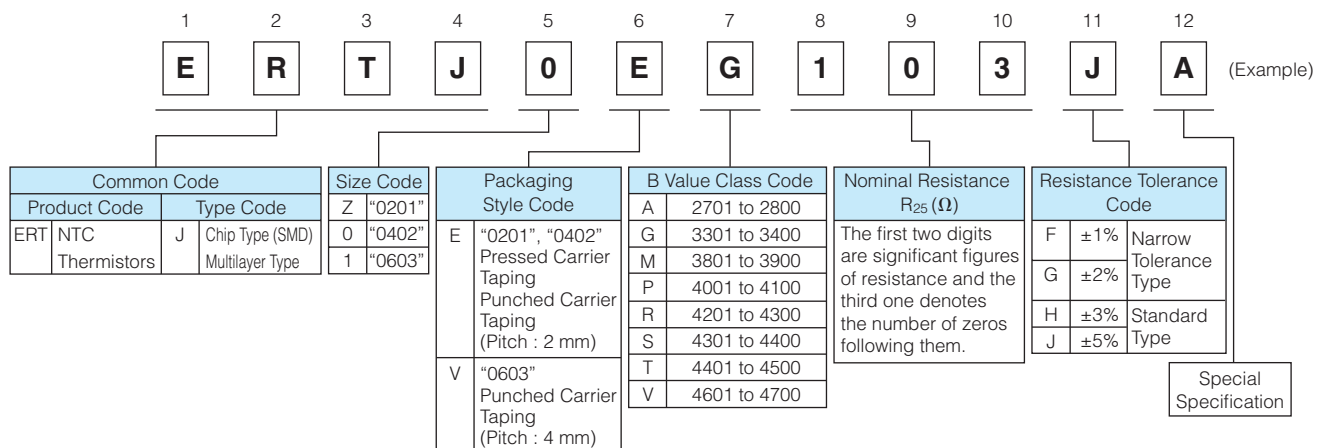
Features

- Surface Mount Device (0201, 0402, 0603)
- Highly reliable multilayer / monolithic structure
- Wide temperature operating range (-40 to 125 °C)
- Environmentally-friendly lead-free
- RoHS compliant

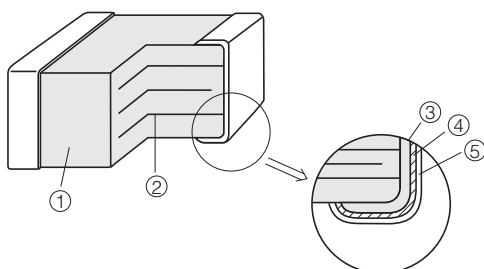
Recommended Applications

- Mobile Phone
 - Temperature compensation for crystal oscillator
 - Temperature compensation for semiconductor devices
- Personal Computer and Peripheral Device
 - Temperature detection for CPU and memory device
 - Temperature compensation for ink-viscosity (Inkjet Printer)
- Battery Pack (secondary battery)
 - Temperature detection of battery cells
- Liquid Crystal Display
 - Temperature compensation of display contrast
 - Temperature compensation of display backlighting (CCFL)

Explanation of Part Numbers



Construction



| No. | Name | |
|-----|-------------------------|------------------------|
| ① | Semiconductive Ceramics | |
| ② | Internal electrode | |
| ③ | Terminal electrode | Substrate electrode |
| ④ | | Intermediate electrode |
| ⑤ | | External electrode |

Ratings

| Size code (EIA) | Z(0201) | O(0402) | 1(0603) |
|-----------------------------------|--------------------------|--------------------------|--------------------------|
| Operating Temperature Range | -40 to 125 °C | | |
| Rated Maximum Power Dissipation*1 | 33 mW | 66 mW | 100 mW |
| Dissipation Factor*2 | Approximately 1 mW/°C | Approximately 2 mW/°C | Approximately 3 mW/°C |

- *1 Rated Maximum Power Dissipation : The maximum power that can be continuously applied at the rated ambient temperature.
 ·The maximum value of power, and rated power is same under the condition of ambient temperature 25 °C or less. If the temperature exceeds 25 °C, rated power depends on the decreased power dissipation curve.
 ·Please see "Operating Power" for details.
- *2 Dissipation factor : The constant amount power required to raise the temperature of the Thermistor 1 °C through self heat generation under stable temperatures.
 ·Dissipation factor is the reference value when mounted on a glass epoxy board (1.6 mmT).

Part Number List of Narrow Tolerance Type (Resistance Tolerance : ±2 %, ±1 %)

● 0201(EIA)

| Part Number | Nominal Resistance at 25 °C | Resistance Tolerance | B Value at 25/50(K) | B Value at 25/85(K) |
|--------------|-----------------------------|--------------------------|---------------------|---------------------|
| ERTJZEG103□A | 10 kΩ | ±1 %(F) or ±2 %(G) | (3380 K) | 3435 K±1% |
| ERTJZEP473□ | 47 kΩ | | 4050 K±1 % | (4100 K) |
| ERTJZEP683□ | 68 kΩ | | 4050 K±1 % | (4100 K) |
| ERTJZER683□ | 68 kΩ | | 4250 K±1 % | (4300 K) |
| ERTJZER104□ | 100 kΩ | | 4250 K±1 % | (4300 K) |
| ERTJZET104□ | 100 kΩ | | 4500 K±1 % | (4550 K) |
| ERTJZEV104□ | 100 kΩ | | 4700 K±1 % | (4750 K) |

□ : Resistance Tolerance Code

● 0402(EIA)

| Part Number | Nominal Resistance at 25 °C | Resistance Tolerance | B Value at 25/50(K) | B Value at 25/85(K) |
|--------------|-----------------------------|--------------------------|---------------------|---------------------|
| ERTJ0EG103□A | 10 kΩ | ±1 %(F) or ±2 %(G) | (3380 K) | 3435 K±1 % |
| ERTJ0EP333□ | 33 kΩ | | 4050 K±1 % | (4100 K) |
| ERTJ0EP473□ | 47 kΩ | | 4050 K±1 % | (4100 K) |
| ERTJ0EP683□ | 68 kΩ | | 4050 K±1 % | (4100 K) |
| ERTJ0ER104□ | 100 kΩ | | 4250 K±1 % | (4300 K) |
| ERTJ0ES104□ | 100 kΩ | | 4330 K±1 % | (4390 K) |
| ERTJ0EV104□ | 100 kΩ | | 4700 K±1 % | (4750 K) |
| ERTJ0EV224□ | 220 kΩ | | 4700 K±1 % | (4750 K) |

□ : Resistance Tolerance Code

● 0603(EIA)

| Part Number | Nominal Resistance at 25 °C | Resistance Tolerance | B Value at 25/50(K) | B Value at 25/85(K) |
|--------------|-----------------------------|--------------------------|---------------------|---------------------|
| ERTJ1VG103□A | 10 kΩ | ±1 %(F) or ±2 %(G) | (3380 K) | 3435 K±1 % |
| ERTJ1VS104□A | 100 kΩ | | (4330 K) | 4390 K±1 % |

□ : Resistance Tolerance Code

Part Number List of Standard Type (Resistance Tolerance : ±5 %, ±3 %)

● 0201(EIA)

| Part Number | Nominal Resistance at 25 °C | Resistance Tolerance | B Value at 25/50(K) | B Value at 25/85(K) |
|--------------|-----------------------------|--------------------------|---------------------|---------------------|
| ERTJZET202□ | 2.0 kΩ | ±3 %(H) or ±5 %(J) | 4500 K±2 % | (4450 K) |
| ERTJZET302□ | 3.0 kΩ | | 4500 K±2 % | (4450 K) |
| ERTJZET472□ | 4.7 kΩ | | 4500 K±2 % | (4450 K) |
| ERTJZEG103□A | 10 kΩ | | (3380 K) | 3435 K±1 % |
| ERTJZEP473□ | 47 kΩ | | 4050 K±2 % | (4100 K) |
| ERTJZEP683□ | 68 kΩ | | 4050 K±2 % | (4100 K) |
| ERTJZER683□ | 68 kΩ | | 4250 K±2 % | (4300 K) |
| ERTJZER104□ | 100 kΩ | | 4250 K±2 % | (4300 K) |
| ERTJZET104□ | 100 kΩ | | 4500 K±2 % | (4550 K) |
| ERTJZEV104□ | 100 kΩ | | 4700 K±2 % | (4750 K) |
| ERTJZET154□ | 150 kΩ | | 4500 K±2 % | (4750 K) |
| ERTJZET224□ | 220 kΩ | | 4500 K±2 % | (4750 K) |

□ : Resistance Tolerance Code

● 0402(EIA)

| Part Number | Nominal Resistance at 25 °C | Resistance Tolerance | B Value at 25/50(K) | B Value at 25/85(K) |
|--------------|-----------------------------|----------------------------|---------------------|---------------------|
| ERTJ0EA220□ | 22 Ω | ±3 % (H) or ±5 % (J) | 2750 K±3 % | (2700 K) |
| ERTJ0EA330□ | 33 Ω | | 2750 K±3 % | (2700 K) |
| ERTJ0EA400□ | 40 Ω | | 2750 K±3 % | (2700 K) |
| ERTJ0EA470□ | 47 Ω | | 2750 K±3 % | (2700 K) |
| ERTJ0EA680□ | 68 Ω | | 2800 K±3 % | (2750 K) |
| ERTJ0EA101□ | 100 Ω | | 2800 K±3 % | (2750 K) |
| ERTJ0EA151□ | 150 Ω | | 2800 K±3 % | (2750 K) |
| ERTJ0ET102□ | 1.0 kΩ | | 4500 K±2 % | (4450 K) |
| ERTJ0ET152□ | 1.5 kΩ | | 4500 K±2 % | (4450 K) |
| ERTJ0ET202□ | 2.0 kΩ | | 4500 K±2 % | (4450 K) |
| ERTJ0ET222□ | 2.2 kΩ | | 4500 K±2 % | (4450 K) |
| ERTJ0ET302□ | 3.0 kΩ | | 4500 K±2 % | (4450 K) |
| ERTJ0ER332□ | 3.3 kΩ | | 4250 K±2 % | (4300 K) |
| ERTJ0ET332□ | 3.3 kΩ | | 4500 K±2 % | (4450 K) |
| ERTJ0ET472□ | 4.7 kΩ | | 4500 K±2 % | (4450 K) |
| ERTJ0ER472□ | 4.7 kΩ | | 4250 K±2 % | (4300 K) |
| ERTJ0ER682□ | 6.8 kΩ | | 4250 K±2 % | (4300 K) |
| ERTJ0EG103□A | 10 kΩ | | (3380 K) | 3435 K±1 % |
| ERTJ0EM103□ | 10 kΩ | | 3900 K±2 % | (3970 K) |
| ERTJ0ER103□ | 10 kΩ | | 4250 K±2 % | (4300 K) |
| ERTJ0ER153□ | 15 kΩ | | 4250 K±2 % | (4300 K) |
| ERTJ0ER223□ | 22 kΩ | | 4250 K±2 % | (4300 K) |
| ERTJ0EP333□ | 33 kΩ | | 4050 K±2 % | (4100 K) |
| ERTJ0ER333□ | 33 kΩ | | 4250 K±2 % | (4300 K) |
| ERTJ0ET333□ | 33 kΩ | | 4500 K±2 % | (4580 K) |
| ERTJ0EP473□ | 47 kΩ | | 4050 K±2 % | (4100 K) |
| ERTJ0ET473□ | 47 kΩ | | 4500 K±2 % | (4550 K) |
| ERTJ0EV473□ | 47 kΩ | | 4700 K±2 % | (4750 K) |
| ERTJ0EP683□ | 68 kΩ | | 4050 K±2 % | (4100 K) |
| ERTJ0ER683□ | 68 kΩ | | 4250 K±2 % | (4300 K) |
| ERTJ0EV683□ | 68 kΩ | | 4700 K±2 % | (4750 K) |
| ERTJ0EP104□ | 100 kΩ | | 4050 K±2 % | (4100 K) |
| ERTJ0ER104□ | 100 kΩ | | 4250 K±2 % | (4300 K) |
| ERTJ0ES104□ | 100 kΩ | 4330 K±2 % | (4390 K) | |
| ERTJ0ET104□ | 100 kΩ | 4500 K±2 % | (4580 K) | |
| ERTJ0EV104□ | 100 kΩ | 4700 K±2 % | (4750 K) | |
| ERTJ0ET154□ | 150 kΩ | 4500 K±2 % | (4580 K) | |
| ERTJ0EV154□ | 150 kΩ | 4700 K±2 % | (4750 K) | |
| ERTJ0EV224□ | 220 kΩ | 4700 K±2 % | (4750 K) | |
| ERTJ0EV334□ | 330 kΩ | 4700 K±2 % | (4750 K) | |
| ERTJ0EV474□ | 470 kΩ | 4700 K±2 % | (4750 K) | |

□ : Resistance Tolerance Code

● 0603(EIA)

| Part Number | Nominal Resistance at 25 °C | Resistance Tolerance | B Value at 25/50(K) | B Value at 25/85(K) |
|--------------|-----------------------------|--------------------------|---------------------|---------------------|
| ERTJ1VA220□ | 22 Ω | ±3 %(H) or ±5 %(J) | 2750 K±3 % | (2700 K) |
| ERTJ1VA330□ | 33 Ω | | 2750 K±3 % | (2700 K) |
| ERTJ1VA400□ | 40 Ω | | 2800 K±3 % | (2750 K) |
| ERTJ1VA470□ | 47 Ω | | 2800 K±3 % | (2750 K) |
| ERTJ1VA680□ | 68 Ω | | 2800 K±3 % | (2750 K) |
| ERTJ1VA101□ | 100 Ω | | 2800 K±3 % | (2750 K) |
| ERTJ1VT102□ | 1.0 kΩ | | 4500 K±2 % | (4450 K) |
| ERTJ1VT152□ | 1.5 kΩ | | 4500 K±2 % | (4450 K) |
| ERTJ1VT202□ | 2.0 kΩ | | 4500 K±2 % | (4450 K) |
| ERTJ1VT222□ | 2.2 kΩ | | 4500 K±2 % | (4450 K) |
| ERTJ1VT302□ | 3.0 kΩ | | 4500 K±2 % | (4450 K) |
| ERTJ1VT332□ | 3.3 kΩ | | 4500 K±2 % | (4450 K) |
| ERTJ1VR332□ | 3.3 kΩ | | 4250 K±2 % | (4300 K) |
| ERTJ1VR472□ | 4.7 kΩ | | 4250 K±2 % | (4300 K) |
| ERTJ1VT472□ | 4.7 kΩ | | 4500 K±2 % | (4450 K) |
| ERTJ1VR682□ | 6.8 kΩ | | 4250 K±2 % | (4300 K) |
| ERTJ1VG103□A | 10 kΩ | | (3380 K) | 3435 K±1% |
| ERTJ1VR103□ | 10 kΩ | | 4250 K±2 % | (4300 K) |
| ERTJ1VR153□ | 15 kΩ | | 4250 K±2 % | (4300 K) |
| ERTJ1VR223□ | 22 kΩ | | 4250 K±2 % | (4300 K) |
| ERTJ1VR333□ | 33 kΩ | | 4250 K±2 % | (4300 K) |
| ERTJ1VP473□ | 47 kΩ | | 4100 K±2 % | (4150 K) |
| ERTJ1VR473□ | 47 kΩ | | 4250 K±2 % | (4300 K) |
| ERTJ1VV473□ | 47 kΩ | | 4700 K±2 % | (4750 K) |
| ERTJ1VR683□ | 68 kΩ | | 4250 K±2 % | (4300 K) |
| ERTJ1VV683□ | 68 kΩ | | 4700 K±2 % | (4750 K) |
| ERTJ1VS104□A | 100 kΩ | | (4330 K) | 4390 K±1% |
| ERTJ1VV104□ | 100 kΩ | | 4700 K±2 % | (4750 K) |
| ERTJ1VV154□ | 150 kΩ | | 4700 K±2 % | (4750 K) |
| ERTJ1VT224□ | 220 kΩ | | 4500 K±2 % | (4580 K) |

□ : Resistance Tolerance Code

● Temperature and Resistance value (the resistance value at 25 °C is set to 1)/ Reference values

| | ERTJ□□A~ | | ERTJ□□G~ | | ERTJ□□M~ | | ERTJ□□P~ | | ERTJ□□R~ | | ERTJ0ES~ | | ERTJ1VS~ | | ERTJ□□T~ | | ERTJ□□T~ | | ERTJ□□V~ | |
|--------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|--|----------|--|----------|----|----------|--|----------|--|
| B _{25/50} | 2750 K | 2800 K | (3375 K) | 3900 K | 4050 K | 4250 K | 4330 K | (4330 K) | 4500 K | 4500 K | 4700 K | | | | | | | | | |
| B _{25/85} | (2700 K) | (2750 K) | 3435 K | (3970 K) | (4100 K) | (4300 K) | (4390 K) | 4390 K | (4450 K) | (4580 K) | (4750 K) | | | | | | | | | |
| T(°C) | | | | | | | | | | | | | | | *1 | *2 | | | | |
| -40 | 13.05 | 13.28 | 20.52 | 32.11 | 33.10 | 43.10 | 45.67 | 45.53 | 63.30 | 47.07 | 59.76 | | | | | | | | | |
| -35 | 10.21 | 10.40 | 15.48 | 23.29 | 24.03 | 30.45 | 32.08 | 31.99 | 42.92 | 33.31 | 41.10 | | | | | | | | | |
| -30 | 8.061 | 8.214 | 11.79 | 17.08 | 17.63 | 21.76 | 22.80 | 22.74 | 29.50 | 23.80 | 28.61 | | | | | | | | | |
| -25 | 6.427 | 6.547 | 9.069 | 12.65 | 13.06 | 15.73 | 16.39 | 16.35 | 20.53 | 17.16 | 20.14 | | | | | | | | | |
| -20 | 5.168 | 5.261 | 7.037 | 9.465 | 9.761 | 11.48 | 11.91 | 11.89 | 14.46 | 12.49 | 14.33 | | | | | | | | | |
| -15 | 4.191 | 4.261 | 5.507 | 7.147 | 7.362 | 8.466 | 8.743 | 8.727 | 10.30 | 9.159 | 10.31 | | | | | | | | | |
| -10 | 3.424 | 3.476 | 4.344 | 5.444 | 5.599 | 6.300 | 6.479 | 6.469 | 7.407 | 6.772 | 7.482 | | | | | | | | | |
| -5 | 2.819 | 2.856 | 3.453 | 4.181 | 4.291 | 4.730 | 4.845 | 4.839 | 5.388 | 5.046 | 5.481 | | | | | | | | | |
| 0 | 2.336 | 2.362 | 2.764 | 3.237 | 3.312 | 3.582 | 3.654 | 3.650 | 3.966 | 3.789 | 4.050 | | | | | | | | | |
| 5 | 1.948 | 1.966 | 2.227 | 2.524 | 2.574 | 2.734 | 2.778 | 2.776 | 2.953 | 2.864 | 3.015 | | | | | | | | | |
| 10 | 1.635 | 1.646 | 1.806 | 1.981 | 2.013 | 2.102 | 2.128 | 2.126 | 2.221 | 2.179 | 2.262 | | | | | | | | | |
| 15 | 1.380 | 1.386 | 1.474 | 1.567 | 1.584 | 1.629 | 1.642 | 1.641 | 1.687 | 1.669 | 1.710 | | | | | | | | | |
| 20 | 1.171 | 1.174 | 1.211 | 1.247 | 1.255 | 1.272 | 1.277 | 1.276 | 1.293 | 1.287 | 1.303 | | | | | | | | | |
| 25 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | | | | |
| 30 | 0.8585 | 0.8565 | 0.8309 | 0.8072 | 0.8016 | 0.7921 | 0.7888 | 0.7890 | 0.7799 | 0.7823 | 0.7734 | | | | | | | | | |
| 35 | 0.7407 | 0.7372 | 0.6941 | 0.6556 | 0.6461 | 0.6315 | 0.6263 | 0.6266 | 0.6131 | 0.6158 | 0.6023 | | | | | | | | | |
| 40 | 0.6422 | 0.6376 | 0.5828 | 0.5356 | 0.5235 | 0.5067 | 0.5004 | 0.5007 | 0.4856 | 0.4876 | 0.4721 | | | | | | | | | |
| 45 | 0.5595 | 0.5541 | 0.4916 | 0.4401 | 0.4266 | 0.4090 | 0.4022 | 0.4025 | 0.3874 | 0.3884 | 0.3723 | | | | | | | | | |
| 50 | 0.4899 | 0.4836 | 0.4165 | 0.3635 | 0.3496 | 0.3319 | 0.3251 | 0.3254 | 0.3111 | 0.3111 | 0.2954 | | | | | | | | | |
| 55 | 0.4309 | 0.4238 | 0.3543 | 0.3018 | 0.2881 | 0.2709 | 0.2642 | 0.2645 | 0.2513 | 0.2504 | 0.2356 | | | | | | | | | |
| 60 | 0.3806 | 0.3730 | 0.3027 | 0.2518 | 0.2386 | 0.2222 | 0.2158 | 0.2161 | 0.2042 | 0.2026 | 0.1889 | | | | | | | | | |
| 65 | 0.3376 | 0.3295 | 0.2595 | 0.2111 | 0.1985 | 0.1832 | 0.1772 | 0.1774 | 0.1670 | 0.1648 | 0.1523 | | | | | | | | | |
| 70 | 0.3008 | 0.2922 | 0.2233 | 0.1777 | 0.1659 | 0.1518 | 0.1463 | 0.1465 | 0.1377 | 0.1348 | 0.1236 | | | | | | | | | |
| 75 | 0.2691 | 0.2600 | 0.1929 | 0.1504 | 0.1393 | 0.1264 | 0.1213 | 0.1215 | 0.1144 | 0.1108 | 0.1009 | | | | | | | | | |
| 80 | 0.2417 | 0.2322 | 0.1672 | 0.1278 | 0.1174 | 0.1057 | 0.1011 | 0.1013 | 0.09560 | 0.09162 | 0.08284 | | | | | | | | | |
| 85 | 0.2180 | 0.2081 | 0.1451 | 0.1090 | 0.09937 | 0.08873 | 0.08469 | 0.08486 | 0.08033 | 0.07609 | 0.06834 | | | | | | | | | |
| 90 | 0.1974 | 0.1871 | 0.1261 | 0.09310 | 0.08442 | 0.07468 | 0.07122 | 0.07138 | 0.06782 | 0.06345 | 0.05662 | | | | | | | | | |
| 95 | 0.1793 | 0.1688 | 0.1097 | 0.07980 | 0.07200 | 0.06307 | 0.06014 | 0.06028 | 0.05753 | 0.05314 | 0.04712 | | | | | | | | | |
| 100 | 0.1636 | 0.1528 | 0.09563 | 0.06871 | 0.06166 | 0.05353 | 0.05099 | 0.05112 | 0.04903 | 0.04472 | 0.03939 | | | | | | | | | |
| 105 | 0.1498 | 0.1387 | 0.08357 | 0.05947 | 0.05306 | 0.04568 | 0.04340 | 0.04351 | 0.04198 | 0.03784 | 0.03308 | | | | | | | | | |
| 110 | 0.1377 | 0.1263 | 0.07317 | 0.05170 | 0.04587 | 0.03918 | 0.03708 | 0.03718 | 0.03609 | 0.03218 | 0.02791 | | | | | | | | | |
| 115 | 0.1270 | 0.1153 | 0.06421 | 0.04512 | 0.03979 | 0.03374 | 0.03179 | 0.03188 | 0.03117 | 0.02748 | 0.02364 | | | | | | | | | |
| 120 | 0.1175 | 0.1056 | 0.05650 | 0.03951 | 0.03460 | 0.02916 | 0.02734 | 0.02742 | 0.02702 | 0.02352 | 0.02009 | | | | | | | | | |
| 125 | 0.1091 | 0.09695 | 0.04986 | 0.03470 | 0.03013 | 0.02527 | 0.02359 | 0.02367 | 0.02351 | 0.02017 | 0.01712 | | | | | | | | | |

*1 Apply to products with a B_{25/50} constant of 4500 K and a resistance value of 25 °C less than 10 kΩ. *2 Applied only to ERTJ0ET104□.

*2 Apply to products with a B_{25/50} constant of 4500 K and a resistance value of 25 °C of 10 kΩ or more. *2 Applied only to ERTJ0ET104□.

$$B_{25/50} = \frac{\ln(R_{25}/R_{50})}{1/298.15 - 1/323.15}$$

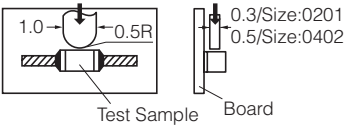
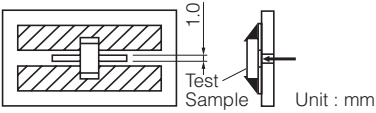
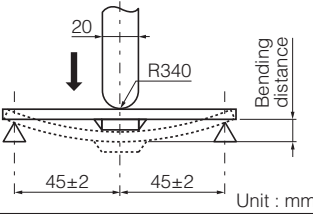
$$B_{25/85} = \frac{\ln(R_{25}/R_{85})}{1/298.15 - 1/358.15}$$

R₂₅=Resistance at 25.0±0.1 °C

R₅₀=Resistance at 50.0±0.1 °C

R₈₅=Resistance at 85.0±0.1 °C

Specification and Test Method

| Item | Specification | Test Method | | | | | | | | | | | | | | | | | | |
|--|---|--|------------------|----------------|------------------------|--------------------|--------------|----------------|--------------------|--------------|---|------|-----------|------------|---|-----------|------------|---|------------|------------|
| Rated Zero-power Resistance (R ₂₅) | Within the specified tolerance. | The value is measured at a power that the influence of self-heat generation can be negligible (0.1mW or less), at the rated ambient temperature of 25.0±0.1°C. | | | | | | | | | | | | | | | | | | |
| B Value | Shown in each Individual Specification. * Individual Specification shall specify B _{25/50} or B _{25/85} . | <p>The Zero-power resistances; R₁ and R₂, shall be measured respectively at T₁ (deg.C) and T₂ (deg.C). The B value is calculated by the following equation.</p> $B_{T_1/T_2} = \frac{\ln(R_1) - \ln(R_2)}{1/(T_1 + 273.15) - 1/(T_2 + 273.15)}$ <table border="1"> <thead> <tr> <th></th> <th>T₁</th> <th>T₂</th> </tr> </thead> <tbody> <tr> <td>B_{25/50}</td> <td>25.0 ±0.1 °C</td> <td>50.0 ±0.1 °C</td> </tr> <tr> <td>B_{25/85}</td> <td>25.0 ±0.1 °C</td> <td>85.0 ±0.1 °C</td> </tr> </tbody> </table> | | T ₁ | T ₂ | B _{25/50} | 25.0 ±0.1 °C | 50.0 ±0.1 °C | B _{25/85} | 25.0 ±0.1 °C | 85.0 ±0.1 °C | | | | | | | | | |
| | T ₁ | T ₂ | | | | | | | | | | | | | | | | | | |
| B _{25/50} | 25.0 ±0.1 °C | 50.0 ±0.1 °C | | | | | | | | | | | | | | | | | | |
| B _{25/85} | 25.0 ±0.1 °C | 85.0 ±0.1 °C | | | | | | | | | | | | | | | | | | |
| Adhesion | The terminal electrode shall be free from peeling or signs of peeling. | <p>Applied force : Size 0201 : 2 N Size 0402, 0603 : 5 N Duration : 10 s</p> <p>Size : 0201, 0402</p>  <p>Size : 0603</p>  | | | | | | | | | | | | | | | | | | |
| Bending Strength | There shall be no cracks and other mechanical damage. R ₂₅ change : within ±5 % | <p>Bending distance : 1 mm Bending speed : 1 mm/s</p>  | | | | | | | | | | | | | | | | | | |
| Resistance to Soldering Heat | There shall be no cracks and other mechanical damage. <table border="0"> <tr> <td></td> <td>Narrow Tol. type</td> <td>Standard type</td> </tr> <tr> <td>R₂₅ change</td> <td>: within ±2 %</td> <td>within ±3 %</td> </tr> <tr> <td>B Value change</td> <td>: within ±1 %</td> <td>within ±2 %</td> </tr> </table> | | Narrow Tol. type | Standard type | R ₂₅ change | : within ±2 % | within ±3 % | B Value change | : within ±1 % | within ±2 % | <p>Soldering bath method Solder temperature : 270 ±5 °C Dipping period : 4.0 ±1 s Preheat condition :</p> <table border="1"> <thead> <tr> <th>Step</th> <th>Temp (°C)</th> <th>Period (s)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>80 to 100</td> <td>120 to 180</td> </tr> <tr> <td>2</td> <td>150 to 200</td> <td>120 to 180</td> </tr> </tbody> </table> | Step | Temp (°C) | Period (s) | 1 | 80 to 100 | 120 to 180 | 2 | 150 to 200 | 120 to 180 |
| | Narrow Tol. type | Standard type | | | | | | | | | | | | | | | | | | |
| R ₂₅ change | : within ±2 % | within ±3 % | | | | | | | | | | | | | | | | | | |
| B Value change | : within ±1 % | within ±2 % | | | | | | | | | | | | | | | | | | |
| Step | Temp (°C) | Period (s) | | | | | | | | | | | | | | | | | | |
| 1 | 80 to 100 | 120 to 180 | | | | | | | | | | | | | | | | | | |
| 2 | 150 to 200 | 120 to 180 | | | | | | | | | | | | | | | | | | |
| Solderability | More than 95 % of the soldered area of both terminal electrodes shall be covered with fresh solder. | <p>Soldering bath method Solder temperature : 230 ±5 °C Dipping period : 4 ±1 s Solder : Sn-3.0Ag-0.5Cu</p> | | | | | | | | | | | | | | | | | | |

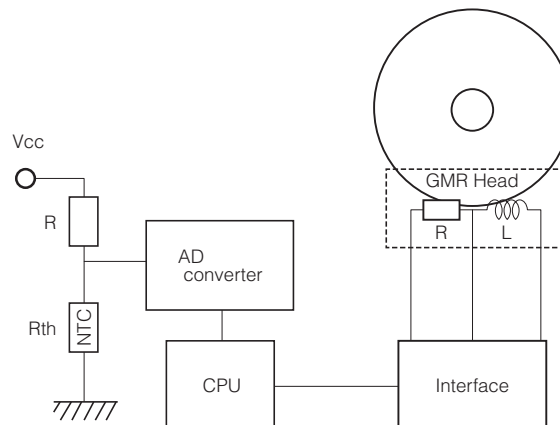
Specification and Test Method

| Item | Specification | | Test Method |
|---------------------------|--|---|--|
| Temperature Cycling | Narrow Tol. type R ₂₅ change : within ±2 % B Value change : within ±1 % | Standard type within ±3 % within ±2 % | Conditions of one cycle Step 1 : -40 °C, 30±3 min Step 2 : Room temp., 3 min max. Step 3 : 125 °C, 30±3 min. Step 4 : Room temp., 3 min max. Number of cycles: 100 cycles |
| Humidity | Narrow Tol. type R ₂₅ change : within ±2 % B Value change : within ±1 % | Standard type within ±3 % within ±2 % | Temperature : 85 ±2 °C Relative humidity : 85 ±5 % Test period : 1000 +48/0 h |
| Biased Humidity | Narrow Tol. type R ₂₅ change : within ±2 % B Value change : within ±1 % | Standard type within ±3 % within ±2 % | Temperature : 85 ±2 °C Relative humidity : 85 ±5 % Applied power : 10 mW(D.C.) Test period : 500 +48/0 h |
| Low Temperature Exposure | Narrow Tol. type R ₂₅ change : within ±2 % B Value change : within ±1 % | Standard type within ±3 % within ±2 % | Specimens are soldered on the testing board shown in Fig.2. Temperature : -40 ±3 °C Test period : 1000 +48/0 h |
| High Temperature Exposure | Narrow Tol. type R ₂₅ change : within ±2 % B Value change : within ±1 % | Standard type within ±3 % within ±2 % | Specimens are soldered on the testing board shown in Fig.2. Temperature : 125 ±3 °C Test period : 1000 +48/0 h |

Typical Application

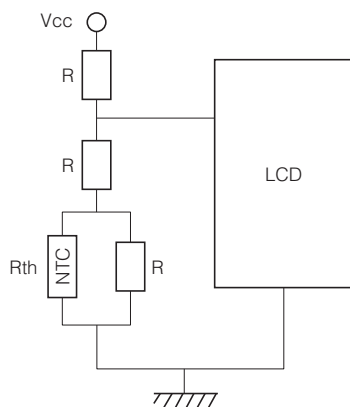
● Temperature Detection

Writing current control of HDD



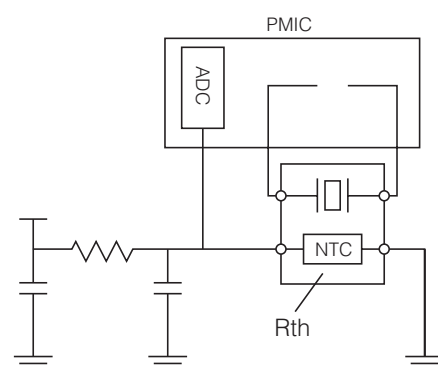
● Temperature Compensation (Pseudo-linearization)

Contrast level control of LCD

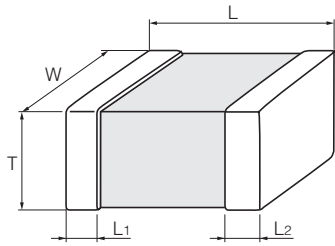


● Temperature Compensation (RF circuit)

Temperature compensation of TCXO



Dimensions in mm (not to scale)



(Unit : mm)

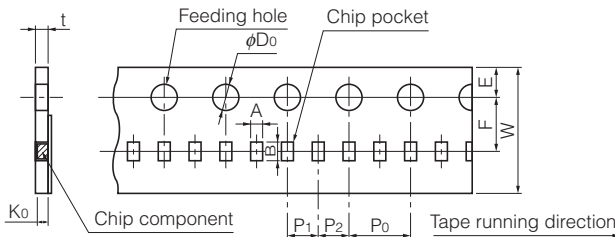
| Size Code (EIA) | L | W | T | L ₁ , L ₂ |
|-----------------|-----------|-----------|-----------|---------------------------------|
| Z(0201) | 0.60±0.03 | 0.30±0.03 | 0.30±0.03 | 0.15±0.05 |
| 0(0402) | 1.0±0.1 | 0.50±0.05 | 0.50±0.05 | 0.25±0.15 |
| 1(0603) | 1.60±0.15 | 0.8±0.1 | 0.8±0.1 | 0.3±0.2 |

Packaging Methods

● Standard Packing Quantities

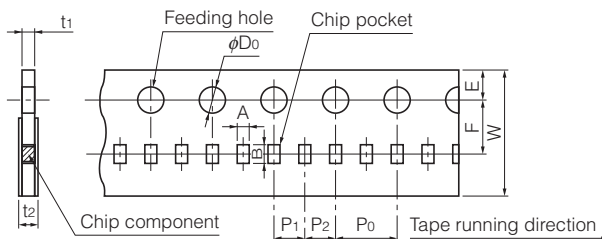
| Size Code | Thickness (mm) | Kind of Taping | Pitch (mm) | Quantity (pcs./reel) |
|-----------|----------------|------------------------|------------|----------------------|
| Z(0201) | 0.3 | Pressed Carrier Taping | 2 | 15,000 |
| 0(0402) | 0.5 | Punched Carrier Taping | 2 | 10,000 |
| 1(0603) | 0.8 | | 4 | 4,000 |

● Pitch 2 mm (Pressed Carrier Taping) : Size 0201



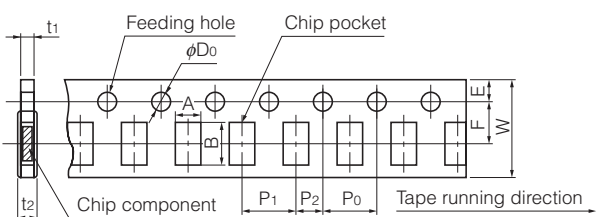
| Symbol | A | B | W | F | E | P ₁ | P ₂ | P ₀ | φD ₀ | t | K ₀ |
|-----------|------------|------------|----------|------------|------------|----------------|----------------|----------------|----------------------------------|-----------|----------------|
| Dim. (mm) | 0.36 ±0.03 | 0.66 ±0.03 | 8.0 ±0.2 | 3.50 ±0.05 | 1.75 ±0.10 | 2.00 ±0.05 | 2.00 ±0.05 | 4.0 ±0.1 | 1.5 ^{+0.1} ₀ | 0.55 max. | 0.36 ±0.03 |

● Pitch 2 mm (Punched Carrier Taping) : Size 0402



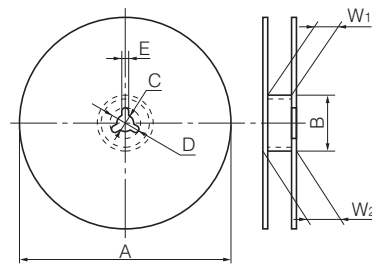
| Symbol | A | B | W | F | E | P ₁ | P ₂ | P ₀ | φD ₀ | t ₁ | t ₂ |
|-----------|------------|------------|----------|------------|------------|----------------|----------------|----------------|----------------------------------|----------------|----------------|
| Dim. (mm) | 0.62 ±0.05 | 1.12 ±0.05 | 8.0 ±0.2 | 3.50 ±0.05 | 1.75 ±0.10 | 2.00 ±0.05 | 2.00 ±0.05 | 4.0 ±0.1 | 1.5 ^{+0.1} ₀ | 0.7 max. | 1.0 max. |

● Pitch 4 mm (Punched Carrier Taping) : Size 0603



| Symbol | A | B | W | F | E | P ₁ | P ₂ | P ₀ | φD ₀ | t ₁ | t ₂ |
|-----------|----------|----------|----------|------------|------------|----------------|----------------|----------------|----------------------------------|----------------|----------------|
| Dim. (mm) | 1.0 ±0.1 | 1.8 ±0.1 | 8.0 ±0.2 | 3.50 ±0.05 | 1.75 ±0.10 | 4.0 ±0.1 | 2.00 ±0.05 | 4.0 ±0.1 | 1.5 ^{+0.1} ₀ | 1.1 max. | 1.4 max. |

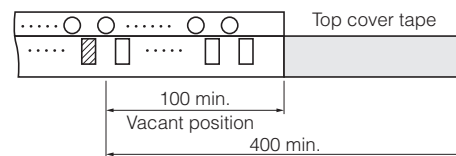
● Reel for Taping



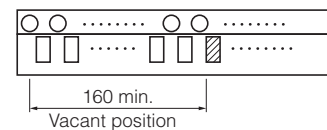
| Symbol | φA | φB | C | D | E | W ₁ | W ₂ |
|-----------|---------------------|-----------------------------------|----------|----------|---------|----------------------------------|----------------|
| Dim. (mm) | 180 ^{-0.3} | 60.0 ^{+1.0} ₀ | 13.0±0.5 | 21.0±0.8 | 2.0±0.5 | 9.0 ^{+1.0} ₀ | 11.4±1.0 |

● Leader Part and Taped End

Leader part



Taped end



(Unit : mm)

Minimum Quantity / Packing Unit

| Part Number (Size) | Minimum Quantity / Packing Unit | Packing Quantity in Carton | Carton L×W×H (mm) |
|--------------------|---------------------------------|----------------------------|-------------------|
| ERTJZ (0201) | 15,000 | 300,000 | 250×200×200 |
| ERTJ0 (0402) | 10,000 | 200,000 | 250×200×200 |
| ERTJ1 (0603) | 4,000 | 80,000 | 250×200×200 |

Part No., quantity and country of origin are designated on outer packages in English.