

## Ratings

|                                   |                          |                          |                          |
|-----------------------------------|--------------------------|--------------------------|--------------------------|
| Size code (EIA)                   | Z(0201)                  | 0(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<br>1 mW/°C | Approximately<br>2 mW/°C | Approximately<br>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 : $\pm 2\%$ , $\pm 1\%$ )

### ● 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                       | $\pm 1\%$ (F)<br>or<br>$\pm 2\%$ (G) | (3380 K)            | 3435 K $\pm 1\%$    |
| ERTJZEP473□  | 47 kΩ                       |                                      | 4050 K $\pm 1\%$    | (4100 K)            |
| ERTJZEP683□  | 68 kΩ                       |                                      | 4050 K $\pm 1\%$    | (4100 K)            |
| ERTJZER683□  | 68 kΩ                       |                                      | 4250 K $\pm 1\%$    | (4300 K)            |
| ERTJZER104□  | 100 kΩ                      |                                      | 4250 K $\pm 1\%$    | (4300 K)            |
| ERTJZET104□  | 100 kΩ                      |                                      | 4500 K $\pm 1\%$    | (4550 K)            |
| ERTJZEV104□  | 100 kΩ                      |                                      | 4700 K $\pm 1\%$    | (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                       | $\pm 1\%$ (F)<br>or<br>$\pm 2\%$ (G) | (3380 K)            | 3435 K $\pm 1\%$    |
| ERTJ0EP333□  | 33 kΩ                       |                                      | 4050 K $\pm 1\%$    | (4100 K)            |
| ERTJ0EP473□  | 47 kΩ                       |                                      | 4050 K $\pm 1\%$    | (4100 K)            |
| ERTJ0EP683□  | 68 kΩ                       |                                      | 4050 K $\pm 1\%$    | (4100 K)            |
| ERTJ0ER104□  | 100 kΩ                      |                                      | 4250 K $\pm 1\%$    | (4300 K)            |
| ERTJ0ES104□  | 100 kΩ                      |                                      | 4330 K $\pm 1\%$    | (4390 K)            |
| ERTJ0EV104□  | 100 kΩ                      |                                      | 4700 K $\pm 1\%$    | (4750 K)            |
| ERTJ0EV224□  | 220 kΩ                      |                                      | 4700 K $\pm 1\%$    | (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                       | $\pm 1\%$ (F)<br>or<br>$\pm 2\%$ (G) | (3380 K)            | 3435 K $\pm 1\%$    |
| ERTJ1VS104□A | 100 kΩ                      |                                      | (4330 K)            | 4390 K $\pm 1\%$    |

□ : Resistance Tolerance Code

## Part Number List of Standard Type (Resistance Tolerance : $\pm 5\%$ , $\pm 3\%$ )

### ● 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                      | $\pm 3\%$ (H)<br>or<br>$\pm 5\%$ (J) | 4500 K $\pm 2\%$    | (4450 K)            |
| ERTJZET302□  | 3.0 kΩ                      |                                      | 4500 K $\pm 2\%$    | (4450 K)            |
| ERTJZET472□  | 4.7 kΩ                      |                                      | 4500 K $\pm 2\%$    | (4450 K)            |
| ERTJZEG103□A | 10 kΩ                       |                                      | (3380 K)            | 3435 K $\pm 1\%$    |
| ERTJZEP473□  | 47 kΩ                       |                                      | 4050 K $\pm 2\%$    | (4100 K)            |
| ERTJZEP683□  | 68 kΩ                       |                                      | 4050 K $\pm 2\%$    | (4100 K)            |
| ERTJZER683□  | 68 kΩ                       |                                      | 4250 K $\pm 2\%$    | (4300 K)            |
| ERTJZER104□  | 100 kΩ                      |                                      | 4250 K $\pm 2\%$    | (4300 K)            |
| ERTJZET104□  | 100 kΩ                      |                                      | 4500 K $\pm 2\%$    | (4550 K)            |
| ERTJZEV104□  | 100 kΩ                      |                                      | 4700 K $\pm 2\%$    | (4750 K)            |
| ERTJZET154□  | 150 kΩ                      |                                      | 4500 K $\pm 2\%$    | (4750 K)            |
| ERTJZET224□  | 220 kΩ                      |                                      | 4500 K $\pm 2\%$    | (4750 K)            |

□ : Resistance Tolerance Code

● 0402(EIA)

| Part Number  | Nominal Resistance<br>at 25 °C | Resistance<br>Tolerance    | B Value<br>at 25/50(K) | B Value<br>at 25/85(K) |
|--------------|--------------------------------|----------------------------|------------------------|------------------------|
| ERTJ0EA220□  | 22 Ω                           | ±3 % (H)<br>or<br>±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<br>at 25 °C | Resistance<br>Tolerance  | B Value<br>at 25/50(K) | B Value<br>at 25/85(K) |
|--------------|--------------------------------|--------------------------|------------------------|------------------------|
| ERTJ1VA220□  | 22 Ω                           | ±3 %(H)<br>or<br>±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 <sub>25/50</sub> | 2750 K   | 2800 K   | (3375 K) | 3900 K   | 4050 K   | 4250 K   | 4330 K   | (4330 K) | 4500 K   | 4500 K   | 4700 K   |
| B <sub>25/85</sub> | (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<sub>25/50</sub> constant of 4500 K and a resistance value of 25 °C less than 10 kΩ. \*2 Applied only to ERTJ0ET104□.

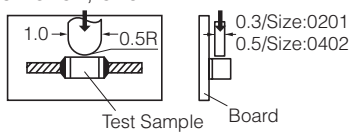
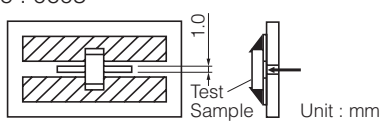
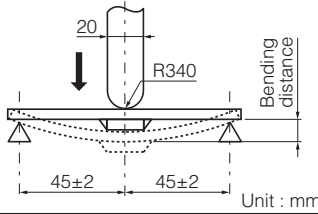
\*2 Apply to products with a B<sub>25/50</sub> constant of 4500 K and a resistance value of 25 °C of 10 kΩ or more. \*2 Applied only to ERTJ0ET104□.

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

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

R<sub>25</sub>=Resistance at 25.0±0.1 °C  
R<sub>50</sub>=Resistance at 50.0±0.1 °C  
R<sub>85</sub>=Resistance at 85.0±0.1 °C

## Specification and Test Method

| Item                                           | Specification                                                                                                                                                                                    | Test Method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |                |                |                    |              |              |                    |              |              |
|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----------------|----------------|--------------------|--------------|--------------|--------------------|--------------|--------------|
| Rated Zero-power Resistance (R <sub>25</sub> ) | 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.<br>* Individual Specification shall specify B <sub>25/50</sub> or B <sub>25/85</sub> .                                                                   | <p>The Zero-power resistances; R<sub>1</sub> and R<sub>2</sub>, shall be measured respectively at T<sub>1</sub> (deg.C) and T<sub>2</sub> (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>T<sub>1</sub></th><th>T<sub>2</sub></th></tr> </thead> <tbody> <tr> <td>B<sub>25/50</sub></td><td>25.0 ±0.1 °C</td><td>50.0 ±0.1 °C</td></tr> <tr> <td>B<sub>25/85</sub></td><td>25.0 ±0.1 °C</td><td>85.0 ±0.1 °C</td></tr> </tbody> </table> |      | T <sub>1</sub> | T <sub>2</sub> | B <sub>25/50</sub> | 25.0 ±0.1 °C | 50.0 ±0.1 °C | B <sub>25/85</sub> | 25.0 ±0.1 °C | 85.0 ±0.1 °C |
|                                                | T <sub>1</sub>                                                                                                                                                                                   | T <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |      |                |                |                    |              |              |                    |              |              |
| B <sub>25/50</sub>                             | 25.0 ±0.1 °C                                                                                                                                                                                     | 50.0 ±0.1 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |      |                |                |                    |              |              |                    |              |              |
| B <sub>25/85</sub>                             | 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 :<br/>           Size 0201 : 2 N<br/>           Size 0402, 0603 : 5 N<br/>           Duration : 10 s</p> <p>Size : 0201, 0402</p>  <p>Size : 0603</p>                                                                                                                                                                                                                                             |      |                |                |                    |              |              |                    |              |              |
| Bending Strength                               | There shall be no cracks and other mechanical damage.<br>R <sub>25</sub> change : within ±5 %                                                                                                    | <p>Bending distance : 1 mm<br/>           Bending speed : 1 mm/s</p>                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                |                |                    |              |              |                    |              |              |
| Resistance to Soldering Heat                   | There shall be no cracks and other mechanical damage.<br>Nallow Tol. type    Standard type<br>R <sub>25</sub> change : within ±2 %    within ±3 %<br>B Value change : within ±1 %    within ±2 % | <p>Soldering bath method<br/>           Solder temperature : 270 ±5 °C<br/>           Dipping period : 4.0 ±1 s<br/>           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   |
| 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<br/>           Solder temperature : 230 ±5 °C<br/>           Dipping period : 4 ±1 s<br/>           Solder : Sn-3.0Ag-0.5Cu</p>                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                |                |                    |              |              |                    |              |              |

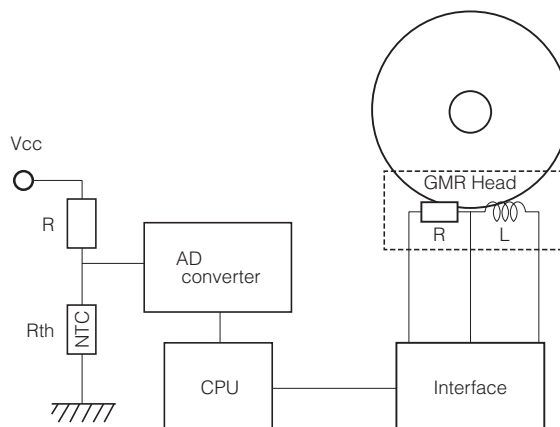
## Specification and Test Method

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

## Typical Application

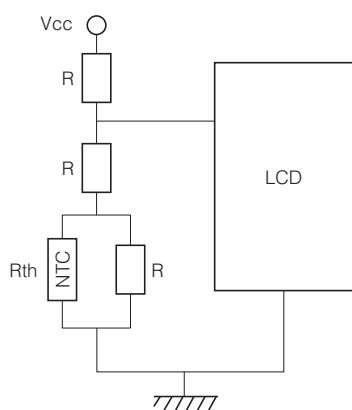
### ● Temperature Detection

Writing current control of HDD



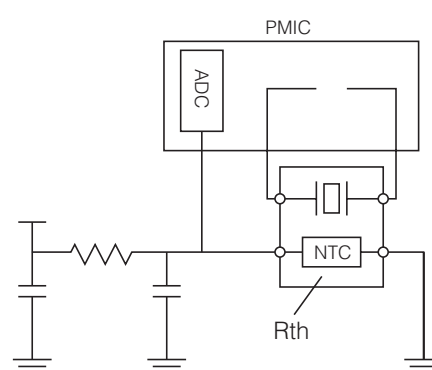
### ● Temperature Compensation (Pseudo-linearization)

Contrast level control of LCD

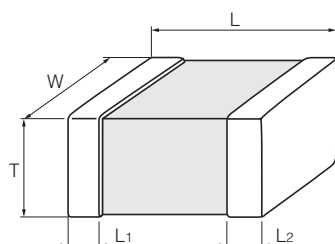


### ● Temperature Compensation (RF circuit)

Temperature compensation of TCXO



## Dimensions in mm (not to scale)



(Unit : mm)

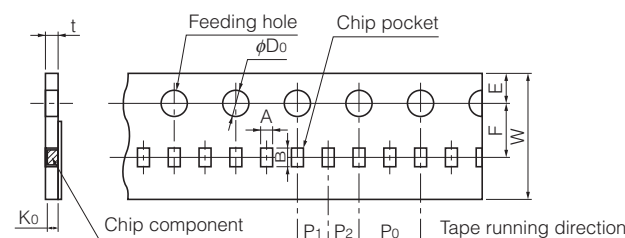
| Size Code (EIA) | L         | W         | T         | L <sub>1</sub> , L <sub>2</sub> |
|-----------------|-----------|-----------|-----------|---------------------------------|
| Z(0201)         | 0.60±0.03 | 0.30±0.03 | 0.30±0.03 | 0.15±0.05                       |
| 0(0402)         | 1.0±0.1   | 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

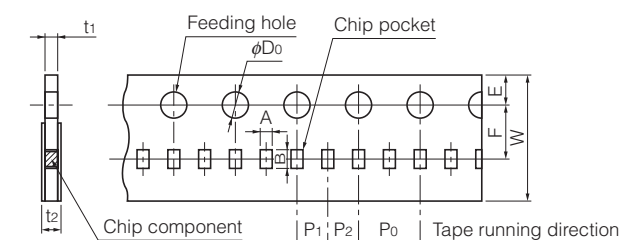
| Size Code | Thickness (mm) | Kind of Taping         | Pitch (mm) | Quantity (pcs./reel) |
|-----------|----------------|------------------------|------------|----------------------|
| Z(0201)   | 0.3            | Pressed Carrier Taping | 2          | 15,000               |
| 0(0402)   | 0.5       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

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



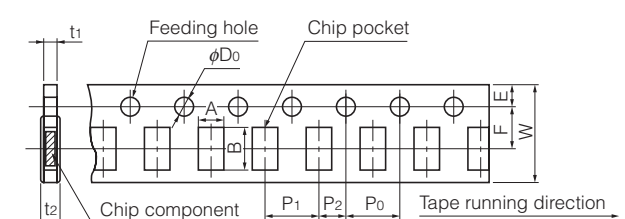
| Symbol    | A             | B             | W           | F             | E             | P <sub>1</sub> | P <sub>2</sub> | P <sub>0</sub> | φD <sub>0</sub> | t            | K <sub>0</sub> |
|-----------|---------------|---------------|-------------|---------------|---------------|----------------|----------------|----------------|-----------------|-----------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

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



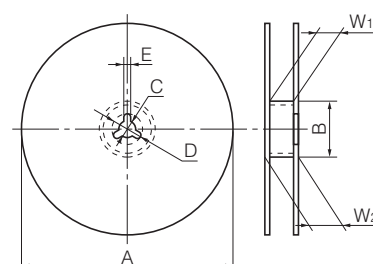
| Symbol    | A             | B             | W           | F             | E             | P <sub>1</sub> | P <sub>2</sub> | P <sub>0</sub> | φD <sub>0</sub> | t <sub>1</sub> | t <sub>2</sub> |
|-----------|---------------|---------------|-------------|---------------|---------------|----------------|----------------|----------------|-----------------|---------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

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



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

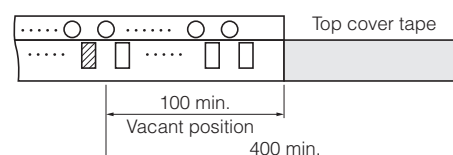
### ● Reel for Taping



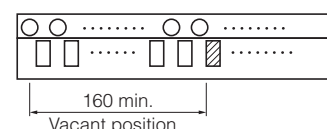
| Symbol    | φA                              | φB                                | C        | D        | E       | W <sub>1</sub>                   | W <sub>2</sub> |
|-----------|---------------------------------|-----------------------------------|----------|----------|---------|----------------------------------|----------------|
| Dim. (mm) | 180 <sup>-0</sup> <sub>-3</sub> | 60.0 <sup>+1.0</sup> <sub>0</sub> | 13.0±0.5 | 21.0±0.8 | 2.0±0.5 | 9.0 <sup>+1.0</sup> <sub>0</sub> | 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.

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