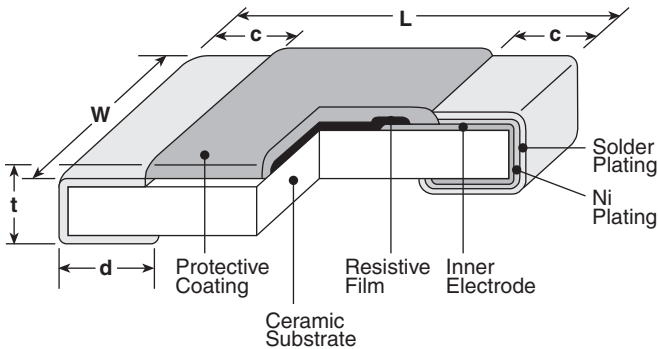


### features

- Twelve standard resistance values
- Products with lead-free terminations meet EU RoHS requirements. EU RoHS regulation is not intended for Pb-glass contained in electrode, resistor element and glass.

### dimensions and construction



| Type<br>(Inch Size Code) | Dimensions inches (mm) |                         |                        |  |   |
|--------------------------|------------------------|-------------------------|------------------------|--|---|
|                          | L                      | W                       | c                      | d  | t   |
| <b>1J</b><br>(0603)      | .063±.008<br>(1.6±0.2) | .031±.004<br>(0.8±0.1)  | .012±.004<br>(0.3±0.1) | .012±.004<br>(0.3±0.1)   | .02±.004<br>(0.5±0.1)   |
| <b>2A</b><br>(0805)      | .079±.008<br>(2.0±0.2) | .049±.004<br>(1.25±0.1) | .016±.008<br>(0.4±0.2) | .012 <sup>+0.008</sup> <sub>-0.004</sub><br>(0.3 <sup>+0.2</sup> <sub>-0.1</sub> ) | .02 <sup>+0.008</sup> <sub>-0.004</sub><br>(0.5 <sup>+0.2</sup> <sub>-0.1</sub> ) |
| <b>2B</b><br>(1206)      | .126±.008<br>(3.2±0.2) | .063±.008<br>(1.6±0.2)  | .02±.008<br>(0.5±0.3)  | .016 <sup>+0.008</sup> <sub>-0.004</sub><br>(0.4 <sup>+0.2</sup> <sub>-0.1</sub> ) | .024±.004<br>(0.6±0.1)  |

### ordering information

|             |                                  |  |                                       |                                      |                              |  |                             |
|-------------|----------------------------------|--|---------------------------------------|--------------------------------------|------------------------------|--|-----------------------------|
| <b>NT73</b> | <b>2A</b>                        | <b>T</b>   | <b>TD</b>                             | <b>103</b>                           | <b>K</b>                     | <b>3800</b>                                  | <b>J</b>                    |
| Type        | Size Code                        | Termination Material   | Packaging                             | Nominal Resistance                   | Resistance Tolerance         | B Constant Nominal                           | B Constant Tolerance        |
|             | 1J: 0603<br>2A: 0805<br>2B: 1206 | T: Sn<br>(Other termination styles may be available, please contact factory for options) | TD: 7" paper tape (5,000 pieces/reel) | 2 significant figures + 1 multiplier | J: ±5%<br>K: ±10%<br>L: ±15% | 3200<br>3500<br>3700<br>3800<br>3950<br>4100 | H: ±3%<br>J: ±5%<br>K: ±10% |

### applications and ratings

| Part Designation | Resistance @ 25°C | Resistance Tolerance       | B Constant @ 25°C/75°C | B Constant Tolerance | Power Rating (mW) | Operating Temperature Range |
|------------------|-------------------|----------------------------|------------------------|----------------------|-------------------|-----------------------------|
| NT731J           | 6.8kΩ             | J: ±5%<br>K: ±10%          | 3500K                  | ±10%                 | 5                 | -55°C to +125°C             |
|                  | 10kΩ              |                            |                        | ±5%                  |                   |                             |
|                  | 15kΩ              |                            |                        |                      |                   |                             |
|                  | 10kΩ              |                            | 3700K                  | ±3%                  |                   |                             |
|                  | 20kΩ              |                            |                        | ±5%                  |                   |                             |
|                  | 22kΩ              |                            |                        |                      |                   |                             |
|                  | 30kΩ              |                            | 3800K                  | ±5%                  |                   |                             |
|                  | 33kΩ              |                            |                        |                      |                   |                             |
|                  | 47kΩ              |                            |                        |                      |                   |                             |
|                  | 68kΩ              |                            | 4100K                  | ±3%                  |                   |                             |
|                  | 100kΩ             |                            |                        |                      |                   |                             |
|                  | 47kΩ              |                            |                        |                      |                   |                             |
| NT732A           | 1kΩ               | K: ±10%<br>L: ±15%         | 3200K                  | ±10%                 | 5                 |                             |
|                  | 2kΩ               |                            |                        |                      |                   |                             |
|                  | 2.2kΩ             |                            |                        |                      |                   |                             |
|                  | 2.4kΩ             |                            |                        |                      |                   |                             |
|                  | 3.3kΩ             | J: ±5%; K: ±10%<br>L: ±15% | 3500K                  | ±5%                  |                   |                             |
|                  | 4.7kΩ             |                            |                        |                      |                   |                             |
|                  | 5kΩ               |                            |                        |                      |                   |                             |
|                  | 5kΩ               |                            |                        |                      |                   |                             |

For further information on packaging, please refer to Appendix A.

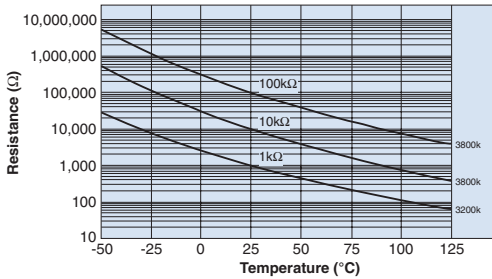
**applications and ratings (continued)**

| Part Designation | Resistance @ 25°C | Resistance Tolerance | B Constant @ 25°C/75°C | B Constant Tolerance | Power Rating (mW) | Operating Temperature Range |
|------------------|-------------------|----------------------|------------------------|----------------------|-------------------|-----------------------------|
| NT732A           | 6.8kΩ             | K: ±10%; L: ±15%     | 3800K                  | ±10%                 | 5                 | -55°C to +125°C             |
|                  | 10kΩ              |                      | 3500K                  |                      |                   |                             |
|                  | 15kΩ              |                      | 3800K                  |                      |                   |                             |
|                  | 10kΩ              |                      | 3800K                  |                      |                   |                             |
|                  | 20kΩ              |                      | 3800K                  |                      |                   |                             |
|                  | 22kΩ              |                      | 3800K                  |                      |                   |                             |
|                  | 30kΩ              |                      | 3800K                  |                      |                   |                             |
|                  | 33kΩ              |                      | 3800K                  |                      |                   |                             |
|                  | 47kΩ              |                      | 3800K                  | ±3%                  |                   |                             |
|                  | 68kΩ              |                      | 3800K                  |                      |                   |                             |
|                  | 100kΩ             |                      | 3800K                  |                      |                   |                             |
|                  | 150kΩ             |                      | 3800K                  |                      |                   |                             |
|                  | 50kΩ              |                      | 3950K                  |                      |                   |                             |
|                  | 10kΩ              |                      | 4100K                  |                      |                   |                             |
|                  | 15kΩ              |                      | 4100K                  | ±10%                 |                   |                             |
|                  | 20kΩ              |                      | 4100K                  |                      |                   |                             |
|                  | 22kΩ              |                      | 4100K                  |                      |                   |                             |
|                  | 30kΩ              |                      | 4100K                  |                      |                   |                             |
| 33kΩ             | 4100K             |                      |                        |                      |                   |                             |
| 47kΩ             | 4100K             |                      |                        |                      |                   |                             |
| NT732B           | 68kΩ              | K: ±10%; L: ±15%     | 3200K                  | ±10%                 | 5                 | -55°C to +125°C             |
|                  | 100kΩ             |                      | 3500K                  |                      |                   |                             |
|                  | 150kΩ             |                      | 3500K                  |                      |                   |                             |
|                  | 1kΩ               |                      | 3800K                  | ±5%                  |                   |                             |
|                  | 2.2kΩ             |                      | 3800K                  |                      |                   |                             |
|                  | 3.3kΩ             |                      | 3800K                  |                      |                   |                             |
|                  | 4.7kΩ             | 3800K                |                        |                      |                   |                             |
|                  | 6.8kΩ             | 3800K                |                        |                      |                   |                             |
|                  | 10kΩ              | 3800K                |                        |                      |                   |                             |
|                  | 22kΩ              | 3800K                | K: ±10%; L: ±15%       |                      |                   |                             |
|                  | 33kΩ              | 3800K                |                        |                      |                   |                             |
|                  | 47kΩ              | 3800K                |                        |                      |                   |                             |
| 68kΩ             | 3800K             |                      |                        |                      |                   |                             |
| 100kΩ            | 3800K             |                      |                        |                      |                   |                             |
| 150kΩ            | 3800K             |                      |                        |                      |                   |                             |

Thermal dissipation constant - in the atmosphere - (reference) 1J: 2.0mW/°C, 2A: 2.8mW/°C, 2B: 3.0mW/°C

**environmental applications**

**Temperature Characteristics**



**RT/R25 Ratio vs. B Constant**

| Resistance | 1k     | 5k     | 10k    | 100k   | 10k    | Resistance | 1k     | 5k      | 10k     | 100k   | 10k     |
|------------|--------|--------|--------|--------|--------|------------|--------|---------|---------|--------|---------|
| B Constant | 3200K  | 3500K  | 3700K  | 3800K  | 4100K  | B Constant | 3200K  | 3500K   | 3700K   | 3800K  | 4100K   |
| Temp. (°C) | k      | k      | k      | k      | k      | Temp. (°C) | k      | k       | k       | k      | k       |
| -55        | 38770  | 273.24 | 638.23 | 7692.5 | 1203.1 | 40         | 604.07 | 2.8809  | 5.5500  | 54.959 | 5.1999  |
| -50        | 28840  | 197.67 | 465.81 | 5414.6 | 820.76 | 45         | 515.10 | 2.4202  | 4.6100  | 45.484 | 4.2349  |
| -45        | 21706  | 144.85 | 343.25 | 3864.5 | 568.09 | 50         | 441.00 | 2.0421  | 3.8500  | 37.823 | 3.4692  |
| -40        | 16517  | 107.43 | 255.22 | 2794.3 | 398.57 | 55         | 379.00 | 1.7302  | 3.2300  | 31.594 | 2.8585  |
| -35        | 12696  | 80.577 | 191.37 | 2045.2 | 283.20 | 60         | 326.90 | 1.4718  | 2.7200  | 26.506 | 2.3692  |
| -30        | 9857.0 | 61.077 | 144.64 | 1514.1 | 203.64 | 65         | 282.95 | 1.2568  | 2.3100  | 22.330 | 1.9721  |
| -25        | 7721.2 | 46.759 | 110.13 | 1133.0 | 148.07 | 70         | 245.72 | 1.0771  | 1.9700  | 18.886 | 1.6504  |
| -20        | 6100.5 | 36.137 | 83.710 | 856.49 | 108.37 | 75         | 214.08 | 0.92637 | 1.6800  | 16.035 | 1.3877  |
| -15        | 4858.7 | 28.173 | 64.190 | 653.63 | 80.182 | 80         | 187.08 | 0.79937 | 1.4500  | 13.663 | 1.1724  |
| -10        | 3899.0 | 22.147 | 49.640 | 503.31 | 59.943 | 85         | 163.96 | 0.69199 | 1.2500  | 11.682 | 0.99491 |
| -5         | 3151.3 | 17.546 | 38.680 | 390.86 | 45.252 | 90         | 144.11 | 0.60087 | 1.0800  | 10.022 | 0.84926 |
| 0          | 2564.2 | 14.004 | 30.370 | 305.97 | 34.478 | 95         | 127.00 | 0.52329 | 0.94000 | 8.6257 | 0.72802 |
| 5          | 2099.9 | 11.256 | 23.970 | 241.34 | 26.473 | 100        | 112.21 | 0.45701 | 0.82000 | 7.4466 | 0.62662 |
| 10         | 1730.0 | 9.1063 | 19.070 | 191.73 | 20.506 | 105        | 99.377 | 0.40016 | 0.72000 | 6.4466 | 0.54156 |
| 15         | 1433.5 | 7.4135 | 15.270 | 153.36 | 16.016 | 110        | 88.224 | 0.35129 | 0.63000 | 5.5368 | 0.46982 |
| 20         | 1194.2 | 6.0712 | 12.320 | 123.46 | 12.608 | 115        | 78.501 | 0.30915 | 0.56000 | 4.8721 | 0.40906 |
| 25         | 1000.0 | 5.0000 | 10.000 | 100.00 | 10.000 | 120        | 70.004 | 0.27272 | 0.49000 | 4.2523 | 0.35741 |
| 30         | 841.48 | 4.1398 | 8.1700 | 81.470 | 7.9880 | 125        | 62.558 | 0.24114 | 0.44000 | 3.7207 | 0.31332 |
| 35         | 711.39 | 3.4451 | 6.7100 | 66.739 | 6.4242 |            |        |         |         |        |         |

**Performance Characteristics**

| Parameter                   | Requirement Δ R ±(%+0.05%) |                       | Test Method  |
|-----------------------------|----------------------------|-----------------------|--|
|                             | Limit                      | Typical               |  |
| Resistance                  | Within specified tolerance | —                     | 25°C   |
| B Constant                  | Within specified tolerance | —                     | +25°C/+75°C  |
| Resistance to Solder Heat   | Other: ±1%, ±2%:1kΩ        | Other: ±0.5%, ±1%:1kΩ | 260°C ± 5°C, 10 seconds ± 1 second                 |
| Rapid Change of Temperature | ±3.0%                      | ±1.3%                 | -55°C (30 minutes), +125°C (30 minutes), 50 cycles |
| Moisture Resistance         | ±3.0%                      | ±1.1%                 | 40°C ± 2°C, 90 - 95% RH, 1000 hours                |
| Load Life                   | ±3.0%                      | ±2.5%                 | 80°C ± 2°C, DC5mW, 1000 hours                      |
| High Temperature Exposure   | ±3.0%                      | ±1.6%                 | 80°C, 1000 hours                                   |

Confirming resistance drift is recommended since this product has a tendency to have bigger resistance change than general flat chip over 80°C. Please pay attention not to be applied ESD, it may cause of resistance change.

**Actual Value (Out of Guarantee)**

| Test Items                | Reference | Test Method                |
|---------------------------|-----------|----------------------------|
| High Temperature Exposure | ±7.0%     | 125°C, 1000 hours          |
| ESD                       | 500V      | Human model, 100 pF 1.5 kΩ |

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