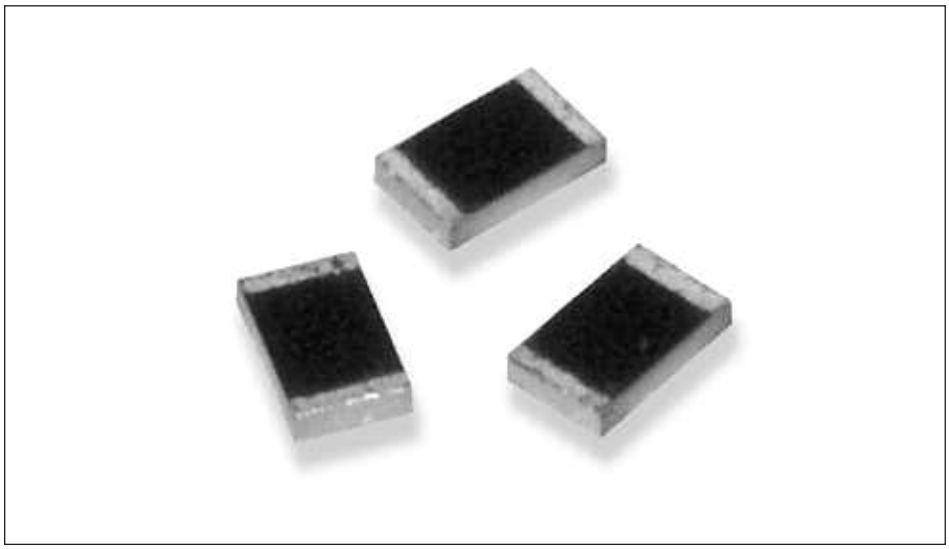
# Type RP73 Series

## Key Features

- High precision - tolerances down to 0.05%
- Low TCR - down to 5ppm/°C
- Stable high frequency performance
- Operating temperature -55°C to +155°C
- Increased power rating - up to 1.0W
- Up to 200V DC operating voltage
- Range of packaging options
- Terminal finish - electroplated 100% matte Sn



## Applications

- Communications
- Instrumentation
- Industrial Controls
- Medical

The RP73 resistor series is a stable thin film chip resistor range offering increased power dissipation, higher temperature capabilities and increased working voltages compared to the standard RN73 series. The resistor is produced by sputtering a metal film onto high grade alumina and protecting with three complete printed layers. Values are normally offered in E96 and E24 series. The RP73 resistor has accurate and uniform physical dimensions to reduce placement problems.

## Characteristics - Electrical - RP73 Series - Standard

| | 0402 | | | | | | | | | | | | | | | 0603 | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rated Power @ 70°C: | 0.063W | | | | | | | | | | | | | | | 0.1W | | | | | | | | | | | | | |
| Resistance Range (Ohms) Min: | 49R9 | 49R9 | 49R9 | 49R9 | 49R9 | 49R9 | 10R | 49R9 | 49R9 | 10R | | | | | | 24R9 | 4R7 | | 24R9 | 4R7 | 4R7 | 24R9 | 4R7 | 4R7 | | | | | |
| Max: | 5K0 | 15K | 100K | 5K0 | 15K | 70K | 255K | 5K0 | 15K | 255K | | | | | | 15K | 332K | | 15K | 332K | 1M0 | 15K | 332K | 1M0 | | | | | |
| Tolerance (%): | 0.05 | | | 0.1 | | | | 0.5 / 1 | | | | | | | | 0.05 | | | 0.1 | | | 0.5 / 1 | | | | | | | |
| Code Letter: | A | | | B | | | | D / F | | | | | | | | A | | | B | | | D / F | | | | | | | |
| Selection Series: | E24 & E96 | | | | | | | | | | | | | | | E24 & E96 | | | | | | | | | | | | | |
| Temp. Coefficient (ppm/°C): | 5 | 10 | 15 | 25 | 50 | 5 | 10 | 15 | 25 | 50 | 5 | 10 | 15 | 25 | 50 | 5 | 10 | 15 | 25 | 50 | 5 | 10 | 15 | 25 | 50 | 5 | 10 | 15 | 25 | 50 |
| Code Letter: | A | C | D | F | G | A | C | D | F | G | A | C | D | F | G | A | C | D | F | G | A | C | D | F | G | A | C | D | F | G |
| Limiting Element Voltage: | 25V | | | | | | | | | | | | | | | 75V | | | | | | | | | | | | | |
| Max. Overload Voltage: | 50V | | | | | | | | | | | | | | | 150V | | | | | | | | | | | | | |
| Operating Temp. Range: | -55 to +155°C | | | | | | | | | | | | | | | -55 to +155°C | | | | | | | | | | | | | |
| Climatic Category (°C): | 55/125/55 | | | | | | | | | | | | | | | 55/125/55 | | | | | | | | | | | | | |
| Insulation Resistance Dry Min: | 1000MΩ | | | | | | | | | | | | | | | 1000MΩ | | | | | | | | | | | | | |
| Stability: | 0.5% | | | | | | | | | | | | | | | 0.5% | | | | | | | | | | | | | |

| | 0805 | | | | | | | | | | | | | | | 1206 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rated Power @ 70°C: | 0.125W | | | | | | | | | | | | | | | 0.25W | | | | |
| Resistance Range (Ohms) Min: | 24R9 | 4R7 | | | | 24R9 | 4R7 | 4R7 | | | 24R9 | 4R7 | 4R7 | 1R0 | | 24R9 | 4R7 | | | |
| Max: | 30K | 511K | | | | 30K | 511K | 1M0 | | | 30K | 511K | 1M0 | 1M0 | | 50K | 1M0 | | | |
| Tolerance (%): | 0.05 | | | | | 0.1 | | | | | 0.5 / 1 | | | | | 0.05 / 0.1 / 0.5 / 1 | | | | |
| Code letter: | A | | | | | B | | | | | D / F | | | | | A / B / D / F | | | | |
| Selection Series: | E24 & E96 | | | | | | | | | | | | | | | E24 & E96 | | | | |
| Temp. Coefficient (ppm/°C): | 5 | 10 | 15 | 25 | 50 | 5 | 10 | 15 | 25 | 50 | 5 | 10 | 15 | 25 | 50 | 5 | 10 | 15 | 25 | 50 |
| Code Letter: | A | C | D | F | G | A | C | D | F | G | A | C | D | F | G | A | C | D | F | G |
| Limiting Element Voltage: | 150V | | | | | | | | | | | | | | | 200V | | | | |
| Max. Overload Voltage: | 300V | | | | | | | | | | | | | | | 400V | | | | |
| Operating Temp. Range: | -55 to +155°C | | | | | | | | | | | | | | | -55 to +155°C | | | | |
| Climatic Category (°C): | 55/125/55 | | | | | | | | | | | | | | | 55/125/55 | | | | |
| Insulation Resistance Dry Min: | 1000MΩ | | | | | | | | | | | | | | | 1000MΩ | | | | |
| Stability: | 0.5% | | | | | | | | | | | | | | | 0.5% | | | | |



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## Type RP73 Series

| | | 1210 | | | | | 2010 | | | | | 2512 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rated Power @ 70°C:** | | 0.3W | | | | | 0.3W | | | | | 1W | | | |
| **Resistance Range (Ohms)** | **Min:** | 24R9 | 4R7 | | | | 24R9 | 4R7 | | | | 4R7 | | 1R0 | |
| | **Max:** | 50K | 1M0 | | | | 50K | 1M0 | | | | 100R | | 100R | |
| **Tolerance (%):** | | 0.05 / 0.1 / 0.5 / 1 | | | | | 0.05 / 0.1 / 0.5 / 1 | | | | | 0.1 | | 0.5 / 1 | |
| **Code Letter:** | | A / B / D / F | | | | | A / B / D / F | | | | | B | | D / F | |
| **Selection Series:** | | E24 & E96 | | | | | E24 & E96 | | | | | E24 & E96 | | | |
| **Temp. Coefficient (ppm/°C):** | | 5 | 10 | 15 | 25 | 50 | 5 | 10 | 15 | 25 | 50 | 25 | 50 | 25 | 50 |
| **Code Letter:** | | A | C | D | F | G | A | C | D | F | G | F | G | F | G |
| **Limiting Element Voltage:** | | 200V | | | | | 200V | | | | | 200V | | | |
| **Max. Overload Voltage:** | | 400V | | | | | 400V | | | | | 400V | | | |
| **Operating Temp. Range:** | | -55 to +155°C | | | | | -55 to +155°C | | | | | -55 to +155°C | | | |
| **Climatic Category (°C):** | | 55/125/55 | | | | | 55/125/55 | | | | | 55/125/55 | | | |
| **Insulation Resistance Dry Min:** | | 1000MΩ | | | | | 1000MΩ | | | | | 1000MΩ | | | |
| **Stability:** | | 0.5% | | | | | 0.5% | | | | | 0.5% | | | |

## Characteristics - Electrical - RP73P Series - High Power

| | | 0603 | | | | | | 0805 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rated Power @ 70°C:** | | 0.166W | | | | | | 0.25W | | | | | |
| **Resistance Range (Ohms)** | **Min:** | 10R | | | | | | 10R | | | | | |
| | **Max:** | 332K | | | | | | 500K | | | | | |
| **Tolerance (%):** | | 0.1 | | 0.5 | | 1 | | 0.1 | | 0.5 | | 1 | |
| **Code Letter:** | | B | | D | | F | | B | | D | | F | |
| **Selection Series:** | | E24 & E96 | | | | | | E24 & E96 | | | | | |
| **Temp. Coefficient (ppm/°C):** | | 25 | 50 | 25 | 50 | 25 | 50 | 25 | 50 | 25 | 50 | 25 | 50 |
| **Code Letter:** | | F | G | F | G | F | G | F | G | F | G | F | G |
| **Limiting Element Voltage:** | | 100V | | | | | | 150V | | | | | |
| **Max. Overload Voltage:** | | 150V | | | | | | 300V | | | | | |
| **Operating Temp. Range:** | | -55 to +155°C | | | | | | -55 to +155°C | | | | | |
| **Climatic Category (°C):** | | 55/125/55 | | | | | | 55/125/55 | | | | | |
| **Insulation Resistance Dry Min:** | | 1000MΩ | | | | | | 1000MΩ | | | | | |
| **Stability:** | | 0.5% | | | | | | 0.5% | | | | | |

## Characteristics - Environmental

| Item | Requirement | | Test Method |
|---|---|---|---|
| | **Tol. ≤ 0.05%** | **Tol. > 0.05%** | |
| **Temperature Coefficient of Resistance (TCR):** | As per TCRs specified in value range table on page 1 | | +25/-55/+25/+125/+25°C |
| **Short Time Overload:** | ΔR ±0.05% | ΔR ±0.2%<br>ΔR ±0.2% for high power rating | RCWV* 2.5 or max. overload voltage for 5 seconds |
| **Insulation Resistance:** | >1000MΩ | | Apply 100VDC for 1 minute |
| **Endurance:** | ΔR ±0.05%<br>>7kΩ ΔR ±0.5% | ΔR ±0.2%<br>ΔR ±0.5% for high power rating | 70 ±2°C, max. working voltage for 1000hrs with 1.5hrs "ON" and 0.5 hrs "OFF" |
| **Damp Heat with Load:** | ΔR ±0.05% | ΔR ±0.3%<br>ΔR ±0.5% for high power rating | 40 ±2°C, 90 - 95% R.H. max. working voltage hrs with 1.5hrs "ON" and 0.5hrs "OFF" |
| **Bending Strength:** | ΔR ±0.05% | ΔR ±0.2% | Bending amplitude 3mm for 10 seconds |
| **Solderability:** | 95% min. coverage | | 245 ±5°C for 3 seconds |
| **Resistance to Soldering Heat:** | ΔR ±0.05% | ΔR ±0.2% | 260 ±5°C for 10 seconds |
| **Dielectric Withstand Voltage:** | By Type | | Max. overload voltage for 1 minute |
| **Thermal Shock:** | ΔR ±0.05% | ΔR ±0.25% | -55°C to +150°C, 100 cycles |
| **Low Temperature Operation:** | ΔR ±0.05% | ΔR ±0.2%<br>ΔR ±0.5% for high power rating | 1 hour, -65°C, followed by 45 minutes of RCWV |

**Reference Standards: MIL-STD-202, JIS-C 5201-1**

**Storage Temperature: 25±3°C; Humidity < 80%RH**



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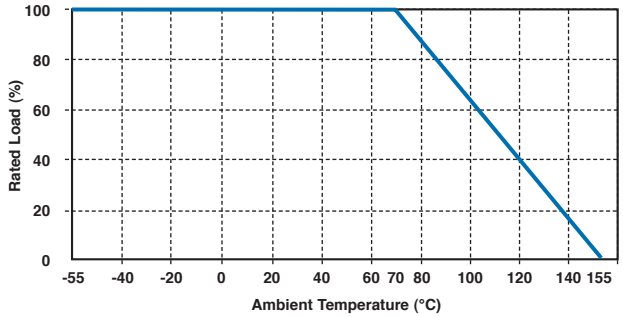
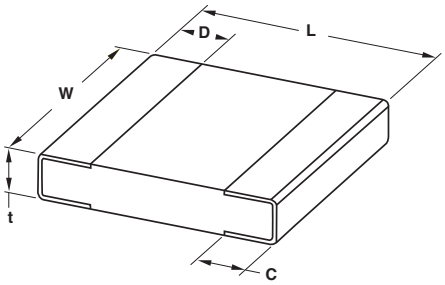
# Type RP73 Series

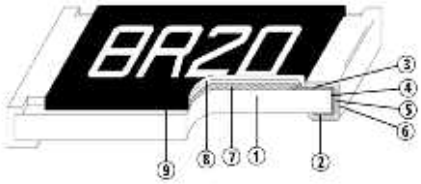
## Power Derating Curve




For resistors operated in ambient temperatures above 70°C, power rating must be derated in accordance with this curve.

## Dimensions




| | | |
|---|---|---|
| 1. Alumina Substrate | 4. Edge Electrode (NiCr) | 7. Resistor Layer (NiCr) |
| 2. Bottom Electrode (Ag) | 5. Barrier Layer (Ni) | 8. Overcoat (Epoxy) |
| 3. Top Electrode (Ag-Pd) | 6. External Electrode (Sn) | 9. Marking |

| Part Number | L | W | t | D | C | Weight (g) 1000 pieces |
|---|---|---|---|---|---|---|
| RP73 1E (0402) | 1.00 ±0.05 | 0.50 ±0.05 | 0.30 ±0.05 | 0.20 ±0.10 | 0.20 ±0.10 | 0.54 |
| RP73(P) 1J (0603) | 1.55 ±0.10 | 0.80 ±0.10 | 0.45 ±0.10 | 0.30 ±0.20 | 0.30 ±0.20 | 1.83 |
| RP73(P) 2A (0805) | 2.00 ±0.15 | 1.25 ±0.15 | 0.55 ±0.10 | 0.30 ±0.20 | 0.40 ±0.25 | 4.71 |
| RP73 2B (1206) | 3.05 ±0.15 | 1.55 ±0.15 | 0.55 ±0.10 | 0.42 ±0.20 | 0.35 ±0.25 | 9.02 |
| RP73 2E (1210) | 3.10 ±0.15 | 2.40 ±0.15 | 0.55 ±0.10 | 0.40 ±0.20 | 0.55 ±0.25 | 10.00 |
| RP73 2H (2010) | 4.90 ±0.15 | 2.40 ±0.15 | 0.55 ±0.10 | 0.60 ±0.30 | 0.50 ±0.25 | 23.61 |
| RP73 3A (2512) | 6.30 ±0.15 | 3.10 ±0.15 | 0.55 ±0.10 | 0.60 ±0.30 | 0.50 ±0.25 | 38.08 |

## Marking Codes - Case Sizes 0805 to 2512

### IEC 4 Digit Marking

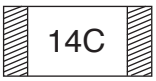
| Resistance: | 100Ω | 2.2KΩ | 10KΩ | 49.9KΩ | 100KΩ |
|---|---|---|---|---|---|
| Marking Code: | 1000 | 2201 | 1002 | 4992 | 1003 |

## Case Sizes 0603

### E24 3 Digit Marking - Example: 101=100Ω 102=1KΩ

| E24 | 10 | 11 | 12 | 13 | 15 | 16 | 18 | 20 | 22 | 24 | 27 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 33 | 36 | 39 | 43 | 47 | 51 | 56 | 62 | 68 | 75 | 82 | 91 |

### E96 3 Digit Marking - Examples: 14C=13K7Ω, 13C=13K3Ω, 68B=4K99Ω, 68X=49.9Ω



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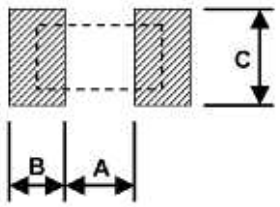
# Type RP73 Series

### 0603 E96 Marking Code Table

| Code | E96 | Code | E96 | Code | E96 | Code | E96 |
|---|---|---|---|---|---|---|---|
| 01 | 100 | 25 | 178 | 49 | 316 | 73 | 562 |
| 02 | 102 | 26 | 182 | 50 | 324 | 74 | 576 |
| 03 | 105 | 27 | 187 | 51 | 332 | 75 | 590 |
| 04 | 107 | 28 | 191 | 52 | 340 | 76 | 604 |
| 05 | 110 | 29 | 196 | 53 | 348 | 77 | 619 |
| 06 | 113 | 30 | 200 | 54 | 357 | 78 | 634 |
| 07 | 115 | 31 | 205 | 55 | 365 | 79 | 649 |
| 08 | 118 | 32 | 210 | 56 | 374 | 80 | 665 |
| 09 | 121 | 33 | 215 | 57 | 383 | 81 | 681 |
| 10 | 124 | 34 | 221 | 58 | 392 | 82 | 698 |
| 11 | 127 | 35 | 226 | 59 | 402 | 83 | 715 |
| 12 | 130 | 36 | 232 | 60 | 412 | 84 | 732 |
| 13 | 133 | 37 | 237 | 61 | 422 | 85 | 750 |
| 14 | 137 | 38 | 243 | 62 | 432 | 86 | 768 |
| 15 | 140 | 39 | 249 | 63 | 442 | 87 | 787 |
| 16 | 143 | 40 | 255 | 64 | 453 | 88 | 806 |
| 17 | 147 | 41 | 261 | 65 | 464 | 89 | 825 |
| 18 | 150 | 42 | 267 | 66 | 475 | 90 | 845 |
| 19 | 154 | 43 | 274 | 67 | 487 | 91 | 866 |
| 20 | 158 | 44 | 280 | 68 | 499 | 92 | 887 |
| 21 | 162 | 45 | 287 | 69 | 511 | 93 | 909 |
| 22 | 165 | 46 | 294 | 70 | 523 | 94 | 931 |
| 23 | 169 | 47 | 301 | 71 | 536 | 95 | 953 |
| 24 | 174 | 48 | 309 | 72 | 549 | 96 | 976 |

| Code | A | B | C | D | E | F | G | H | X | Y | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Multiplier | $10^0$ | $10^1$ | $10^2$ | $10^3$ | $10^4$ | $10^5$ | $10^6$ | $10^7$ | $10^{-1}$ | $10^{-2}$ | $10^{-3}$ |

## Recommend Land Pattern




| Type | A | B | C |
|---|---|---|---|
| **RP73 1E (0402)** | 0.5 | 0.5 | 0.60 ±0.2 |
| **RP73(P) 1J (0603)** | 0.8 | 1.0 | 0.90 ±0.2 |
| **RP73(P) 2A (0805)** | 1.0 | 1.0 | 1.35 ±0.2 |
| **RP73 2B (1206)** | 2.0 | 1.15 | 1.70 ±0.2 |
| **RP73 2E (1210)** | 2.0 | 1.15 | 2.50 ±0.2 |
| **RP73 2H (2010)** | 3.6 | 1.4 | 2.50 ±0.2 |
| **RP73 3A (2512)** | 4.9 | 1.6 | 3.10 ±0.2 |



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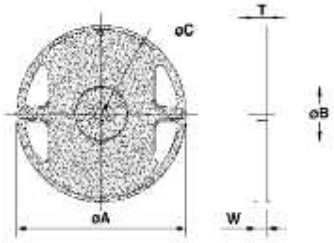
# Type RP73 Series

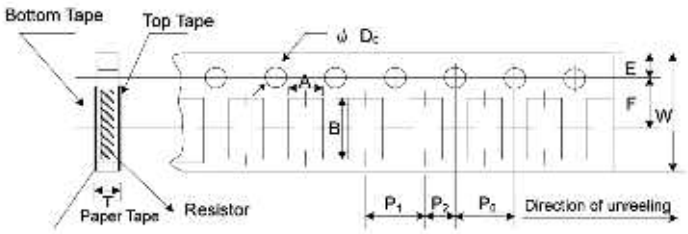
## Packaging Quantity & Reel Specifications




| Type | øA | øB | øC | W | T | Paper Tape (EA) | Embossed Plastic Tape (EA) |
|---|---|---|---|---|---|---|---|
| **RP73 1E (0402)** | 178.0 ±1.0 | 60.0 +1.0 | 13.5 ±0.7 | 9.5 ±1.0 | 11.5 ±1.0 | *250 / 1000 / 5000 | - |
| **RP73(P) 1J (0603)** | 178.0 ±1.0 | 60.0 +1.0 | 13.5 ±0.7 | 9.5 ±1.0 | 11.5 ±1.0 | *250 / 1000 / 5000 | - |
| **RP73(P) 2A (0805)** | 178.0 ±1.0 | 60.0 +1.0 | 13.5 ±0.7 | 9.5 ±1.0 | 11.5 ±1.0 | *250 / 1000 / 5000 | - |
| **RP73 2B (1206)** | 178.0 ±1.0 | 60.0 +1.0 | 13.5 ±0.7 | 9.5 ±1.0 | 11.5 ±1.0 | *250 / 1000 / 5000 | - |
| **RP73 2E (1210)** | 178.0 ±1.0 | 60.0 +1.0 | 13.5 ±0.7 | 9.5 ±1.0 | 11.5 ±1.0 | *250 / 1000 / 5000 | - |
| **RP73 2H (2010)** | 178.0 ±1.0 | 60.0 +1.0 | 13.5 ±0.7 | 13.5 ±1.0 | 15.5 ±1.0 | - | 1000 / 4000 |
| **RP73 3A (2512)** | 178.0 ±1.0 | 60.0 +1.0 | 13.5 ±0.7 | 13.5 ±1.0 | 15.5 ±1.0 | - | 1000 / 4000 |

* 250 piece packs supplied in sealed bags of cut tape length

## Paper Tape Specification




| Type | A | B | W | E | F | $P_0$ | $P_1$ | $P_2$ | $øD_0$ | T |
|---|---|---|---|---|---|---|---|---|---|---|
| **RP73 1E (0402)** | 0.70 ±0.05 | 1.16 ±0.05 | 8.00 ±0.10 | 1.75 ±0.05 | 3.5 ±0.05 | 4.00 ±0.10 | 2.00 ±0.05 | 2.00 ±0.05 | 1.55 ±0.05 | 0.40 ±0.03 |
| **RP73(P) 1J (0603)** | 1.10 ±0.05 | 1.90 ±0.05 | 8.00 ±0.10 | 1.75 ±0.05 | 3.5 ±0.05 | 4.00 ±0.10 | 4.00 ±0.10 | 2.00 ±0.05 | 1.55 ±0.05 | 0.60 ±0.03 |
| **RP73(P) 2A (0805)** | 1.60 ±0.05 | 2.37 ±0.05 | 8.00 ±0.10 | 1.75 ±0.05 | 3.5 ±0.05 | 4.00 ±0.10 | 4.00 ±0.10 | 2.00 ±0.05 | 1.55 ±0.05 | 0.75 ±0.05 |
| **RP73 2B (1206)** | 2.00 ±0.05 | 3.55 ±0.05 | 8.00 ±0.10 | 1.75 ±0.05 | 3.5 ±0.05 | 4.00 ±0.10 | 4.00 ±0.10 | 2.00 ±0.05 | 1.55 ±0.05 | 0.75 ±0.05 |
| **RP73 2E (1210)** | 2.75 ±0.05 | 3.40 ±0.05 | 8.00 ±0.10 | 1.75 ±0.05 | 3.5 ±0.05 | 4.00 ±0.05 | 4.00 ±0.10 | 2.00 ±0.05 | 1.60 ±0.10 | 0.75 ±0.05 |



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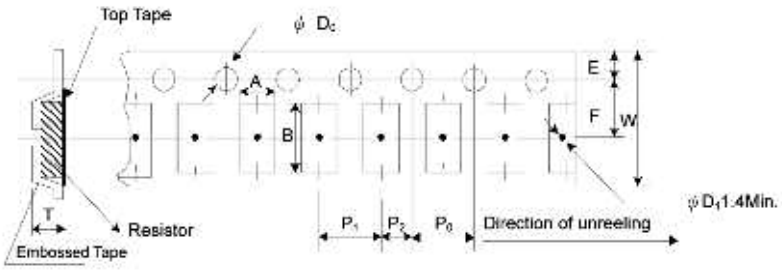
# Type RP73 Series

## Embossed Plastic Tape Specifications




| Type | A | B | W | E | F | $P_0$ | $P_1$ | $P_2$ | $øD_0$ | T |
|---|---|---|---|---|---|---|---|---|---|---|
| **RP73 2H (2010)** | 2.85 ±0.10 | 5.45 ±0.10 | 12.0 ±0.10 | 1.75 ±0.10 | 5.5 ±0.05 | 4.00 ±0.05 | 4.00 ±0.10 | 2.00 ±0.05 | 1.50 +0.10 | 1.00 ±0.20 |
| **RP73 3A (2512)** | 3.40 ±0.10 | 6.65 ±0.10 | 12.0 ±0.10 | 1.75 ±0.10 | 5.5 ±0.05 | 4.00 ±0.05 | 4.00 ±0.10 | 2.00 ±0.05 | 1.50 +0.10 | 1.00 ±0.20 |

## How to Order

| RP73 | C | 2A | 1K0 | B | TG |
|---|---|---|---|---|---|
| **Common Part** | **Temp. Coefficient** | **Package Size** | **Resistor Value** | **Tolerance** | **Packaging** |
| RP73 - Standard<br>RP73P - High Power | A - ±5ppm/°C<br>C - ±10ppm/°C<br>D - ±15ppm/°C<br>F - ±25ppm/°C<br>G - ±50ppm/°C | 1E - 0402<br>1J - 0603<br>2A - 0805<br>2B - 1206<br>2E - 1210<br>2H - 2010<br>3A - 2512 | 100R<br>(100 Ohms)<br>1K0<br>(1000 Ohms)<br>10K<br>(10,000 Ohms)<br>100K<br>(100,000 Ohms)<br>1M0<br>(1,000,000 Ohms) | A - ±0.05%<br>B - ±0.1%<br>D - ±0.5%<br>F - ±1% | TG - Cut Tape<br>(250 pcs)<br>TDF - Reel<br>(1000 pcs)<br>TD - Reel<br>(5000 pcs)<br>TDG - Reel<br>(250 pcs)<br>TE - Reel<br>(4000 pcs)<br>2H & 3A only |

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