

Type RQ73 Series

Key Features

SMD TaN Thin film resistor

Special passivation layer on resistive element

AEC-Q200 qualified

Sulfur resistant

RoHS Compliant



TE Connectivity is proud to introduce this automotive grade thin film precision chip resistor, a sister to our highly successful RN73 range. The resistors are constructed in a high grade raw materials and laser trimmed to give precise tolerance figures. This, coupled with the tight TCR and anti-corrosive protection layer gives us a range of resistors which are ideal not just for automotive applications, but also for medical equipment, measuring instruments and industrial applications.

Characteristics – Electrical

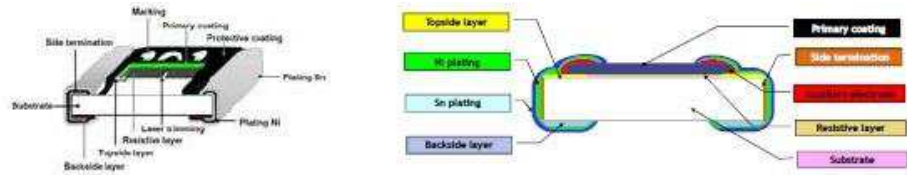
| Type | RQ73 1E | RQ73 1J | RQ73 2A | RQ73 2B |
|---|-------------|------------|------------|-----------|
| Size | 0402 | 0603 | 0805 | 1206 |
| Resistance tolerance | ±0.1% | | | |
| Resistance Range | 40R ~ 35K | 40R ~ 130K | 10R ~ 350K | 10R ~ 1M0 |
| TCR (ppm/°C) | ±10PPM/°C | | | |
| Power rating @ 85°C | 0.0625W | 0.15W | 0.2W | 0.4W |
| Max. Working Voltage (DC or RMS) ^{1 2} | 50V | 75V | 100V | 200V |
| Max. Overload Voltage (DC or RMS) | 100V | 150V | 200V | 400V |
| Operating Temperature | -55 ~ 155°C | | | |

Notes:

1. This is the maximum voltage that may be continuously supplied to the resistor element, see "IEC publication 60115-8"
2. Max. Operation Voltage : So called RCWV (Rated Continuous Working Voltage) determined by

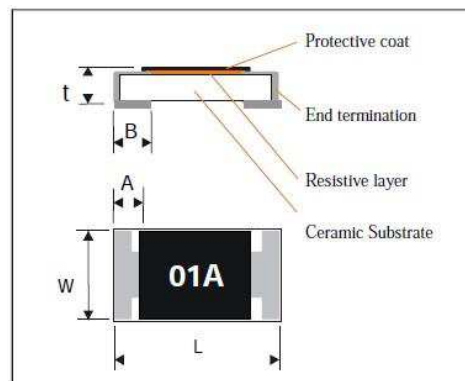
$$RCWV = \sqrt{\text{Rated Power} \times \text{Resistance Value}} \text{ or Max. RCWV listed above, whichever is lower.}$$

Construction

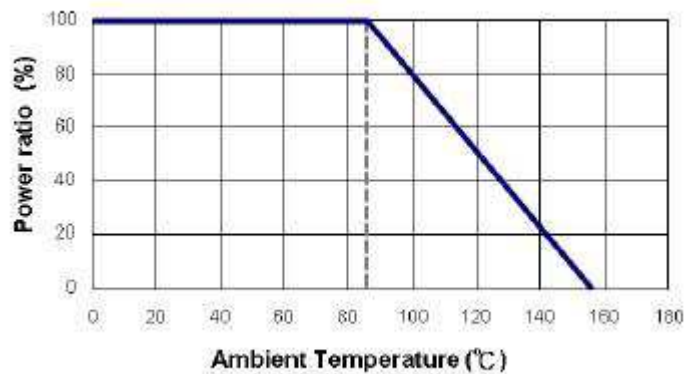


Dimensions: (mm)

| Type | RQ73 1E | RQ73 1J | RQ73 2A | RQ73 2B |
|------|-------------|-------------|-------------|-------------|
| L | 1.00 ± 0.05 | 1.55 ± 0.10 | 2.00 ± 0.15 | 3.05 ± 0.15 |
| W | 0.50 ± 0.05 | 0.80 ± 0.10 | 1.25 ± 0.15 | 1.55 ± 0.15 |
| A | 0.20 ± 0.10 | 0.30 ± 0.20 | 0.30 ± 0.20 | 0.42 ± 0.20 |
| B | 0.20 ± 0.10 | 0.30 ± 0.20 | 0.40 ± 0.20 | 0.35 ± 0.25 |
| t | 0.30 ± 0.05 | 0.45 ± 0.10 | 0.55 ± 0.10 | 0.55 ± 0.10 |



Derating Curve



Environmental Characteristics

| Test | Procedure | Requirement |
|--|--|--|
| Temperature Coefficient of Resistance (T.C.R.) | JIS-C-5201-1 4.8 IEC-60115-1 4.8 -55°C~+125°C, 25°C is the reference temperature | As Spec. |
| Short time overload | JIS-C-5201-1 4.13 RCWV*2.5 or Max. overload voltage whichever is lower for 5 seconds | ΔR±0.1% |
| Resistance to soldering heat | JIS-C-5201-1 4.18 IEC-60115-1 4.18 260±5°C for 10 seconds | ΔR±0.1% |
| Solderability | JIS-C-5201-1 4.17 IEC-60115-1 4.17 245±5°C for 3 seconds | 95% min. coverage |
| Temperature Cycling | JESD22 Method JA-104 -55°C to +125°C, 1000cycles | ΔR±0.1% for 125°C |
| | JESD22 Method JA-104 -55°C to +155°C, 1000cycles | ΔR±0.2% for 155 |
| Bias Humidity | MIL-STD-202 Method 103 1000 hrs 85°C/85%RH 10% of operating power. | ΔR±0.1% |
| Load Life | IEC60115-1 4.25 1000 +48/-0 hours, loaded with RCWV or Vmax in chamber controller 85 ±2°C, 1.5 hours on and 0.5 hours off | ΔR±0.1% |
| Operational Life | MIL-STD-202 Method 108 Condition D Steady State TA=125°C at derated power. Measurement at 24±4 hours after test conclusion. | ΔR±0.1% |
| High Temperature Exposure | MIL-STD-202 Method 108 at +155°C for 1000 hrs | ΔR±0.1% |
| Moisture Resistance | MIL-STD-202 Method 106 65±2°C, 80~100% RH, 10 cycles, 24 hours/cycle | ΔR±0.1% |
| Mechanical Shock | MIL-STD-202 Method 213 Wave Form: Tolerance for half sine shock pulse. Peak value is 100g's. Normal duration(D) is 6. | ΔR±0.1% |
| Vibration | MIL-STD-202 Method 204 5 g's for 20 min., 12 cycles each of 3 orientations, 10-2000 Hz | ΔR±0.1% |
| Terminal strength | AEC-Q200-006 Force of 1kg for 60 seconds. | No Damage |
| Board flex | JIS-C-5201-1 4.33 Bending 2mm for 60seconds | ΔR±0.1% |
| Flower of sulfur test | EIA-977(Conditions B) 105±2 °C no power rating for 750 hrs. | ΔR±1% |
| ESD | AEC-Q200-002 Human body model RQ0402 · RQ0603 0.2KV RQ0805 · RQ1206 1KV | ΔR±0.1% |
| Resistance to solvents | MIL-STD-202 Method 215 Add Aqueous wash chemical -OKEM Clean or equivalent. Do not use banned solvents. | Marking Unsmearred |
| Flammability | UL-94 V-0 or V-1 are acceptable. Electrical test not required. | No ignition of the tissue paper or scorching or the pinewood board |

Marking:

0603 E24 series 3 Digits – first two digits denote significant figures of resistance and third digit denotes number of zeros thereafter. EG

| | | |
|--|-----|--|
| | 222 | |
|--|-----|--|

 =
 2K2

0603 E96 series 3 Digits - The 1st two digit codes are referring to the CODE in the table, the 3rd code is the index of resistance value :

$Y=10^{-2}$, $X=10^{-1}$, $A=10^0$, $B=10^1$, $C=10^2$, $D=10^3$, $E=10^4$, $F=10^5$

EX : $17.8\Omega=25X$, $178\Omega=25A$, $1K78 =25B$

$17K8=25C$, $178K=25D$, $1M78=25E$

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

0805 & 1206 E24 and E96 4 digits – Where value is below 100R use R as decimal, otherwise three significant figures plus number of following zeros.

E.G.

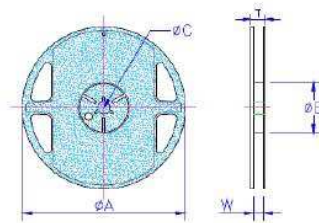
| Resistance | 10 Ω | 12 Ω | 100 Ω | 6K8 | 47K |
|-----------------|-------------|-------------|--------------|------|------|
| 4 digit marking | 10R0 | 12R0 | 1000 | 6801 | 4702 |

Notes:

1. No marking for non-E24/E96 resistance values.
2. No marking for 0402 size resistors

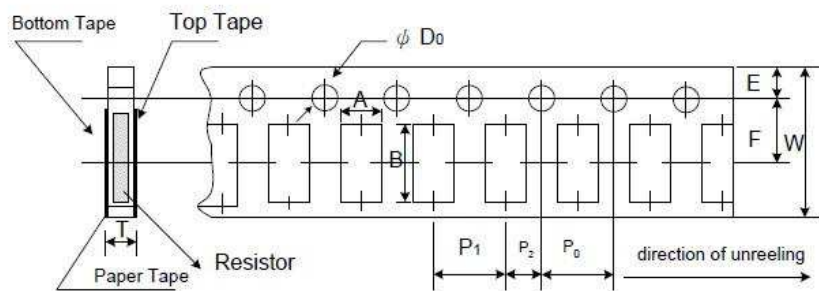
Packaging

Reel Dimensions (mm)



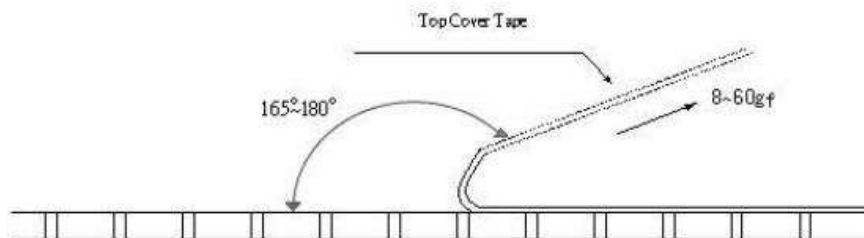
| ØA | ØB | ØC | W | T | QTY |
|-------|------|------|------|------|--------|
| 178.0 | 60.0 | 13.5 | 9.5 | 1.5 | 1000 / |
| ±1.0 | +1.0 | ±0.7 | ±1.0 | ±1.0 | 5000 |

Paper Tape Specification (mm)



| | A | B | W | E | F | P ₀ | P ₁ | P ₂ | ØD ₀ | T |
|------|---------------|---------------|---------------|---------------|--------------|----------------|----------------|----------------|-----------------|---------------|
| 0402 | 1.16 ±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 |
| 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 |
| 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 |
| 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 |

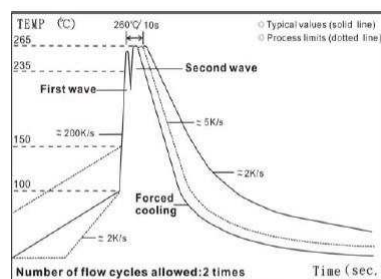
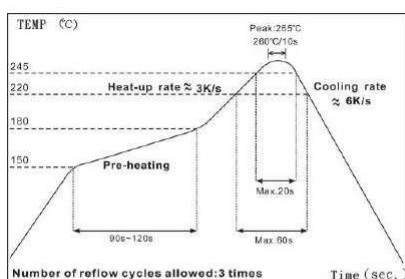
- Peel force of top cover tape
- The peel speed shall be about 300mm/min±5%
- The peel force of top cover tape shall be between 8gf to 60gf



Storage and Handling Condition:

1. Products are recommended to be used up within two years. Check solderability in case shelf life extension is needed.
2. To store products with following condition:
 Temperature : 5 to 40°C
 Humidity : 20 to 70% relative humidity
3. Caution:
 - a. Don't store products in a corrosive environment such as sulfide, chloride gas, or acid. It may cause oxidation of electrode, which easily be resulted in poor soldering.
 - b. To store products on the shelf and avoid exposure to moisture.
 - c. Don't expose products to excessive shock, vibration, direct sunlight etc.

Soldering Profile



IR Reflow Soldering

Wave Soldering (Flow Soldering)

- (1) Time of IR reflow soldering at maximum temperature point 260°C : 10s
- (2) Time of wave soldering at maximum temperature point 260°C : 10s
- (3) Time of soldering iron at maximum temperature point 410°C : 5s

How To Order

RQ73 C 1E 40R2 B TDF

| Common Part | TCR | Size Code | Resistance Value | Tolerance | Packaging Spec. |
|-------------|--------------|--|---|-----------|-----------------------------------|
| RQ73 | C = 10PPM/°C | 1E = 0402 1J = 0603 2A = 0805 2B = 1206 | 100R (100Ω) 1K0 (1000Ω) 100K (100,000Ω) | B = .1% | TD = Reel 5000 TDF = Reel 1000 |

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