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# Thin Film Precision Chip Resistors

## Features

- TRSTNF – 0402 package
- Tantalum nitride thin film resistor
- High stability in humid environments
- Tight tolerance down to ±0.1%
- Extremely low TCR down to ±25PPM/°C
- Resistance values from 100 ohm to 27k ohm
- Test proven immunity to humidity, moisture, and sulfur
- Manufactured in accordance with AEC-Q200 compliance

## RS PRO Thin Film Chip Resistors TRSTNF02 Series

RS Stock No.:

243-0691, 243-0692, 243-0693, 243-0694, 243-0695, 243-0696, 243-0697, 243-0698, 243-0700, 243-0701, 243-0702, 243-0703, 243-0704, 243-0705, 243-0707, 243-0708, 243-0709, 243-0710, 243-0711, 243-0713, 243-0714, 243-0715, 243-0716, 243-0717




RS PRO is the own brand of RS. The RS PRO Seal of Approval is your assurance of professional quality, a guarantee that every part is rigorously tested, inspected, and audited against demanding standards. Making RS PRO the Smart Choice for our customers.

# Thin Film Precision Chip Resistors

## Product Description

Applications Include:

- Automotive
- Medical Equipment
- Testing/Measurement Equipment
- Automatic Equipment Controller
- Converters
- Communication Devices

## Dimensions

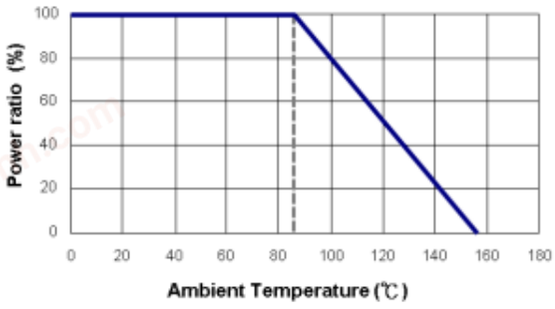
| Type | RS Article | Size (Inch) | L | W | T | D1 | D2 | Weight (g) (1000pcs) |
|---|---|---|---|---|---|---|---|---|
| TRSTNF02 | 2430692<br>2430694<br>2430696<br>2430698<br>2430701<br>2430703<br>2430705<br>2430708<br>2430710<br>2430713<br>2430715<br>2430717<br>2430691<br>2430693<br>2430695<br>2430697<br>2430700<br>2430702<br>2430704<br>2430707<br>2430709<br>2430711<br>2430714<br>2430716 | 0402 | 1.00±0.05 | 0.50±0.05 | 0.30±0.05 | 0.20±0.10 | 0.20±0.10 | 0.54 |

## Part Number Make Up

| Part Number | Package Dimensions | Resistance Tolerance | Packaging Code | TCR (PPM/°C) | Power Rating | Resistance Ohmic value |
|---|---|---|---|---|---|---|
| TRSTNF | 02: 0402 | B: ±0.1% | T: Taping Reel | C: ±25 | Y: 1/16W | 0010: 1Ω<br>1001: 1KΩ<br>1004: 1MΩ |

# Thin Film Precision Chip Resistors

## Derating Curve




## Electrical Specifications

| Type | Power Rating at 85°C | Operating Temp. Range | Max Operating Voltage | Max. Overload Voltage | Resistance Range ±0.1% | TCR (PPM/°c) |
|---|---|---|---|---|---|---|
| TRSTNF02 (0402) | 1/16W | -55°C~ +155°c | 50V | 100V | 100Ω-27kΩ | ±25 |

Operating voltage=√(P*R) or Max. operating voltage listed above, whichever is lower.

Overload voltage= 2.5*√(P*R) or Max. overload voltage listed above, whichever is lower.

## Environmental Characteristics

| Item | Requirement | Test Method |
|---|---|---|
| Temperature Coefficient of Resistance (T.C.R.) | As Spec | JIS-C-5201-1 4.8<br>IEC-60115-1 4.8<br>-55°C~+125°C, 25°C is the reference temperature |
| Short Time Overload | ±0.1% | JIS-C-5201-1 4.13<br>RCWV*2.5 or Max overload voltage whichever is lower for 5 seconds |
| Insulation Resistance | >1000 MΩ | JIS-C-5201-1 4.6<br>IEC-60115-1 4.6<br>Apply 100VDC for 1 minute |
| Operational Life | ±0.1% | MIL-STD-202 Method 108<br>Condition D Steady State $T_A$ = 125°C at derated power.<br>Measurement at 24±4 hours after test conclusion. |
| Biased Humidity | ±0.1% | MIL-STD-202 Method 103<br>1000hrs 85°C/85%RH 10% of operating power. |
| High Temperature Exposure | ±0.15% | MIL-STD-202 Method 108<br>at +155°C for 1000 hrs |
| Temperature Cycling | ±0.1% for 125°C<br>±0.2% for 155°C | JESD22 Method JA-104<br>-55°C to +125°C, 1000 cycles<br>-55°C to +155°C, 1000 cycles |

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# Thin Film Precision Chip Resistors

| | | |
|---|---|---|
| Bonding Strength (Board Flex) | ±0.1% | JIS-C-5201-1 4.33<br>Bending 2mm for 60 seconds |
| Solderability | 95% min. coverage | JIS-C-5201-1 4.17<br>IEC-60115-1 4.17<br>245±5°C for 3 seconds |
| Resistance to Soldering Heat | ±0.1% | JIS-C-5201-1 4.18<br>IEC-60115-1 4.18<br>260±5°C for 10 seconds |
| Terminal Strength | No broken | AEC-Q200-006<br>Force of 1kg for 60 seconds |
| Mechanical Shock | ±0.1% | MIL-STD-202 Method 213<br>Wave Form: Tolerance for half sine shock pulse. Peak value is 100g's. Normal duration (D) is 6. |
| Vibration | ±0.1% | MIL-STD-202 Method 204<br>5g's for 20min., 12 cycles each of 3 orientations, 10-2000Hz |
| ESD | ±0.1% | AEC-Q200-002<br>Human body model<br>TRSTNF02 0.2KV |
| Resistance to solvents | Marking Unsmeared | MIL-STD-202 Method 215<br>Add Aqueous wash chemical – OKEM Clean or equivalent. Do not use banned solvents. |
| Sulfur Test | ±1% | EIA-977 (Conditions B)<br>105±2°C no power rating for 750 hrs. |
| Flammability | No ignition of the tissue paper or scorching of the pinewood board | UL-94<br>V-0 or V-1 are acceptable. Electrical test not required |
| Endurance | ±0.1% | IEC60115-1 4.25<br>1000 +48/-0 hours, loaded with RCWV or Vmax in chamber controller 85 ±2°C, 1.5 hours on and 0.5 hours off |
| Moisture Resistance | ±0.1% | MIL-STD-202 Method 106<br>65±2°C, 80-100% RH, 10 cycles, 24 hours/cycle |

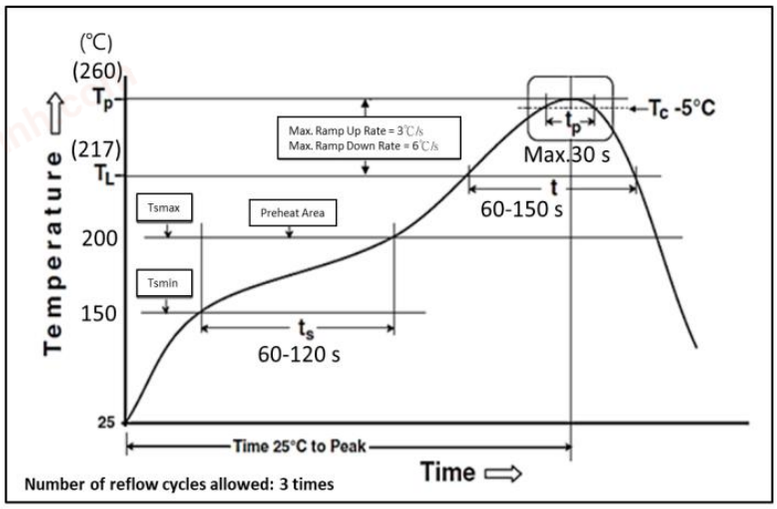
RCWV(Rated continuous working voltage)= √(P*R) or Max. Operating voltage whichever is lower

- Storage Temperature: 15~28°C; Humidity < 80%RH
- Shelf Life: 2 years from production date.

# Thin Film Precision Chip Resistors

## Soldering Condition

(IPC/JEDEC J-STD-020)

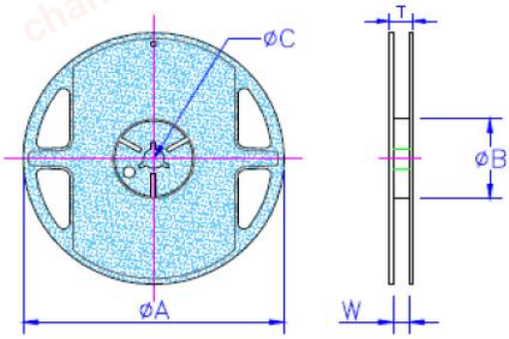



## Packaging

Packaging Quantity & Reel Specification

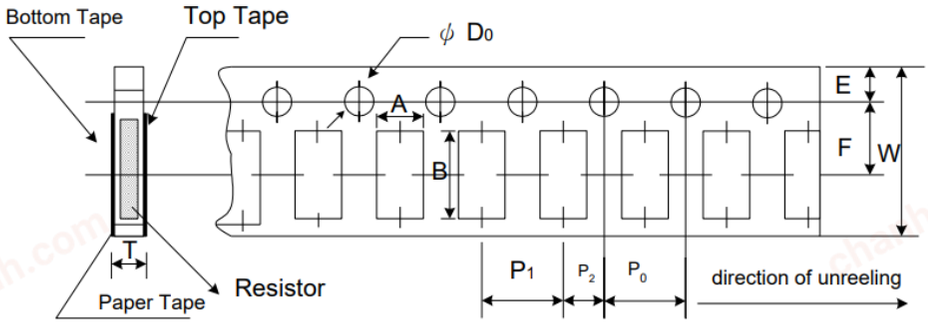
Unit:mm

| Type | ØA | ØB | ØC | W | T | Paper Tape (EA) | Emboss Plastic Tape (EA) |
|---|---|---|---|---|---|---|---|
| TRSTNF02 | 178.0±1.0 | 60.0±1.0 | 13.5±0.7 | 9.5±1.0 | 11.5±1.0 | 10,000 | - |



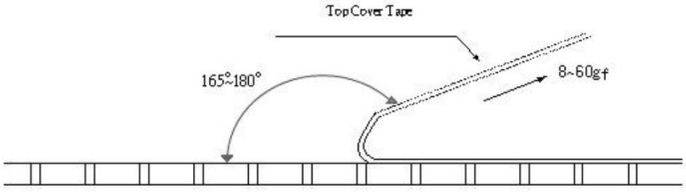

Paper Tape Specifications

# Thin Film Precision Chip Resistors




| Type | A | B | W | E | F | P0 | P1 | P2 | ΦD0 | T |
|---|---|---|---|---|---|---|---|---|---|---|
| TRSTNF02 | 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±0.5 | 2.00±0.05 | 1.55±0.05 | 0.40±0.03 |

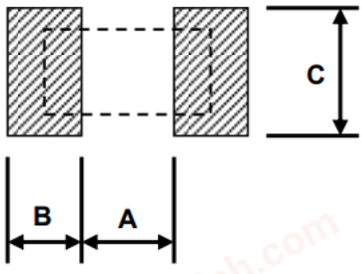
- Peel force top cover tape
- The peel speed shall be about 300mm/min±5%
- The peel force of top cover tape shall be between 8gf to 60gf




## Recommended Land Pattern

| Type | A | B | C |
|---|---|---|---|
| TRSTNF02 | 0.50 | 0.50 | 0.60±0.2 |

Unit:mm



# Thin Film Precision Chip Resistors

## Similar Products

| MPN | RS Article Number | |
|---|---|---|
| | SSM | MPQ |
| TRSTNF02BTCY1000 | 2430692 | 2430691 |
| TRSTNF02BTCY1001 | 2430694 | 2430693 |
| TRSTNF02BTCY1002 | 2430696 | 2430695 |
| TRSTNF02BTCY1200 | 2430698 | 2430697 |
| TRSTNF02BTCY2002 | 2430701 | 2430700 |
| TRSTNF02BTCY2200 | 2430703 | 2430702 |
| TRSTNF02BTCY2202 | 2430705 | 2430704 |
| TRSTNF02BTCY2702 | 2430708 | 2430707 |
| TRSTNF02BTCY3300 | 2430710 | 2430709 |
| TRSTNF02BTCY4700 | 2430713 | 2430711 |
| TRSTNF02BTCY5600 | 2430715 | 2430714 |
| TRSTNF02BTCY6200 | 2430717 | 2430716 |