chanhvinh.com

# Thin Film Precision Chip Resistors

## Features

- RSTNF – Precision Thin Film
- RSTNF – 0201, 0402, 0603, 0805 packages
- Tight tolerance down to ±0.1%
- Extremely low TCR down to ±25 PPM/°C
- Resistance values from 1 ohm to 1M ohm
- High purity alumina substrate for high power dissipation

## RS PRO Thin Film Chip Resistors RSTNF Series

### RS Stock No.:

243-0392, 243-0393, 243-0394, 243-0395, 243-0397, 243-0398, 243-0399, 243-0400, 243-0401, 243-0402, 243-0404, 243-0405, 243-0406, 243-0407, 243-0408, 243-0409, 243-0410, 243-0411, 243-0412, 243-0413, 243-0414, 243-0415, 243-0416, 243-0417, 243-0418, 243-0420, 243-0421, 243-0422, 243-0423, 243-0424, 243-0426, 243-0427, 243-0428, 243-0429, 243-0430, 243-0432, 243-0433, 243-0434, 243-0435, 243-0436, 243-0437, 243-0438, 243-0439, 243-0440, 243-0441, 243-0442, 243-0443, 243-0444, 243-0445, 243-0446, 243-0448, 243-0449, 243-0450, 243-0451, 243-0452, 243-0454, 243-0455, 243-0456, 243-0457, 243-0458, 243-0459, 243-0460, 243-0461, 243-0462, 243-0463, 243-0464, 243-0465, 243-0466, 243-0467, 243-0468, 243-0470, 243-0471, 243-0472, 243-0473, 243-0474, 243-0476, 243-0477, 243-0478, 243-0479, 243-0480, 243-0482, 243-0483, 243-0484, 243-0485, 243-0486, 243-0487, 243-0488, 243-0489, 243-0490, 243-0491, 243-0492, 243-0493, 243-0494, 243-0495, 243-0496, 243-0497, 243-0498, 243-0499, 243-0500, 243-0501, 243-0502, 243-0503, 243-0504, 243-0505, 243-0506, 243-0507, 243-0508, 243-0509




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:

- Medical Equipment
- Testing/Measurement Equipment
- Printer Equipment
- Automatic Equipment Controller
- Converters
- Communication Device, Cell Phone, GPS, PDS

## Dimensions

| Type | RS Article | Size (Inch) | L | W | T | D1 | D2 | Weight (g) (1000pcs) |
|---|---|---|---|---|---|---|---|---|
| RSTNF01 | 2430392<br>2430394<br>2430397<br>2430399<br>2430401<br>2430404<br>2430406<br>2430408<br>2430410<br>2430412<br>2430392<br>2430394<br>2430397<br>2430399<br>2430401<br>2430404<br>2430406<br>2430408<br>2430410<br>2430412 | 0201 | 0.58±0.05 | 0.29±0.05 | 0.23±0.05 | 0.12±0.05 | 0.15±0.05 | 0.14 |
| RSTNF02 | 2430414<br>2430416<br>2430418<br>2430421<br>2430423<br>2430426<br>2430428<br>2430430<br>2430433<br>2430435<br>2430437<br>2430439<br>2430441<br>2430443 | 0402 | 1.00±0.05 | 0.50±0.05 | 0.30±0.05 | 0.20±0.10 | 0.20±0.10 | 0.54 |

# Thin Film Precision Chip Resistors

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 2430445<br>2430448<br>2430450<br>2430452<br>2430455<br>2430457<br>2430459<br>2430461<br>2430463<br>2430465<br>2430467<br>2430470<br>2430415<br>2430417<br>2430420<br>2430422<br>2430424<br>2430427<br>2430429<br>2430432<br>2430434<br>2430436<br>2430438<br>2430440<br>2430442<br>2430444<br>2430446<br>2430449<br>2430451<br>2430454<br>2430456<br>2430458<br>2430460<br>2430462<br>2430464<br>2430466<br>2430468<br>2430471 | | | | | | | |
| RSTNF03 | 2430470<br>2430472<br>2430474<br>2430477<br>2430479<br>2430482<br>2430484<br>2430486<br>2430471<br>2430473<br>2430476<br>2430478<br>2430480<br>2430483<br>2430485<br>2430487 | 0603 | 1.55±0.10 | 0.80±0.10 | 0.45±0.10 | 0.30±0.20 | 0.30±0.20 | 1.83 |
| RSTNF05 | 2430488<br>2430490<br>2430492<br>2430494<br>2430496<br>2430498<br>2430500<br>2430502<br>2430504 | 0805 | 2.0±0.15 | 1.25±0.15 | 0.55±0.15 | 0.30±0.20 | 0.40±0.20 | 4.71 |

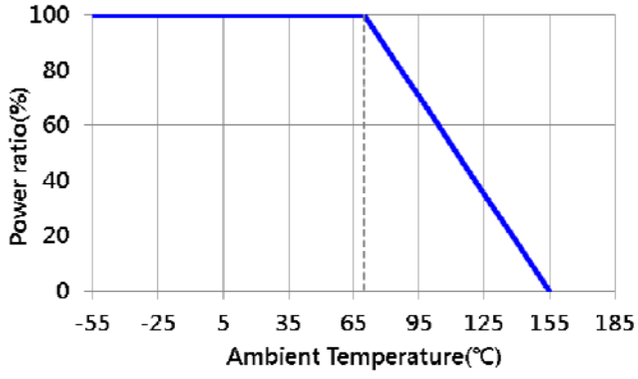
# Thin Film Precision Chip Resistors

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 2430506<br>2430508<br>2430489<br>2430491<br>2430493<br>2430495<br>2430497<br>2430499<br>2430501<br>2430503<br>2430505<br>2430507<br>2430509 | | | | | | | |

## Part Number Make Up

| Part Number | Package Dimensions | Resistance Tolerance | Packaging Code | TCR (PPM/°C) | Resistance Ohmic value |
|---|---|---|---|---|---|
| RSTNF | 01: 0201<br>02: 0402<br>03: 0603<br>05: 0805 | B:±0.1% | T: Taping Reel | C: ±25 | 0010: 1Ω<br>4R70: 4.7Ω<br>1001: 1KΩ<br>1004: 1MΩ |

## Derating Curve



# Thin Film Precision Chip Resistors

## Electrical Specifications

| Type | RS Article | Power Rating at 70°C | Operating Temp. Range | Max Operating Voltage | Max. Overload Voltage | Resistance Range ±0.1% | TCR (PPM/°c) |
|---|---|---|---|---|---|---|---|
| RSTNF01 (0201) | 2430392<br>2430394<br>2430397<br>2430399<br>2430401<br>2430404<br>2430406<br>2430408<br>2430410<br>2430412<br>2430392<br>2430394<br>2430397<br>2430399<br>2430401<br>2430404<br>2430406<br>2430408<br>2430410<br>2430412 | 1/32W | -55 ~ +155°c | 15V | 30V | 22Ω- 47kΩ | ±25 |
| RSTNF02 (0402) | 2430414<br>2430416<br>2430418<br>2430421<br>2430423<br>2430426<br>2430428<br>2430430<br>2430433<br>2430435<br>2430437<br>2430439<br>2430441<br>2430443<br>2430445<br>2430448<br>2430450<br>2430452<br>2430455<br>2430457<br>2430459<br>2430461<br>2430463<br>2430465<br>2430467<br>2430470<br>2430415<br>2430417<br>2430420<br>2430422<br>2430424<br>2430427<br>2430429<br>2430432<br>2430434 | 1/16W | -55 ~ +155°c | 50V | 100V | 5Ω- 511kΩ | ±25 |

# Thin Film Precision Chip Resistors

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2430436<br>2430438<br>2430440<br>2430442<br>2430444<br>2430446<br>2430449<br>2430451<br>2430454<br>2430456<br>2430458<br>2430460<br>2430462<br>2430464<br>2430466<br>2430468<br>2430471 | | | | | | |
| RSTNF03 (0603) | 2430470<br>2430472<br>2430474<br>2430477<br>2430479<br>2430482<br>2430484<br>2430486<br>2430471<br>2430473<br>2430476<br>2430478<br>2430480<br>2430483<br>2430485<br>2430487 | 1/16W | -55~ +155°c | 50V | 100V | 1Ω- 1MΩ | ±25 |
| RSTNF05 (0805) | 2430488<br>2430490<br>2430492<br>2430494<br>2430496<br>2430498<br>2430500<br>2430502<br>2430504<br>2430506<br>2430508<br>2430489<br>2430491<br>2430493<br>2430495<br>2430497<br>2430499<br>2430501<br>2430503<br>2430505<br>2430507<br>2430509 | 1/10W | -55~ +155°c | 100V | 200V | 1Ω- 1MΩ | ±25 |

# Thin Film Precision Chip Resistors

## Environmental Characteristics

| Item | Requirement | | Test Method |
|---|---|---|---|
| | Tol. ≤ 0.05% | Tol. > 0.05% | |
| Temperature Coefficient of Resistance (T.C.R.) | As Spec | | MIL-STD-202 Method 304 +25/-55/+25/+125/+25°C |
| Short Time Overload | ±0.5% | ±0.2% | JIS-C-5201-1 4.13<br>RCWV*2.5 or Max. overload voltage whichever is lower for 5 seconds |
| | ±0.2% for high power rating | | |
| Insulation Resistance | >9999 MΩ | | MIL-STD-202 Method 302<br>Apply 100VDC for 1 minute |
| Endurance | ±0.5% | ±0.2% | MIL-STD-202 Method 108A<br>70±2°C, RCWV for 1000 hrs with 1.5 hrs “ON” and 0.5 hrs “OFF” |
| | ±0.5% for high power rating | | |
| | 0201: >7kΩ ±0.5%<br>≤ 7kΩ ±0.2% | | |
| Damp Heat with Load | ±0.5% | ±0.3% | MIL-STD-202 Method 103B<br>40±2°C, 90~95% R.H. RCWV for 1000 hrs with 1.5h hrs “ON” and 0.5 hrs “OFF” |
| | ±0.5% for high power rating | | |
| Bending Strength | ±0.5% | ±0.1% | JIS-C-5201-1 4.33<br>Bending amplitude 3 mm for 60 seconds 2010 2512 sizes: 2 mm<br>Other sizes: 3 m |
| Solderability | 95% min. coverage | | MIL-STD-202 Method 208H<br>245±5°C for 3 seconds |
| Resistance to Soldering Heat | ±0.5% | ±0.1% | MIL-STD-202 Method 210E<br>260±5°C for 10 seconds |
| Dielectric Withstand Voltage | By Type | | MIL-STD-202 Method 301 Max. overload voltage for 1 minute |
| Low Temperature Operation | ±0.5% | ±0.2% | JIS-C-5201-1 4.36<br>1 hour, -65°C, followed by 45 minutes of RCWV |
| | ±0.5% for high power rating | | |
| High Temperature Exposure | ±0.5% | | MIL-STD-202 Method 108 at +155°C for 1000 hrs |

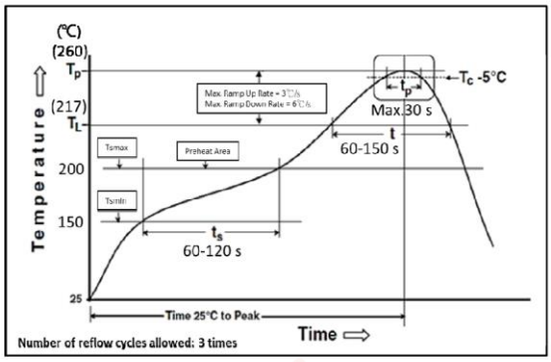
RCWV(Rated continuous working voltage)= √(P*R) or Max. Operating voltage whichever is lower

- 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)

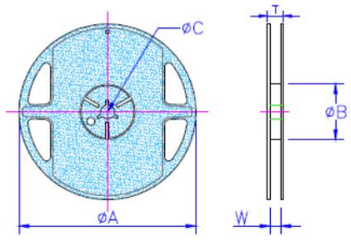



## Packaging

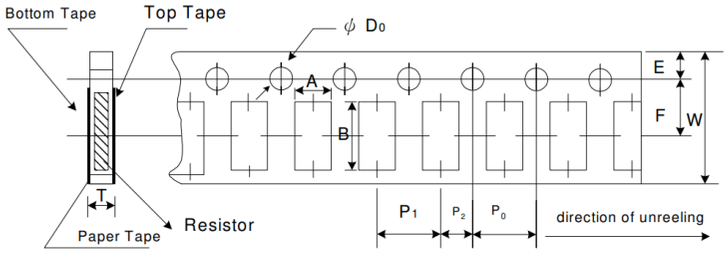
Packaging Quantity & Reel Specification

Unit:mm

| Type | ØA | ØB | ØC | W | T | Paper Tape (EA) |
|---|---|---|---|---|---|---|
| RSTNF01 | 178.0±1.0 | 60.0+1.0 | 13.5±0.7 | 9.5±1.0 | 11.5±1.0 | 10,000 |
| RSTNF02 | 178.0±1.0 | 60.0+1.0 | 13.5±0.7 | 9.5±1.0 | 11.5±1.0 | 10,000 |
| RSTNF03 | 178.0±1.0 | 60.0+1.0 | 13.5±0.7 | 9.5±1.0 | 11.5±1.0 | 5000 |
| RSTNF05 | 178.0±1.0 | 60.0+1.0 | 13.5±0.7 | 9.5±1.0 | 11.5±1.0 | 5000 |




Paper Tape Specifications

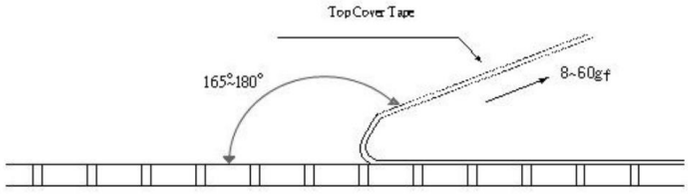



| Type | A | B | W | E | F | P0 | P1 | P2 | ΦD0 | T |
|---|---|---|---|---|---|---|---|---|---|---|
| RSTNF01 | 0.40±0.05 | 0.70±0.05 | 8.00±0.10 | 1.75±0.05 | 3.5±0.05 | 4.00±0.10 | 2.00±0.05 | 2.00±0.05 | 1.55±0.03 | 0.42±0.02 |

# Thin Film Precision Chip Resistors

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| RSTNF02 | 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 | 0.42±0.03 |
| RSTNF03 | 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 |
| RSTNF05 | 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 |

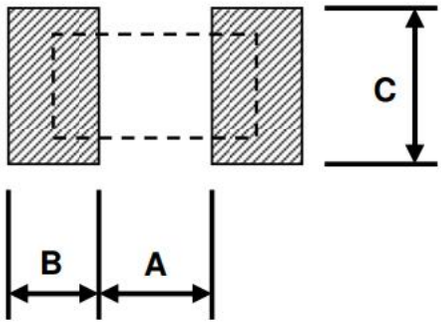
- Peel force top cover tape
- The peel speed shall be about 300mm/min±5%
- The peel force of top cover tape shall be between 8gf to 60gf




## Recommended Land Pattern

| Type | A | B | C |
|---|---|---|---|
| RSTNF01 | 0.25 | 0.30 | 0.40±0.2 |
| RSTNF02 | 0.50 | 0.50 | 0.60±0.2 |
| RSTNF03 | 0.80 | 1.00 | 0.90±0.2 |
| RSTNF05 | 1.00 | 1.00 | 1.35±0.2 |

Unit:mm



# Thin Film Precision Chip Resistors

## Similar Products

| MPN | RS Article Number | |
|---|---|---|
| | SSM | MPQ |
| RSTNF01BTC0220 | 2430393 | 2430392 |
| RSTNF01BTC0330 | 2430395 | 2430394 |
| RSTNF01BTC0470 | 2430398 | 2430397 |
| RSTNF01BTC1000 | 2430400 | 2430399 |
| RSTNF01BTC1001 | 2430402 | 2430401 |
| RSTNF01BTC1002 | 2430405 | 2430404 |
| RSTNF01BTC2202 | 2430407 | 2430406 |
| RSTNF01BTC3302 | 2430409 | 2430408 |
| RSTNF01BTC4700 | 2430411 | 2430410 |
| RSTNF01BTC4702 | 2430413 | 2430412 |
| RSTNF02BTC0050 | 2430415 | 2430414 |
| RSTNF02BTC0100 | 2430417 | 2430416 |
| RSTNF02BTC0220 | 2430420 | 2430418 |
| RSTNF02BTC0330 | 2430422 | 2430421 |
| RSTNF02BTC0470 | 2430424 | 2430423 |
| RSTNF02BTC0560 | 2430427 | 2430426 |
| RSTNF02BTC1000 | 2430429 | 2430428 |
| RSTNF02BTC1001 | 2430432 | 2430430 |
| RSTNF02BTC1002 | 2430434 | 2430433 |
| RSTNF02BTC1003 | 2430436 | 2430435 |
| RSTNF02BTC2200 | 2430438 | 2430437 |
| RSTNF02BTC2201 | 2430440 | 2430439 |
| RSTNF02BTC2202 | 2430442 | 2430441 |
| RSTNF02BTC2203 | 2430444 | 2430443 |
| RSTNF02BTC3300 | 2430446 | 2430445 |
| RSTNF02BTC3301 | 2430449 | 2430448 |
| RSTNF02BTC3302 | 2430451 | 2430450 |
| RSTNF02BTC3303 | 2430454 | 2430452 |
| RSTNF02BTC4700 | 2430456 | 2430455 |
| RSTNF02BTC4701 | 2430458 | 2430457 |
| RSTNF02BTC4702 | 2430460 | 2430459 |
| RSTNF02BTC4703 | 2430462 | 2430461 |
| RSTNF02BTC4990 | 2430464 | 2430463 |
| RSTNF02BTC5113 | 2430466 | 2430465 |
| RSTNF02BTC5600 | 2430468 | 2430467 |
| RSTNF02BTC5602 | 2430471 | 2430470 |
| RSTNF03BTC0010 | 2430473 | 2430472 |
| RSTNF03BTC1000 | 2430476 | 2430474 |
| RSTNF03BTC1001 | 2430478 | 2430477 |
| RSTNF03BTC1002 | 2430480 | 2430479 |

# Thin Film Precision Chip Resistors

| | | |
|---|---|---|
| RSTNF03BTC1003 | 2430483 | 2430482 |
| RSTNF03BTC1004 | 2430485 | 2430484 |
| RSTNF03BTC4701 | 2430487 | 2430486 |
| RSTNF05BTC0010 | 2430489 | 2430488 |
| RSTNF05BTC0050 | 2430491 | 2430490 |
| RSTNF05BTC0100 | 2430493 | 2430492 |
| RSTNF05BTC0150 | 2430495 | 2430494 |
| RSTNF05BTC0220 | 2430497 | 2430496 |
| RSTNF05BTC0330 | 2430499 | 2430498 |
| RSTNF05BTC1004 | 2430501 | 2430500 |
| RSTNF05BTC2203 | 2430503 | 2430502 |
| RSTNF05BTC3303 | 2430505 | 2430504 |
| RSTNF05BTC4703 | 2430507 | 2430506 |
| RSTNF05BTC5113 | 2430509 | 2430508 |