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C type E-beam welding alloy resistor

# E-beam Welding Alloy Resistor

## Current sensing, SMD, Ultra-low resistance valueExcellent stability, AEC-Q200


### Features:

- Vacuum Electron-beam welding craf , pure copper electrode , Ideal solution for current detection applications.
- Bridge-shaped structure, conducive to heat dissipation, high power, superb pulse load capability
- All-metal structure, surface pickling and passivation treatment, strong weather resistance
- Ultra-low EMF
- Ultra-low parasitic inductance, fast response , suitable for high frequency AC current detection
- RoHS compliant
- customization

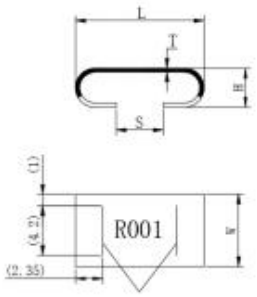
| parameter: | |
|---|---|
| resistance value | 1～20mΩ |
| tolerance | ±1%(F),±5%(J) |
| TCR | Min.±50ppm/℃ |
| temperature range | -55℃～+170℃ |
| inductance | <3nH |
| thermal EMF (0-100°C) | <1 μV/°C |
| 4312/4320 power ($P_{70℃}$) | 4 W / 7W |

| Type Designation: WSNB4320MR001FT0 | WSNB4320 Manganese copper 1mohm 1% standard |
|---|---|

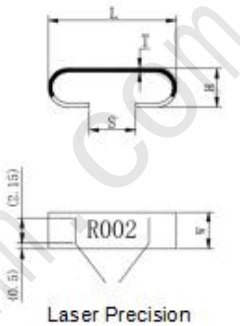
| W | S | N | B | 4 | 3 | 2 | 0 | M | R | 0 | 0 | 1 | F | T | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| WSNB | size | material | resistance value | tolerance | code |
|---|---|---|---|---|---|
| C-type E-beam alloy resistor | 4320<br>4312 | K: Karma<br>M: Manganese copper | R001 = 1mΩ<br>R005 = 5mΩ | F=±1%<br>F=±5% | T0: package with tape and reel<br>B0: without tape and reel<br>Tx: special code(x: 0~9) |

## Dimensions(mm):




Laser Precision Trimming of Resistor Traces

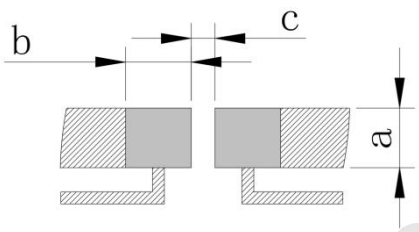



Laser Precision Trimming of Resistor Traces

| series | power | resistance value | tolerance | TCR | Alloy material | Standard package | L (mm) | W (mm) | H (mm) | S (mm) | T (mm) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| WSNB4320 | 7W | 1mΩ | ±1%(F)<br>±5%(J) | ±100ppm | Manganese copper | 1000PCS | 11±0.3 | 6.2±0.3 | 3.3±0.3 | 4±0.25 | 0.85±0.1 |
| | | 2mΩ | | | | | | | | | 0.43±0.1 |
| | | 5mΩ | | ±50ppm | Karma | | | | | | 0.6±0.1 |
| | | 6mΩ | | | | | | | | | 0.5±0.1 |
| | | 8mΩ | | | | | | | | | 0.38±0.1 |
| | | 10mΩ | | | | | | | | | 0.3±0.1 |
| WSNB4312 | 4W | 2mΩ | | ±100ppm | Manganese copper | 2000PCS | 11±0.3 | 3.15±0.3 | 3.3±0.3 | 4±0.25 | 0.85±0.1 |
| | | 3mΩ | | | | | | | | | 0.6±0.1 |
| | | 5mΩ | | | | | | | | | 0.35±0.1 |
| | | 10mΩ | | ±50ppm | Karma | | | | | | 0.6±0.1 |
| | | 20mΩ | | | | | | | | | 0.3±0.1 |

## Recommended pad and size(mm):

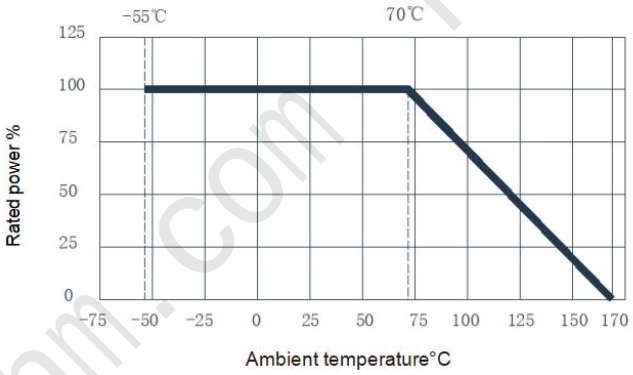
| | series | resistance value | a (mm) | b (mm) | c (mm) |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
|  | WSNB4320 | 1mΩ--10mΩ | 7.2 | 5 | 2 |
| | WSNB4312 | 2mΩ--20mΩ | 4.2 | 5 | 2 |

## Construction:


1. manganese copper ,Karma,low TCR(<20ppm/℃)
2. pure red copper terminal
3.electron-beam welding

## Derating Curve:

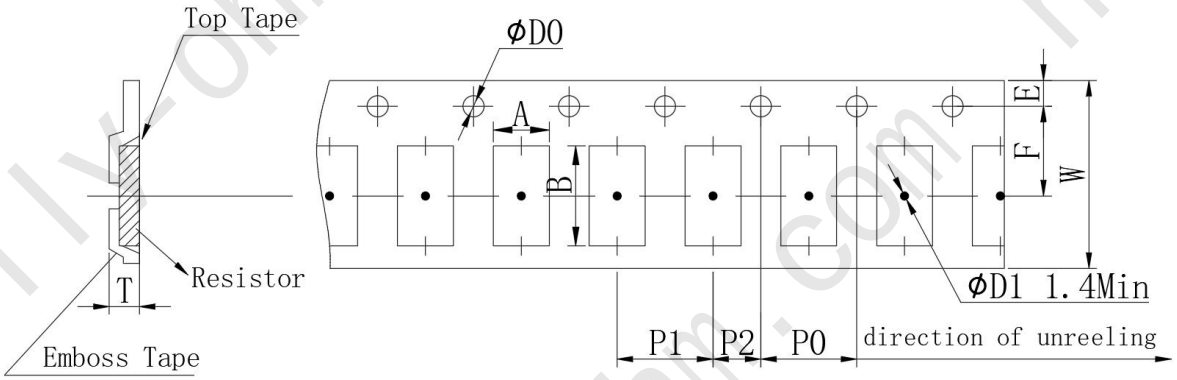



## Performance:

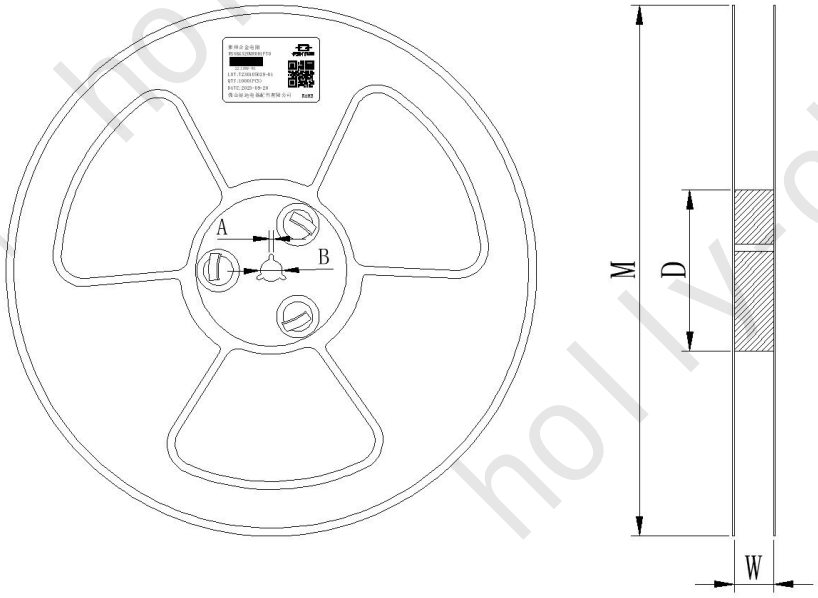
| Test Item | standard | Test method |
|---|---|---|
| TCR | Within specified TCR | IEC60115-1 4.8，measured point 20°C～+130°C，reference point +20°C |
| Solderability | No visible damage<br>Minimum 95%covered | IEC60115-1 4.17，245°C tin bath，3s |
| Short-time overload | No visible damage<br>△R±1% Maximum | IEC60115-1 4.13，five times rated power，5s |
| Resistance to soldering heat | No visible damage<br>△R±0.5% Maximum | IEC60115-1 4.18，260°C tin bath，10s |
| High temp. & high humidity | No visible damage△R±1% Maximum | Applying 10% of the rated power (current) or the maximum current of the component (whichever is lower) for a duration of 1000 hours in a temperature of 85°C and a humidity of 85% according to MIL-STD-202 method 103 |
| High temperature storage | No visible damage△R±1% Maximum | IEC60115-1 4.25.3，1000hours@170°C，without loading current and voltage |
| Low temperature load | No visible damage<br>△R±0.5%Maximum | IEC60115-1 4.36，cooled from room temperature to -55°C ,no load for 1.5 hours,applying rated power,continuously flowing for 45 minutes,cool for 15 minutes，then recover to room temperature for testing again. |

| | | |
|---|---|---|
| temperature cycle | No visible damage<br>△R±1% Maximum | IEC60115-1 4.19，-55°C@30mins～+155°C@30mins；1000 cycles |
| load life | No visible damage<br>△R±1.0% Maximum | IEC 60115-1 4.25.1，1000hrs.， 70℃±2℃，rated current, or the maximum current rating of the component (whichever is lower) is applied for 1.5 hours/0.5 hour interruption |

## Packing specifications and size (units:mm):




| Type | A | B | W | E | F | P0 | P1 | P2 | ΦD0 | T | Quantity |
|---|---|---|---|---|---|---|---|---|---|---|---|
| WSNB4312 | 3.7 | 11.7 | 24 | 1.75 | 11.5 | 4 | 8 | 2 | 1.5 | 3.8 | 2000 |
| WSNB4320 | 6.8 | 11.7 | 24 | 1.75 | 11.5 | 4 | 12 | 2 | 1.5 | 3.8 | 1000 |




| Reel Type | W | M | A | B | D |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| 13"reel for24mm tape | 25±0.5 | Φ330±2.0 | 2.0±0.5 | Φ13.5±0.5 | Φ99.0±1.0 |

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version update record

| version no. | update record | person in charge | issue date |
|---|---|---|---|
| A0 | new version release | Qingke Zeng | 07Apr2023 |
| A1 | Update parameter and performance metrics | Qingke Zeng | 24Oct2023 |
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