# Molded, SC70 Thin Film Resistor, Surface Mount Network



MP 3 LEAD

MP 4 LEAD

Actual Size

Vishay Dale Thin Film MP Series Dividers provide ± 2 ppm/°C tracking and a ratio tolerance as tight as ± 0.05 %, ultra small size, 3 or 4 lead package and exceptional stability for all surface mount applications. The standard SC70 package format with common standard resistance values provide easy selection for most applications requiring matched pair resistor elements. If you require a non-standard ratio, consult the applications engineering group as we may be able to meet your requirements.

## FEATURES

- Small physical size EIAJ SC70 format
- Tight resistance ratio tolerances ± 0.05 %
- Low TCR tracking ± 2 ppm
- Excellent long term ratio stability ($\Delta R$ ± 0.015 % at 70 °C for 2000 h)
- Center-tapped or isolated matched pair resistors
- Compliant to RoHS Directive 2002/95/EC
- Halogen-free according to IEC 61249-2-21 definition

Pb-free Available

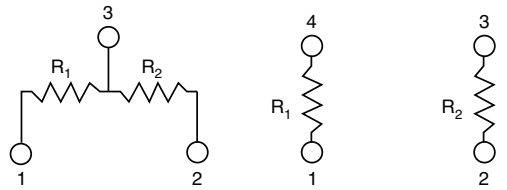
RoHS* COMPLIANT

HALOGEN FREE

**Note**

* Pb containing terminations are not RoHS compliant, exemptions may apply

## SCHEMATIC




3 LEAD VERSION

4 LEAD VERSION

## TYPICAL PERFORMANCE

| | ABSOLUTE | TRACKING |
|---|---|---|
| TCR | 25 | 2 |
| | ABSOLUTE | RATIO |
| TOL. | 0.1 | 0.05 |

## STANDARD RESISTANCE VALUES

| TYPE | STANDARD VALUES | |
|---|---|---|
| | $R_1$ (Ω) | $R_2$ (Ω) |
| MP3 | 500 | 500 |
| | 1K | 1K |
| | 10K | 10K |
| MP4 | 1K | 1K |
| | 10K | 10K |
| | 50K | 50K |

## STANDARD ELECTRICAL SPECIFICATIONS

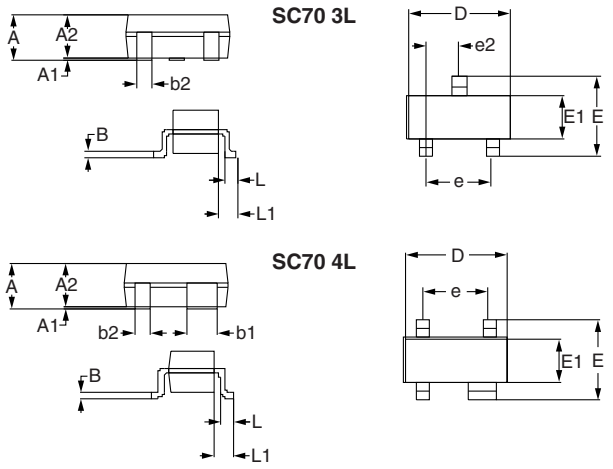
| TEST | SPECIFICATIONS | CONDITIONS |
|---|---|---|
| **Material** | Passivated nichrome | - |
| **Pin/Lead Number** | 3, 4 | - |
| **Resistance Range** | 100 Ω to 50 kΩ per resistor | - |
| **TCR: Absolute** | ± 25 ppm/°C | - 55 °C to + 125 °C |
| **TCR: Tracking** | ± 2 ppm/°C (typical) | - 55 °C to + 125 °C |
| **Tolerance: Absolute** | ± 0.10 % to ± 1.0 % | + 25 °C |
| **Tolerance: Ratio** | ± 0.05 % (standard), ± 1.0 % | - |
| **Power Rating: Resistor** | 0.075 W | Maximum at + 70 °C |
| **Power Rating: Package** | 0.150 W | Maximum at + 70 °C |
| **Stability: Absolute** | $\Delta R$ ± 0.05 % | 2000 h at + 70 °C |
| **Stability: Ratio** | $\Delta R$ ± 0.015 % | 2000 h at + 70 °C |
| **Voltage Coefficient** | 0.1 ppm/V | - |
| **Working Voltage** | 100 V max. not to exceed $\sqrt{P \times R}$ | - |
| **Operating Temperature Range** | - 55 °C to + 125 °C | - |
| **Storage Temperature Range** | - 55 °C to + 150 °C | - |
| **Noise** | < - 30 dB | - |
| **Thermal EMF** | 0.1 µV/°C | - |
| **Shelf Life Stability: Absolute** | $\Delta R$ ± 0.01 % | 1 year at + 25 °C |
| **Shelf Life Stability: Ratio** | $\Delta R$ ± 0.002 % | 1 year at + 25 °C |



For technical questions, contact: thinfilm@vishay.com

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## DIMENSIONS AND IMPRINTING in millimeters

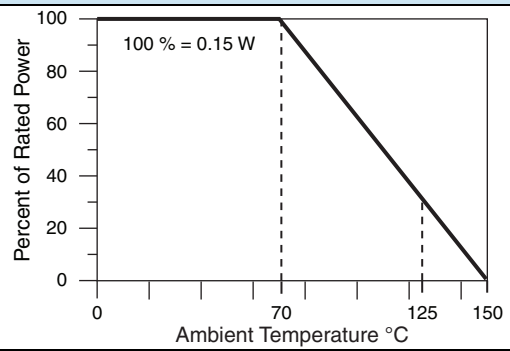



| DIMENSION | MIN. | MAX. |
|---|---|---|
| A | 0.800 | 1.100 |
| A1 | 0.000 | 0.100 |
| A2 | 0.800 | 1.000 |
| B | 0.100 | 0.018 |
| b1 | 0.400 | 0.500 |
| b2 | 0.200 | 0.250 |
| D | 1.800 | 2.200 |
| E | 1.800 | 2.400 |
| E1 | 1.150 | 1.350 |
| e | 1.300 | - |
| e2 | 0.650 | - |
| L | 0.100 | 0.030 |

## MECHANICAL SPECIFICATIONS

| | |
|---|---|
| **Resistive Element** | Passivated nichrome |
| **Substrate Material** | Silicon |
| **Body** | Molded epoxy |
| **Terminals** | Copper alloy |
| **Lead (Pb)-free Option** | 100 % matte tin |
| **Tin Lead Option** | Sn85 |
| **Tin Lead and Lead (Pb)-free Finish** | Plated |

## DERATING CURVE




## GLOBAL PART NUMBER INFORMATION

**New Global Part Numbering: MP32001AWS**

| M | P | 3 | 2 | 0 | 0 | 1 | A | W | S |
|---|---|---|---|---|---|---|---|---|---|
| M | P | T | 4 | 2 | 0 | 0 | 1 | B | T | 1 |

**GLOBAL MODEL (2 or 3 digits)**

**MP** (Tin Lead)

**MPT** (Lead (Pb)-free) (e3)

**LEADS**

**3**
**4**

**RESISTANCE**

The first 3 digits are significant figures and the last digit specifies the number of zeros to follow. When like values are required use total resistance.

Example:
2001 = 2K (1K/1K)
2002 = 20K (10K/10K)

**TOLERANCE AND RATIO TOLERANCE**

| Abs. Tol. | Ratio |
|---|---|
| **A** = 0.1 % | 0.05 % |
| **B** = 0.1 % | 0.1 % |
| **C** = 0.25 % | 0.1 % |
| **D** = 0.5 % | 0.1 % |
| **F** = 1.0 % | 0.5 % |

**PACKAGING**

**BS** = BULK 100 min., 1 mult
**WS** = WAFFLE 100 min., 1 mult

TAPE AND REEL
**T1** = 1000 min., 1000 mult (1)

**Note**
(1) Preferred packaging code

**Historical Part Number example: MP32002BW (for reference purposes only)**

| MP | 3 | 2002 | B | W |
|---|---|---|---|---|
| SERIES | LEADS | RESISTANCE | TOLERANCE AND RATIO TOLERANCE | PACKAGING |



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