MORN



Vishay Dale Thin Film

Molded, Compact, 0.65 mm Pitch, Dual-In-Line Thin Film Resistor, Surface-Mount Network 0.01 % Ratio Tolerance and 1 ppm/°C TCR Tracking



MORN series resistor networks feature four isolated resistors with standard 0.65 mm (25.6 mil) pitch lead spacing. The networks feature close TCR tracking and tight ratio tolerance and are ideally suited for unity gain operational amplifier circuitry. The standard resistance offerings listed are available for immediate delivery.

SCHEMATICS



FEATURES

- Low TCR tracking of \pm 1 ppm/°C and ratio tolerance as low as \pm 0.01 %
- 1.10 mm (0.043 mil) maximum seated height
- Excellent long-term ratio stability, ± 0.015 % RoHS* over 2000 h at 70 °C
- JEDEC[®] MO-187 variation AA package (25 mil pitch, QSOP)
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

⁶ This datasheet provides information about parts that are RoHS-compliant and / or parts that are non-RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information / tables in this datasheet for details.

TYPICAL PERFORMANCE

| \bullet | ABSOLUTE | TRACKING |
|-----------|----------|----------|
| TCR | 25 | 1 |
| | ABSOLUTE | RATIO |
| TOL. | 0.1 | 0.01 |

| STANDARD RESISTANCE OFFERING ($R_1 =$) | | |
|--|--------|--|
| 500 Ω | 10 kΩ | |
| 1 kΩ | 20 kΩ | |
| 2 kΩ | 25 kΩ | |
| 4.99 kΩ | 50 kΩ | |
| 5 kΩ | 100 kΩ | |

Note

• Consult factory for additional values and schematics.

| STANDARD ELECTRICAL SPECIFICATIONS | | | | |
|------------------------------------|---|-------------------|--|--|
| TEST | SPECIFICATIONS | CONDITIONS | | |
| Material | Passivated nichrome | - | | |
| Pin/Lead Number | 8 | - | | |
| Resistance Range | 400 Ω to 100 k Ω per resistor | _ | | |
| TCR: Absolute | ± 25 ppm/°C | -55 °C to +125 °C | | |
| TCR: Tracking | ± 1 ppm/°C (typical) ; ± 2 ppm/°C (max.) | -55 °C to +125 °C | | |
| Tolerance: Absolute | ± 0.05 % to ± 1.0 % | +25 °C | | |
| Tolerance: Ratio | ± 0.01 % to ± 0.5 % | +25 °C | | |
| Power Rating: Resistor | 50 mW | Maximum at +70 °C | | |
| Power Rating: Package | 200 mW | Maximum at +70 °C | | |
| Stability: Absolute | $\Delta R \pm 0.05 \%$ | 2000 h at +70 °C | | |
| Stability: Ratio | ∆ <i>R</i> ± 0.015 % | 2000 h at +70 °C | | |
| Voltage Coefficient | 0.1 ppm/V (typical) | _ | | |
| Working Voltage | 50 V max. not to exceed $\sqrt{P \times R}$ | _ | | |
| Operating Temperature Range | -55 °C to +125 °C | _ | | |
| Storage Temperature Range | -55 °C to +155 °C | _ | | |
| Noise | ≤ -30 dB | _ | | |
| Thermal EMF | 0.08 µV/°C | _ | | |
| Shelf Life Stability: Absolute | $\Delta R \pm 0.01$ % | 1 year at +25 °C | | |
| Shelf Life Stability: Ratio | $\Delta R \pm 0.002 \%$ | 1 year at +25 °C | | |

Document Number: 60129



FREE

Note



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| DIMENSION | INCHES | MILLIMETERS |
|-----------|-------------------|----------------|
| A | 0.118 | 3.00 |
| В | 0.0118 ± 0.0086 | 0.3 ± 0.08 |
| С | 0.0256 | 0.65 |
| D | 0.118 max. | 3.00 |
| E | 0.006 ± 0.003 | 0.16 ± 0.08 |
| F | 0.024 ± 0.008 | 0.60 ± 0.20 |
| G | 0.193 | 4.90 |
| Н | 0.043 max. | 1.10 |
| I | 0.006 max. | 0.15 max. |
| Ø | 0° to 8° | 0° to 8° |

Note

SHA

• Marking - Vishay symbol, part number from ordering information.





| 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 | Sn90 | |
| Tin Lead and Lead (Pb)-free Finish | Plated | |

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Notes

⁽¹⁾ Tolerance available 1K and up

⁽²⁾ Preferred packaging code



Vishay

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