

High Precision (0.01 %/10 ppm/°C) Through Hole Thin Film Conformal Coating Sil Resistor



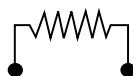
FEATURES

- Tight TCR to 5 ppm/°C (in 0 °C; + 70 °C)
- Incorporates high stability thin film element (0.1 % at + 70 °C at Pn during 1000 h)
- Through hole (Sil)
- 100 Ω to 10 MΩ
- Tight tolerance down to 0.01 %
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

SCHEMATIC



STANDARD ELECTRICAL SPECIFICATIONS

| MODEL | RESISTANCE RANGE Ω | RATED POWER $P_{70^{\circ}\text{C}}$ W | LIMITING ELEMENT VOLTAGE V | TOLERANCE ± % | TEMPERATURE COEFFICIENT ⁽¹⁾ ± ppm/°C |
|---------|-----------------------|--|----------------------------------|-------------------------------------|---|
| CNS 020 | 100 to 10M | 0.5 | 300 | 0.01, 0.02, 0.05, 0.1, 0.25, 0.5, 1 | 5, 10 |

Note

⁽¹⁾ 15 ppm/°C for R ≥ 1.5M

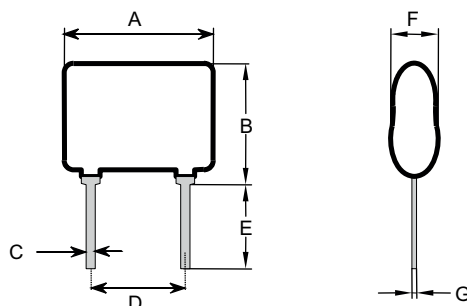
CLIMATIC SPECIFICATIONS

| | |
|-----------------------------|-------------------|
| Operating temperature range | - 55 °C; + 155 °C |
|-----------------------------|-------------------|

MECHANICAL SPECIFICATIONS

| | |
|--------------------|-------------------------|
| Resistive material | Nichrome |
| Substrate material | Alumina |
| Terminals | Tin/silver on Cu alloy |
| Protection | Conformal epoxy coating |

DIMENSIONS AND IMPRINTING CNS 020



In clear: model, Vishay logo and manufacturing code. On back: ohmic value (in Ω), tolerance (in %)

| DIMENSION | INCHES | MILLIMETERS |
|-----------|--------|-------------|
| A | 0.330 | 8.38 max. |
| B | 0.261 | 6.62 max. |
| C | 0.020 | 0.51 |
| D | 0.200 | 5.08 |
| E | 0.125 | 3.17 min. |
| F | 0.100 | 2.54 max. |
| G | 0.010 | 0.25 |

**TECHNICAL SPECIFICATIONS**

| TEST | SPECIFICATIONS | CONDITIONS |
|---|-------------------------|---------------------------------------|
| MATERIAL | PASSIVATED NICHROME | |
| Absolute TCR | Standard ⁽¹⁾ | $\pm 10 \text{ ppm}/^{\circ}\text{C}$ |
| | On request | $\pm 5 \text{ ppm}/^{\circ}\text{C}$ |
| Power rating | 0.5 W | at + 70 °C |
| | 0.3 W | at + 125 °C |
| Dissipation factor (in air) $1/R_{TH}$ ⁽²⁾ | | 6.7 mW/°C |

Notes⁽¹⁾ 15 ppm/°C for $R \geq 1.5M$ ⁽²⁾ For information only**ENVIRONMENTAL TEST**

| TEST | REQUIREMENTS | | | CONDITIONS |
|---------------------------|--|-------------------|------------------|---|
| | NFC 83220 CECC40300 | MIL-PRF 55182E | DRIFTS (MAX.) | |
| Overload | $\pm 0.01 \%$ | $\pm 0.05 \%$ | 0.01 % | 2.5 Un/5 s $U_{max} < 2 U_n$ |
| Temperature cycling | $\pm 0.01 \%$ | $\pm 0.05 \%$ | 0.01 % | - 55 °C/+ 155 °C 5 cycles CEI 68-2-14 Test No |
| Terminal strength | $\pm 0.01 \%$ | $\pm 0.02 \%$ | 0.01 % | CEI 68-2-21 Test Ua (pulling), Ub (bending), Uc (twisting) |
| Resistance to solder heat | $\pm 0.01 \%$ | $\pm 0.02 \%$ | 0.01 % | + 260 °C/10 s, CEI 68-2-20A Test T6 (Met 1A) |
| Vibration | $\pm 0.01 \%$ | $\pm 0.02 \%$ | 0.01 % | 10 Hz to 500 Hz 10 g, 6 h Met B4; CEI 68-2-6 Test Fc |
| Climatic sequence | $\pm 0.05 \%$ insulation resistance > $10^2 M\Omega$ | - | 0.05 % | - 55 °C/+ 155 °C 6 cycles 95 % RH RH 85 mbar CEI68-1 |
| Moisture | $\pm 0.05 \%$ insulation resistance > $10^2 M\Omega$ | - | 0.02 % | 56 days 95 % RH + 40 °C CEI 68-2-3 |
| High temperature storage | $\pm 0.05 \%$ | - | 0.05 % | 1000 h/+ 155 °C CEI 68-2-20A; Test B |

GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: CNS020-301KF (preferred part number format)

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C | N | S | 0 | 2 | 0 | - | 3 | 0 | 1 | K | F |
|---|---|---|---|---|---|---|---|---|---|---|---|

| GLOBAL MODEL |
|--------------|
| CNS 020 |

| VALUE |
|--------------------|
| Decimal: R, K or M |

| TOLERANCE |
|---|
| L = $\pm 0.01 \%$ P = $\pm 0.02 \%$ W = $\pm 0.05 \%$ B = $\pm 0.1 \%$ |
| C = $\pm 0.25 \%$ D = $\pm 0.5 \%$ F = $\pm 1.0 \%$ |

Historical Part Number example: CNS 020 301K 1 % (will continue to be accepted)

| HISTORICAL MODEL |
|------------------|
| CNS 020 |

| VALUE |
|-------|
| 301K |

| TOLERANCE |
|-----------|
| 1 % |



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