

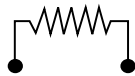
High Precision (0.01 %/10 ppm/°C) Through Hole Thin Film Conformal Coating Sil Resistor


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 $P_{70\text{ °C}}$ 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⁾ | ± 10 ppm/°C | - 40 °C to + 125 °C |
| | On request | ± 5 ppm/°C | 0 °C to + 70 °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 ≥ 1.5M
- (2) For information only

| ENVIRONMENTAL TEST | | | | |
|---------------------------|---|-------------------|------------------|---|
| TEST | REQUIREMENTS | | | CONDITIONS |
| | NFC 83220 CECC40300 | MIL-PRF 55182E | DRIFTS (MAX.) | |
| Overload | ± 0.01 % | ± 0.05 % | 0.01 % | 2.5 Un/5 s U _{max} < 2 Un |
| Temperature cycling | ± 0.01 % | ± 0.05 % | 0.01 % | - 55 °C/+ 155 °C 5 cycles CEI 63-2-14 Test No |
| Terminal strength | ± 0.01 % | ± 0.02 % | 0.01 % | CEI 68-2-21 Test Ua (pulling), Ub (bending), Uc (twisting) |
| Resistance to solder heat | ± 0.01 % | ± 0.02 % | 0.01 % | + 260 °C/10 s, CEI 68-2-20A Test T6 (Met 1A) |
| Vibration | ± 0.01 % | ± 0.02 % | 0.01 % | 10 Hz to 500 Hz 10 g, 6 h Met B4; CEI 68-2-6 Test Fc |
| Climatic sequence | ± 0.05 % insulation resistance > 10 ² MΩ | - | 0.05 % | - 55 °C/+ 155 °C 6 cycles 95 % RH RH 85 mbar CEI68-1 |
| Moisture | ± 0.05 % insulation resistance > 10 ² MΩ | - | 0.02 % | 56 days 95 % RH + 40 °C CEI 68-2-3 |
| High temperature storage | ± 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 | <table style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2" style="text-align: center;">TOLERANCE</td> </tr> <tr> <td style="width: 50%;">L = ± 0.01 %</td> <td style="width: 50%;">C = ± 0.25 %</td> </tr> <tr> <td>P = ± 0.02 %</td> <td>D = ± 0.5 %</td> </tr> <tr> <td>W = ± 0.05 %</td> <td>F = ± 1.0 %</td> </tr> <tr> <td>B = ± 0.1 %</td> <td></td> </tr> </table> | TOLERANCE | | L = ± 0.01 % | C = ± 0.25 % | P = ± 0.02 % | D = ± 0.5 % | W = ± 0.05 % | F = ± 1.0 % | B = ± 0.1 % | |
| TOLERANCE | | | | | | | | | | | | |
| L = ± 0.01 % | C = ± 0.25 % | | | | | | | | | | | |
| P = ± 0.02 % | D = ± 0.5 % | | | | | | | | | | | |
| W = ± 0.05 % | F = ± 1.0 % | | | | | | | | | | | |
| B = ± 0.1 % | | | | | | | | | | | | |

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

| | | |
|------------------|-------|-----------|
| CNS 020 | 301K | 1 % |
| HISTORICAL MODEL | VALUE | TOLERANCE |



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