

Thin Film Top-Contact Resistor



Product may not be to scale

The SFM series single-value resistor chips offer a small size, wide ohmic value range and excellent power capacity. The SFMs tantalum nitride resistor material offers excellent resistance to high moisture environments. The SFMs are manufactured using Vishay Electro-Films (EFI) sophisticated thin film equipment and manufacturing technology. The SFMs are 100 % electrically tested and visually inspected to MIL-STD-883, method 2032 class H or K.

FEATURES

- Wire bondable
- Small size: 0.020 inches square
- Case: 0202
- Resistance range: 1.0 Ω to 1 M Ω
- DC power rating: 250 mW
- Oxidized silicon substrate for good power dissipation
- Resistor material: tantalum nitride, self-passivating
- Moisture resistant
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

APPLICATIONS

Vishay EFI SFM top-contact resistor chips are designed to handle substantial power loads in many types of hybrid packages. They are ideally suited for this purpose because of their small size.

| TEMPERATURE COEFFICIENT OF RESISTANCE, VALUES, AND TOLERANCES | | |
|---|---|-------------------|
| PARAMETER | VALUE | UNIT |
| Total resistance range | 1 to 1M | Ω |
| Standard tolerances | ± 0.1 , ± 0.5 , ± 1 | % |
| TCR | ± 25 , ± 50 , ± 100 , ± 250 | ppm/ $^{\circ}$ C |



| STANDARD ELECTRICAL SPECIFICATIONS | | |
|--|------------------------------|--------------|
| PARAMETER | VALUE | UNIT |
| Noise, MIL-STD-202, method 308 100 Ω to 250 k Ω < 100 Ω or > 251 k Ω | -35 typ. -20 typ. | dB |
| Moisture resistance, MIL-STD-202 method 106 | ± 0.5 max. $\Delta R/R$ | % |
| Stability, 1000 h, +125 $^{\circ}$ C, 125 mW | ± 0.25 max. $\Delta R/R$ | % |
| Operating temperature range | -55 to +150 | $^{\circ}$ C |
| Thermal shock, MIL-STD-202, method 107, test condition F | ± 0.25 max. $\Delta R/R$ | % |
| High temperature exposure, +150 $^{\circ}$ C, 100 h | ± 0.5 max. $\Delta R/R$ | % |
| Dielectric voltage breakdown | 200 | V |
| Insulation resistance | 10^{12} min. | Ω |
| Operating voltage | 100 max. | V |
| DC power rating at +70 $^{\circ}$ C (derated to zero at +175 $^{\circ}$ C) | 0.250 | W |
| 5 x rated power short-time overload, +25 $^{\circ}$ C, 5 s | ± 0.25 max. $\Delta R/R$ | % |

CONFIGURATIONS in inches

SCHEMATIC


| MECHANICAL SPECIFICATIONS | |
|---------------------------|---|
| PARAMETER | VALUE |
| Chip size | 0.020" x 0.020" \pm 0.003" (0.5 mm x 0.5 mm \pm 0.076 mm) |
| Chip thickness | 0.010" \pm 0.002" (0.254 mm \pm 0.05 mm) |
| Chip substrate material | Oxidized silicon, 10 k \AA minimum SiO ₂ |
| Resistor material | Tantalum nitride, self-passivating |
| Bonding pad size | 0.004" x 0.004" (0.10 mm x 0.10 mm) |
| Number of pads | 2 |
| Pad material | 25 k \AA minimum aluminum |
| Backing | None, lapped semiconductor silicon |

| GLOBAL PART NUMBER INFORMATION | | | | | | | | | | | | | |
|---|--|--|--|---|------------------|--------------------|----------------------------|---------------------------------------|---|---|---|---|---|
| Global Part Number: SFM50000FKANHWS | | | | | | | | | | | | | |
| Global Part Number Description: SFM 5K 1 %, 100 ppm/ $^{\circ}$ C, Al, no back metal, class H, WS | | | | | | | | | | | | | |
| S | F | M | 5 | 0 | 0 | 0 | F | K | A | N | H | W | S |
| MODEL | RESISTANCE | RESISTANCE MULTIPLIER CODE | TOLERANCE CODE (%) | TCR (ppm/ $^{\circ}$ C) | TERMINATION | BACK METAL | VISUAL CLASS | PACKAGING CODE | | | | | |
| SFM | First 4 digits are significant figures of resistance | C = 0.001 B = 0.01 A = 0.1 0 = 1 1 = 10 2 = 100 3 = 1000 | B = 0.1 C = 0.25 D = 0.5 F = 1.0 G = 2.0 H = 2.5 J = 5.0 K = 10 | E = \pm 25 C = \pm 50 K = \pm 100 M = \pm 250 R = 0 / -250 | G = Au A = Al | G = Au N = none | H = class H K = class K | WS = waffle pack 100 min., 1 mult. | | | | | |



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