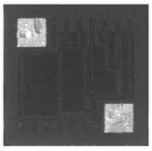
# Thin Film Top-Contact Resistor



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

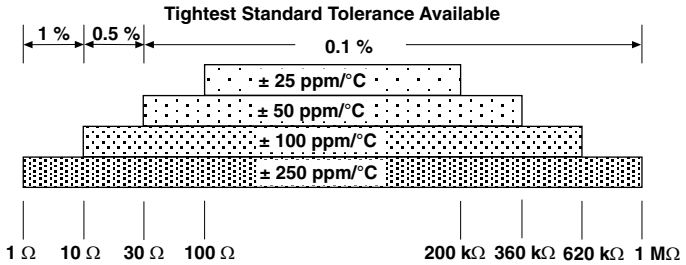
- Wire bondable
- Small size: 0.020 inches square
- Case: 0202
- Resistance range: 1.0 Ω to 1 MΩ
- DC power rating: 250 mW
- Oxidized silicon substrate for good power dissipation
- Resistor material: tantalum nitride, self-passivating
- Moisture resistant
- Material categorization: for definitions of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

Pb-free
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/°C |




| STANDARD ELECTRICAL SPECIFICATIONS | | |
|---|---|---|
| **PARAMETER** | **VALUE** | **UNIT** |
| Noise, MIL-STD-202, method 308<br>100 Ω to 250 kΩ<br>< 100 Ω or > 251 kΩ | <br>-35 typ.<br>-20 typ. | dB |
| Moisture resistance, MIL-STD-202 method 106 | ± 0.5 max. $\Delta R/R$ | % |
| Stability, 1000 h, +125 °C, 125 mW | ± 0.25 max. $\Delta R/R$ | % |
| Operating temperature range | -55 to +150 | °C |
| Thermal shock, MIL-STD-202, method 107, test condition F | ± 0.25 max. $\Delta R/R$ | % |
| High temperature exposure, +150 °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 °C (derated to zero at +175 °C) | 0.250 | W |
| 5 x rated power short-time overload, +25 °C, 5 s | ± 0.25 max. $\Delta R/R$ | % |


For technical questions, contact: efi@vishay.com
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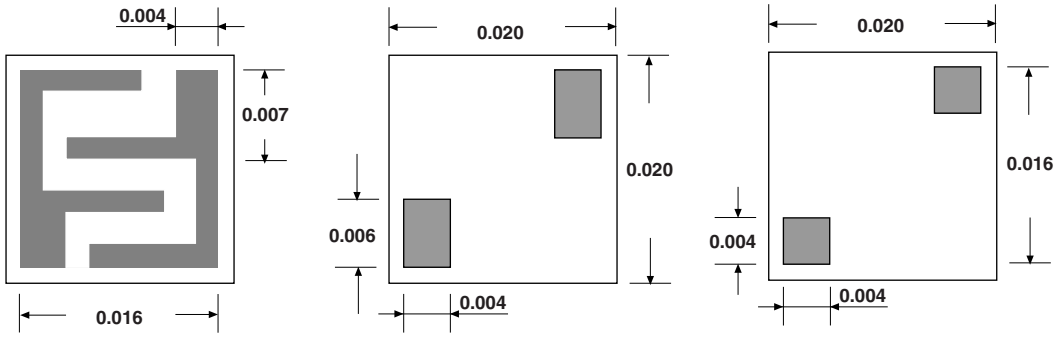
## CONFIGURATIONS in inches




TYPICAL RANGE
1 Ω to 29 Ω

TYPICAL RANGE
30 Ω to 819 Ω

TYPICAL RANGE
820 Ω to 1 MΩ

## SCHEMATIC

| MECHANICAL SPECIFICATIONS | |
|---|---|
| **PARAMETER** | **VALUE** |
| Chip size | 0.020" x 0.020" ± 0.003" (0.5 mm x 0.5 mm ± 0.076 mm) |
| Chip thickness | 0.010" ± 0.002" (0.254 mm ± 0.05 mm) |
| Chip substrate material | Oxidized silicon, 10 kÅ 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 kÅ minimum aluminum |
| Backing | None, lapped semiconductor silicon |

## GLOBAL PART NUMBER INFORMATION

**Global Part Number: SFM50000FKANHWS**

**Global Part Number Description: SFM 5K 1 %, 100 ppm/°C, Al, no back metal, class H, WS**

| S | F | M | 5 | 0 | 0 | 0 | 0 | F | K | A | N | H | W | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| MODEL | RESISTANCE | RESISTANCE MULTIPLIER CODE | TOLERANCE CODE (%) | TCR (ppm/°C) | TERMINATION | BACK METAL | VISUAL CLASS | PACKAGING CODE |
|---|---|---|---|---|---|---|---|---|
| **SFM** | First 4 digits are significant figures of resistance | **C** = 0.001<br>**B** = 0.01<br>**A** = 0.1<br>**0** = 1<br>**1** = 10<br>**2** = 100<br>**3** = 1000 | **B** = 0.1<br>**C** = 0.25<br>**D** = 0.5<br>**F** = 1.0<br>**G** = 2.0<br>**H** = 2.5<br>**J** = 5.0<br>**K** = 10 | **E** = ± 25<br>**C** = ± 50<br>**K** = ± 100<br>**M** = ± 250<br>**R** = 0 / -250 | **G** = Au<br>**A** = Al | **G** = Au<br>**N** = none | **H** = class H<br>**K** = class K | **WS** = waffle pack 100 min., 1 mult. |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