

## 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  $\Omega$  to 1 M $\Omega$
- 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](http://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	$\Omega$
Standard tolerances	$\pm 0.1$ , $\pm 0.5$ , $\pm 1$	%
TCR	$\pm 25$ , $\pm 50$ , $\pm 100$ , $\pm 250$	ppm/ $^{\circ}$ C



### STANDARD ELECTRICAL SPECIFICATIONS

PARAMETER	VALUE	UNIT
Noise, MIL-STD-202, method 308 100 $\Omega$ to 250 k $\Omega$ < 100 $\Omega$ or > 251 k $\Omega$	-35 typ. -20 typ.	dB
Moisture resistance, MIL-STD-202 method 106	$\pm 0.5$ max. $\Delta R/R$	%
Stability, 1000 h, +125 $^{\circ}$ C, 125 mW	$\pm 0.25$ max. $\Delta R/R$	%
Operating temperature range	-55 to +150	$^{\circ}$ C
Thermal shock, MIL-STD-202, method 107, test condition F	$\pm 0.25$ max. $\Delta R/R$	%
High temperature exposure, +150 $^{\circ}$ C, 100 h	$\pm 0.5$ max. $\Delta R/R$	%
Dielectric voltage breakdown	200	V
Insulation resistance	$10^{12}$ min.	$\Omega$
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	$\pm 0.25$ 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 $\text{\AA}$ minimum SiO <sub>2</sub>
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 $\text{\AA}$ 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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