

## Thin Film MELF Resistors



### FEATURES

- MELF resistor with high power rating
- AEC-Q200 qualified
- Advanced thin film technology
- Pure tin termination on nickel barrier, plated on press fit steel caps
- Compliant to RoHS Directive 2002/95/EC



**RoHS**  
COMPLIANT

**GREEN**  
(5-2008)\*\*

### STANDARD ELECTRICAL SPECIFICATIONS

MODEL	POWER RATING <sup>(1)</sup> $P_{70}$ W	LIMITING ELEMENT VOLTAGE DC or $AC_{RMS}$ V	TEMPERATURE COEFFICIENT ppm/K	TOLERANCE %	RESISTANCE RANGE $\Omega$	E-SERIES
SMM0207	1.0	350	$\pm 50$	$\pm 0.5$	1R0 to 2M21	24; 96
SMM0207	1.0	350	$\pm 50$	$\pm 1$	1R0 to 10M	24; 96
SMM0207	1.0	350	$\pm 100$	$\pm 5$	R16 to R91	24

Zero-Ohm-Resistor: OMM0207  $R_{max.} = 10 \text{ m}\Omega$   $I_{max.} = 5 \text{ A}$

#### Note

<sup>(1)</sup> Permissible dissipation depends on the maximum temperature at the solder joint, the component placement density and the substrate material.

### TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	SMM0207
Power rating $P_{70}$	W	1
Limiting element voltage, DC or $AC_{RMS}$	V	350
Insulation voltage (1 min), DC or $AC_{PEAK}$	V	500
Insulation resistance	$\Omega$	$\geq 10^{10}$
Category temperature range	$^{\circ}\text{C}$	- 55 to + 155
Failure rate: FIT <sub>observed</sub>		$\leq 0.1 \times 10^{-9}/\text{h}$

#### Notes

- The power dissipation on the resistor generates a temperature rise against the local ambient, depending on the heat flow support of the printed-circuit board (thermal resistance). The rated dissipation applies only if the permitted film temperature of 155 °C is not exceeded.
- The specification of this product is based on a test board, providing a thermal resistance of approximately 85 K/W.
- These resistors do not feature a limited lifetime when operated within the permissible limits. However, resistance value drift increasing over operating time may result in exceeding a limit acceptable to the specific application, thereby establishing a functional lifetime.

\*\* Please see document "Vishay Material Category Policy": [www.vishay.com/doc?999902](http://www.vishay.com/doc?999902)

**DIMENSIONS**



DIMENSIONS AND MASS						
TYPE	L (mm)	D <sub>max.</sub> (mm)	L <sub>1</sub> min. (mm)	D <sub>1</sub> (mm)	K (mm)	MASS (mg)
SMM0207 OMM0207	5.8 + 0/- 0.3	2.2	2.6	D + 0/- 0.2	1.25 ± 0.2	77

**Notes**

- Color code marking is applied according to IEC 60062 <sup>(1)</sup> in five bands. Each color band appears as a single solid line, voids are permissible if at least 2/3 of the band is visible from each radial angle of view. The last color band for tolerance is approximately 50 % wider than the other bands.
- Zero ohm jumper are marked with one centered black band.

**PATTERN STYLES FOR MELF RESISTORS**



RECOMMENDED SOLDER PAD DIMENSIONS								
TYPE	WAVE SOLDERING				REFLOW SOLDERING			
	G (mm)	Y (mm)	X (mm)	Z (mm)	G (mm)	Y (mm)	X (mm)	Z (mm)
SMM0207 OMM0207	2.4	2.3	2.6	7.0	2.6	2.0	2.4	6.6

**Notes**

- The given solder pad dimensions reflect the considerations for board design and assembly as outlined e.g. in standards IEC 61188-5-x, or in publication IPC-7351.
- The specified dissipation of 1 W relies on special support from the printed-circuit board in order to achieve the required heat flow. Specification of a particular conductor size is not feasible since its thermal performance depends on a variety of influences from the actual PCB design and from the application environment.



**PART NUMBER AND PRODUCT DESCRIPTION**

Part Number: SMM02070C5620FBS00  
 Part Number: OMM0207000000BS00

S	M	M	0	2	0	7	0	C	5	6	2	0	F	B	S	0	0
O	M	M	0	2	0	7	0	0	0	0	0	0	0	B	S	0	0

MODEL	VERSION	TCR	RESISTANCE	TOLERANCE	PACKAGING
SMM0207 OMM0207	0 = Neutral	C = ± 50 ppm/K B = ± 100 ppm/K 0 = Jumper	3 digit value 1 digit multiplier 0000 = Jumper MULTIPLIER 7 = *10 <sup>-3</sup> 2 = *10 <sup>2</sup> 8 = *10 <sup>-2</sup> 3 = *10 <sup>3</sup> 9 = *10 <sup>-1</sup> 4 = *10 <sup>4</sup> 0 = *10 <sup>0</sup> 5 = *10 <sup>5</sup> 1 = *10 <sup>1</sup>	D = ± 0.5 % F = ± 1 % J = ± 5 % 0 = Jumper	BP BS

Product Description: SMM0207 50 562R 1 % BS  
 Product Description: OMM0207 0R0 BS

SMM0207	50	562R	1 %	BS
OMM0207	-	0R0	-	BS
MODEL	TCR	RESISTANCE	TOLERANCE	PACKAGING
SMM0207 OMM0207	± 50 ppm/K ± 100 ppm/K	100R = 100 Ω 2M21 = 2.21 MΩ 0R0 = Jumper	± 0.5 % ± 1 % ± 5 %	BP BS

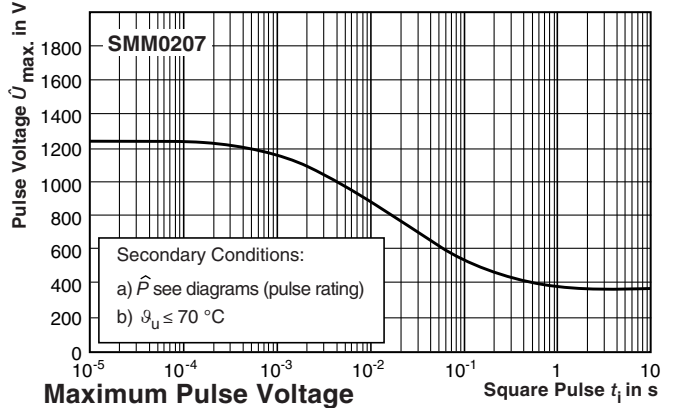
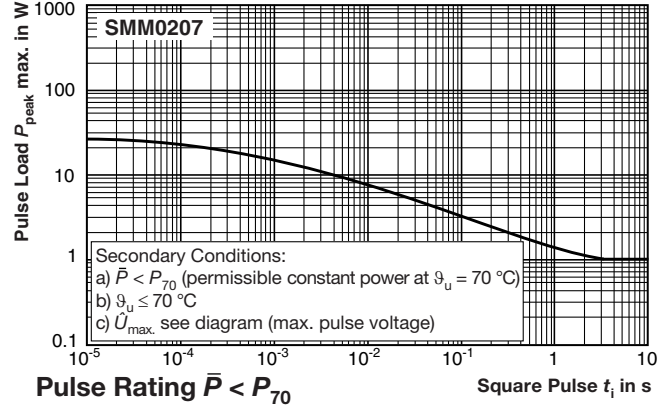
**Note**

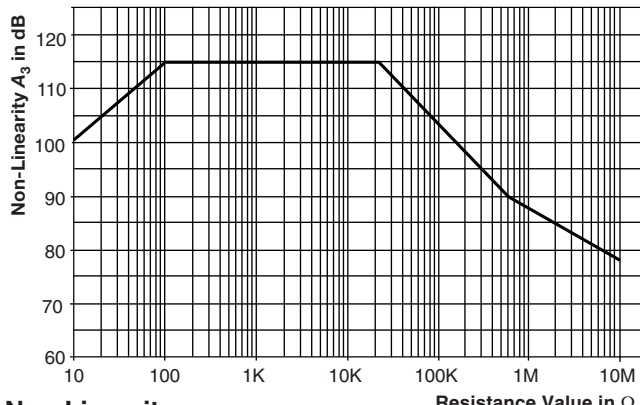
- Products can be ordered using either the PART NUMBER or the PRODUCT DESCRIPTION.

**PACKAGING**

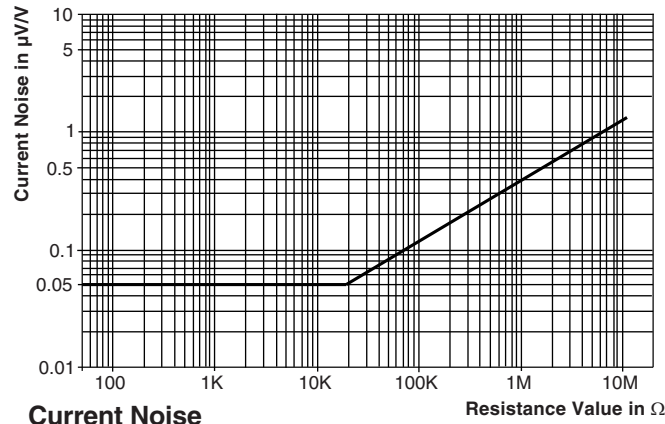
TYPE	CODE	QUANTITY	CARRIER TAPE	WIDTH	PITCH	REEL DIAMETER
SMM0207 OMM0207	BP	1500	Blister tape acc. IEC 60286-3 Type II	12 mm	4 mm	180 mm/7"
	BS	7500				330 mm/13"

**FUNCTIONAL PERFORMANCE**





Non-Linearity



Current Noise

**TEST PROCEDURES AND REQUIREMENTS**

TEST	CONDITIONS OF TEST	REQUIREMENTS PERMISSIBLE CHANGE ( $\Delta R$ )			
		STABILITY CLASS 0.25	STABILITY CLASS 0.5	STABILITY CLASS 1	STABILITY CLASS 2
		10 $\Omega$ to 1 M $\Omega$	1 $\Omega$ to 10 $\Omega$	< 1 $\Omega$	> 1 M $\Omega$
Endurance test at 70 °C IEC 60115-1, 4.25.1	$U = \sqrt{P_{70} \times R} \leq U_{max.}$ ; 1.5 h "on", 0.5 h "off" at 70 °C, 1000 h at 70 °C, 8000 h	$\pm (0.25 \% R + 0.05 \Omega)$ $\pm (0.5 \% R + 0.05 \Omega)$			$\pm (0.5 \% R + 0.05 \Omega)$ $\pm (1.0 \% R + 0.05 \Omega)$
Endurance at UCT IEC 60115-1, 4.25.3	at 125 °C, 1000 h	$\pm (0.25 \% R + 0.05 \Omega)$			$\pm (0.5 \% R + 0.05 \Omega)$
Damp heat steady state 40 °C/93 % RH IEC 60115-1, 4.24 and IEC 60068-2-78	56 days; $U = 0.1 \times \sqrt{P_{70} \times R}$ ; $U_{max.} = 20 V$	$\pm (0.25 \% R + 0.05 \Omega)$		$\pm (0.5 \% R + 0.05 \Omega)$	
Damp heat steady state accelerated 85 °C/85 % RH	1000 h; $U = 0.3 \times \sqrt{P_{70} \times R}$ ; $U_{max.} = 40 V$		$\pm (1.0 \% R + 0.05 \Omega)$		$\pm (2.0 \% R + 0.05 \Omega)$
Rapid change of temperature; 1000 cycles IEC 60115-1, 4.19 and IEC 60068-2-14	30 min at LCT; 30 min at UCT; LCT = - 55 °C; UCT = 125 °C		$\pm (0.25 \% R + 0.05 \Omega)$		
Overload test IEC 60115-1, 4.13	$U = 2.5 \times \sqrt{P_{70} \times R} \leq 2 \times U_{max.}$ ; 5 s		$\pm (0.05 \% + 0.01 \Omega/R)$		$\pm (0.1 \% R + 0.05 \Omega)$
Electrostatic discharge (HBM) IEC 60340-3-1	3 positive + 3 negative discharges 4 kV		$\pm (0.5 \% R + 0.05 \Omega)$		
Resistance to soldering heat IEC 60115-1, 4.18.2 and IEC 60068-2-58	Solder bath method (260 $\pm$ 5) °C; 10 s	$\pm (0.05 \% R + 0.01 \Omega)$		$\pm (0.1 \% R + 0.05 \Omega)$	

**APPLICABLE SPECIFICATIONS**

- EN 60115-1                      Generic specification
- EN 140400                      Sectional specification
- EN 140401-803                Detail specification
- IEC 60068-2-x                Variety of environmental test procedures
- IEC 60286-3                    Packaging of SMD components



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