

## 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

AUTOMOTIVE  
GRADERoHS  
COMPLIANTGREEN  
(5-2008)\*\*

## STANDARD ELECTRICAL SPECIFICATIONS

MODEL	POWER RATING <sup>(1)</sup> $P_{70}$ W	LIMITING ELEMENT VOLTAGE DC or AC <sub>RMS</sub> 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 <sub>RMS</sub>	V	350
Insulation voltage (1 min), DC or AC <sub>PEAK</sub>	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  $^{\circ}\text{C}$  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**

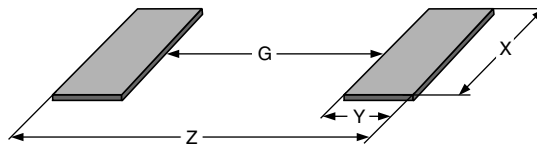


DIMENSIONS AND MASS						
TYPE	L (mm)	D <sub>max.</sub> (mm)	L <sub>1</sub> min. (mm)	D <sub>1</sub> (mm)	K (mm)	MASS (mg)
SMM0207 OMM0207	5.8 + 0/- 0.3	2.2	2.6	D + 0/- 0.2	1.25 ± 0.2	77

**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  $\frac{2}{3}$  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.



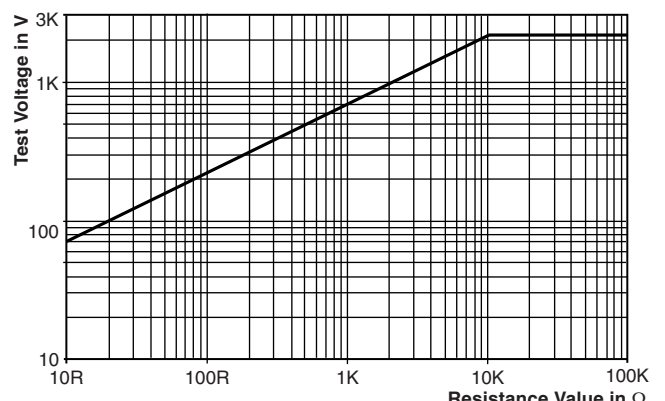
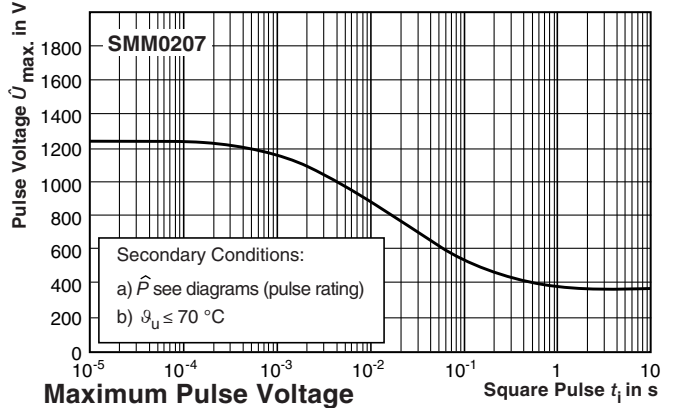
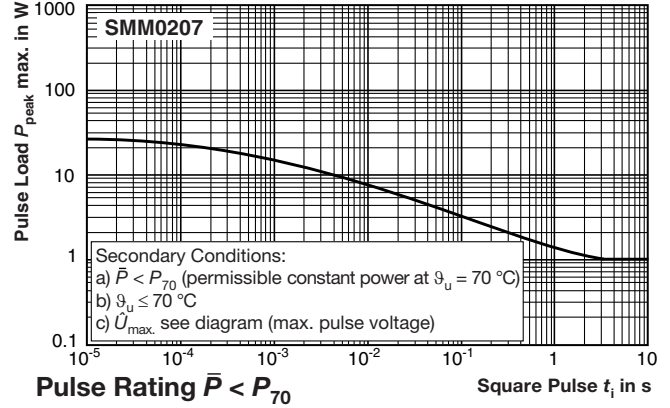
PART NUMBER AND PRODUCT DESCRIPTION					
Part Number: SMM02070C5620FBS00					
Part Number: OMM02070000000BS00					
S	M	M	0	2	0
7	0	C	5	6	2
0	F	B	S	0	0
O	M	M	0	2	0
7	0	0	0	0	0
0	0	0	0	0	0
0	B	S	0	0	
MODEL	VERSION	TCR	RESISTANCE	TOLERANCE	PACKAGING
SMM0207 OMM0207	0 = Neutral	C = ± 50 ppm/K B = ± 100 ppm/K 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	

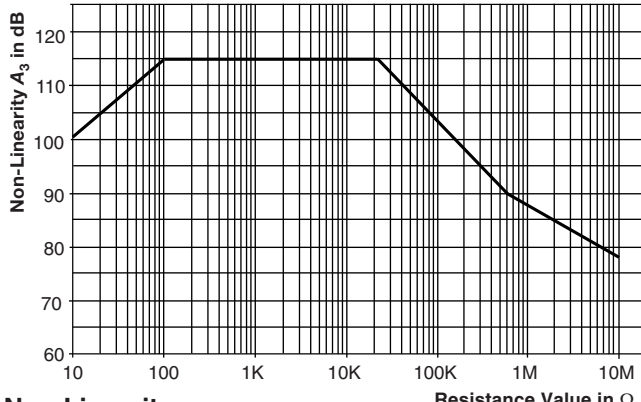
Note

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

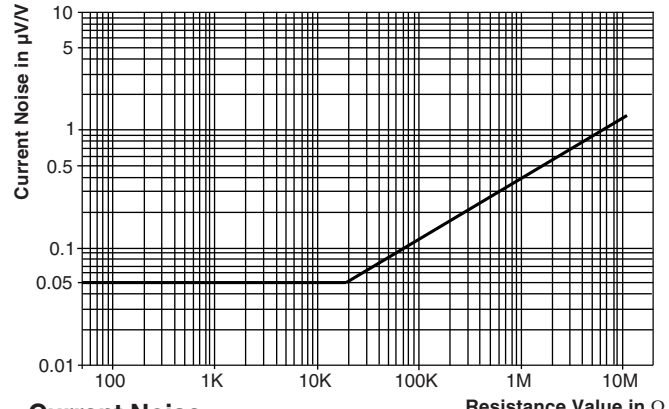
PACKAGING						
TYPE	CODE	QUANTITY	CARRIER TAPE	WIDTH	PITCH	REEL DIAMETER
SMM0207 OMM0207	BP	1500	Blister tape acc. IEC 60286-3 Type II	12 mm	4 mm	180 mm/7"
	BS	7500				330 mm/13"

**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



## Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

## Material Category Policy

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.**

**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.**



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.