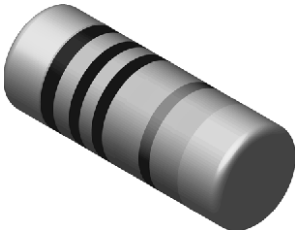
SMM0207

Vishay Draloric

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 GRADE

Pb-free

RoHS COMPLIANT

GREEN (5-2008)**

STANDARD ELECTRICAL SPECIFICATIONS

MODEL	POWER RATING (1) P_{70} W	LIMITING ELEMENT VOLTAGE DC or AC_{RMS} V	TEMPERATURE COEFFICIENT ppm/K	TOLERANCE %	RESISTANCE RANGE Ω	E-SERIES
SMM0207	1.0	350	± 50	± 0.5	1R0 to 2M21	24; 96
SMM0207	1.0	350	± 50	± 1	1R0 to 10M	24; 96
SMM0207	1.0	350	± 100	± 5	R16 to R91	24
Zero-Ohm-Resistor: OMM0207		$R_{max.}$ = 10 mΩ	$I_{max.}$ = 5 A			

Note

(1) 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	Ω	≥ 10^{10}
Category temperature range	°C	- 55 to + 155
Failure rate: $FIT_{observed}$	≤ 0.1 x 10^{-9}/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?99902

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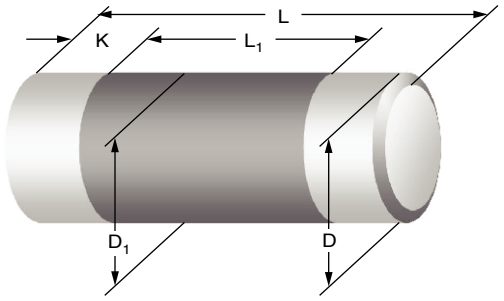
DIMENSIONS

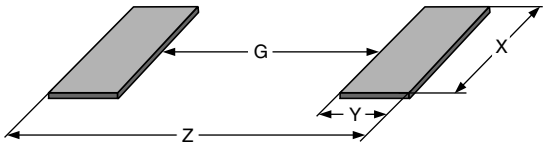


DIMENSIONS AND MASS						
TYPE	L (mm)	$D_{max.}$ (mm)	$L_{1\ min.}$ (mm)	D_1 (mm)	K (mm)	MASS (mg)
SMM0207 OMM0207	5.8 + 0/- 0.3	2.2	2.6	D + 0/- 0.2	1.25 ± 0.2	77

Notes

- Color code marking is applied according to IEC 60062 (1) 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.

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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	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** = $*10^{-3}$ **2** = $*10^{2}$ **8** = $*10^{-2}$ **3** = $*10^{3}$ **9** = $*10^{-1}$ **4** = $*10^{4}$ **0** = $*10^{0}$ **5** = $*10^{5}$ **1** = $*10^{1}$	**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"

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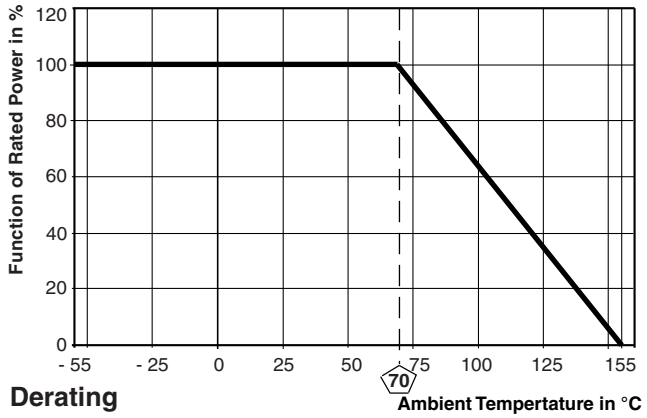
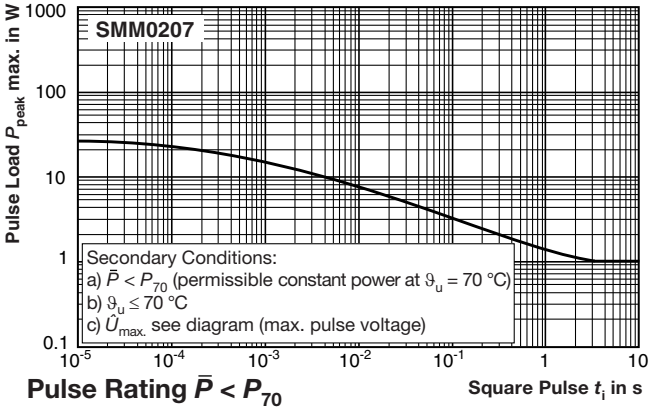
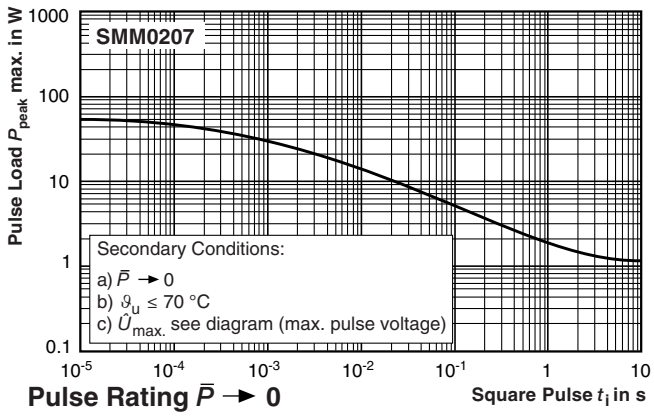
FUNCTIONAL PERFORMANCE



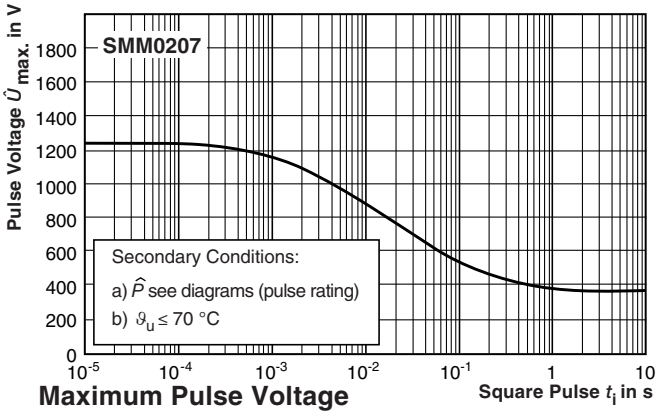
Derating



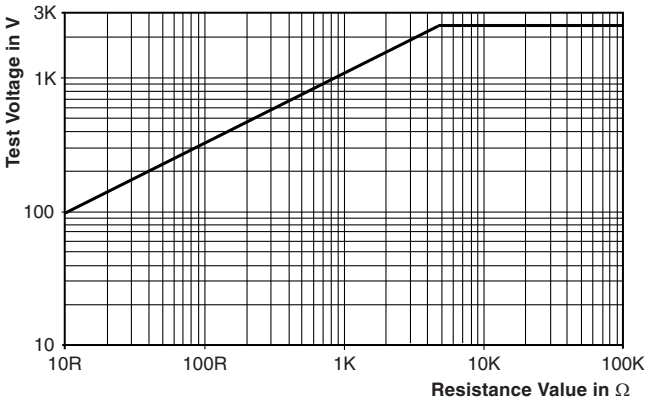
Pulse Rating $\bar{P} < P_{70}$



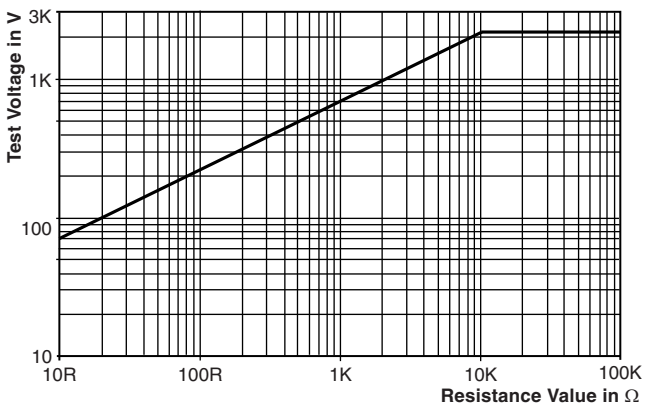
Pulse Rating $\bar{P} \rightarrow 0$



Maximum Pulse Voltage



Single Pulse High Voltage Overload Capability 1.2/50 acc. EN 60115-1, 4.27



Single Pulse High Voltage Overload Capability 10/700 acc. EN 60115-1, 4.27

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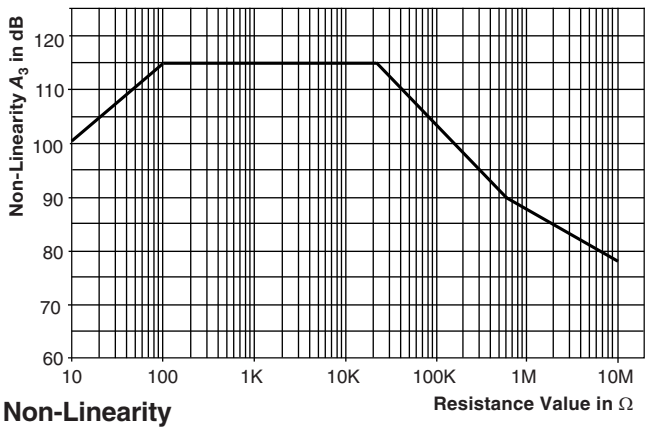
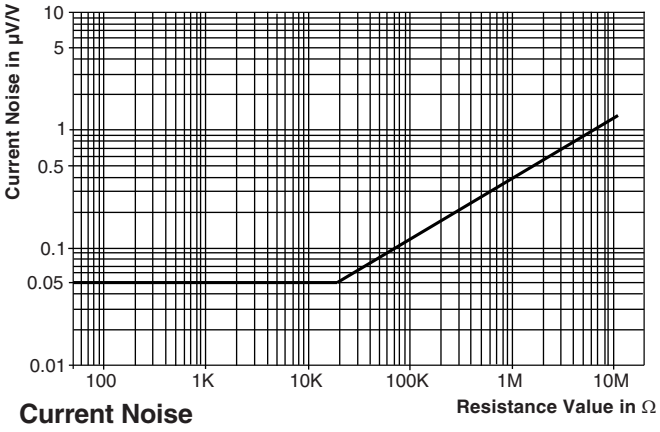


Non-Linearity



Current Noise

TEST PROCEDURES AND REQUIREMENTS

TEST	CONDITIONS OF TEST	REQUIREMENTS PERMISSIBLE CHANGE (ΔR)			
		STABILITY CLASS 0.25	STABILITY CLASS 0.5	STABILITY CLASS 1	STABILITY CLASS 2
		10 Ω to 1 MΩ	1 Ω to 10 Ω	< 1 Ω	> 1 MΩ
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	± (0.25 % R + 0.05 Ω)			± (0.5 % R + 0.05 Ω)
	at 70 °C, 8000 h	± (0.5 % R + 0.05 Ω)			± (1.0 % R + 0.05 Ω)
Endurance at UCT IEC 60115-1, 4.25.3	at 125 °C, 1000 h	± (0.25 % R + 0.05 Ω)			± (0.5 % R + 0.05 Ω)
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	± (0.25 % R + 0.05 Ω)	± (0.5 % R + 0.05 Ω)		
Damp heat steady state accelerated 85 °C/85 % RH	1000 h; $U = 0.3 \times \sqrt{P_{70} \times R}$; $U_{max.}$ = 40 V	± (1.0 % R + 0.05 Ω)			± (2.0 % R + 0.05 Ω)
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	± (0.25 % R + 0.05 Ω)			
Overload test IEC 60115-1, 4.13	$U = 2.5 \times \sqrt{P_{70} \times R} \leq 2 \times U_{max.}$; 5 s	± (0.05 % + 0.01 Ω/R)			± (0.1 % R + 0.05 Ω)
Electrostatic discharge (HBM) IEC 60340-3-1	3 positive + 3 negative discharges 4 kV	± (0.5 % R + 0.05 Ω)			
Resistance to soldering heat IEC 60115-1, 4.18.2 and IEC 60068-2-58	Solder bath method (260 ± 5) °C; 10 s	± (0.05 % R + 0.01 Ω)	± (0.1 % R + 0.05 Ω)		

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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