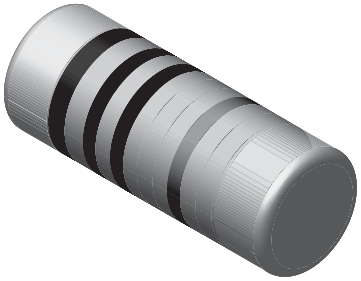
Thin Film Micro-MELF Resistors



FEATURES

- Advanced thin film technology
- Low TCR and tight tolerances
- Excellent stability
- Pure tin termination on nickel barrier, plated on press fit steel caps
- Compliant to RoHS Directive 2002/95/EC

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
SMM0102	0.2	150	± 15	± 0.1	100R to 100K	24; 96
SMM0102	0.2	150	± 25	± 0.1	100R to 100K	24; 96
SMM0102	0.2	150	± 50	± 1.0	10R to 2M21	24; 96
Zero-Ohm-Resistor: OMM0102		$R_{max.}$ = 10 mΩ		$I_{max.}$ = 2 A		

Note

(1) Permissible dissipation depends on the maximum temperature at the solder joint, the component placement density, the substrate material and PCB layout.

TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	SMM0102
Power rating P_{70}	W	0.2
Limiting element voltage, DC or AC_{RMS}	V	150
Insulation voltage (1 min), DC or AC_{PEAK}	V	200
Thermal resistance	K/W	≤ 250
Insulation resistance	Ω	≥ 10^9
Category temperature range	°C	- 55 to + 125
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 125 °C is not exceeded.
- The specification of this product is based on a test board according to EN 140400, providing a thermal resistance of approximately 275 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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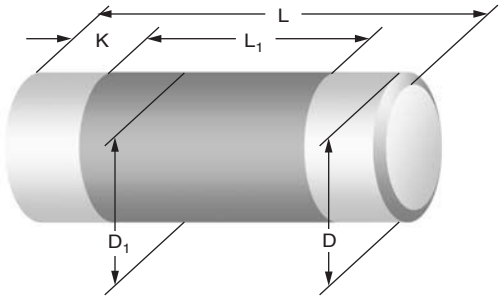
DIMENSIONS

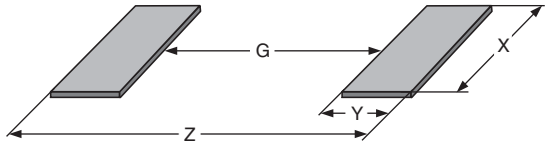


DIMENSIONS AND MASS						
TYPE	L (mm)	D (mm)	$L_{1\ min.}$ (mm)	D_1 (mm)	K (mm)	MASS (mg)
SMM0102 OMM0102	2.2 + 0/- 0.15	1.1 + 0/- 0.1	1.2	D + 0/- 0.1	0.4 ± 0.05	7

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. An interrupted band between the 4th and 5th full band indicates the temperature coefficient (yellow = TC25, orange = TC15).
- 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)
SMM0102 OMM0102	0.7	1.2	1.5	3.1	1.1	0.8	1.3	2.7

Note

- 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. They do not guarantee any supposed thermal properties, however, they will be found adequate for most general applications.

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PART NUMBER AND PRODUCT DESCRIPTION

Part Number: SMM01020D5620BB300
Part Number: OMM01020000000B300

S	M	M	0	1	0	2	0	D	5	6	2	0	B	B	3	0	0
O	M	M	0	1	0	2	0	0	0	0	0	0	0	B	3	0	0

MODEL	VERSION	TCR	RESISTANCE	TOLERANCE	PACKAGING
SMM0102 **OMM0102**	**0** = Neutral	**E** = ± 15 ppm/K **D** = ± 25 ppm/K **C** = ± 50 ppm/K **0** = Jumper	**3 digit value** **1 digit multiplier** **0000 =** Jumper MULTIPLIER **9** = $*10^{-1}$ **2** = $*10^{2}$ **0** = $*10^{0}$ **3** = $*10^{3}$ **1** = $*10^{1}$ **4** = $*10^{4}$	**B** = ± 0.1 % **F** = ± 1 % **0** = Jumper	**B1** **B3** **B0** **M8**

Product Description: SMM0102 25 562R 0.1 % B3
Product Description: OMM0102 0R0 B3

SMM0102	**25**	**562R**	**0.1 %**	**B3**
OMM0102	**-**	**0R0**	**-**	**B3**
MODEL	TCR	RESISTANCE	TOLERANCE	PACKAGING
SMM0102 **OMM0102**	± **15** ppm/K ± **25** ppm/K ± **50** ppm/K	**100** = 100 Ω **2M21** = 2.21 MΩ **0R0** = Jumper	± **0.1** % ± **1** %	**B1** **B3** **B0** **M8**

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

PACKAGING

TYPE	CODE	QUANTITY	CARRIER TAPE	WIDTH	PITCH	REEL DIAMETER
SMM0102 OMM0102	B1 (1)	1000 (1)	Blister tape acc. IEC 60286-3 Type II	8 mm	4 mm	180 mm/7"
	B3	3000				
	B0	10 000				330 mm/13"

Note
(1) Package of 1000 pieces, code B1, is available only for products with tolerance ± 0.1 %.

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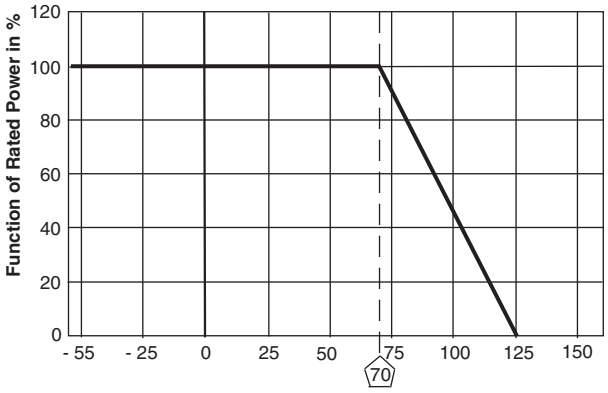
FUNCTIONAL PERFORMANCE



Derating

TEST PROCEDURES AND REQUIREMENTS

TEST	CONDITIONS OF TEST	REQUIREMENTS PERMISSIBLE CHANGE (Δ*R*)	
		< 221 kΩ	> 221 kΩ
Endurance test at 70 °C IEC 60115-1, 4.25.1	1000 h at 70 °C, 1.5 h "on", 0.5 h "off" 8000 h at 70 °C, 1.5 h "on", 0.5 h "off"	± 0.25 % *R* ± 0.5 % *R*	± 0.5 % *R* ± 1 % *R*
Endurance at UCT IEC 60115-1, 4.25.3	1000 h at 125 °C without load	± 0.25 % *R*	± 1 % *R*
Overload test IEC 60115-1, 4.13	Short time overload for 2 s at 6.25 x rated power	± 0.1 % *R*	± 0.15 % *R*
Thermal shock IEC 60115-1, 4.19 and IEC 60068-2-14	Rapid change between LCT = - 55 °C and UCT = 125 °C, 5 cycles	± 0.1 % *R*	± 0.15 % *R*
Damp heat steady state IEC 60115-1, 4.24 and IEC 60068-2-78	56 days at 40 °C and 93 % relative humidity	± 0.5 % *R*	± 1 % *R*
Resistance to soldering heat IEC 60115-1, 4.18 and IEC 60068-2-58	10 s at 260 °C solder bath temperature	± 0.1 % *R*	± 0.25 % *R*

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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Тел: +7 (812) 336 43 04 (многоканальный)
Email: org@lifeelectronics.ru

www.lifeelectronics.ru