

## 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



**RoHS**  
COMPLIANT  
**GREEN**  
[5-2009]\*\*

### 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
SMM0102	0.2	150	$\pm 15$	$\pm 0.1$	100R to 100K	24; 96
SMM0102	0.2	150	$\pm 25$	$\pm 0.1$	100R to 100K	24; 96
SMM0102	0.2	150	$\pm 50$	$\pm 1.0$	10R to 2M21	24; 96

Zero-Ohm-Resistor: OMM0102       $R_{max.} = 10 \text{ m}\Omega$        $I_{max.} = 2 \text{ A}$

#### Note

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

### TECHNICAL SPECIFICATIONS

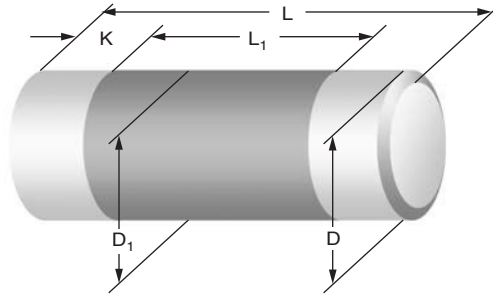
PARAMETER	UNIT	SMM0102
Power rating $P_{70}$	W	0.2
Limiting element voltage, DC or AC <sub>RMS</sub>	V	150
Insulation voltage (1 min), DC or AC <sub>PEAK</sub>	V	200
Thermal resistance	K/W	$\leq 250$
Insulation resistance	$\Omega$	$\geq 10^9$
Category temperature range	$^{\circ}\text{C}$	- 55 to + 125
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 125  $^{\circ}\text{C}$  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?999902](http://www.vishay.com/doc?999902)

**DIMENSIONS**

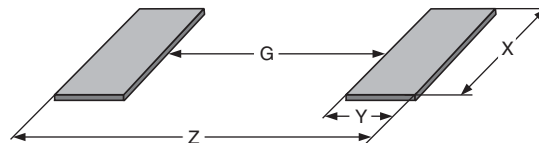


DIMENSIONS AND MASS						
TYPE	L (mm)	D (mm)	L <sub>1</sub> min. (mm)	D <sub>1</sub> (mm)	K (mm)	MASS (mg)
SMM0102 OMM0102	2.2 + 0/- 0.15	1.1 + 0/- 0.1	1.2	D + 0/- 0.1	0.4 ± 0.05	7

**Notes**

- Color code marking is applied according to IEC 60062 <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. An interrupted band between the 4<sup>th</sup> and 5<sup>th</sup> 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.



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	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 <sup>-1</sup> 2 = *10 <sup>2</sup> 0 = *10 <sup>0</sup> 3 = *10 <sup>3</sup> 1 = *10 <sup>1</sup> 4 = *10 <sup>4</sup>			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 <sup>(1)</sup>	1000 <sup>(1)</sup>	Blister tape acc. IEC 60286-3 Type II	8 mm	4 mm	180 mm/7"
	B3	3000				330 mm/13"
	B0	10 000				

Note

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

**FUNCTIONAL PERFORMANCE**



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

<b>APPLICABLE SPECIFICATIONS</b>	
• 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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