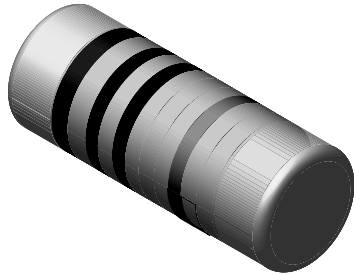


## Metal Film, Cylindrical Resistors



### FEATURES

- Stable metal film on high quality ceramic
- Low TC and tight tolerances
- Excellent stability in different environmental conditions
- Pure tin termination on nickel barrier, plated on press fit steel caps
- Compatible with lead (Pb)-free and lead containing soldering processes
- Lead (Pb)-free and RoHS compliant



### STANDARD ELECTRICAL SPECIFICATIONS

MODEL	POWER RATING <sup>1)</sup> $P_{70}$ W	LIMITING ELEMENT VOLTAGE <sup>2)</sup> DC or AC rms V	TEMPERATURE COEFFICIENT ppm/K	TOLERANCE %	RESISTANCE RANGE $\Omega$	E-SERIES
SMM0204	0.25	200	$\pm 15$	$\pm 0.1$ $\pm 0.25$ $\pm 0.5$	43R - 221K 22R - 221K 10R - 221K	24 - 192 24 - 192 24 - 192
SMM0204	0.25	200	$\pm 25$	$\pm 0.1$ $\pm 0.25$ $\pm 0.5$	43R - 511K 22R - 511K 10R - 1M0	24 - 192 24 - 192 24 - 192
SMM0204	0.25	200	$\pm 50$	$\pm 0.5$ $\pm 1$	10R - 1M0 R82 - 10M	24 - 192 24 - 96
SMM0204	0.25	200	$\pm 100$	$\pm 5$	R22 - 10M	24
Zero-Ohm-Resistor: OMM0204 $R_{max} = 10 \text{ m}\Omega$ $I_{max} = 2 \text{ A}$						

#### Note

1. Permissible dissipation depends on the maximum temperature at the solder point, the component placement density and the substrate material.
  2. Rated voltage:  $\sqrt{P \times R}$ .
- Further values and tolerances on request
  - Coating:  
Light green for TC = 100 ppm/K, 50 ppm/K and zero ohm resistor  
Pink TC = 25 ppm/K  
Violet TC = 15 ppm/K
  - Marking: According to IEC 60062; see also data sheet "surface mount resistor marking" (document number: 20020)
  - Zero ohm resistor has a black band only

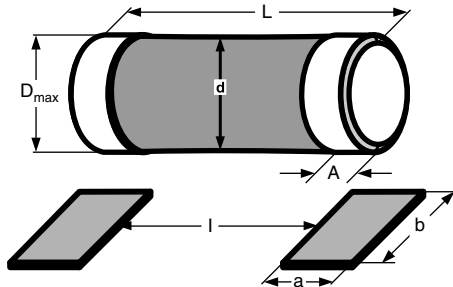
### TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	SMM0204
Rated Dissipation at 70 °C	W	0.25
Limiting Element Voltage, DC or AC rms	V	200
Insulation Voltage (1 min), DC or AC peak	V	300
Thermal Resistance <sup>3)</sup>	K/W	$\leq 220$
Insulation Resistance	$\Omega$	$\geq 10^{10}$
Category Temperature Range	°C	- 55 to + 125 (+ 155)
Failure Rate	$10^{-9}/\text{h}$	$< 1$
Weight/1000 pcs	g	18

#### Note

3. Based on measurements on test board acc. to EN 140400.

**DIMENSIONS**



MODEL	DIMENSIONS [in millimeters]				
	D <sub>max</sub>	d*	L	A <sub>max</sub>	A <sub>min</sub>
SMM0204	1.4	D - 0.15	3.6 - 0.15	0.85	0.5

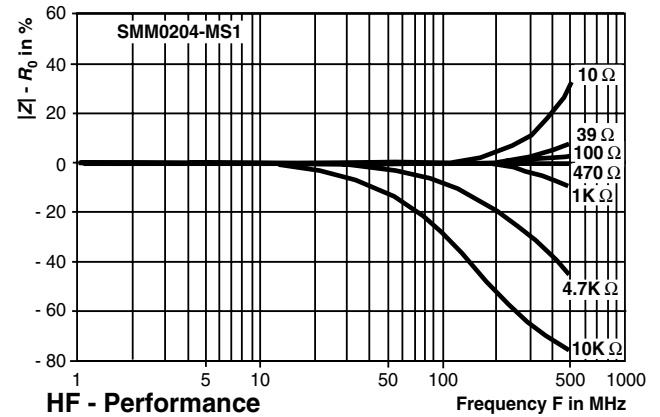
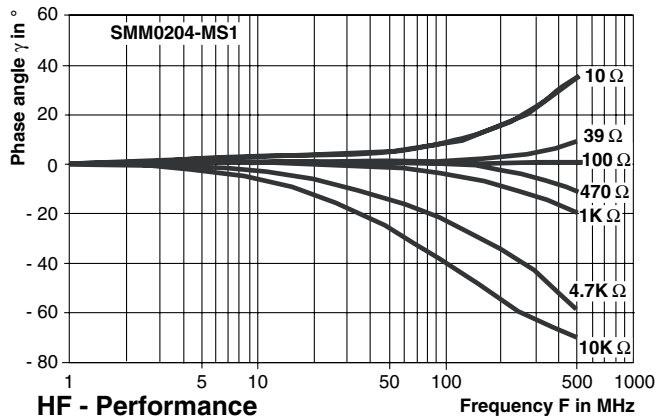
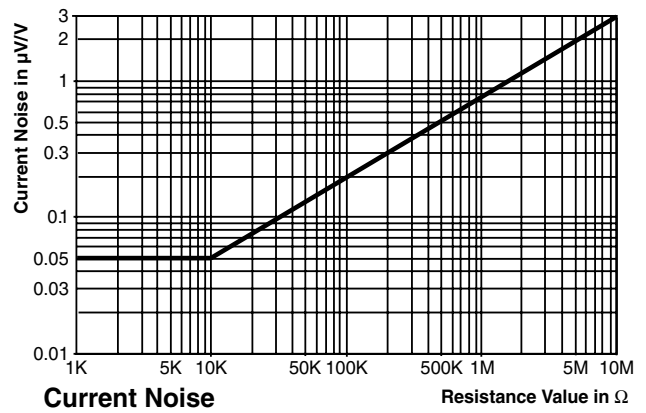
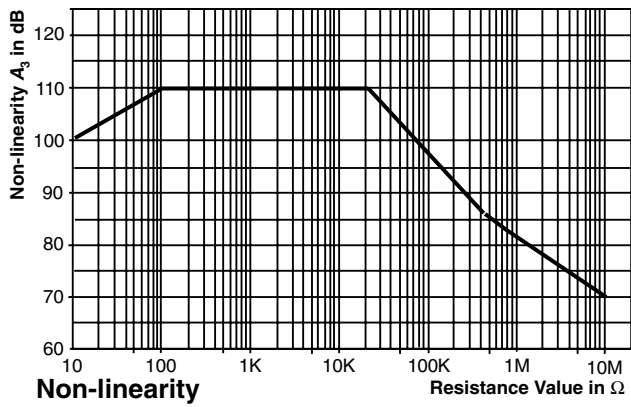
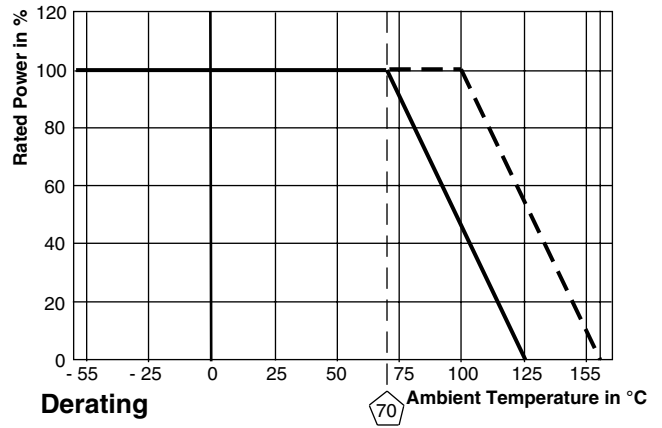
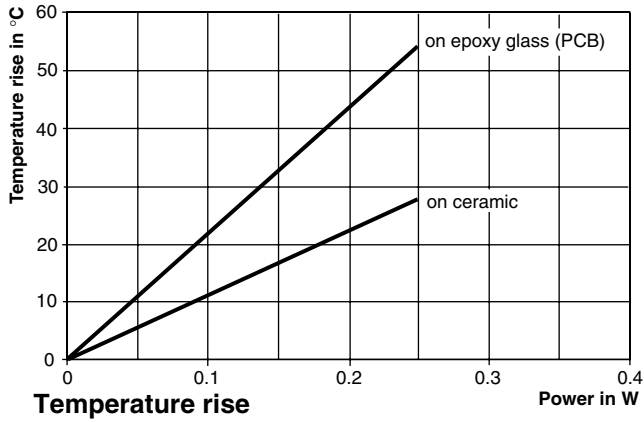
\* d measured in the middle of the resistor

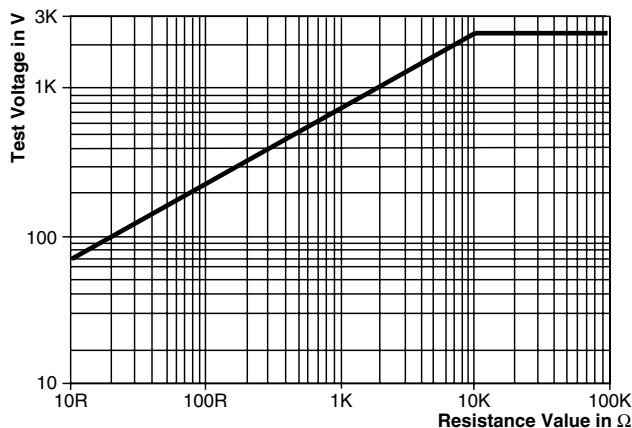
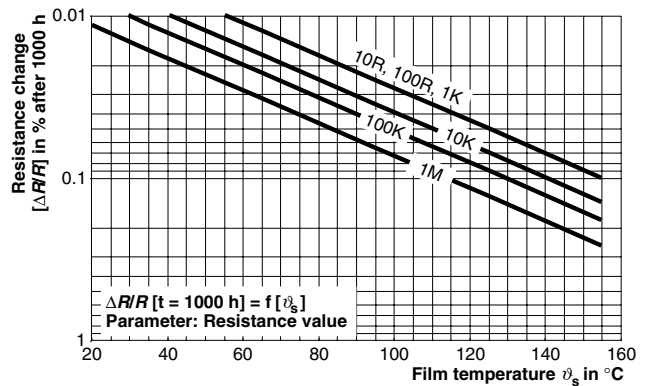
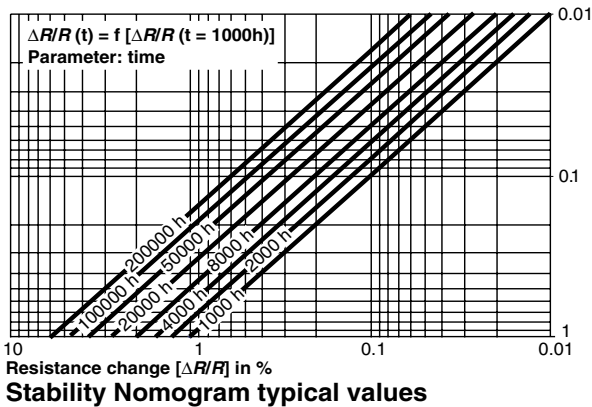
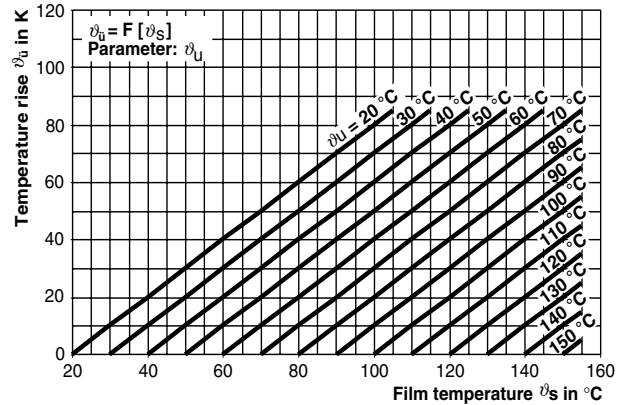
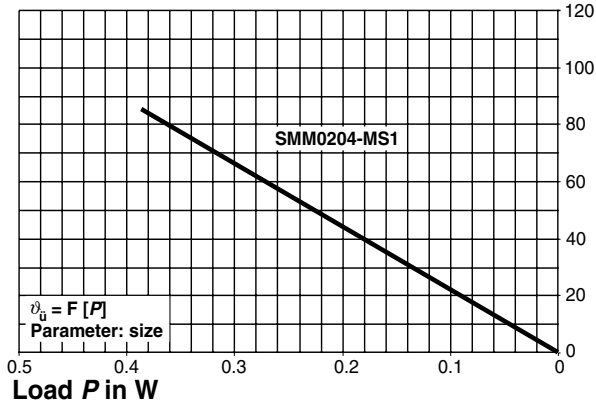
MODEL	SOLDER PAD DIMENSIONS [in millimeters]					
	REFLOW SOLDERING			WAVE SOLDERING		
	a	b	l	a	b	l
SMM0204	1.0	1.6	2.2	1.2	1.6	2.2

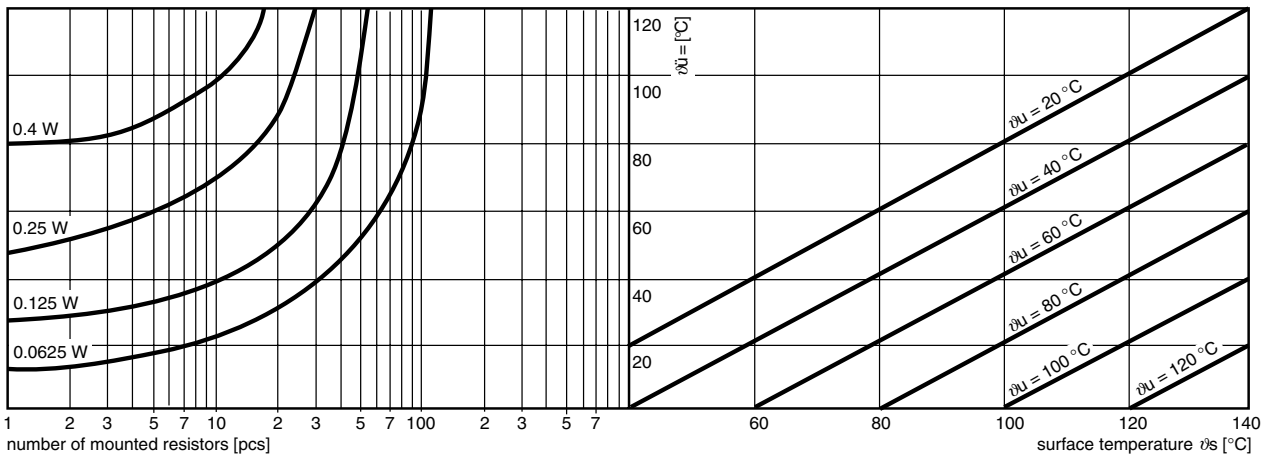
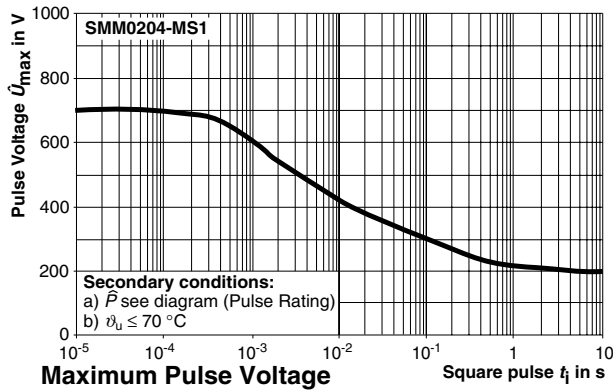
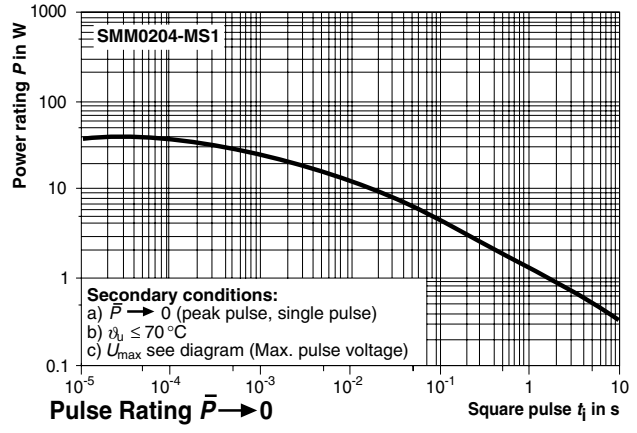
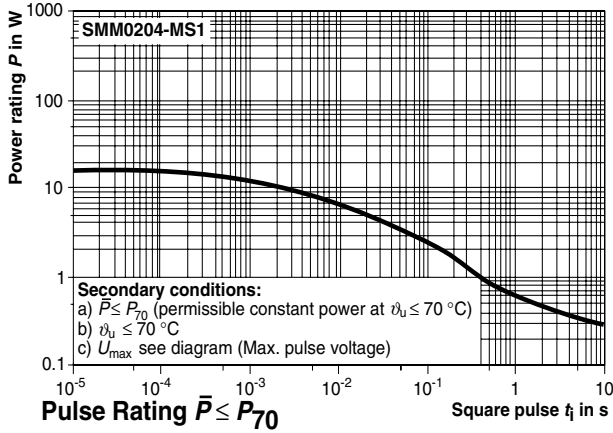
PART NUMBER AND PRODUCT DESCRIPTION <sup>1)</sup>																	
PART NUMBER <sup>2)</sup> : SMM0204VC5620FB0																	
PART NUMBER <sup>2)</sup> : OMM0204000000B0																	
S	M	M	0	2	0	4	V	C	5	6	2	0	F	B	0	0	0
O	M	M	0	2	0	4	0	0	0	0	0	0	0	B	0	0	0
MODEL/SIZE	SPECIAL CHARACTER		TC		VALUE				TOLERANCE		PACKING <sup>3)</sup>		SPECIAL				
SMM0204 OMM0204	0 = neutral V = CECC E0		E = ± 15 ppm/K D = ± 25 ppm/K 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> 6 = *10 <sup>6</sup>				B = ± 0.1 % C = ± 0.25 % D = ± 0.5 % F = ± 1 % J = ± 5 % 0 = Jumper		B1 B3 B0 M3		up to 2 digits 00 = standard				
PRODUCT DESCRIPTION: SMM0204 50 562R 1% B0 CECC 40401-803E0																	
PRODUCT DESCRIPTION: OMM0204 0R0 B0																	
SMM0204	50		562R		1 %		B0		CECC 40401-803E0								
OMM0204	-		0R0		-		B0		-								
MODEL	TC		RESISTANCE VALUE		TOLERANCE		PACKING <sup>3)</sup>		SPECIAL								
SMM0204 OMM0204	± 15 ppm/K ± 25 ppm/K ± 50 ppm/K ± 100 ppm/K		100R = 100 Ω 2M21 = 2.21 MΩ 0R0 = Jumper		± 0.1 % ± 0.25 % ± 0.5 % ± 1 % ± 5 %		B1 B3 B0 M3		CECC 40401-803E0								

**Note**

1. Products can be ordered using either the PRODUCT DESCRIPTION or the PART NUMBER.
2. The PART NUMBER is shown to facilitate the introduction of a unified part numbering system. Currently, this PART NUMBER is applicable in the Americas only.
3. Please refer to table PACKING, see below.







Power rating as a function of packaging density (guideline)



<b>PACKING</b>					
MODEL	BLISTER TAPE ON REEL ACC. IEC 60286-6			BULK CASE ACC. IEC 60286-6	
	DIAMETER	PIECES / REEL	CODE	PIECES/BULK CASE	CODE
SMM0204	180 mm/7"	1000	B1*	3000	M3
	180 mm/7"	3000	B3		
OMM0204	330 mm/13"	10000	B0		

\* For TC  $\leq$  25 ppm/K and Tolerance  $\leq$  0.25 % only

<b>PERFORMANCE</b>		
TEST	CONDITIONS OF TEST	REQUIREMENTS <sup>1)</sup>
Endurance Test at 70 °C IEC 60115-1, 4.25.1	1000 hours at 70 °C 1.5 hours "ON" 0.5 hours "OFF"	$\leq$ 0.25 %
Endurance at UCT IEC 60115-1, 4.25.3	1000 hours at 125 °C without load	$\leq$ 0.25 %
Overload Test IEC 60115-1, 4.13	Short time overload for 2 seconds 2.5 x rated voltage or $\leq$ 2 x limiting element voltage	$\leq$ 0.05 %
Thermal Shock IEC 60115-1, 4.19 and IEC 60068-2-14	Rapid change between upper and lower category temperature, 5 cycles	$\leq$ 0.05 %
Damp Heat Steady State IEC 60115-1, 4.24 and IEC 60068-2-78	56 days at 40 °C and 93 % relative humidity	$\leq$ 0.25 %
Resistance to Soldering Heat IEC 60115-1, 4.18 and IEC 60068-2-58	10 seconds at 260 °C solder bath temperature	$\leq$ 0.05 %

**Note**

1. For a resistance range from 10  $\Omega$  to 332 k $\Omega$ , limits for change of resistance at test acc. to EN 140401-803.

<b>APPLICABLE SPECIFICATIONS</b>
<ul style="list-style-type: none"> <li>• EN140401-803</li> <li>• EN140400</li> <li>• EN 60115-1</li> </ul>



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