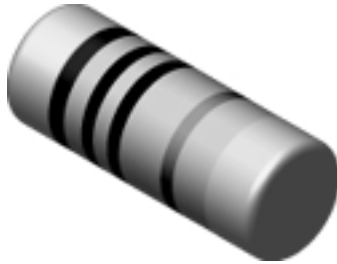


Metal Film, Cylindrical Resistors



FEATURES

- Stable metal film on high quality ceramic
- Low TC and tight tolerances
- Excellent stability in different environmental conditions
- Force fitted steel caps, tin plated on nickel barrier
- Reliable solderable terminations to facilitate surface mounting

STANDARD ELECTRICAL SPECIFICATIONS

MODEL	POWER RATING $P_{70^{\circ}\text{C}}^{1)}$ W	LIMITING ELEMENT VOLTAGE MAX ²⁾ V_{\cong}	TEMPERATURE COEFFICIENT ppm/K	TOLERANCE %	RESISTANCE RANGE Ω	E-SERIES
SMM0204-MS1	0.25	200	15	0.1 0.25 0.5	43R – 221K 22R – 221K 10R – 221K	24 – 192 24 – 192 24 – 192
SMM0204-MS1	0.25	200	25	0.1 0.25 0.5	43R – 511K 22R – 511K 10R – 1M0	24 – 192 24 – 192 24 – 192
SMM0204-MS1	0.25	200	50	0.5 1	10R – 1M0 R82 – 10M	24 – 192 24 – 96
SMM0204-MS1	0.25	200	100	5	R22 – 10M	24
SMM0204HF MS1 ⁴⁾	0.25	200	50	1	10R – 1K0 ³⁾	96

Zero-Ohm-Resistor: OMM0204-MS1 $R_{\text{max}} = 10\text{m}\Omega$ $I_{\text{max}} = 2\text{A}$

¹⁾ Power rating depends on the maximum temperature at the solder point, the component placement density and the substrate material

²⁾ Rated voltage: $\sqrt{P \times R}$

³⁾ Values below 10 Ω on request

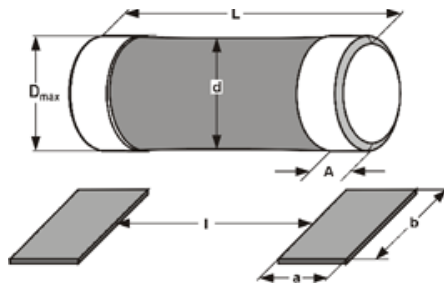
⁴⁾ Low inductive trim for high frequency application

- Further values and tolerances on request
- Coating:
Light green for TC= 100ppm/K, 50ppm/K and zero ohm resistor
Pink TC= 25ppm/K
Violet TC= 15ppm/K
Beige HF version
- Marking : see appropriate catalog or web page
- Zero ohm resistor has a black band only

ORDERING INFORMATION

SMM0204-MS1	50	562R	1%	B0
MODEL	TC ppm / K	RESISTANCE VALUE Ω	TOLERANCE \pm %	PACKAGING B0-Blistertape 10000 pcs

DIMENSIONS



MODEL	DIMENSIONS [in millimeters]				
	D _{max}	d *	L	A _{max}	A _{min}
SMM0204-MS1	1.4	D -0.15	3.6 - 0.15	0.85	0.5

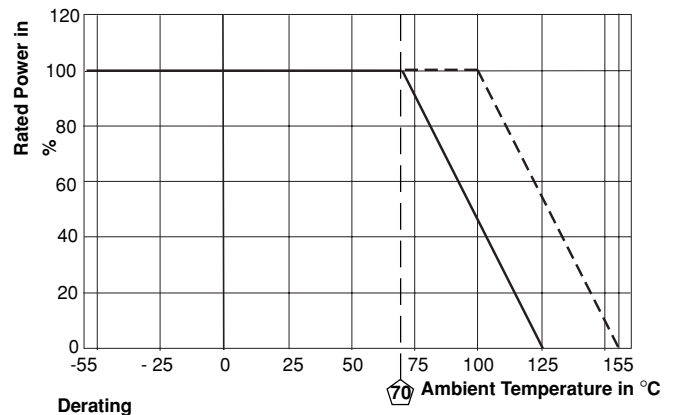
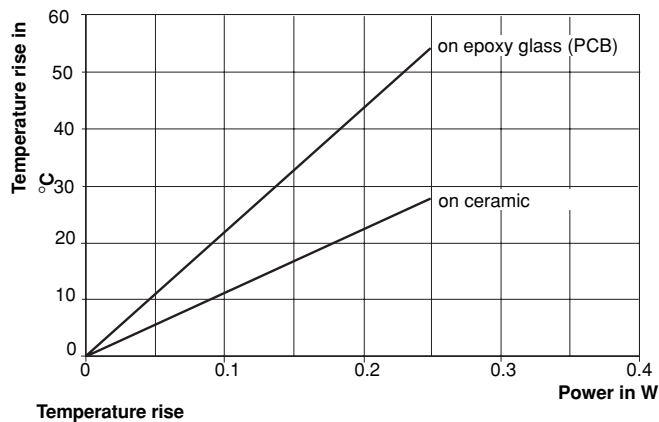
*d measured in the middle of the resistor

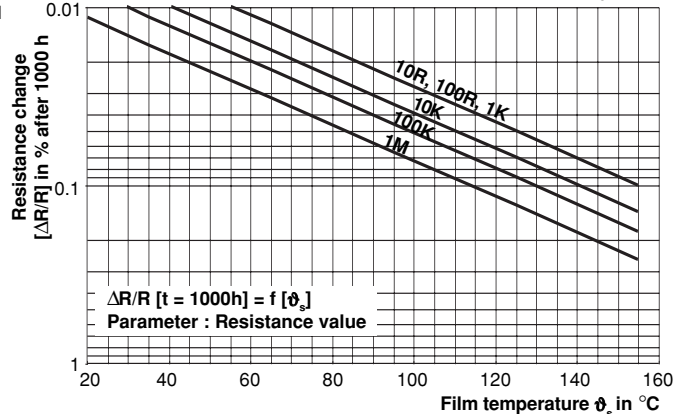
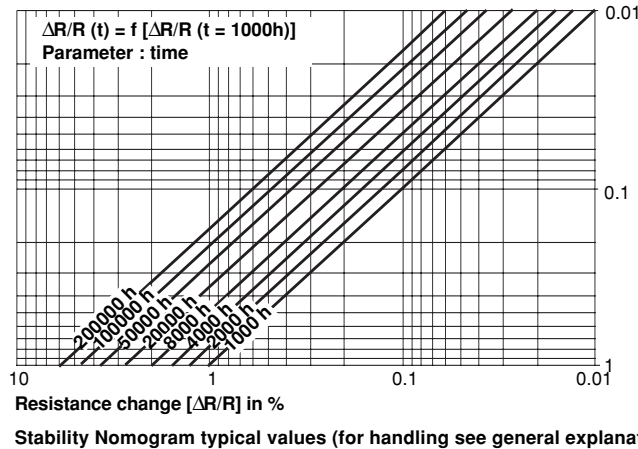
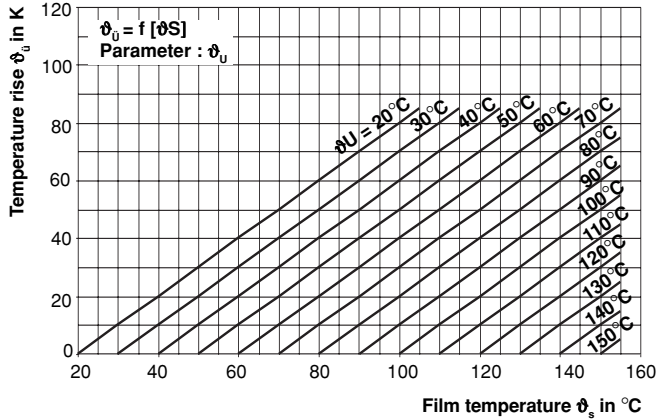
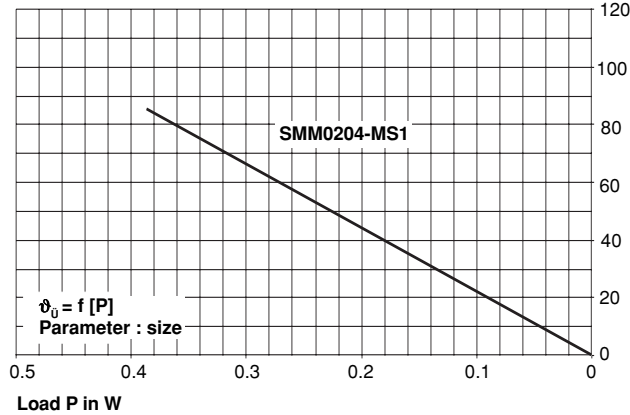
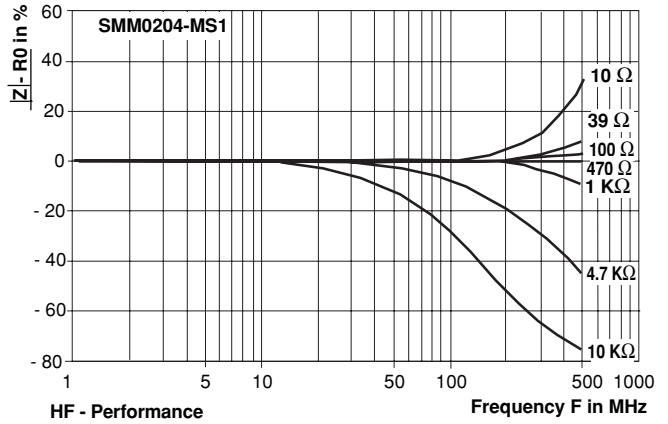
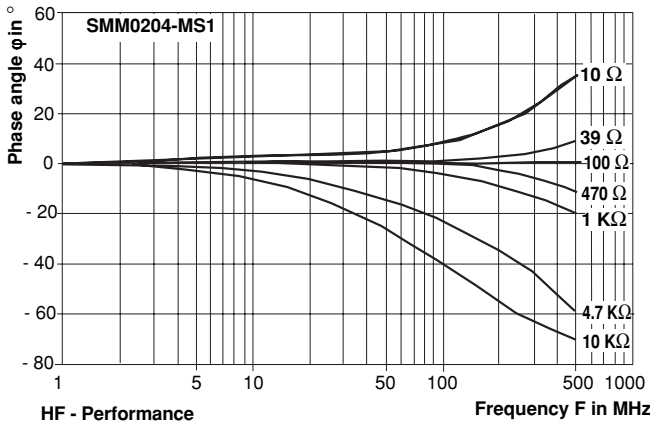
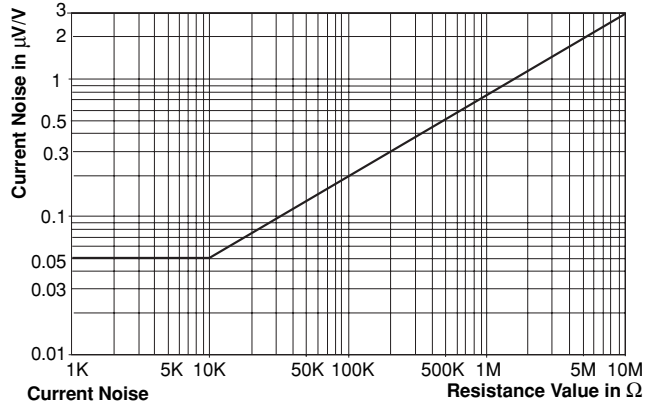
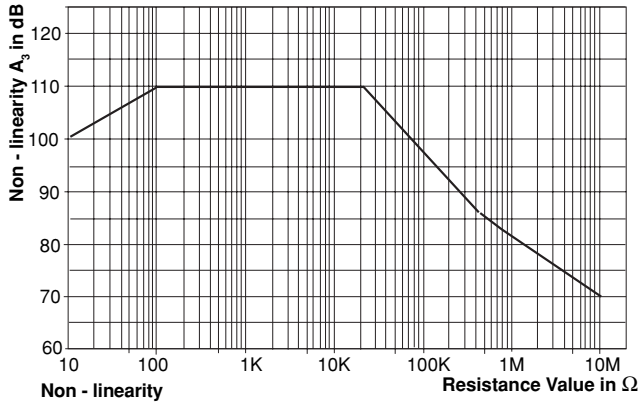
MODEL	SOLDER PAD DIMENSIONS [in millimeters]					
	REFLOW SOLDERING			WAVE SOLDERING		
	a	b	l	a	b	l
SMM0204-MS1	1.0	1.6	2.2	1.2	1.6	2.2

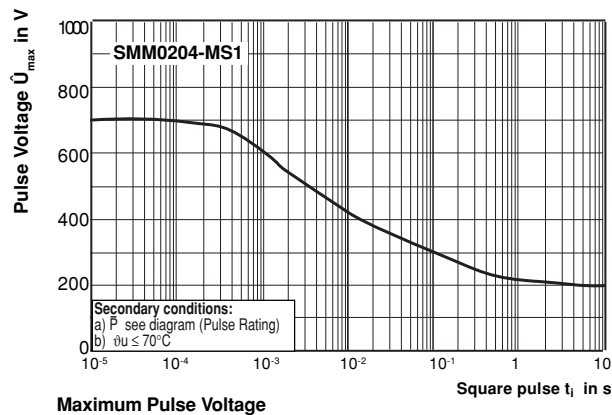
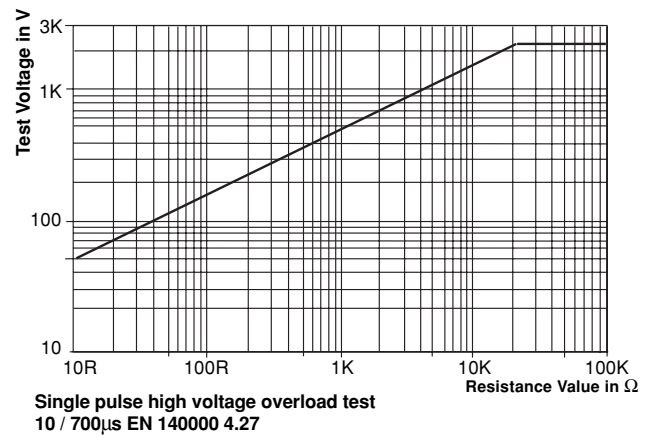
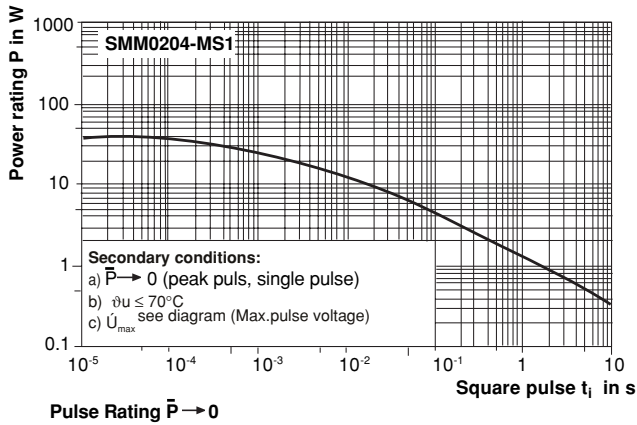
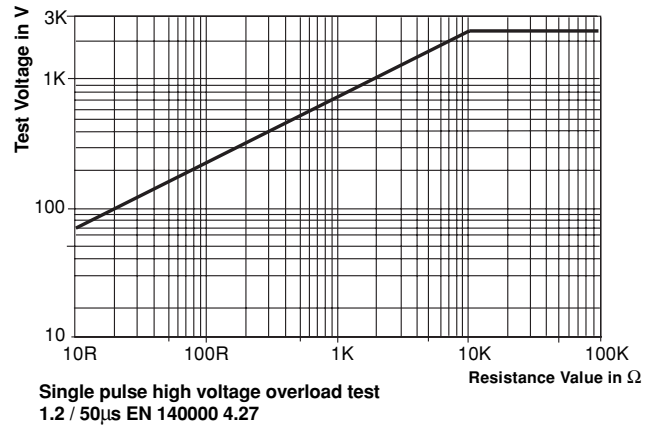
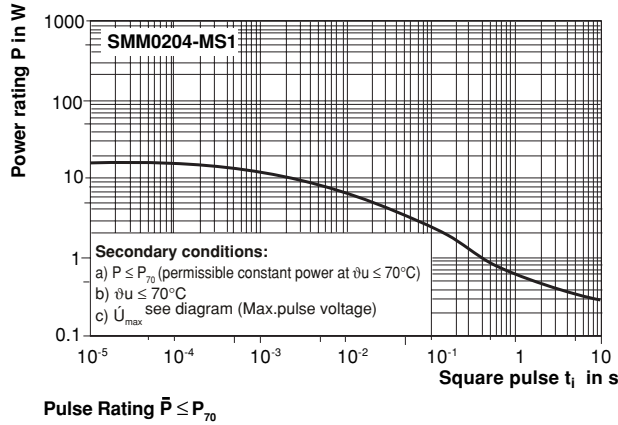
TECHNICAL SPECIFICATIONS		
PARAMETER	UNIT	SMM0204 – MS1
Rated Dissipation at 70°C	W	0.25
Limiting Element Voltage ²⁾	V _≅	200
Insulation Voltage (1 min)	V _{dc/ac peak}	> 300
Thermal Resistance ¹⁾	K/W	≤ 220
Insulation Resistance	Ω	≥ 10 ¹⁰
Category Temperature Range	°C	- 55 / + 125 (+ 155)
Failure Rate	10 ⁻⁹ /h	< 1
Weight / 1000pcs	g	18

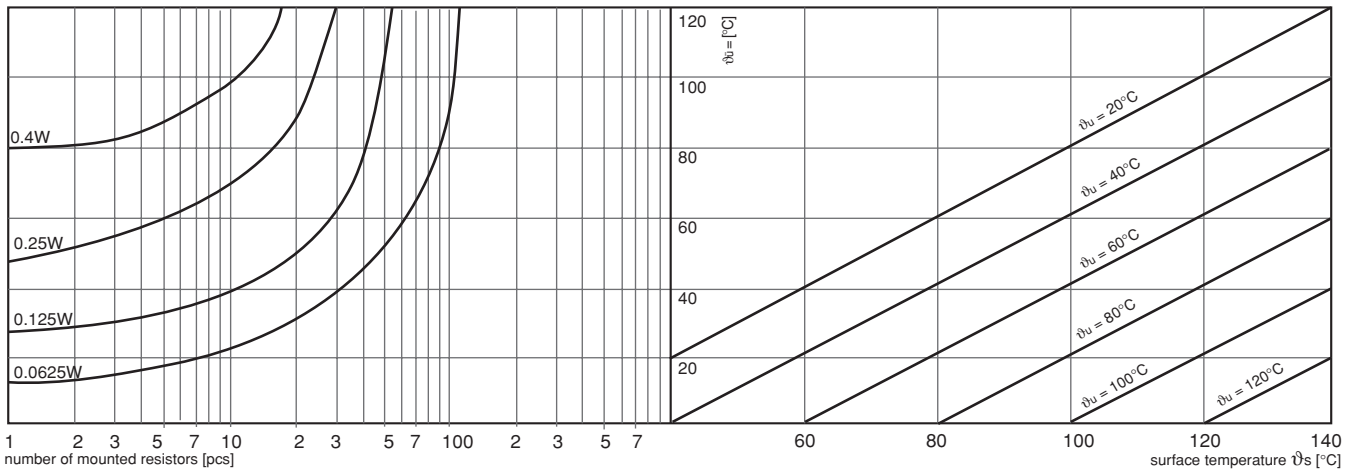
¹⁾ Based on measurements on test board acc. to EN 140000

²⁾ Rated voltage: $\sqrt{P \times R}$









Power rating as a function of packaging density (guideline)
 Testboard FR4 (50 x 50 x 1.6)mm

PACKAGING								
MODEL	REEL				BULK			
	TAPE WIDTH	DIAMETER	PIECES / REEL	CODE	BULK FEEDING MAGAZINE		LOOSE IN PLASTIC CONTAINER	
					PIECES	CODE	PIECES	CODE
SMM0204-MS1	8mm Blisertape	180mm	1000	B1*	3000	M3	1000	L1
SMM0204HF-MS1		180mm	2500	BE				
		180mm	3000	B3				
OMM0204-MS1		330mm	10000	B0				

*For <= TC25 and Tol. <= 0.5% only



PERFORMANCE		
TEST	CONDITIONS OF TEST	REQUIREMENTS ¹⁾
Endurance Test at 70°C IEC 60115-1 4.25.1	1000 hours at 70°C 1.5 hours "ON" 0.5 hours "OFF"	$\leq \pm 0.25 \%$
Endurance at UCT IEC 60115-1 4.25.3	1000 hours at 125°C without load	$\leq \pm 0.25 \%$
Overload Test IEC 60115-1 4.13	Short time overload for 2 seconds 2.5 x rated voltage or $\leq 2 \times$ limiting element voltage	$\leq \pm 0.05 \%$
Thermal Shock IEC 60115-1 4.19 IEC 60068-2-14	Rapid change between upper and lower category temperature	$\leq \pm 0.05 \%$
Damp Heat Steady State IEC 60115-1 4.24 IEC 60068-2-3	56 days at 40°C and 93% relative humidity	$\leq \pm 0.25 \%$
Resistance to Soldering Heat IEC 60115-1 4.18 IEC 60068-2-20	10 seconds at 260°C solder bath temperature	$\leq \pm 0.05 \%$

¹⁾ for a resistance range from 10Ω to 332KΩ, Limits for change of resistance at test acc. to CECC 40401-803

APPLICABLE SPECIFICATIONS

- CECC40000 / 40400 / 40401-803
- EN140400 / IEC 60115 – 1