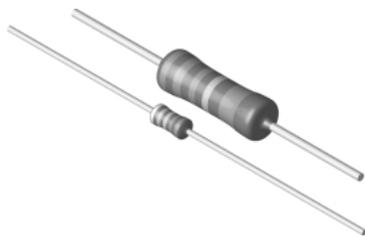


Metal Film, Standard, Professional



FEATURES

- Stable metal film on high quality ceramic
- Low TC and tolerances
- Excellent stability
- Force fitted metal caps retain a good electrical connection to the resistive film
- Suitable for commercial and professional applications

STANDARD ELECTRICAL SPECIFICATIONS

MODEL	SIZE	P _{70°C} W	LIMITING ELEMENT VOLTAGE MAX. V _≅	TC ppm/K	TOLERANCE %	RESISTANCE RANGE Ω	E-SERIES
MK1	0204	0.4	250	25	0.5	10R - 1M0	24 - 192
MK1	0204	0.4	250	50	0.5 1	10R - 1M0 1R0 - 10M	24 - 192 24 - 96
MK1	0204	0.4	250	100	5	R22 - 10M	24
SMA0204*	0204	0.5	250	15	0.1, 0.25, 0.5	51R1 - 332K	24 - 192
SMA0204*	0204	0.5	250	25	0.1 0.25 0.5	51R1 - 322K 22R - 322K 10R - 511K	24 - 192 24 - 192 24 - 192
SMA0204*	0204	0.5	250	50	0.5 1	10R - 511K 1R0 - 7M5	24 - 192 24 - 96
SMA0204*	0204	0.5	250	100	5	1R0 - 7M5	24
SMA0207, MK2	0207	0.25	350	5	0.1, 0.25, 0.5	1K0 - 100K	192
SMA0207, MK2	0207	0.25	350	10	0.1, 0.25, 0.5	510R - 100K	192
SMA0207, MK2	0207	0.6	350	15	0.1, 0.25, 0.5	47R - 1M0	24 - 192
SMA0207, MK2	0207	0.6	350	25	0.1 0.25 0.5	47R - 1M0 10R - 1M0 1R0 - 2M2	24 - 192 24 - 192 24 - 192
SMA0207/MK2	0207	0.6	350	50	0.5 1	1R0 - 2M2 1R0 - 10M	24 - 96 24 - 96
SMA0207/MK2	0207	0.6	350	100	5	R16 - 10M	24
SMA0309	0309	0.7	350	50	1	10R - 1M0	24 - 96
SMA0309	0309	0.7	350	100	5	10R - 1M0	24
SMA0411	0411	1.0	500	15	0.1, 0.25, 0.5	47R - 1M0	24 - 192
SMA0411	0411	1.0	500	25	0.1 0.25, 0.5	47R - 1M0 10R - 1M0	24 - 192 24 - 192
SMA0411	0411	1.0	500	50	0.5 1	10R - 1M0 1R0 - 10M	24 - 96 24 - 96
SMA0411	0411	1.0	500	100	5	1R0 - 10M	24
MK4	0414	1.0	500	25	0.5	10R - 2M4	24 - 192
MK4	0414	1.0	500	50	0.5 1.0	10R - 2M4 1R0 - 10M	24 - 96 24 - 96
MK4	0414	1.0	500	100	5	R22 - 10M	24
MK5	0617	1.2	600	50	0.5 1	10R - 2M4 1R0 - 5M1	24 - 96 24 - 96
MK5	0617	1.2	600	100	5	R22 - 5M1	24
MK8	0922	1.5	600	50	0.5 1	10R - 2M4 1R0 - 2M4	24 - 96 24 - 96
MK8	0922	1.5	600	100	5	R22 - 2M4	24

* Not for new designs please specify MK1 the replacement for SMA0204

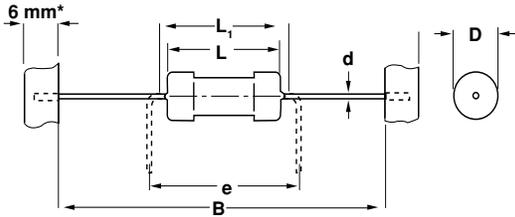
- Coating - Green, MK4 to MK8 -Grey
- TC ≤ 10ppm/°C : temperature range -25°C.. +85°C
- For Zero-ohm resistors, special assembly versions, and marking please see appropriate catalog or web page.

• Limiting element voltage $\sqrt{P \times R}$

• Further values and tolerances on request



DIMENSIONS



- Taping in acc. with IEC60286-1
- D and L measured in acc. with IEC60294
- d according to IEC60301
- 1) Also available in 26mm taping. *9mm for MK5, MK8

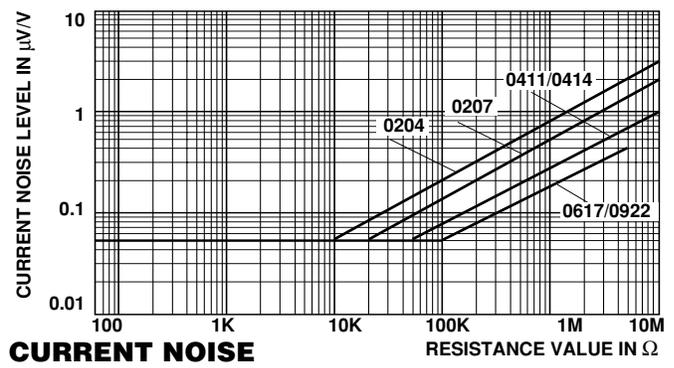
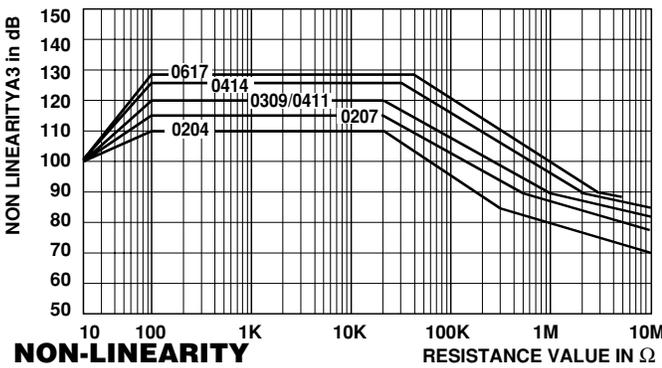
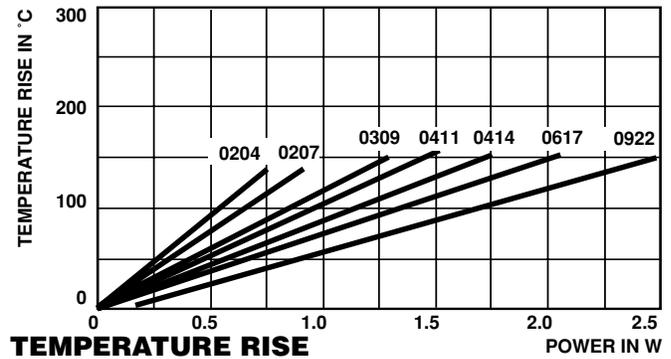
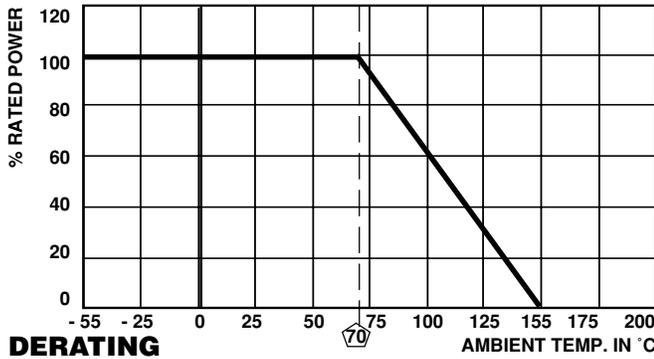
MODEL	DIMENSIONS [in millimeters]					
	D _{max}	L	L _{1MAX}	B	d	e
MK1	1.6 _{-0.3}	3.6 _{-0.4}	4.0	53 ±1 ¹⁾	0.5	5.0
SMA0204	1.8 _{-0.25}	3.6 _{-0.3}	4.0	53 ±1 ¹⁾	0.5	5.0
SMA0207/MK2	2.5 _{-0.3}	6.3 _{-0.5}	7.0	53 ±1 ¹⁾	0.6	7.5
SMA0309	3.0 _{-0.4}	8.2 _{-0.6}	9.5	53 ±1	0.7	10
SMA0411	3.7 _{-0.4}	10.5 _{-0.6}	12.5	53 ±1	0.7	12.5
MK4	4.1 _{-0.5}	12.0 _{-1.5}	14.0	73 ±1	0.8	15
MK5	6.0 _{-0.5}	16.5 _{-1.5}	18.5	77 ±1	0.8	17.5
MK8	9.0 _{-0.5}	20.0 _{-1.5}	24.0	77 ±1	0.8	22.5

TECHNICAL SPECIFICATIONS									
PARAMETER	UNIT	MK1	SMA0204 ²⁾	SMA0207/MK2	SMA0309	SMA0411	MK4	MK5	MK8
Rated Dissipation at 70°C	W	0.4	0.5	0.6	0.7	1.0	1.0	1.2	1.5
Limiting Element Voltage ²⁾	V _≧	≤250	≤250	≤350	≤350	≤500	≤500	≤600	≤600
Insulation Voltage (1min)	V _{eff}	>500	>500	>700	>700	>700	>500	>500	>500
Thermal Resistance	K/W	≤ 200	≤170	≤140	≤120	≤100	≤95	≤70	≤60
Insulation Resistance	Ω	≥10 ¹¹							
Category Temperature Range	°C	-55 / +155							
Failure Rate	10 ⁻⁹ /h	<1							
Terminal Strength, axial	N	>30	>30	>50	>60	>60	>80	>80	>80
Weight	g	0.1	0.14	0.22	0.31	0.52	0.67	1.5	3.3

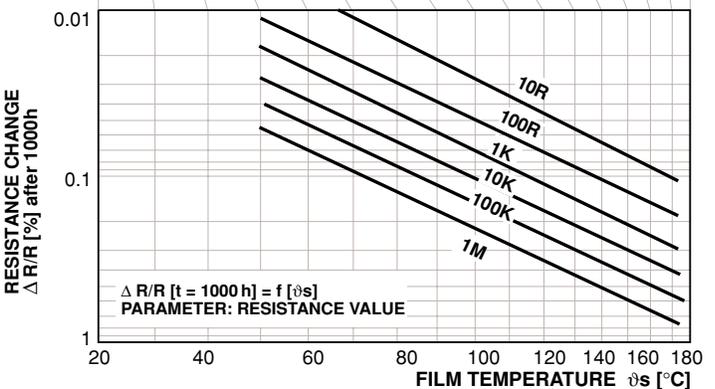
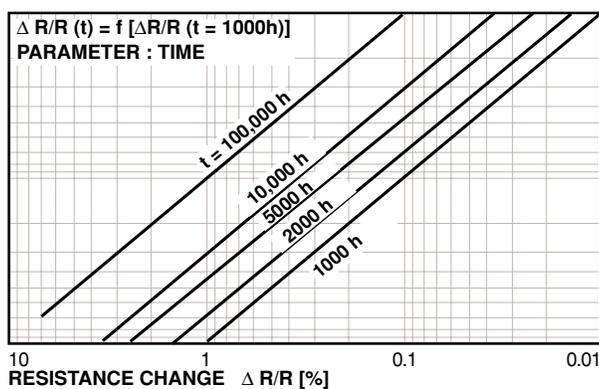
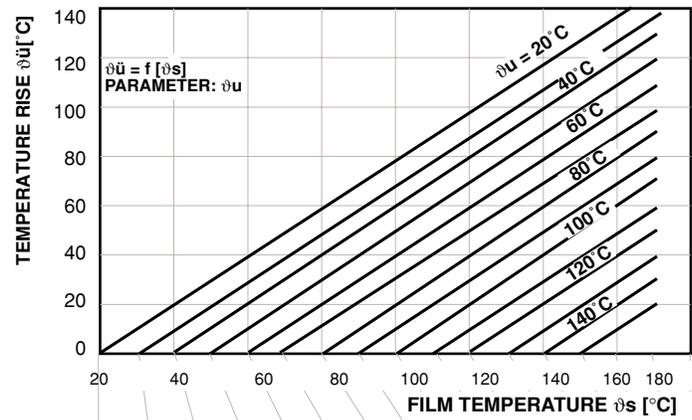
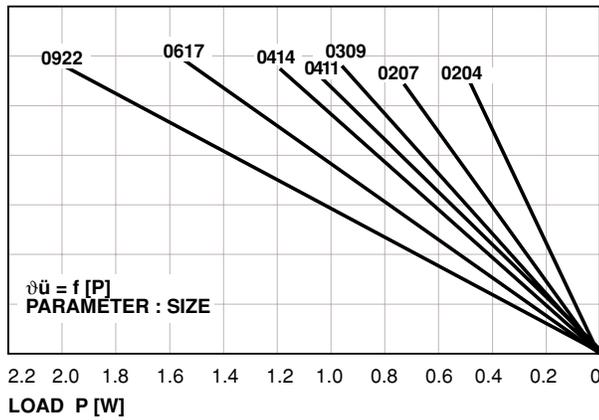
²⁾Rated Voltage $\sqrt{P \times R}$

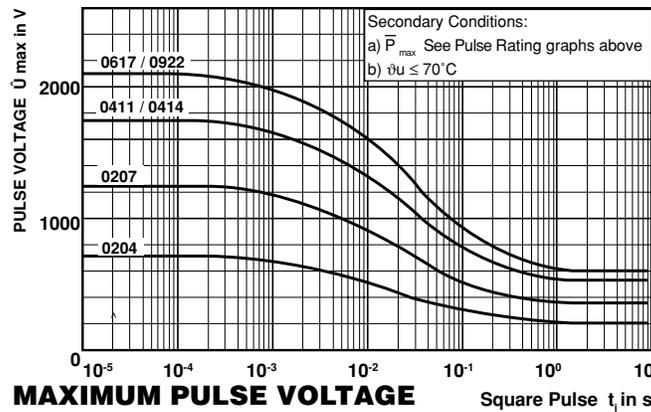
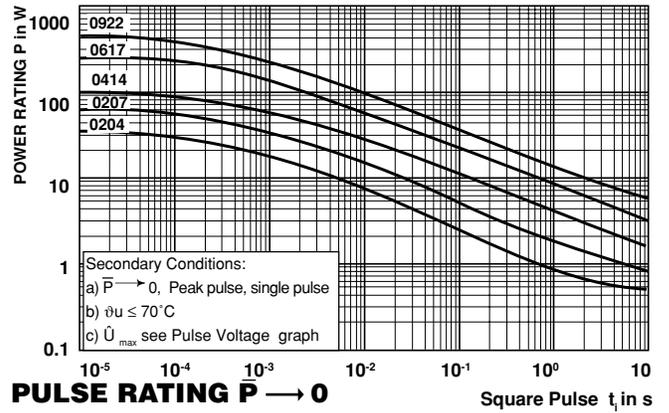
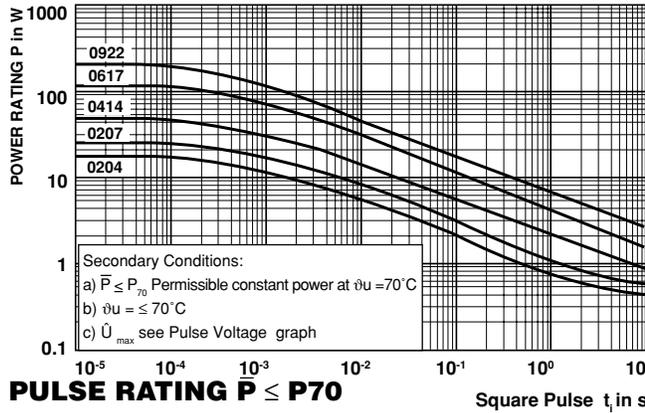
PACKAGING						
MODEL	T.C. [ppm/°C]	REEL		BOX		MIN. ORDER QTY PACKAGING UNITS
		PIECES / REEL	CODE	PIECES / BOX	CODE	
MK1	15 - 25	5000	R5	2000 500	A2 AC	1
	50 - 100	5000	R5	5000 2000	A5 A2	1
SMA0207 / MK2	5 - 25	5000	R5	2000 1000 500	A2 A1 AC	1
	50 - 100	5000	R5	5000 2000	A5 A2	1
SMA0309	50 - 100	3000	R3	5000 2000	A5 A2	1
SMA0411	15 - 25	2500	RE	1000 500	A1 AC	1
	50 - 100	2500	RE	1000	A1	1
MK4	25 - 100	2500	RE	1000	A1	1
MK5	50 - 100	1500	RP	1000	A1	1
MK8	50 - 100	1000	R1	500	AC	1

ORDERING INFORMATION				
SMA0207 / MK2	25	562R	0.1%	A2
MODEL	TC ppm / K	RESISTANCE VALUE Ω	TOLERANCE ± %	PACKAGING A2-Ammopack - 2000pcs



STABILITY NOMOGRAM, TYPICAL VALUES (For handling see General Information)





PERFORMANCE		
TEST	CONDITIONS OF TEST	TEST RESULTS*
Endurance at 70°C IEC 60115-1 4.25.1	1000h at 70°C 1.5hrs "ON", 0.5hrs "OFF" 8000h at 70°C 1.5hrs "ON", 0.5hrs "OFF"	≤ ± 0.5% ≤ ± 1.0%
Endurance at Upper Category Temperature IEC 60115-1 4.25.3	1000h at 155°C without load 8000h at 155°C without load	≤ ± 0.5% ≤ ± 1.0%
Overload Test IEC 60115-1 4.13	Short time overload at 6.25 x rated power 2s for size 0204 and 5s for sizes ≥ 0207	≤ ± 0.1%
Thermal Shock IEC 60115-1 4.19 IEC 60068-2-14	Rapid change between upper and lower category temperature	≤ ± 0.1%
Climatic Sequence IEC 60115-1 4.23	Dry heat, damp heat cyclic, cold, low air pressure	≤ ± 0.5%
Damp Heat Steady State IEC 60115-1 4.24 IEC 60068-2-3	56 days at 40°C and 93% relative humidity	≤ ± 0.5%
Resistance to Soldering Heat IEC 60115-1 4.18; IEC 60068-2-20	10 seconds at 260°C solder bath temperature	≤ ± 0.1%
Robustness of Terminations IEC 60115-1 4.16	Tensile, bending and torsion	≤ ± 0.1%
Vibration IEC 60115-1 4.22	0.75mm or 10g, 10Hz - 500Hz 6h	≤ ± 0.1%

* for a resistance range from 10Ω to 2M2

APPLICABLE SPECIFICATIONS
<ul style="list-style-type: none"> CECC 40000 / 40100 / 40101 EN 140 000 / 140 100