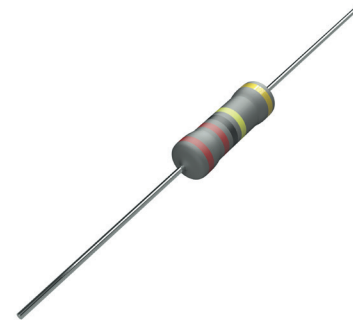


SMA - Series

Flameproof Metal Film Resistors

FEATURES

- Resistance from 10Ω
- Temperature Coefficients to ±15ppm/°C
- Resistance Tolerances to ±0,1%
- High Power Rating, Small Size
- Low Inductance
- No Flame Formation (UL-1412)
- RoHS - compliant



RATED VALUES (IEC 60115-1)

Resistance Range	Ω	10Ω to 1MΩ (see Tolerance- / Resistance Range)
Resistance Tolerance	%	±0,1% to ±1%
Temperature Coefficient	ppm/°C	±50ppm/°C, ±25ppm/°C < 100Ω ±50ppm/°C, ±25ppm/°C, ±15ppm/°C ≥ 100Ω - 1MΩ
Operating Voltage (U _{max})	V	500V or √(P x R)
Insulation Resistance (R _{ins})	Ω	>1GΩ
Operating Temperature Range (T)	°C	-55°C to 155°C

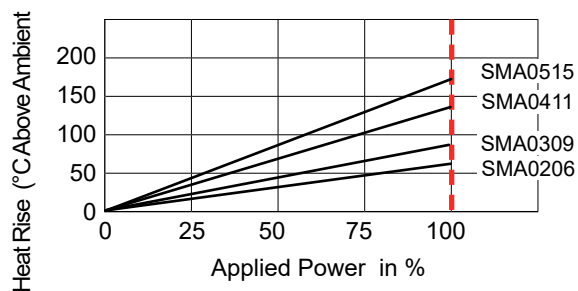
Typ	U _{max} (V)	Power P ₇₀ (W)	Tolerance- / Resistance Range*			
			E96: ±1,0% / Ω	E96: ±0,5% / Ω	E192: ±0,25% / Ω	E192: ±0,1% / Ω
SMA0206	300	0,25	10R0 - 1M0	10R0 - 1M0	100R0 - 1M0	100R0 - 1M0
SMA0309	400	1,00	10R0 - 1M0	10R0 - 1M0	100R0 - 1M0	100R0 - 1M0
SMA0411	500	2,00	10R0 - 1M0	10R0 - 1M0	100R0 - 1M0	100R0 - 1M0
SMA0515	500	3,00	10R0 - 1M0	10R0 - 1M0	100R0 - 1M0	100R0 - 1M0

*other Resistance Values on Request

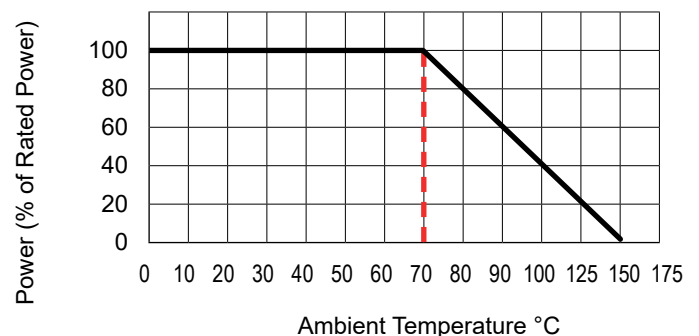
CONSTRUCTION

Resistance Material	NiCr - Alloy
Carrier Material	High Purity Ceramic (Alumina)
Coating	Special Lacquer (meets UL94V)
Lead Wires	Tin Plated Copper Wire

HOT-SPOT TEMPERATURE



POWER DERATING CURVE

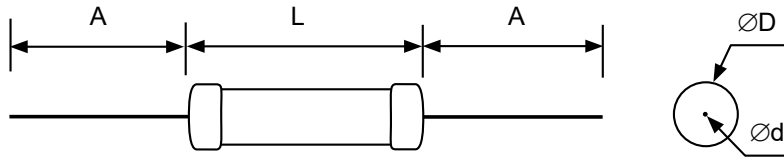


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SMA - Series

Flameproof Metal Film Resistors

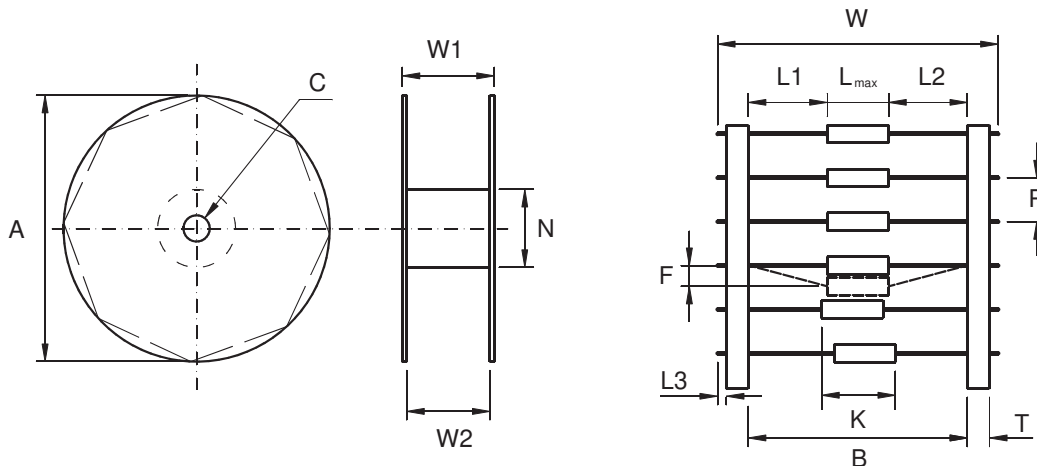
DIMENSIONS



	D	L	d	A
SMA0206	2,3 ±0,5	6,3 ±0,5	0,55 ±0,05	min. 26,0
SMA0309	3,2 ±0,5	9,0 ±0,5	0,65 ±0,05	min. 24,0
SMA0411	4,5 ±0,5	11,5 ±1,0	0,78 ±0,05	min. 35,0
SMA0515	5,0 ±0,5	15,5 ±1,0	0,78 ±0,05	min. 32,0

All Dimension in mm

TAPING & PACKAGING DIMENSIONS



Reel	A	C	N	W1	W2
12"	305,0 ±1,5	15,0 ±1,0	51,0 ±1,0	W2 +5...+8	B +1,5 ... +8

Tape	
Lead Extension (L3)	0,5 max.
Centring Tolerance (K)	±1,5
Tape (T)	5,0...6,5
Deflection (F)	1,2 max.
L1 = (B - L _{max} + L2) ±1,5	
L2 = (B - L _{max} + L1) ±1,5	

Diameter of Resistor Body - Spacing

Diameter of the Resistor Body (D)	≤ 5,0 ±0,5	> 5,0 ±0,5
Distance between Resistors (P)	5,0 ±0,5	10,0 ±0,5

Tape Spacing

Type	SMA0206	SMA0309	SMA0411	SMA0515
Type Spacing (B)	52,0	52,0	73,0	73,0

All Dimension in mm

- **Standard Packaging:** Ammo Pack Axial Taped

SMA - Series

Flameproof Metal Film Resistors

PERFORMANCE

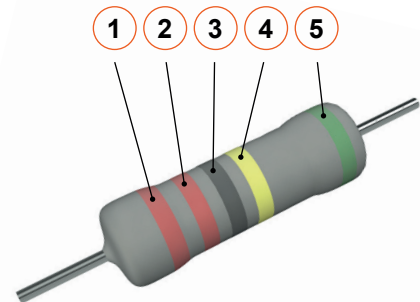
Test	Conditions of Test	Specification ΔR
Moisture Resistance	40 \pm 2°C, 90-95% R.H., Rated Power, 1000h	$\pm(1,5\% R + 0,05\Omega)$
Insulation Strength	U _{ins} 500VAC, 60 Sec.	
Endurance	+70°C, U _{max} 1,5h „ON“ and 0,5h „OFF“, 1000h	$\pm(1,5\% R + 0,05\Omega)$
Short Time Overload	2,5 x Rated Operating Voltage U _{max} , 5s	$\pm(0,25\% R + 0,05\Omega)$
Pulse Load	4 x Rated Operating Voltage, 1Sec. „ON“ and 25Sec. „OFF“, 10000 Cycles	$\pm(0,75\% R + 0,05\Omega)$
Soldering Resistance	235°C, max. 2,5 Sec.	$\pm(0,5\% R + 0,05\Omega)$
Terminal Strength	2,5 kg (Pull Test), max. 10 Sec.	
Shelf Life	25 \pm 2°C, 80% R.H. max., 12 Month	$\pm(0,1\% R)$

OPTIONS

Lead Wires	Pre-made/Custom-made Leads (on Request)
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MARKING

	Ring 1 - 3 Digit	Ring 4 Multiplier	Ring 5 Tolerance
Silver		10 ⁻²	
Gold		10 ⁻¹	
Black	0	10	
Brown	1	10 ¹	$\pm 1,0\%$
Red	2	10 ²	
Orange	3	10 ³	
Yellow	4	10 ⁴	
Green	5	10 ⁵	$\pm 0,50\%$
Blue	6	10 ⁶	$\pm 0,25\%$
Violet	7	10 ⁷	$\pm 0,10\%$
Grey	8	10 ⁸	
White	9	10 ⁹	



Example: 2,2M Ω , $\pm 0,5\%$

PACKAGING UNITS

Type	SMA0206	SMA0309	SMA0411	SMA0515
Quantity: Ammo Pack / T&R	5000/5000	1000/2500	1000/2000	1000/1000

ORDERING INFORMATION

SMA0206 150R00 0,1% TK25 (SMA0206 150 Ω ; $\pm 0,1\%$; $\pm 25\text{ppm}^\circ\text{C}$)

Type	Special	Resistance Value	Tolerance	Temperat. Coefficient	Power	Options	Packaging
SMA0206		0R1000 100R00 10K000 1M0000	0,1% 0,25% 0,5% 1,0%	TK15 TK25 TK50 TK25	-	-	T - (Tape/Belt) A - Ammo Pack B - Bulk

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