

Surge Metal Film Leaded Resistor



A multi layer metal film is deposited on a high grade ceramic body. After a helical groove has been cut in the resistive layer, tinned electrolytic copper wires are welded to the end-caps. The resistors are coated with a light blue non-flammable lacquer, which provides electrical, mechanical, and climatic protection.

The encapsulation is resistant to all cleaning solvents in accordance with IEC 60068-2-45.

FEATURES

- Metal film technology
- High pulse load (up to 10 kV) capability
- Replacement for carbon-composition resistors
- Compatible with lead (Pb)-free and lead containing soldering processes
- Compliant to RoHS directive 2002/95/EC



RoHS
COMPLIANT

APPLICATIONS

- Automotive
- Telecommunication
- Industrial
- Medical equipment

TECHNICAL SPECIFICATIONS	
DESCRIPTION	SR37
Resistance Range	220 Ω to 10 k Ω
Resistance Tolerance	$\pm 10 \%$, $\pm 20 \%$, E12 series
Temperature Coefficient	± 250 ppm/K
Climatic Category (LCT/UCT/Days)	55/155/56
Rated Dissipation, P_{70}	0.5 W
Rated Voltage, U_{max}	$\sqrt{P_n \times R}$
Voltage Proof on Insulation	700 V
Basic Specification	IEC 60115-1
Stability After:	
Load (1000 h, P_{70})	$\pm (3 \% R + 0.1 \Omega)$
Long Term Damp Heat Test (56 Days)	$\pm (3 \% R + 0.1 \Omega)$
Soldering (10 s, 260 $^{\circ}$ C)	$\pm (1 \% R + 0.1 \Omega)$
High Voltage Pulse Test for R-Value ≤ 4.7 k Ω , 10 kV; 1 nF; 50 x 12/Min	$\pm 20 \%$

PART NUMBER AND PRODUCT DESCRIPTION ⁽¹⁾

PART NUMBER: SR03700001501KR500

S	R	0	3	7	0	0	0	0	1	5	0	1	K	R	5	0	0
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MODEL/SIZE	VARIANT	TCR/MATERIAL	VALUE	TOLERANCE	PACKAGING ⁽²⁾	SPECIAL
SR03700	0 = Neutral	0 = Standard	3 digit value 1 digit multiplier MULTIPLIER 3 = *10 ³ 4 = *10 ⁴ 5 = *10 ⁵	K = ± 10 % M = ± 20 %	A1 R5	Up to 2 digits 00 = Standard

PRODUCT DESCRIPTION: SR037 10 % R5 1K5

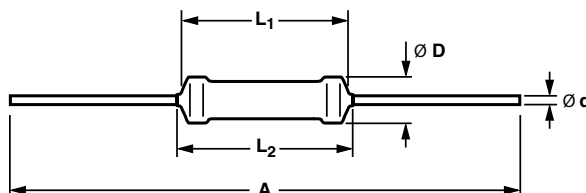
SR037	10 %	R5	1K5
MODEL	TOLERANCE	PACKAGING ⁽²⁾	RESISTANCE VALUE
SR03700	± 10 % ± 20 %	A1 R5	1K5 = 1.5 kΩ

Notes:
⁽¹⁾ The PART NUMBER is shown to facilitate the introduction of the unified part numbering system

⁽²⁾ Please refer to table PACKAGING, see next page

PACKAGING

MODEL	REEL		BOX	
	PIECES	CODE	PIECES	CODE
SR37	5000	R5	1000	A1

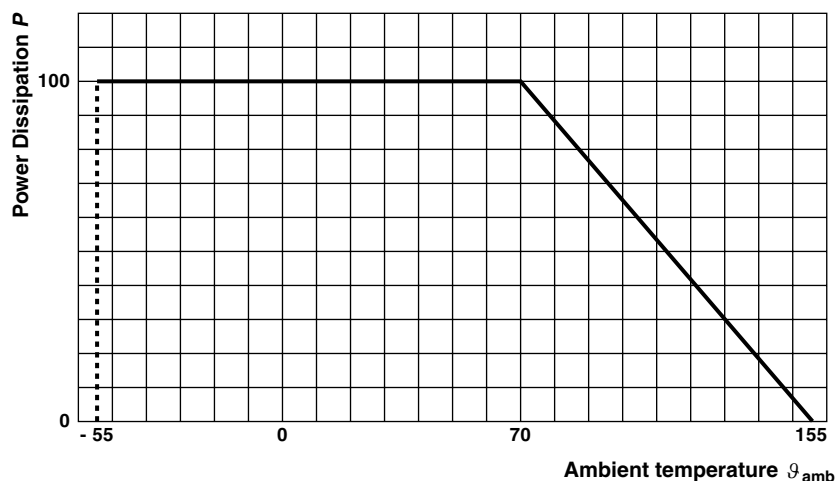
DIMENSIONS

DIMENSIONS - Resistor types, mass and relevant physical dimensions

TYPE	L ₁ max. (mm)	L ₂ max. (mm)	D _{max} . (mm)	Ø d (mm)	A (mm)	MASS (g/ 100 pieces)
SR37	9.0	11.0	4.0	0.80 ± 0.03	52.5 ± 1.5	50.5

MARKING

The nominal resistance and tolerance are marked on the resistor using three colored bands for ± 20 % tolerance and four bands for ± 10 % tolerance in accordance with IEC 60062, marking codes for resistors and capacitors. Standard values of nominal resistance are taken from the E12 series for resistors with a tolerance of ± 10 % or ± 20 %. The values of the E12 series are in accordance with IEC 60063.

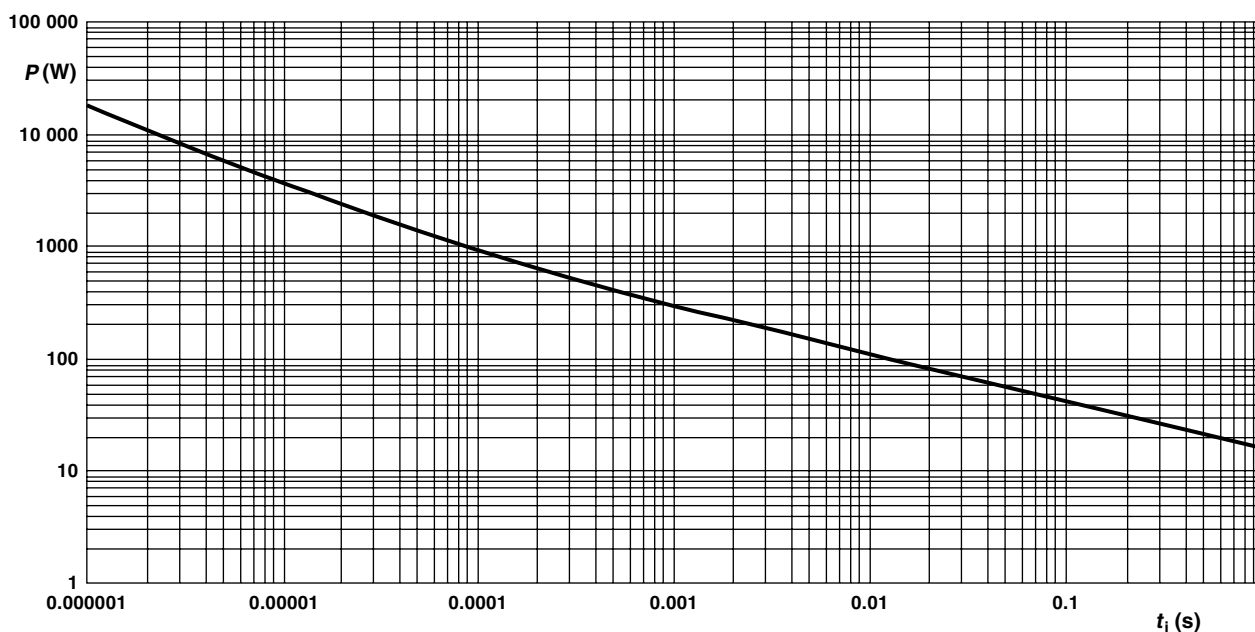
FUNCTIONAL PERFORMANCE



Derating - Standard Operation

Maximum dissipation ($P_{max.}$) in percentage of rated power as a function of ambient temperature (T_{amb})

PULSE LOADING CAPABILITY



Pulse on a regular basis; maximum permissible peak pulse power (P_{max}) as a function of pulse duration (t_i) for single pulse condition

TESTS AND REQUIREMENTS

Essentially all tests are carried out in accordance with IEC 60115-1, category 55/155/56 (rated temperature range - 55 to + 155 °C; damp heat, steady state, 56 days). The tests are carried out in accordance with IEC 60068-2-xx.

Test method under standard atmospheric conditions according to IEC 60068-1, 5.3. In the Test Procedures and Requirements table the tests and requirements are listed with reference to the relevant clauses of IEC 60115-1 and IEC 60068-2-xx test methods. A short description of the test procedure is also given. In some instances deviations from IEC applications were necessary for our specified method.

PERFORMANCE				
IEC 60115-1 CLAUSE	IEC 60068-2-xx TEST METHOD	TEST	PROCEDURE	REQUIREMENTS PERMISSIBLE CHANGE (ΔR) SR37
4.8	-	Temperature coefficient	Between - 55 °C and + 155 °C	± 250 ppm/K
4.25.1	-	Endurance at 70 °C	1000 h; loaded with P_{70} or $U_{max.}$; 1.5 h ON; 0.5 h OFF	$\pm (3 \% R + 0.1 \Omega)$
4.24	78 (Cab)	Damp heat, steady state	56 days; 40 °C; 90 % to 95 % RH loaded with 0.01 P_{70}	$\pm (3 \% R + 0.1 \Omega)$
4.23	2 (Ba) 30 (Db) 1 (Aa) 30 (Db)	Climatic sequence	155 °C; 16 h dry heat 24 h; 25 °C to 55 °C; 90 % to 100 % RH 1 st cycle - 55 °C; 2 h 5 days; 25 °C to 55 °C 90 % to 100 % RH	$\pm (3 \% R + 0.1 \Omega)$
4.23.2		Dry heat		
4.23.3		Damp heat (accelerated)		
4.23.4		Cold		
4.23.6	30 (Db)	Damp heat, (accelerated) remaining cycles	5 days; 25 °C to 55 °C 90 % to 100 % RH	
4.19	14 (Na)	Rapid change of temperature	30 min at LCT; 30 min at UCT; LCT = - 55 °C; UCT = 155 °C; 5 cycles	No visual damage $\pm (1 \% R + 0.1 \Omega)$
4.26	-	Active flammability "Cheese-cloth test"	Steps of: 5/10/16/25/40 x P_{70} duration 5 min	No flaming of gauze cylinder
-	-	Passive flammability "Needle-flame test"	Application of test flame for 20 s	No ignition of product no ignition of under-layer burning time less than 30 s
-	-	High voltage pulse test	For R-value ≤ 4.7 k Ω , 10 kV; 1 nF; 50 x 12/min (in accordance with IEC 60065 14.1.a)	$\pm 20 \% R$
4.16	21 (Ua1) 21 (Ub) 21 (Uc)	Robustness of terminations:	Load 10 N; 10 s Load 5 N; 4 x 90° 3 x 360° in opposite direction	No damage $\pm (1 \% R + 0.1 \Omega)$
4.16.2		Tensile all samples		
4.16.3		Bending half number of samples		
4.16.4		Torsion other half of samples		
4.22	6 (Fc)	Vibration	Frequency 10 Hz to 500 Hz; displacement 1.5 mm or acceleration 10 g; 3 directions; total 6 h (3 x 2 h)	$\pm (1 \% R + 0.1 \Omega)$
4.17	20 (Ta)	Solderability (after ageing)	2 s; 235 °C: Solder bath method; SnPb40 3 s; 245 °C: Solder bath method; SnAg3Cu0.5	Good tinning (≥ 95 % covered); no visible damage
4.18	20 (Tb)	Resistance to soldering heat	Thermal shock: 10 s; 260 °C; 3 mm from body	$\pm (1 \% R + 0.1 \Omega)$
4.29	45 (XA)	Component solvent resistance	Isopropyl alcohol or H ₂ O followed by brushing	No visible damage
4.6.1.1	-	Insulation resistance	$U = 500$ V _{DC} during 1 min, V-block method	R_{ins} min. 10 ⁴ M Ω
4.7	-	Voltage proof on insulation	$U_{RMS} = 700$ V during 1 min, V-block method	No flashover or breakdown

12NC INFORMATION FOR HISTORICAL CODING REFERENCE ONLY

- The resistors have a 12 digit ordering code starting with 2306
- The next 5 digits indicate the resistor type and packaging. The last 3 digits indicate resistance value in which:
 - The first 2 digits indicate the resistance value
 - The last digit indicates the resistance decade in accordance with table

Last Digit of 12NC Indicating Resistance Decade

RESISTANCE DECADE	LAST DIGIT
220 Ω to 910 Ω	1
1 k Ω to 9.1 k Ω	2
10 k Ω	3

12NC Example

SR37, 1.5 k Ω , $\pm 10\%$, reel 5000 pieces is **2306 245 33152**

12NC - Resistor type and packaging

DESCRIPTION			2306	
			BANDOLIER IN AMMOPACK	BANDOLIER ON REEL
TYPE	TAPE WIDTH	TOLERANCE	1000 UNITS	5000 UNITS
SR37	52.5	$\pm 10\%$	245 31....	245 33....
		$\pm 20\%$	245 11...	245 23...



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