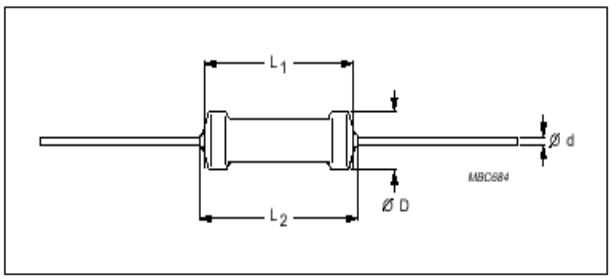
Carbon composition resistors SR25/37/37L/52

FEATURES

- Non inductive
- High pulse loading capability.

APPLICATIONS

- Application for overload and high voltage surge hazard circuits.



DESCRIPTION

A carbon film is deposited on a high grade ceramic body. After that caps are applied to the rods and copper wire are welded to these end caps. The resistors are coated with a brown and blue non flammable lacquer witch provides electrical, mechanical and climatic protection.
copper are welded to the end-caps.

TYPE	Dimensions (mm)			
	D ±0.8	L 1 ±0.8	L 2 Max.	d (±0.05)
SR25	2.7	6.5	7.5	0.6
SR37	3.7	9.0	12	0.7
SR37L	3.7	11	13	0.7
SR52	6.0	16.5	18.5	0.8

QUICK REFERENCE DATA

DESCRIPTION	VALUE			
	SR25	SR37	SR37L	SR52
resistance range	10 Ω to 9.1 kΩ			
resistance tolerance	±5%, ±10% (E12, E24 series)			
temperature coefficient	± 600 ppm / ℃			
rated dissipation at T_{amb} = 70 ℃	0.25 W	0.5 W	1 Ws	1W
max. working voltage	250 V	350 V	500 V	750 V
max. overload voltage	500 V	700 V	1000 V	1500 V
basic specifications	IEC 60 115-1B			
climatic category (IEC60)	55 / 155 / 56			
stability, $\Delta R/R_{max}$ after load : 1000 hours	± 5% +0.1 Ω			
soldering heat	± 3% +0.1 Ω			

Carbon composition resistors SR25/37/37L/52

ORDERING INFORMATION

Ordering code indicating resistor types and packing

Table 1

Type	Bandolier width	Packing	Quantity	Resistance range	Tol. ± %	Ordering code
SR25 (0.25W)	52mm	ammo	5000	10Ω to 9.1 kΩ	5 10	PPSR 241 43xxx PPSR 241 73xxx

Table 2

Type	Bandolier width	Packing	Quantity	Resistance range	Tol. ± %	Ordering code
SR37 (0.5W)	52mm	ammo	1000	10Ω to 9.1 kΩ	5 10 15	PPSR 242 33xxx PPSR 242 15xxx PPSR 242 22xxx

Table 3

Type	Bandolier width	Packing	Quantity	Resistance range	Tol. ± %	Ordering code
SR37L (1Ws)	64mm	ammo	1500	10Ω to 9.1 kΩ	5 10	PPSR 243 13xxx PPSR 243 14xxx

Table 4

Type	Bandolier width	Packing	Quantity	Resistance range	Tol. ± %	Ordering code
SR52 (1W)	64mm	ammo	500	10Ω to 9.1 kΩ	5 10	PPSR 250 11xxx PPSR 250 14xxx

Table 5. Last digit of 12NC

Resistance decade	Last digit
1 to 9.76Ω	8
10 to 97.6Ω	9
100 to 976Ω	1
1 to 9.76 kΩ	2

Ordering Example

The ordering code of a SR37- 0.5W resistor, value 4.7 kΩ ±10%, taped on a bandolier of 1000 units in ammopack is: PPSR 242 15472.

Carbon composition resistors SR25/37/37L/52

Limiting values

Table 6

TYPE	LIMITING VOLTAGE(1) (V)	LIMITING POWER (W)
SR25	250	0.25
SR37	350	0.5
SR37L	500	1 (small)
SR52	750	1

Note

1. the maximum voltage that may be continuously applied to the resistor element, see "IEC publication 60 115-1"

The maximum permissible hot – spot temperature is 155 ℃.

DERATING

The power that the resistor can dissipate depends on the operating temperature : Fig. 1

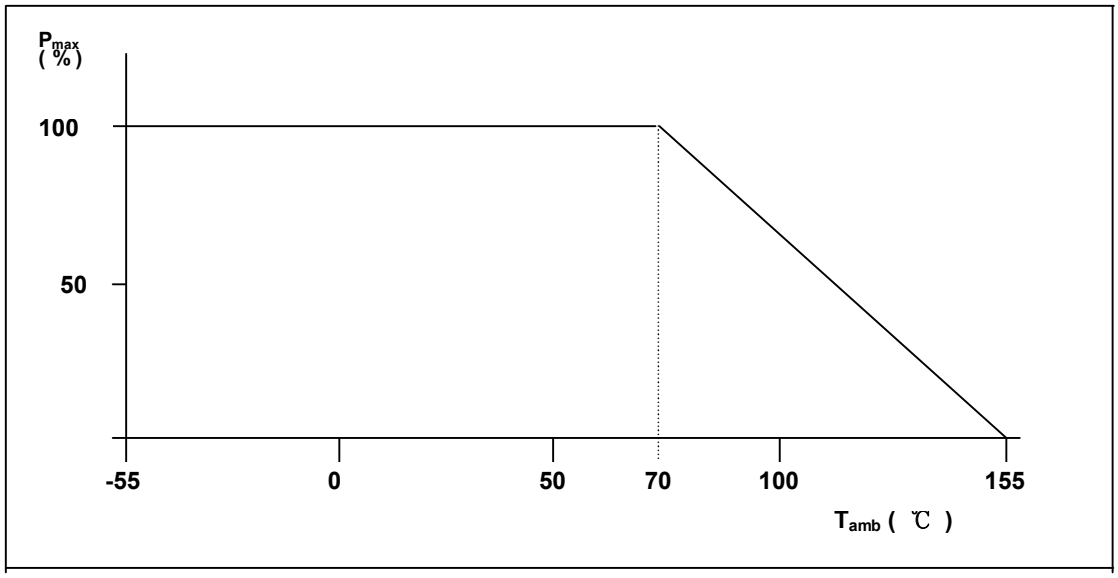


Fig. 1 Maximum dissipation (P_{max}) in percentage of rated power as a function of the ambient Temperature (T_{amb})

Carbon composition resistors SR25/37/37L/52

Surge resistance characteristics

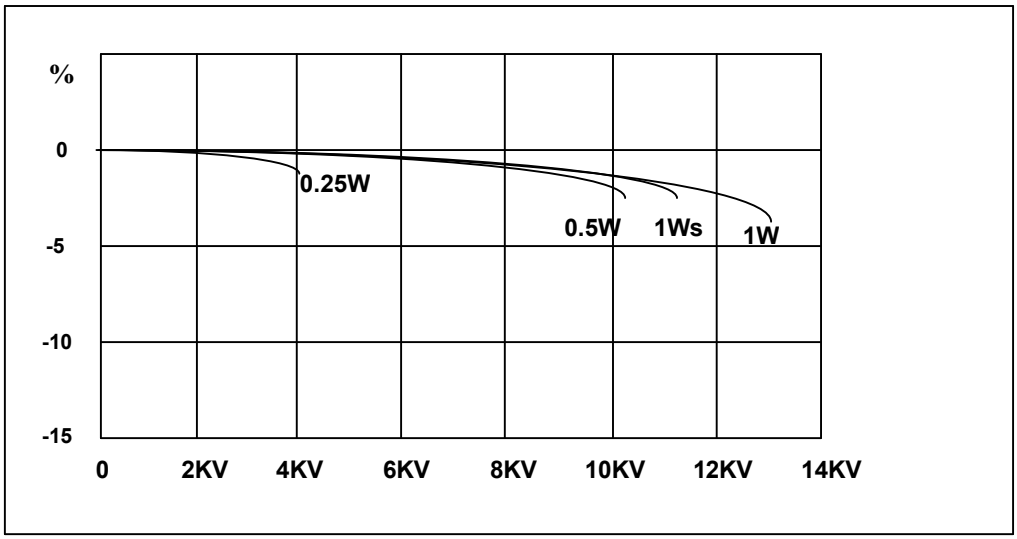


Fig. 2 Maximum allowed peak surge voltage in accordance with "IEC 60065 chapter 14.1" 50 discharges form a 1nF capacitor charged to V_{max} ; 12 discharges / minute

Application information

SR25 - 0.25W

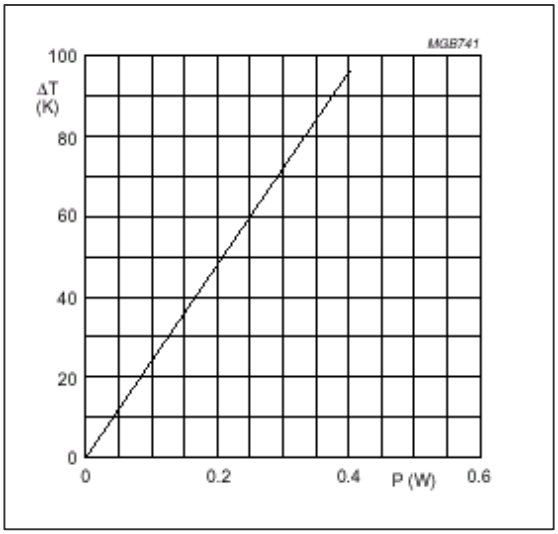


Fig. 3 Hot – spot temperature rise (Δ T) as a function of dissipated power

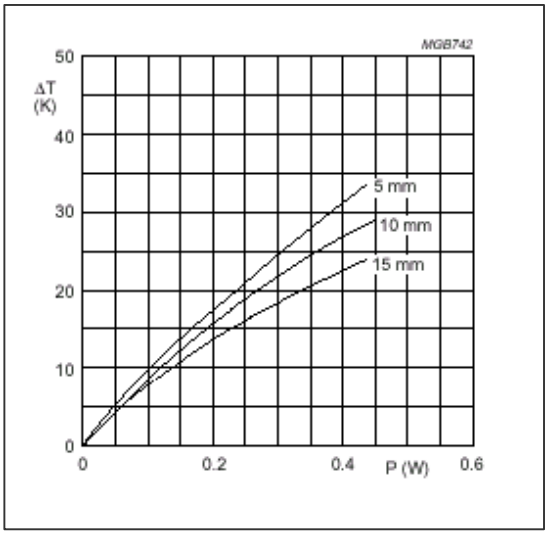


Fig.4 Temperature rise (Δ T) at the lead end of the lead (soldering point) as a f function of dissipated Power at various lead lengths after mounting

Carbon composition resistors SR25/37/37L/52

SR37 – 0.5W

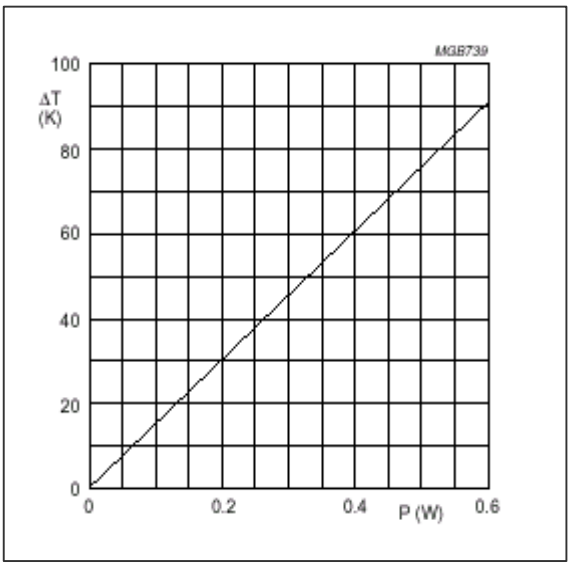


Fig. 5 Hot – spot temperature rise (Δ T) as a function of dissipated power

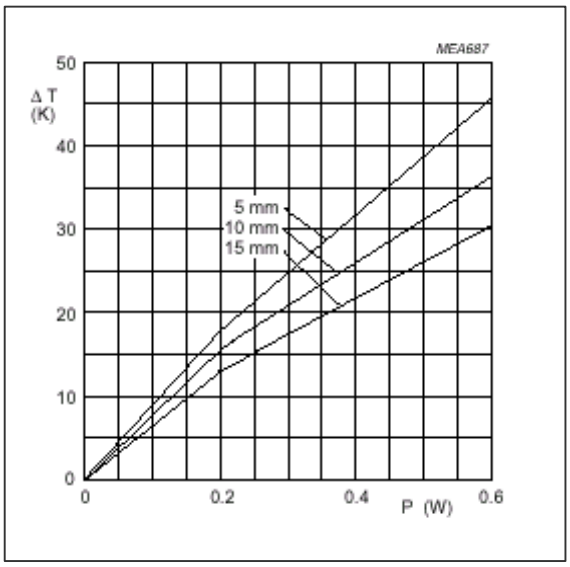


Fig.6 Temperature rise (Δ T) at the lead end of the lead soldering point as a function of dissipated power at various lead lengths after mounting

SR37L – 1Ws

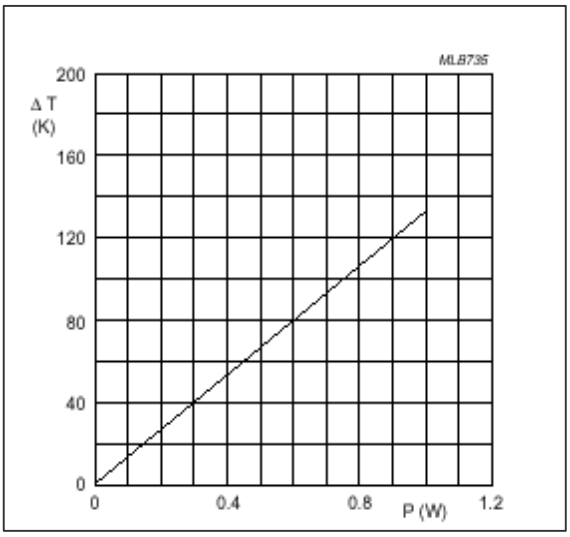


Fig. 7 Hot – spot temperature rise (Δ T) as a function of dissipated power

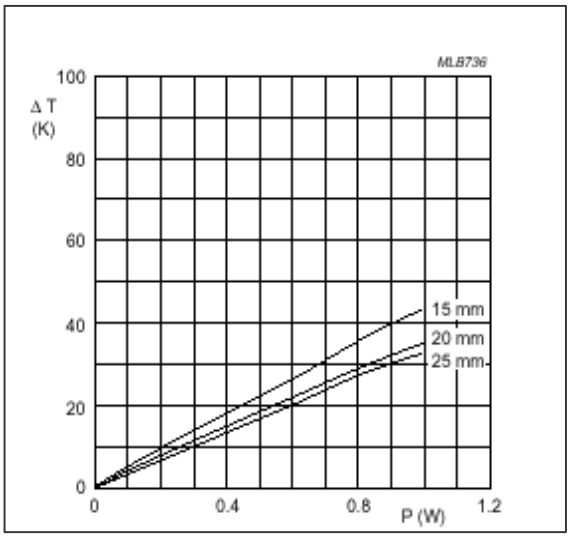


Fig.8 Temperature rise (Δ T) at the lead end of the lead soldering point as a function of dissipated power at various lead lengths after mounting

Carbon composition resistors SR25/37/37L/52

SR52 – 1W

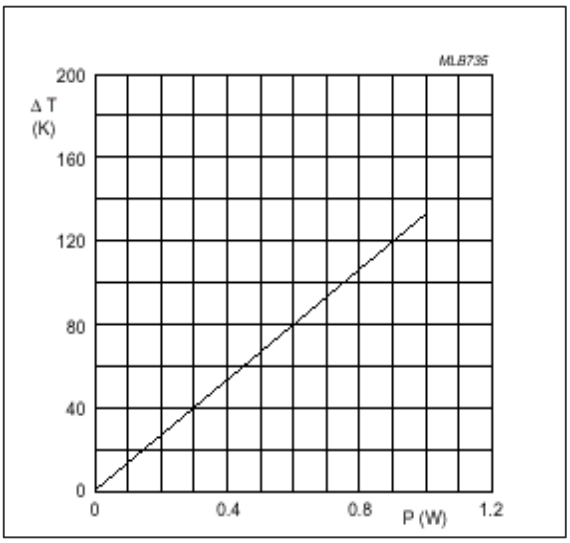


Fig. 9 Hot – spot temperature rise (Δ T) as a function of dissipated power

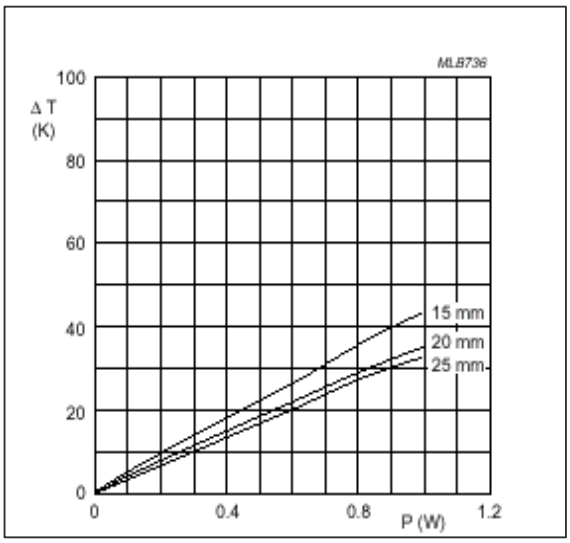


Fig.10 Temperature rise (Δ T) at the lead end of the lead soldering point as a function of dissipated power at various lead lengths after mounting

MECHANICAL DATA

Table 7. Mass per 100 units

TYPE	MASS (g)
SR25 - 0.25W	25
SR37 - 0.5W	42
SR37L - 1Ws	67
SR52 - 1W	148

MARKING

The nominal resistance and tolerance are marked on the resistor using four or five colored Bands in accordance with IEC publication 60 062 “color codes for fixed resistors”

Table 8. BODY COLORS

TYPE	COLORS
SR25 – 0.25W	Brown
SR37 – 0.5W	Brown
SR37L – 1Ws	Brown
SR52 – 1W	Blue

Carbon composition resistors SR25/37/37L/52

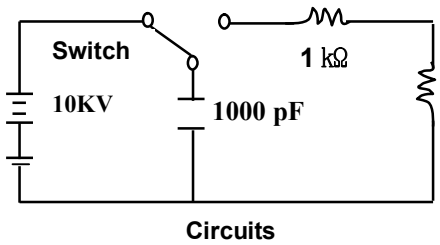
TEST AND REQUIREMENTS

Table 9. Test procedures and requirements

TEST	PROCEDURE	REQUIREMENTS			
		SR25	SR37	SR37L	SR52
robustness of terminations: tensile all samples	ϕ 0.6 / 0.7 / 0.8 mm : load 10N:10s	number of failures < 10^{-6}			
bending half number of samples	ϕ 0.6 / 0.7 / 0.8 mm : load 5N: 4x90°	number of failures < 10^{-6}			
torsion other half number samples	3x360°in opposite directions	no damage ±0.25% + 0.05 Ω			
solderability	2 s ; 235℃ flux 600	good tinning; no damage			
soldering heat	Thermal shock: 3 s; 360℃ 6mm from body	± 3% +0.1Ω			
rapid change of temperature	30 minutes at –55℃ and 30 minutes at +155℃;5cycles	± 2% +0.05Ω			
vibration	frequency 10 to 500 Hz; displacement 1.5mm or acceleration 10g; 3 directions total 6 hours(3x2 hours)	no damage ± 1% +0.05Ω			
Climatic sequence dry heat damp heat (accelerated) 1st cycle cold low air pressure damp heat (accelerated) remaining cycles	16 hours;155℃ 24hours;55℃; 90 to 100% RH 2 hours; - 55℃ 2 hours;8.5 Kpa; 15 to 35℃ 5 days;55℃;95 to 100% RH	$R_{ins\ min}$; 1000 MΩ ± 2% + 0.05Ω			
damp heat	56 days; 40 ℃; 90 to 95% RH dissipation 0.01 P_n	± 3% + 0.1Ω			
endurance	1000 hours at 70 ℃; P_n or V_{max}	± 5% + 0.1Ω			
temperature coefficient	between –55 ℃and +155 ℃	± 600 ppm/ ℃			
dielectric withstanding voltage	$500V_{RMS}$ SR25 $700V_{RMS}$ SR37,SR37L and SR52 during 1 min. V- block method	no breakdown			

Carbon composition resistors SR25/37/37L/52

TEST AND REQUIREMENTS

TEST	PROCEDURE	REQUIREMENTS			
		SR25	SR37	SR37L	SR52
insulation resistance	$500V_{DC}$ during 1 minute ; V – block method	min. : 1000 MΩ			
short time overload	rated voltage x 2.5 5 s on 45 s off ($V \leq 2 \times V_{max}$) 10 cycles	± 2.5% + 0.1Ω			
overload test	rated voltage x 2.5 during 1 min.	± 10% + 0.1Ω			
high voltage surge test		no evidence of flash over, mechanical damage, arcing or, insulation breakdown.			
50 discharges from a 1 nF capacitor charged to V_{max} ;12 discharges / minute		± 10 % + 0.1Ω			
SR25	SR37	SR37L	SR52		
10Ω -3.3 kΩ: 2 KV	10Ω -3.3 kΩ: 7 KV	10Ω - 9.1 kΩ: 10 KV	10Ω - 9.1 kΩ: 10 KV		
3.6 kΩ-9.1 kΩ: 3 KV	3.6 kΩ-9.1 kΩ: 10 KV				