

# DATA SHEET

## SURGE CHIP RESISTORS

SR series

20%, 10%, 5%

sizes 0805/1206/1218/2010/2512

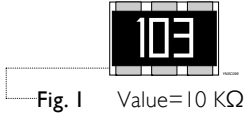
RoHS compliant & Halogen free





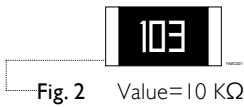
**MARKING**

**SR1218**



E-24 series: 3 digits  
First two digits for significant figure and 3rd digit for number of zeros

**SR0805 / SR1206 / SR2010 / SR2512**



E-24 series: 3 digits  
First two digits for significant figure and 3rd digit for number of zeros

**NOTE**

For further marking information, please refer to data sheet “Chip resistors marking”.

**CONSTRUCTION**

The resistor is constructed on top of a high-grade ceramic body. Internal metal electrodes are added at each end and connected by a resistive glaze. The resistive glaze is covered by a lead-free glass. The composition of the glaze is adjusted to give the approximately required resistance value. The whole element is covered by a protective overcoat. The top of overcoat is marked with the resistance value. Finally, the two external terminations (Ni/matte tin) are added, as shown in Fig.3.

**OUTLINES**

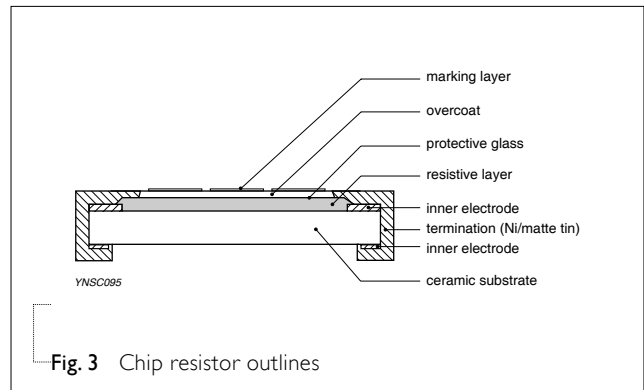


Fig. 3 Chip resistor outlines

**DIMENSIONS**

Table I

TYPE	L (mm)	W (mm)	H (mm)	l <sub>1</sub> (mm)	l <sub>2</sub> (mm)
SR0805	2.00 ±0.10	1.25 ±0.10	0.50 ±0.10	0.35 ±0.20	0.35 ±0.20
SR1206	3.10 ±0.10	1.60 ±0.10	0.55 ±0.10	0.45 ±0.20	0.40 ±0.20
SR1218	3.10 ±0.10	4.60 ±0.10	0.55 ±0.10	0.45 ±0.20	0.40 ±0.20
SR2010	5.00 ±0.10	2.50 ±0.15	0.55 ±0.10	0.55 ±0.15	0.50 ±0.20
SR2512	6.35 ±0.10	3.10 ±0.15	0.55 ±0.10	0.60 ±0.20	0.50 ±0.20

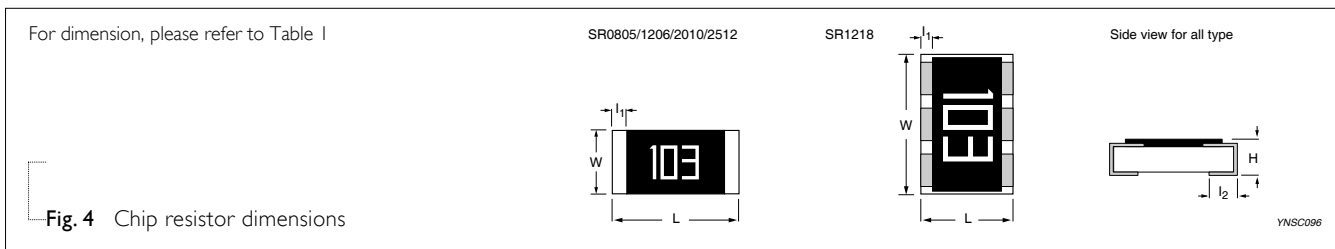


Fig. 4 Chip resistor dimensions

**ELECTRICAL CHARACTERISTICS**

Table 2

TYPE	POWER	RESISTANCE RANGE	CHARACTERISTICS				
			Operating Temperature Range	Max. Working Voltage	Max. Overload Voltage	Dielectric Withstanding Voltage	Temperature Coefficient of Resistance
SR0805	1/8 W	E24 5%, 10%, 20% 1 Ω ≤ R ≤ 100 KΩ	-55 °C to +155 °C	150 V	300 V	300 V	±200 ppm/°C
SR1206	1/4 W			150 V	400 V	500 V	
SR1218	1 W			200 V	400 V	500 V	
SR2010	3/4 W			200 V	400 V	500 V	
SR2512	1 W			200 V	400 V	500 V	

**FOOTPRINT AND SOLDERING PROFILES**

Recommended footprint and soldering profiles, please refer to data sheet “Chip resistors mounting”.

**PACKING STYLE AND PACKAGING QUANTITY**

Table 3 Packing style and packaging quantity

PACKING STYLE	REEL DIMENSION	SR0805	SR1206	SR1218	SR2010	SR2512
Paper taping reel (R)	7" (178 mm)	5,000	5,000	---	---	---
	10" (254 mm)	10,000	10,000	---	---	---
	13" (330 mm)	20,000	20,000	---	---	---
Embossed taping reel (K)	7" (178 mm)	---	---	4,000	4,000	4,000

**NOTE**

I. For paper/embossed tape and reel specification/dimensions, please refer to data sheet “Chip resistors packing”.

**FUNCTIONAL DESCRIPTION**

**OPERATING TEMPERATURE RANGE**

Range: -55 °C to +155 °C

**POWER RATING**

Each type rated power at 70 °C:

SR0805 = 1/8 W (0.125W)

SR1206 = 1/4 W (0.25W)

SR1218 = 1 W

SR2010 = 3/4W (0.75W)

SR2512 = 1 W

**RATED VOLTAGE**

The DC or AC (rms) continuous working voltage corresponding to the rated power is determined by the following formula:

$$V = \sqrt{P \times R}$$

Where

V = Continuous rated DC or AC (rms) working voltage (V)

P = Rated power (W)

R = Resistance value ( $\Omega$ )

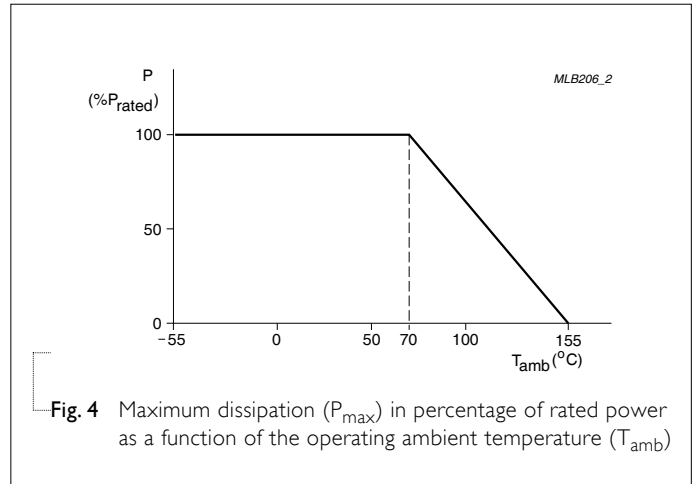


Fig. 4 Maximum dissipation ( $P_{max}$ ) in percentage of rated power as a function of the operating ambient temperature ( $T_{amb}$ )

**PULSE LOAD BEHAVIOR**

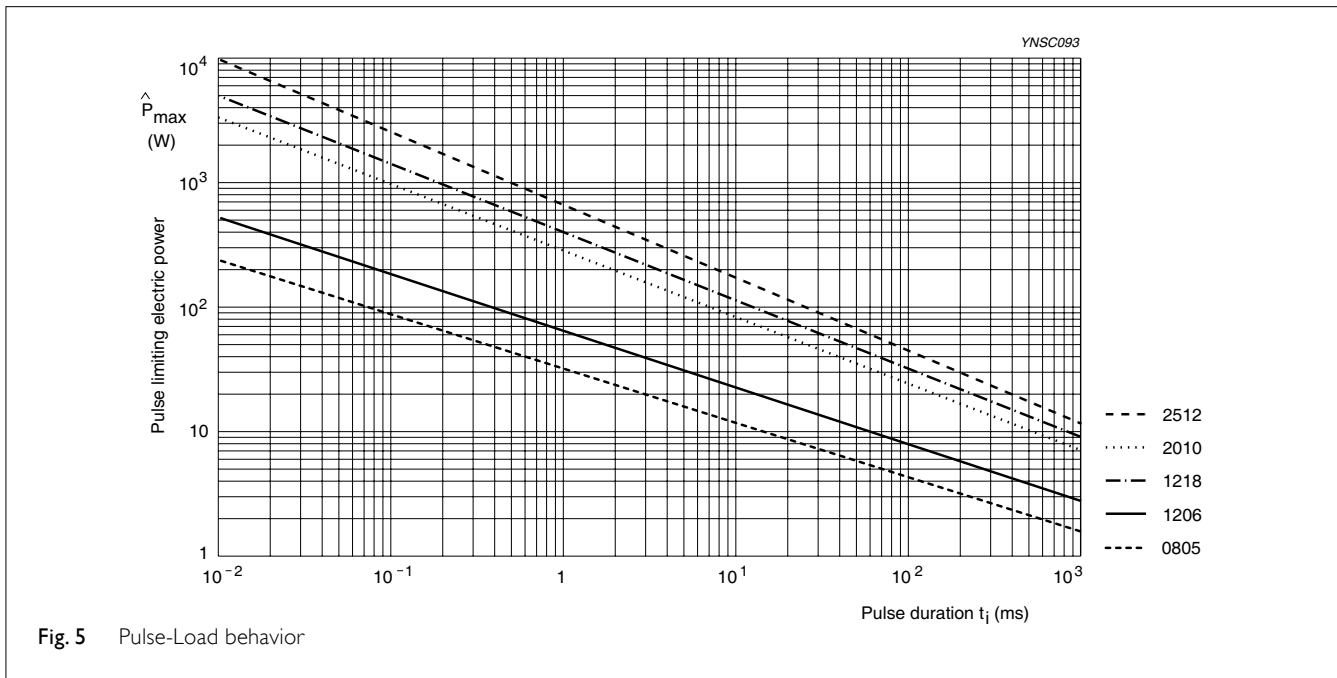


Fig. 5 Pulse-Load behavior

**TESTS AND REQUIREMENTS**
**Table 4** Test condition, procedure and requirements

TEST	TEST METHOD	PROCEDURE	REQUIREMENTS
Temperature Coefficient of Resistance (T.C.R.)	MIL-STD-202 Method 304	At +25/-55 °C and +25/+125 °C  <b>Formula:</b> $T.C.R = \frac{R_2 - R_1}{R_1(t_2 - t_1)} \times 10^6 \text{ (ppm/°C)}$ Where t <sub>1</sub> = +25 °C or specified room temperature t <sub>2</sub> = -55 °C or +125 °C test temperature R <sub>1</sub> = resistance at reference temperature in ohms R <sub>2</sub> = resistance at test temperature in ohms	Refer to table 2
Short Time Overload	IEC60115-1 4.13	2.5 times of rated voltage or maximum overload voltage whichever is less for 5 sec at room temperature	±(2.0%+0.05 Ω)
High Temperature Exposure	IEC 60068-2-2	1,000 hours at T <sub>A</sub> = 155 °C ±5 °C, unpowered	±(3.0%+0.05 Ω)
Humidity	IEC 60115-1 4.24.8	Steady state for 1,000 hours at 40 °C / 95% R.H. RCVV applied for 1.5 hours on and 0.5 hour off	±(3.0%+0.05 Ω)
Life	IEC 60115-1 4.25.1	1,000 hours at 70±2 °C, derated voltage applied for 1.5 hours on, 0.5 hour off, still-air required	±(3.0%+0.05 Ω)
Resistance to Soldering Heat	IEC 60068-2-58	Condition B, no pre-heat of samples Lead-free solder, 260±5 °C, 10±1 seconds immersion time Procedure 2 for SMD: devices fluxed and cleaned with isopropanol	±(1.0%+0.05 Ω) No visible damage
Temperature Cycling	JESD22-A104C	-55/+125 °C for 1 cycle per hour, with 5 cycles. Devices mounted	±(1.0%+0.05 Ω)

TEST	TEST METHOD	PROCEDURE	REQUIREMENTS
Solderability - Wetting	J-STD-002	Electrical Test not required Magnification 50X SMD conditions: Immerse the specimen into the solder pot at 235±3°C for 2±0.5 seconds.	Well tinned (≥95% covered) No visible damage
Board Flex	IEC 60068-2-21 IEC 60115-1 4.33	Chips mounted on a 90mm glass epoxy resin PCB (FR4) Bending for 0805: 3 mm 1206 and above: 2 mm Holding time: minimum 60 seconds	±(1.0%+0.05 Ω)

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version 1	Mar 18, 2011	-	- Change to dual brand datasheet that describes SR0805 to SR2512 with RoHS compliant - Define global part number
Version 0	Oct 19, 2004	-	-

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