Double-Sided Chip Resistors

DSC Series

Features

- Two parallel resistance elements in a single chip
- Excellent pulse withstand performance
- Laser trimmed up to 0.5% tolerance
- Enhanced working voltage
- Enhanced power rating
- Anti-sulphur version available.

All Pb-free parts comply with EU Directive 2011/65/EU amended by (EU) 2015/863 (RoHS3)

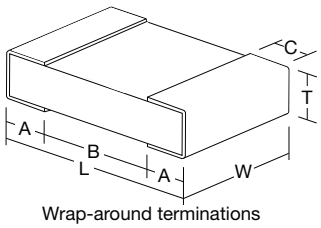
Electrical Data

		0603	0805	1206	2010	2512
Power @70˚C	W	0.125	0.25	0.33	0.75	1.5
2 second overload power @25˚C	W	0.8	1.6	2.1	4.7	9.4
Short pulse performance		See graphs				
Resistance range	ohms	0R5 to 1M0		0R5 to 4M7		
Tolerance	%	10R to 1M: 0.5, All values: 1, 5				
LEV	V	75	150	200	400	500
TCR	ppm/˚C	<10R:200 ≥10R:100				
Operating temperature	˚C	-55 to +155				
Dielectric withstand voltage	V	500				
Thermal Impedance	˚C/W	302	210	160	80	50
Pad & trace area for rated power*	mm²	30	40	50	60	100
Values		E24 or 96 preferred - other values to special order				

*Recommended minimum pad & adjacent trace area for each termination for rated power dissipation on FR4 PCB

Physical Data

Dimensions (mm) & Weight (mg)							
	L	W	T max	A	B min	C	Wt.
0603	1.6±0.1	0.8±0.1	0.6	0.3±0.15	0.6	0.3±0.15	2.7
0805	2.0±0.15	1.25±0.15	0.7	0.3±0.15	0.9	0.3±0.1	5.0
1206	3.2±0.2	1.6±0.2	0.7	0.4±0.2	1.7	0.4±0.15	10
2010	5.1±0.3	2.5±0.2	0.8	0.6±0.3	3.0	0.6±0.25	42
2512	6.5±0.3	3.2±0.2	0.8	0.6±0.3	4.4	0.6±0.25	65



Wrap-around terminations
(3 faces)

Construction

Thick film resistor material, overglaze and organic protection are screen printed on a 96% alumina substrate. Wrap-around terminations have an electroplated nickel barrier and solderable coating, this ensures excellent 'leach' resistance properties and solderability.

Marking

Components are not marked. Reels are marked with type, value, tolerance, date code and quantity.

Solvent Resistance

The body protection is resistant to all normal industrial cleaning solvents suitable for printed circuits.

DSC Series

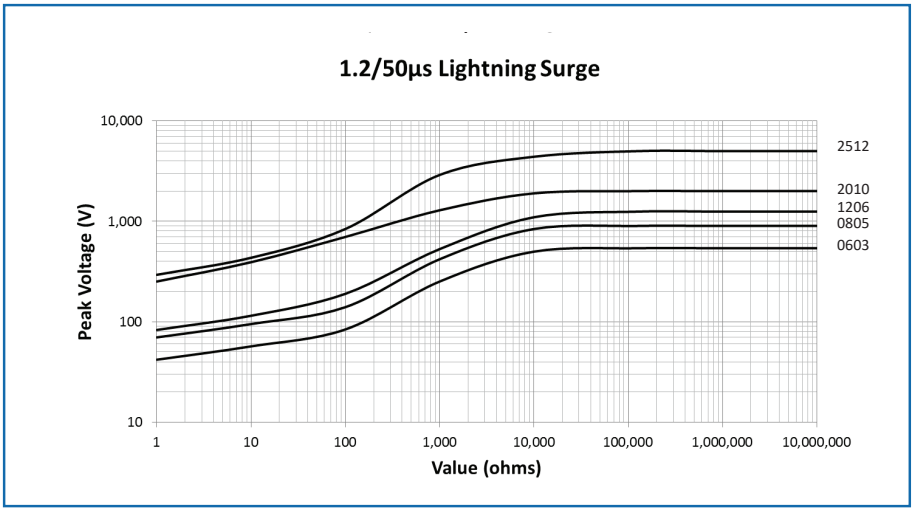
Performance Data

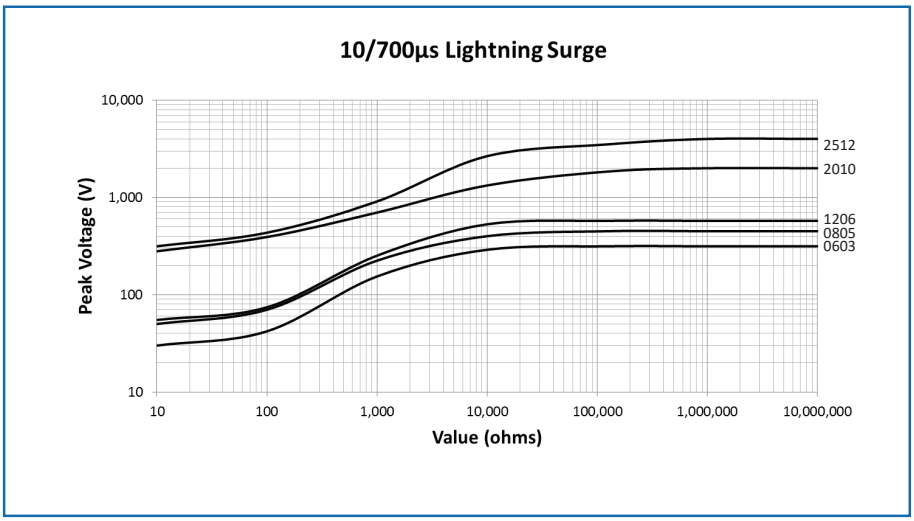
			Maximum	Typical
Load at rated power: 1000 hours at 70°C		ΔR%	1	0.25
Derating from rated power at 70°C			Zero at 155°C	
Overload: 6.25 x rated power for 2 seconds		ΔR%	1	0.1
Shelf life test: 12 months at room temperature		ΔR%	0.1	0.02
Dry heat: 1000 hours at 155°C		ΔR%	1	0.2
Long term damp heat		ΔR%	1	0.25
Temperature rapid change		ΔR%	0.25	0.05
Anti-sulphur grade (AS)	ASTM-B-809 (1000 hours, 50°C, 91-93% RH)	ΔR%	0.25	0.05
Sulphur-resistant grade (SR)	EIA-977 (750 hours, 105°C)	ΔR%	0.25	0.05
	ASTM-B-809 (1000 hours, 50°C, 91-93% RH)	ΔR%	0.25	0.05
	Modified ASTM-B-809 (1000 hours, 105°C, 85% RH)	ΔR%	1	0.25
Resistance to solder heat		ΔR%	0.25	0.05

Pulse Performance Data

Lightning Surge

Resistors are tested in accordance with IEC 60 115-1 using both 1.2/50µs and 10/700µs pulse shapes. 10 pulses are applied. The limit of acceptance is a shift in resistance of less than 1% from the initial value.





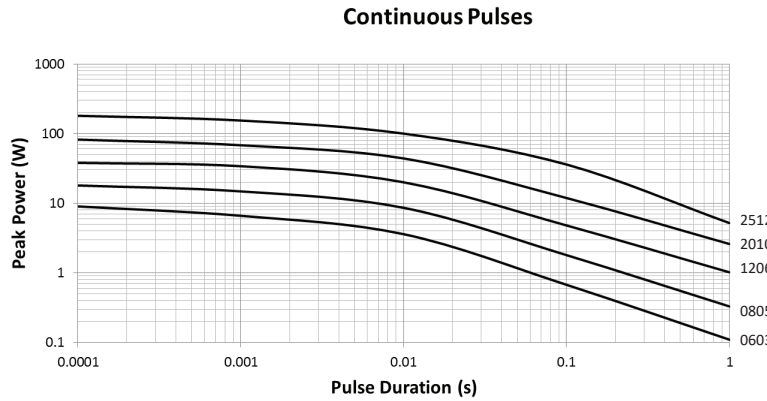
DSC Series

Single Pulse

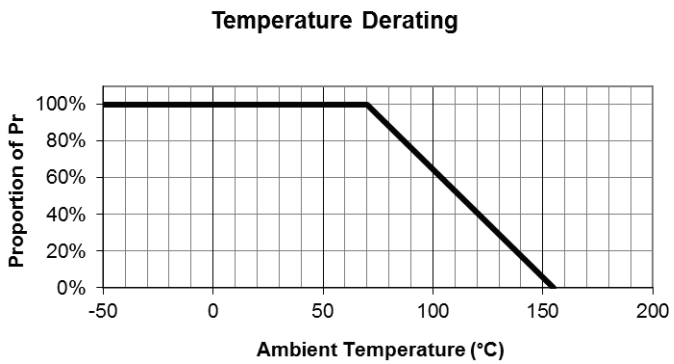
The single impulse graph is the result of 50 impulses of rectangular shape applied at one-minute intervals. The limit of acceptance was a shift in resistance of less than 1% from the initial value.

Continuous Load Due to Repetitive Pulses

The continuous load graph was obtained by applying repetitive rectangular pulses where the pulse period was adjusted so that the average power dissipated in the resistor was equal to its rated power at 70°C. Again the limit of acceptance was a shift in resistance of less than 1% from the initial value.



Thermal Performance Data



Packaging

0603, 0805 and 1206 resistors are supplied on 8mm carrier tape and 2010 and 2512 resistors are supplied on 12mm carrier tape, all on 7 inch reels as per IEC 286-3.

Application Notes

DSC resistors are ideally suited for handling by automatic methods due to their rectangular shape and the small dimensional tolerances. Electrical connection to a ceramic substrate or to a printed circuit board can be made by reflow or wave soldering of wrap-around terminations. For reflow processing of DSC parts, a solder paste thickness of not less than 100µm is recommended.

Wrap-around terminations provide good leach properties and ensure reliable contact. Due to the robust construction, the DSC can be immersed in the solder bath for 30 seconds at 260˚C. This enables the resistor to be mounted on one side of a printed circuit board and wire-leaded components applied on the other side. DSC is compatible with typical Pb-free soldering materials and temperature profiles.

DSC resistors themselves can operate at a maximum temperature of 155˚C. For soldered resistors, the joint temperature should not exceed 110˚C. This condition is met when the stated power levels at 70˚C and recommended pad and trace areas are used. Pad and trace area is defined as the total area of the solder pad plus all copper trace within two squares of the edge of the solder pad. Allowance should be made if smaller areas of copper are used.

Ordering Procedure

Example: DSC2512-10KFT18 (DSC2512, 10 kilohms ±1%, Pb-free)

D	S	C	2	5	1	2			-	1	0	K	F	T	1	8
1			2				3			4			5		6	

1 Type	2 Size	3 Sulphur Grade[1]		4 Value	5 Tolerance		6 Termination & Packing		
DSC	0603		Omit for Standard	E24 = 3/4 characters	D	±0.5%	Standard Pb-free finish		
	0805	AS	Anti-Sulphur	E96 = 3/4 characters	F	±1%	T5	0603	5000/reel standard
	1206	SR	Sulphur Resistant	R = ohms	J	±5%	T3	0805	3000/reel standard
	2010			K = kilohms				1206	
	2512			M = megohms				2010	
							T18	2512	1800/reel standard
							T1	All sizes	1000/reel available
							SnPb finish		
							PB	All sizes	Standard quantities as for Pb-free

Note 1: For new designs requiring resistance to sulphur-bearing gas, SR grade is preferred.