

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)

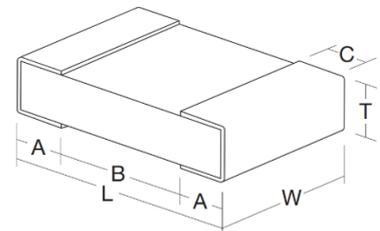
Electrical Data

		DSC0603	DSC0805	DSC1206	DSC2010	DSC2512
Power rating @70°C	W	0.125	0.25	0.33	0.75	1.5
2s overload rating @25°C	W	0.8	1.6	2.1	4.7	9.4
Pad & trace area ¹ for full power operation	mm ²	30	40	50	60	100
Thermal impedance mounted as recommended	°C/W	302	210	160	80	50
Limiting element voltage	V	75	150	200	400	500
Resistance range	ohms	R50 to 1M0		R50 to 4M7		
Resistance tolerance	%	<10R: 1, 5, 10R to 1M0: 0.5, 1, 5, >1M0: 1, 5				
TCR	ppm/°C	<10R: 200, ≥10R: 100				
Ambient temperature range	°C	-55 to +155				
Dielectric withstand voltage	V	500				
Standard values		E24 & E96 preferred				
Pulse capability		See Pulse Performance Data				

Note 1: Recommended minimum pad & adjacent trace area for each termination for rated power dissipation on FR4 PCB.

Physical Data

Dimensions in mm and weight in mg							
	L	W	T _{max}	A	B _{min}	C	Wt. _{nom}
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 ± 0.15	1.25 ± 0.15			0.9		5
1206	3.2 ± 0.2	1.6 ± 0.2	0.7	0.4 ± 0.2	1.7	0.4 ± 0.2	10
2010	5.1 ± 0.3	2.5 ± 0.2			3		42
2512	6.5 ± 0.3	3.2 ± 0.2	0.8	0.6 ± 0.3	4.4	0.6 ± 0.3	65



Construction

Thick film resistor material, overglaze and organic protection are screen printed on both sides of 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.

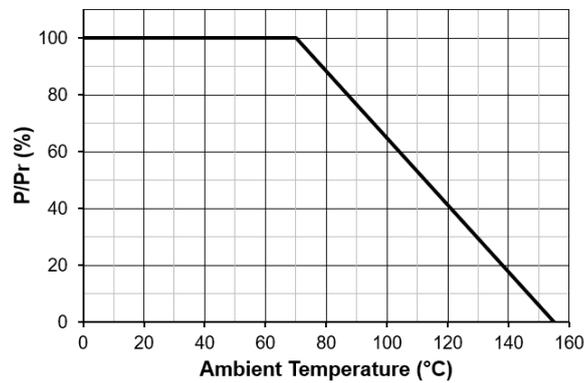
Solvent Resistance

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

Performance Data

			Maximum	Typical
Load at rated power: 1000 hours at 70°C		±ΔR%	1	0.25
Overload: 6.25 x rated power for 2s		±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

Temperature Derating

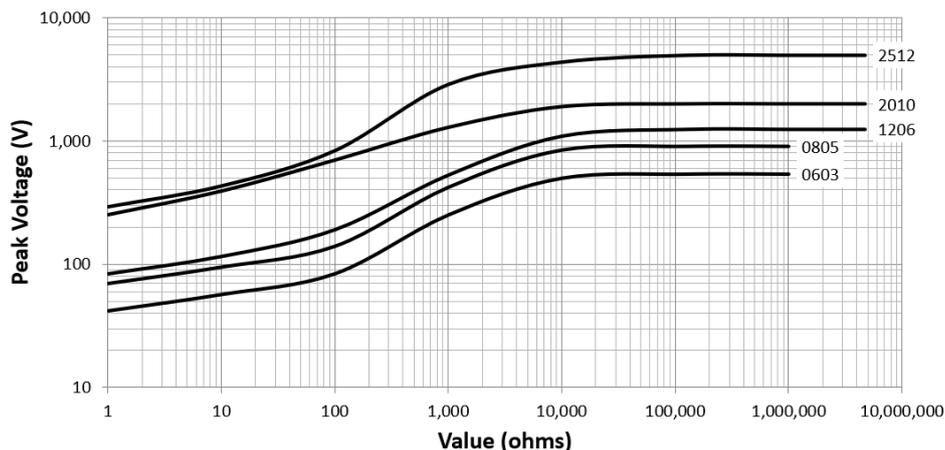


Pulse Performance Data

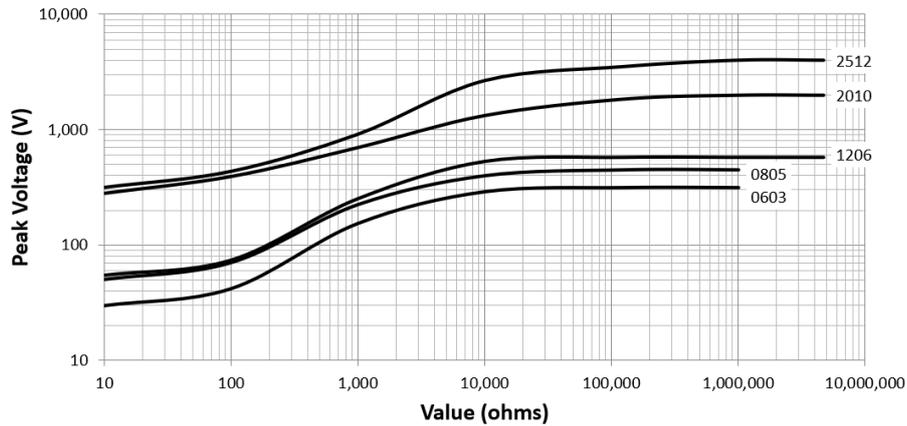
Lightning Surge

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.

1.2/50μs Lightning Surge



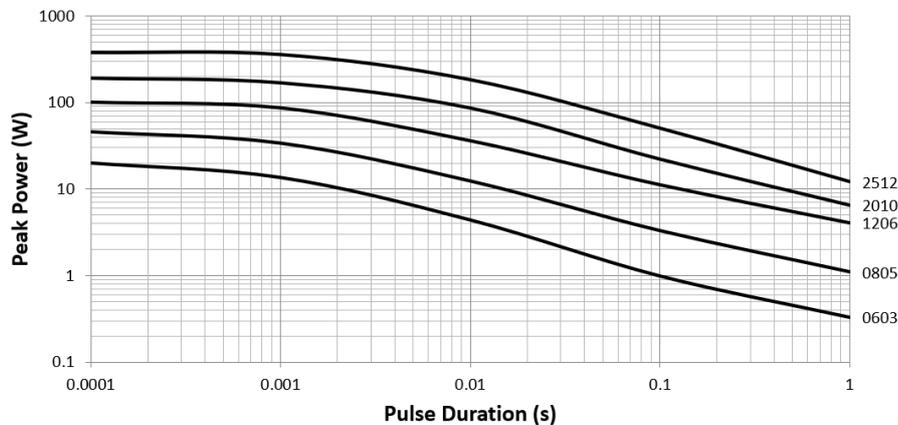
10/700µs Lightning Surge



Single Pulse

50 rectangular pulses are applied at 1 minute intervals to avoid cumulative heating. The limit of acceptance is a shift in resistance of less than 1% from the initial value.

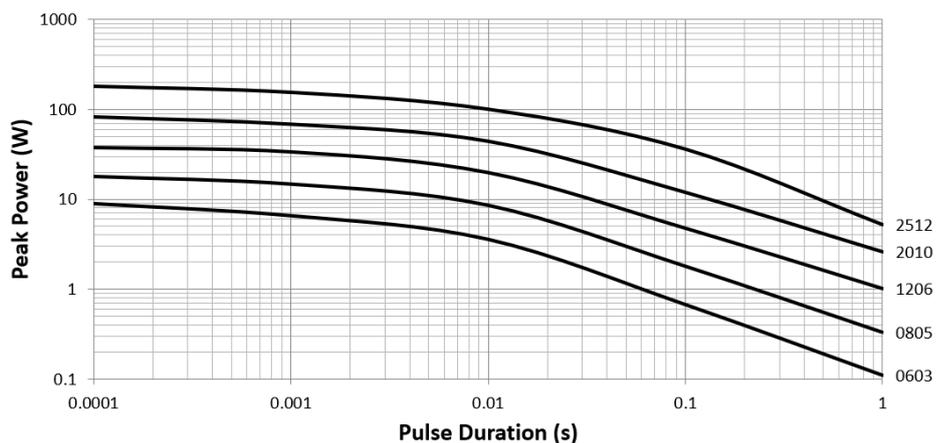
Single Pulse



Continuous Pulses

Repetitive rectangular pulses are applied at a frequency which causes the mean power to equal the rated power. The limit of acceptance is a shift in resistance of less than 1% from the initial value.

Continuous Pulses



Application Note

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.

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. For full details of tape and reel dimensions see: <https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Application-Note/PS003-Packing-of-Specialist-Chip-Resistors.pdf>.

Ordering Procedure

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



1	2	3	4	5	6		
Series	Size	Sulphur Grade ¹	Value	Tolerance	Termination & Packing		
DSC	0603	Omit for standard	E24 = 3/4 characters E96 = 3/4 characters R = ohms K = kilohms M = megohms	D = ±0.5%	Pb-free, standard packing		
	0805	AS = Anti-sulphur		F = ±1%	T5	0603	5000/reel
	1206	SR = Sulphur Resistant		J = ±5%	T3	0805, 1206, 2010	3000/reel
	2010				T18	2512	1800/reel
	2512				Pb-free, non-standard packing		
				T1	All sizes	1000/reel	
				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.