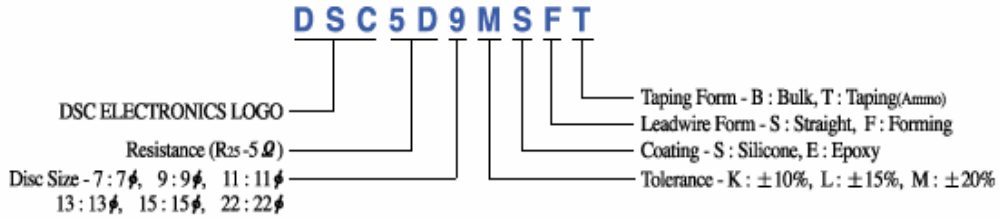
Inrush Current Limiting Thermistor

DSC' s inrush crrrent limiting thermistor limits the current to a low value at turn on for protection against extremely high peak inrush current in AC/DC power supplies etc.

Odering number



Introduction

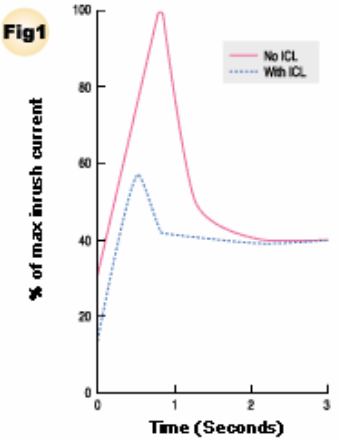
Inrush currents are high current levels that occur in some electrical circuits at the instant when power is switched to the circuits. Thermistor components with Negative Temperature Coefficients(NTC) are useful in reducing the magnitude of inrush currents. NTC thermistors that are used for this purpose are referred to as inrush current limiters. A suitable inrush current limiter in a circuit operates by providing a resistive load, at start-up, in series with the circuit to be protected. This reduces the current that is drawn as a start-up surge, As current flows in the circuit. Power is dissipated in the thermistor, it's bulk temperature increases and it's resistance drops to a negligible value. This process typically happens within a few milliseconds of circuit power-up, but the resistance of the NTC remains high enough for sufficient time to limit the inrush current.
This is indicated in Fig 1 and illustrates the ICL (Inrush Current Limiting) function. The low resistance value is maintained in the steady state operating condition of the circuit by the power dissipation in the thermistor which keeps it's body temperature at a suitable level.
A typical application of ICL devices is indicated in the schematic diagram (Fig 2) of a switch mode power supply where the ICL provides a resistance in series with the filter capacitors which have low impedance in the uncharged condition at circuit power-up.

Features

- High inrush current restriction effect.
- High thermal and electrical stability.
- Wide selection of electrical characteristics.
- Operating temperature range from -40℃ to +180℃
- Maximun temperature rating of +250℃
- Available in tape format for high volume requirements.
- Resistance tolerances : ±10%, ±15% and ±20% on R25 values.
- Straight or in/out kinked leads of tined or nickel plated copper wire.
- Useable in series connections up to 250 V rms.

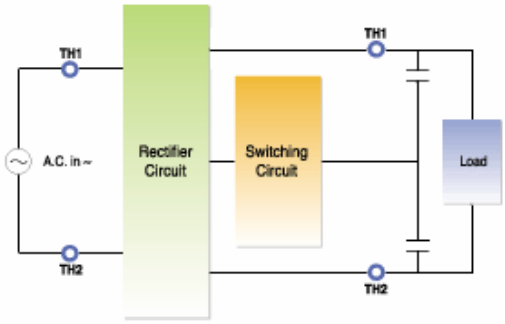
Typical ICL effect on Inrush Current in Switch Mode power supply

Fig1



Typical application of ICL in SMPSU

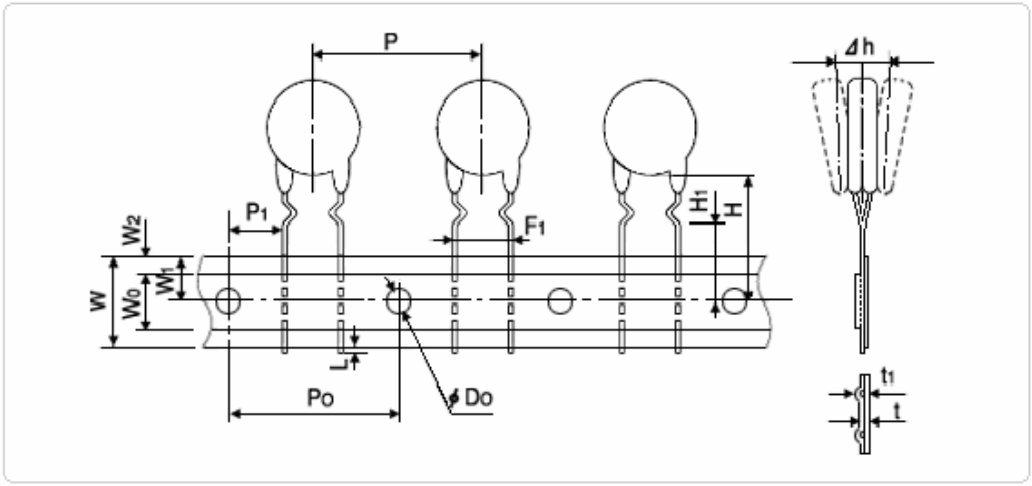
Fig2



▷ Applications

- Power Supplies (Switching Mode).
- Transformers
- Filament Lamps
- Projector Lamps
- Personal Computers
- Video Monitors
- Soft Start Motors

▷ Taping Dimensions



▷ Bulk Specification

(unit: mm)

Disk Size	D	L	W	L1	W1	T	P	d
7.0	9.5	6.0	8.0	25.0	6.0	5.0	5.0	0.6
9.0	10.5	6.0	8.0	25.0	6.0	6.0	5.0	0.6
11.0	12.5	6.0	8.0	25.0	6.0	6.0	7.5	0.8
13.0	14.5	6.0	8.0	25.0	6.0	6.0	7.5	0.8
15.0	16.5	6.0	8.0	25.0	6.0	6.0	7.5	0.8
							10.0	1.0
22.0	24.5			25.0	6.0	9.0	10.0	1.0

▷ Taping Specification

Disk Size(㎜)	P	P_0	P_1	W	W_0	W_1	W_2
7, 9	12.7 ± 1.0	12.7 ± 0.3	3.75 ± 0.7	18 +0.5 / -1.0	9 Min	9.0 ± 0.5	3 Max
11,13,15	15.0 ± 1.0	15.0 ± 0.3	3.75 ± 0.4	18 +0.5 / -1.0	9 Min	9.0 ± 0.5	3 Max
	30.0 ± 1.0						

Disk Size(㎜)	H	H_1	L	F_1	ϕD_0	T	T_1	Δh
7, 9	20.0 ± 1.5	16.0 ± 0.2	1 Max	5.0 ±0.5	4.0 ± 0.2	0.6 ± 0.3	1.7 Max	0 ± 2.0
11,13,15	20.0 ± 1.5	16.0 ± 0.2	1 Max	7.5 ±0.5	4.0 ± 0.2	0.6 ± 0.3	1.7 Max	0 ± 2.0

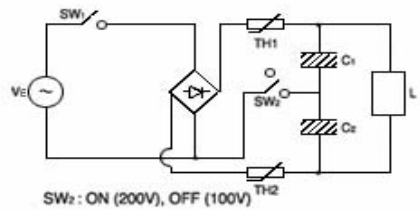
Pb free

DSC 7PIE SERIES

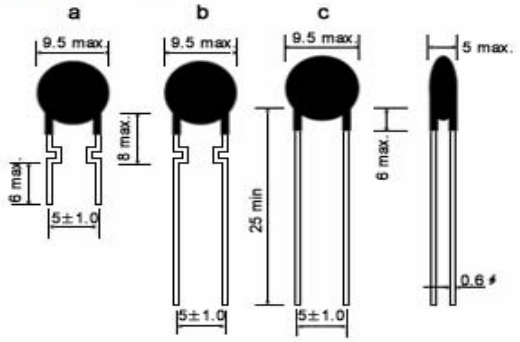
▷ Specifications

Part No.	Resistance at 25℃ (Ω)	Max Steady State Current (A)	Thermal Dissipation Constant (mW/℃)	Thermal Time Constant (Sec.)	Beta Constant (K,25/85℃, ±5%)	Max. Capacitance (μF)	
						120 Vac.	240 Vac.
2.5D - 7	2.5	3.0	9	35	2950	330	80
5D - 7	5.0	3.0	9	35	2950	330	80
8D - 7	8.0	2.5	9	35	2950	330	80
10D - 7	10.0	2.3	9	32	3000	330	80
15D - 7	15.0	2.0	12	30	3050	330	80
16D - 7	16.0	2.0	12	30	3050	330	80
22D - 7	22.0	1.5	10	32	3100	330	80
33D - 7	33.0	1.5	10	32	3100	330	80
50D - 7	50.0	1.2	8	28	3150	330	80

▷ Typical application



▷ Dimensions



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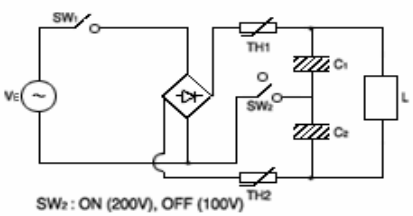
DSC 9PIE SERIES

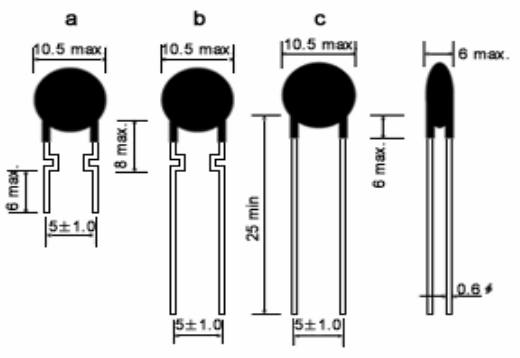
▷ Specifications

Part No.	Resistance at 25℃ (Ω)	Max Steady State Current (A)	Thermal Dissipation Constant (mW/℃)	Thermal Time Constant (Sec.)	Beta Constant (K,25/85℃, ±5%)	Max. Capacitance (μF)	
						120 Vac.	240 Vac.
2.5D - 9	2.5	4.0	11	42	2900	670	160
3D - 9	3.0	4.0	11	42	2900	670	160
5D - 9	5.0	3.8	11	42	2900	1350	340
8D - 9	8.0	3.5	12	43	3000	670	160
10D - 9	10.0	3.0	12	50	3000	670	160
12D - 9	12.0	3.0	12	40	3000	670	160
16D - 9	16.0	2.5	11	44	3100	670	160
18D - 9	18.0	2.0	10	46	3100	670	160
22D - 9	22.0	2.0	10	46	3200	670	160
50D - 9	50.0	1.5	10	47	3200	670	160
400D - 9	400.0	1.2	9	25	3800	150	60

▷ Typical application



▷ Dimensions



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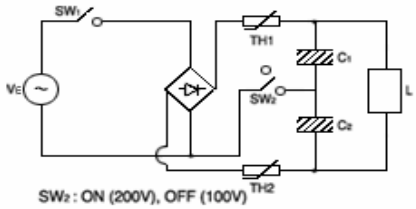
DSC 11PIE SERIES

▷ Specifications

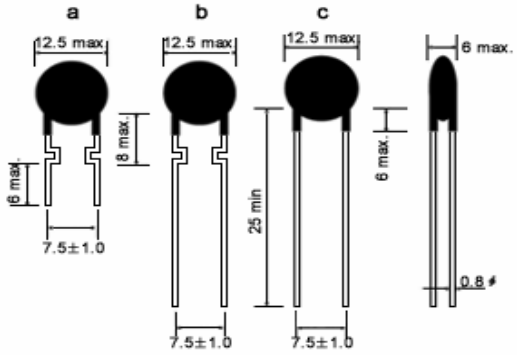
Part No.	Resistance at 25℃ (Ω)	Max Steady State Current (A)	Thermal Dissipation Constant (mW/℃)	Thermal Time Constant (Sec.)	Beta Constant (K,25/85℃, ±5%)	Max. Capacitance (μF)	
						120 Vac.	240 Vac.
2.5D - 11	2.5	5.0	12	44	2900	1000	250
3D - 11	3.0	5.0	12	45	2900	1000	250
4.7D - 11	4.7	4.0	13	45	2950	1000	250
5D - 11	5.0	4.0	13	45	2950	1000	250
8D - 11	8.0	3.5	14	45	3000	1000	250
10D - 11	10.0	3.0	14	45	3000	1000	250
13D - 11	13.0	3.0	14	48	3100	1000	250
16D - 11	16.0	2.8	14	50	3150	800	220
25D - 11	25.0	2.5	13	53	3200	800	220

▷ Typical application



SW2 : ON (200V), OFF (100V)

▷ Dimensions



unit:mm

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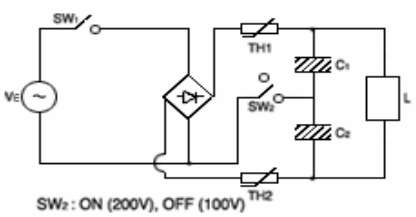
DSC 13PIE SERIES

▷ Specifications

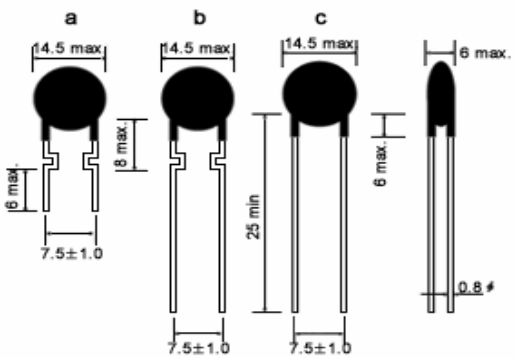
Part No.	Resistance at 25℃ (Ω)	Max Steady State Current (A)	Thermal Dissipation Constant (mW/℃)	Thermal Time Constant (Sec.)	Beta Constant (K,25/85℃, ±5%)	Max. Capacitance (μF)	
						120 Vac.	240 Vac.
2.5D - 13	2.5	5.5	14	45	2950	2450	610
4.7D - 13	4.7	5.0	14	70	3000	2450	610
5D - 13	5.0	5.0	15	70	3000	2450	610
8D - 13	8.0	4.0	16	65	3050	2450	610
10D - 13	10.0	3.8	17	60	2950	2450	610
16D - 13	16.0	3.0	19	55	3100	2450	610
18D - 13	18.0	2.8	18	60	3100	2450	610
22D - 13	22.0	2.5	17	60	3200	2450	610
50D - 13	50.0	2.0	15	75	3400	2000	500

▷ Typical application



SW2 : ON (200V), OFF (100V)

▷ Dimensions



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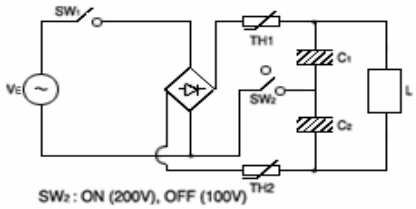
DSC 15PIE SERIES

▷ Specifications

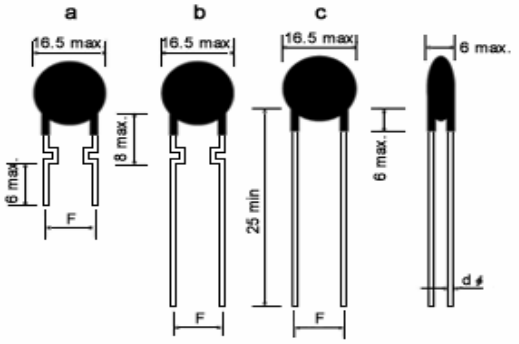
Part No.	Resistance at 25℃ (Ω)	Max Steady State Current (A)	Thermal Dissipation Constant (mW/℃)	Thermal Time Constant (Sec.)	Beta Constant (K,25/85℃, ±5%)	Max. Capacitance (μF)	
						120 Vac.	240 Vac.
2.5D - 15	2.5	7.0	21	63	2900	2450	610
3D - 15	3.0	6.7	21	70	2950	2450	610
5D - 15	5.0	6.0	20	75	3000	2450	610
8D - 15	8.0	5.5	20	78	3100	2450	610
10D - 15	10.0	5.0	19	80	3100	2450	610
12D - 15	12.0	4.8	18	82	3100	2450	610
15D - 15	15.0	4.5	17	86	3180	2450	610
16D - 15	16.0	4.0	17	87	3200	2450	610
20D - 15	20.0	3.0	15	90	3200	2450	610
25D - 15	25.0	2.8	15	90	3200	2450	610
30D - 15	30.0	2.5	16	95	3300	2000	500
47D - 15	47.0	2.2	16	97	3350	2000	500

▷ Typical application



SW2 : ON (200V), OFF (100V)

▷ Dimensions



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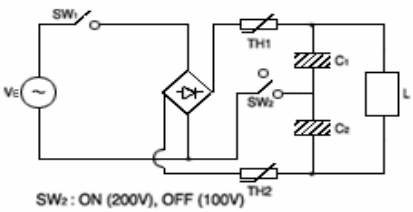
DSC 22PIE SERIES

▷ Specifications

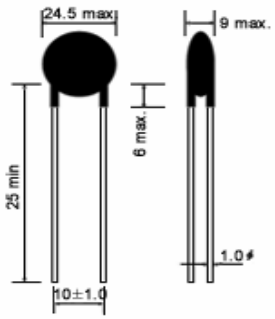
Part No.	Resistance at 25℃ (Ω)	Max Steady State Current (A)	Thermal Dissipation Constant (mW/℃)	Thermal Time Constant (Sec.)	Beta Constant (K,25/85℃,±5%)	Max. Capacitance (μF)	
						120 Vac.	240 Vac.
R50D - 22	0.5	13.0	23	100	2900	10000	3000
1D - 22	1.0	10.0	23	100	2950	10000	3000
2D - 22	2.0	10.0	24	100	3000	10000	3000
2.5D - 22	2.5	8.5	24	100	3000	10000	3000
3D - 22	3.0	8.0	24	100	3100	10000	3000
5D - 22	5.0	8.0	25	95	3150	10000	3000
7D - 22	7.0	6.5	24	90	3150	10000	3000
10D - 22	10.0	6.0	29	95	3150	10000	3000
20D - 22	20.0	4.8	29	105	3200	10000	3000
30D - 22	30.0	2.0	28	115	3230	10000	3000
40D - 22	40.0	1.5	27	95	3400	10000	3000
100D - 22	100.0	1.0	24	105	3600	10000	3000

▷ Typical application



SW2 : ON (200V), OFF (100V)

▷ Dimensions



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