

## Over-voltage Protection Thyristor

## SPXXX0LB

ROHS

### Description

P Series solid state protection thyristor protect telecommunications equipment such as modems, line cards, fax machines, and other CPE. P Series devices are used to enable equipment to meet various regulatory requirements including GR 1089, ITUK.20, K.21 and K.45, IEC 60950, UL 60950, and TIA-968 (formerly known as FCC Part 68).



Compared to surge suppression using other technologies, P Series devices offer absolute surge protection regardless of the surge current available and the rate of applied voltage ( $dv/dt$ ).

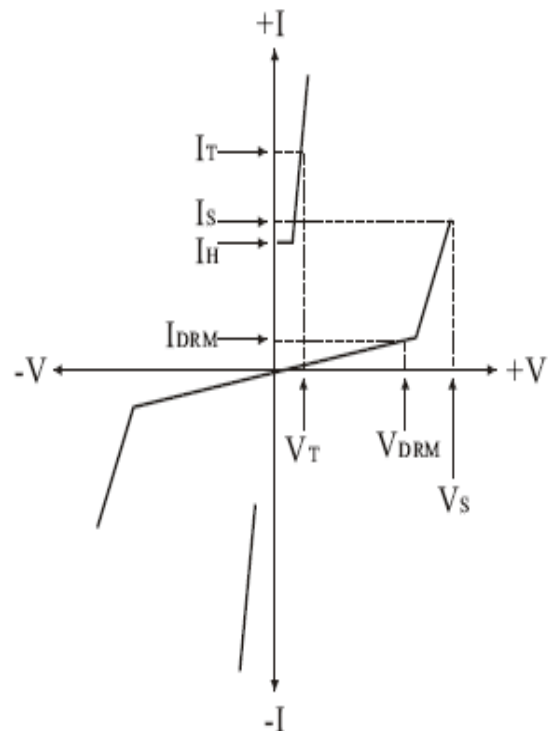
P Series devices:

- Cannot be damaged by voltage
- Eliminate hysteresis and heat dissipation typically found with clamping devices
- Eliminate voltage overshoot caused by fast-rising transients
- Are non-degenerative
- Will not fatigue
- Have low capacitance, making them ideal for high-speed transmission equipment

TIA-968 (formerly known as FCC Part 68).

### Electrical Parameters

Parameter	Definition
$C_0$	<b>Off-state Capacitance</b> — typical capacitance measured in off state
$di/dt$	<b>Rate of Rise of Current</b> — maximum rated value of the acceptable rate of rise in current over time
$I_S$	<b>Switching Current</b> — maximum current required to switch to on state
$I_{DRM}$	<b>Leakage Current</b> — maximum peak off-state current measured at $V_{DRM}$
$I_H$	<b>Holding Current</b> — minimum current required to maintain on state
$I_{PP}$	<b>Peak Pulse Current</b> — maximum rated peak impulse current
$I_T$	<b>On-state Current</b> — maximum rated continuous on-state current
$I_{TSM}$	<b>Peak One-cycle Surge Current</b> — maximum rated one-cycle AC current
$V_S$	<b>Switching Voltage</b> — maximum voltage prior to switching to on state
$V_{DRM}$	<b>Peak Off-state Voltage</b> — maximum voltage that can be applied while maintaining off state
$V_F$	<b>On-state Forward Voltage</b> — maximum forward voltage measured at rated on-state current
$V_T$	<b>On-state Voltage</b> — maximum voltage measured at rated on-state current



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**Electrical Characteristics**

Part Number*	V <sub>DRM</sub> Volts	V <sub>S</sub> Volts	V <sub>T</sub> Volts	I <sub>DRM</sub> μ Amps	I <sub>S</sub> mAmps	I <sub>T</sub> Amps	I <sub>H</sub> mAmps	C <sub>O</sub> pF
SP0080LA	6	25	4	5	800	2.2	50	60
SP0300LA	25	40	4	5	800	2.2	50	65
SP0640LA	58	77	4	5	800	2.2	150	45
SP0720LA	65	88	4	5	800	2.2	150	45
SP0900LA	75	98	4	5	800	2.2	150	40
SP1100LA	90	130	4	5	800	2.2	150	40
SP1300LA	120	160	4	5	800	2.2	150	40
SP1500LA	140	180	4	5	800	2.2	150	35
SP1800LA	170	220	4	5	800	2.2	150	65
SP2000LA	180	220	4	5	800	2.2	150	60
SP2300LA	190	260	4	5	800	2.2	150	60
SP2600LA	220	300	4	5	800	2.2	150	45
SP3100LA	275	350	4	5	800	2.2	150	45
SP3500LA	320	400	4	5	800	2.2	150	40
SP4000LA	360	460	4	5	800	2.2	150	40
SP4500LA	400	540	4	5	800	2.2	150	40
SP5000LA	440	600	4	5	800	2.2	150	40

\* For surge ratings, see table below.


Notes:

- All measurements are made at an ambient temperature of 25°C. I<sub>PP</sub> applies to -40°C through +85°C temperature range.
- Off-state capacitance (C<sub>O</sub>) is measured at 1 MHz with a 2 V bias and is typical value.

**Surge Ratings**

Series	I <sub>PP</sub> 2x10 μ s Amps	I <sub>PP</sub> 8x20 μ s Amps	I <sub>PP</sub> 10x160 μ s Amps	I <sub>PP</sub> 10x560 μ s Amps	I <sub>PP</sub> 10x1000 μ s Amps	I <sub>TSM</sub> 60 Hz Amps	di/dt Amps/μ s
B	250	250	150	100	80	30	500

**Thermal Considerations**

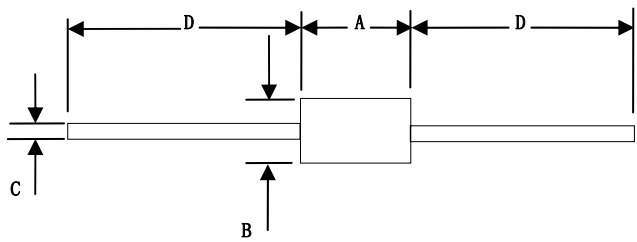
Package	D0-15	Symbol	Parameter	Value	Unit
		T <sub>J</sub>	Operating Junction Temperature	-40 to +150	°C
		T <sub>S</sub>	Storage Temperature Range	-40 to +150	°C
		R <sub>θJA</sub>	Junction to Ambient on printed circuit	90	°C/W

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Dimensions



Dimension	Inches		Millimeters		NOTE
	MIN	MAX	MIN	MAX	
A	0.230	0.300	5.80	7.60	
B	0.104	0.140	2.60	3.60	$\phi$
C	0.026	0.034	0.70	0.90	$\phi$
D	1.000		25.40		

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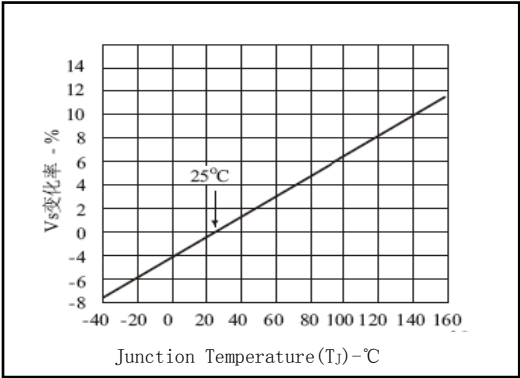
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Summary of Packing Options

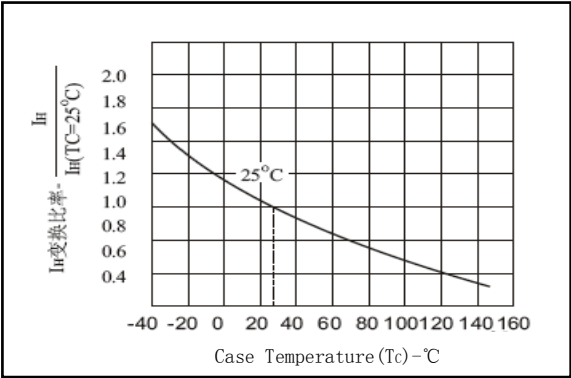
Package Type	Description	Packing Quantity	Industry Standard
D0-15	Tape and Reel Pack	4000 PCS	N/A



Thermal Derating Curves



Normalized VS Change versus Junction Temperature



Normalized DC Holding Current versus Case Temperature



E313687