

# Thyristor Surge Suppressors

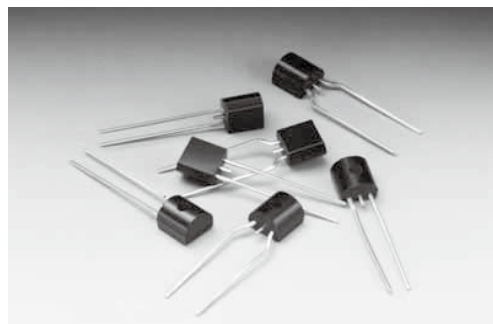
**PxxxxEX Series  
TO-92**

## Thyristor Surge Suppressors - PxxxxEX Series

### Description

TO-92 Series are designed to protect baseband equipment such as modems, line cards, CPE and DSL from damaging overvoltage transients.

The series provides a cost-effective through-hole solution that enables equipment to comply with global regulatory standards.



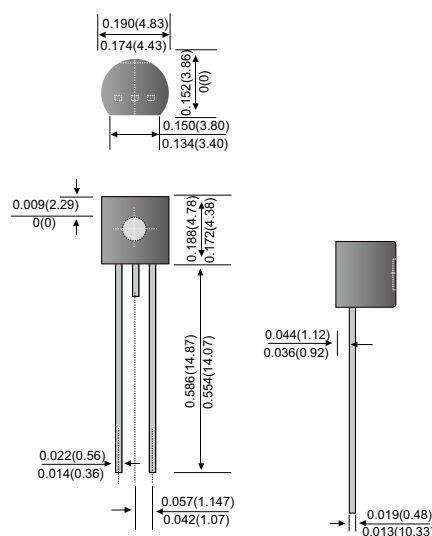
### Features

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:

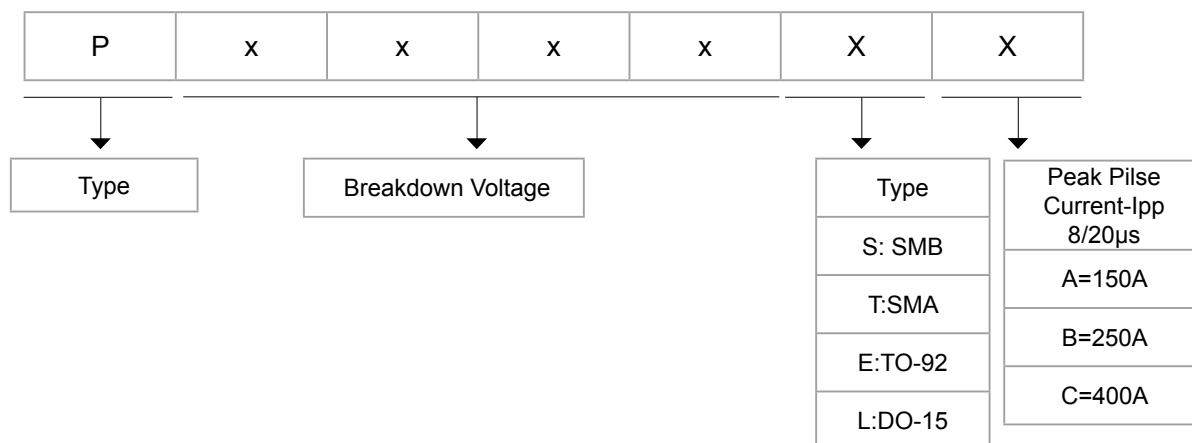
- Cannot be damaged by voltage
- Eliminate hysteresis and heat dissipation typically found with clamping devices
- Eliminate voltage overshoot caused by fast-rising transients
- Are non-degenerative
- Will not fatigue
- Have low capacitance, making them ideal for high-speed transmission equipment

### Dimensions

(mm)  
(inches)



### Part Number Code



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### Electrical Characteristics

Type Number	V <sub>DRM</sub>	I <sub>DRM</sub>	V <sub>S</sub>	I <sub>H</sub>	I <sub>S</sub>	I <sub>T</sub>	V <sub>T</sub>	C <sub>J</sub>	
	V	μA	V	MA	MA	A	V	pF <sub>Min</sub>	pF <sub>Max</sub>
P0080EA	6	5	25	50	800	2.2	4	25	150
P0080EB	6	5	25	50	800	2.2	4	25	150
P0080EC	6	5	25	50	800	2.2	4	35	260
P0300EA	25	5	40	50	800	2.2	4	15	140
P0300EB	25	5	40	50	800	2.2	4	15	140
P0300EC	25	5	40	50	800	2.2	4	25	250
P0640EA	58	5	77	150	800	2.2	4	40	60
P0640EB	58	5	77	150	800	2.2	4	40	60
P0640EC	58	5	77	150	800	2.2	4	55	155
P0720EA	65	5	88	150	800	2.2	4	35	60
P0720EB	65	5	88	150	800	2.2	4	35	75
P0720EC	65	5	88	150	800	2.2	4	50	150
P0900EA	75	5	98	150	800	2.2	4	35	55
P0900EB	75	5	98	150	800	2.2	4	35	70
P0900EC	75	5	98	150	800	2.2	4	45	140
P1100EA	90	5	130	150	800	2.2	4	30	50
P1100EB	90	5	130	150	800	2.2	4	30	70
P1100EC	90	5	130	150	800	2.2	4	45	115
P1300EA	120	5	160	150	800	2.2	4	25	45
P1300EB	120	5	160	150	800	2.2	4	25	60
P1300EC	120	5	160	150	800	2.2	4	40	105
P1500EA	140	5	180	150	800	2.2	4	25	40
P1500EB	140	5	180	150	800	2.2	4	25	55
P1500EC	140	5	180	150	800	2.2	4	35	95
P1800EA	170	5	220	150	800	2.2	4	25	35
P1800EB	170	5	220	150	800	2.2	4	25	50
P1800EC	170	5	220	150	800	2.2	4	35	90
P2300EA	190	5	260	150	800	2.2	4	25	35
P2300EB	190	5	260	150	800	2.2	4	25	50
P2300EC	190	5	260	150	800	2.2	4	30	80
P2600EA	220	5	300	150	800	2.2	4	20	35
P2600EB	220	5	300	150	800	2.2	4	20	45
P2600EC	220	5	300	150	800	2.2	4	30	80
P3100EA	275	5	350	150	800	2.2	4	20	35
P3100EB	275	5	350	150	800	2.2	4	20	45
P3100EC	275	5	350	150	800	2.2	4	30	70
P3500EA	320	5	400	150	800	2.2	4	20	35
P3500EB	320	5	400	150	800	2.2	4	20	40
P3500EC	320	5	400	150	800	2.2	4	25	65

Notes:


- Is: Switching Current – maximum current required to switch to on state
- IDRM: Leakage Current – maximum peak off-state current measured at VDRM
- IH: Holding Current – minimum current required to maintain on state
- IPP: Peak Pulse Current – maximum rated peak impulse current
- IT: On-state Current – maximum rated continuous on-state current
- VDRM: Peak Off-state Voltage – maximum voltage that can be applied while maintaining off state
- VT: On-state Voltage – maximum voltage measured at rated on-state current
- VS: Switching Voltage – maximum voltage prior to switching to on state

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### Surge Ratings

Series	Peak Pulse Current-Ipp(A)				
	2/10µs	8/20µs	10/160µs	10/560µs	10/1000µs
A	200	150	100	60	50
B	250	250	150	100	80
C	500	400	200	120	100

### Thermal Considerations

Package	Symbol	Parameter	Value	Unit
 TO-92	TJ	Operating Junction Temperature	-40 to +150	°C
	TS	Storage Temperature Range	-40 to +150	°C
	RθJA	Junction to Ambient on printed circuit	90	°C/W

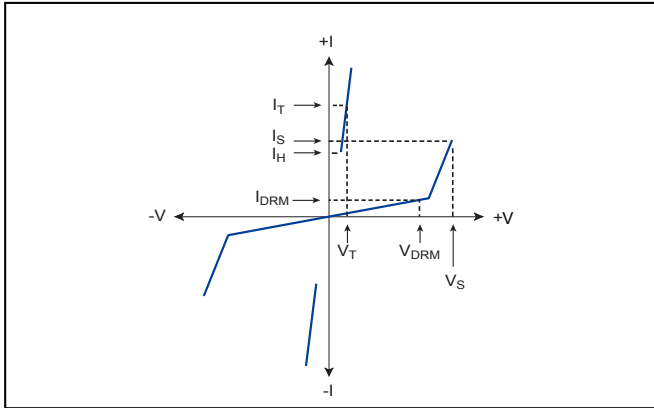
### Thermal Considerations

Part Number	Description	Quantity
PXXXXEX	TO-92	1000 pcs

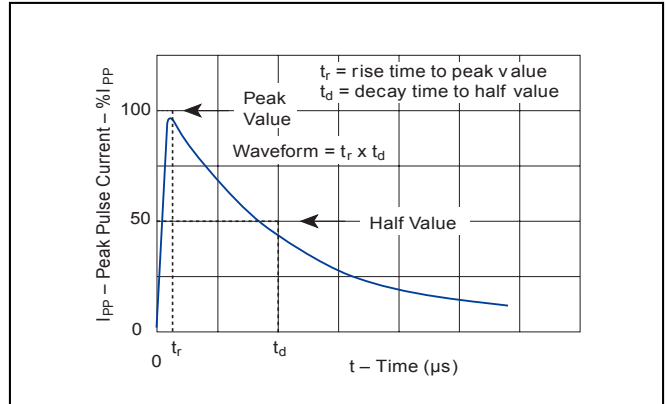
# Thyristor Surge Suppressors - PxxxxEX Series

## Characteristics Curves

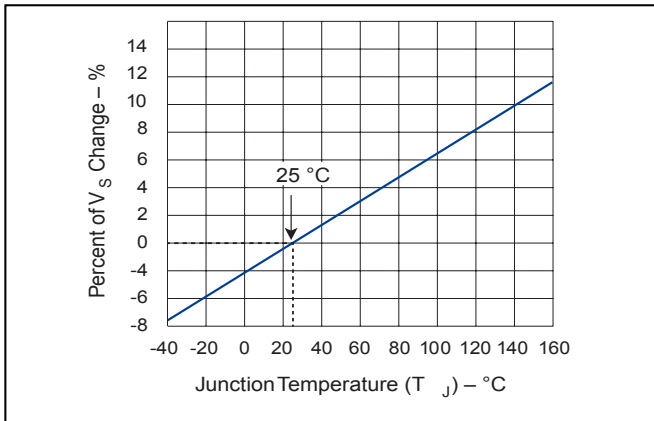
V-I Characteristics



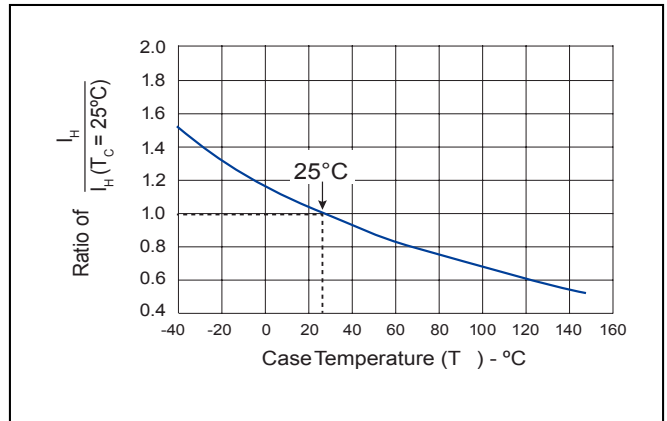
$t_r \times t_d$  Pulse Waveform



Normalized  $V_S$  Change vs. Junction Temperature

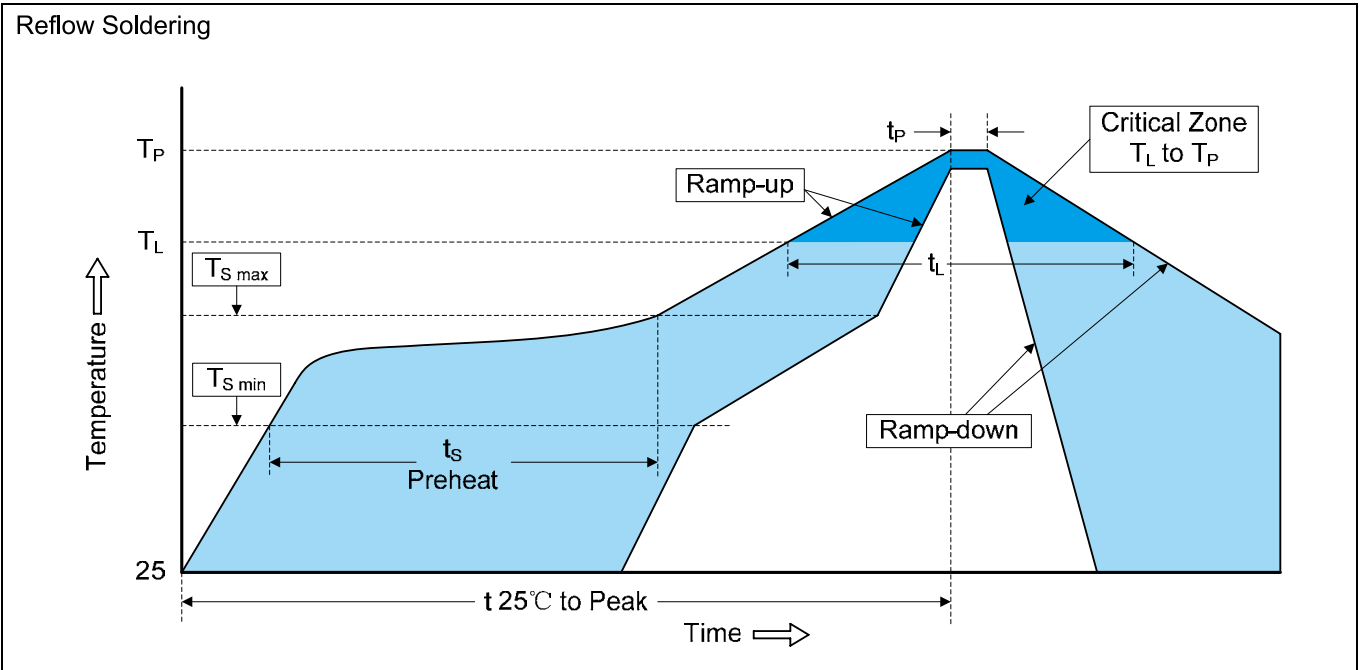


Normalized DC Holding Current vs. Case Temperature



# Thyristor Surge Suppressors - PxxxxEX Series

## Recommended Soldering Conditions



### Recommended Conditions

Profile Feature	Pb-Free Assembly
Average ramp-up rate ( $T_L$ to $T_P$ )	3°C/second max.
Preheat	
-Temperature Min ( $T_{S\ min}$ )	150°C
-Temperature Max ( $T_{S\ max}$ )	200°C
-Time (min to max) ( $t_s$ )	60-180 seconds
$T_{S\ max}$ to $T_L$	
-Ramp-up Rate	3°C/second max.
Time maintained above:	
-Temperature ( $T_L$ )	217°C
-Time ( $t_L$ )	60-150 seconds
Peak Temperature ( $T_P$ )	260°C
Time within 5°C of actual Peak Temperature ( $t_p$ )	20-40 seconds
Ramp-down Rate	6°C/second max.
Time 25°C to Peak Temperature	8 minutes max.

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