

## Thyristor Surge Suppressor (TSS) – Low Capacitance S Series

### Description

DO-214AA PXXXX S-XC series solid state protection thyristor is applied to telecommunication equipments and such as modem, line cards, fax machines and other CPE. PXXXX S series devices are used to enable equipment to meet various regulatory requirements including GR 1089, ITU K.20, K.21 and K.45, IEC 60950, UL 60950 and TIA-968 (formerly known as FCC Part 68)

### Electrical Parameters

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

P series devices:

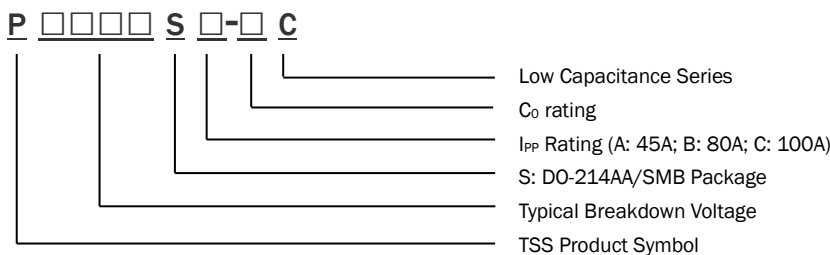
- Cannot be damaged by voltage
- Eliminate hysteresis and heat dissipation typically found with clamping devices.
- Eliminate voltage overshoot caused by fast-rising transients
- Are non-degenerative.
- Will not fatigue
- Have low capacitance, making them ideal for high-speed transmission equipment.



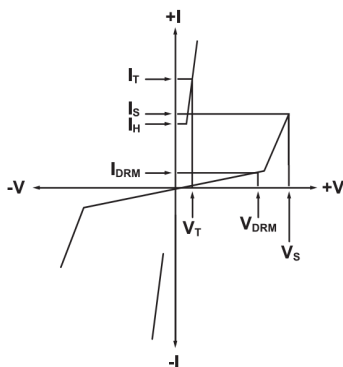
### Thermal Considerations

- $T_J$  – Operating Junction Temperature Range: -40~150°C
- $T_S$  – Storage Temperature Range: -40~150°C
- $R_{\theta JA}$  – Thermal Resistance: Junction to Ambient: 90°C/W

### Part Number Code



### I-V Curve Characteristics



$C_0$  Off-state Capacitance — typical capacitance measured in off state.

$I_S$  Switching Current — maximum current required to switch to on state

$I_{DRM}$  Leakage Current — maximum peak off-state current measured at  $V_{DRM}$

$I_H$  Holding Current — minimum current required to maintain on state

$I_{PP}$  Peak Pulse Current — maximum rated peak impulse current

$I_T$  On-state Current — maximum rated continuous on-state current

$I_{TSM}$  Peak One-cycle Surge Current — maximum rated one-cycle AC current

$V_S$  Switching Voltage — maximum voltage prior to switching to on state during 100 V/ $\mu$ s surge

$V_{DRM}$  Peak Off-state Voltage — maximum voltage that can be applied while maintaining off state

$V_T$  On-state Voltage — maximum voltage measured at rated on-state current

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### Electrical Characteristics

Part Number	Marking	V <sub>DRM</sub> (V)	V <sub>S</sub> (V)	I <sub>DRM</sub> (μA)	I <sub>S</sub> (mA)	I <sub>H</sub> (mA)	I <sub>T</sub> (A)	V <sub>T</sub> (V)	C <sub>0</sub> (pF)
		(Min.)	(Max.)	(Max.)	(Max.)	(Typ.)	(Max.)	(Max.)	(Typ.)
P0080SA-LC	008A	6	25	5	800	50	2.2	4	10
P0080SB-LC	008B	6	25	5	800	50	2.2	4	10
P0080SC-LC	008C	6	25	5	800	50	2.2	4	15
P0080SA-MC	008A	6	25	5	800	50	2.2	4	20
P0080SB-MC	008B	6	25	5	800	50	2.2	4	20
P0080SC-MC	008C	6	25	5	800	50	2.2	4	35

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>0</sub>) is measured at 1MHz with a 2V bias and is typical value.

### Surge Ratings

Series	I <sub>PP</sub> (A)						I <sub>TSM</sub> 60 Hz (A)	di/dt (A/μs)
	2/10 <sup>1</sup>	1.2/50 <sup>1</sup>	10/160 <sup>1</sup>	10/560 <sup>1</sup>	10/700 <sup>1</sup>	10/1000 <sup>1</sup>		
	2/10 <sup>2</sup>	8/20 <sup>2</sup>	10/160 <sup>2</sup>	10/560 <sup>2</sup>	5/320 <sup>2</sup>	10/1000 <sup>2</sup>		
A	(Min.) 150	(Min.) 150	(Min.) 90	(Min.) 50	(Min.) 75	(Min.) 45	(Min.) 20	(Typ.) 500
B	(Min.) 250	(Min.) 250	(Min.) 150	(Min.) 100	(Min.) 100	(Min.) 80	(Min.) 30	(Typ.) 500
C	(Min.) 500	(Min.) 400	(Min.) 200	(Min.) 150	(Min.) 150	(Min.) 100	(Min.) 50	(Typ.) 500

Notes:

- 1. Voltage waveform in μs.
- 2. Current waveform in μs.

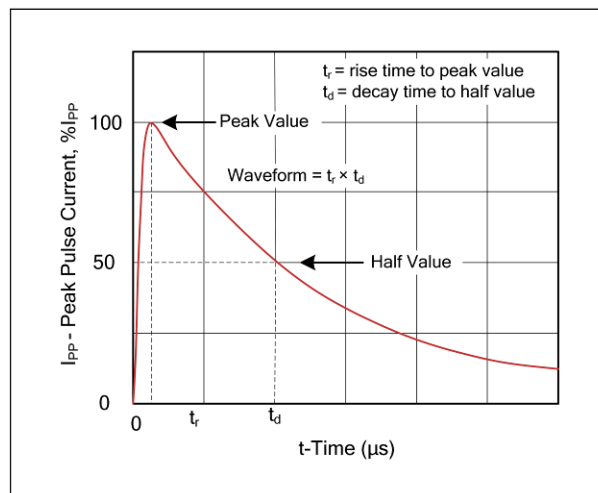
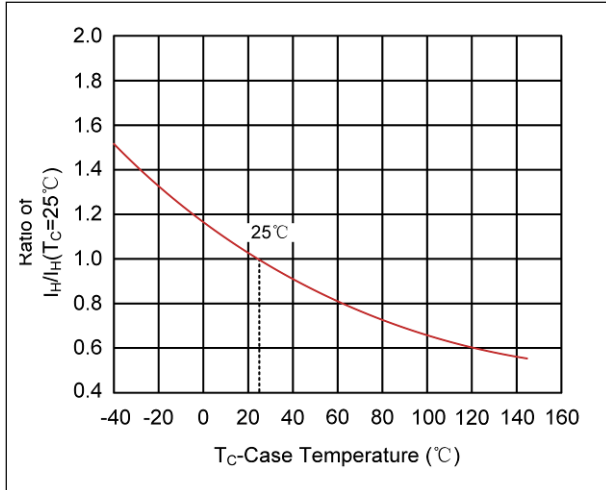


Fig 1.  $t_r \times t_d$  Pulse Waveform

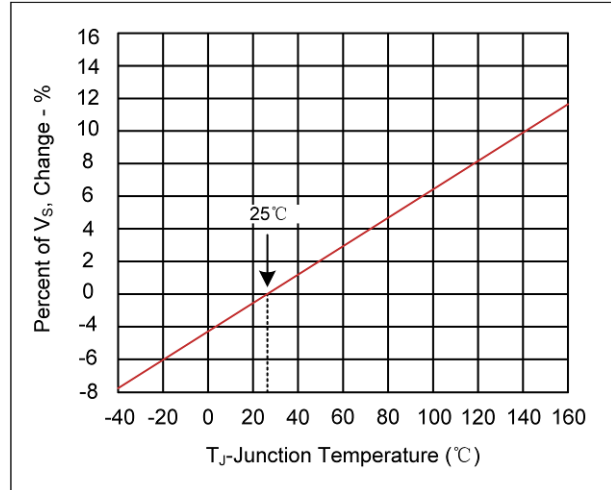
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### Ratings and Characteristic Curves

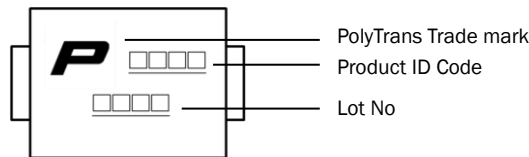
Normalized DC Holding Current vs. Case Temp



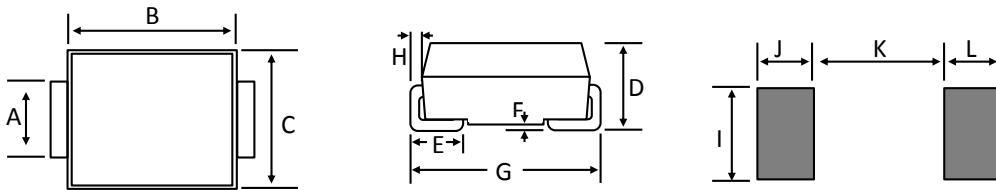
Normalized V<sub>s</sub> Change vs. Junction Temperature



### Marking Definitions



### Physical Dimensions

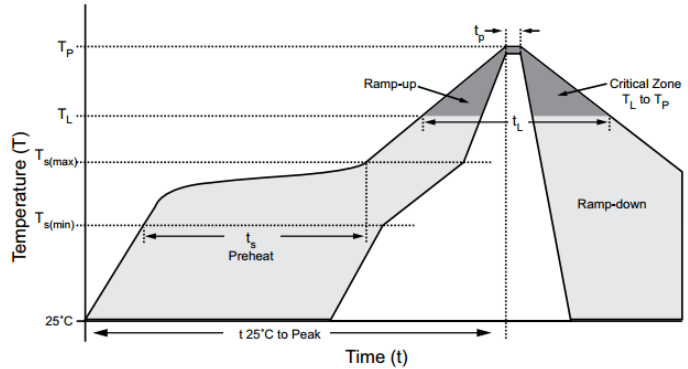


Dimension	Millimeters		Inches	
	Min	Max	Min	Max
A	1.90	2.20	0.077	0.086
B	4.06	4.85	0.160	0.191
C	3.30	3.94	0.130	0.155
D	1.95	2.44	0.084	0.096
E	0.76	1.52	0.030	0.060
F	-	0.20	-	0.008
G	5.21	5.59	0.205	0.220
H	0.15	0.31	0.006	0.012
I	2.26	-	0.089	-
J	2.16	-	0.085	-
K	-	2.74	-	0.107
L	2.16	-	0.085	-

## Thyristor Surge Suppressor (TSS) – Low Capacitance S Series

### Lead Free Reflow Soldering Recommendations

Preheat	
- Temperature Min (T <sub>smin</sub> )	150°C
- Temperature Max (T <sub>smax</sub> )	200°C
- Time (T <sub>smin</sub> to T <sub>smax</sub> )	60-180 seconds
- Average Ramp-Up Rate	1~3°C/second
Peak Temperature	260°C max.
Time within 5°C of actual Peak Temperature (t <sub>p</sub> )	40 seconds max.
Ramp-Down Rate	6 °C /second max.



**Note:** If the wave soldering temperatures exceed the recommended profile, devices may not meet the performance requirements.

### Packaging

Part Number	Component Package	Quantity	Packaging Specification	Standard
PXXXX S - XC Series	DO-214AA	2500	Tape & Reel – 12mm tape/13" reel	EIA STD RS-481

### Tape and Reel Specifications

