

## Thyristor Surge Suppressor (TSS) – T Series

### Description

DO-214AC PXXXX TA series solid state protection thyristor protect telecommunication equipments such as modem, line cards, fax machines and other CPE. PXXXX TA 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 TA 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.

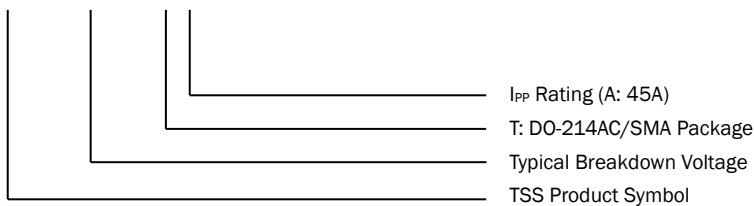


### Thermal Considerations

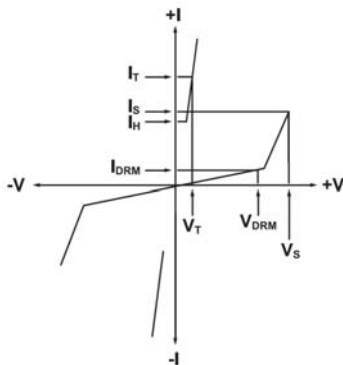
- $T_J$  – Operating Junction Temperature Range: -40~150°C
- $T_S$  – Storage Temperature Range: -40~150°C
- $R_{\theta JA}$  – Thermal Resistance: Junction to Ambient: 90°C/W

### Part Number Code

**P** □ □ □ □ **T A**



### I-V Curve Characteristics



**$C_o$  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> ( $\mu$ A)	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.)	(Min.)	(Max.)	(Max.)	(Typ.)
P0080TA	008A	6	25	5	800	50	2.2	4	45
P0300TA	03A	25	40	5	800	50	2.2	4	45
P0640TA	06A	58	77	5	800	150	2.2	4	35
P0720TA	07A	65	88	5	800	150	2.2	4	50
P0900TA	09A	75	98	5	800	150	2.2	4	40
P1100TA	11A	90	130	5	800	150	2.2	4	35
P1300TA	13A	120	160	5	800	150	2.2	4	35
P1500TA	15A	140	180	5	800	150	2.2	4	40
P1800TA	18A	170	220	5	800	150	2.2	4	40
P2000TA	20A	180	240	5	800	150	2.2	4	40
P2300TA	23A	190	260	5	800	150	2.2	4	45
P2600TA	26A	220	300	5	800	150	2.2	4	35
P3100TA	31A	275	350	5	800	150	2.2	4	35
P3500TA	35A	320	400	5	800	150	2.2	4	30
P4000TA	40A	360	460	5	800	150	2.2	4	20
P4500TA	45A	400	540	5	800	150	2.2	4	20
P5000TA	50A	440	600	5	800	150	2.2	4	20

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.

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### 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>		
	(Min.)	(Min.)	(Min.)	(Min.)	(Min.)	(Min.)	(Min.)	(Typ.)
A	150	150	90	50	75	45	20	500
B	250	250	150	100	100	80	30	500
C	500	400	200	150	200	100	50	500

Notes:

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

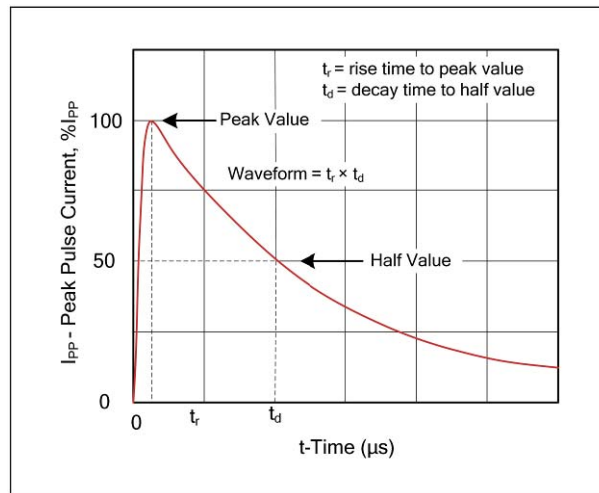
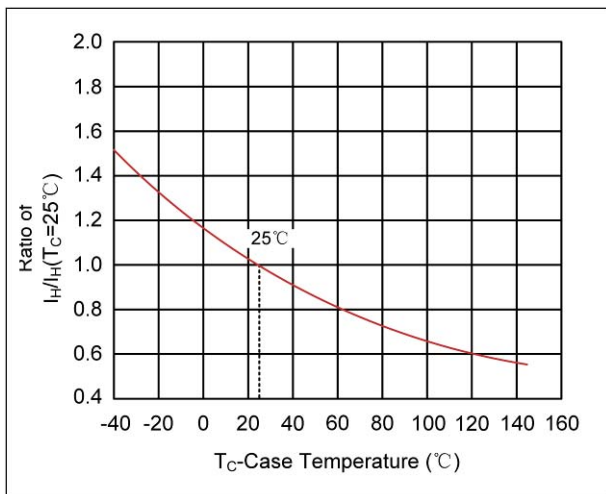


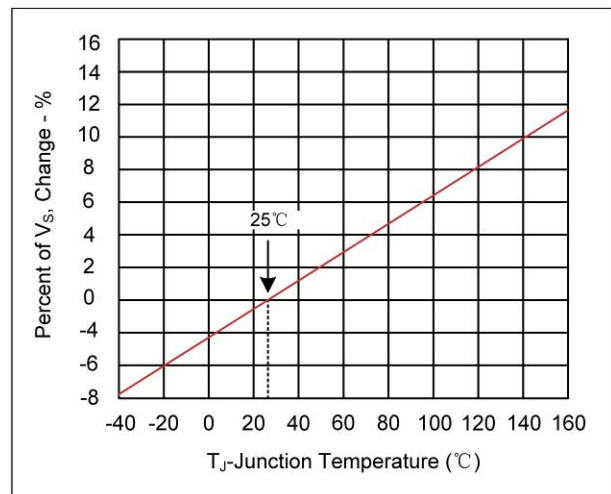
Fig 1. t<sub>r</sub> \* t<sub>d</sub> Pulse Waveform

### Ratings and Characteristic Curves

#### Normalized DC Holding Current vs. Case Temp

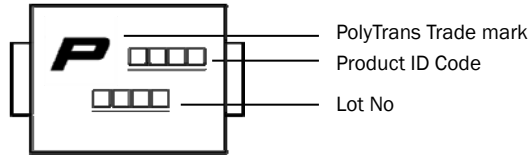


#### Normalized V<sub>s</sub> Change vs. Junction Temperature

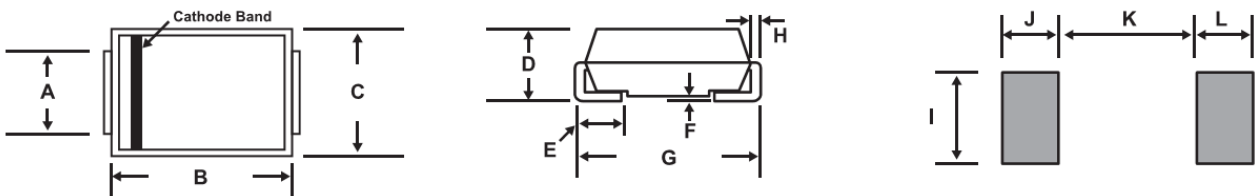


## Thyristor Surge Suppressor (TSS) – T Series

### Marking Definitions



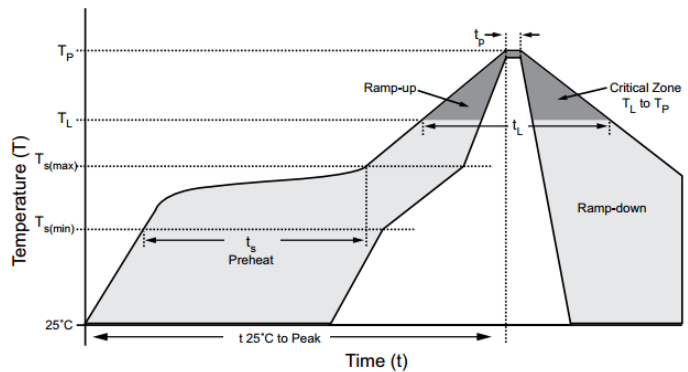
### Physical Dimensions



Dimension	Millimeters		Inches	
	Min	Max	Min	Max
A	1.25	1.65	0.049	0.065
B	3.99	4.60	0.157	0.177
C	2.50	2.90	0.100	0.110
D	1.98	2.29	0.078	0.090
E	0.78	1.52	0.030	0.060
F	-	0.203	-	0.008
G	4.93	5.28	0.194	0.208
H	0.152	0.305	0.006	0.012
I	1.80	-	0.070	-
J	2.10	-	0.082	-
K	-	2.30	-	0.090
L	2.10	-	0.082	-

### Lead Free Wave Soldering Recommendations

<b>Preheat</b>	
- 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
<b>Peak Temperature</b>	260°C max.
<b>Time within 5°C of actual Peak Temperature (t<sub>p</sub>)</b>	40 seconds max.
<b>Ramp-Down Rate</b>	6 °C /second max.



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

## Thyristor Surge Suppressor (TSS) – T Series

### Packaging

Part Number	Component Package	Quantity	Packaging Specification	Standard
PXXXX T Series	DO-214AC	5000	Tape & Reel – 12mm tape/13" reel	EIA STD RS-481

### Tape and Reel Specifications

