Thyristor Surge Suppressor (TSS) – S Series

Description

DO-214AA PXXXX S series solid state protection thyristor protect telecommunication equipments 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

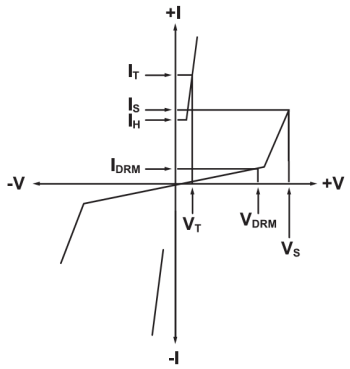
- T_J – Operating Junction Temperature Range: -40~150°C
- T_S – Storage Temperature Range: -40~150°C
- $R_{\theta JA}$ – Thermal Resistance: Junction to Ambient: 90°C/W

Part Number Code

P □□□□ S □

- I_{PP} Rating (A: 45A; B: 80A; C: 100A)
- S: DO-214AA/SMB Package
- Typical Breakdown Voltage
- TSS Product Symbol

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/μs 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_{DRM} (V)	V_S (V)	I_{DRM} (μA)	I_S (mA)	I_H (mA)	I_T (A)	V_T (V)	C_O (pF)
		(Min.)	(Max.)	(Max.)	(Max.)	(Min.)	(Max.)	(Max.)	(Typ.)
P0080SA	008A	6	25	5	800	50	2.2	4	45
P0300SA	03A	25	40	5	800	50	2.2	4	45
P0640SA	06A	58	77	5	800	150	2.2	4	35
P0720SA	07A	65	88	5	800	150	2.2	4	50
P0900SA	09A	75	98	5	800	150	2.2	4	40
P1100SA	11A	90	130	5	800	150	2.2	4	35
P1300SA	13A	120	160	5	800	150	2.2	4	35
P1500SA	15A	140	180	5	800	150	2.2	4	40
P1800SA	18A	170	220	5	800	150	2.2	4	40
P2000SA	20A	180	240	5	800	150	2.2	4	40
P2300SA	23A	190	260	5	800	150	2.2	4	45
P2600SA	26A	220	300	5	800	150	2.2	4	35
P3100SA	31A	275	350	5	800	150	2.2	4	35
P3500SA	35A	320	400	5	800	150	2.2	4	30
P4000SA	40A	360	460	5	800	150	2.2	4	20
P4500SA	45A	400	540	5	800	150	2.2	4	20
P5000SA	50A	440	600	5	800	150	2.2	4	20
P0080SB	008B	6	25	5	800	50	2.2	4	60
P0300SB	03B	25	40	5	800	50	2.2	4	65
P0640SB	06B	58	77	5	800	150	2.2	4	45
P0720SB	07B	65	88	5	800	150	2.2	4	45
P0900SB	09B	75	98	5	800	150	2.2	4	40
P1100SB	11B	90	130	5	800	150	2.2	4	40
P1300SB	13B	120	160	5	800	150	2.2	4	40
P1500SB	15B	140	180	5	800	150	2.2	4	35
P1800SB	18B	170	220	5	800	150	2.2	4	65
P2000SB	20B	180	240	5	800	150	2.2	4	60
P2300SB	23B	190	260	5	800	150	2.2	4	60
P2600SB	26B	220	300	5	800	150	2.2	4	45
P3100SB	31B	275	350	5	800	150	2.2	4	45
P3500SB	35B	320	400	5	800	150	2.2	4	40
P4000SB	40B	360	460	5	800	150	2.2	4	40
P4500SB	45B	400	540	5	800	150	2.2	4	40
P5000SB	50B	440	600	5	800	150	2.2	4	40
P0080SC	008C	6	25	5	800	50	2.2	4	75
P0300SC	03C	25	40	5	800	50	2.2	4	75
P0640SC	06C	58	77	5	800	150	2.2	4	55
P0720SC	07C	65	88	5	800	150	2.2	4	60
P0900SC	09C	75	98	5	800	150	2.2	4	65
P1100SC	11C	90	130	5	800	150	2.2	4	55
P1300SC	13C	120	160	5	800	150	2.2	4	90
P1500SC	15C	140	180	5	800	150	2.2	4	50
P1800SC	18C	170	220	5	800	150	2.2	4	55
P2000SC	20C	180	240	5	800	150	2.2	4	85
P2300SC	23C	190	260	5	800	150	2.2	4	65
P2600SC	26C	220	300	5	800	150	2.2	4	65

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Part Number	Marking	V_{DRM} (V)	V_S (V)	I_{DRM} (μA)	I_S (mA)	I_H (mA)	I_T (A)	V_T (V)	C_0 (pF)
		(Min.)	(Max.)	(Max.)	(Max.)	(Min.)	(Max.)	(Max.)	(Typ.)
P3100SC	31C	275	350	5	800	150	2.2	4	55
P3500SC	35C	320	400	5	800	150	2.2	4	50
P4000SC	40C	360	460	5	800	150	2.2	4	45
P4200SC	42C	400	500	5	800	150	2.2	4	45
P4500SC	45C	400	540	5	800	150	2.2	4	45
P5000SC	50C	440	600	5	800	150	2.2	4	45

Notes:

- All measurements are made at an ambient temperature of 25℃. I_{PP} applies to -40℃ through +85℃ temperature range.
- Off-state capacitance (C_0) is measured at 1MHz with a 2V bias and is typical value.

Surge Ratings

Series	I_{PP} (A)						I_{TSM} 60 Hz (A)	di/dt (A/μs)
	2/10[1] 2/10[2]	1.2/50[1] 8/20[2]	10/160[1] 10/160[2]	10/560[1] 10/560[2]	10/700[1] 5/320[2]	10/1000[1] 10/1000[2]		
	(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.

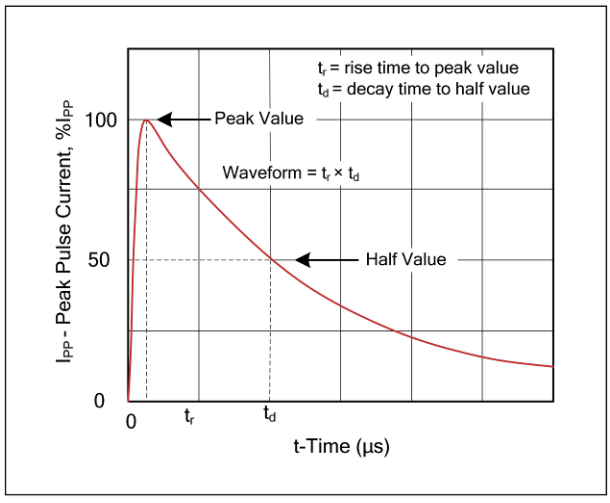

Fig 1. t_r * t_d Pulse Waveform

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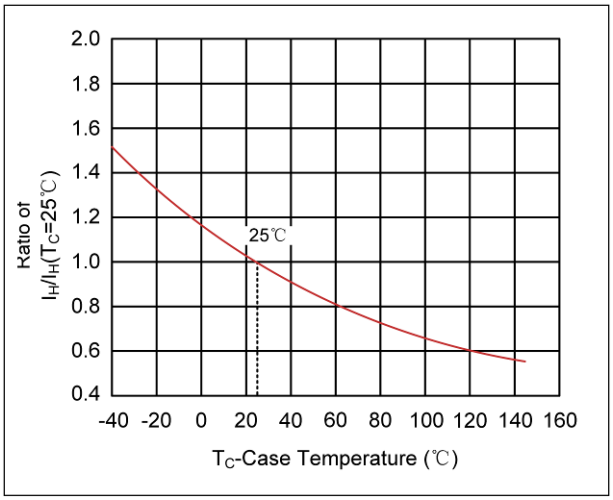
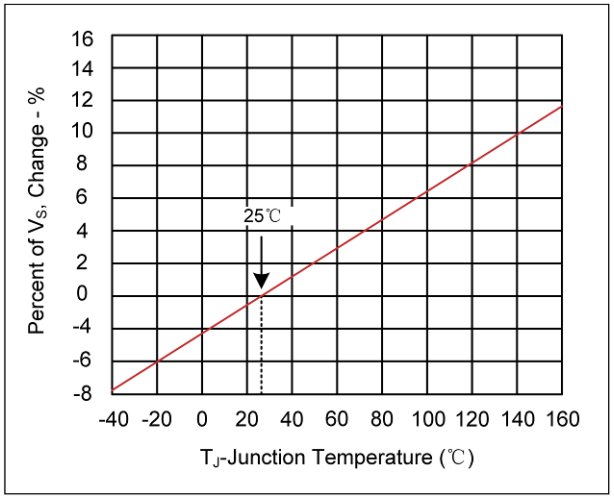
Ratings and Characteristic Curves

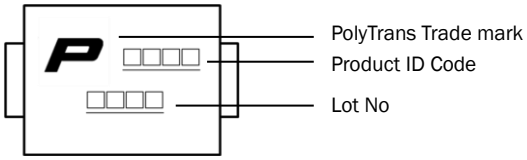
Normalized DC Holding Current vs. Case Temp



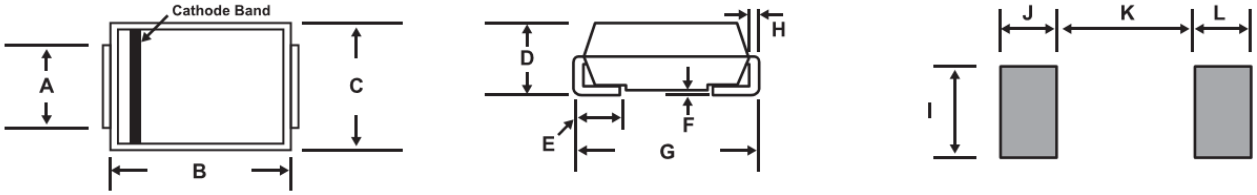
Normalized V_S Change vs. Junction Temperature



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	-

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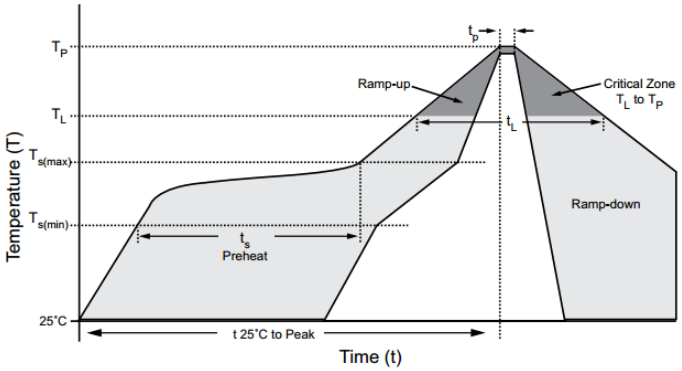
Lead Free Wave Soldering Recommendations

Preheat - Temperature Min (Tsmin) - Temperature Max (Tsmax) - Time (Tsmin to Tsmax) - Average Ramp-Up Rate	 150°C 200°C 60-180 seconds 1~3°C/second
Peak Temperature	260°C max.
Time within 5°C of actual Peak Temperature (t_p)	40 seconds max.
Ramp-Down Rate	6 °C /second max.

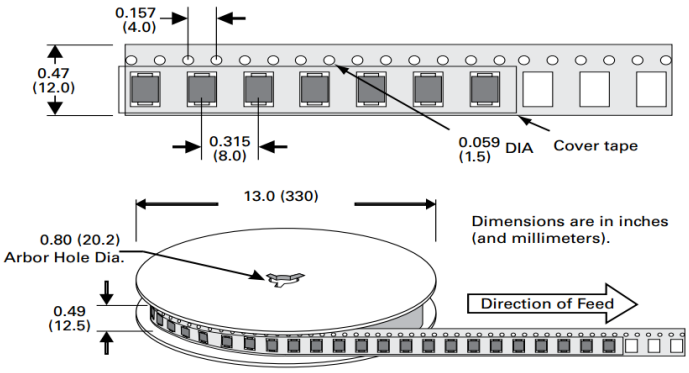


Note: If the wave soldering temperatures exceed the recommended profile, devices may not meet the performance requirements.

Packaging

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

Tape and Reel Specifications



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