Thyristor Surge Suppressors (TSS) Data Sheet

Description

DO-214AA Thyristor 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, ITU K.20, K.21 and K.45, IEC 60950, UL 60950, and TIA-968 (formerly known as FCC Part 68).

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
- Meets MSL level 1, per J-STD-020

Electrical Parameters

Parameter	Definition
V_{DRM}	**Peak Off-state Voltage –** maximum voltage that can be applied while maintaining off state
V_S	**Switching Voltage –** maximum voltage prior to switching to on state
V_T	**On-state Voltage –** maximum voltage measured at rated on-state current
I_{DRM}	**Leakage Current –** maximum peak off-state current measured at V_{DRM}
I_S	**Switching Current –** maximum current required to switch to on state
I_T	**On-state Current –** maximum rated continuous on-state current
I_H	**Holding Current –** typical current required to maintain on state
C_O	**Off-state Capacitance –** typical capacitance measured in off state
I_{PP}	**Peak Pulse Current –** maximum rated peak impulse current

Electrical Characteristics

Part Number	V_{DRM} (V)	V_S (V)	V_T (V)	I_{DRM} (μA)	I_S (mA)	I_T (A)	I_H (mA)	C_O (pF)	Marking
P0080SA	6	25	4	5	800	2.2	50	50	P008A
P0080SB	6	25	4	5	800	2.2	50	70	P008B
P0080SC	6	25	4	5	800	2.2	50	100	P008C
P0300SA	25	40	4	5	800	2.2	50	70	P03A
P0300SB	25	40	4	5	800	2.2	50	70	P03B
P0300SC	25	40	4	5	800	2.2	50	100	P03C
P0640SA	58	77	4	5	800	2.2	150	50	P06A
P0640SB	58	77	4	5	800	2.2	150	60	P06B
P0640SC	58	77	4	5	800	2.2	150	100	P06C
P0720SA	65	88	4	5	800	2.2	150	50	P07A
P0720SB	65	88	4	5	800	2.2	150	60	P07B
P0720SC	65	88	4	5	800	2.2	150	100	P07C
P0900SA	75	98	4	5	800	2.2	150	45	P09A
P0900SB	75	98	4	5	800	2.2	150	55	P09B
P0900SC	75	98	4	5	800	2.2	150	90	P09C
P1100SA	90	130	4	5	800	2.2	150	45	P11A
P1100SB	90	130	4	5	800	2.2	150	55	P11B
P1100SC	90	130	4	5	800	2.2	150	90	P11C
P1300SA	120	160	4	5	800	2.2	150	45	P13A
P1300SB	120	160	4	5	800	2.2	150	55	P13B
P1300SC	120	160	4	5	800	2.2	150	90	P13C
P1500SA	140	180	4	5	800	2.2	150	40	P15A
P1500SB	140	180	4	5	800	2.2	150	60	P15B
P1500SC	140	180	4	5	800	2.2	150	85	P15C
P1800SA	170	220	4	5	800	2.2	150	40	P18A
P1800SB	170	220	4	5	800	2.2	150	60	P18B
P1800SC	170	220	4	5	800	2.2	150	85	P18C
P2300SA	190	260	4	5	800	2.2	150	35	P23A

Part Number	V_{DRM} (V)	V_S (V)	V_T (V)	I_{DRM} (μA)	I_S (mA)	I_T (A)	I_H (mA)	C_O (pF)	Marking
P2300SB	190	260	4	5	800	2.2	150	55	P23B
P2300SC	190	260	4	5	800	2.2	150	80	P23C
P2600SA	220	300	4	5	800	2.2	150	35	P26A
P2600SB	220	300	4	5	800	2.2	150	50	P26B
P2600SC	220	300	4	5	800	2.2	150	80	P26C
P3100SA	275	350	4	5	800	2.2	150	30	P31A
P3100SB	275	350	4	5	800	2.2	150	45	P31B
P3100SC	275	350	4	5	800	2.2	150	65	P31C
P3500SA	320	400	4	5	800	2.2	150	30	P35A
P3500SB	320	400	4	5	800	2.2	150	40	P35B
P3500SC	320	400	4	5	800	2.2	150	65	P35C

Notes:

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

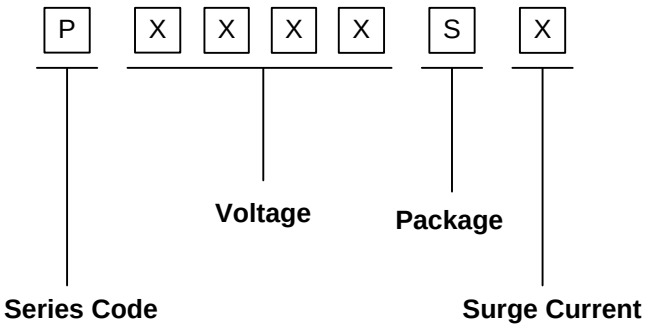
Surge Ratings

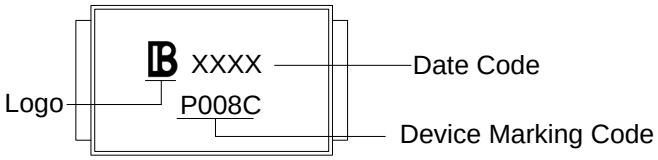
Series	I_{PP} 2×10μs (A)	I_{PP} 8×20μs (A)	I_{PP} 10×160μs (A)	I_{PP} 10×560μs (A)	I_{PP} 10×1000μs (A)	VPP 10×1000μs (V)	I_{TSM} 60Hz (A)	di/dt (A/μs)
A	150	150	90	50	45	2000	20	500
B	250	250	150	100	80	4000	30	500
C	500	400	200	150	100	6000	50	500

Thermal Considerations

Package DO-214AA/SMB	Symbol	Parameter	Value	Unit
	T_J	Operating Junction Temperature	-40 to +125	℃
	T_S	Storage Temperature Range	-40 to +150	℃
	$R_{\theta JA}$	Junction to Ambient on printed circuit	90	℃/W

Part Number Code and Marking





Characteristics Curves

Figure 1. V-I Characteristics

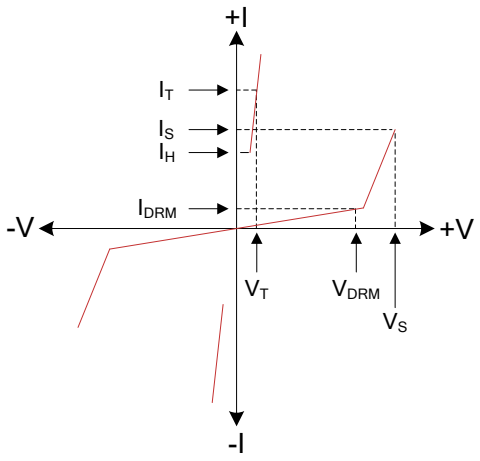


Figure 2. tr × td Pulse Wave-form

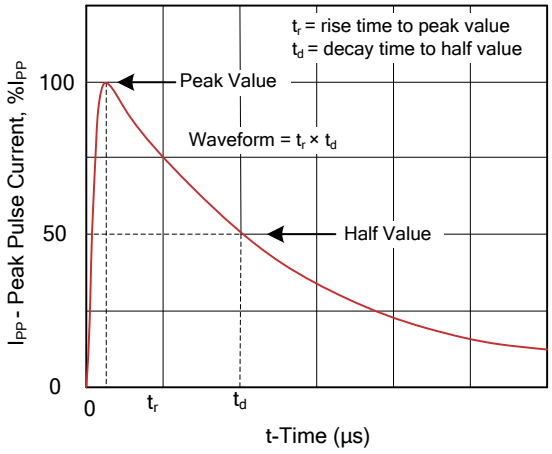


Figure 3. Normalized Vs Change versus Junction Temperature

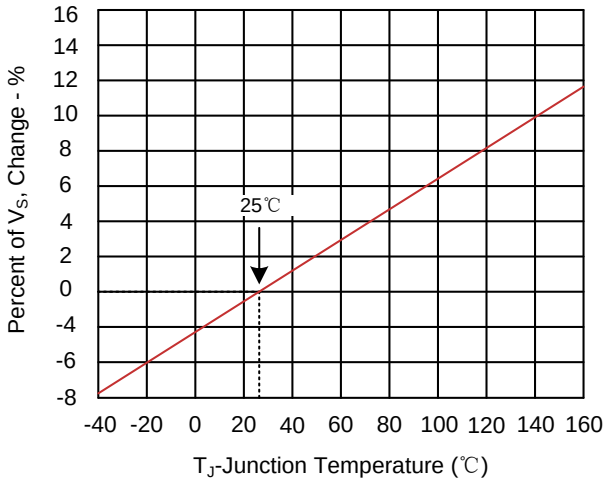
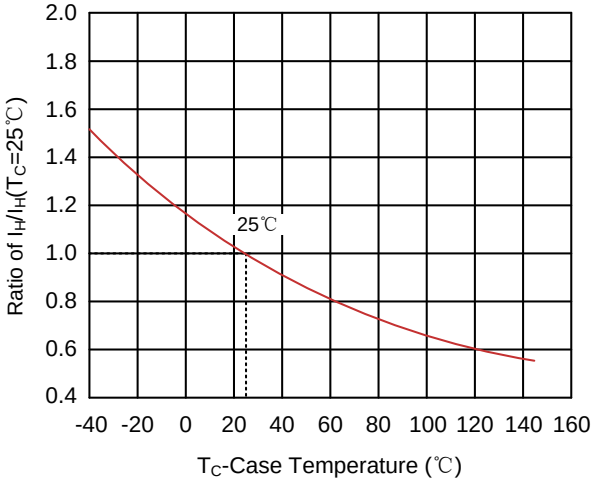
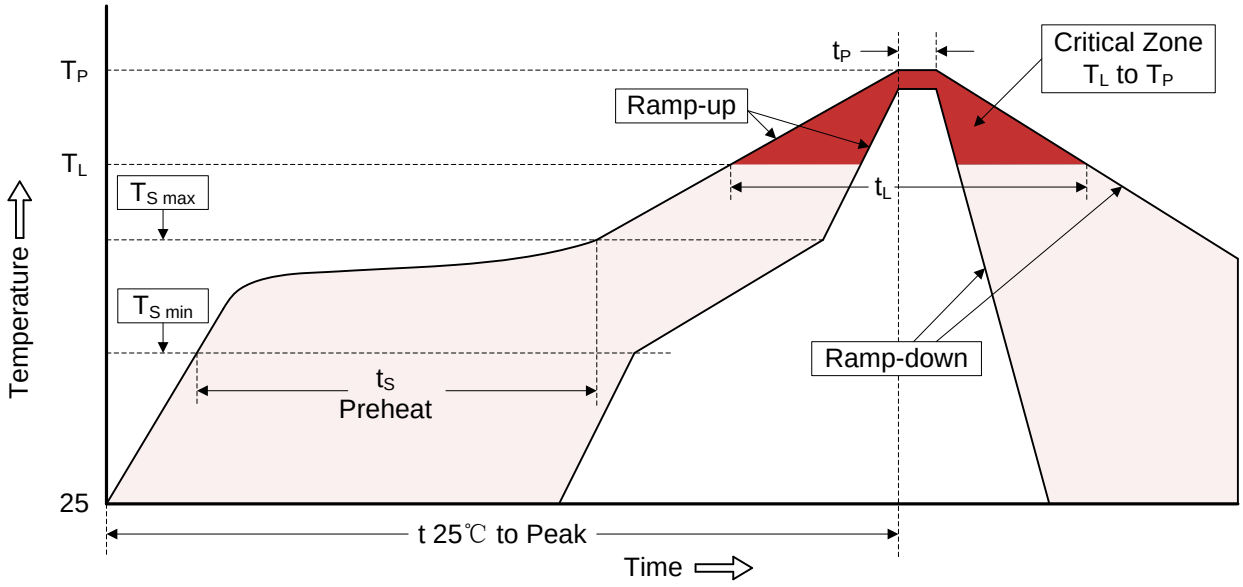


Figure 4. Normalized DC Holding Current versus Case Temperature



Recommended Soldering Conditions

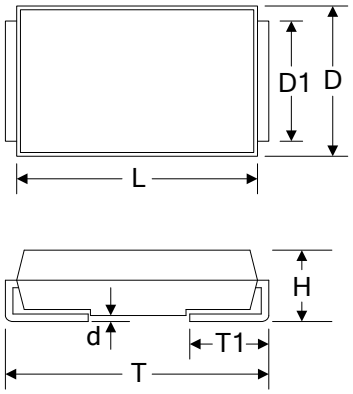
Reflow Soldering



Recommended Conditions

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

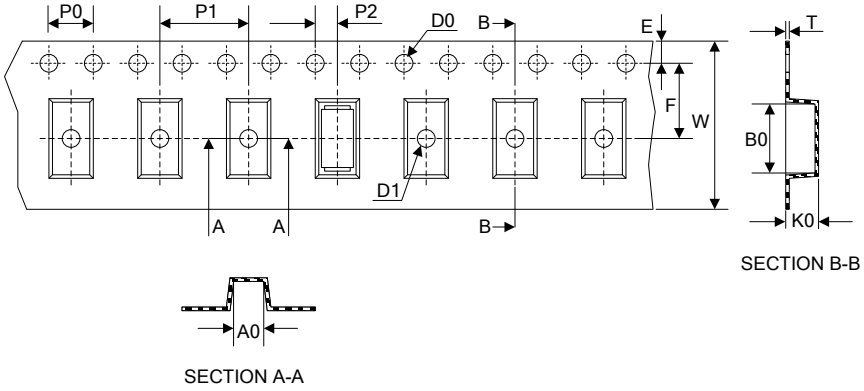
Dimensions (SMB/DO-214AA)



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
L	4.06	4.70	0.160	0.185
D	3.30	3.94	0.130	0.155
D1	1.90	2.20	0.075	0.086
T	5.21	5.59	0.205	0.220
T1	0.76	1.52	0.030	0.060
d	-	0.203	-	0.008
H	1.95	2.65	0.077	0.104

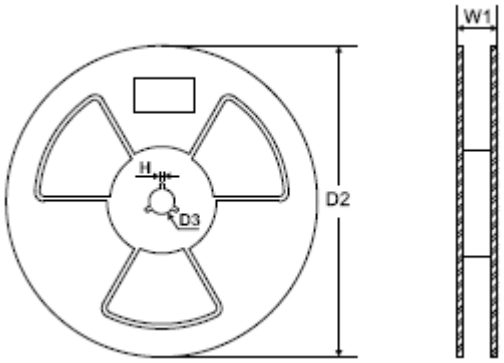
Packaging

Tape



Symbol	Dimension (mm)
W	12.00±0.30
P0	4.00±0.10
P1	8.00±0.10
P2	2.00±0.10
D0	Φ1.55±0.05
D1	Φ1.55±0.05
E	1.75±0.10
F	5.50±0.10
A0	3.76±0.10
B0	5.69±0.10
K0	2.70±0.10
T	0.25±0.10

13〃Reel



D2	Φ330.0±2.0
D3	Φ13.5±0.5
H	2.5±0.5
W1	16.0±1.0

Quantity: 2500PCS
P0080SB: 3000PCS