

# Transient Voltage Suppressors

**PxxxxSX Series  
DO-214AA/SMB**

## Thyristor Surge Suppressors -PxxxxSX Series

### Description

DO-214AA/SMB Series are low capacitance devices designed to protect broadband equipment such as VOIP, DSL modems and DSLAMs from damaging overvoltage transients.

The series provides a surface mount solution that enables equipment to comply with global regulatory standards while limiting the impact to broadband signals.

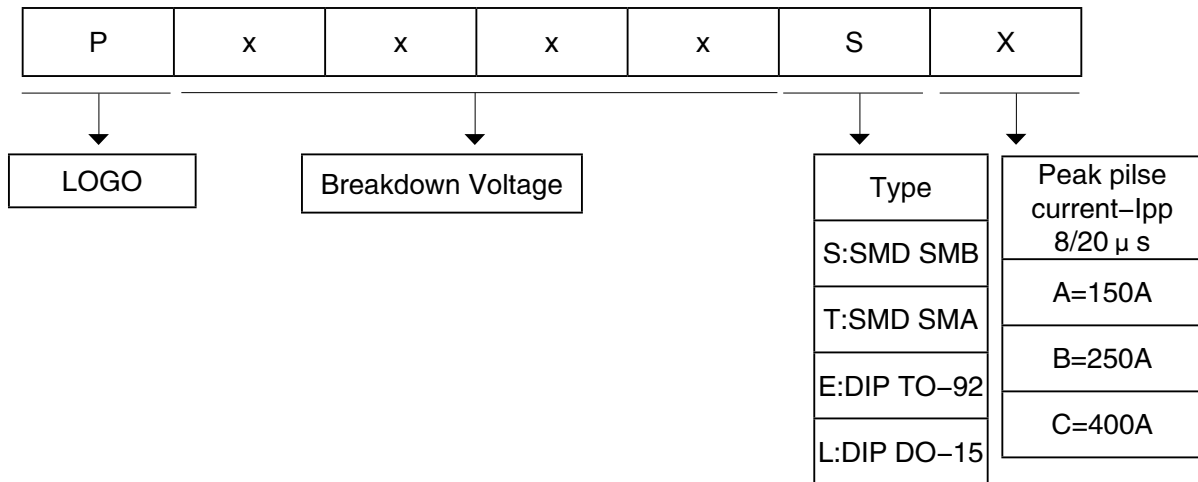


### Features

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

### Part Number Code



## Electrical Characteristics

Type Number	VDRM	IDRM	VBO	IH	IS	IT	VT	CJ	
	V	μA	V	MA	MA	A	V	pFMin	pFMax
P0080SA	6	5	25	50	800	2.2	4	25	150
P0080SB	6	5	25	50	800	2.2	4	25	150
P0080SC	6	5	25	50	800	2.2	4	35	260
P0300SA	25	5	40	50	800	2.2	4	15	140
P0300SB	25	5	40	50	800	2.2	4	15	140
P0300SC	25	5	40	50	800	2.2	4	25	250
P0640SA	58	5	77	150	800	2.2	4	40	60
P0640SB	58	5	77	150	800	2.2	4	40	60
P0640SC	58	5	77	150	800	2.2	4	28	80
P0720SA	65	5	88	150	800	2.2	4	35	60
P0720SB	65	5	88	150	800	2.2	4	35	75
P0720SC	65	5	88	150	800	2.2	4	50	150
P0900SA	75	5	98	150	800	2.2	4	35	55
P0900SB	75	5	98	150	800	2.2	4	35	70
P0900SC	75	5	98	150	800	2.2	4	45	140
P1100SA	90	5	130	150	800	2.2	4	30	50
P1100SB	90	5	130	150	800	2.2	4	30	70
P1100SC	90	5	130	150	800	2.2	4	45	115
P1300SA	120	5	160	150	800	2.2	4	25	45
P1300SB	120	5	160	150	800	2.2	4	25	60
P1300SC	120	5	160	150	800	2.2	4	40	105
P1500SA	140	5	180	150	800	2.2	4	25	40
P1500SB	140	5	180	150	800	2.2	4	25	55
P1500SC	140	5	180	150	800	2.2	4	35	95
P1800SA	170	5	220	150	800	2.2	4	25	35
P1800SB	170	5	220	150	800	2.2	4	25	50
P1800SC	170	5	220	150	800	2.2	4	35	90
P2300SA	190	5	260	150	800	2.2	4	25	35
P2300SB	190	5	260	150	800	2.2	4	25	50
P2300SC	190	5	260	150	800	2.2	4	30	80
P2600SA	220	5	300	150	800	2.2	4	20	35
P2600SB	220	5	300	150	800	2.2	4	20	45
P2600SC	220	5	300	150	800	2.2	4	30	80
P3100SA	275	5	350	150	800	2.2	4	20	35
P3100SB	275	5	350	150	800	2.2	4	20	45
P3100SC	275	5	350	150	800	2.2	4	30	70
P3500SA	320	5	400	150	800	2.2	4	20	35
P3500SB	320	5	400	150	800	2.2	4	20	40
P3500SC	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

## Surge Ratings

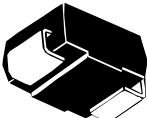
Series	I <sub>pp</sub>					ITSM 50/60 Hz	di/dt
	2x10 μs	8x20 μs	10x160 μs	10x560 μs	10x1000 μs		
	A min	A min	A min	A min	A min	A min	A/μs max
A	150	150	90	50	45	20	500
B	250	250	150	100	80	30	500
C	500	400	200	150	100	50	500

Notes:

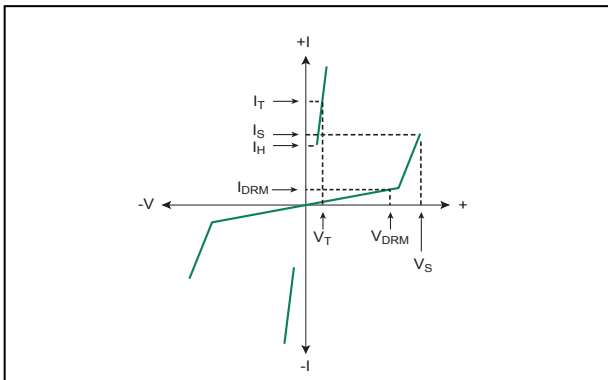
- Peak pulse current rating (I<sub>pp</sub>) is repetitive and guaranteed for the life of the product.
- I<sub>pp</sub> ratings applicable over temperature range of -40°C to +85°C
- The device must initially be in thermal equilibrium with -40°C ≤ T<sub>j</sub> ≤ +150°C

1 Current waveform in μs  
2 Voltage waveform in μs

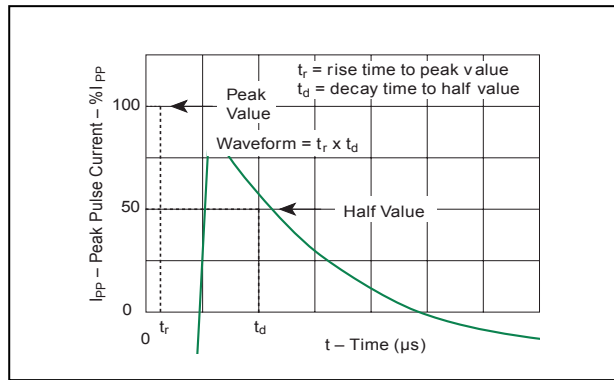
## Thermal Considerations

Package	Symbol	Parameter	Value	Unit
 DO-214AA	T <sub>J</sub>	Operating Junction Temperature Range	-40 to +150	°C
	T <sub>S</sub>	Storage Temperature Range	-65 to +150	°C
	R <sub>θJA</sub>	Thermal Resistance: Junction to Ambient	90	°C/W

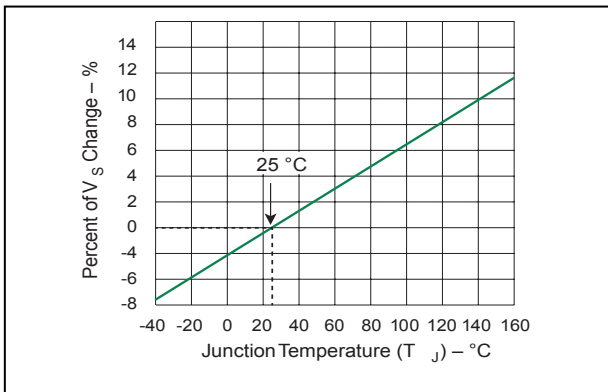
V-I Characteristics



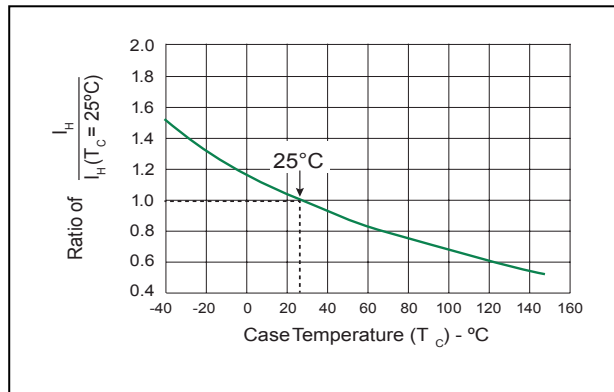
t<sub>r</sub> x t<sub>d</sub> Pulse Waveform



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



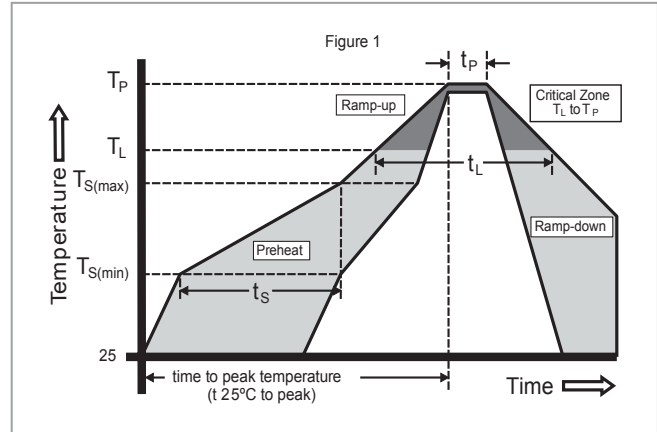
Normalized DC Holding Current vs. Case Temperature



# Thyristor Surge Suppressors -PxxxxSX Series

## Soldering Parameters

Reflow Condition		Pb-Free assembly (see Fig. 1)
Pre Heat	- Temperature Min ( $T_{s(min)}$ )	+150°C
	- Temperature Max ( $T_{s(max)}$ )	+200°C
	- Time (Min to Max) ( $t_s$ )	60-180 secs.
Average ramp up rate (Liquidus Temp ( $T_L$ ) to peak)		3°C/sec. Max.
$T_{S(max)}$ to $T_L$ - Ramp-up Rate		3°C/sec. Max.
Reflow	- Temperature ( $T_L$ ) (Liquidus)	+217°C
	- Temperature ( $t_L$ )	60-150 secs.
Peak Temp ( $T_p$ )		+260(+0/-5)°C
Time within 5°C of actual Peak Temp ( $t_p$ )		30 secs. Max.
Ramp-down Rate		6°C/sec. Max.
Time 2.5°C to Peak Temp ( $T_p$ )		8 min. Max.
Do not exceed		+260°C



## Physical Specifications

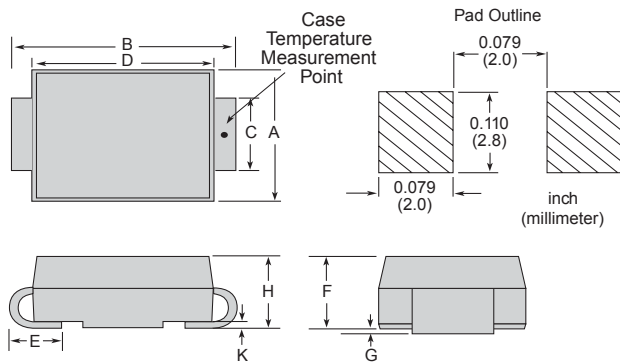
Lead Material	Copper Alloy
Terminal Finish	100% Matte-Tin Plated
Body Material	UL recognized epoxy meeting flammability classification 94V-0

## Environmental Specifications

High Temp Voltage Blocking	80% Rated $V_{DRM}$ ( $V_{AC}$ Peak) +125°C or +150°C, 504 or 1008 hrs. MIL-STD-750 (Method 1040) JEDEC, JESD22-A-101
Temp Cycling	-65°C to +150°C, 15 min. dwell, 10 up to 100 cycles. MIL-STD-750 (Method 1051) EIA/JEDEC, JESD22-A104
Biased Temp & Humidity	52 $V_{DC}$ (+85°C) 85%RH, 504 up to 1008 hrs. EIA/JEDEC, JESD22-A-101
High Temp Storage	+150°C 1008 hrs. MIL-STD-750 (Method 1031) JEDEC, JESD22-A-101
Low Temp Storage	-65°C, 1008 hrs.
Thermal Shock	0°C to +100°C, 5 min. dwell, 10 sec. transfer, 10 cycles. MIL-STD-750 (Method 1056) JEDEC, JESD22-A-106
Autoclave (Pressure Cooker Test)	+121°C, 100%RH, 2atm, 24 up to 168 hrs. EIA/JEDEC, JESD22-A-102
Resistance to Solder Heat	+260°C, 30 secs. MIL-STD-750 (Method 2031)
Moisture Sensitivity Level	85%RH, +85°C, 168 hrs., 3 reflow cycles (+260°C Peak). JEDEC-J-STD-020, Level 1

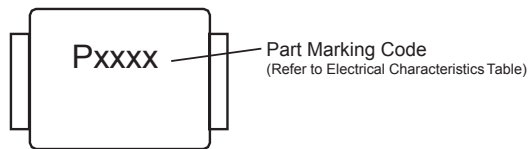
# Thyristor Surge Suppressors -PxxxxSX Series

## Dimensions-DO-214AA



Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.130	0.156	3.30	3.95
B	0.201	0.220	5.10	5.60
C	0.077	0.087	1.95	2.20
D	0.159	0.181	4.05	4.60
E	0.030	0.063	0.75	1.60
F	0.075	0.096	1.90	2.45
G	0.002	0.008	0.05	0.20
H	0.077	0.104	1.95	2.65
K	0.006	0.016	0.15	0.41

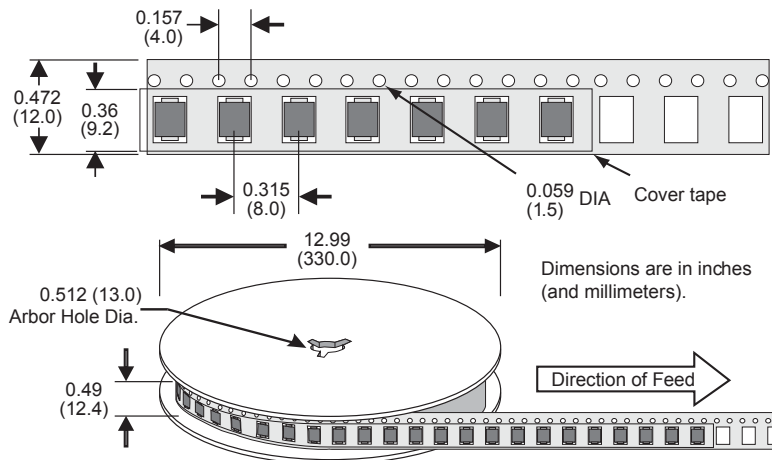
## Part Marking



## Packing Options

Package Type	Description	Quantity	Added Suffix	Industry Standard
S	DO-214AA Tape & Reel Pack	2500	N/A	EIA-481-D

## Tape and Reel Specification — DO-214AA



## RuiLongYuan Electronics Co., Ltd.

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**Tel: +86-755-8290 8296**

**Fax: +86-755-8290 8002**

**E-mail: jack@ruilon.com**