

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.

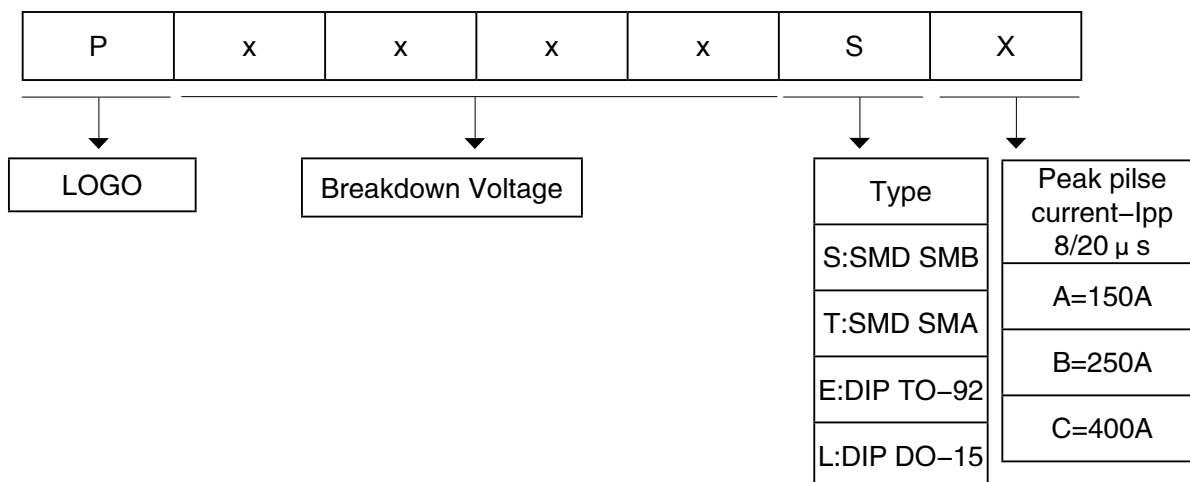


Features

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	μ A	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

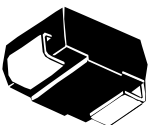
Surge Ratings

Series	I _{pp}					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

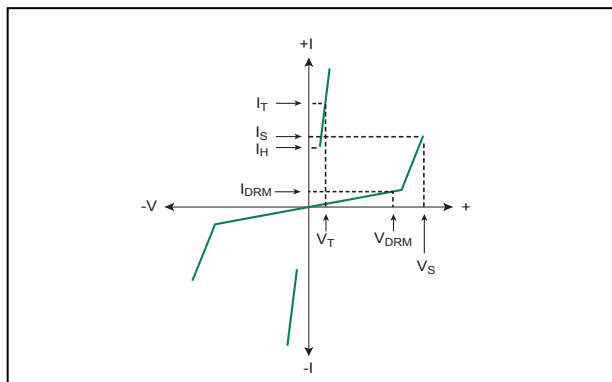
Notes:

- Current waveform in μs
 - Voltage waveform in μs
- Peak pulse current rating (I_{pp}) is repetitive and guaranteed for the life of the product.
 - I_{pp} ratings applicable over temperature range of -40°C to +85°C
 - The device must initially be in thermal equilibrium with -40°C ≤ T_j ≤ +150°C

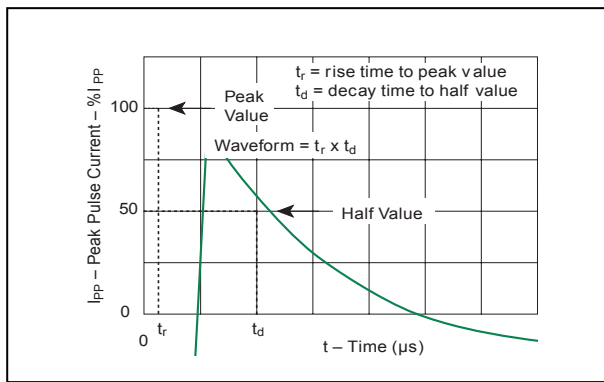
Thermal Considerations

Package	Symbol	Parameter	Value	Unit
DO-214AA 	T _j	Operating Junction Temperature Range	-40 to +150	°C
	T _s	Storage Temperature Range	-65 to +150	°C
	R _{θJA}	Thermal Resistance: Junction to Ambient	90	°C/W

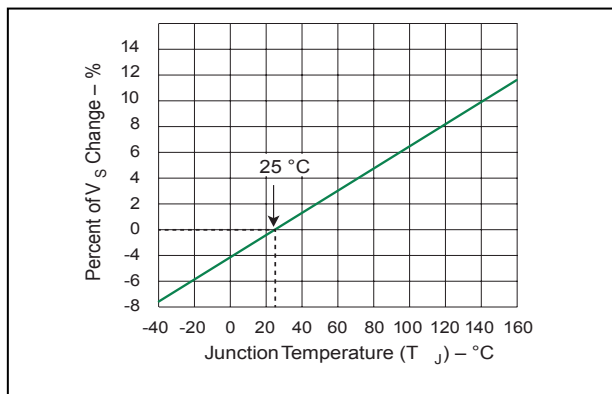
V-I Characteristics



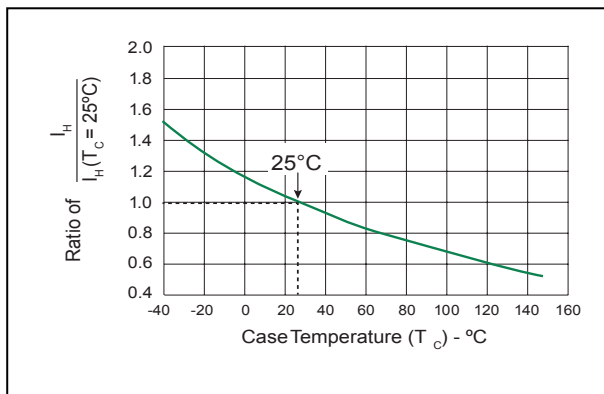
t_r x t_d Pulse Waveform



Normalized V_s Change vs. Junction Temperature



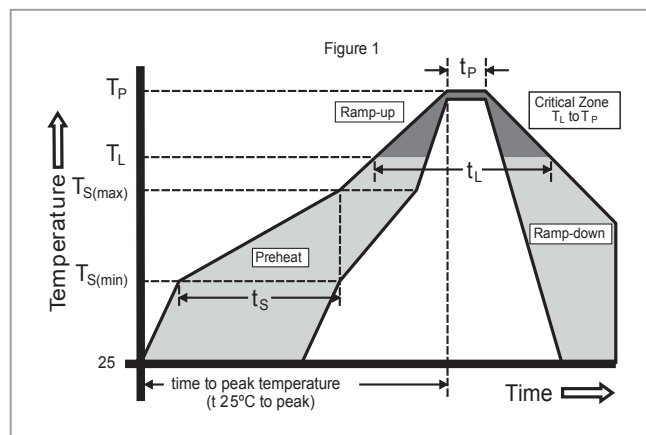
Normalized DC Holding Current vs. Case Temperature



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 25°C to Peak Temp (T_p)		8 min. Max.
Do not exceed		+260°C



Physical Specifications

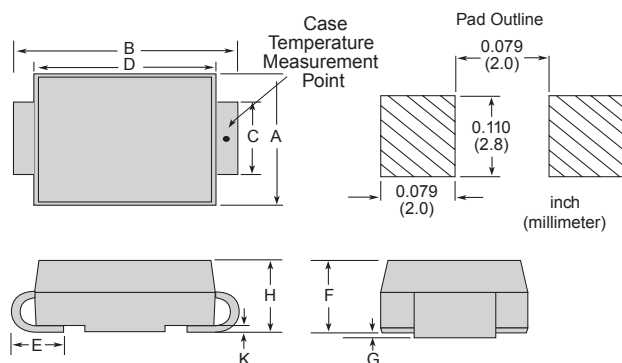
Lead Material	Copper Alloy
Terminal Finish	100% Matte-Tin Plated
Body Material	UL recognized epoxy meeting flammability classification 94V-0

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-A-104
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

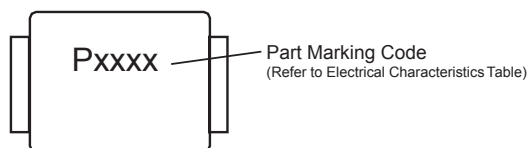
Thyristor Surge Suppressors -PxxxxSX Series

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

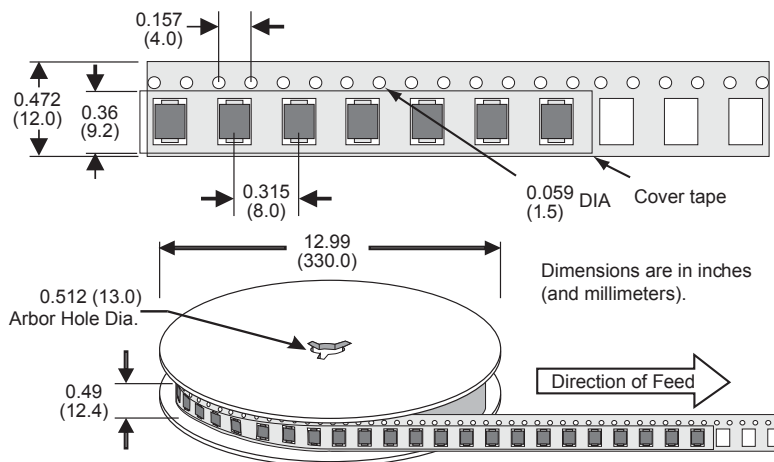
Part Marking



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.

- Reproducing and modifying information of the document is prohibited without permission from Ruilongyuan International Inc.
- Ruilongyuan International Inc. reserves the rights to make changes of the content herein the document anytime without notification. Please refer to our website for the latest document.
- Ruilongyuan International Inc. disclaims any and all liability arising out of the application or use of any product including damages incidentally and consequentially occurred.
- Ruilongyuan International Inc. does not assume any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.
- Applications shown on the herein document are examples of standard use and operation. Customers are responsible in comprehending the suitable use in particular applications. Ruilongyuan International Inc. makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.
- The products shown herein are not designed and authorized for equipments requiring high level of reliability or relating to human life and for any applications concerning life-saving or life-sustaining, such as medical instruments, transportation equipment, aerospace machinery et cetera. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Ruilongyuan International Inc. for any damages resulting from such improper use or sale.

Tel: +86-755-8290 8296

Fax: +86-755-8290 8002

E-mail: jack@ruilon.com