

# Pxxx0S3N Series

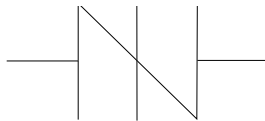
## High Surge Current SIDACtor® - D0214AB



### Agency Approvals

Agency	Agency File Number
	E133083

### Schematic Symbol



### Description

The Pxxx0S3N Series DO-214AB thyristors are components designed to protect equipment located in hostile environments from overvoltage transients.

The Pxxx0S3N Series protect exposed interfaces in industrial and ICT applications, such as RS-485 data interfaces or AC and DC power supplies. These components' switching voltage  $V_S$  are much lower than alternative Gas Discharge Tubes (GDT), and on-state voltage  $V_T$  are much lower than alternative GDTs, Metal Oxide Varistors (MOV) and TVS Diodes.

This Pxxx0S3N series are rated 3000A 8/20  $\mu$ s, enabling equipment compliance with regulatory and customer surge requirements.

### Features and Benefits

- Low voltage overshoot
- Low on-state voltage
- Component properties do not degrade after multiple surge events within its limits
- Fails short circuit when surged in excess of ratings
- Fast response in microseconds
- 3000A 8/20  $\mu$ s Surge Rating
- RoHS Compliant and Halogen-Free
- Pb-free E3 means 2nd level interconnect is Pb-free and the terminal finish material is tin (Sn) (IPC/JEDEC J-STD609A.01)

### Applicable Global Standards

- TIA-968-A
- TIA-968-B
- ITU K.20/21 Enhanced Level
- ITU K.20/21 Basic Level
- GR 1089 Inter-building
- GR 1089 Intra-building
- IEC 61000-4-5, 2nd Ed
- YD/T 1082
- YD/T 993
- YD/T 950

### Electrical Characteristics

Part Number	Marking	$V_{DRM}$	$V_S$	$I_H$	$I_S$	$I_T$	$V_T$	Capacitance	
		@ $I_{DRM}=5\mu A$	@ 100V/ $\mu s$				@ $I_T=2.2A$	@ 1MHz, 2V bias	
		V min	V max	mA min	mA max	A max	V max	pF min	pF max
P0080S3NLRP	P-8N	6	25	50	800	2.2	4	80	150
P0300S3NLRP	P03N	30	45	50	800	2.2	4	80	150
P0640S3NLRP	P06N	58	77	50	800	2.2	4	150	550
P0720S3NLRP	P07N	65	88	50	800	2.2	4	150	550
P0900S3NLRP	P09N	75	98	50	800	2.2	4	150	550
P1100S3NLRP	P11N	90	130	50	800	2.2	4	150	450
P1300S3NLRP	P13N	120	160	50	800	2.2	4	150	450
P1500S3NLRP	P15N	140	180	50	800	2.2	4	150	450
P1900S3NLRP	P19N	155	220	50	800	2.2	4	150	450
P2300S3NLRP	P23N	180	260	50	800	2.2	4	150	450
P2600S3NLRP	P26N	220	300	50	800	2.2	4	150	450
P3100S3NLRP	P31N	275	350	50	800	2.2	4	150	450
P3500S3NLRP	P35N	320	400	50	800	2.2	4	150	450
P3800S3NLRP	P38N	350	430	50	800	2.2	4	150	450

#### Notes:

- Absolute maximum ratings measured at  $T_A=25^\circ C$  (unless otherwise noted).
- Components are bi-directional (unless otherwise noted).

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### Surge Ratings


Series	$I_{PP}$	$I_{TSM}$ 50 / 60 Hz	di/dt
	8/20 <sup>1</sup> 1.2/50 <sup>2</sup>		
	A min		
N	2500/3000	250	420

**Notes:**

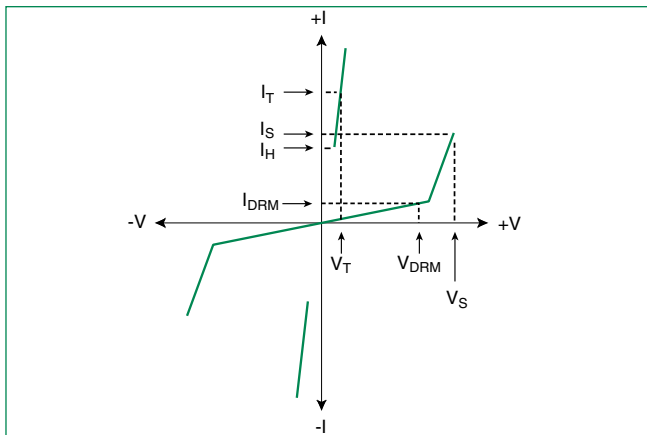
1. Current waveform in μs
2. Voltage waveform in μs
3. Surge Rating 2500A for P0080S3NLRP and P0300S3NLRP

- 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

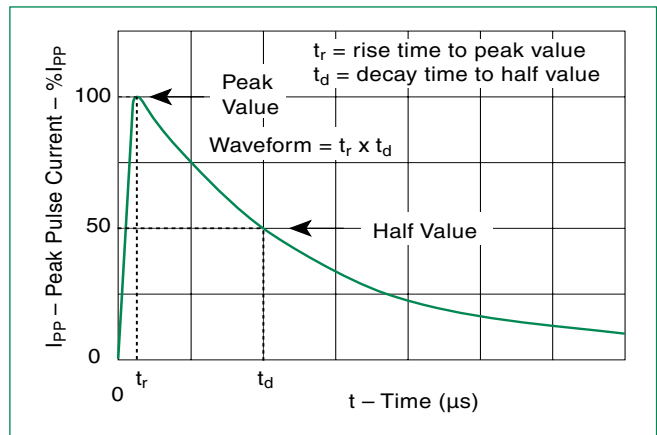
### Thermal Considerations

Package	Symbol	Parameter	Value	Unit
DO-214AB 	$T_J$	Operating Junction Temperature Range	-65 to +150	°C
	$T_S$	Storage Temperature Range	-65 to +150	°C
	$R_{\theta JA}$	Thermal Resistance: Junction to Ambient	75	°C/W

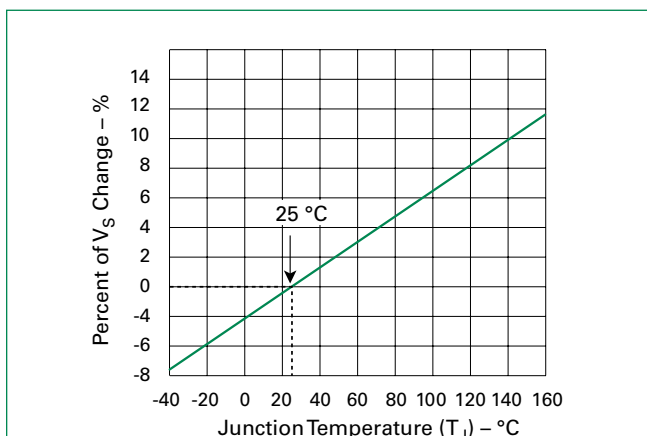
### V-I Characteristics



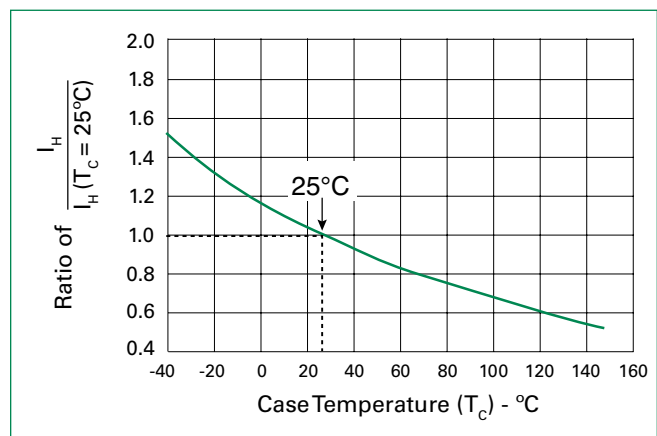
### tr x td Pulse Waveform



### Normalized $V_S$ Change vs. Junction Temperature



### Normalized DC Holding Current vs. Case Temperature

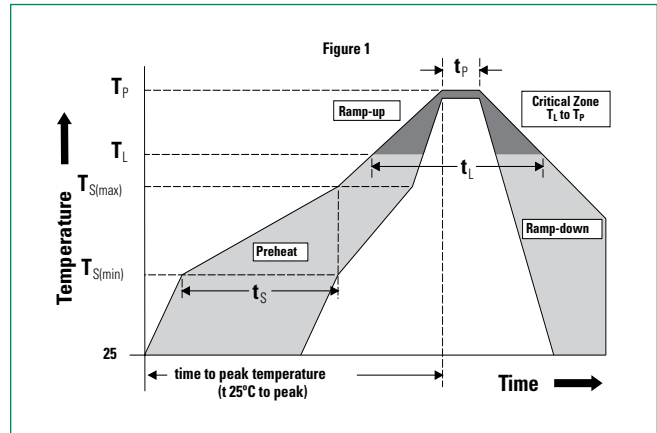


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### Soldering Parameters

<b>Reflow Condition</b>		Pb-Free assembly (see Fig. 1)
<b>Pre Heat</b>	- Temperature Min ( $T_{s(min)}$ )	+150°C
	- Temperature Max ( $T_{s(max)}$ )	+200°C
	- Time (Min to Max) ( $t_s$ )	60-120 secs.
<b>Average ramp up rate (Liquidus Temp (<math>T_L</math>) to peak)</b>		3°C/sec. Max.
<b><math>T_{s(max)}</math> to <math>T_L</math> - Ramp-up Rate</b>		3°C/sec. Max.
<b>Reflow</b>	- Temperature ( $T_L$ ) (Liquidus)	+217°C
	- Temperature ( $t_l$ )	60-150 secs.
<b>Peak Temp (<math>T_p</math>)</b>		+260(+0/-5)°C
<b>Time within 5°C of actual Peak Temp (<math>t_p</math>)</b>		30 secs. Max.
<b>Ramp-down Rate</b>		6°C/sec. Max.
<b>Time 25°C to Peak Temp (<math>T_p</math>)</b>		8 min. Max.
<b>Do not exceed</b>		+260°C



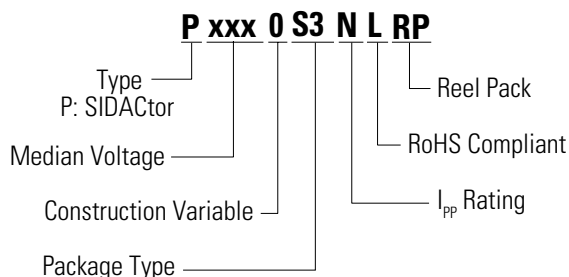
### Physical Specifications

<b>Lead Material</b>	Copper Alloy
<b>Terminal Finish</b>	100% Matte-Tin Plated
<b>Body Material</b>	UL Recognized epoxy meeting flammability classification V-0

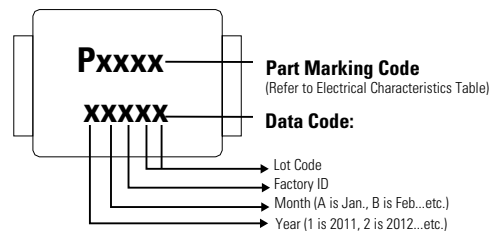
### Environmental Specifications

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

### Part Numbering



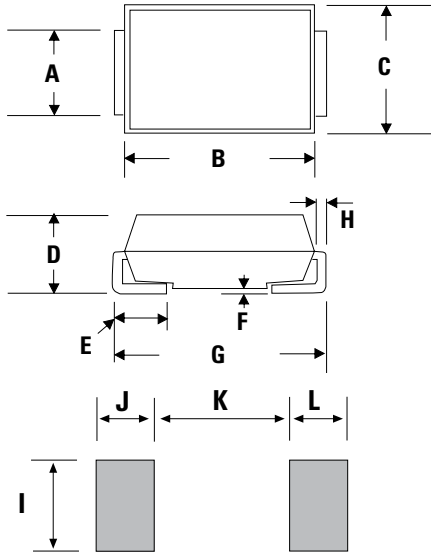
### Part Marking



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## High Surge Current SIDACtor® - D0214AB

### Dimensions – DO-214AB

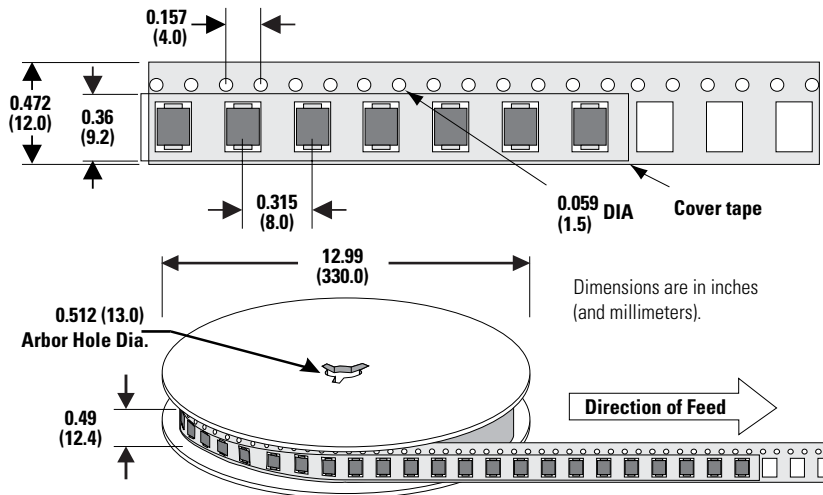


Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.114	0.126	2.900	3.200
B	0.260	0.280	6.600	7.110
C	0.220	0.245	5.590	6.220
D	0.079	0.103	2.060	2.620
E	0.030	0.060	0.760	1.520
F	-	0.008	-	0.203
G	0.305	0.320	7.750	8.130
H	0.006	0.012	0.152	0.305
I	0.129	-	3.300	-
J	0.094	-	2.400	-
K	-	0.165	-	4.200
L	0.094	-	2.400	-

### Packing Options

Package Type	Description	Quantity	Added Suffix	Industry Standard
S3	DO-214AB Tape and Reel Pack	3000	RP	EIA-481-D tape and reel specification

### Tape and Reel Specification – DO-214AB



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