

# Pxxx0S3N Series

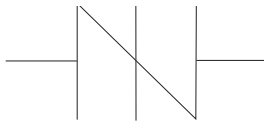
## High Surge Current SIDACtor® - D0214AB



### Agency Approvals

Agency	Agency File Number
	E133083

### Schematic Symbol



### Description

The Pxxx0S3N Series DO-214AB protection 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, AC or 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 nanoseconds
- 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).

# Pxxx0S3N Series

## High Surge Current SIDACtor® - D0214AB

### 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:**

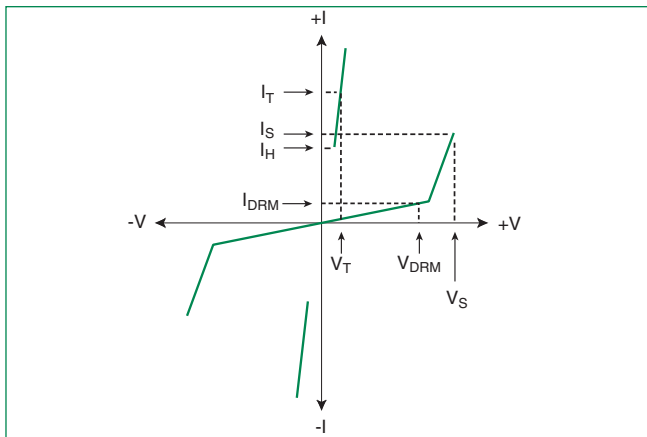
1. Current waveform in μs
2. Voltage waveform in μs
3. Surge Rating 2500A for P0080S3NLRP and P0300S3NLRP

- 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

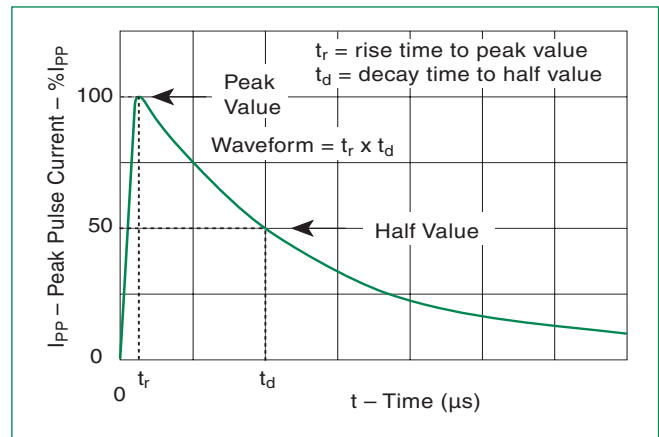
### Thermal Considerations

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

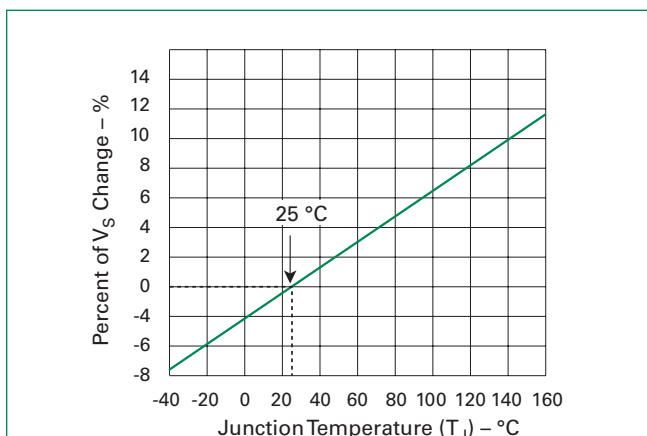
### V-I Characteristics



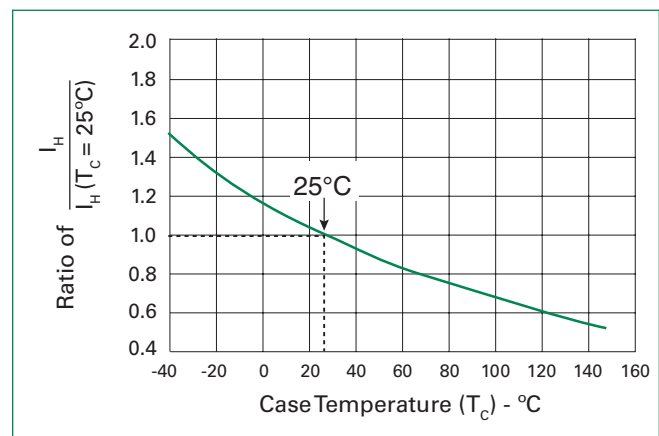
### tr x td Pulse Waveform



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



### Normalized DC Holding Current vs. Case Temperature

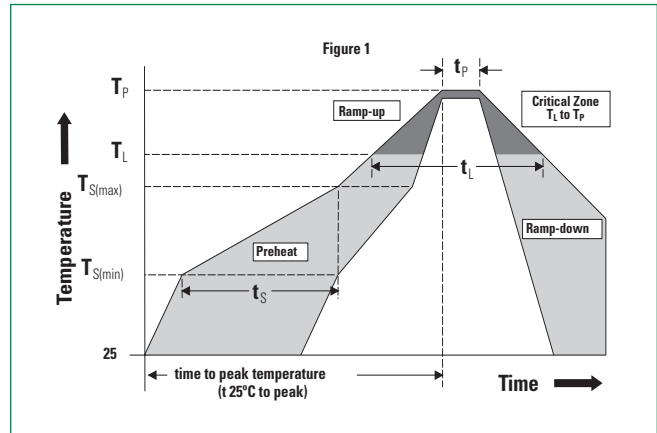


# Pxxx0S3N Series

## High Surge Current SIDACtor® - D0214AB

### 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



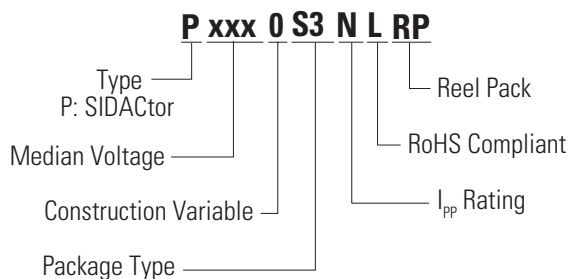
### Physical Specifications

<b>Lead Material</b>	Copper Alloy
<b>Terminal Finish</b>	100% Matte-Tin Plated
<b>Body Material</b>	UL Recognized epoxy meeting flammability classification UL94-V0

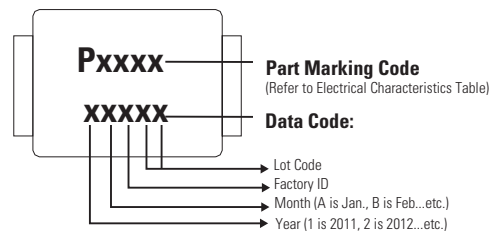
### Environmental Specifications

<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



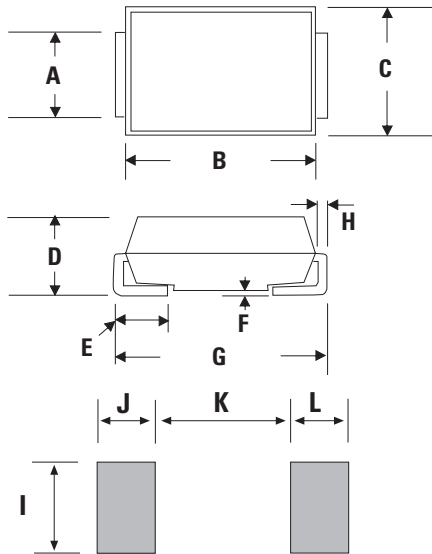
### Part Marking



# Pxxx0S3N Series

## High Surge Current SIDACtor® - D0214AB

### Dimensions – DO-214AB

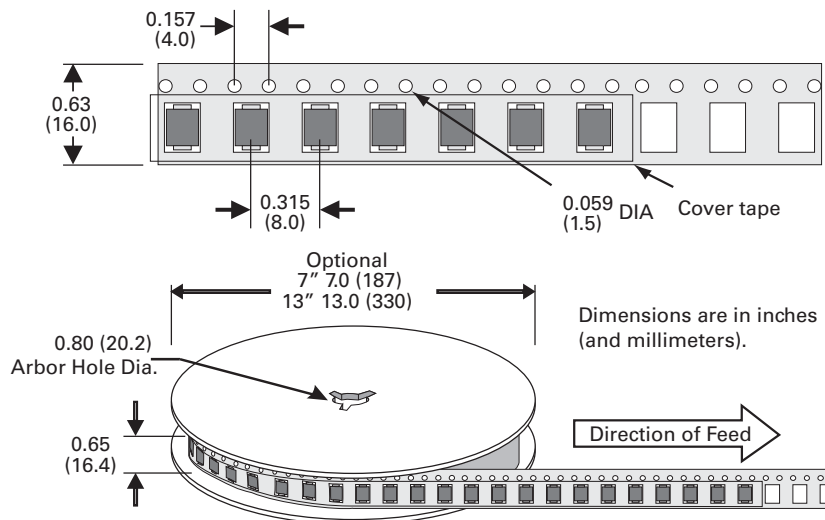


Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.114	0.126	2.900	3.200
B	0.260	0.280	6.600	7.110
C	0.220	0.245	5.590	6.220
D	0.079	0.103	2.060	2.620
E	0.030	0.060	0.760	1.520
F	-	0.008	-	0.203
G	0.305	0.320	7.750	8.130
H	0.006	0.012	0.152	0.305
I	0.129	-	3.300	-
J	0.094	-	2.400	-
K	-	0.165	-	4.200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



**Disclaimer Notice** - Littelfuse products are not designed for, and shall not be used for, any purpose (including, without limitation, automotive, military, aerospace, medical, life-saving, life-sustaining or nuclear facility applications, devices intended for surgical implant into the body, or any other application in which the failure or lack of desired operation of the product may result in personal injury, death, or property damage) other than those expressly set forth in applicable Littelfuse product documentation. Warranties granted by Littelfuse shall be deemed void for products used for any purpose not expressly set forth in applicable Littelfuse documentation. Littelfuse shall not be liable for any claims or damages arising out of products used in applications not expressly intended by Littelfuse as set forth in applicable Littelfuse documentation. The sale and use of Littelfuse products is subject to Littelfuse Terms and Conditions of Sale, unless otherwise agreed by Littelfuse. "Littelfuse" includes Littelfuse, Inc., and all of its affiliate entities. <http://www.littelfuse.com/disclaimer-electronics>.