

# Pxxx0S3N-A Series

## High Surge Current SIDACtor® - DO-214AB



### Agency Approvals

Agency	Agency File Number
	E133083

### Schematic Symbol



### Electrical Characteristics

Part Number	Marking	$V_{DRM}$	$V_s$	$I_H$	$I_s$	$I_T$	$V_T$	Capacitance	
		@ $I_{DRM} = 5 \mu A$	@ 100 V/ $\mu s$	mA min	mA max	A max	@ $I_T = 2.2 A$	pf min	pF max
P0640S3NLRP-A	P06N	58	77	50	800	2.2	4	150	550
P0720S3NLRP-A	P07N	65	88	50	800	2.2	4	150	550
P0900S3NLRP-A	P09N	75	98	50	800	2.2	4	150	550
P1100S3NLRP-A	P11N	90	130	50	800	2.2	4	150	450
P1300S3NLRP-A	P13N	120	160	50	800	2.2	4	150	450
P1500S3NLRP-A	P15N	140	180	50	800	2.2	4	150	450
P1900S3NLRP-A	P19N	155	220	50	800	2.2	4	150	450
P2100S3NLRP-A	P21N	170	240	50	800	2.2	4	150	450
P2300S3NLRP-A	P23N	180	260	50	800	2.2	4	150	450
P2600S3NLRP-A	P26N	220	300	50	800	2.2	4	150	450
P3100S3NLRP-A	P31N	275	350	50	800	2.2	4	150	450
P3500S3NLRP-A	P35N	320	400	50	800	2.2	4	150	450
P3800S3NLRP-A	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).

### Description

The automotive grade Pxxx0S3N-A series DO-214AB protection thyristors are components designed to protect AC power line located in hostile environments from overvoltage transients.

The Pxxx0S3N-A 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 component.

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

### Features and Benefits

- High reliability application and automotive grade AEC-Q101 qualified
- High surge rating 8/20  $\mu s$  3000 A protection
- High surge SIDACtor designed in a surface mount and compact DO-214AB package
- Low voltage overshoot
- Low on-state voltage
- Fails short circuit when surged in excess of ratings
- Component properties do not degrade after multiple surge events within its limits
- Fast response in microseconds
- RoHS compliant and Halogen-free
- Pb-free E3 means 2<sup>nd</sup> 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, 2<sup>nd</sup> edition
- YD/T 1082
- YD/T 993
- YD/T 950

# Pxxx0S3N-A Series

## High Surge Current SIDACtor® - DO-214AB

### 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	3000	250	420

**Notes:**

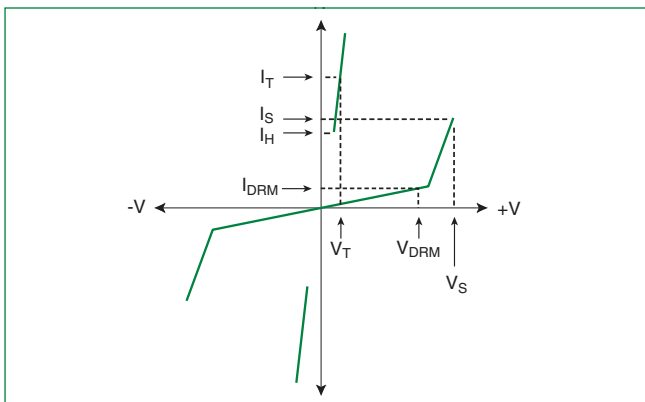
1. Current waveform in μs
2. Voltage waveform in μs

- Peak pulse current rating ( $I_{pp}$ ) is repetitive and guaranteed for the life of the product.

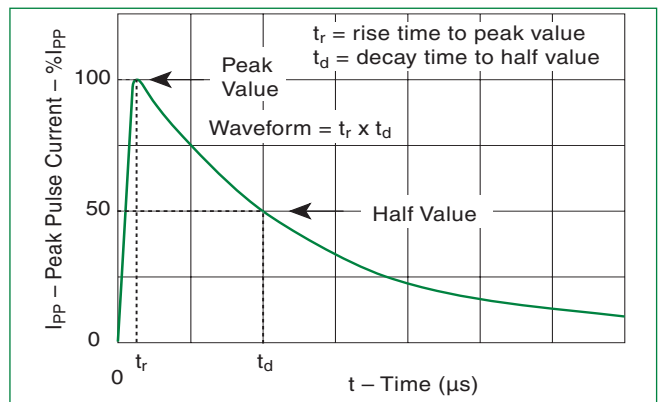
### Thermal Considerations

Package	Symbol	Parameter	Value	Unit
DO-214AB 	$T_J$	Operating Junction Temperature Range	-65 to +125	°C
	$T_S$	Storage Temperature Range	-65 to +150	°C
	$R_{\theta JA}$	Thermal Resistance: Junction to Ambient	75	°C/W

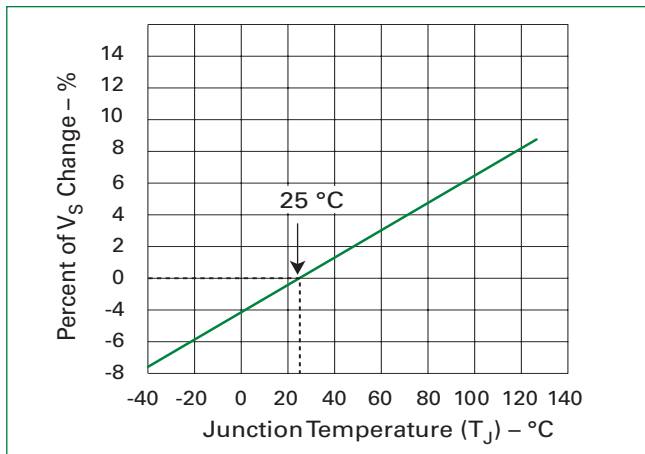
### V-I Characteristics



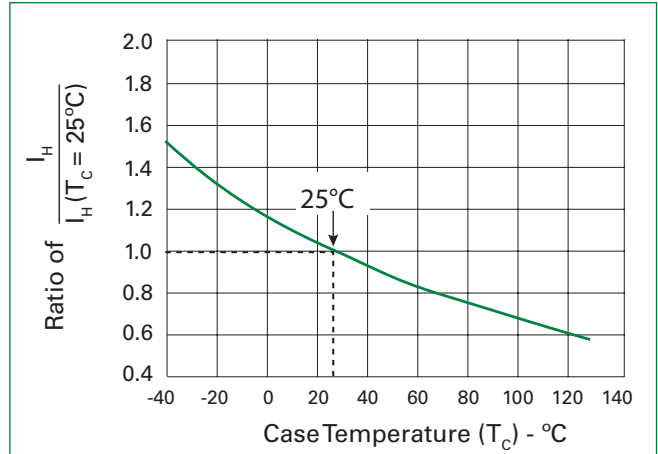
### tr x td Pulse Waveform



### Normalized VS Change vs. Junction Temperature



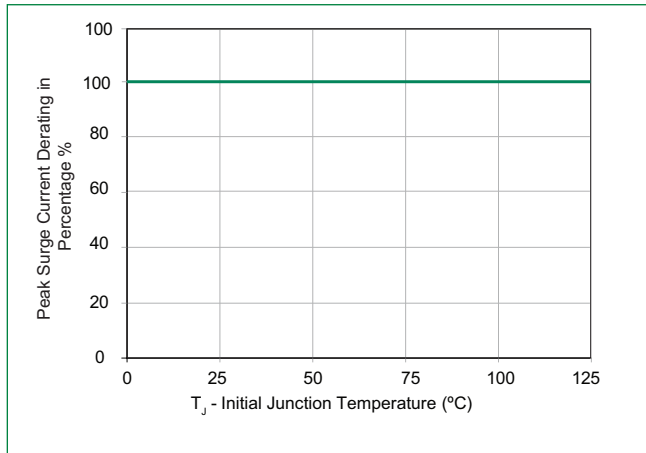
### Normalized DC Holding Current vs. Case Temperature



# Pxxx0S3N-A Series

## High Surge Current SIDACtor® - DO-214AB

### Peak Surge Current Derating Curve



### Physical Specifications

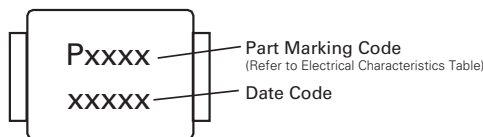
<b>Lead Material</b>	Copper alloy
<b>Terminal Finish</b>	100 % Matte-tin plated
<b>Body Material</b>	UL recognized epoxy meeting flammability classification V-0

### Soldering Parameters

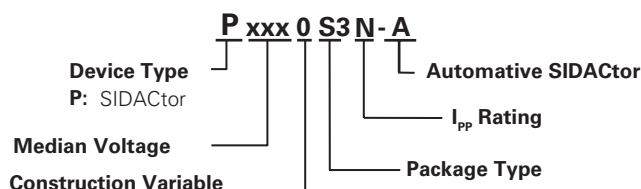
<b>Reflow Condition</b>	Pb-free assembly (see Fig. 1)	
<b>Pre Heat</b>	- Temperature Min (T <sub>s(min)</sub> )	+150 °C
	- Temperature Max (T <sub>s(max)</sub> )	+200 °C
	- Time (Min to Max) (t <sub>s</sub> )	60-120 secs.
<b>Average Ramp Up Rate (Liquidus Temp (T<sub>L</sub>) to Peak)</b>	3 °C/sec. max.	
<b>T<sub>S(max)</sub> to T<sub>L</sub> - Ramp-up Rate</b>	3 °C/sec. max.	
<b>Reflow</b>	- Temperature (T <sub>L</sub> ) (Liquidus)	+217 °C
	- Temperature (t <sub>L</sub> )	60-150 secs.
<b>Peak Temp (T<sub>p</sub>)</b>	+260 (+0/-5) °C	
<b>Time Within 5 °C of Actual Peak Temp (t<sub>p</sub>)</b>	30 secs. max..	
<b>Ramp-down Rate</b>	6 °C/sec. max.	
<b>Time 25 °C to Peak Temp (T<sub>p</sub>)</b>	8 min. max.	
<b>Do Not Exceed</b>	+260 °C	



### Part Marking



### Part Numbering



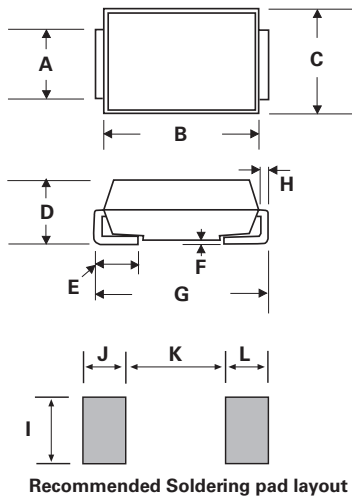
### Environmental Specifications

<b>High Temp Voltage Blocking</b>	80 % rated V <sub>DRM</sub> (V <sub>AC Peak</sub> ) +125 °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-A-104
<b>Biased Temp &amp; Humidity</b>	80 % rated V <sub>DRM</sub> (+85 °C) 85 %RH, and not exceed 100 V or limit of chamber. 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>Unbiased HAST</b>	96 hrs. at T <sub>A</sub> = 130 °C/85 %RH or 264 hrs. at T <sub>A</sub> = 110 °C/85 %RH. TEST before and after UHAST, JEDEC, JESD22-A-118
<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

# Pxxx0S3N-A Series

## High Surge Current SIDACtor® - DO-214AB

### Dimensions – DO-214AB

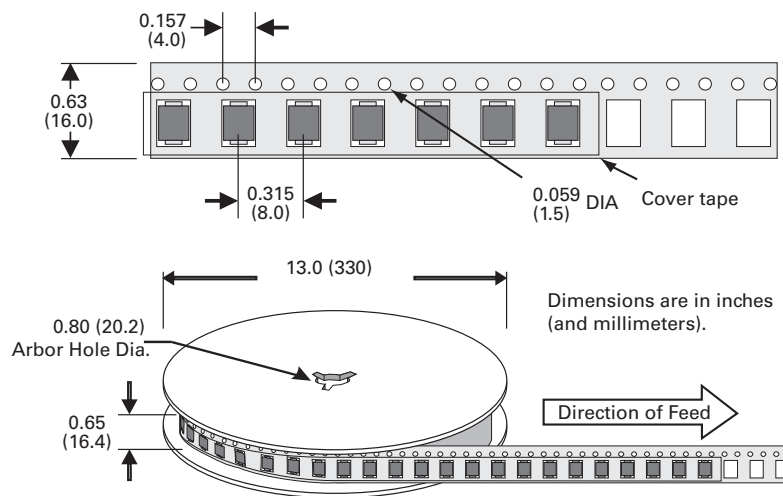


Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.114	0.126	2.900	3.200
B	0.260	0.280	6.600	7.110
C	0.220	0.245	5.590	6.220
D	0.079	0.103	2.060	2.620
E	0.030	0.060	0.760	1.520
F	-	0.008	-	0.203
G	0.305	0.320	7.750	8.130
H	0.006	0.012	0.152	0.305
I	0.129	-	3.300	-
J	0.094	-	2.400	-
K	-	0.165	-	4.200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

### Packing Options

Package Type	Description	Quantity	Industry Standard
S3	DO-214AB tape and reel pack	3000	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>