

# Pxxx0S3N-A Series

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



### Agency Approvals

Agency	Agency File Number
	E133083

### Schematic Symbol



### Electrical Characteristics

Part Number	Marking	$V_{DRM}$ @ $I_{DRM} = 5 \mu A$	$V_S$ @ 100 V/ $\mu s$	$I_H$	$I_S$	$I_T$	$V_T$ @ $I_T = 2.2 A$	Capacitance @ 1 MHz, 2V bias	
		V min	V max	mA min	mA max	A max	V max	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:**

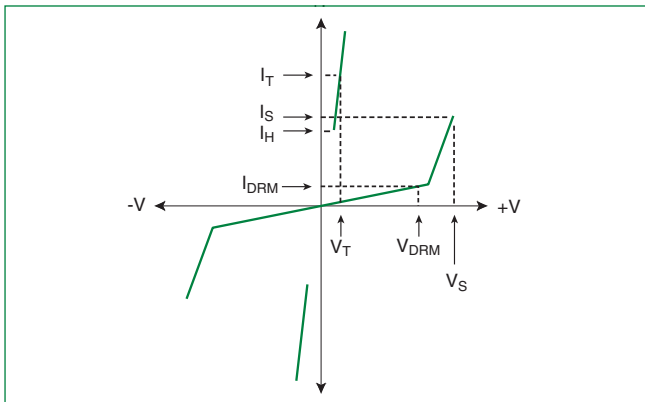
1. Current waveform in μs
2. Voltage waveform in μs

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

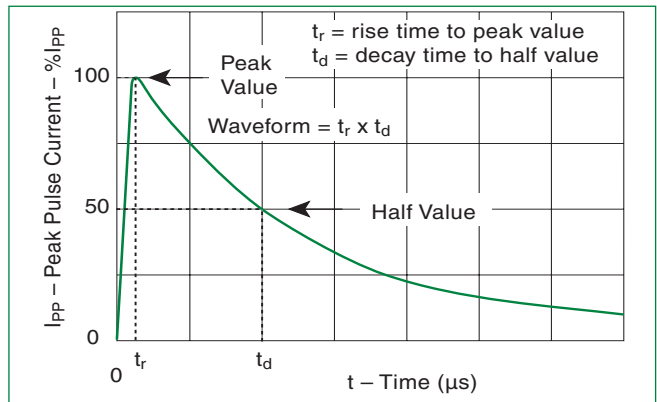
### Thermal Considerations

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
	$R_{θJA}$	Thermal Resistance: Junction to Ambient	75	°C/W

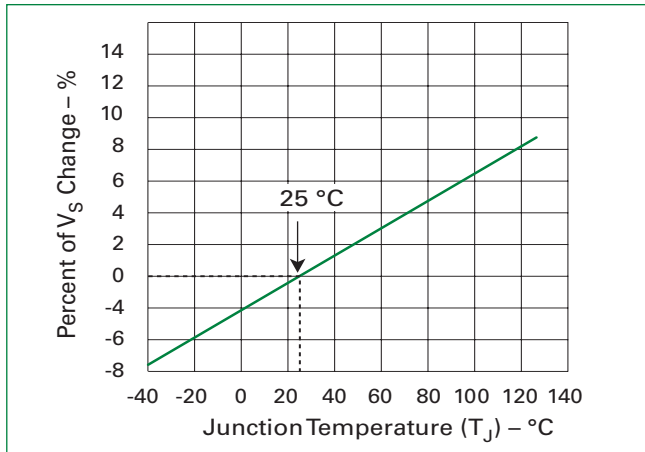
### V-I Characteristics



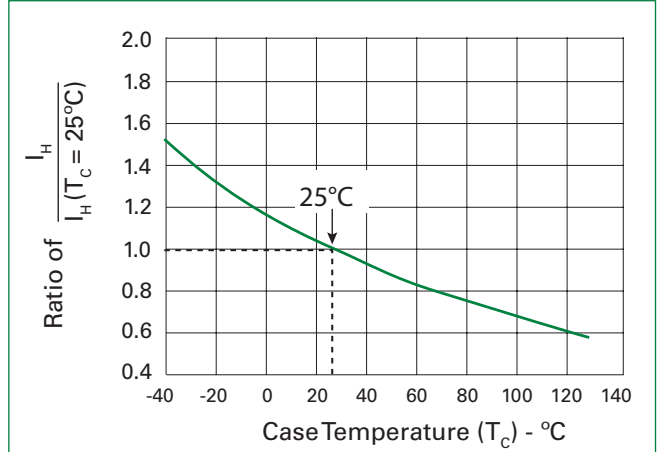
### tr x td Pulse Waveform



### Normalized VS Change vs. Junction Temperature



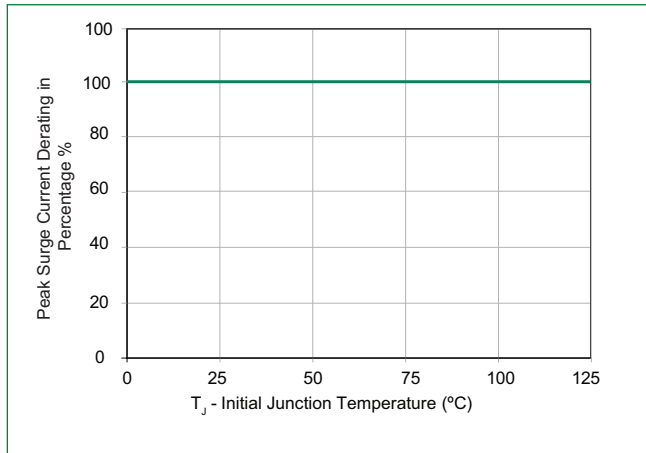
### Normalized DC Holding Current vs. Case Temperature



# Pxxx0S3N-A Series

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

### Peak Surge Current Derating Curve

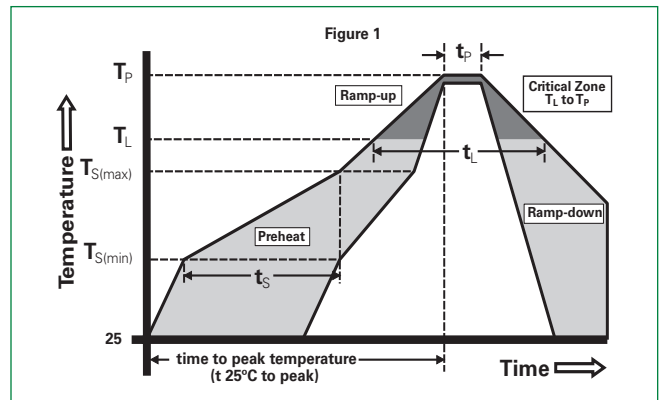


### Physical Specifications

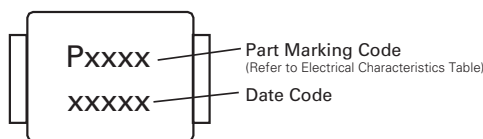
<b>Lead Material</b>	Copper alloy
<b>Terminal Finish</b>	100 % Matte-tin plated
<b>Body Material</b>	UL recognized epoxy meeting flammability classification V-0

### Soldering Parameters

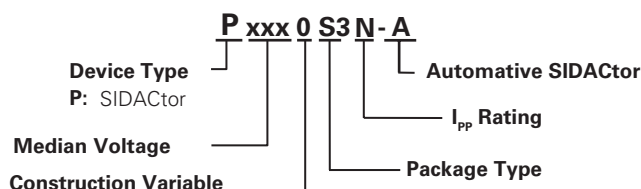
<b>Reflow Condition</b>	Pb-free assembly (see Fig. 1)	
<b>Pre Heat</b>	- Temperature Min (T <sub>s(min)</sub> )	+150 °C
	- Temperature Max (T <sub>s(max)</sub> )	+200 °C
	- Time (Min to Max) (t <sub>s</sub> )	60-120 secs.
<b>Average Ramp Up Rate (Liquidus Temp (T<sub>L</sub>) to Peak)</b>	3 °C/sec. max.	
<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



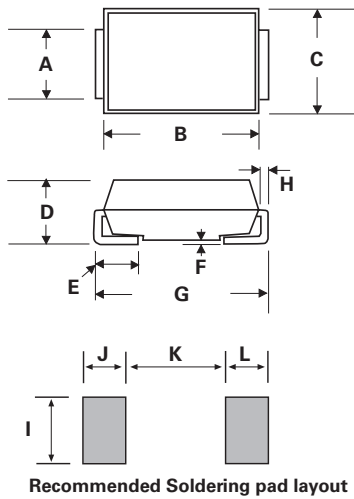
### Environmental Specifications

<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

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

### Dimensions – DO-214AB

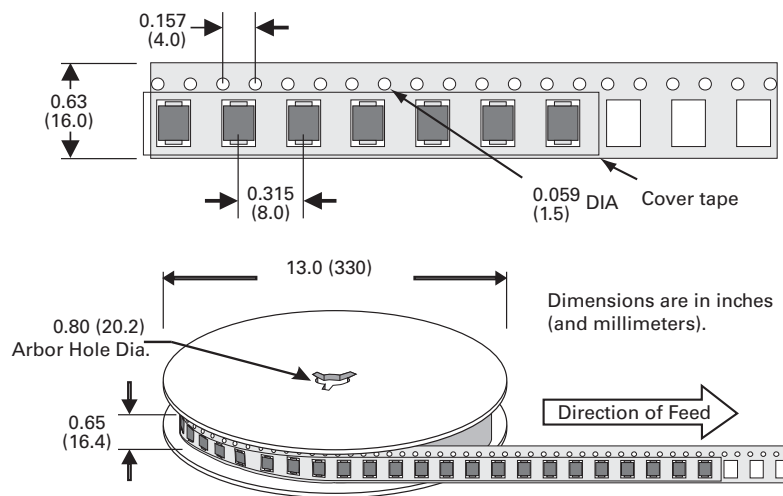


Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.114	0.126	2.900	3.200
B	0.260	0.280	6.600	7.110
C	0.220	0.245	5.590	6.220
D	0.079	0.103	2.060	2.620
E	0.030	0.060	0.760	1.520
F	-	0.008	-	0.203
G	0.305	0.320	7.750	8.130
H	0.006	0.012	0.152	0.305
I	0.129	-	3.300	-
J	0.094	-	2.400	-
K	-	0.165	-	4.200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



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