

# Pxxx0S3G-A Series

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



### Description

The automotive grade Pxxx0S3G-A DO-214AB series protection thyristors are components designed to protect AC power line located in hostile environments from overvoltage transients.

The Pxxx0S3G-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.

Designed to withstand a 4.0 kV (1.2/50 voltage, 8/20 current) combination wave surge per IEC 61000-4-5 and provide both overcurrent and overvoltage protection for the AC line.

### Features and Benefits

- High reliability application and automotive grade AEC-Q101 qualified
- High surge rating 8/20  $\mu$ s 2000 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
- Whisker test is conducted based on JEDEC JESD201A per its table 4a and 4c pass class 1/1A/2
- IEC 61000-4-2 ESD 30 kV(Air), 30 kV (Contact)
- UL recognized compound meeting flammability rating V-0
- Component properties do not degrade after multiple surge events within its limits
- 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)
- Recognized to UL 497B as an isolated loop circuit protector

### Agency Approvals

Agency	Agency File Number
	E133083

### Schematic Symbol



### 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

### Electrical Characteristics

Part Number	Marking	$V_{DRM}$	$V_S$	$I_H$	$I_S$	$I_T$	$V_T$	Capacitance		$I_{PP}$	Surge life (6KV 1,2/50us 3kA 8/20us, 1minute combination wave Pulse Withstand)
		@ $I_{DRM} = 5 \mu A$	@ 100 V/ $\mu$ s	mA min	mA max	A max	@ $I_T = 2.2 A$	@ 1 MHz, 2V bias	8/20 <sup>1</sup>		
		V min	V max	min	max		V max	pf min	pf max	A min	No. of Pulses
P2600S3GLRP-A	P26G	220	300	50	800	2.2	4	150	450	2000	40
P3100S3GLRP-A	P31G	275	350	50	800	2.2	4	150	450		
P3500S3GLRP-A	P35G	320	400	50	800	2.2	4	150	450		
P3800S3GLRP-A	P38G	350	430	50	800	2.2	4	150	450		

**Notes:**

1. Current waveform in  $\mu$ s.
  2. Voltage waveform in  $\mu$ s
- Absolute maximum ratings measured at  $T_A = 25^\circ C$  (unless otherwise noted).
  - Components are bi-directional (unless otherwise noted).
  - Peak pulse current rating (IPP) is repetitive and guaranteed for the life of the product.
  - IPP ratings applicable over temperature range of  $-40^\circ C$  to  $+85^\circ C$
  - The device must initially be in thermal equilibrium with  $-40^\circ C < T_J < +150^\circ C$


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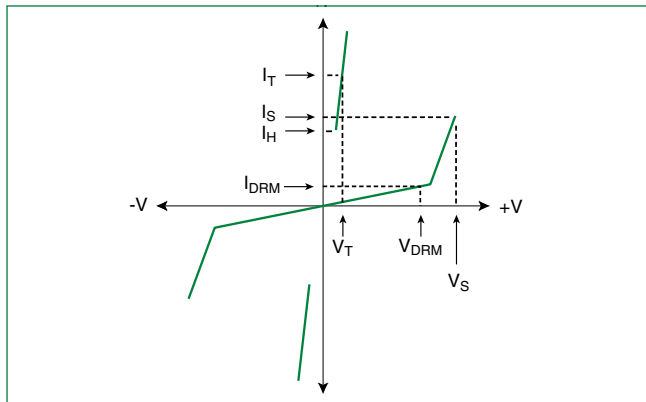
### Surge Ratings

Series	$I_{TSM}$ 50 / 60 Hz	di/dt
	A min	A/ $\mu$ s max
G	250	420

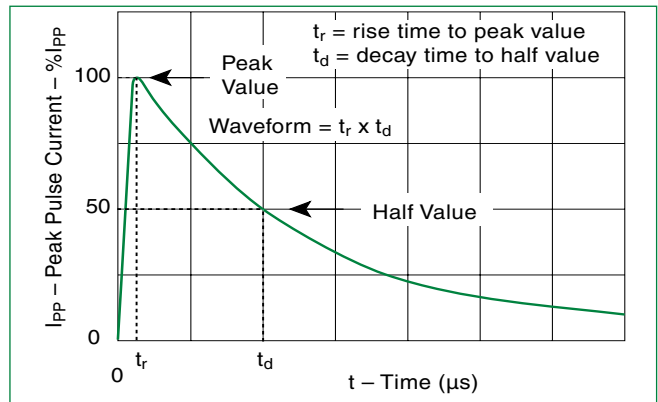
### Thermal Considerations

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

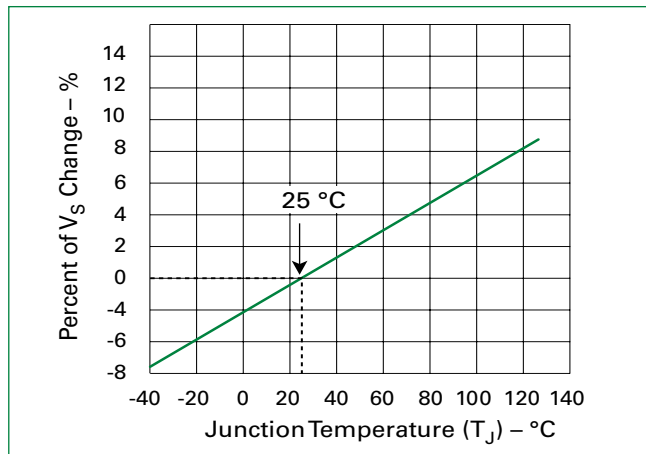
### V-I Characteristics



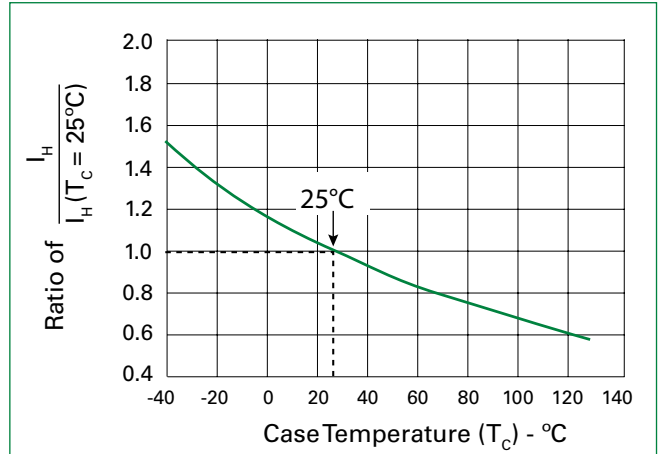
### tr x td Pulse Waveform



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



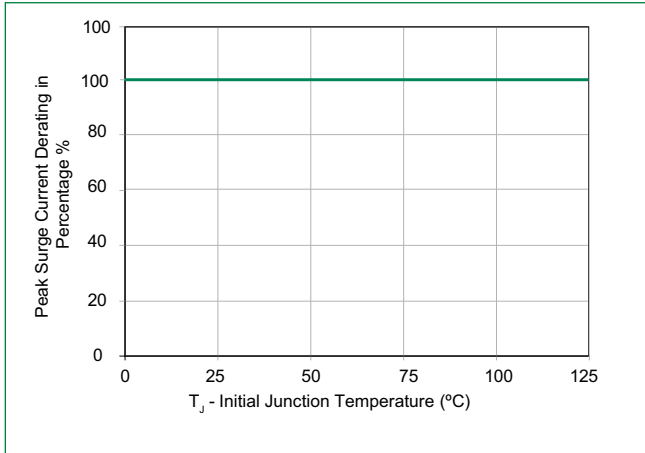
### Normalized DC Holding Current vs. Case Temperature



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### Peak Surge Current Derating Curve

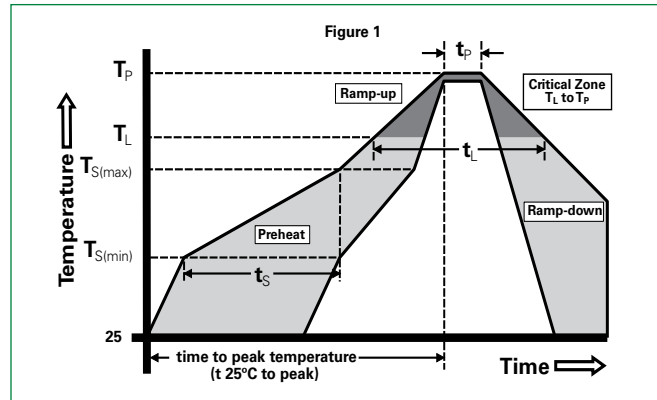


### Physical Specifications

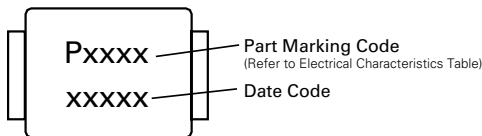
<b>Weight</b>	0.007 ounce, 0.21 grams
<b>Case</b>	JEDEC DO214AB. Molded component over glass passivated junction
<b>Polarity</b>	Uni-directional products are denoted with a cathode band
<b>Terminal</b>	Matte tin-plated leads, solderable per JESD22-B102

### Soldering Parameters

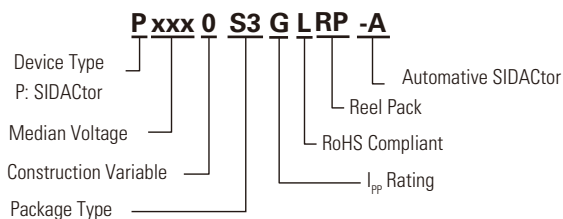
<b>Reflow Condition</b>	Pb-free assembly (see Fig. 1)	
<b>Pre Heat</b>	- Temperature Min ( $T_{s(min)}$ )	+150 °C
	- Temperature Max ( $T_{s(max)}$ )	+200 °C
	- Time (Min to Max) ( $t_s$ )	60-120 secs.
<b>Average Ramp Up Rate (Liquidus Temp (<math>T_L</math>) to Peak)</b>	3 °C/sec. max.	
<b><math>T_{s(max)}</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	



### Part Marking



### Part Numbering



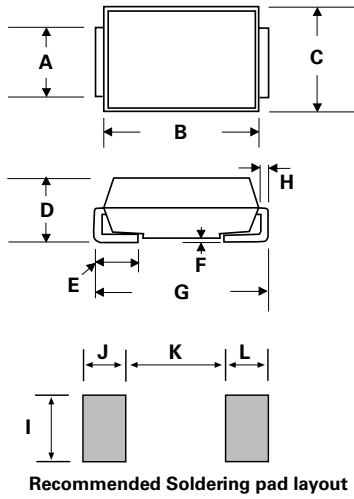
### Environmental Specifications

<b>High Temp Voltage Blocking</b>	80 % rated $V_{DRM}$ ( $V_{A, Peak}$ ) +125 °C, 504 or 1008 hrs. MIL-STD-750 (Method 1040) JEDEC, JESD22-A-101
<b>Temp Cycling</b>	-55 °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>	80 % rated $V_{DRM}$ (+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>Unbiased HAST</b>	96 hrs. at $T_s = 130$ °C/85 %RH or 264 hrs. at $T_s = 110$ °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

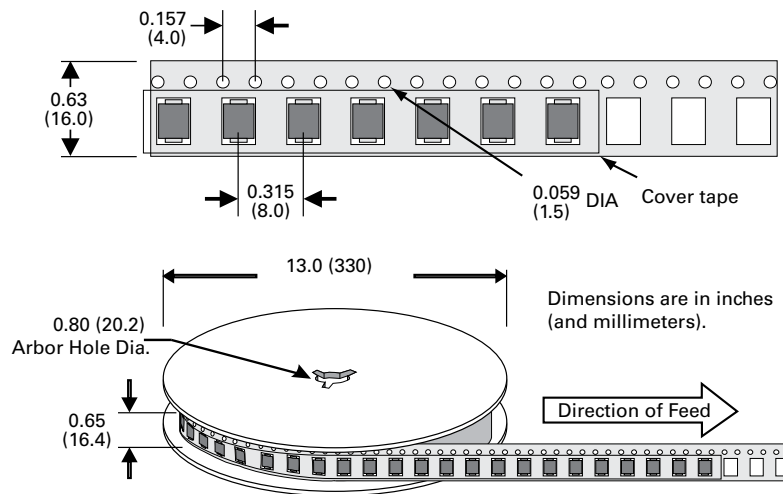


Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.114	0.126	2.900	3.200
B	0.260	0.280	6.600	7.110
C	0.220	0.245	5.590	6.220
D	0.079	0.103	2.060	2.620
E	0.030	0.060	0.760	1.520
F	-	0.008	-	0.203
G	0.305	0.320	7.750	8.130
H	0.006	0.012	0.152	0.305
I	0.129	-	3.300	-
J	0.094	-	2.400	-
K	-	0.165	-	4.200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

### Packing Option

Part number	Component Package	Quantity	Packaging Option	Packaging Specification
Pxxx0S3GLRP-A	DO-214AB	3000	Tape & Reel - 16 mm tape/13" reel	EIA STD RS-481

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



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