

# Pxxx0SD

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



### Web Resources



Download ECAD models, order samples, and find technical resources at [www.littelfuse.com](http://www.littelfuse.com)

### Agency Approvals

Agency	Agency File Number
	E133083

### Schematic Symbol



### Pinout Designation

Not Applicable

### Description

Pxxx0SD Series are SIDACtor® thyristors designed to protect equipment located in hostile environments from overvoltage transients.

The series provides a 200A 10/1000 rated surge current capability that enables equipment to comply with enhanced surge requirements now specified in regulatory and customer requirements.

### Features & Benefits

- Low voltage overshoot
- Low on-state voltage
- Does not degrade surge capability after multiple surge events within limit.
- Fails short circuit when surged in excess of ratings
- 200A 10/1000 Surge Rating
- 1000A 2/10 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-STD-609A.01)
- UL Recognized to UL 497B
- Aids compliance to 2 kV CWG surge per IEC 61000-4-5 when used in series with an appropriate OVP clamp device\*

**Note:** \* SIDACtor connected in-series with a Littelfuse MOV and this complete circuit provides both overcurrent and overvoltage protection for the AC line.

### Applicable Global Standards

- TIA-968-A
- TIA-968-B
- ITU K.20/21/45 Enhanced Level
- ITU K.20/21/45 Basic Level
- GR 1089 Inter-building
- GR 1089 Intra-building
- IEC 61000-4-5 2nd edition
- YD/T 1082
- YD/T 993
- YD/T 950

### Electrical Characteristics

Part Number	Marking	$V_{DRM}$ @ $I_{DRM}=5\mu A$	$V_s$ @ 100V/ $\mu s$	$I_H$	$I_s$	$I_{T^{**}}$	$V_T$ @ $I_T=2.2A$	Capacitance @ 1MHz, 2V bias	
		V min	V max	mA min	mA max	A max	V max	pf min	pf max
P0080SDLRP	P-8D	6	25	50	800	2.2	4	50	150
P0640SDLRP	P06D	58	77	50	800	2.2	4	100	160
P0720SDLRP	P07D	65	88	50	800	2.2	4	100	150
P0900SDLRP	P09D	75	98	50	800	2.2	4	95	140
P1100SDLRP	P11D	90	130	50	800	2.2	4	75	115
P1300SDLRP	P13D	120	160	50	800	2.2	4	65	100
P1500SDLRP	P15D	140	180	50	800	2.2	4	60	90
P1800SDLRP	P18D	170	220	50	800	2.2	4	50	90
P2300SDLRP	P23D	190	260	50	800	2.2	4	50	80
P2600SDLRP	P26D	220	300	50	800	2.2	4	50	75
P3100SDLRP	P31D	275	350	50	800	2.2	4	45	70
P3500SDLRP	P35D	320	400	50	800	2.2	4	45	65

#### Notes:

- Absolute maximum ratings measured at  $T_c=25^\circ C$  (unless otherwise noted).

- Components are bi-directional (unless otherwise noted).

\*\* Will meet 4.4A power cross requirement without fire hazard.

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


### Surge Ratings

Series	0.2/310 <sup>1</sup>	2/10 <sup>1</sup>	8/20 <sup>1</sup>	10/160 <sup>1</sup>	10/560 <sup>1</sup>	5/320 <sup>1</sup>	10/360 <sup>1</sup>	10/1000 <sup>1</sup>	5/310 <sup>1</sup>	I <sub>TSM</sub> 50/60 Hz	di/dt
	0.5/700 <sup>2</sup>	2/10 <sup>2</sup>	1.2/50 <sup>2</sup>	10/160 <sup>2</sup>	10/560 <sup>2</sup>	9/720 <sup>2</sup>	10/360 <sup>2</sup>	10/1000 <sup>2</sup>	10/700 <sup>2</sup>		
	A min	A min	A min	A min	A min	A min	A min	A min	A min	A min	A/μs max
D	—	1000	800 <sup>3</sup>	—	—	—	—	200	350	50	1000

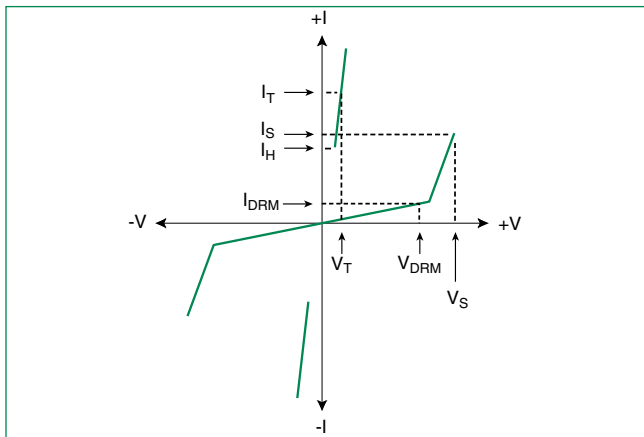
**Notes:**

- Current waveform in μs
  - Voltage waveform in μs
  - Designed to withstand a 2.0 kV (1.2/50 voltage, 8/20 current) combination wave surge per IEC 61000-4-5 level 3 when used in series with an appropriate overvoltage clamp device. (Detail refer to file "High Power Semiconductor Crowbar Protector for AC Power Line Applications"
- Peak pulse current rating (IPP) is repetitive and guaranteed for the life of the product that remains in thermal equilibrium.
  - IPP ratings applicable over temperature range of -40°C to +85°C
  - The component must initially be in thermal equilibrium with -40°C < T<sub>J</sub> < +150°C

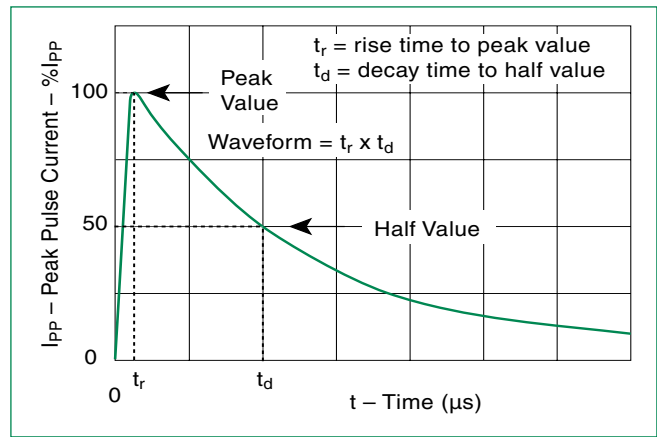
### Thermal Considerations

Package	Symbol	Parameter	Value	Unit
 DO-214AA	T <sub>J</sub>	Operating Junction Temperature Range	-40 to +150	°C
	T <sub>S</sub>	Storage Temperature Range	-65 to +150	°C
	R <sub>θJA</sub>	Thermal Resistance: Junction to Ambient	90	°C/W

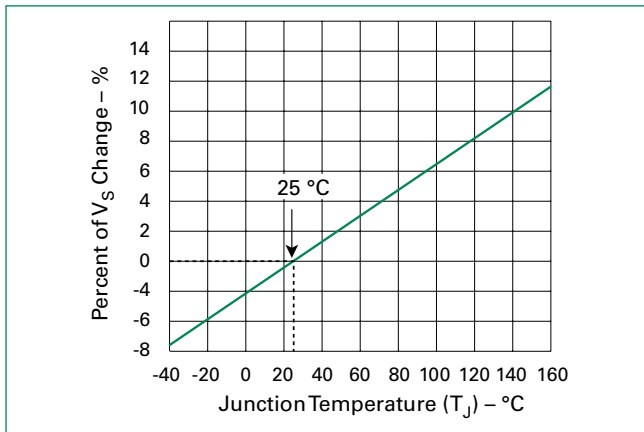
### V-I Characteristics



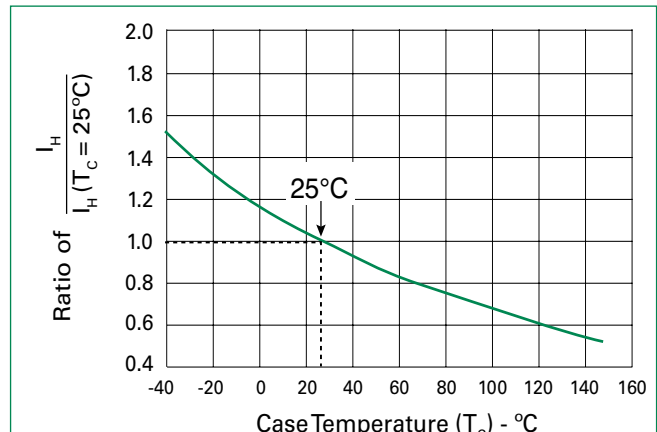
### tr x td Pulse Waveform



### Normalized V<sub>S</sub> Change vs. Junction Temperature



### Normalized DC Holding Current vs. Case Temperature

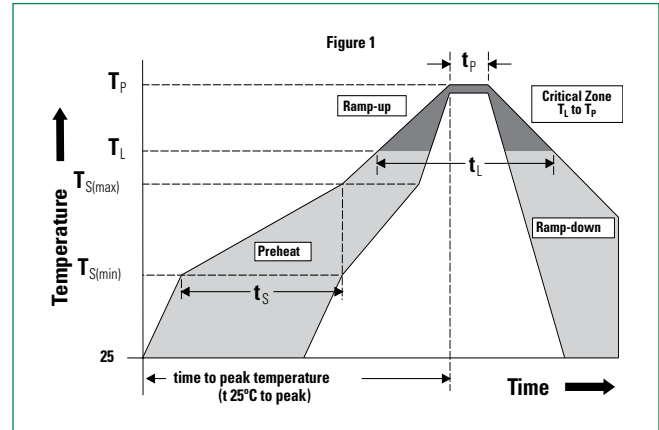


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## High Surge Current SIDACtor® - DO-214AA

### 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) ( $t_s$ )	60-180 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



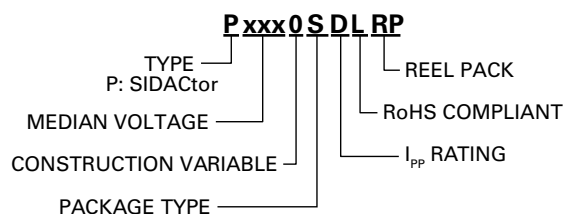
### Physical Specifications

<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 per UL 94

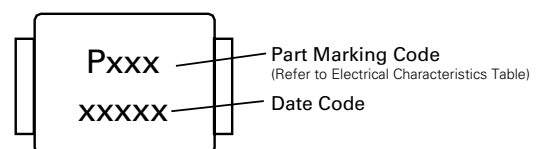
### Environmental Specifications

<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



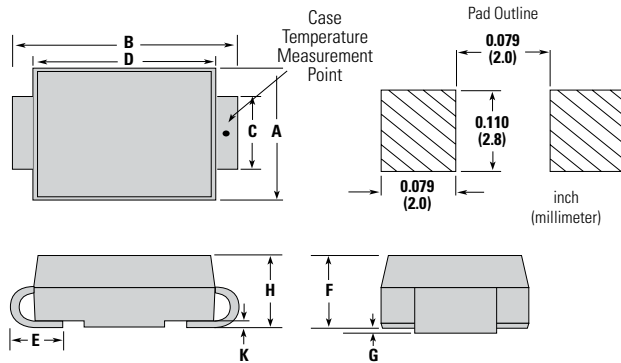
### Part Marking



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

### Dimensions – DO-214AA

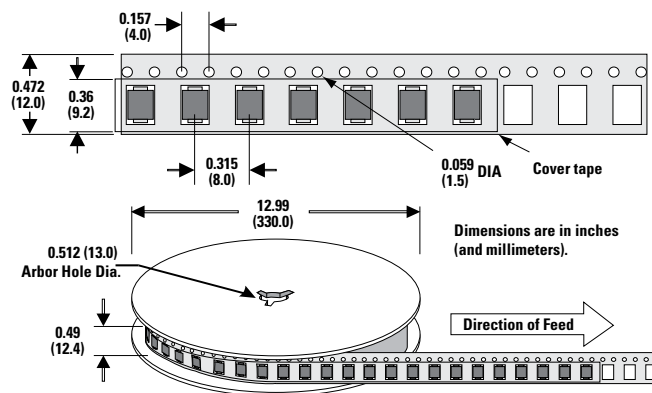


Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.130	0.156	3.30	3.95
B	0.201	0.220	5.10	5.60
C	0.077	0.087	1.95	2.20
D	0.159	0.181	4.05	4.60
E	0.030	0.063	0.75	1.60
F	0.075	0.096	1.90	2.45
G	0.002	0.008	0.05	0.20
H	0.077	0.104	1.95	2.65
K	0.006	0.016	0.15	0.41

### Packing Options

Package Type	Description	Quantity	Added Suffix	Industry Standard
S	DO-214AA Tape and Reel Pack	2500	RP	EIA-481-D

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



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