Pxxx0S3G-A Series

High Surge Current SIDACtor® - DO-214AB

AUTOMOTIVE GRADE HF RoHS

Agency Approvals

Agency	Agency File Number
	E133083

Schematic Symbol

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 VS 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 µs 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 2nd 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

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 edition
- YD/T 1082
- YD/T 993
- YD/T 950

Electrical Characteristics

Part Number	Marking	V_{DRM} @I_{DRM} = 5 µA	V_S @100 V/µs	I_H	I_S	I_T	V_T @I_T = 2.2 A	Capacitance @1 MHz, 2 V bias		I_{PP} 8/20[1] 1.2/50 [2]	Surge life (6KV 1,2/50us 3kA 8/20us, 1minute between pulses. Combination wave Pulse Withstand
				mA min	mA max	A max					
		V min	V 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 µs.
2. Voltage waveform in µs
- Absolute maximum ratings measured at TA= 25°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°C to +85°C
- The device must initially be in thermal quilibrium with -40°C < TJ < +150°C

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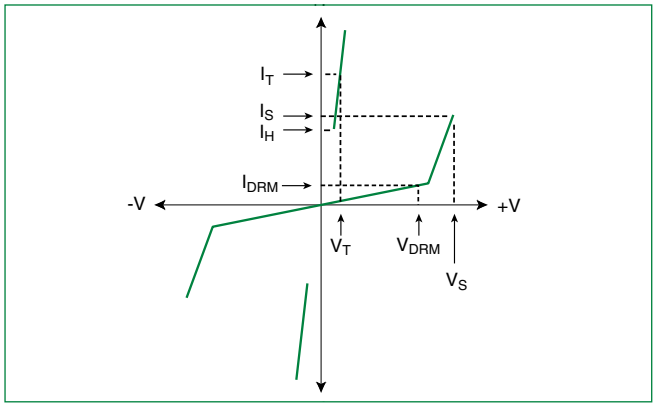
Surge Ratings

Series	I_{TSM} 50 / 60 Hz	di/dt
	A min	A/µs max
G	250	420

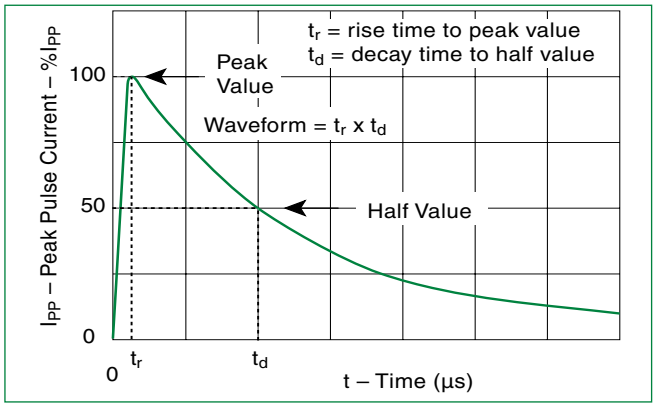
Thermal Considerations

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

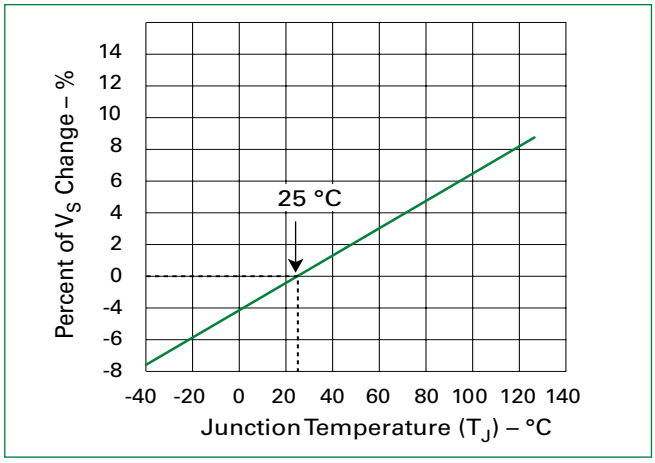
V-I Characteristics



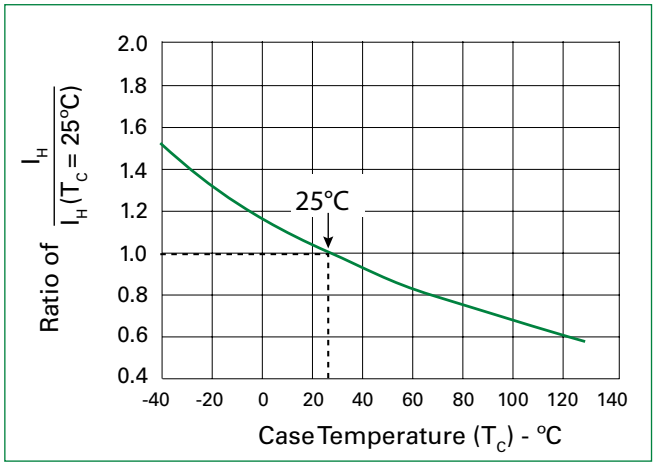
tr x td Pulse Waveform



Normalized VS Change vs. Junction Temperature



Normalized DC Holding Current vs. Case Temperature



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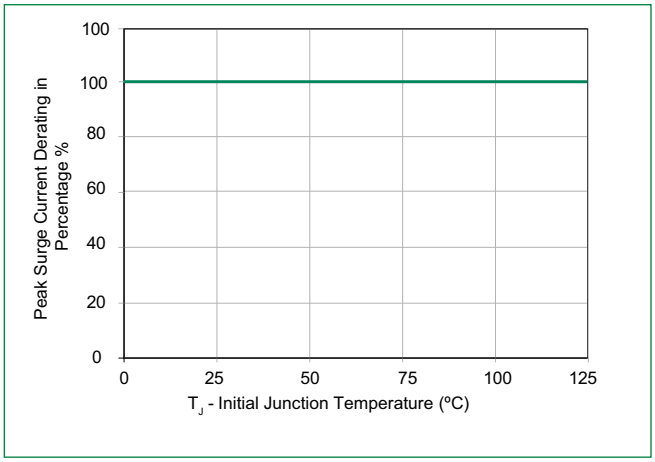
Peak Surge Current Derating Curve



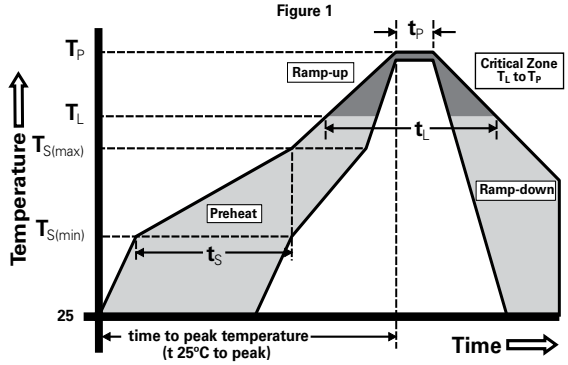
Physical Specifications

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

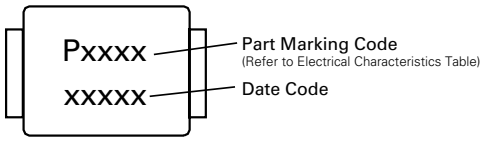
Soldering Parameters

Reflow Condition		Pb-free assembly (see Fig. 1)
Pre Heat	- Temperature Min ($T_{s(min)}$)	+150 °C
	- Temperature Max ($T_{s(max)}$)	+200 °C
	- Time (Min to Max) (t_s)	60-120 secs.
Average Ramp Up Rate (Liquidus Temp (T_L) to Peak)		3 °C/sec. max.
$T_{S(max)}$ to T_L - Ramp-up Rate		3 °C/sec. max.
Reflow	- Temperature (T_L) (Liquidus)	+217 °C
	- Temperature (t_L)	60-150 secs.
Peak Temp (T_P)		+260 (+0/-5) °C
Time Within 5 °C of Actual Peak Temp (t_p)		30 secs. max.
Ramp-down Rate		6 °C/sec. max.
Time 25 °C to Peak Temp (T_P)		8 min. max.
Do Not Exceed		+260 °C

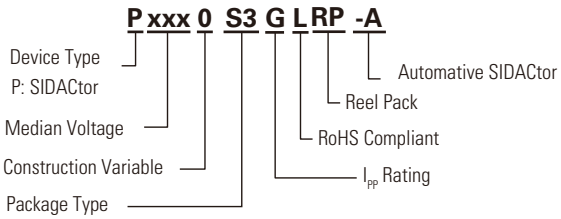
Figure 1



Part Marking



Part Numbering



Environmental Specifications

High Temp Voltage Blocking	80 % rated V_{DRM} (V_{AC} Peak) +125 °C, 504 or 1008 hrs. MIL-STD-750 (Method 1040) JEDEC, JESD22-A-101
Temp Cycling	-55 °C to -150 °C, 15 min. dwell, 10 up to 100 cycles. MIL-STD-750 (Method 1051) EIA/JEDEC, JESD22-A104
Biased Temp & Humidity	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
High Temp Storage	+150 °C 1008 hrs. MIL-STD-750 (Method 1031) JEDEC, JESD22-A-101
Low Temp Storage	-65 °C, 1008 hrs.
Unbiased HAST	96 hrs. at T_A = 130 °C/85 %RH or 264 hrs. at T_A = 110 °C/85 %RH. TEST before and after UHAST, JEDEC, JESD22-A-118
Resistance to Solder Heat	+260 °C, 30 secs. MIL-STD-750 (Method 2031)
Moisture Sensitivity Level	85 %RH, +85 °C, 168 hrs., 3 reflow cycles (+260 °C Peak). JEDEC-J-STD-020, Level 1

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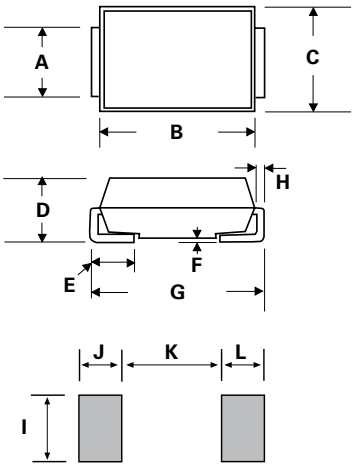
Dimensions — DO-214AB



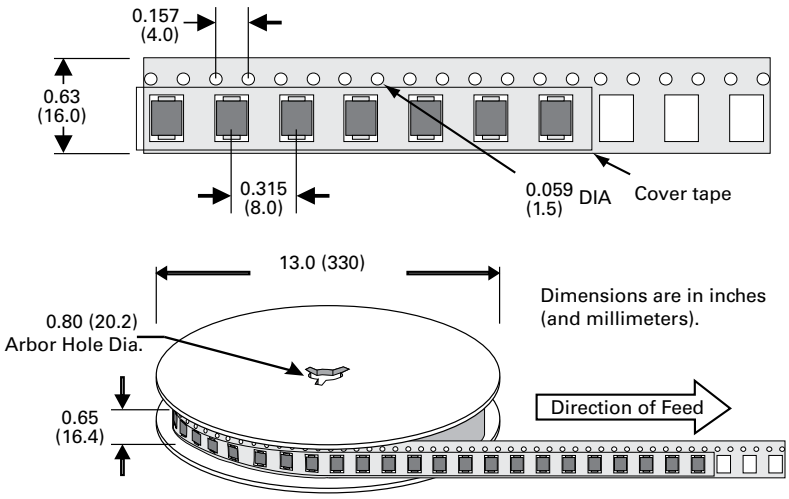
Recommended Soldering pad layout

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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