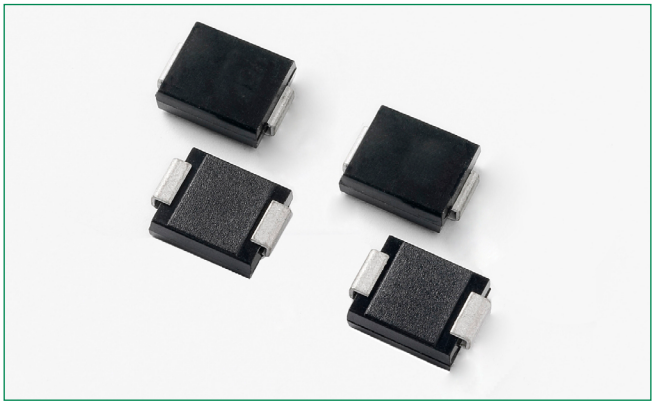
Pxxx0S3H Series

High Surge Current SIDACtor® - DO-214AB



Description

The Pxxx0S3H series DO-214AB protection thyristors are components designed to protect equipment located in hostile environments from overvoltage transients.

The Pxxx0S3H series protect exposed interfaces in industrial and ICT applications, such as RS-485 data interfaces, AC or DC power supplies. These components' switching voltage V_S are much lower than alternative Gas Discharge Tubes (GDT), and on-state voltage V_T are much lower than alternative GDTs, Metal Oxide Varistors (MOV) and TVS Diodes.

This Pxxx0S3H series are rated 2000 A 8/20 µs, enabling equipment compliance with regulatory and customer surge requirements.

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, 2nd edition
- YD/T 1082
- YD/T 993
- YD/T 950

Features and Benefits

- High surge rating 8/20 µs 2000 A protection
- Component properties do not degrade after multiple surge events within its limits
- SMD low profile surface mount package minimizing PCB footprint
- Low voltage overshoot
- Low on-state voltage
- Typical failure mode is short from over-specified voltage orcurrent
- Whisker test is conducted based on JEDEC JESD201A per its table 4a and 4c passclass 1/2
- IEC 61000-4-2 ESD 30 kV(Air), 30 kV (Contact)
- Recognized compound meeting flammability rating UL94V-0
- 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)

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	
		V min	V max	mA min	mA max	A max	V max	pF typ	pF max
P0640S3HLRP	P06H	58	77	50	800	2.2	4	150	550
P0720S3HLRP	P07H	65	88	50	800	2.2	4	150	550
P0900S3HLRP	P09H	75	98	50	800	2.2	4	150	550
P1100S3HLRP	P11H	90	130	50	800	2.2	4	150	450
P1300S3HLRP	P13H	120	160	50	800	2.2	4	150	450
P1500S3HLRP	P15H	140	180	50	800	2.2	4	150	450
P1900S3HLRP	P19H	155	220	50	800	2.2	4	150	450
P2300S3HLRP	P23H	180	260	50	800	2.2	4	150	450
P2600S3HLRP	P26H	220	300	50	800	2.2	4	150	450
P3100S3HLRP	P31H	275	350	50	800	2.2	4	150	450
P3500S3HLRP	P35H	320	400	50	800	2.2	4	150	450
P3800S3HLRP	P38H	350	430	50	800	2.2	4	150	450

Notes:
- Absolute maximum ratings measured at T_A = 25 °C (unless otherwise noted).
- Components are bi-directional (unless otherwise noted).

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Surge Ratings

Series	I_{PP} 8/20[1] 1.2/50[2]	I_{TSM} 50 / 60 Hz	di/dt
	A min	A min	A/µs max
H	2000	250	1000

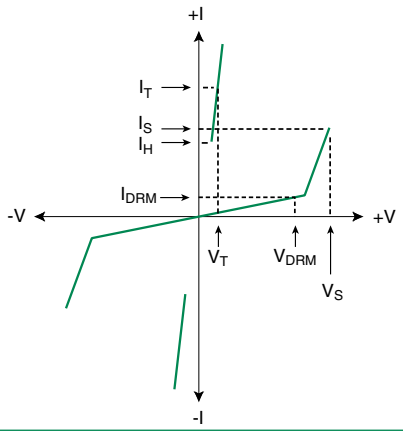
Notes:
1. Current waveform in µs
2. Voltage waveform in µs

- Peak pulse current rating (I_{PP}) is repetitive and guaranteed for the life of the product.
- I_{PP} ratings applicable over temperature range of -40 °C to +85 °C
- The device must initially be in thermal equilibrium with -40 °C ≤ T_J ≤ +150 °C

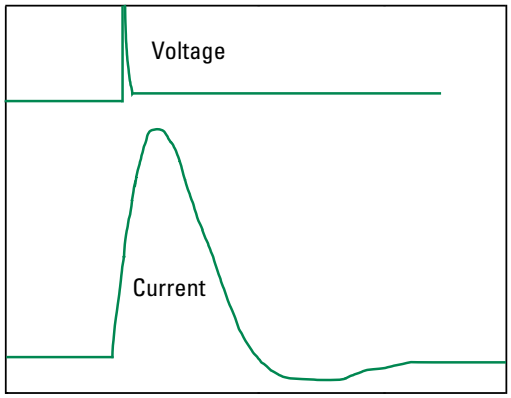
Thermal Considerations

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

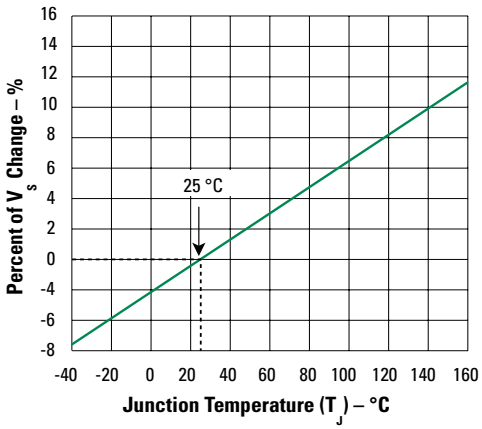
V-I Characteristics



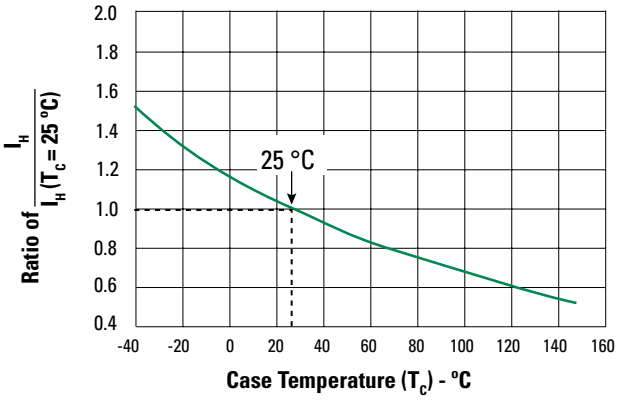
Typical Surge Response (8/20 µs)



Normalized VS Change vs. Junction Temperature



Normalized DC Holding Current vs. Case Temperature



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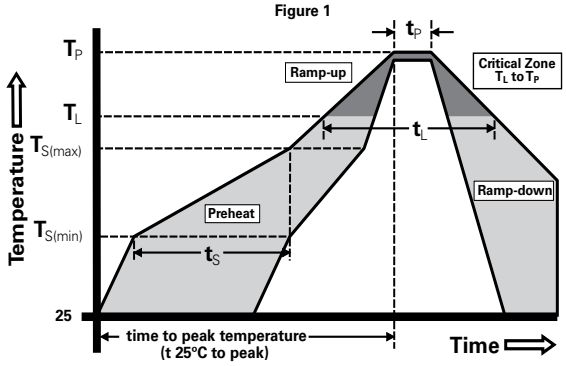
Soldering Parameters

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



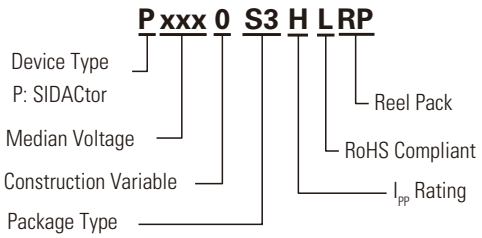
Physical Specifications

Weight	0.009 ounce, 0.266 grams
Case	JEDEC DO-214AA. Molded component over glass passivated junction
Terminal	Matte tin-plated leads, solderable per JESD22-B102

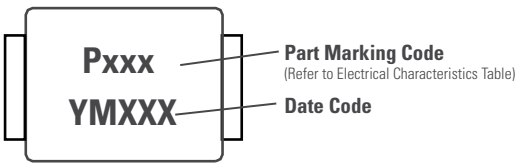
Environmental Specifications

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	-65 °C to +150 °C, 15 min. dwell, 10 up to 100 cycles. MIL-STD-750 (Method 1051) EIA/JEDEC, JESD22-A104
Biased Temp & Humidity	52 V_{DC} (+85 °C) 85 %RH, 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.
UAHST	96 hours at T_A = 130 °C/85 %RH.JEDEC, JESD22-A-101
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

Part Numbering



Part Marking



YMXXX - Trace Code Marking
Y - Year code
M - Month Code
XXX - Lot Code

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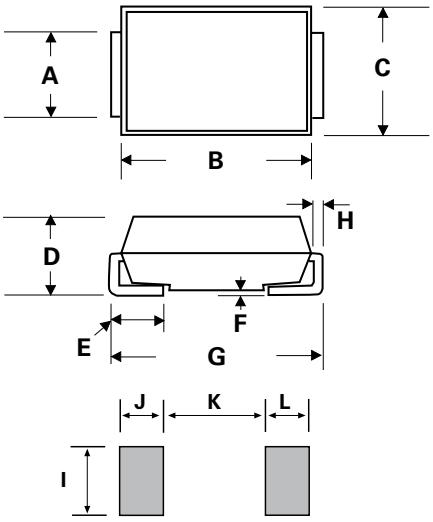
Dimensions



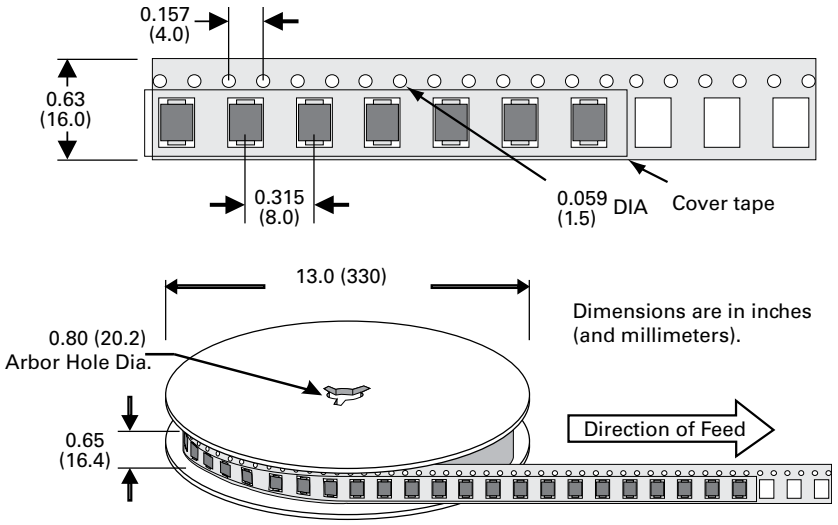
Recommended Soldering pad layout

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 Options

Part number	Component Package	Quantity	Packaging Option	Packaging Specification
Pxxx0S3HLRP	DO-214AB	3000	Tape & Reel - 16 mm tape/13" reel	EIA STD RS-481

Tape and Reel Specification



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