

# P0080LA - P5000LA Series - DO-15

ROHS

@10/700 $\mu$ S, 2KV

## Thyristor Surge Suppressors (TSS)

### Description

P0080LA - P5000LA Series are designed to protect broadband equipment such as modems, line card, CPE and DSL from damaging over-voltage transients.

The series provides a surface mount solution that enables equipment to comply with global regulatory standards.

### Features and 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
- ◆ Low Capacitance

### 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
- ◆ IEC 6100-4-5
- ◆ YD/T 1082
- ◆ YD/T 993
- ◆ YD/T 950

### Electrical Parameters

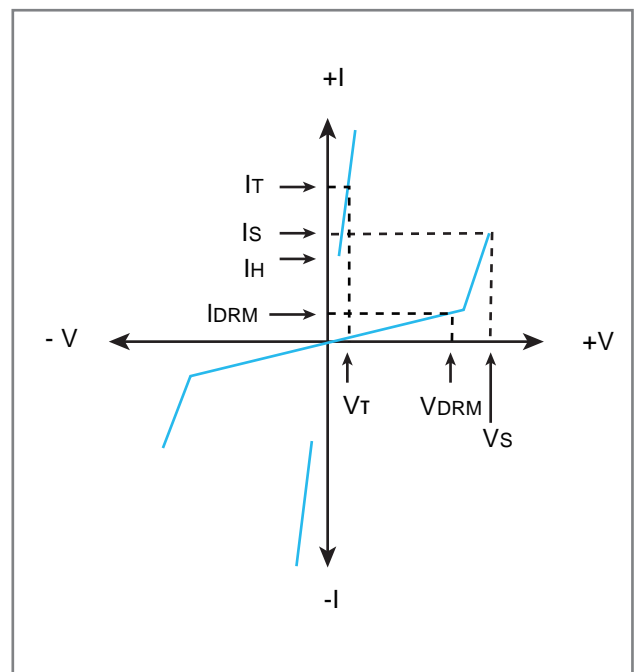
Parameter	Definition
$I_S$	<b>Switching Current</b> - maximum current required to switch to on state
$I_{DRM}$	<b>Leakage Current</b> - maximum peak off-state current measured at $V_{DRM}$
$I_H$	<b>Holding Current</b> - minimum current required to maintain on state
$I_T$	<b>On-state Current</b> - maximum rated continuous on-state current
$V_S$	<b>Switching Voltage</b> - maximum voltage prior to switching to on state
$V_{DRM}$	<b>Peak Off-state Voltage</b> - maximum voltage that can be applied while maintaining off state
$V_T$	<b>On-state Voltage</b> - maximum voltage measured at rated on-state current
$C_0$	<b>Off-state Capacitance</b> - typical capacitance measured in off state



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### Schematic Symbol



### Electrical Characteristics

Part Number	Marking	$V_{DRM}$ @ $I_{DRM}=5\mu A$	$I_{DRM}$	$V_s$ @100V/ $\mu$ S	$I_s$	$V_T$ @ $I_T=2.2A$	$I_T$	$I_H$	$C_o$ @1MHz
		VMin.	$\mu$ AMax.	VMax.	mAMax.	VMax.	AMax.	mAMin.	pFMax.
P0080LA	P008LA	6	5	25	800	4	2.2	50	50
P0300LA	P03LA	25	5	40	800	4	2.2	50	70
P0640LA	P06LA	58	5	77	800	4	2.2	150	50
P0720LA	P07LA	65	5	88	800	4	2.2	150	50
P0900LA	P09LA	75	5	98	800	4	2.2	150	45
P1100LA	P11LA	90	5	130	800	4	2.2	150	45
P1300LA	P13LA	120	5	160	800	4	2.2	150	45
P1500LA	P15LA	140	5	180	800	4	2.2	150	40
P1800LA	P18LA	170	5	220	800	4	2.2	150	40
P2000LA	P20LA	180	5	220	800	4	2.2	150	40
P2300LA	P23LA	190	5	260	800	4	2.2	150	35
P2600LA	P26LA	220	5	300	800	4	2.2	150	35
P3100LA	P31LA	275	5	350	800	4	2.2	150	30
P3500LA	P35LA	320	5	400	800	4	2.2	150	30
P3800LA	P38LA	360	5	460	800	4	2.2	150	30
P4200LA	P42LA	400	5	520	800	4	2.2	150	30
P4500LA	P45LA	420	5	540	800	4	2.2	150	30
P5000LA	P50LA	440	5	600	800	4	2.2	150	30

Notes:

- Absolute maximum ratings measured at TA= 25°C (unless otherwise noted).
- Devices are bi-directional.


### Surge Ratings

Series	2/10 $\mu$ S <sup>1</sup>	8/20 $\mu$ S <sup>1</sup>	10/560 $\mu$ S <sup>1</sup>	10/560 $\mu$ S <sup>1</sup>	10/1000 $\mu$ S <sup>1</sup>	5/320 $\mu$ S <sup>1</sup>	$I_{TSM}$ 50/60Hz	di/dt
	2/10 $\mu$ S <sup>2</sup>	1.2/50 $\mu$ S <sup>2</sup>	10/560 $\mu$ S <sup>2</sup>	10/560 $\mu$ S <sup>2</sup>	10/1000 $\mu$ S <sup>2</sup>	10/700 $\mu$ S <sup>2</sup>		
	A min	A min	A min	A min	A min	A min	A min	Amps/ $\mu$ s max
A	150	150	90	50	45	50	20	500

Notes:

- Current waveform in  $\mu$ s
  - Voltage waveform in  $\mu$ s
- 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 equilibrium with -40°C < TJ < +150°C

### Thermal Considerations

Package	Symbol	Parameter	Value	Unit
	TJ	Operating Junction Temperature Range	- 40 to +150	°C
	Ts	Storage Temperature Range	- 40 to +150	°C
	R $\theta$ JA	Thermal Resistance: Junction to Ambient	90	°C/W

### Characteristic Curves

Figure 1 - V- I Characteristics

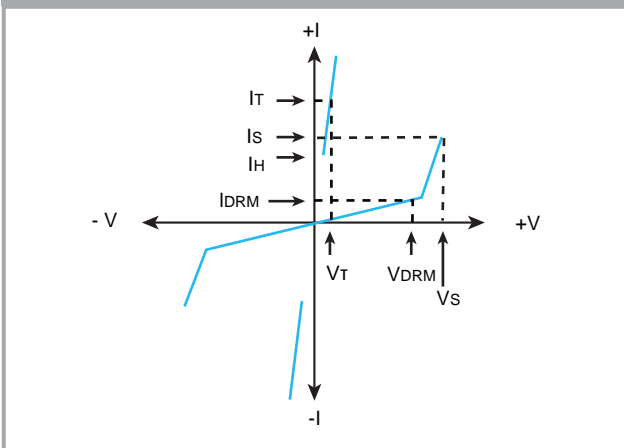


Figure 2 -  $t_r \times t_d$  Pulse Waveform

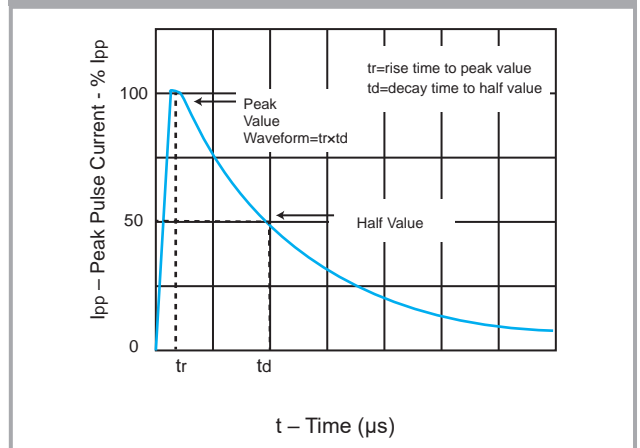


Figure 3 - Normalized VS Change Versus Junction Temperature

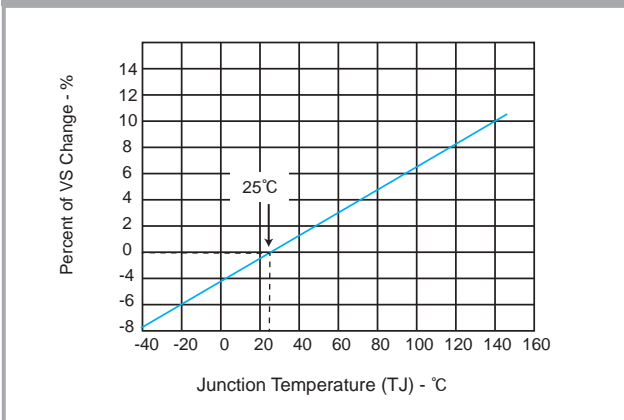
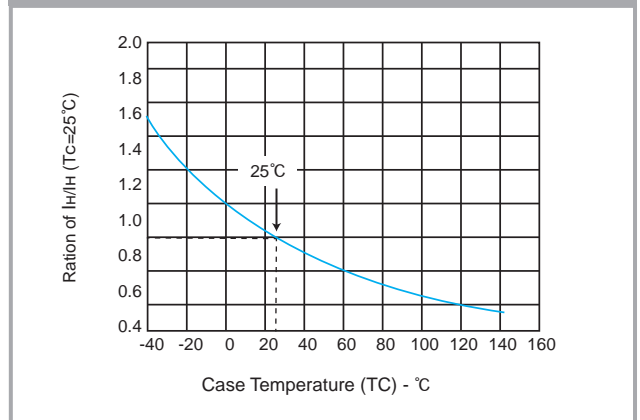


Figure 4 - Normalized DC Holding Current Versus Case Temperature



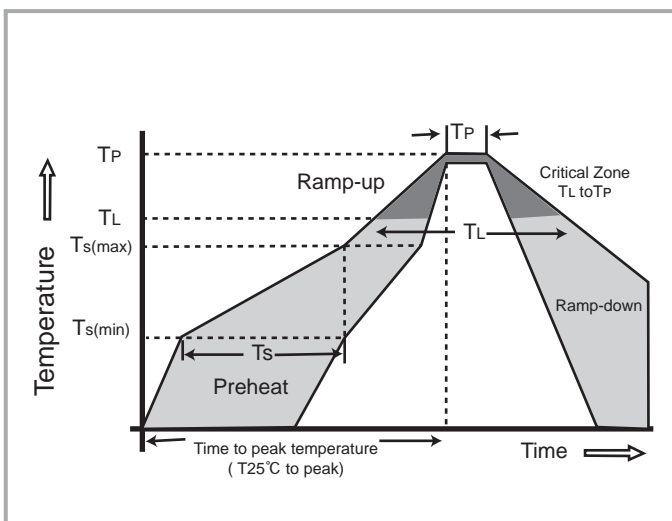
### Environmental Specifications

High Temp Voltage Blocking	80% Rated VDRM (VAC Peak) +125°C or +150°C, Lead Material Copper Alloy High Temp Voltage Blocking 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 VDC (+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.
Thermal Shock	0°C to +100°C, 5 min. dwell, 10 sec. transfer, Thermal Shock 10 cycles. MIL-STD-750 (Method 1056) JEDEC, JESD22-A-106
Autoclave (Pressure Cooker Test)	+121°C, 100%RH, 2atm, 24 up to 168 hrs. EIA/Cooker Test) JEDEC, JESD22-A-102
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 Level (+260°C Peak). JEDEC-J-STD-020, Level 1

### Physical Specifications

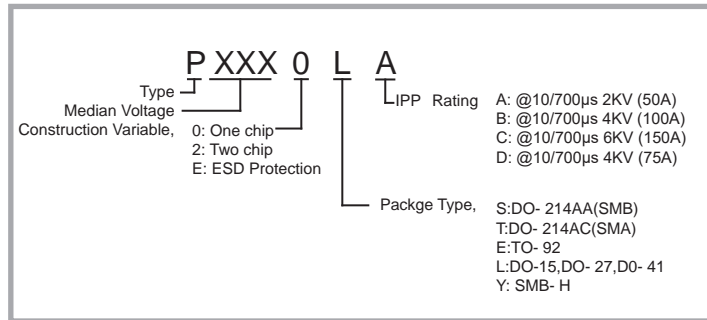
Lead Material	Copper Alloy
Terminal Finish	100% Matte-Tin Plated
Body Material	UL recognized epoxy meeting flammability classification 94V-0

### Soldering Parameters

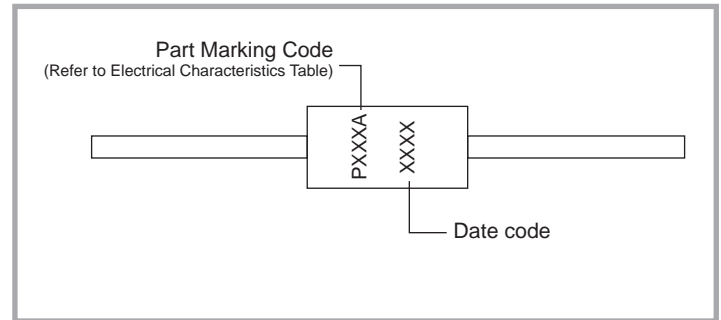


Reflow Condition		Lead-free assembly
Pre Heat	-Temperature Min (Ts(min))	+150°C
	-Temperature Max (Ts(max))	+200°C
	- Time (min to max) (Ts)	60 -180 Seconds
Average ramp up rate ( Liquidus Temp TL) to peak		3°C/Second max
Ts(max) to TL - Ramp-up Rate		5°C/Second max
Reflow	- Temperature (TL) (Liquidus)	217°C
	- Time (min to max) (Ts)	60 -150 Seconds
Peak Temperature (TP)		260 +0/-5°C
Time within 5°C of actual peak Temperature (TP)		30 Seconds Max
Ramp-down Rate		6°C/Second Max
Time 25°C to peak Temperature (TP)		8 minutes Max
Do not exceed		+260°C

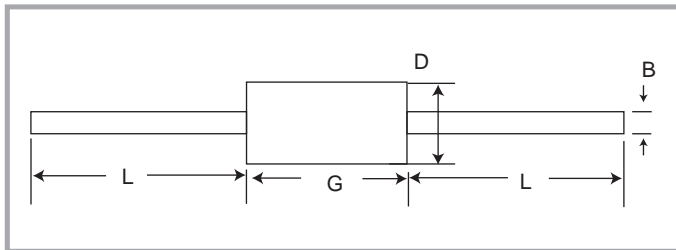
### Part Numbering



### Part Marking



### Dimensions DO-15

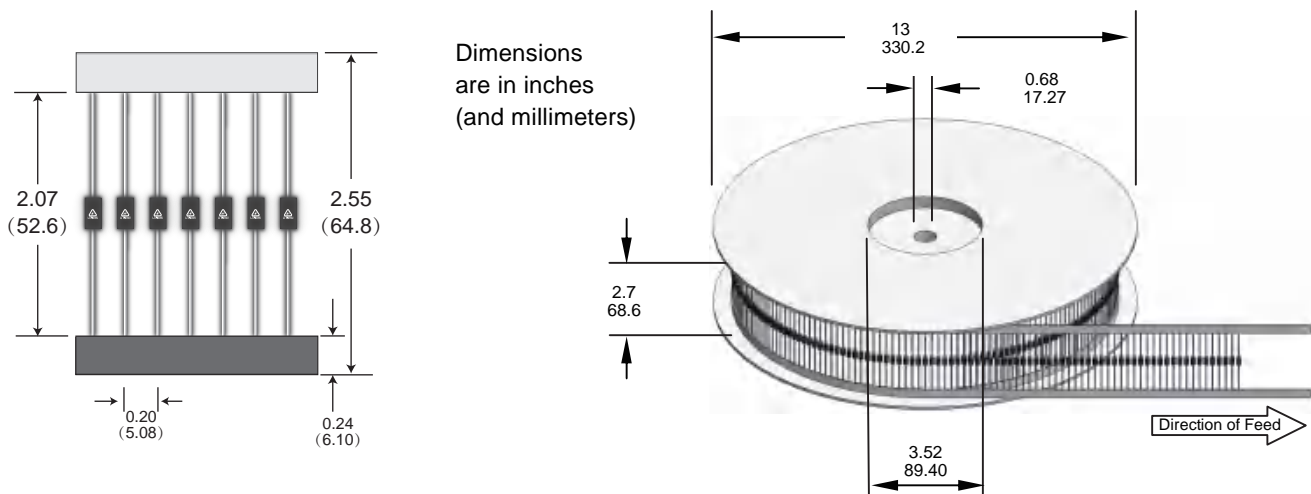


Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
<b>B</b>	0.028	0.035	0.70	0.90
<b>D</b>	0.102	0.140	2.60	3.60
<b>G</b>	0.193	0.220	4.90	5.60
<b>L</b>	1.000		25.40	

### Packaging

Part Number	Description	Quantity	Industry Standard
Pxxx0LA	DO-15 Axial Tape & Reel	5000	EIA-RS-296-D
	DO-15 Bulk Pack	500	N/A

### Tape and Reel Specifications DO-15



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