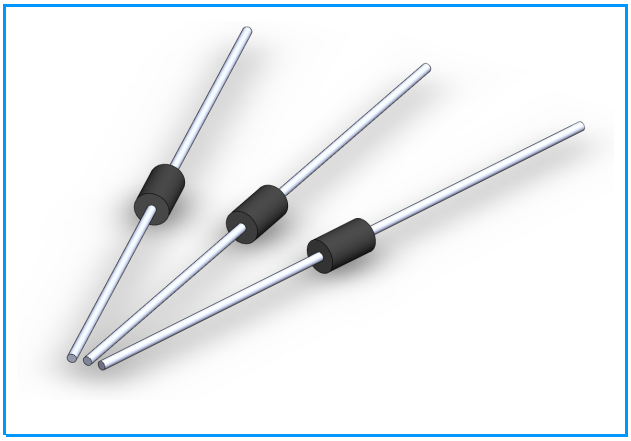
Thyristor Surge Suppressors (TSS)

P0080LA - P5000LA Series - DO-41 @10/700µS , 2KV

Description

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

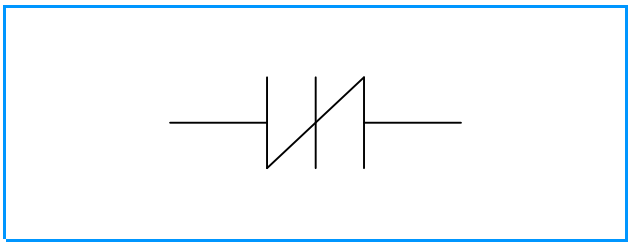
The series provides a surface mount solution that enables equipment to comply with global regulatory standards.



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

Schematic Symbol

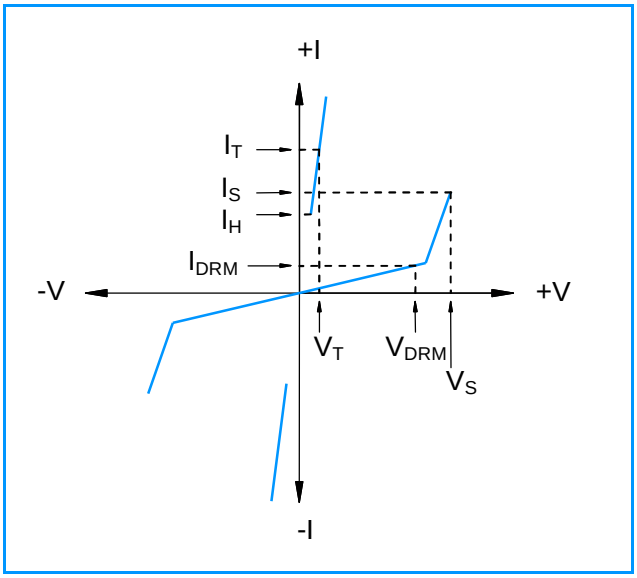


Applicable Global Standards

- TIA-968-A TIA-968-B
- ITU K.20/21 Enhanced level
- ITU K.20/21 Basic Level
- GR 1089 Inter building
- GR 1089 Inter building
- IEC 6100-4-5
- YD/T 1082
- YD/T 993
- YD/T 950

Electrical Parameters

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



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Electrical Characteristics

Part Number	Marking	V_{DRM} @I_{DRM}=5µA	V_S @100V/µS	V_T @I_T=2.2A	I_S	I_T	I_H	C_0 @1MHz	
		V min	V max	V max	mA max	A max	mA min	pF min	pF max
P0080LA	P008LA	6	25	4	800	2.2	50	25	150
P0300LA	P03LA	25	40	4	800	2.2	50	15	140
P0640LA	P06LA	58	77	4	800	2.2	150	40	60
P0720LA	P07LA	65	88	4	800	2.2	150	35	60
P0900LA	P09LA	75	98	4	800	2.2	150	25	55
P1100LA	P11LA	90	130	4	800	2.2	150	30	50
P1300LA	P13LA	120	160	4	800	2.2	150	25	45
P1500LA	P15LA	140	180	4	800	2.2	150	25	40
P1800LA	P18LA	170	220	4	800	2.2	150	25	35
P2000LA	P20LA	180	220	4	800	2.2	150	20	35
P2300LA	P23LA	190	260	4	800	2.2	150	25	35
P2600LA	P26LA	220	300	4	800	2.2	150	20	35
P3100LA	P31LA	275	350	4	800	2.2	150	20	35
P3500LA	P35LA	320	400	4	800	2.2	150	20	35
P4000LA	P40LA	360	460	4	800	2.2	150	20	35
P4500LA	P45LA	400	540	4	800	2.2	150	20	35
P5000LA	P50LA	440	600	4	800	2.2	150	20	35

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

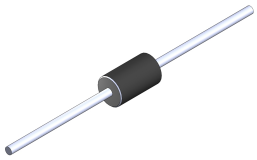
Surge Ratings

Series	2/10µS[1] 2/10µS[2]	8/20µS[1] 1.2/50µS[2]	10/160µS[1] 10/160µS[2]	10/560µS[1] 10/560µS[2]	10/1000µS[1] 10/1000µS[2]	5/310µS[1] 10/700µS[2]	I_{TSM} 50/60 Hz	di/dt
	A min	A min	A min	A min	A min	A min	A min	Amps/µs max
A	150	150	90	50	45	50	20	500

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 -40ºC to +85ºC
- The device must initially be in thermal equilibrium with -40°C < T_J < +150°C

Thermal Considerations

Package	Symbol	Parameter	Value	Unit
DO-41 	T_J	Operating Junction Temperature Range	- 40 to + 150	°C
	T_S	Storage Temperature Range	- 40 to +150	°C
	$R_{\theta JA}$	Thermal Resistance: Junction to Ambient	90	°C/W

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Characteristic Curves

Figure 1 - V-I Characteristics

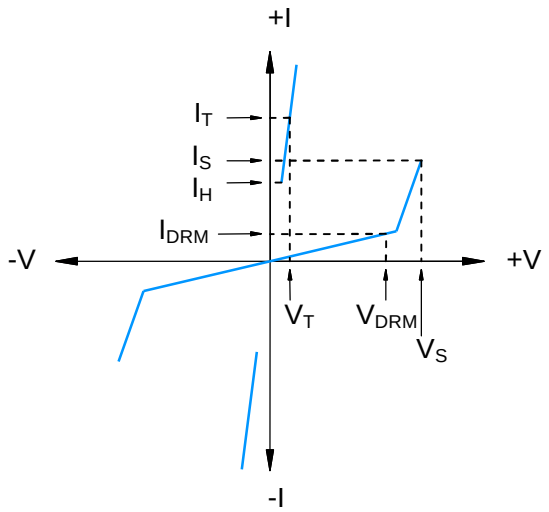


Figure 2 - $t_r \times t_d$ Pulse Waveform

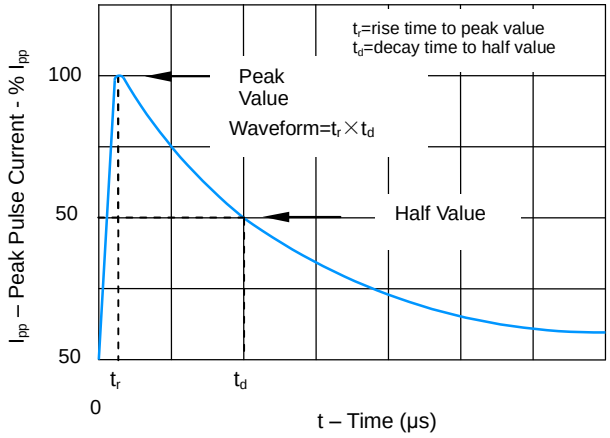


Figure 3 - Normalized V_S Change Versus Junction Temperature

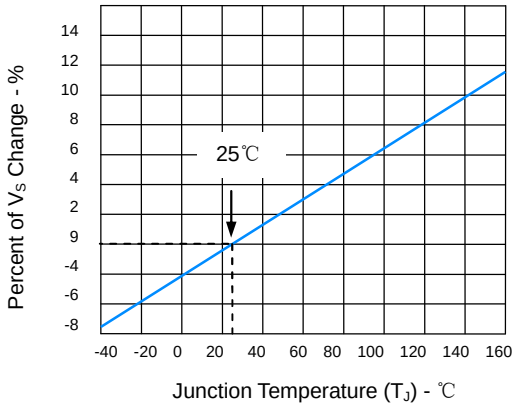
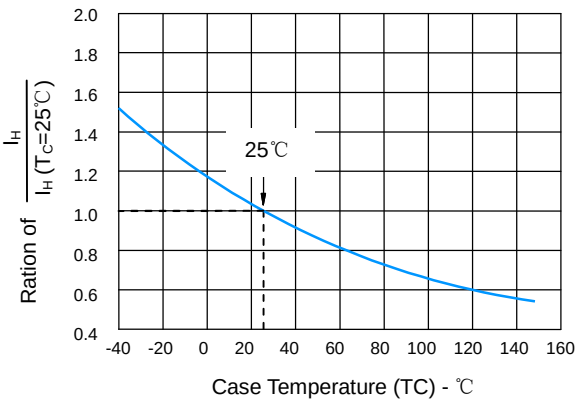


Figure 4 - Normalized DC Holding Current Versus Case Temperature



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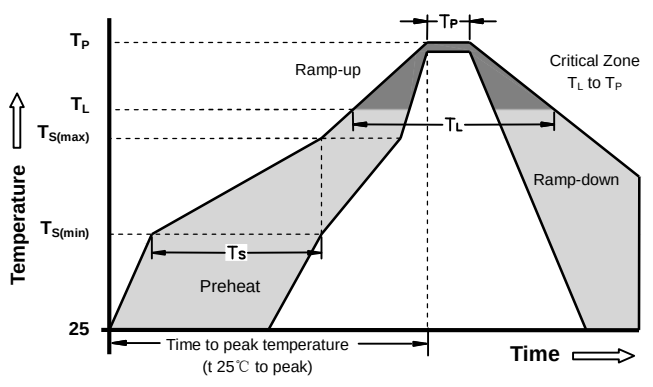
Environmental Specifications

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 ($T_{s(min)}$)	+150°C
	-Temperature Max ($T_{s(max)}$)	+200°C
	-Time (min to max) (t_s)	60 -180 Seconds
Average ramp up rate (Liquidus Temp T_L) to peak		3°C/Second Max
$T_{S(max)}$ to T_L - Ramp-up Rate		3°C/Second Max
Reflow	- Temperature (T_L) (Liquidus)	+217°C
	- Time (min to max) (t_s)	60 -150 Seconds
Peak Temperature (T_P)		260 +0/-5°C
Time within 5°C of actual peak Temperature (t_p)		30 Seconds Max
Ramp-down Rate		6°C/Second Max
Time 25°C to peak Temperature (T_P)		8 minutes Max
Do not exceed		+260°C

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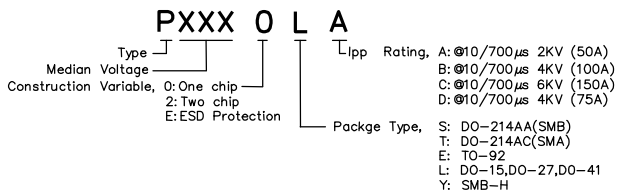
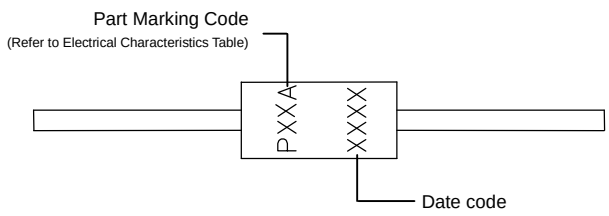
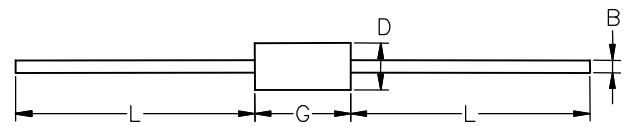
Part Numbering



Part Marking



Dimensions DO-41

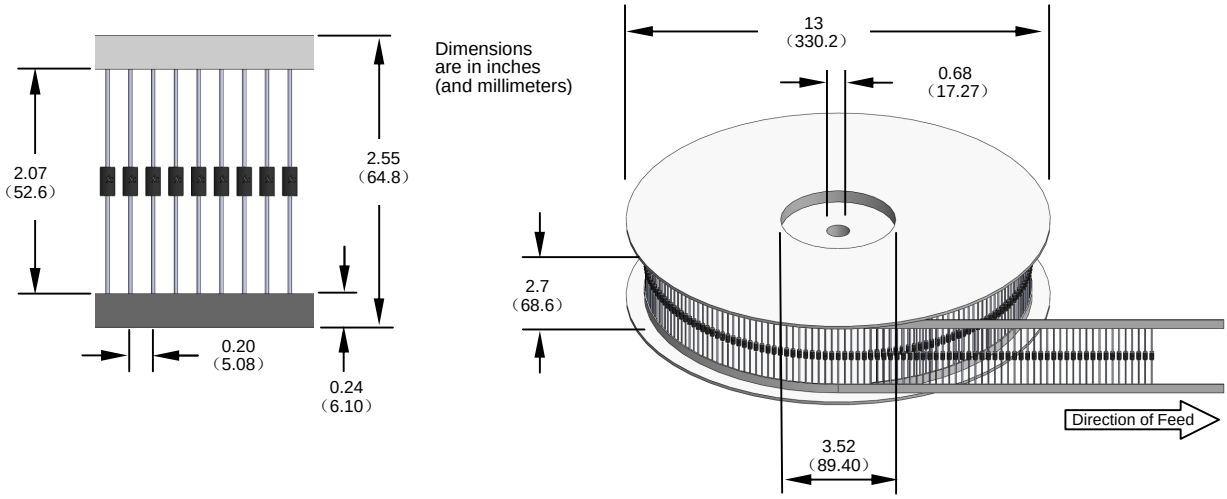


Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
B	0.028	0.035	0.70	0.90
D	0.102	0.140	2.60	3.60
G	0.193	0.220	4.90	5.60
L	1.000		25.40	

Packaging

Part Number	Description	Quantity	Industry Standard
Pxxx0LA	DO-41 Axial Tape & Reel	5000	EIA-RS-296-D
	DO-41 Bulk Pack	500	N/A

Tape and Reel Specifications DO-41



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