P0080LC - P5000LC Series - DO-15

ROHS

@10/700μS，6KV

Thyristor Surge Suppressors (TSS)

www.unsemi.com.tw

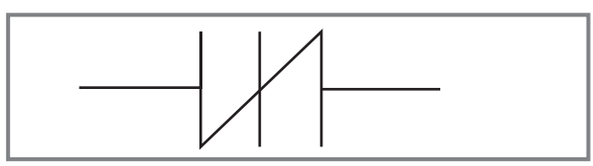
Description

P0080LC - P5000LC 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

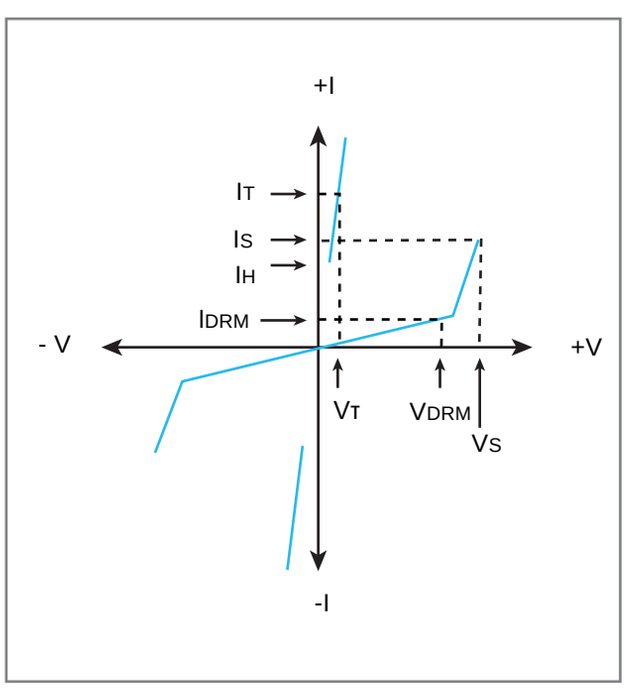


Applicable Global Standards

- TIA-968-A / TIA-968-B
- ITU K.20/21 Enhanced level
- ITU K.20/21 Basic Level
- GR 1089 Inter building
- 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 bcurrent
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	I_{DRM}	V_S @100V/μS	I_S	V_T @IT=2.2A	I_T	I_H	C_O @1MHz
		VMin.	μAMax.	VMax.	mAMax.	VMax.	AMax.	mAMin.	pFMax.
P0080LC	P008LC	6	5	25	800	4	2.2	50	110
P0300LC	P03LC	25	5	40	800	4	2.2	50	110
P0640LC	P06LC	58	5	77	800	4	2.2	150	100
P0720LC	P07LC	65	5	88	800	4	2.2	150	100
P0900LC	P09LC	75	5	98	800	4	2.2	150	90
P1100LC	P11LC	90	5	130	800	4	2.2	150	90
P1300LC	P13LC	120	5	160	800	4	2.2	150	90
P1500LC	P15LC	140	5	180	800	4	2.2	150	85
P1800LC	P18LC	170	5	220	800	4	2.2	150	85
P2000LC	P20LC	180	5	220	800	4	2.2	150	85
P2300LC	P23LC	190	5	260	800	4	2.2	150	80
P2600LC	P26LC	220	5	300	800	4	2.2	150	80
P3100LC	P31LC	275	5	350	800	4	2.2	150	65
P3500LC	P35LC	320	5	400	800	4	2.2	150	65
P3800LC	P38LC	360	5	460	800	4	2.2	150	30
P4200LC	P42LC	400	5	520	800	4	2.2	150	30
P4500LC	P45LC	420	5	540	800	4	2.2	150	30
P5000LC	P50LC	440	5	600	800	4	2.2	150	30

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

Surge Ratings

Series	2/10μS[1]	8/20μS[1]	10/560μS[1]	10/560μS[1]	10/1000μS[1]	5/320μS[1]	I_{TSM} 50/60Hz	di/dt
	2/10μS[2]	1.2/50μS[2]	10/560μS[2]	10/560μS[2]	10/1000μS[2]	10/700μS[2]		
	A min	A min	A min	A min	A min	A min	A min	Amps/μs max
C	500	400	200	150	100	150	50	500

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

- Peak pulse current rating (IPP) is repetitive and guaranteed for the life of the product.
- IPP ratings applicable over temperature range of -40ºC to +85ºC
- The device must initially be in thermal equilibrium with -40°C < TJ < +150°C

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Thermal Considerations

Package	Symbol	Parameter	Value	Unit
DO-15 	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

Characteristic Curves

Figure 1 - V- I Characteristics

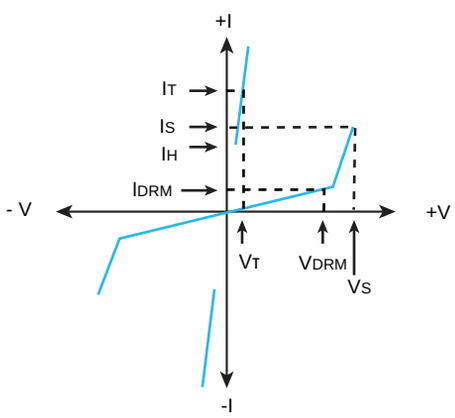


Figure 2 - $t_r \times t_d$ Pulse Waveform

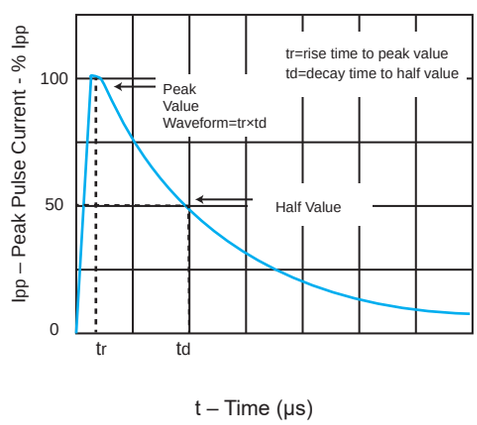


Figure 3 - Normalized VS Change Versus Junction Temperature

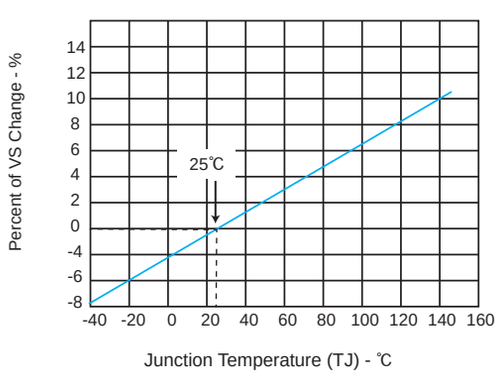
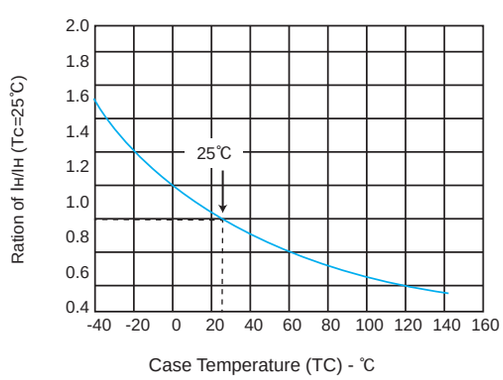


Figure 4 - Normalized DC Holding Current Versus Case Temperature



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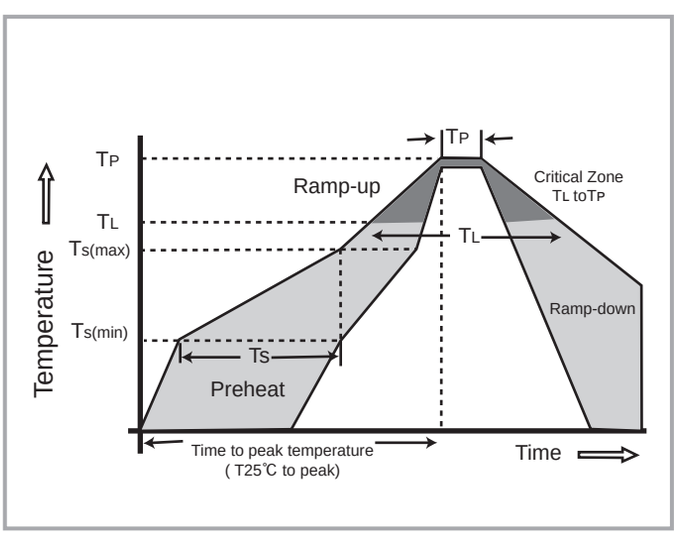
Environmental Specifications

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 Cycing	-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

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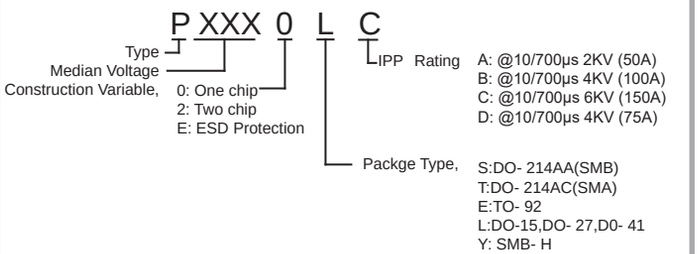
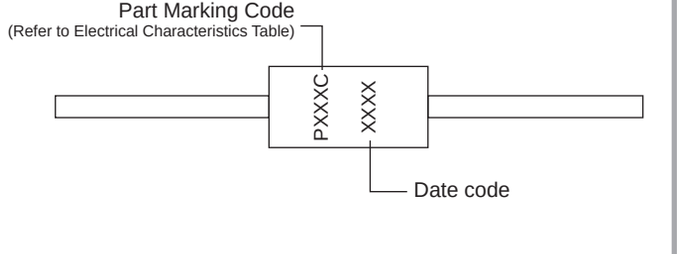
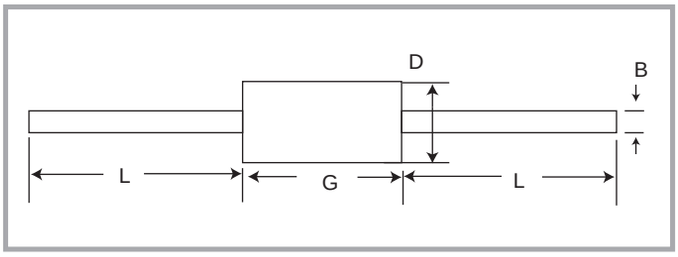
Part Numbering



Part Marking



Dimensions DO-15

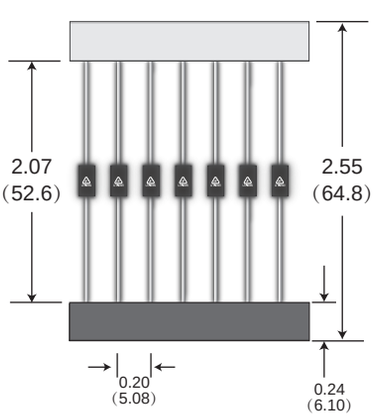


Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
B	0.028	0.042	0.711	1.067
D	0.190	0.205	4.826	5.207
G	0.360	0.375	9.146	9.527
L	1.000		25.40	

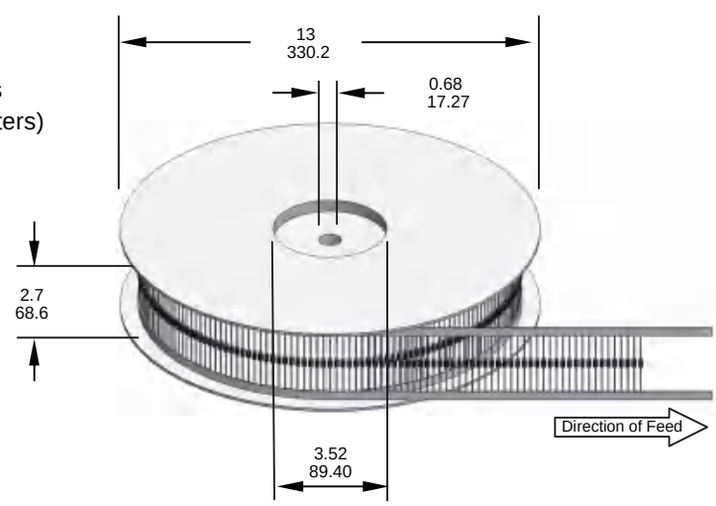
Packaging

Part Number	Description	Quantity	Industry Standard
Pxxx0LC	DO-15 Axial Tape & Reel	1000	EIA-RS-296-D
	DO-15 Bulk Pack	500	N/A

Tape and Reel Specifications DO-15



Dimensions
are in inches
(and millimeters)



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ROHS

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