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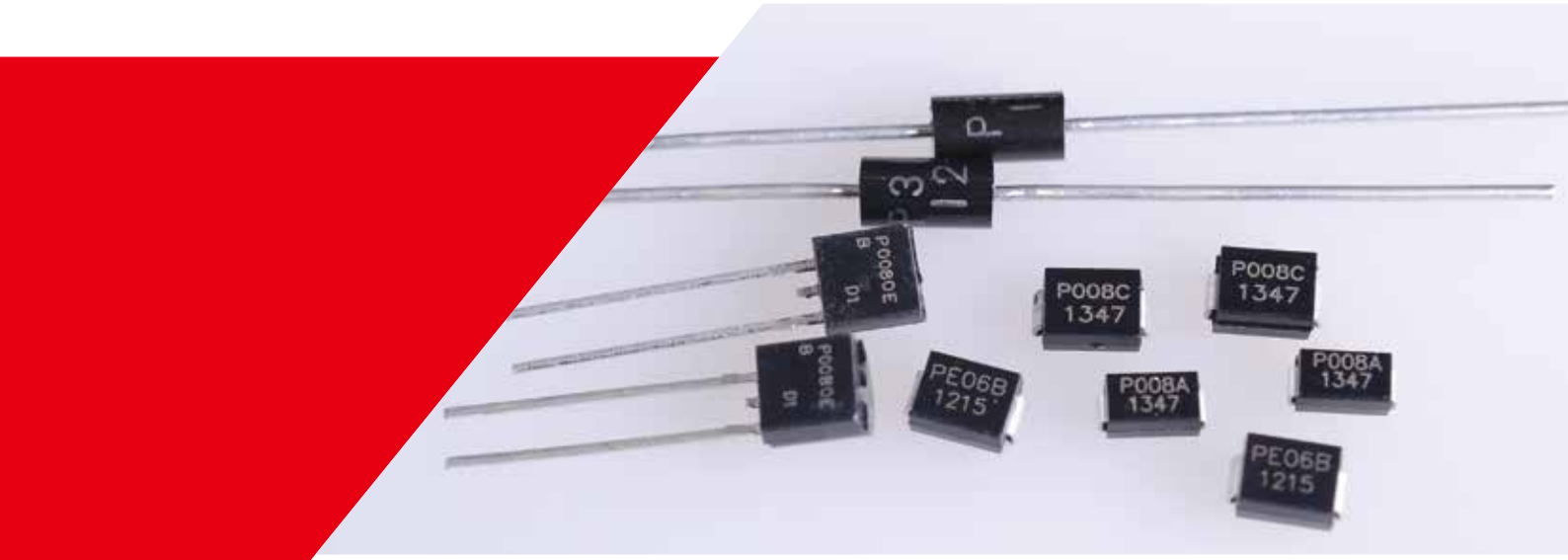

Thyristor Surge Suppressors

PxxxxLX Series
DO-15

361° Circuit Protection System

Specifications are subject to change without notice.

Please refer to http://www.ruilon.com.cn for current information.

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Thyristor Surge Suppressors -PxxxxLX Series

Description

DO-15 Series are designed to protect baseband equipment such as modems, line cards, CPE and DSL from damaging overvoltage transients.

The series provides a cost-effective through-hole solution that enables equipment to comply with global regulatory standards.

Features

Compared to surge suppression using other technologies, P Series devices offer absolute surge protection regardless of the surge current available and the rate of applied voltage (dv/dt). P Series devices:

- Cannot be damaged by voltage
- Eliminate hysteresis and heat dissipation typically found with clamping devices
- Eliminate voltage overshoot caused by fast-rising transients
- Are non-degenerative
- Will not fatigue
- Have low capacitance, making them ideal for high-speed transmission equipment

Part Number Code

P	x	x	x	x	E	X

- P: LOGO
- x x x: breakdown voltage
- E: Type
  - S:SMD SMB
  - T:SMD SMA
  - E:DIP TO–92
  - L:DIP DO–15
- X: Peak pilse current–Ipp 8/20 μ s
  - A=150A
  - B=250A
  - C=400A

Electriacl Characteristics

Type Number	VDRM	IDRM	VBO	IH	IS	IT	VT	CJ	
	V	μA	V	MA	MA	A	V	pFMin	pFMax
P0080LA	6	5	25	50	800	2.2	4	25	150
P0080LB	6	5	25	50	800	2.2	4	25	150
P0080LC	6	5	25	50	800	2.2	4	35	260
P0300LA	25	5	40	50	800	2.2	4	15	140
P0300LB	25	5	40	50	800	2.2	4	15	140
P0300LC	25	5	40	50	800	2.2	4	25	250
P0640LA	58	5	77	150	800	2.2	4	40	60
P0640LB	58	5	77	150	800	2.2	4	40	60
P0640LC	58	5	77	150	800	2.2	4	55	155
P0720LA	65	5	88	150	800	2.2	4	35	60
P0720LB	65	5	88	150	800	2.2	4	35	75
P0720LC	65	5	88	150	800	2.2	4	50	150
P0900LA	75	5	98	150	800	2.2	4	35	55
P0900LB	75	5	98	150	800	2.2	4	35	70
P0900LC	75	5	98	150	800	2.2	4	45	140
P1100LA	90	5	130	150	800	2.2	4	30	50
P1100LB	90	5	130	150	800	2.2	4	30	70
P1100LC	90	5	130	150	800	2.2	4	45	115
P1300LA	120	5	160	150	800	2.2	4	25	45
P1300LB	120	5	160	150	800	2.2	4	25	60
P1300LC	120	5	160	150	800	2.2	4	40	105
P1500LA	140	5	180	150	800	2.2	4	25	40
P1500LB	140	5	180	150	800	2.2	4	25	55
P1500LC	140	5	180	150	800	2.2	4	35	95
P1800LA	170	5	220	150	800	2.2	4	25	35
P1800LB	170	5	220	150	800	2.2	4	25	50
P1800LC	170	5	220	150	800	2.2	4	35	90
P2300LA	190	5	260	150	800	2.2	4	25	35
P2300LB	190	5	260	150	800	2.2	4	25	50
P2300LC	190	5	260	150	800	2.2	4	30	80
P2600LA	220	5	300	150	800	2.2	4	20	35
P2600LB	220	5	300	150	800	2.2	4	20	45
P2600LC	220	5	300	150	800	2.2	4	30	80
P3100LA	275	5	350	150	800	2.2	4	20	35
P3100LB	275	5	350	150	800	2.2	4	20	45
P3100LC	275	5	350	150	800	2.2	4	30	70
P3500LA	320	5	400	150	800	2.2	4	20	35
P3500LB	320	5	400	150	800	2.2	4	20	40
P3500LC	320	5	400	150	800	2.2	4	25	65

Notes:
Is:Switching Current – maximum current required to switch to on state
IDRM:Leakage Current – maximum peak off-state current measured at VDRM
IH:Holding Current – minimum current required to maintain on state
IPP:Peak Pulse Current – maximum rated peak impulse current
IT:On-state Current – maximum rated continuous on-state current
VDRM:Peak Off-state Voltage – maximum voltage that can be applied while maintaining off state
VT:On-state Voltage – maximum voltage measured at rated on-state current

Surge Ratings

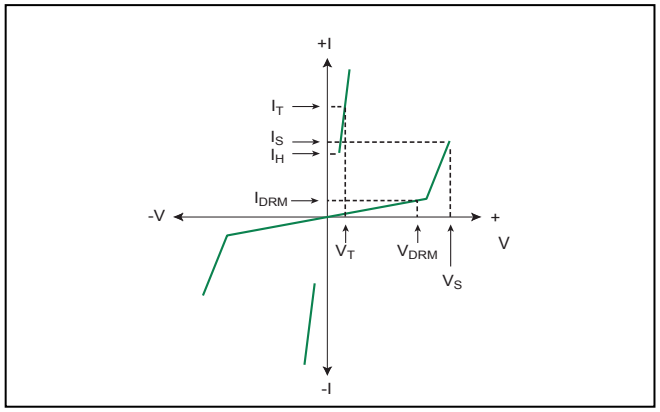
SERIES	Peak Pilse Current-Ipp(A)				
	2/10μs	8/20μs	10/160μs	10/560μs	10/1000μs
A	200	150	100	60	50
B	250	250	150	100	80
C	500	400	200	120	100

Notes:

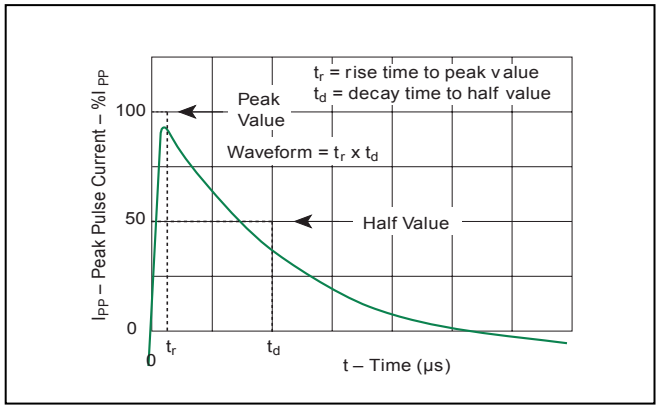
1 Current waveform in μs
2 Voltage waveform in μs

- 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 $\leq T_J \leq$ +150°C

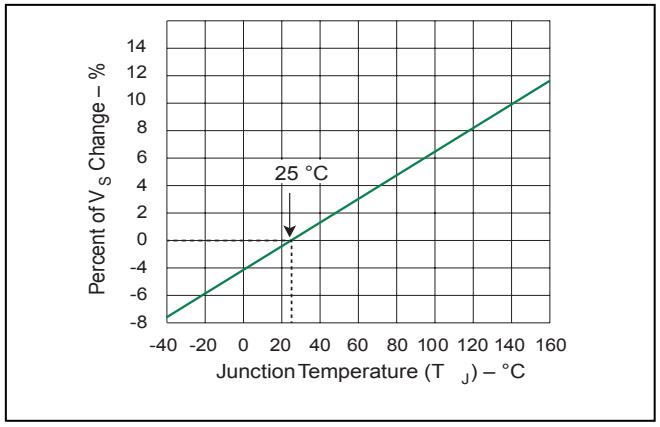
V-I Characteristics



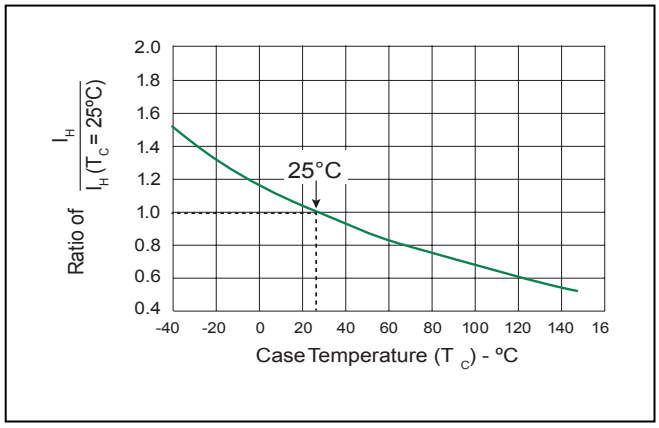
t_r x t_d Pulse Waveform



Normalized V_S Change vs. Junction Temperature

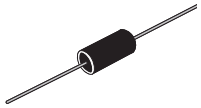


Normalized DC Holding Current vs. Case Temperature



Thyristor Surge Suppressors - PxxxxLX Series

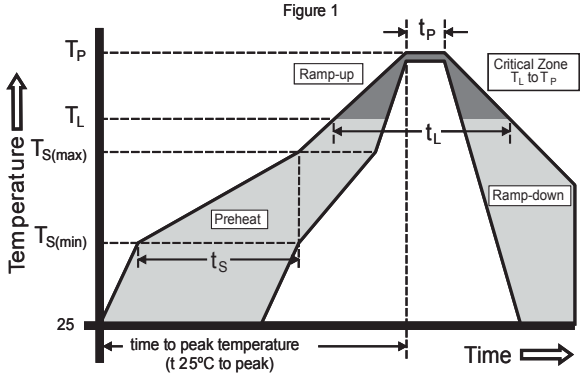
Thermal Considerations

Package	Symbol	Parameter	Value	Unit
DO-15 	T_J	Operating Junction Temperature Range	-40 to +150	°C
	T_S	Storage Temperature Range	-65 to +150	°C
	$R_{\theta JA}$	Thermal Resistance: Junction to Ambient	60	°C/W

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)	60-180 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.

Figure 1



Thyristor Surge Suppressors -PxxxxLX Series

Physical Specifications

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

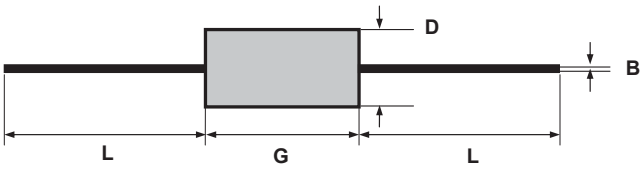
Packing Options

Package Type	Description	Quantity	Added Suffix	Industry Standard
L	DO-15 Axial Tape & Reel	2000	RP	EIA-RS-296-D

Environmental Specifications

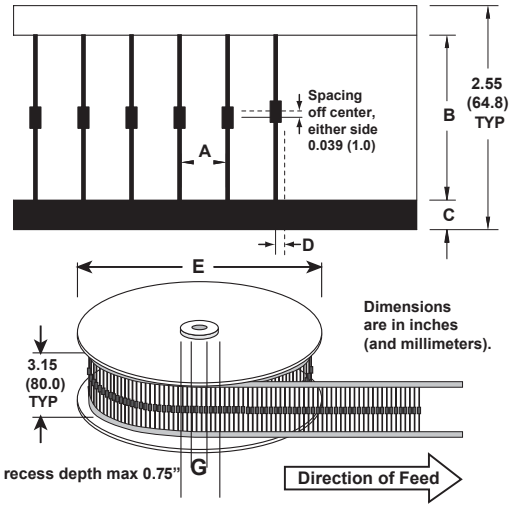
High Temp Voltage Blocking	**80% Rated V_{DRM} (V_{AC} Peak) +125°C or +150°C, 504 or 1008 hrs. MIL-STD-750 (Method 1040) JEDEC, JESD22-A-101**
Temp Cycling	-65°C to +150°C, 15 min. dwell, 10 up to 100 **cycles. MIL-STD-750 (Method 1051) EIA/JEDEC, JESD22-A104**
Biased Temp & Humidity	**52 V_{DC}** (+85°C) 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.**
Thermal Shock	0°C to +100°C, 5 min. dwell, 10 sec. transfer, **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/ **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 (+260°C Peak). JEDEC-J-STD-020, Level 1

Dimensions — DO-15



Dimension	Inches		Millimeters	
	MIN	MAX	MIN	MAX
B	0.028	0.034	0.711	0.864
D	0.12	0.14	3.048	3.556
G	0.235	0.27	5.969	6.858
L	1		25.4	

Tape and Reel Specification — DO-15



Symbols	Description	Inches	MM
A	Component Spacing (lead to lead)	0.200 ± 0.020"	**5.08 ± 0.508**
B	Inner Tape Pitch	2.062 ± 0.059"	**52.37 ± 1.498**
C	Tape Width	0.250"	**6.35**
D	Max. Off Alignment	0.048"	**1.219**
E	Reel Dimension	13"	**330.2**
F	Max. Hub Recess	3"	**76.19**
G	Max. Abor Hole	0.68"	**17.27**

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