Thyristor Surge Suppressors (TSS) Data Sheet

Description

DO-15/DO-201 Thyristor solid state protection thyristor protect telecommunications equipment such as modems, line cards, fax machines, and other CPE.
P Series devices are used to enable equipment to meet various regulatory requirements including GR 1089, ITU K.20, K.21 and K.45, IEC 60950, UL 60950, and TIA-968 (formerly known as FCC Part 68).

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
- Meets MSL level 1, per J-STD-020
- Safety certification: UL: E244458

Electrical Parameters

Parameter	Definition
V_{DRM}	**Peak Off-state Voltage –** maximum voltage that can be applied while maintaining off state
V_S	**Switching Voltage –** maximum voltage prior to switching to on state
V_T	**On-state Voltage –** maximum voltage measured at rated on-state current
I_{DRM}	**Leakage Current –** maximum peak off-state current measured at V_{DRM}
I_S	**Switching Current –** maximum current required to switch to on state
I_T	**On-state Current –** maximum rated continuous on-state current
I_H	**Holding Current –** minimum current required to maintain on state
C_O	**Off-state Capacitance –** typical capacitance measured in off state
I_{PP}	**Peak Pulse Current –** maximum rated peak impulse current
I_{TSM}	**Peak One-cycle Surge Current –** maximum rated one-cycle AC current
di/dt	**Rate of Rise of Current –** maximum rated value of the acceptable rate of rise in current over time

Electrical Characteristics

Part Number	V_{DRM} (V)	V_S (V)	V_T (V)	I_{DRM} (μA)	I_S (mA)	I_T (A)	I_H (mA)	C_O (pF)	Marking
P0080LA	6	25	4	5	800	2.2	50	50	P008LA
P0080LB	6	25	4	5	800	2.2	50	85	P008LB
P0080LC	6	25	4	5	800	2.2	50	110	P008LC
P0300LA	25	40	4	5	800	2.2	50	70	P03LA
P0300LB	25	40	4	5	800	2.2	50	85	P03LB
P0300LC	25	40	4	5	800	2.2	50	110	P03LC
P0640LA	58	77	4	5	800	2.2	150	50	P06LA
P0640LB	58	77	4	5	800	2.2	150	60	P06LB
P0640LC	58	77	4	5	800	2.2	150	100	P06LC
P0720LA	65	88	4	5	800	2.2	150	50	P07LA
P0720LB	65	88	4	5	800	2.2	150	60	P07LB
P0720LC	65	88	4	5	800	2.2	150	100	P07LC
P0900LA	75	98	4	5	800	2.2	150	45	P09LA
P0900LB	75	98	4	5	800	2.2	150	55	P09LB
P0900LC	75	98	4	5	800	2.2	150	90	P09LC
P1100LA	90	130	4	5	800	2.2	150	45	P11LA
P1100LB	90	130	4	5	800	2.2	150	55	P11LB
P1100LC	90	130	4	5	800	2.2	150	90	P11LC
P1300LA	120	160	4	5	800	2.2	150	45	P13LA
P1300LB	120	160	4	5	800	2.2	150	55	P13LB
P1300LC	120	160	4	5	800	2.2	150	90	P13LC
P1500LA	140	180	4	5	800	2.2	150	40	P15LA
P1500LB	140	180	4	5	800	2.2	150	60	P15LB
P1500LC	140	180	4	5	800	2.2	150	85	P15LC
P1800LA	170	220	4	5	800	2.2	150	40	P18LA
P1800LB	170	220	4	5	800	2.2	150	60	P18LB
P1800LC	170	220	4	5	800	2.2	150	85	P18LC
P2300LA	190	260	4	5	800	2.2	150	35	P23LA
P2300LB	190	260	4	5	800	2.2	150	55	P23LB
P2300LC	190	260	4	5	800	2.2	150	80	P23LC

Electrical Characteristics

Part Number	V_{DRM} (V)	V_S (V)	V_T (V)	I_{DRM} (μA)	I_S (mA)	I_T (A)	I_H (mA)	C_O (pF)	Marking
P2600LA	220	300	4	5	800	2.2	150	35	P26LA
P2600LB	220	300	4	5	800	2.2	150	50	P26LB
P2600LC	220	300	4	5	800	2.2	150	80	P26LC
P3100LA	275	350	4	5	800	2.2	150	30	P31LA
P3100LB	275	350	4	5	800	2.2	150	45	P31LB
P3100LC	275	350	4	5	800	2.2	150	65	P31LC
P3500LA	320	400	4	5	800	2.2	150	30	P35LA
P3500LB	320	400	4	5	800	2.2	150	40	P35LB
P3500LC	320	400	4	5	800	2.2	150	65	P35LC

Notes:

- All measurements are made at an ambient temperature of 25℃. I_{PP} applies to -40℃ through +85℃ temperature range.
- Off-state capacitance(C_O) is measured at 1 MHz with a 2V bias and is typical value.
- For individual “LA”, “LB” and “LC” surge ratings, see table below.

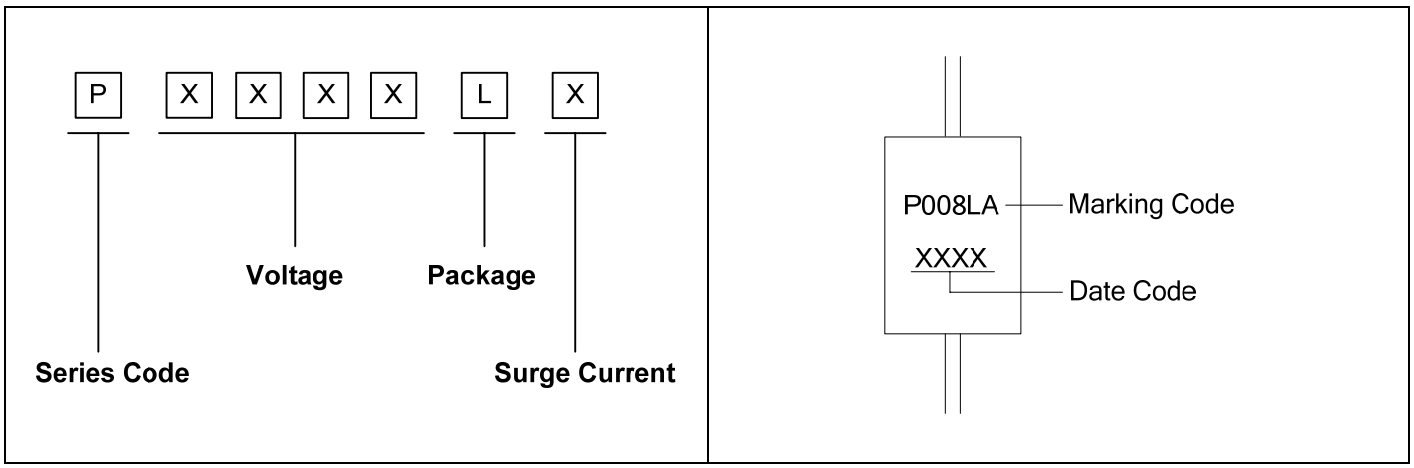
Surge Ratings

Series	I_{PP} 2×10μs (A)	I_{PP} 8×20μs (A)	I_{PP} 10×160μs (A)	I_{PP} 10×560μs (A)	I_{PP} 10×1000μs (A)	I_{TSM} 60Hz (A)	di/dt (A/μs)
A	150	150	90	50	45	20	500
B	250	250	150	100	80	30	500
C	500	400	200	150	100	50	500

Thermal Considerations

Symbol	Parameter	Value		Unit
		DO-15 (A/B Series)	DO-201 (C Series)	
T_J	Operating Junction Temperature	-40 to +150	-40 to +150	℃
T_S	Storage Temperature Range	-40 to +150	-40 to +150	℃
$R_{\theta JA}$	Junction to Ambient on printed circuit	90	70	℃/W

Part Number Code and Marking



Characteristics Curves

Figure 1. V-I Characteristics

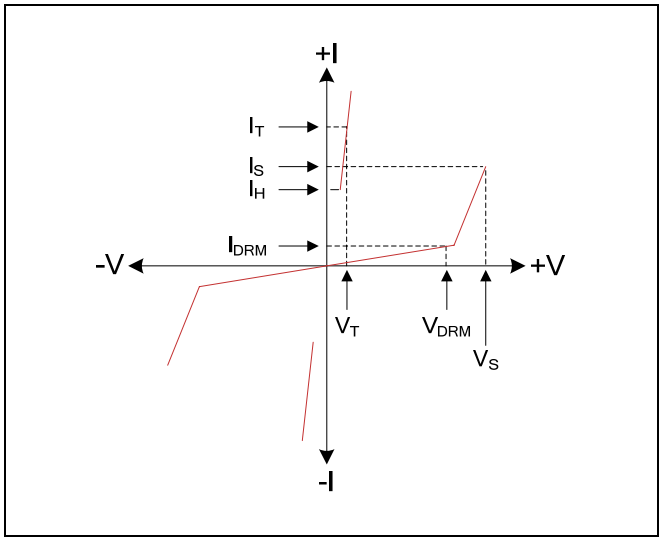


Figure 2. tr × td Pulse Wave-form

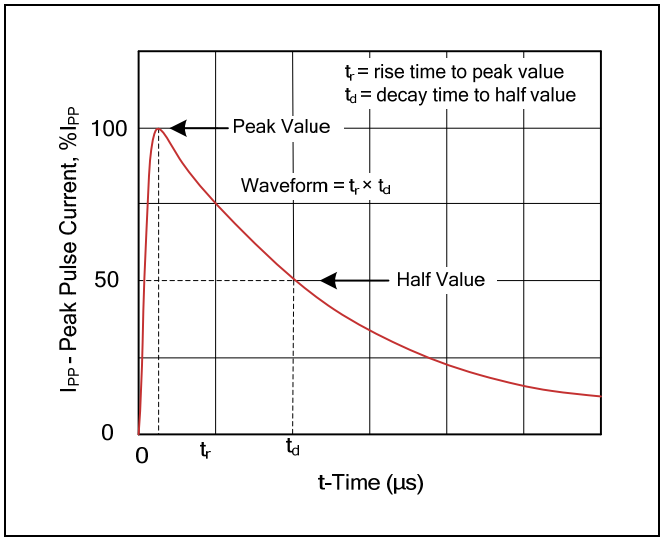


Figure 3. Normalized Vs Change versus Junction Temperature

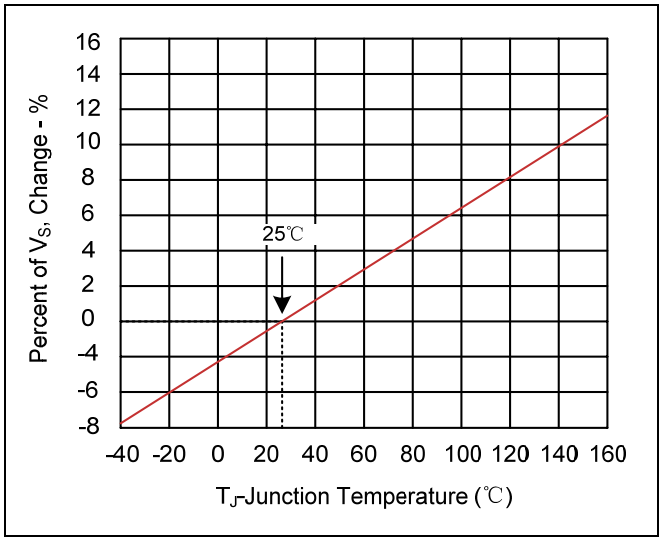
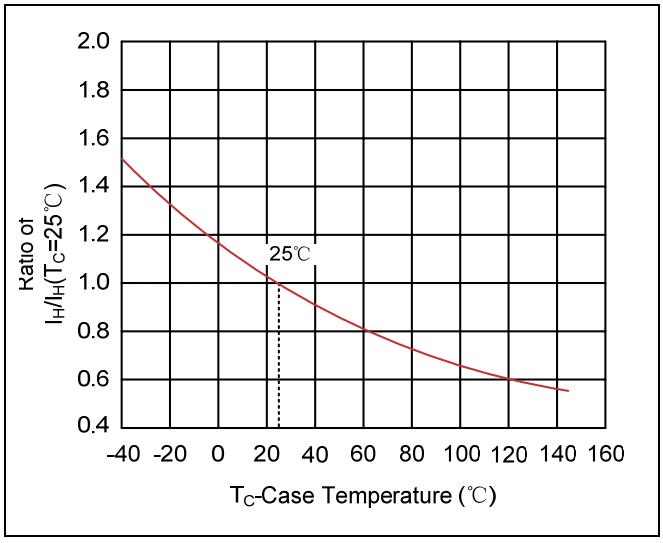
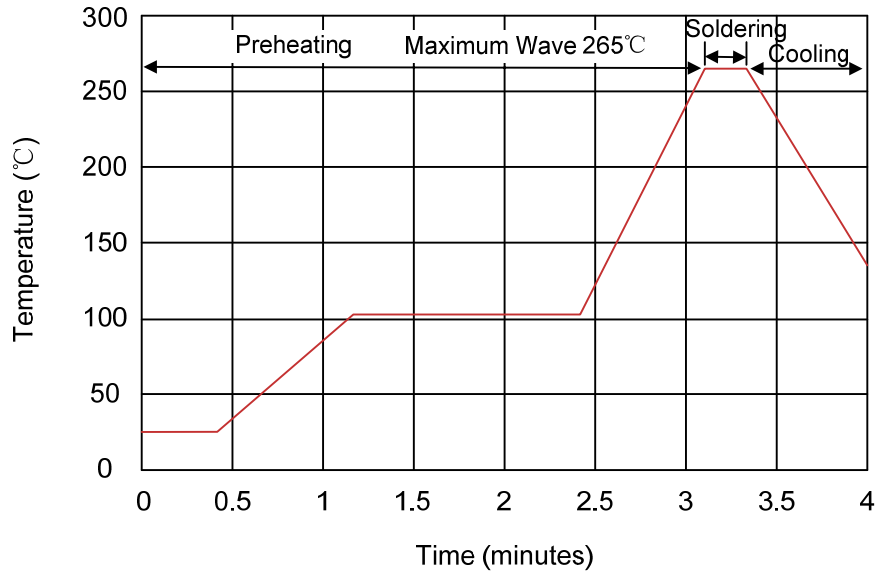


Figure 4. Normalized DC Holding Current versus Case Temperature



Recommended Soldering Conditions

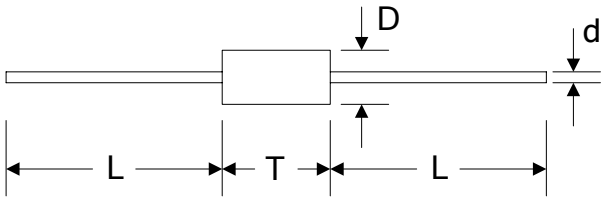
Wave Soldering



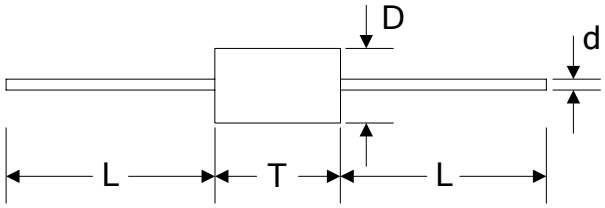
Item	Conditions
Peak Temperature	265℃
Dipping Time	10 seconds
Soldering	1 time

Dimensions (DO-15/DO-201)

DO-15 (LA & LB Series)



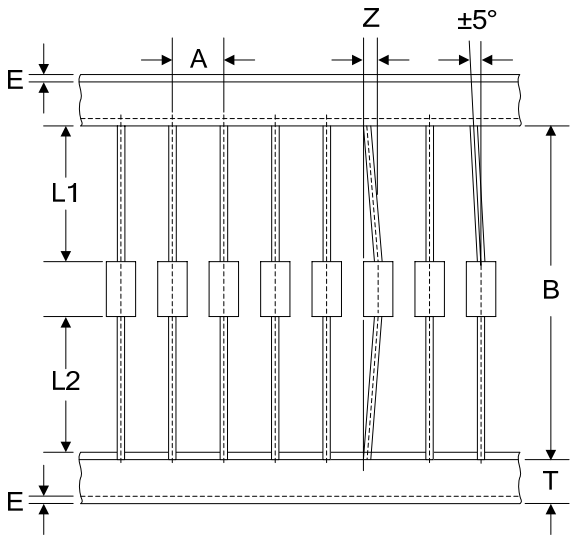
DO-201 (LC Series)



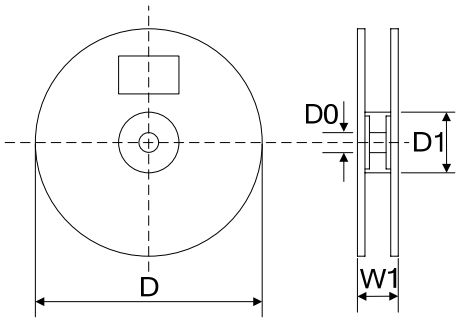
Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
L	25.40	-	1.000	-
T	5.80	7.60	0.230	0.300
ΦD	2.60	3.60	0.104	0.140
Φd	0.70	0.90	0.028	0.035
L	25.40	-	1.000	-
T	7.20	9.50	0.283	0.374
ΦD	4.80	5.30	0.189	0.209
Φd	0.96	1.07	0.038	0.042

Packaging

Tape



Reel



Symbol	Dimension (mm)	
	DO-15	DO-201
A	5.0±0.5	10.0±0.5
B	53.0±1.0	53.0±1.0
Z	1.2Max.	1.2Max.
T	6.0±0.4	6.0±0.4
E	0.8Max.	0.8Max.
L1-L2	1.0Max.	1.0Max.
D	330.0±3.0	330.0±3.0
D0	16.4±2.0	16.4±2.0
D1	86.0±2.0	86.0±2.0
W1	76.0±3.0	76.0±3.0
Quantity	4000PCS	1200PCS