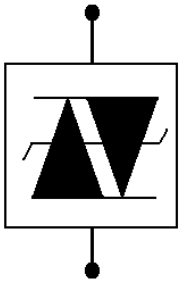
Thyristor Surge Suppressors(TSS)

●General description

P series is designed to protect low voltage or signal line, as well as power line communication circuit interface from damaging over-voltage transients . The series provides a surface mount solution that enables equipment to comply with global regulatory standards.



●Features

- Low voltage overshoot.
- Low on-state voltage.
- Does not degrade surge capability after multiple surge within limit.
- Fails short circuit when surged in excess of ratings.
- Low Capacitance.

●Electrical characteristics

Part number	Type	V_{DRM}	I_{DRM}	V_S	I_S	I_H	V_T	I_T	C_o
		（V） Min	(μA) Max	（V） Max	（mA）Max	（mA）Min	（V） Max	（A）	（pF）Max
P0080	A	6	5	25	800	50	4	2.2	80
P0300	A	25	5	40	800	50	4	2.2	40
P0640	A	58	5	77	800	150	4	2.2	60
P0720	A	65	5	88	800	150	4	2.2	60
P0900	A	75	5	98	800	150	4	2.2	50
P1100	A	90	5	130	800	150	4	2.2	45
P1300	A	120	5	160	800	150	4	2.2	40
P1500	A	140	5	180	800	150	4	2.2	40
P1800	A	170	5	220	800	150	4	2.2	35
P2100	A	180	5	240	800	150	4	2.2	35
P2300	A	190	5	260	800	150	4	2.2	35
P2600	A	220	5	300	800	150	4	2.2	35
P3100	A	275	5	350	800	150	4	2.2	35/20
P3500	A	320	5	400	800	150	4	2.2	35/20
P0080	B	6	5	25	800	50	4	2.2	100
P0300	B	25	5	40	800	50	4	2.2	50
P0640	B	58	5	77	800	150	4	2.2	80
P0720	B	65	5	88	800	150	4	2.2	80
P0900	B	75	5	98	800	150	4	2.2	70
P1100	B	90	5	130	800	150	4	2.2	65
P1300	B	120	5	160	800	150	4	2.2	60
P1500	B	140	5	180	800	150	4	2.2	60

Part number	Type	V_{DRM}	I_{DRM}	V_S	I_S	I_H	V_T	I_T	C_o 1MHz,2V
		（V） Min	(μA) Max	（V）Max	（mA）Max	（mA）Min	（V） Max	（A）	（pF）Max
P1800	B	170	5	220	800	150	4	2.2	50
P2100	B	180	5	240	800	150	4	2.2	50
P2300	B	190	5	260	800	150	4	2.2	45
P2600	B	220	5	300	800	150	4	2.2	45
P3100	B	275	5	350	800	150	4	2.2	40/25
P3500	B	320	5	400	800	150	4	2.2	40/25
P0080	C	6	5	25	800	50	4	2.2	120
P0300	C	25	5	40	800	50	4	2.2	60
P0640	C	58	5	77	800	150	4	2.2	150
P0720	C	65	5	88	800	150	4	2.2	150
P0900	C	75	5	98	800	150	4	2.2	140
P1100	C	90	5	130	800	150	4	2.2	130
P1300	C	120	5	160	800	150	4	2.2	120
P1500	C	140	5	180	800	150	4	2.2	120
P1800	C	170	5	220	800	150	4	2.2	100
P2100	C	180	5	240	800	150	4	2.2	100
P2300	C	190	5	260	800	150	4	2.2	90
P2600	C	220	5	300	800	150	4	2.2	90
P3100	C	275	5	350	800	150	4	2.2	65/35
P3500	C	320	5	400	800	150	4	2.2	60/35

●Surge ratings

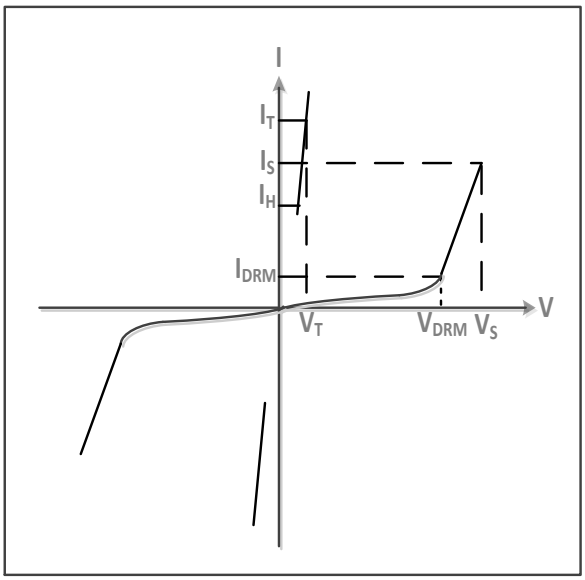
	IPP						ITSM	di/dt
	2x10 μs	8x20 μs	10x160 μs	10x560 μs	10x700 μs	10x1000 μs	60 Hz	Amps/μs
	Amps	Amps	Amps	Amps	Amps	Amps	Amps	
A	150	150	90	50	75	50	20	500
B	250	250	150	100	100	80	25	500
C	500	400	200	150	150	100	30	500

●Thermal considerations

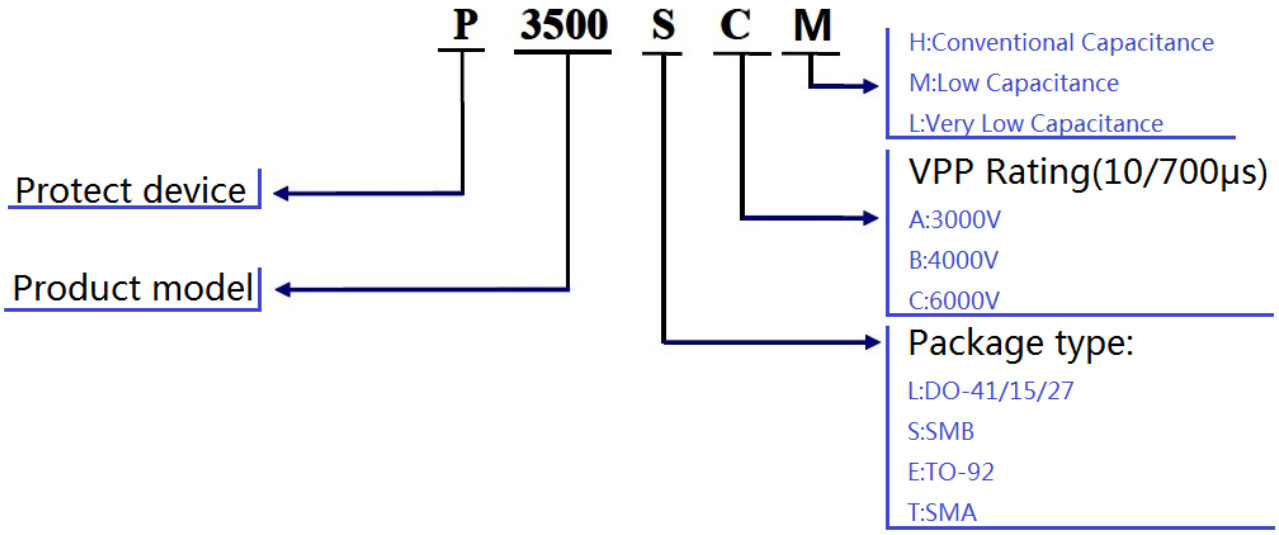
Package	Symbol	Parameter	Value	Unit
DO-214AC DO-214AA DO-15	Tj	Operating junction temperature range	-40 to 150	℃
	Tstg	Storage temperature range	-65 to 150	℃
	Rth(j-a)	Junction to ambient on printed circuit on recommended pad layout	90	℃/W

●I-V Curve Characteristics

I_S	Switching Current
I_{DRM}	Leakage Current
I_H	Holding Current
I_T	On-state Current
V_S	Switching Voltage
V_{DRM}	Peak Off-state Voltage
V_T	On-state Voltage
C_o	Off-state Capacitance

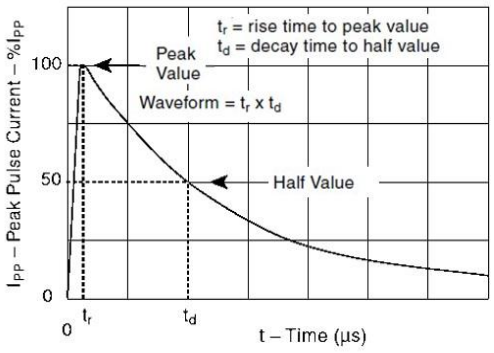


●Name rule

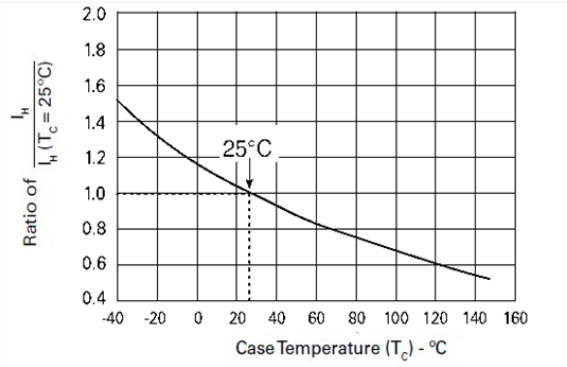


●Ratings and characteristic curves (T_A=25°C unless otherwise noted)

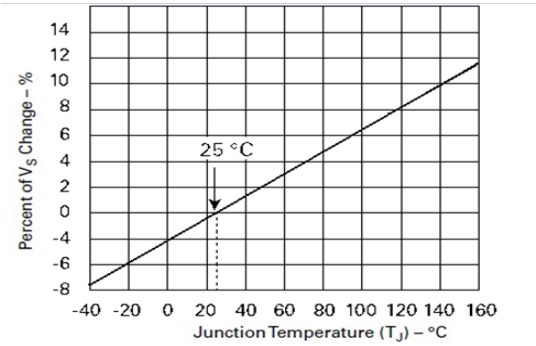
Tr x Td Pulse waveform



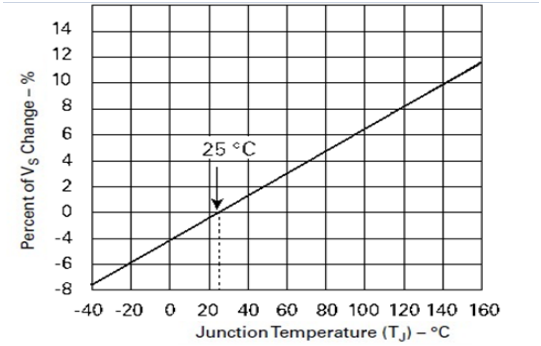
Normalized DC holding current vs. case temperature



Vs change vs. junction temperature



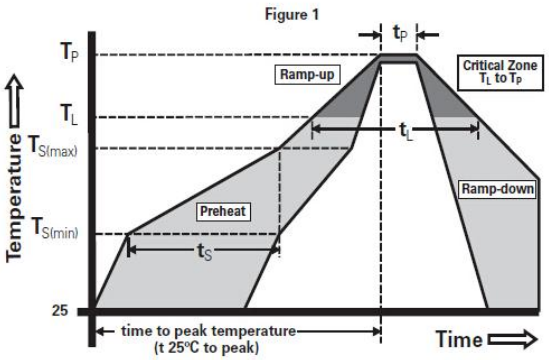
Co change vs. bias voltage （V_R=1V）



●Soldering Parameters

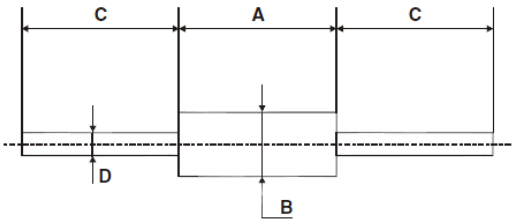
Reflow Condition		Pb-Free assembly (see Fig. 1)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150°C
	-Temperature Max ($T_{s(max)}$)	+200°C
	-Time (Min to Max) (t_s)	60-180 secs.
Average ramp up rate (Liquidus Temp (T_L) to peak)		3°C/sec. Max.
$T_{S(max)}$ to T_L - Ramp-up Rate		3°C/sec. Max.
Reflow	-Temperature (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.
Do not exceed		+260°C

Figure 1



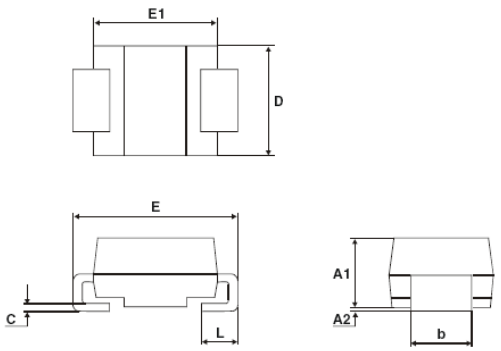
● Dimensions

DO-15



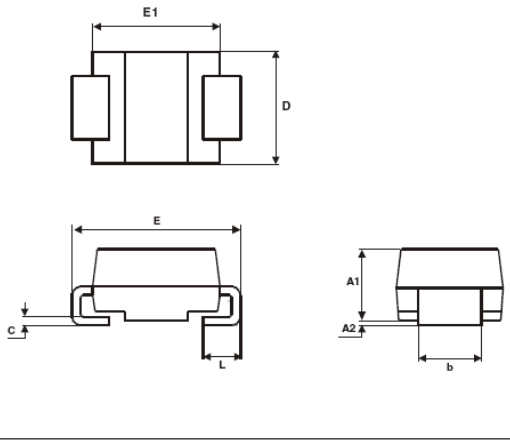
Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	6.05	6.75	0.238	0.266
B	2.95	3.53	0.116	0.139
C	26	31	1.024	1.220
D	0.71	0.88	0.028	0.035

SMA
(DO-214AC)



Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.075	0.094
A2	0.05	0.20	0.002	0.008
b	1.25	1.65	0.049	0.065
c	0.15	0.40	0.006	0.016
D	2.25	2.90	0.089	0.114
E	4.80	5.35	0.189	0.211
E1	3.95	4.60	0.156	0.181
L	0.75	1.50	0.030	0.059

SMB
(DO-214AA)

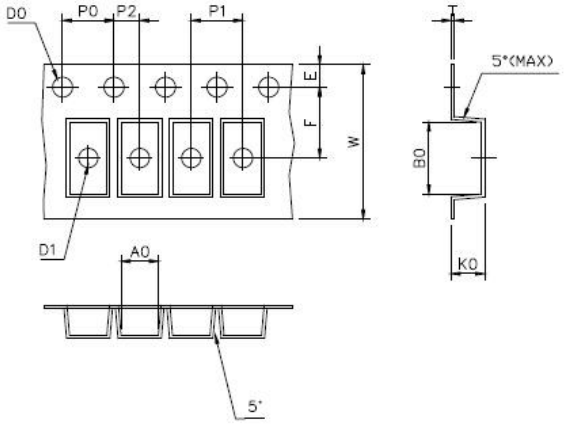


Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.075	0.096
A2	0.05	0.20	0.002	0.008
b	1.95	2.20	0.077	0.087
c	0.15	0.40	0.006	0.016
E	5.10	5.60	0.201	0.220
E1	4.05	4.60	0.159	0.181
D	3.30	3.95	0.130	0.156
L	0.75	1.50	0.030	0.059

●Tape and reel specification

Package Type	Quantity
SMA	5000

Symbol	Spec	Symbol	Spec
W	12.00±0.10	A_0	2.79±0.10
E	1.75±0.10	B_0	5.33±0.10
F	5.50±0.05	K_0	2.36±0.10
D_0	1.55±0.10		
D_1	1.50±0.10		
P_0	4.00±0.10		
P_1	4.00±0.10		
P_2	2.00±0.10		
t	0.25±0.05		
t1	0.05以上		



Package Type	Quantity
SMB	3000

Symbol	Spec	Symbol	Spec
W	12.00±0.10	A_0	3.76±0.10
E	1.75±0.10	B_0	5.69±0.10
F	5.50±0.05	K_0	2.67±0.10
D_0	1.55±0.10		
D_1	1.50±0.10		
P_0	4.00±0.10		
P_1	8.00±0.10		
P_2	2.00±0.10		
t	0.23±0.05		
t1	0.05以上