BORN SEMICONDUCTOR

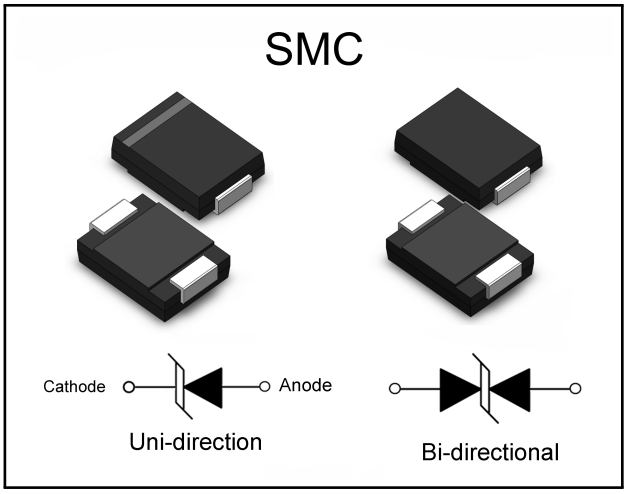
P5T Series

Transient Voltage Suppressor

Features

- Excellent clamping capability
- Low leakage current
- High surge capability
- Glass passivated chip
- Epoxy resin package
- Will not fatigue
- RoHS Compliant
- AEC-Q101 qualified
- IEC 61000-4-2 ±30kV contact ; ±30kV air
- Meets ISO7637-2,16750-2 surge specifiation
- ISO 7637-2 P5a:
  12V System (65-87V 0.5-4Ω 40-400ms)
  24V System (123-174V 1-8Ω 100-350ms)

Package



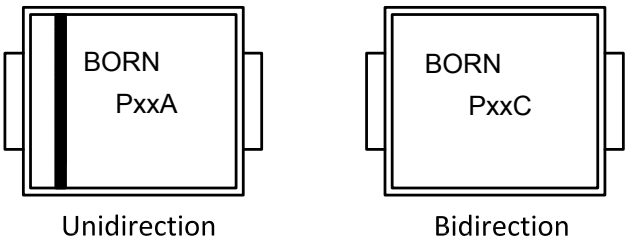
Mechanical Characteristics

- Package: SMC plastic package
- Lead Finish: Matte Tin
- Case Material: Epoxy Molding Compound
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020

Applications

- Auto powers system
- ABS powers
- Automotive instrument

Making Code



Summary of Packing Options

Package	Packing Description	Packing Quantity	Industry Standard
SMC	Tape/Reel,13” reel	3000	EIA-481-1

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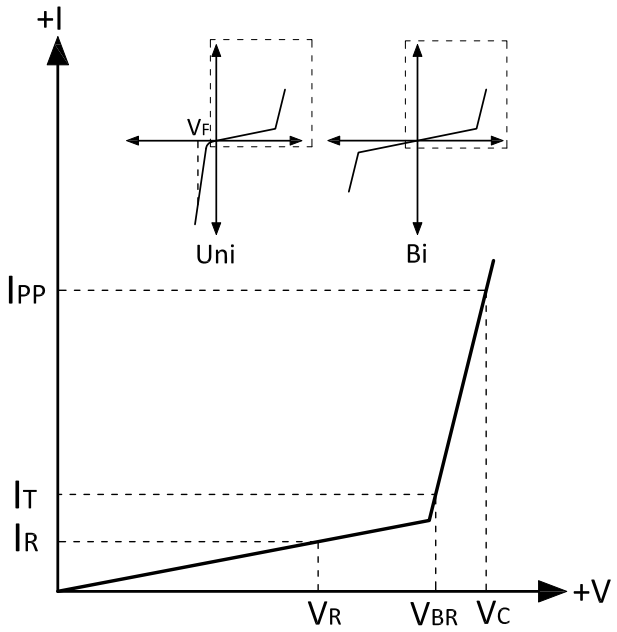
Revision: 2022-Jan-1-B

P5T Series

Transient Voltage Suppressor

Electrical Parameters

Parameter	Definition
C_J	Junction Capacitance - typical capacitance measured with 0V or V_R bias
I_{PP}	Peak Pulse Current - maximum rated peak impulse current
V_C	Clamping Voltage - Peak voltage measured across the suppressor at a specified Ippm
V_{BR}	Breakdown Voltage - Maximum voltage that flows though the TVS at a specified test current (I_T)
I_R	Leakage Current - maximum peak off-state current measured at V_R
V_R	Peak Off-state Voltage - maximum voltage that can be applied while maintaining off state



Absolute Maximum Ratings (T_A=+25°C, unless otherwise noted)

Parameter	Symbol	Value	Units
Peak Pulse Power Dissipation (Note1,3)	P_{PPM}	4600	W
Peak Pulse Power Dissipation (Note2,3)	P_{PPM1}	3600	W
Steady State Power Dissipation (Note4)	P_D	6.5	W
Peak Forward Surge Current (Note5)	I_{FSM}	300	A
Maximum Instantaneous Forward Voltage at 100A (Note6)	V_{FM}	5	V
Typical Thermal Resistance Junction to Lead	$R_{\theta JL}$	15	°C/W
Typical Thermal Resistance Junction to Ambient	$R_{\theta JA}$	75	°C/W
Operating Temperature Range	T_J	-55 to 150	°C
Storage Temperature Range	T_{STG}	-55 to 150	°C

Notes:

(1) Non-repetitive current pulse , 10/1000us Waveform.

(2) Non-repetitive current pulse , 10/10000us Waveform.

(3) Mounted on copper pad area of 8×8mm to each terminal.

(4) Infinite HeatSink at T_L =50°C.

(5) Measured on 8.3ms single half sine wave or equivalent square wave, duty cycle=4 perminute maximum.

(6) For Unidirectional Only.

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P5T Series

Transient Voltage Suppressor

Electrical Characteristics (T_A=+25°C, unless otherwise noted)

Part Number		Marking Code		Reverse Stand-Off Votage V_R	Breakdown Voltage V_{BR}@ I_T		Test Current I_T	Maximum Clamping Voltage V_C@ I_{pp}	Maximum Peak Pulse Current I_{pp}	Maximum Reverse Leakage I_R@ V_R
(Uni)	(Bi)	(Uni)	(Bi)	(V)	Min.(V)	Max.(V)	(mA)	(V)	(A)	(uA)
P5T15A	P5T15CA	P15A	P15C	15	16.7	18.5	1	24.4	188	100
P5T16A	P5T16CA	P16A	P16C	16	17.8	19.7	1	26.0	177	50
P5T18A	P5T18CA	P18A	P18C	18	20.0	22.1	1	29.2	158	10
P5T20A	P5T20CA	P20A	P20C	20	22.2	24.5	1	32.4	142	5
P5T22A	P5T22CA	P22A	P22C	22	24.4	26.9	1	35.5	129	5
P5T24A	P5T24CA	P24A	P24C	24	26.7	29.5	1	38.9	118	5
P5T26A	P5T26CA	P26A	P26C	26	28.9	31.9	1	42.1	109	5
P5T28A	P5T28CA	P28A	P28C	28	31.1	34.4	1	45.4	101	5
P5T30A	P5T30CA	P30A	P30C	30	33.3	36.8	1	48.4	95.0	5
P5T33A	P5T33CA	P33A	P33C	33	36.7	40.6	1	53.3	86.3	5
P5T36A	P5T36CA	P36A	P36C	36	40.0	44.2	1	58.1	79.0	5
P5T40A	P5T40CA	P40A	P40C	40	44.4	49.1	1	64.5	71.3	5
P5T43A	P5T43CA	P43A	P43C	43	47.8	52.8	1	69.4	66.3	5
P5T45A	P5T45CA	P45A	P45C	45	50.0	55.3	1	72.7	63.3	5
P5T48A	P5T48CA	P48A	P48C	48	53.3	58.9	1	77.4	59.4	5
P5T51A	P5T51CA	P48A	P48C	51	56.7	62.7	1	82.4	55.8	5
P5T54A	P5T54CA	P54A	P54C	54	60.0	66.3	1	87.1	52.8	5
P5T58A	P5T58CA	P58A	P58C	58	64.4	71.2	1	93.6	49.1	5
P5T60A	P5T60CA	P60A	P60C	60	66.7	73.7	1	96.8	47.5	5
P5T64A	P5T64CA	P64A	P64C	64	71.1	78.6	1	103	44.7	5
P5T70A	P5T70CA	P70A	P70C	70	77.8	86.0	1	113	40.7	5
P5T75A	P5T75CA	P75A	P75C	75	83.3	92.1	1	121	38.0	5
P5T78A	P5T78CA	P78A	P78C	78	86.7	95.8	1	126	36.5	5
P5T85A	P5T85CA	P85A	P85C	85	94.4	104	1	137	33.6	5

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P5T Series

Transient Voltage Suppressor

Ratings and Characteristic Curves (T_A=+25°C, unless otherwise noted)

Figure 1: Peak Pulse Power Rating

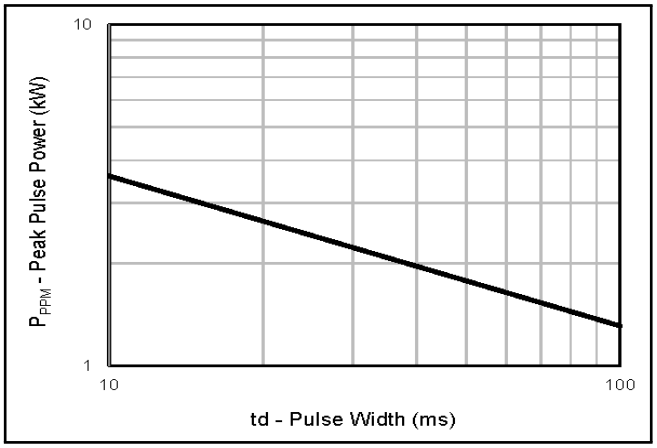


Figure 2: Pulse Derating Curve

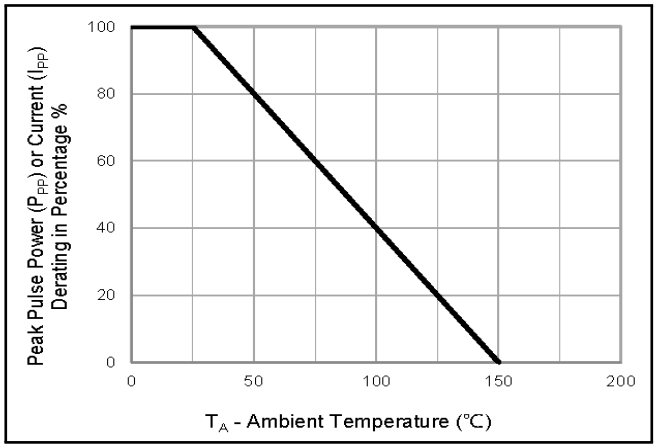


Figure 3: Pulse Waveform

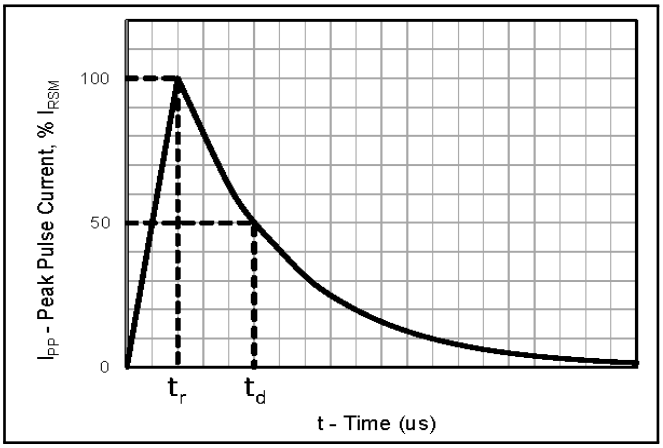


Figure 4 : Typical Junction Capacitance

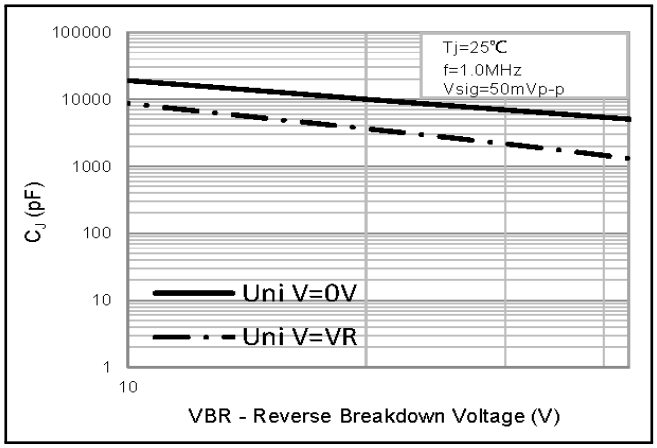


Figure 5: Steady State Power Dissipation Derating Curve

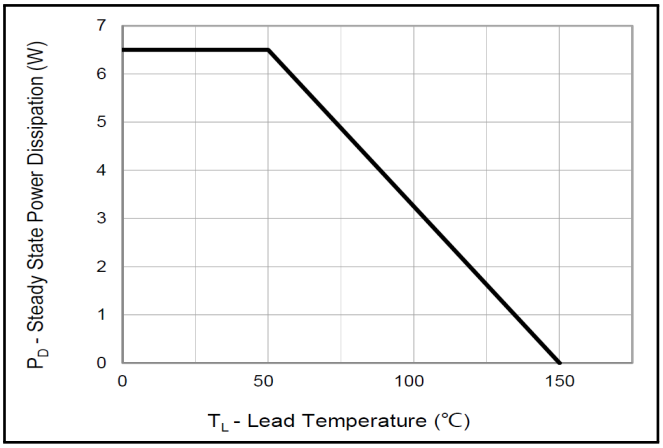
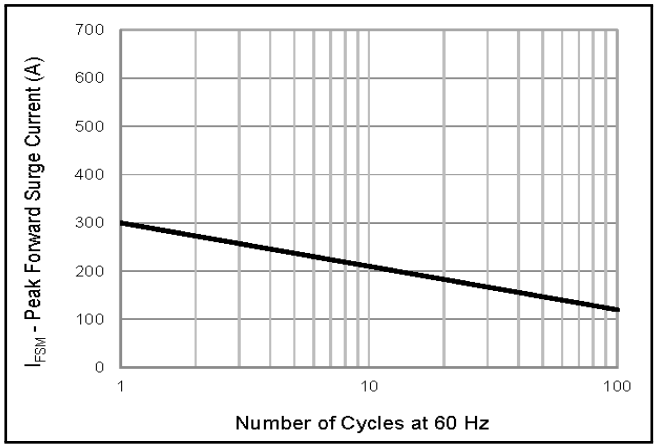


Figure 6 : Maximum Non-Repetitive Peak Forward Surge Current Uni-Directional Only



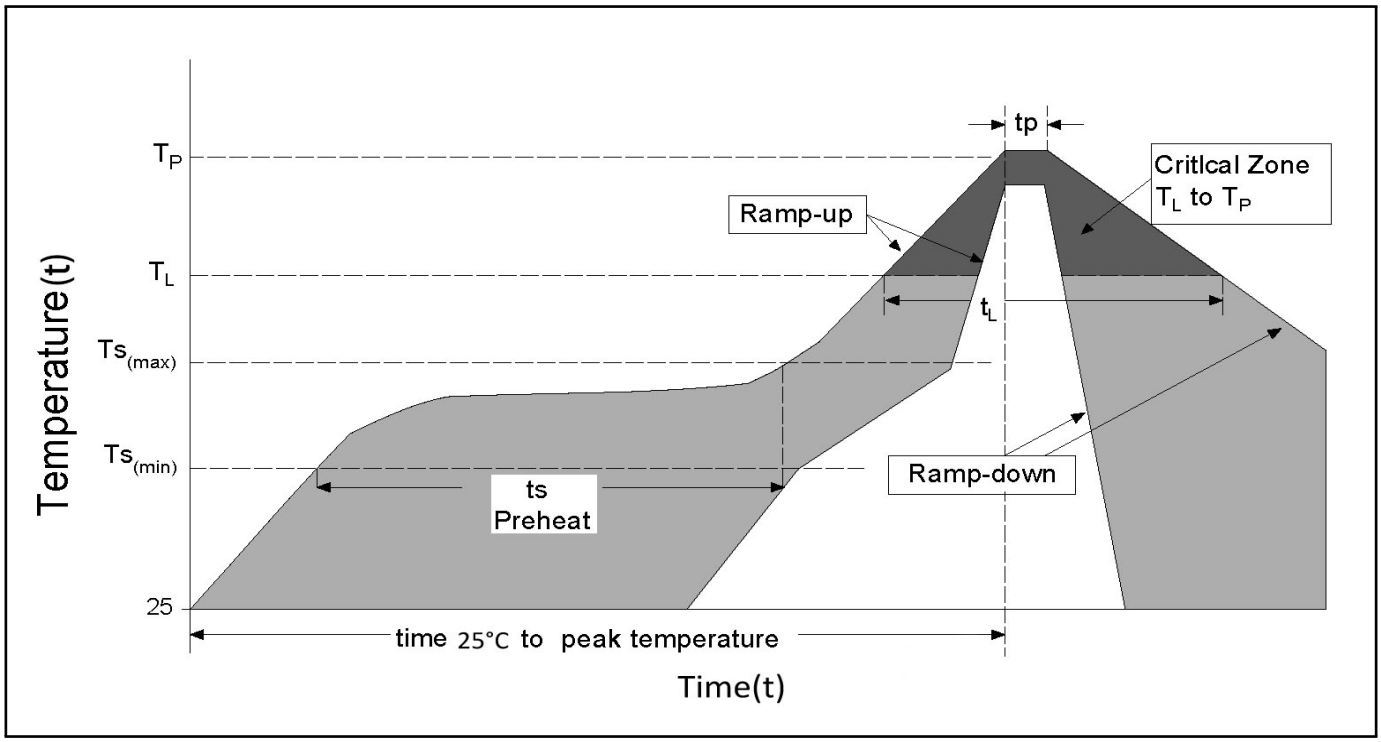
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P5T Series

Transient Voltage Suppressor

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 secs
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 (t_L)	60 -150 secs
Peak Temperature (T_P)		$260^{+0/-5°C}$
Time within 5°C of actual peak Temperature (t_p)		20 - 40 secs
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (t)		8 minutes Max.
Do not exceed		260°C

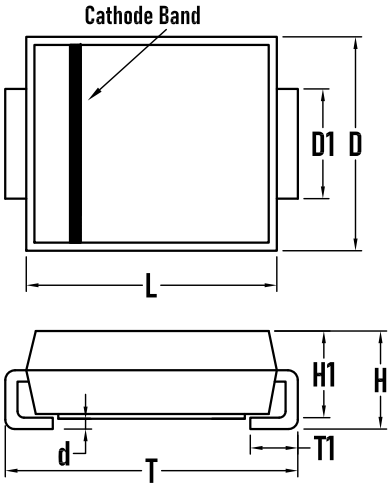
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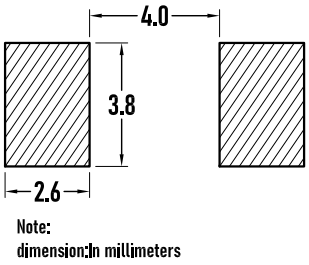
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P5T Series

Transient Voltage Suppressor

Package Mechanical Data - SMC

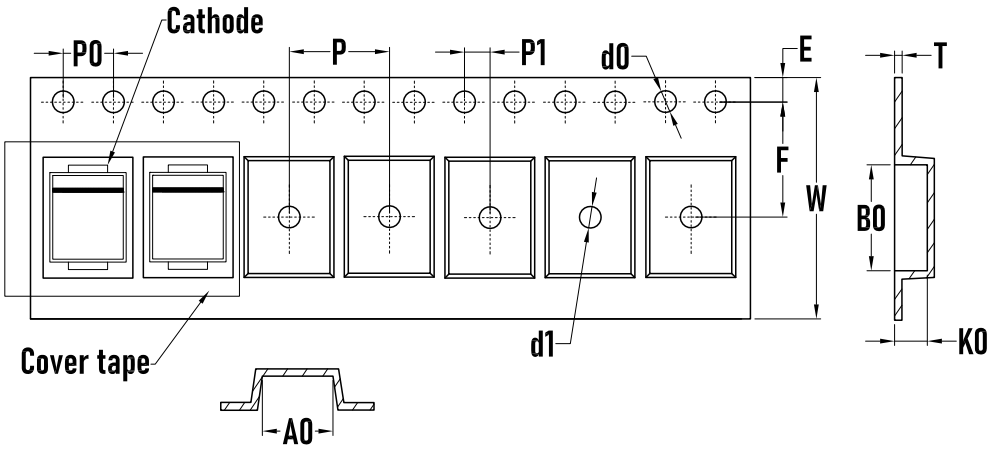




Note:
dimension:In millimeters

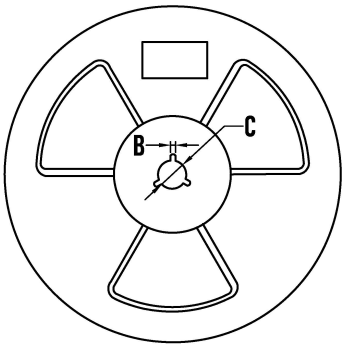
SYMBOL	Inches		MILLIMETER	
	MIN	MAX	MIN	MAX
D	5.5	6.1	0.217	0.240
D1	2.7	3.3	0.106	0.130
T	7.4	8.4	0.291	0.331
T1	0.8	1.6	0.031	0.063
d	–	0.3	–	0.012
H1	2.0	2.6	0.079	0.102
H	2.1	2.7	0.083	0.106
L	6.5	7.1	0.256	0.280

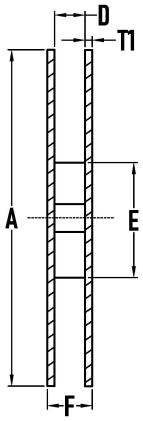
Packaging Tape - SMC



SYMBOL	MILLIMETER
A0	6.00±0.1
B0	8.25±0.02
d0	1.50±0.1
d1	1.50±0.1
E	1.75±0.1
F	7.50±0.1
K0	2.70±0.1
P	8.00±0.1
P0	4.00±0.1
P1	2.00±0.05
W	16.00±0.1
T	0.22±0.02

Packaging Reel





SYMBOL	MILLIMETER
A	323±2
B	3.0±0.2
C	15.0±0.5
D	16±2
E	73±2
T1	2.2±0.2
Quantity	3000PCS

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