

P0080SB - P5000SB Series

ROHS

DO-214AA(SMB) @10/700 μ S, 4KV

Thyristor Surge Suppressors (TSS)

Description

P0080SB- P5000SB 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

Applicable Global Standards

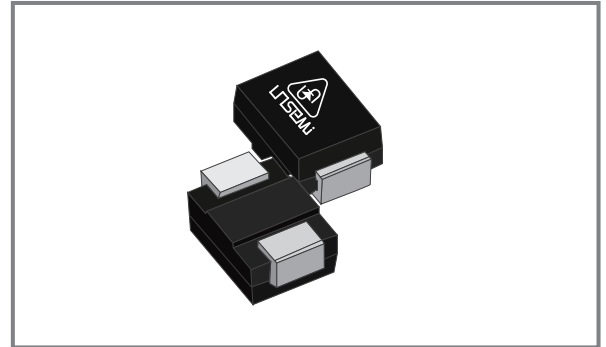
- ◆ TIA-968-A
- ◆ ITU K.20/21 Enhanced level
- ◆ ITU K.20/21 Basic Level
- ◆ GR 1089 Inter building
- ◆ IEC 6100-4-5
- ◆ YD/T 1082
- ◆ YD/T 993
- ◆ YD/T 950

Electrical Parameters

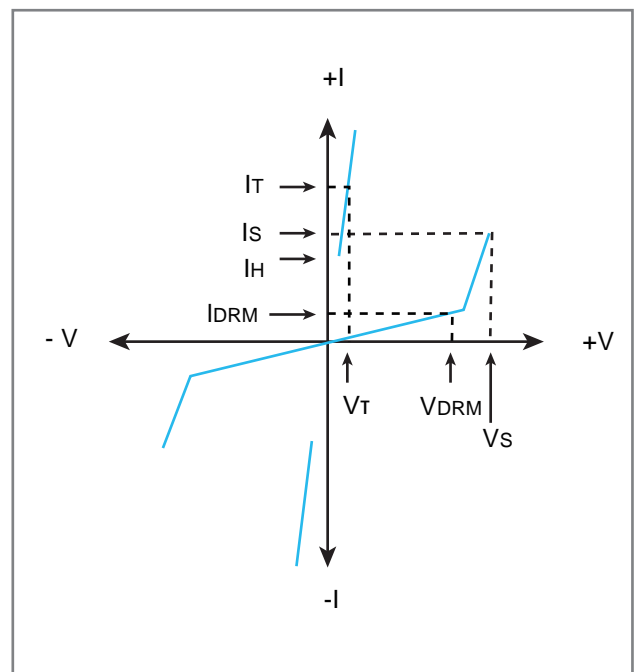
Parameter	Definition
I_S	Switching Current - maximum current required to switch to on state
I_{DRM}	Leakage Current - maximum peak off-state current measured at V_{DRM}
I_H	Holding Current - minimum current required to maintain on state
I_T	On-state Current - maximum rated continuous on-state current
V_S	Switching Voltage - maximum voltage prior to switching to on state
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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Schematic Symbol



Electrical Characteristics

Part Number	Marking	V_{DRM} @ $I_{DRM}=5\mu A$	I_{DRM}	V_s @100V/ μ S	I_s	V_T @ $I_T=2.2A$	I_T	I_H	C_o @1MHz
		VMin.	μ AMax.	VMax.	mAMax.	VMax.	AMax.	mAMin.	pFMax.
P0080SB	P008B	6	5	25	800	4	2.2	50	70
P0300SB	P03B	25	5	40	800	4	2.2	50	70
P0640SB	P06B	58	5	77	800	4	2.2	150	60
P0720SB	P07B	65	5	88	800	4	2.2	150	60
P0900SB	P09B	75	5	98	800	4	2.2	150	55
P1100SB	P11B	90	5	130	800	4	2.2	150	55
P1300SB	P13B	120	5	160	800	4	2.2	150	55
P1500SB	P15B	140	5	180	800	4	2.2	150	60
P1800SB	P18B	170	5	220	800	4	2.2	150	60
P2000SB	P20B	180	5	220	800	4	2.2	150	60
P2300SB	P23B	190	5	260	800	4	2.2	150	55
P2600SB	P26B	220	5	300	800	4	2.2	150	50
P3100SB	P31B	275	5	350	800	4	2.2	150	45
P3500SB	P35B	320	5	400	800	4	2.2	150	40
P3800SB	P38B	360	5	460	800	4	2.2	150	30
P4200SB	P42B	400	5	520	800	4	2.2	150	30
P4500SB	P45B	420	5	540	800	4	2.2	150	30
P5000SB	P50B	440	5	600	800	4	2.2	150	30

Notes:

- Absolute maximum ratings measured at TA= 25°C (unless otherwise noted).
- Devices are bi-directional.

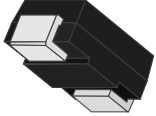
Surge Ratings

Series	2/10 μ S ¹	8/20 μ S ¹	10/560 μ S ¹	10/560 μ S ¹	10/1000 μ S ¹	5/320 μ S ¹	I_{TSM} 50/60Hz	di/dt
	2/10 μ S ²	1.2/50 μ S ²	10/560 μ S ²	10/560 μ S ²	10/1000 μ S ²	10/700 μ S ²		
	A min	A min	A min	A min	A min	A min	A min	Amps/ μ s max
B	250	250	250	200	80	100	30	500

Notes:

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

Thermal Considerations

Package	Symbol	Parameter	Value	Unit
DO-214AA 	T _J	Operating Junction Temperature Range	- 40 to +150	°C
	T _s	Storage Temperature Range	- 40 to +150	°C
	R _{θJA}	Thermal Resistance: Junction to Ambient	90	°C/W

Characteristic Curves

Figure 1 - V- I Characteristics

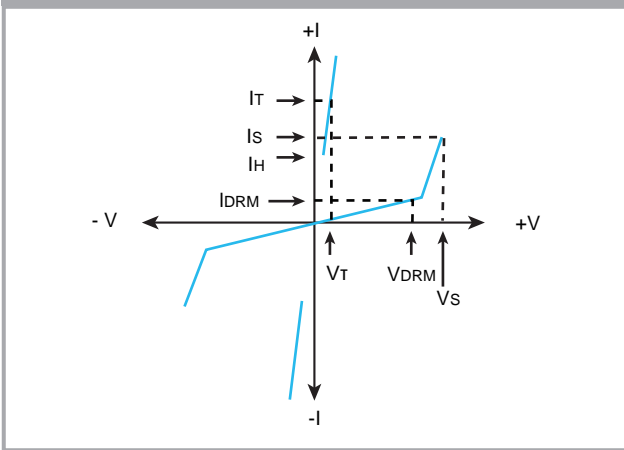


Figure 2 - tr x td Pulse Waveform

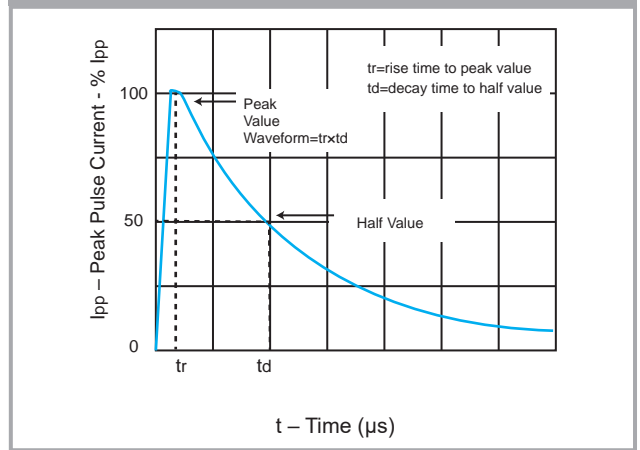


Figure 3 - Normalized VS Change Versus Junction Temperature

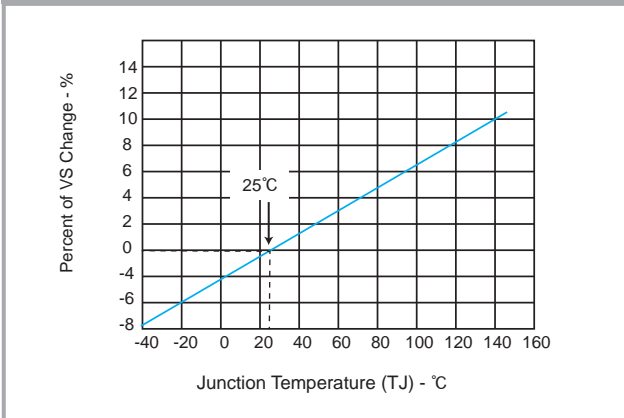
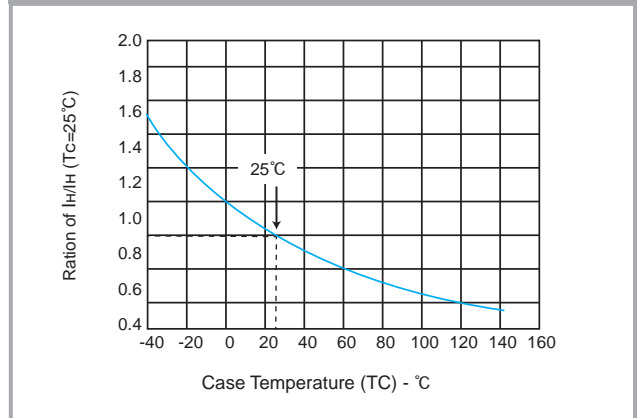


Figure 4 - Normalized DC Holding Current Versus Case Temperature



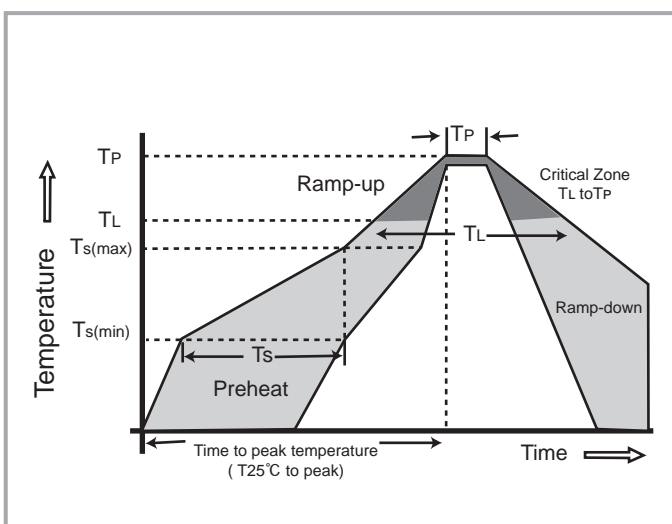
Environmental Specifications

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 Cying	-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

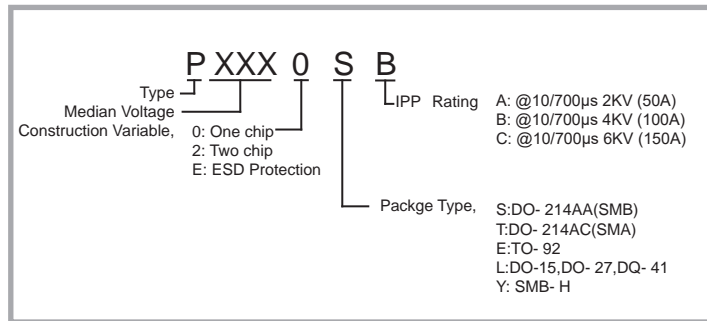
Lead Material	Copper Alloy
Terminal Finish	100% Matte-Tin Plated
Body Material	UL recognized epoxy meeting flammability classification 94V-0

Soldering Parameters

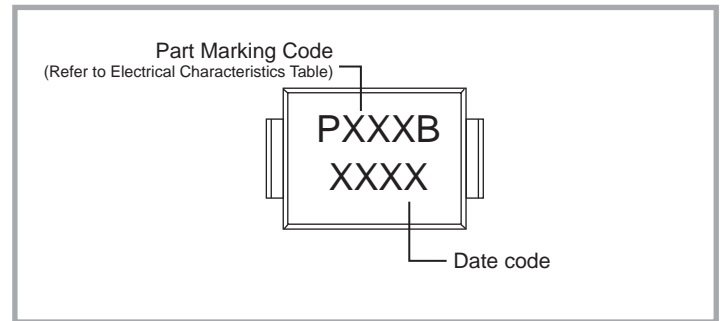


Reflow Condition		Lead-free assembly
Pre Heat	-Temperature Min (Ts(min))	+150°C
	-Temperature Max (Ts(max))	+200°C
	- Time (min to max) (Ts)	60 -180 Seconds
Average ramp up rate (Liquidus Temp TL) to peak		3°C/Second max
Ts(max) to TL - Ramp-up Rate		5°C/Second max
Reflow	- Temperature (TL) (Liquidus)	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

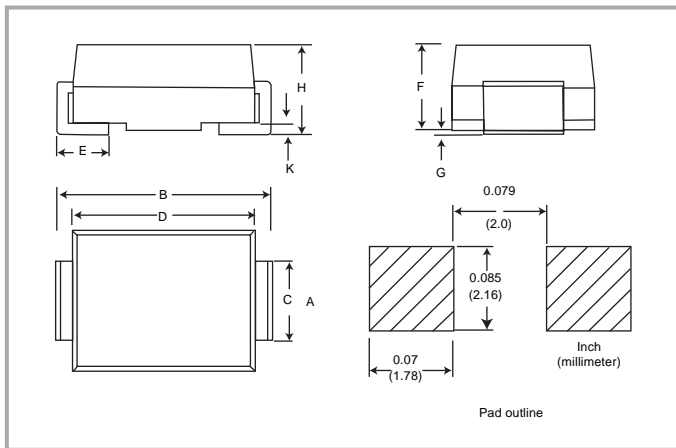
Part Numbering



Part Marking



Dimensions DO-214AA

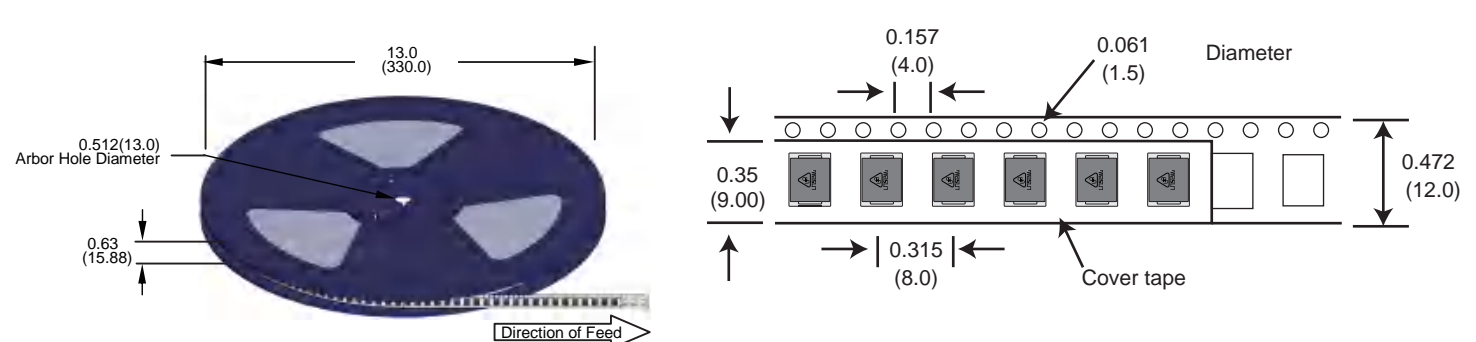


Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.130	0.156	3.30	3.95
B	0.201	0.220	5.10	5.60
C	0.077	0.087	1.95	2.20
D	0.159	0.181	4.05	4.60
E	0.030	0.063	0.76	1.60
F	0.076	0.096	1.90	2.45
G	0.002	0.008	0.05	0.20
H	0.077	0.104	1.95	2.65
K	0.006	0.016	0.15	0.41

Packaging

Part Number	Component Package	Quantity	Packaging Option	Packaging Specification
Pxxx0SB	DO-214AA	2500	Tape & Reel -12mm/13"tape	EIA -481 - D

Tape and Reel Specifications



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