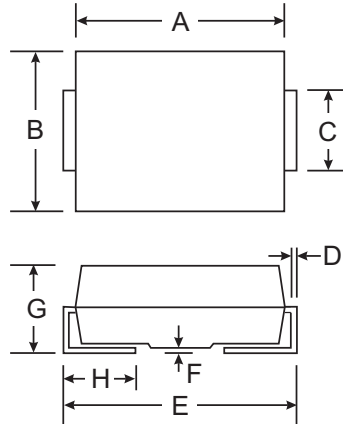


### Features

- 30A Peak Pulse Current @ 10/1000 $\mu$ s
- 150A Peak Pulse Current @ 8/20 $\mu$ s
- 58 - 320V Stand-Off Voltages
- Oxide-Glass Passivated Junction
- Bi-Directional Protection In a Single Device
- High Off-State impedance and Low On-State Voltage
- Helps Equipment Meet GR-1089-CORE, IEC 61000-4-5, FCC Part 68, ITU-T K.20/K.21, and UL497B
- UL Listed Under Recognized Component Index, File Number 156346
- **Lead Free Finish/RoHS Compliant (Note 1)**

### Mechanical Data

- Case: SMB
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Lead Free Plating (Matte Tin Finish). Solderable per MIL-STD-202, Method 208
- Polarity: None; Bi-Directional Devices Have No Polarity Indicator
- Marking: Date Code and Marking Code (See Page 4)
- Ordering Information: See Page 4
- Weight: 0.093 grams (approximate)



SMB		
Dim	Min	Max
A	4.06	4.57
B	3.30	3.94
C	1.96	2.21
D	0.15	0.31
E	5.21	5.59
F	0.05	0.20
G	2.01	2.62
H	0.76	1.52
All Dimensions in mm		

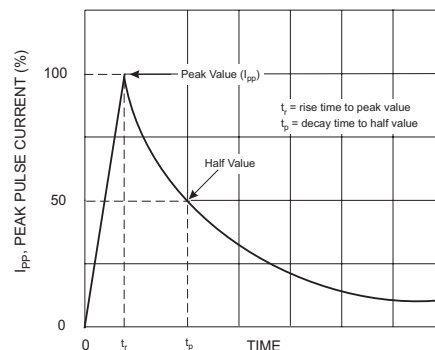
### Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Single phase, half wave, 60Hz, resistive or inductive load.  
For capacitive load, derate current by 20%.

Characteristic	Symbol	Value	Unit
Non-Repetitive Peak Impulse Current @ 10/1000us	$I_{pp}$	30	A
Non-Repetitive Peak On-State Current @ 8.3ms (one-half cycle)	$I_{TSM}$	15	A
Junction Temperature Range	$T_j$	-40 to +150	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-55 to +150	$^\circ\text{C}$
Thermal Resistance, Junction to Lead	$R_{\theta JL}$	30	$^\circ\text{C/W}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	120	$^\circ\text{C/W}$
Typical Positive Temperature Coefficient for Breakdown Voltage	$\Delta V_{BR}/\Delta T_j$	0.1	$\%/^\circ\text{C}$

### Maximum Rated Surge Waveform

Waveform	Standard	$I_{pp}$ (A)
2/10 us	GR-1089-CORE	200
8/20 us	IEC 61000-4-5	150
10/160 us	FCC Part 68	100
10/700 us	ITU-T, K.20/K.21	60
10/560 us	FCC Part 68	50
10/1000 us	GR-1089-CORE	30

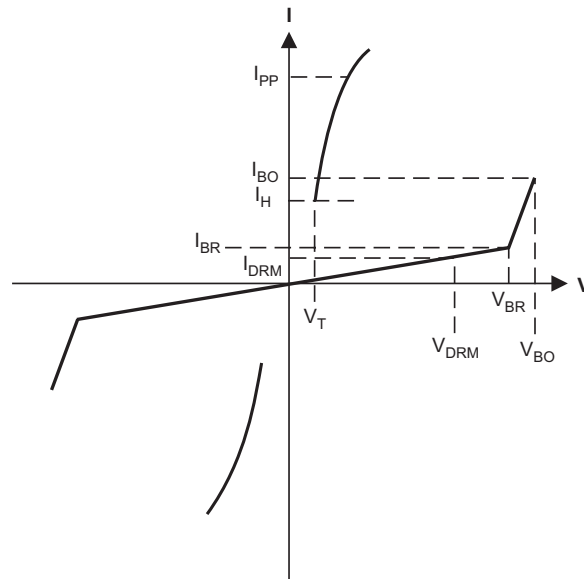


**Electrical Characteristics** @  $T_A = 25^\circ\text{C}$  unless otherwise specified

Part Number	Rated Repetitive Off-State Voltage	Off-State Leakage Current @ $V_{\text{DRM}}$	Breakover Voltage	On-State Voltage @ $I_T = 1\text{A}$	Breakover Current $I_{\text{BO}}$		Holding Current $I_{\text{H}}$		Off-State Capacitance	Marking Code
	$V_{\text{DRM}}$ (V)	$I_{\text{DRM}}$ ( $\mu\text{A}$ )	$V_{\text{BO}}$ (V)	$V_{\text{T}}$ (V)	Min (mA)	Max (mA)	Min (mA)	Max (mA)	$C_{\text{O}}$ (pF)	
TB0640L	58	5	77	3.5	50	800	150	800	100	T064L
TB0720L	65	5	88	3.5	50	800	150	800	100	T072L
TB0900L	75	5	98	3.5	50	800	150	800	100	T090L
TB1100L	90	5	130	3.5	50	800	150	800	60	T110L
TB1300L	120	5	160	3.5	50	800	150	800	60	T130L
TB1500L	140	5	180	3.5	50	800	150	800	60	T150L
TB1800L	160	5	220	3.5	50	800	150	800	60	T180L
TB2300L	190	5	265	3.5	50	800	150	800	40	T230L
TB2600L	220	5	300	3.5	50	800	150	800	40	T260L
TB3100L	275	5	350	3.5	50	800	150	800	40	T310L
TB3500L	320	5	400	3.5	50	800	150	800	40	T350L

Symbol	Parameter
$V_{\text{DRM}}$	Stand-off Voltage
$I_{\text{DRM}}$	Leakage current at stand-off voltage
$V_{\text{BR}}$	Breakdown voltage
$I_{\text{BR}}$	Breakdown current
$V_{\text{BO}}$	Breakover voltage
$I_{\text{BO}}$	Breakover current
$I_{\text{H}}$	Holding current NOTE: 2
$V_{\text{T}}$	On state voltage
$I_{\text{PP}}$	Peak pulse current
$C_{\text{O}}$	Off-state capacitance NOTE: 3

- Notes:
1. RoHS revision 13.2.2003. Glass and High Temperature Solder Exemptions Applied, see *EU Directive Annex Notes 5 and 7*.
  2.  $I_{\text{H}} > (V_{\text{L}}/R_{\text{L}})$  If this criterion is not obeyed, the TSPD triggers but does not return correctly to high-resistance state. The surge recovery time does not exceed 30ms.
  3. Off-state capacitance measured at  $f = 1.0\text{MHz}$ ,  $1.0V_{\text{RMS}}$  signal,  $V_{\text{R}} = 2V_{\text{DC}}$  bias.



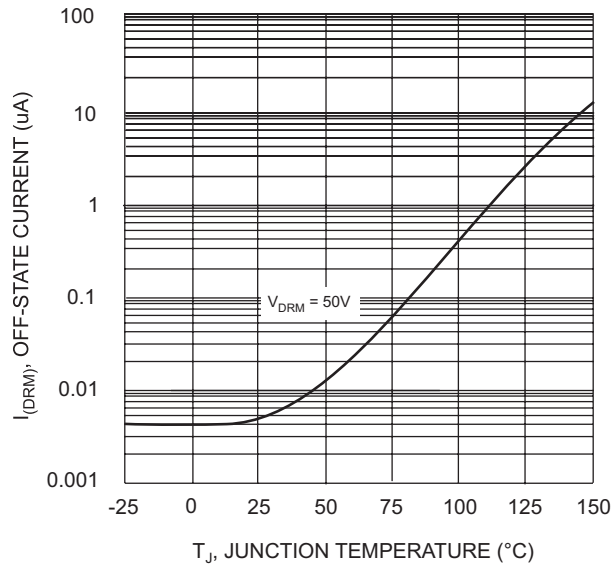


Fig. 1 Off-State Current vs. Junction Temperature

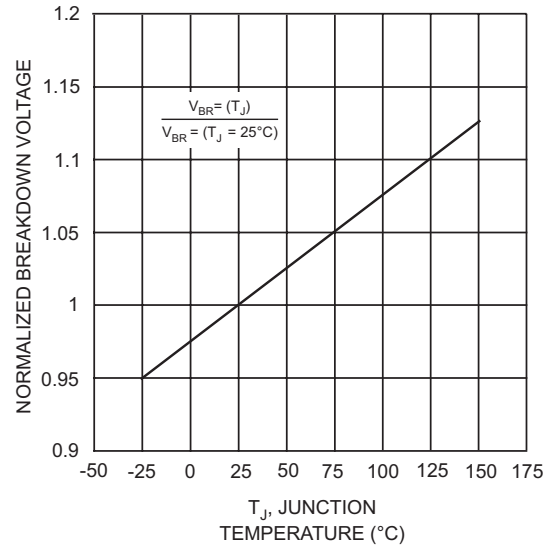


Fig. 2 Relative Variation of Breakdown Voltage vs. Junction Temperature

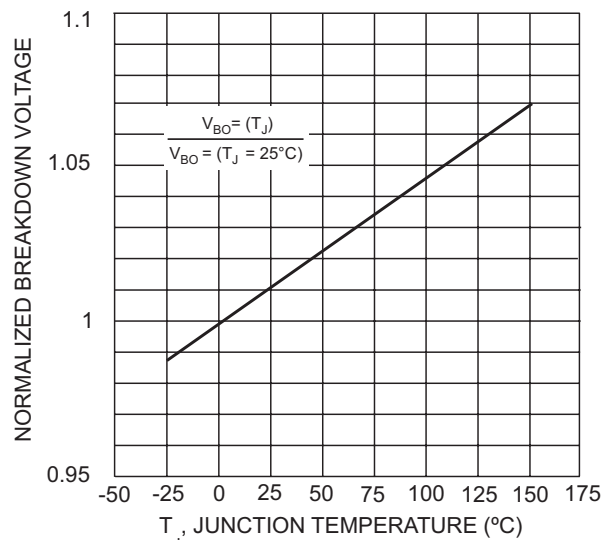


Fig. 3 Relative Variation of Breakover Voltage vs. Junction Temperature

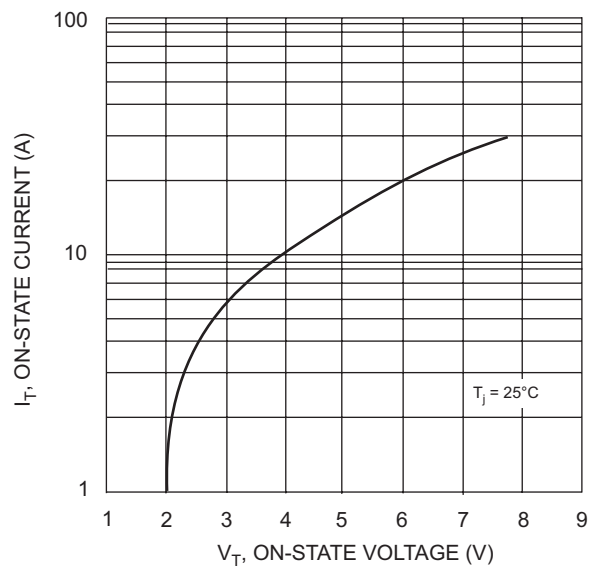


Fig. 4 On-State Current vs. On-State Voltage

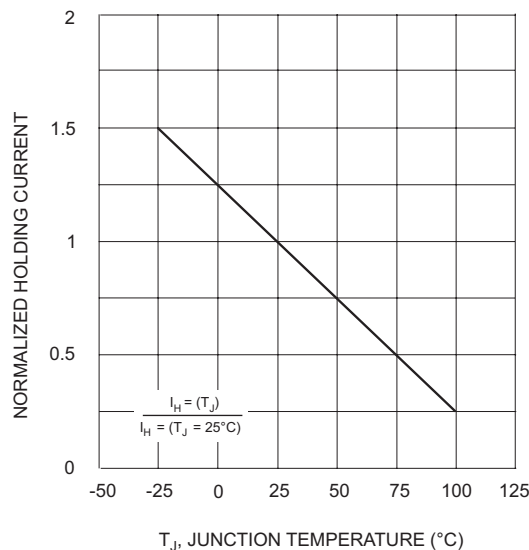


Fig. 5 Relative Variation of Holding Current vs. Junction Temperature

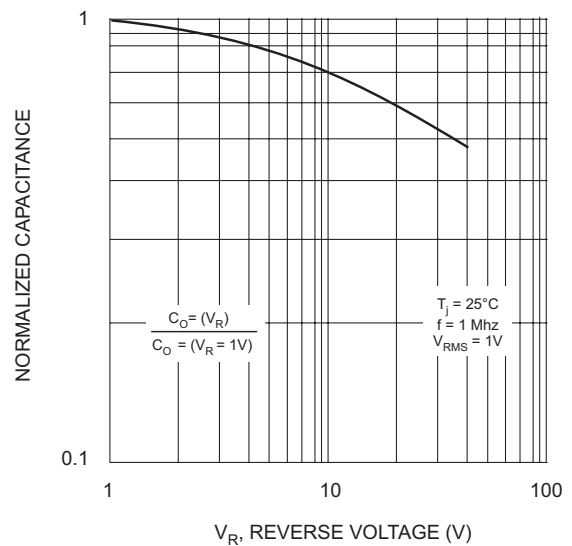


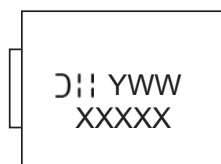
Fig. 6 Relative Variation of Junction Capacitance vs. Reverse Voltage Bias

## Ordering Information (Note 4)

Device	Packaging	Shipping
TB0640L-13-F	SMB	3000/Tape & Reel
TB0720L-13-F	SMB	3000/Tape & Reel
TB0900L-13-F	SMB	3000/Tape & Reel
TB1100L-13-F	SMB	3000/Tape & Reel
TB1300L-13-F	SMB	3000/Tape & Reel
TB1500L-13-F	SMB	3000/Tape & Reel
TB1800L-13-F	SMB	3000/Tape & Reel
TB2300L-13-F	SMB	3000/Tape & Reel
TB2600L-13-F	SMB	3000/Tape & Reel
TB3100L-13-F	SMB	3000/Tape & Reel
TB3500L-13-F	SMB	3000/Tape & Reel

Notes: 4. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

## Marking Information



XXXXX = Product Type Marking Code (See Table on Page 2)  
 YWW = Date Code Marking  
 Y = Year ex: 2 = 2002  
 WW = Week

Date Code Key

Year	2002	2003	2004	2005	2006	2007	2008	2009
Code	2	3	4	5	6	7	8	9

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