50A BI-DIRECTIONAL SURFACE-MOUNT THYRISTOR SURGE PROTECTION DEVICE

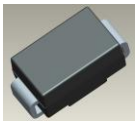
Features

- 50A Peak Pulse Current @ 10/1000μs
- 250A Peak Pulse Current @ 8/20μs
- 58V to 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 E219635
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please contact us or your local Diodes representative. https://www.diodes.com/quality/product-definitions/**

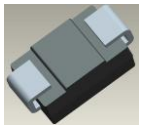
Mechanical Data

- Package: SMB
- Package Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Lead-Free Plating (Matte Tin Finish). Solderable per MIL-STD-202, Method 208 e3
- Polarity: None; Bi-Directional Devices Have No Polarity Indicator
- Weight: 0.093 grams (Approximate)

SMB



Top View



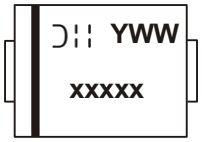
Bottom View

Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
TB0640M-13-F	SMB	3000	Tape & Reel
TB0720M-13-F	SMB	3000	Tape & Reel
TB0900M-13-F	SMB	3000	Tape & Reel
TB1100M-13-F	SMB	3000	Tape & Reel
TB1300M-13-F	SMB	3000	Tape & Reel
TB1500M-13-F	SMB	3000	Tape & Reel
TB1800M-13-F	SMB	3000	Tape & Reel
TB2300M-13-F	SMB	3000	Tape & Reel
TB2600M-13-F	SMB	3000	Tape & Reel
TB3100M-13-F	SMB	3000	Tape & Reel
TB3500M-13-F	SMB	3000	Tape & Reel

Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information



xxxxx = Product Type Marking Code
(See *Electrical Characteristics* Table on Page 3)
= Manufacturer's Code Marking
YWW = Date Code Marking
A Bar or Underline Around the Date Code or Product Type Marking Code Denotes Assembly Site if Marked.
Y = Last Digit of Year (ex: 6 for 2026)
WW = Week Code (01 to 53)

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Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

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

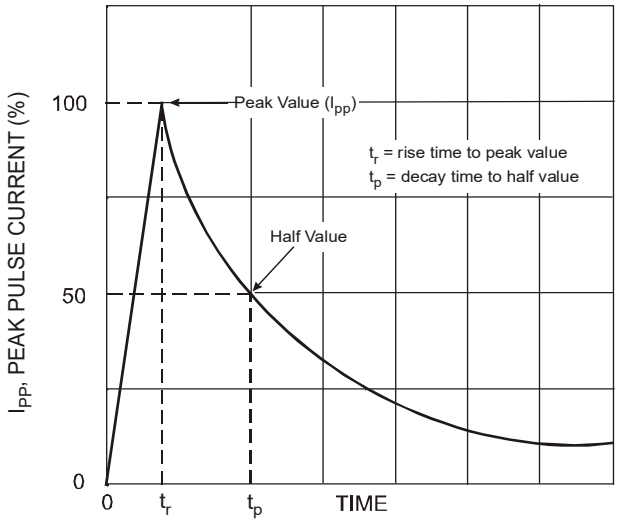
Characteristic		Symbol	Value	Unit
Non-Repetitive Peak Impulse Current	@10/1000μs	I_{PP}	50	A
Non-Repetitive Peak On-State Current	@8.3ms (One-Half Cycle)	I_{TSM}	30	A
Typical Positive Temperature Coefficient for Breakdown Voltage		$\Delta V_{BR}/\Delta T_J$	0.1	%/°C

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Lead	$R_{\theta JL}$	20	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	100	°C/W
Junction Temperature Range	T_J	-40 to 150	°C
Storage Temperature Range	T_{STG}	-55 to 150	°C

Maximum Rated Surge Waveform

Current Waveform	Voltage Waveform	Standard	I_{PP} (A)
2/10μs	2/10μs	GR-1089-CORE	300
8/20μs	1.2/50μs	IEC 61000-4-5	250
10/160μs	10/160μs	FCC Part 68	150
5/310μs	10/700μs	ITU-T, K.20/K.21	100
10/560μs	10/560μs	FCC Part 68	75
10/1000μs	10/1000μs	GR-1089-CORE	50



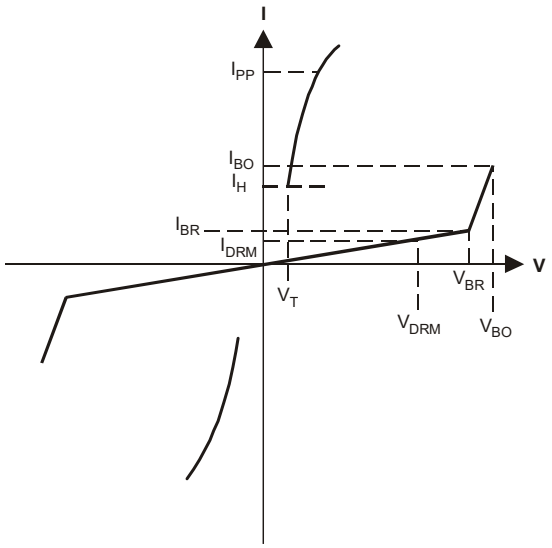
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Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Part Number	Maximum Off-State Leakage Current @ V_{DRM}		Maximum Breakover Voltage	Maximum On-State Voltage @ I_T = 1A	Breakover Current I_{BO}		Holding Current I_H		Typical Off-State Capacitance	Marking Code
	I_{DRM} (µA)	@ V_{DRM} (V)	V_{BO} (V)	V_T (V)	Min (mA)	Max (mA)	Min (mA)	Max (mA)	C_O (pF)	
TB0640M	5	58	77	3.5	50	800	150	800	140	T064M
TB0720M	5	65	88	3.5	50	800	150	800	140	T072M
TB0900M	5	75	98	3.5	50	800	150	800	140	T090M
TB1100M	5	90	130	3.5	50	800	150	800	90	T110M
TB1300M	5	120	160	3.5	50	800	150	800	90	T130M
TB1500M	5	140	180	3.5	50	800	150	800	90	T150M
TB1800M	5	160	220	3.5	50	800	150	800	90	T180M
TB2300M	5	190	265	3.5	50	800	150	800	60	T230M
TB2600M	5	220	300	3.5	50	800	150	800	60	T260M
TB3100M	5	275	350	3.5	50	800	150	800	60	T310M
TB3500M	5	320	400	3.5	50	800	150	800	60	T350M

Symbol	Parameter
V_{DRM}	Stand-Off Voltage
I_{DRM}	Leakage Current at Stand-Off Voltage
V_{BR}	Breakdown Voltage
I_{BR}	Breakdown Current
V_{BO}	Breakover Voltage
I_{BO}	Breakover Current
I_H	Holding Current (Note 5)
V_T	On-State Voltage
I_{PP}	Peak Pulse Current
C_O	Off-State Capacitance (Note 6)

Notes: 5. $I_H > (V_L/R_L)$. If this criterion is not met, the TSPD will be triggered but does not return correctly to high-resistance state. The surge recovery time does not exceed 30ms.
6. Off-state capacitance measured at f = 1.0MHz, 1.0V_{RMS} signal, V_R = 2V_{DC} bias.



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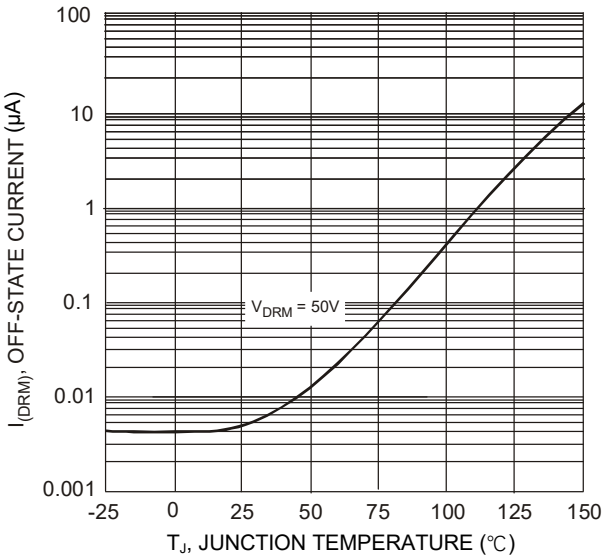


Fig. 1 Off-State Current vs. Junction Temperature

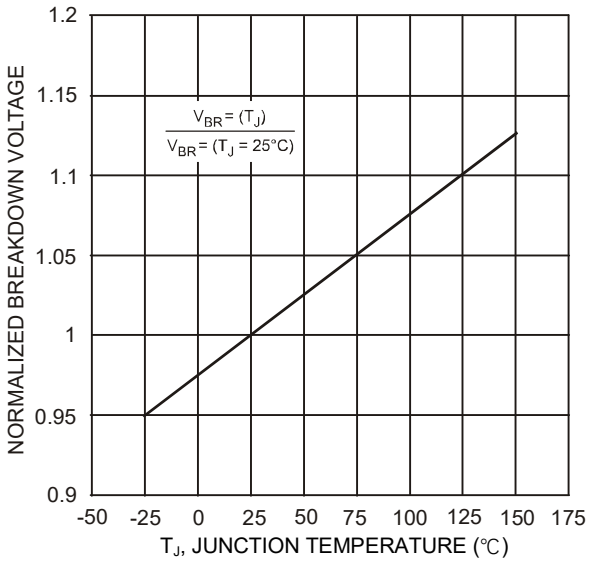


Fig. 2 Relative Variation of Breakdown Voltage vs. Junction Temperature

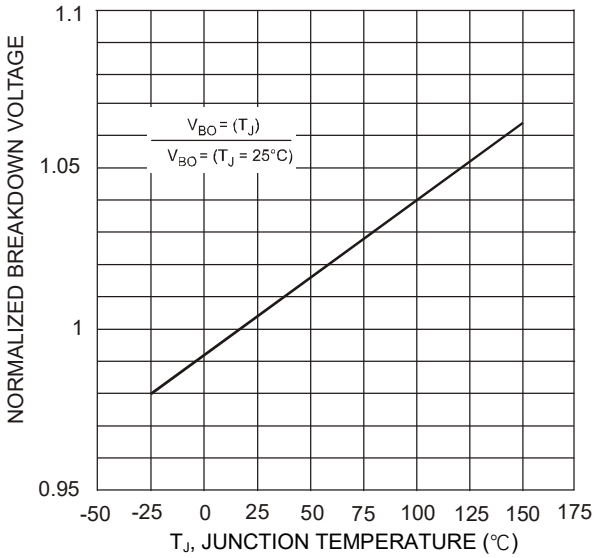


Fig. 3 Relative Variation of Breakover Voltage vs. Junction Temperature

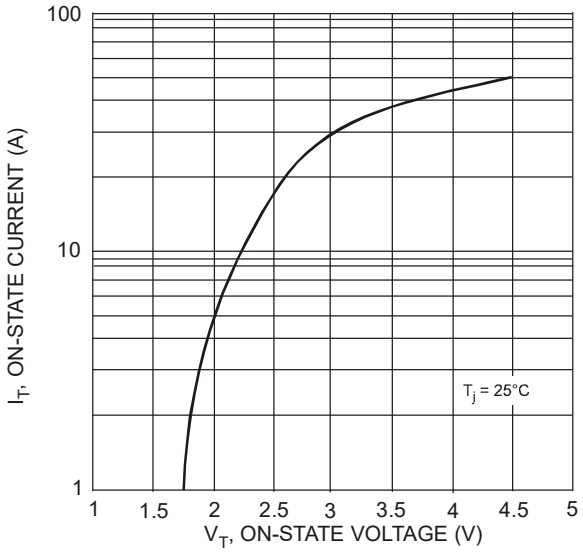


Fig. 4 On-State Current vs. On-State Voltage

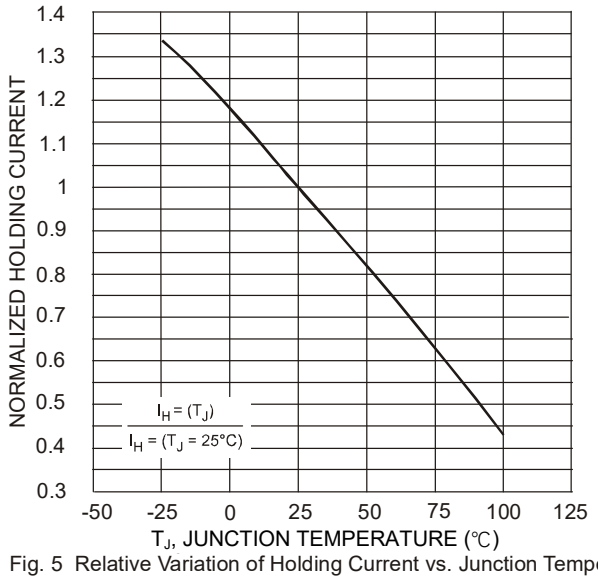


Fig. 5 Relative Variation of Holding Current vs. Junction Temperature

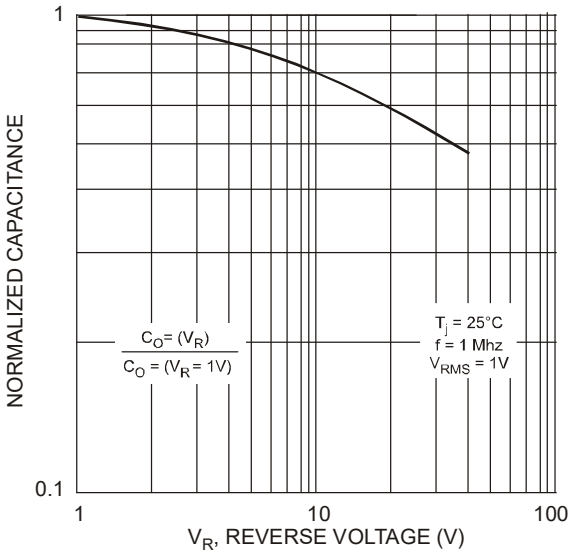


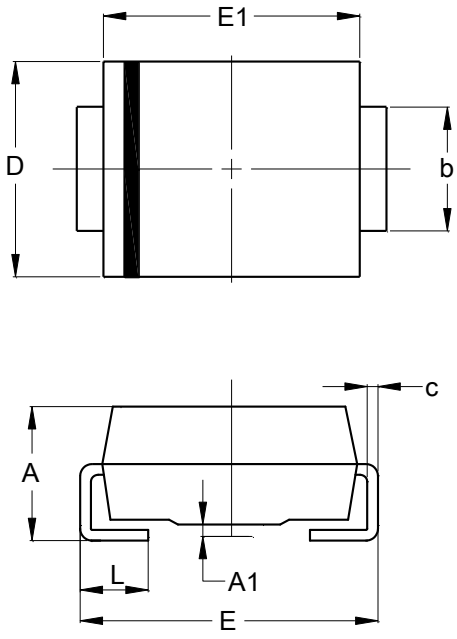
Fig. 6 Relative Variation of Junction Capacitance vs. Reverse Voltage Bias

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Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

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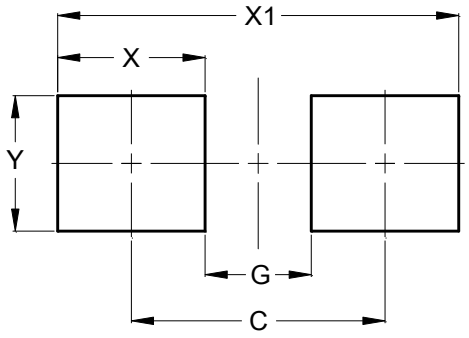


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Dim	**Min**	**Max**
A	2.00	2.50
A1	0.05	0.20
b	1.96	2.21
c	0.15	0.31
D	3.30	3.94
E	5.00	5.59
E1	4.06	4.57
L	0.76	1.52
All Dimensions in mm		

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

SMB



Dimensions	Value (in mm)
C	4.30
G	1.80
X	2.50
X1	6.80
Y	2.30

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