



TB0640M - TB3500M

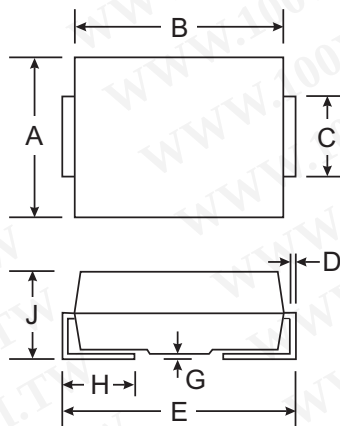
50A BI-DIRECTIONAL SURFACE MOUNT THYRISTOR SURGE PROTECTIVE DEVICE

Features

- 50A Peak Pulse Current @ 10/1000 μ s
- 250A Peak Pulse Current @ 8/20 μ 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	3.30	3.94
B	4.06	4.57
C	1.96	2.21
D	0.15	0.31
E	5.00	5.59
G	0.10	0.20
H	0.76	1.52
J	2.00	2.62
All Dimensions in mm		

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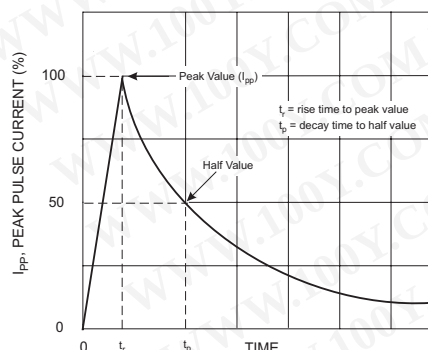
Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

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 @ 10/1000 μ s	I_{PP}	50	A
Non-Repetitive Peak On-State Current @ 8.3ms (one-half cycle)	I_{TSM}	30	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	$R_{\theta JL}$	20	$^\circ\text{C/W}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	100	$^\circ\text{C/W}$
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 μ s	GR-1089-CORE	300
8/20 μ s	IEC 61000-4-5	250
10/160 μ s	FCC Part 68	150
10/700 μ s	ITU-T, K.20/K.21	100
10/560 μ s	FCC Part 68	75
10/1000 μ s	GR-1089-CORE	50

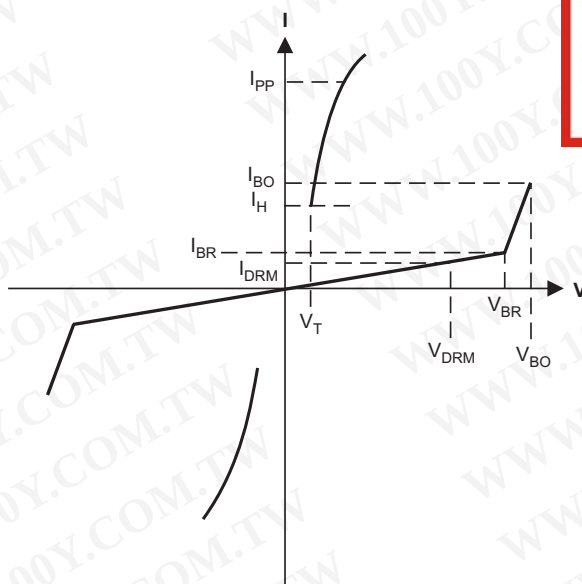


Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Part Number	Rated Repetitive Off-State Voltage	Off-State Leakage Current @ V_{DRM}	Breakover Voltage	On-State Voltage @ $I_T = 1\text{A}$	Breakover Current I_{BO}		Holding Current I_{H}		Off-State Capacitance	Marking Code
	V_{DRM} (V)	I_{DRM} (μA)	V_{BO} (V)	V_{T} (V)	Min (mA)	Max (mA)	Min (mA)	Max (mA)	C_{O} (pF)	
TB0640M	58	5	77	3.5	50	800	150	800	140	T064M
TB0720M	65	5	88	3.5	50	800	150	800	140	T072M
TB0900M	75	5	98	3.5	50	800	150	800	140	T090M
TB1100M	90	5	130	3.5	50	800	150	800	90	T110M
TB1300M	120	5	160	3.5	50	800	150	800	90	T130M
TB1500M	140	5	180	3.5	50	800	150	800	90	T150M
TB1800M	160	5	220	3.5	50	800	150	800	90	T180M
TB2300M	190	5	265	3.5	50	800	150	800	60	T230M
TB2600M	220	5	300	3.5	50	800	150	800	60	T260M
TB3100M	275	5	350	3.5	50	800	150	800	60	T310M
TB3500M	320	5	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: 2
V_{T}	On state voltage
I_{PP}	Peak pulse current
C_{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.



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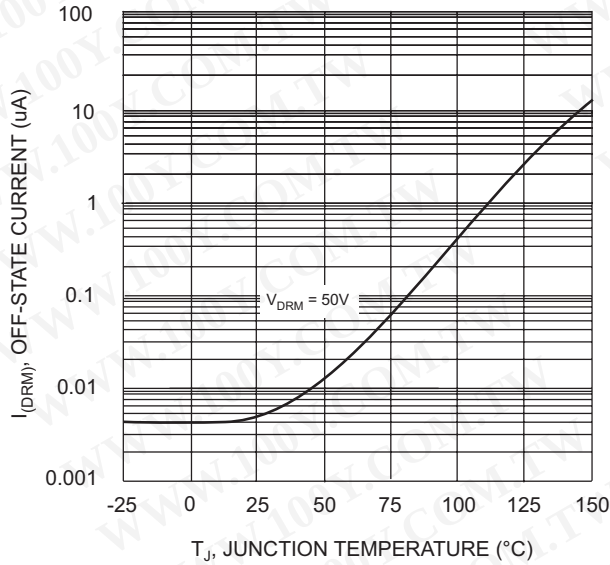


Fig. 1 Off-State Current vs. Junction Temperature

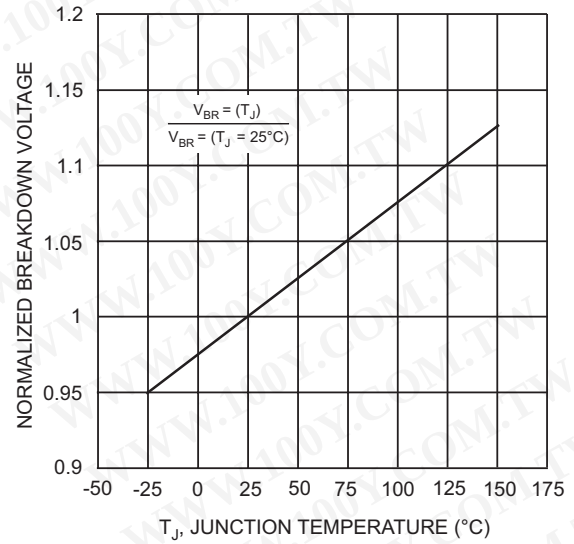


Fig. 2 Relative Variation of Breakdown Voltage vs. Junction Temperature

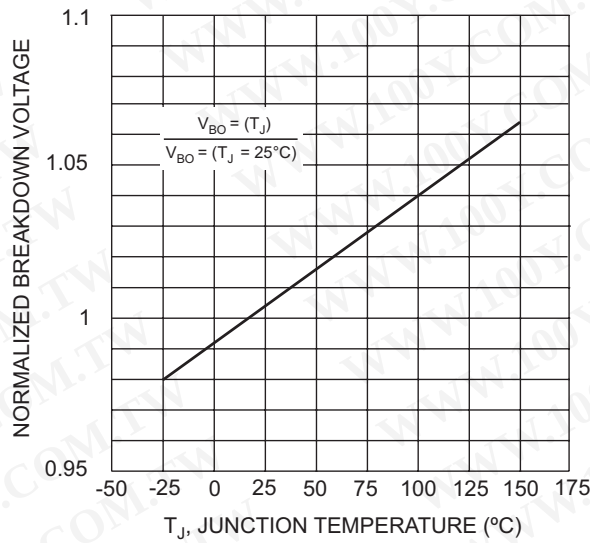


Fig. 3 Relative Variation of Breakover Voltage vs. Junction Temperature

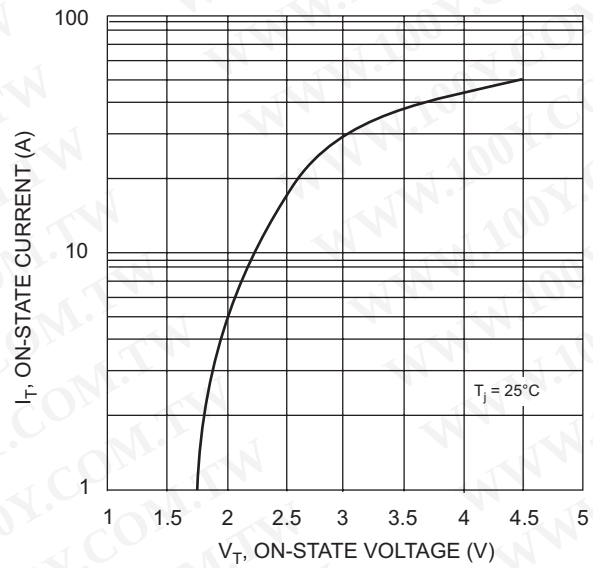


Fig. 4 On-State Current vs. On-State Voltage

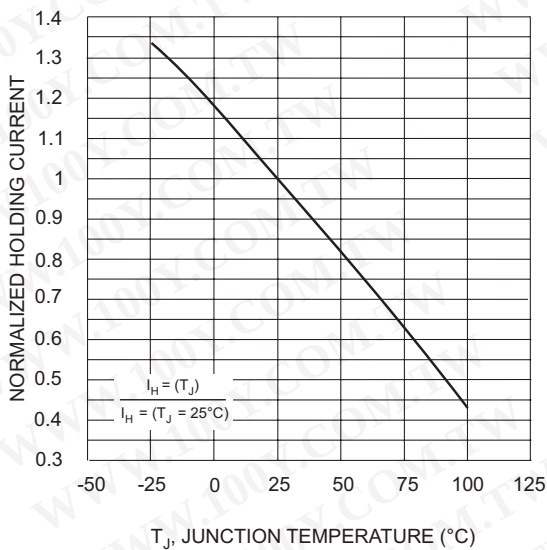


Fig. 5 Relative Variation of Holding Current vs. Junction Temperature

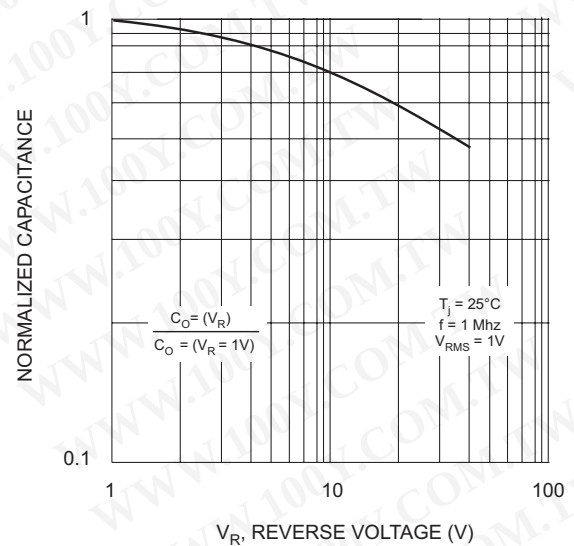
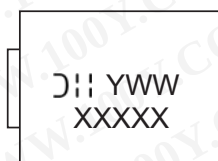


Fig. 6 Relative Variation of Junction Capacitance vs. Reverse Voltage Bias

Ordering Information (Note 4)

Device	Packaging	Shipping
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: 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 Code 01 to 52

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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