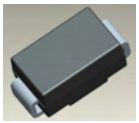
50A BIDIRECTIONAL SURFACE MOUNT THYRISTOR SURGE PROTECTION DEVICE

Features

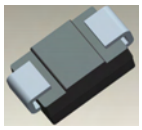
- 50A Peak Pulse Current @ 10/1000μs
- 250A Peak Pulse Current @ 8/20μs
- 58 - 320V Stand-Off Voltages
- Oxide-Glass Passivated Junction
- Bidirectional Protection In a Single Device
- High Off-State impedance and Low On-State Voltage
- Helps Equipment Meet GR-1089-CORE, IEC 61000-4-5, FCC Part 68, ITU-T K.20/K.21, and UL497B
- UL Listed Under Recognized Component Index, File Number 156346
- **Lead Free Finish/RoHS Compliant (Note 1)**
- **Green Molding Compound (No Halogen and Antimony) (Note 2)**

Mechanical Data

- Case: SMB
- Case 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
- Polarity: None; Bidirectional Devices Have No Polarity Indicator
- Weight: 0.093 grams (approximate)



Top View



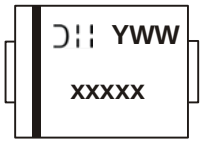
Bottom View

Ordering Information (Note 3)

Part Number	Case	Packaging
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). All applicable RoHS exemptions applied, see EU Directive 2002/95/EC Annex Notes.
2. Product manufactured with Data Code 0924 (week 24, 2009) and newer are built with Green Molding Compound.
3. For packaging details, go to our website at http://www.diodes.com.

Marking Information



xxxxx = Product type marking code
(See Electrical Characteristics table on page 3)
= Manufacturers' code marking
YWW = Date code marking
Y = Last digit of year (ex: 2 for 2002)
WW = Week code (01 to 53)

Maximum Ratings @T_A = 25°C unless otherwise specified

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

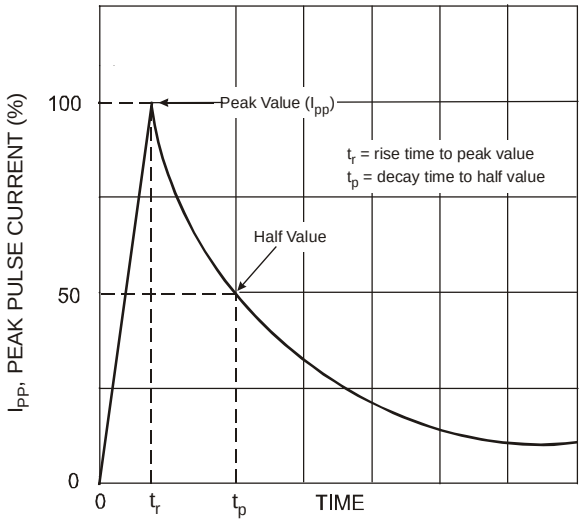
Characteristic		Symbol	Value	Unit
Non-Repetitive Peak Impulse Current	@10/1000us	I_{pp}	50	A
Non-Repetitive Peak On-State Current	@8.3ms (one-half cycle)	I_{TSM}	30	A
Typical Positive Temperature Coefficient for Breakdown Voltage		$\Delta VBR/\Delta T_j$	0.1	%/°C

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

Waveform	Standard	Ipp (A)
2/10 us	GR-1089-CORE	300
8/20 us	IEC 61000-4-5	250
10/160 us	FCC Part 68	150
10/700 us	ITU-T, K.20/K.21	100
10/560 us	FCC Part 68	75
10/1000 us	GR-1089-CORE	50



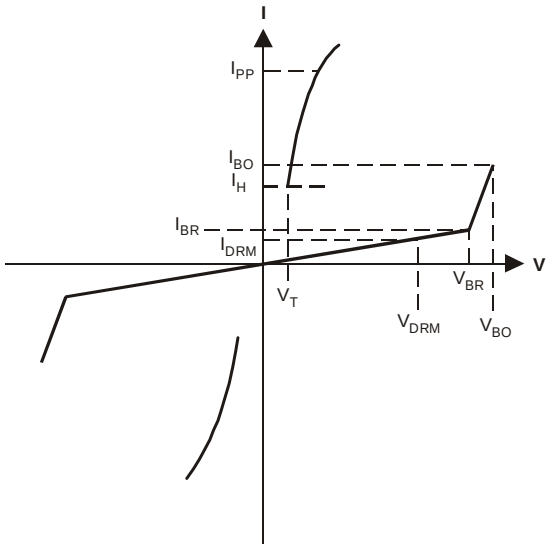
Electrical Characteristics @T_A = 25°C unless otherwise specified

Part Number	Maximum Rated Repetitive Off-State Voltage	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
	V_{DRM} (V)	I_{DRM} (uA)	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 4
V_T	On state voltage
I_{PP}	Peak pulse current
C_O	Off-state capacitance Note 5

Notes: 4. $I_H > (V_L/R_L)$ 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.

5. Off-state capacitance measured at f = 1.0MHz, 1.0V_{RMS} signal, $V_R = 2V_{DC}$ bias.



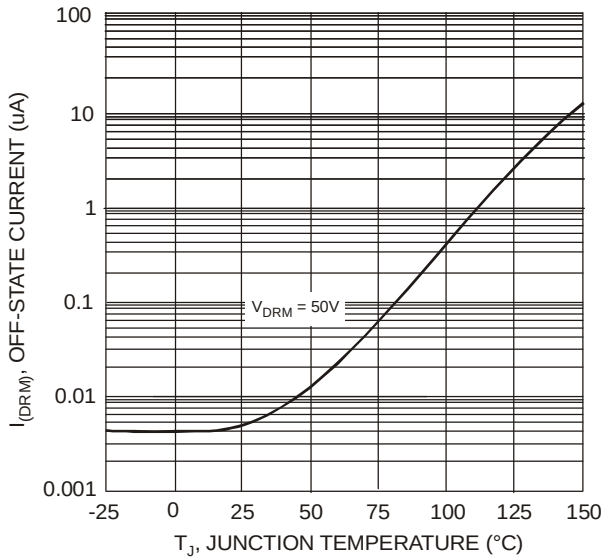


Fig. 1 Off-State Current vs. Junction Temperature

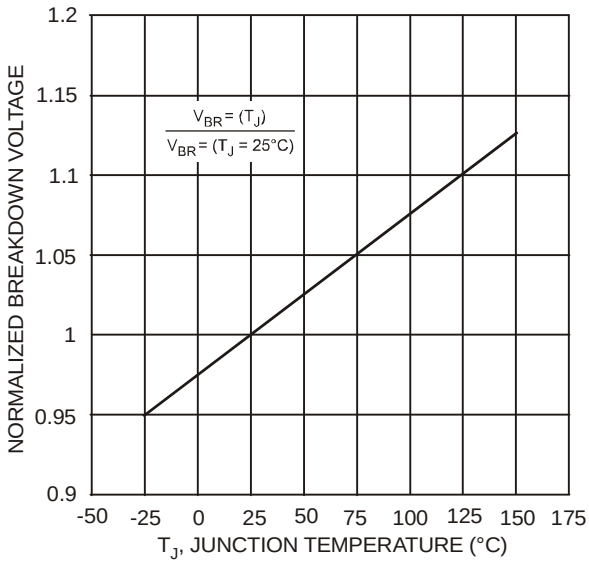


Fig. 2 Relative Variation of Breakdown Voltage vs. Junction Temperature

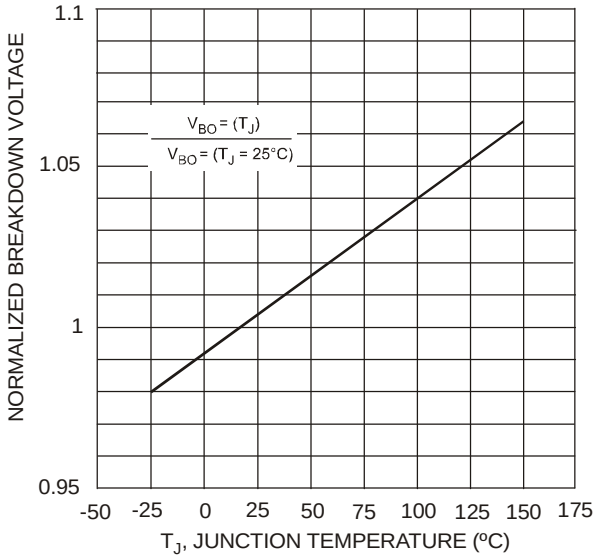


Fig. 3 Relative Variation of Breakover Voltage vs. Junction Temperature

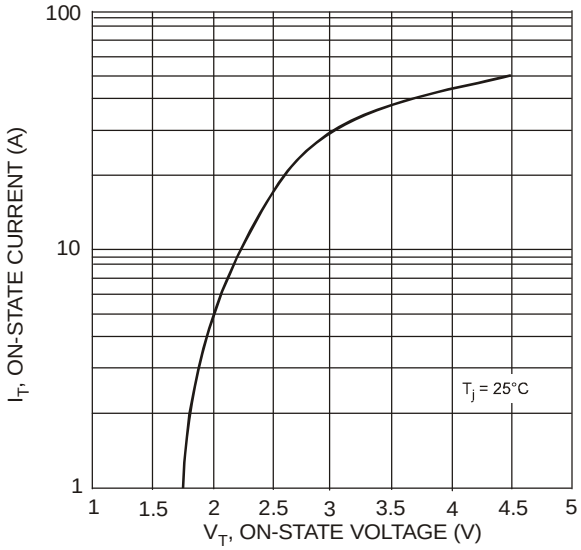


Fig. 4 On-State Current vs. On-State Voltage

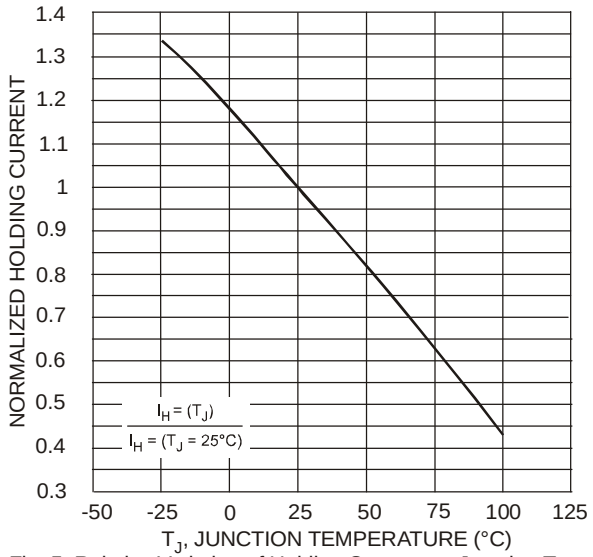


Fig. 5 Relative Variation of Holding Current vs. Junction Temperature

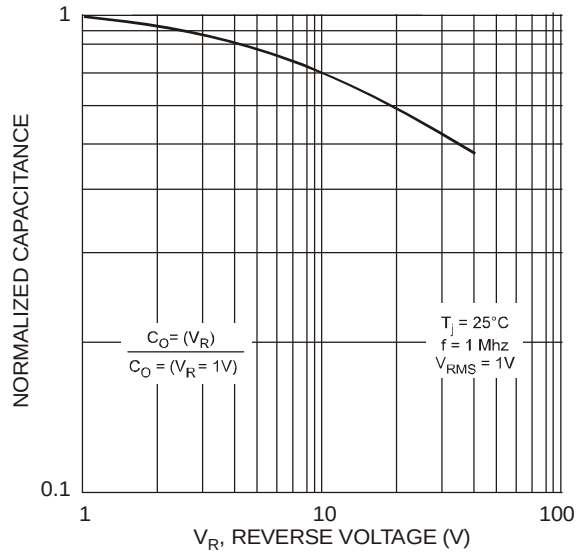
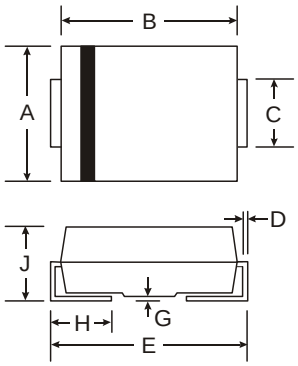


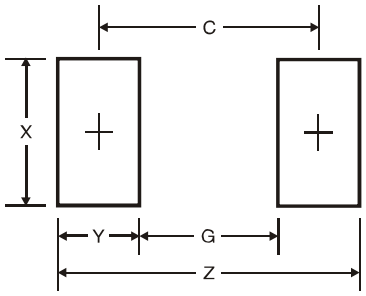
Fig. 6 Relative Variation of Junction Capacitance vs. Reverse Voltage Bias

Package Outline Dimensions



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	0.05	0.20
H	0.76	1.52
J	2.00	2.50
All Dimensions in mm		

Suggested Pad Layout



SMB Dimensions	Value (in mm)
Z	6.8
G	1.8
X	2.3
Y	2.5
C	4.3

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