Preferred Devices

# **Thyristor Surge Protectors**

# **High Voltage Bidirectional TSPD**

These Thyristor Surge Protective devices (TSPD) prevent overvoltage damage to sensitive circuits by lightning, induction and power line crossings. They are breakover-triggered crowbar protectors. Turn-off occurs when the surge current falls below the holding current value.

Secondary protection applications for electronic telecom equipment at customer premises.

### Features

- High Surge Current Capability: 80 Amps 10 x 1000 µsec, for Controlled Temperature Environments
- The MMT08B350T3 is used to help equipment meet various regulatory requirements including: Bellcore 1089, ITU K.20 & K.21, IEC 950, UL 1459 & 1950 and FCC Part 68.
- Bidirectional Protection in a Single Device
- Little Change of Voltage Limit with Transient Amplitude or Rate
- Freedom from Wearout Mechanisms Present in Non–Semiconductor Devices
- Fail–Safe, Shorts When Overstressed, Preventing Continued Unprotected Operation
- Surface Mount Technology (SMT)
- SU Indicates UL Recognized File #E210057
- Pb–Free Package is Available

### **MAXIMUM RATINGS** (T<sub>J</sub> = $25^{\circ}$ C unless otherwise noted)

Rating	Symbol	Value	Unit
Off-State Voltage - Maximum	V <sub>DM</sub>	300	V
Maximum Pulse Surge Short Circuit Current Non–Repetitive Double Exponential Decay Waveform (–25°C Initial Temperature) (Notes 1 and 2) 2 x 10 μsec 8 x 20 μsec 10 x 160 μsec 10 x 360 μsec 10 x 560 μsec 10 x 700 μsec 10 x 1000 μse	IPPS1 IPPS2 IPPS3 IPPS4 IPPS5 IPPS6 IPPS7	$\pm 250 \\ \pm 250 \\ \pm 150 \\ \pm 150 \\ \pm 100 \\ \pm 100 \\ \pm 80$	A(pk)
Non–Repetitive Peak On–State Current 60 Hz Full Sign Wave	I <sub>TSM</sub>	32	A(pk)
Maximum Non–Repetitive Rate of Change of On–State Current Exponential Waveform, < 100 A	di/dt	± 300	A/μs

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

2. Measured under pulse conditions to reduce heating.



## **ON Semiconductor®**

http://onsemi.com

# BIDIRECTIONAL TSPD (9) 80 AMP SURGE, 350 VOLTS





SMB (No Polarity) (Essentially JEDEC DO-214AA) CASE 403C

### MARKING DIAGRAM



#### **ORDERING INFORMATION**

Device	Package	Shipping <sup>†</sup>
MMT08B350T3	SMB	2500/Tape and Reel
MMT08B350T3G	SMB (Pb-Free)	2500/Tape and Reel

+For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

**Preferred** devices are recommended choices for future use and best overall value.

<sup>1.</sup> Allow cooling before testing second polarity.

### THERMAL CHARACTERISTICS

Characteristic		Мах	Unit
Operating Temperature Range Blocking or Conducting State	T <sub>J1</sub>	-40 to +125	°C
Overload Junction Temperature – Maximum Conducting State Only	T <sub>J2</sub>	+ 175	°C
Maximum Lead Temperature for Soldering Purposes 1/8" from Case for 10 Seconds	Τ <sub>L</sub>	260	°C

**ELECTRICAL CHARACTERISTICS** ( $T_J = 25^{\circ}C$  unless otherwise noted) Devices are bidirectional. All electrical parameters apply to forward and reverse polarities.

Characteristics	Symbol	Min	Тур	Max	Unit
Breakover Voltage (Both polarities) (dv/dt = 100 V/μs, I <sub>SC</sub> = 1.0 A, Vdc = 1000 V) (+65°C)	V <sub>(BO)</sub>			400 412	V
Breakover Voltage (Both polarities) (f = 60 Hz, $I_{SC}$ = 1.0 A(rms), $V_{OC}$ = 1000 V(rms), $R_I$ = 1.0 k $\Omega$ , t = 0.5 cycle) (Note 3) (+65°C)	V <sub>(BO)</sub>	-	-	400 412	V
Breakover Voltage Temperature Coefficient	dV <sub>(BO)</sub> /dT <sub>J</sub>	-	0.12	-	V/°C
Breakdown Voltage (I <sub>(BR)</sub> = 1.0 mA) Both polarities	V <sub>(BR)</sub>	-	350	-	V
Off State Current ( $V_{D1} = 50 \text{ V}$ ) Both polarities ( $V_{D2} = V_{DM}$ ) Both polarities	I <sub>D1</sub> I <sub>D2</sub>			2.0 5.0	μΑ
On–State Voltage (I <sub>T</sub> = 1.0 A) (PW $\leq$ 300 µs, Duty Cycle $\leq$ 2%) (Note 3)	V <sub>T</sub>	-	1.7	3.0	V
Breakover Current (f = 60 Hz, V <sub>DM</sub> = 1000 V(rms), R <sub>S</sub> = 1.0 kΩ) Both polarities	I <sub>BO</sub>	-	475	-	mA
Holding Current (Both polarities) (Note 3) $V_S = 500 \text{ V}; I_T \text{ (Initiating Current)} = \pm 1.0 \text{ A} (+65^{\circ}\text{C})$	I <sub>H</sub>	150 130	270 -		mA
Critical Rate of Rise of Off–State Voltage (Linear waveform, $V_D$ = Rated $V_{BR}$ , $T_J$ = 25°C)	dv/dt	2000	-	-	V/µs
Capacitance (f = 1.0 MHz, 50 Vdc, 1.0 V rms Signal) (f = 1.0 MHz, 2.0 Vdc, 1.0 V rms Signal)	C <sub>O</sub>	-	20 42	25 45	pF

3. Measured under pulse conditions to reduce heating.

Symbol	Parameter
I <sub>D1</sub> , I <sub>D2</sub>	Off State Leakage Current
V <sub>D1</sub> , V <sub>D2</sub>	Off State Blocking Voltage
V <sub>BR</sub>	Breakdown Voltage
V <sub>BO</sub>	Breakover Voltage
I <sub>BO</sub>	Breakover Current
I <sub>H</sub>	Holding Current
V <sub>TM</sub>	On State Voltage









\*Polymeric PTC (positive temperature coefficient) overcurrent protection device



#### PACKAGE DIMENSIONS

SMB CASE 403C-01 ISSUE A



CONTROLLING DIMENSION: INCH. D DIMENSION SHALL BE MEASURED WITHIN DIMENSION P.					
	INCHES MILLIMETERS				
DIM	MIN	MAX	MIN	MAX	
Α	0.160	0.180	4.06	4.57	
В	0.130	0.150	3.30	3.81	
С	0.075	0.095	1.90	2.41	
D	0.077	0.083	1.96	2.11	
Н	0.0020	0.0060	0.051	0.152	
J	0.006	0.012	0.15	0.30	
ĸ	0.030	0.050	0.76	1.27	
P	0.020 REF 0.51 REF				
S	0.205	0.220	5.21	5.59	

1. DIMENSIONING AND TOLERANCING PER ANSI

NOTES:

2.

Y14.5M, 1982.

**SOLDERING FOOTPRINT\*** 



\*For additional information on our Pb–Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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