MMT08B310T3

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.

- High Surge Current Capability: 80 Amps 10 x 1000 μsec, for Controlled Temperature Environments
- The MMT08B310 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)
- Ⓤ Indicates UL Registered − File #E210057
- Pb−Free Package is Available

MAXIMUM RATINGS (T_J = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Off−State Voltage − Maximum MMT08B310T3	V_{DM}	±270	V
Maximum Pulse Surge Short Circuit Current Non−Repetitive Double Exponential Decay Waveform (Notes 1 and 2) 10 x 1000 μsec (−25°C Initial Temperature) 8 x 20 μsec 10 x 160 μsec 10 x 560 μsec	 I_{PPS1} I_{PPS2} I_{PPS3} I_{PPS4}	 ±80 ±250 ±150 ±100	A(pk)
Maximum Non−Repetitive Rate of Change of On−State Current Double Exponential Waveform, R = 1.0, L = 1.5 μH, C = 1.67 μF, I_{pk} = 110A	di/dt	±150	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.

1. Allow cooling before testing second polarity.
2. Measured under pulse conditions to reduce heating.

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BIDIRECTIONAL TSPD (Ⓤ)
80 AMP SURGE
310 VOLTS

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

MARKING DIAGRAM

RPCJ = Specific Device Code
A = Assembly Location
Y = Year
WW = Work Week
▪ = Pb−Free Package
(Note: Microdot may be in either location)

ORDERING INFORMATION

Device	Package	Shipping†
MMT08B310T3	SMB	2500 Tape & Reel
MMT08B310T3G	SMB Pb−Free	2500 Tape & Reel

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

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

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Operating Temperature Range Blocking or Conducting State	T_{J1}	−40 to +125	°C
Overload Junction Temperature − Maximum Conducting State Only	T_{J2}	+175	°C
Instantaneous Peak Power Dissipation (I_{pk} = 50 A, 10x1000 μsec @ 25°C)	P_{PK}	2000	W
Maximum Lead Temperature for Soldering Purposes 1/8″ from Case for 10 Seconds	T_L	260	°C

ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise noted)

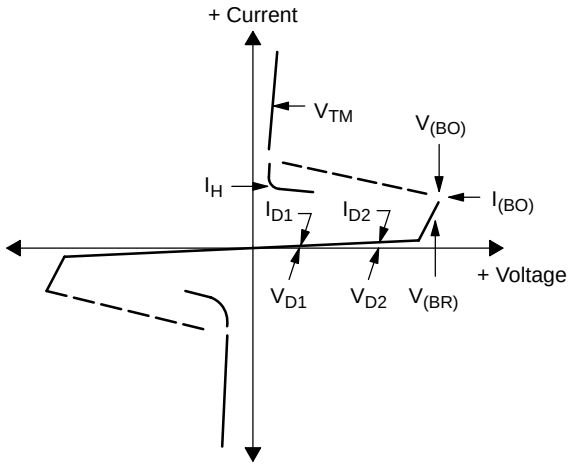
Devices are bidirectional. All electrical parameters apply to forward and reverse polarities.

Characteristics		Symbol	Min	Typ	Max	Unit
Breakover Voltage (Both polarities) (dv/dt = 100 V/μs, I_{SC} = 1.0 A, Vdc = 1000 V) (+65°C)	MMT08B310T3 MMT08B310T3	$V_{(BO)}$	 − −	 − −	 365 400	V
Breakover Voltage (Both polarities) (f = 60 Hz, I_{SC} = 1.0 A(rms), V_{OC} = 1000 V(rms), R_I = 1.0 kΩ, t = 0.5 cycle) (Note 3) (+65°C)	MMT08B310T3 MMT08B310T3	$V_{(BO)}$	 − −	 − −	 365 400	V
Breakover Voltage Temperature Coefficient		$dV_{(BO)}/dT_J$	−	0.08	−	%/°C
Breakdown Voltage ($I_{(BR)}$ = 1.0 mA) Both polarities	MMT08B310T3	$V_{(BR)}$	−	310	−	V
Off State Current (V_{D1} = 50 V) Both polarities (V_{D2} = V_{DM}) Both polarities		I_{D1} I_{D2}	− −	− −	2.0 5.0	μA
On−State Voltage (I_T = 1.0 A) (PW ≤ 300 μs, Duty Cycle ≤ 2%) (Note 3)		V_T	−	1.53	3.0	V
Breakover Current (f = 60 Hz, V_{DM} = 1000 V(rms), R_S = 1.0 kΩ) Both polarities		I_{BO}	−	230	−	mA
Holding Current (Both polarities) V_S = 500 Volts; I_T (Initiating Current) = ±1.0 Amp	(Note 3)	I_H	150	340	−	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_O	− −	23 −	25 50	pF

3. Measured under pulse conditions to reduce heating.

Voltage Current Characteristic of TSPD (Bidirectional Device)

Symbol	Parameter
I_{D1}, I_{D2}	Off State Leakage Current
V_{D1}, V_{D2}	Off State Blocking Voltage
V_{BR}	Breakdown Voltage
V_{BO}	Breakover Voltage
I_{BO}	Breakover Current
I_H	Holding Current
V_{TM}	On State Voltage



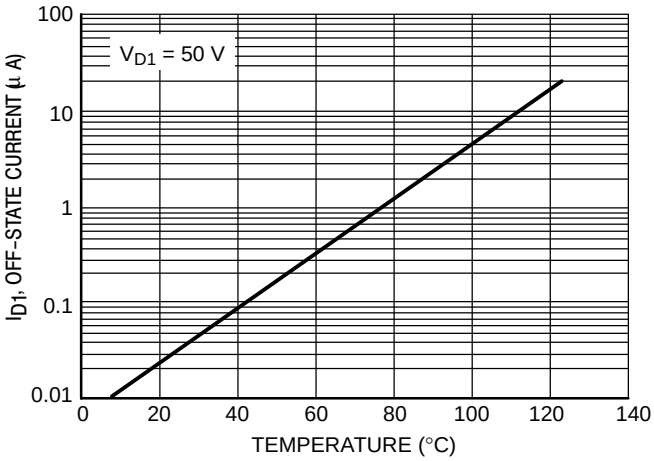


Figure 1. Off−State Current versus Temperature

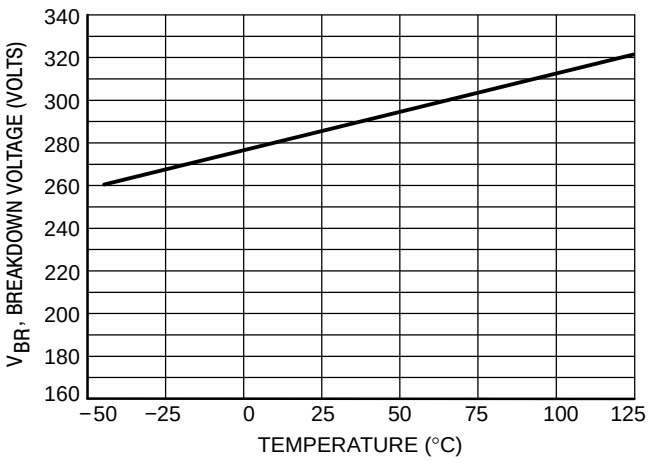


Figure 2. Breakdown Voltage versus Temperature

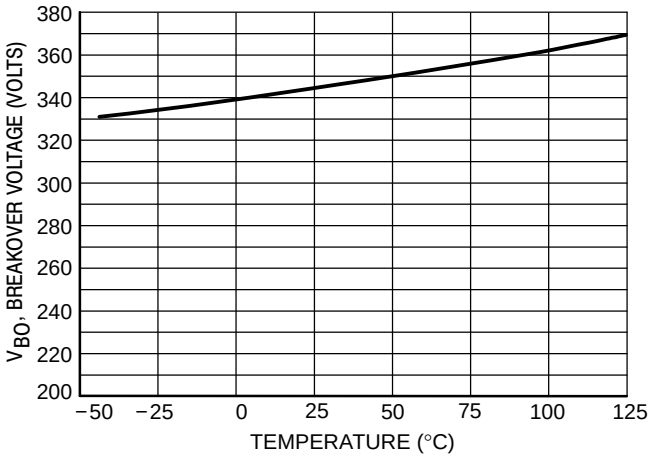


Figure 3. Breakover Voltage versus Temperature

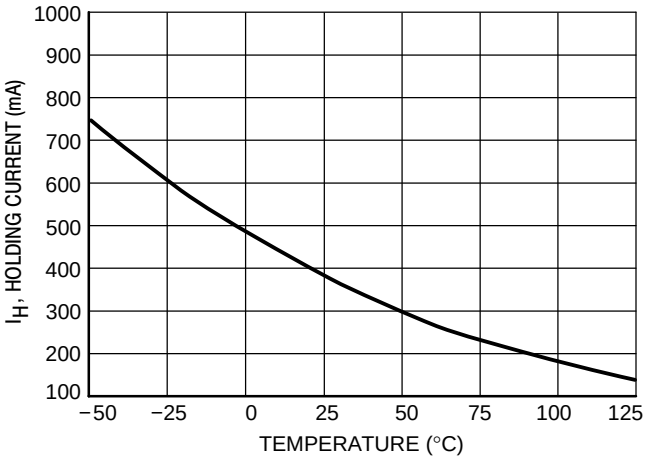


Figure 4. Holding Current versus Temperature

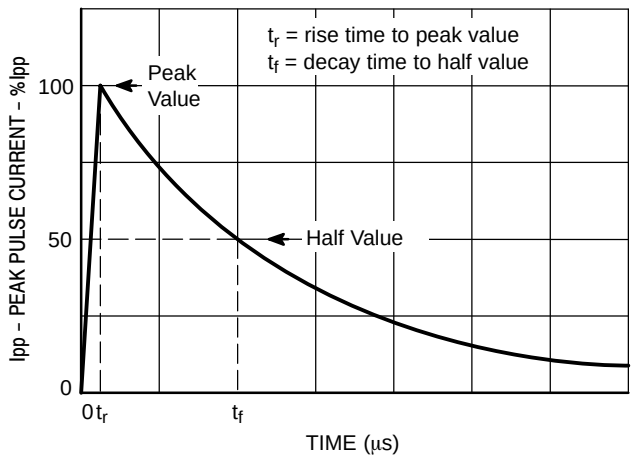


Figure 5. Exponential Decay Pulse Waveform

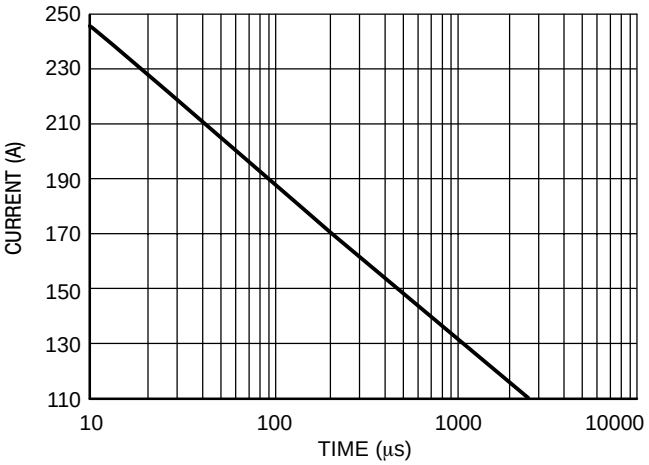
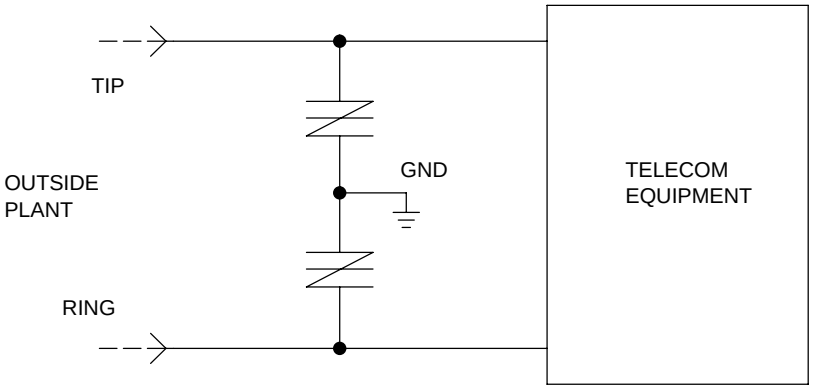
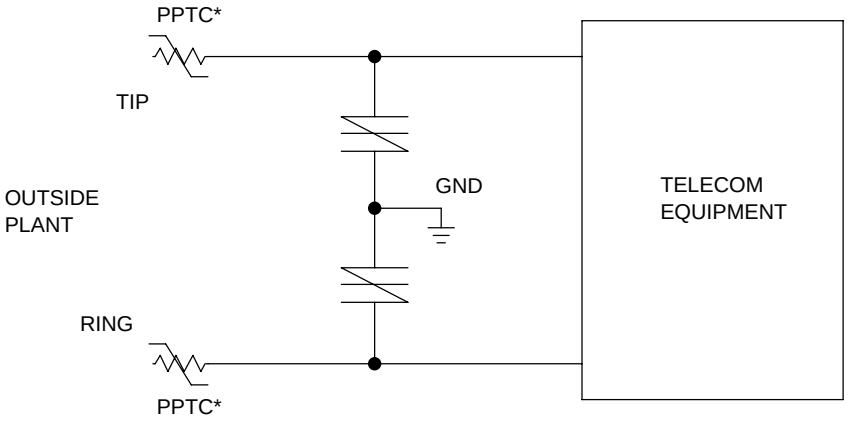
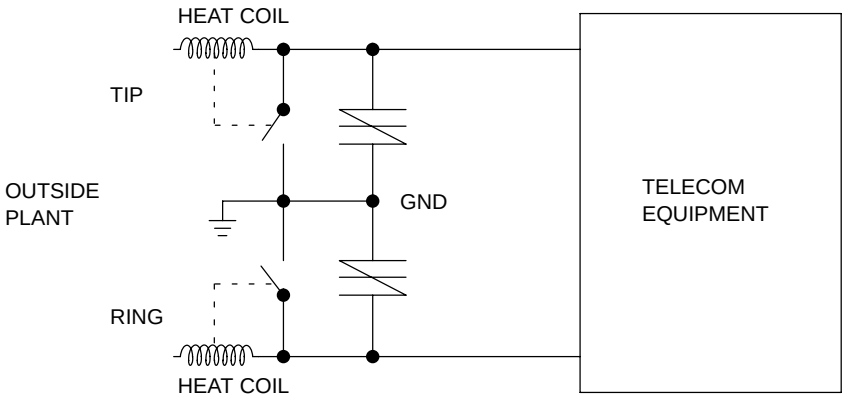


Figure 6. Peak Surge On−State Current versus Surge Current Duration, Sinusoidal Waveform





*Polymeric PTC (positive temperature coefficient) overcurrent protection device



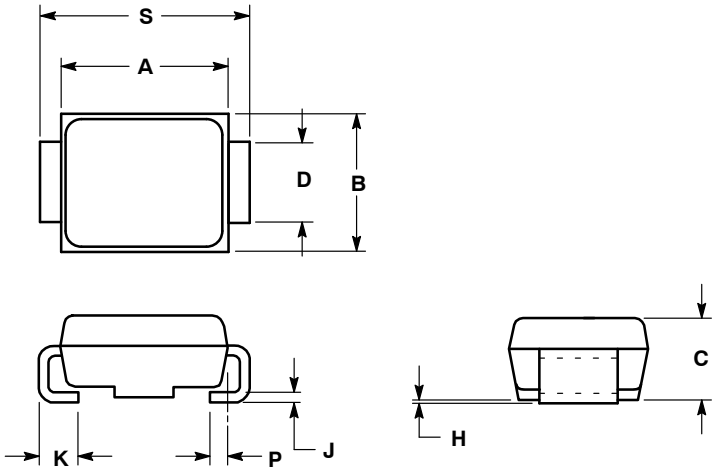
MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

ON Semiconductor®

SMB
CASE 403C−01
ISSUE A

DATE 01/02/2000

SCALE 1:1



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. D DIMENSION SHALL BE MEASURED WITHIN DIMENSION P.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.160	0.180	4.06	4.57
B	0.130	0.150	3.30	3.81
C	0.075	0.095	1.90	2.41
D	0.077	0.083	1.96	2.11
H	0.0020	0.0060	0.051	0.152
J	0.006	0.012	0.15	0.30
K	0.030	0.050	0.76	1.27
P	0.020 REF		0.51 REF	
S	0.205	0.220	5.21	5.59

MARKING DIAGRAM

xxxx = Specific Device Code
Y = Year
WW = Work Week

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DESCRIPTION:	**SMB**		**PAGE 1 OF 1**

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