MMT05B064T3

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.

- High Surge Current Capability: 50 Amps 10 x 1000 μsec, for Controlled Temperature Environments
- The MMT05B064T3 Series 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)
- (UL) Indicates UL Recognized – File #E210057
- Device Marking: MMT05B064T3: RPBC

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

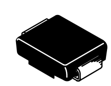
Rating	Symbol	Value	Unit
Off–State Voltage – Maximum	V_{DM}	62	Volts
Maximum Pulse Surge Short Circuit Current Non–Repetitive Double Exponential Decay Waveform (Notes 1 and 2) 10 x 1000 μsec (25°C Initial Temperature) 8 x 20 μsec 10 x 160 μsec 10 x 560 μsec	I_{PPS1} I_{PPS2} I_{PPS3} I_{PPS4}	±50 ±150 ±100 ±70	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} = 70A	di/dt	±100	A/μs

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

ON Semiconductor™

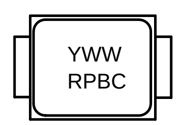
http://onsemi.com

BIDIRECTIONAL TSPD (UL)
50 AMP SURGE
64 VOLTS



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

MARKING DIAGRAMS



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

ORDERING INFORMATION

Device	Package	Shipping
MMT05B064T3	SMB	12mm Tape and Reel (2.5K/Reel)

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
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)

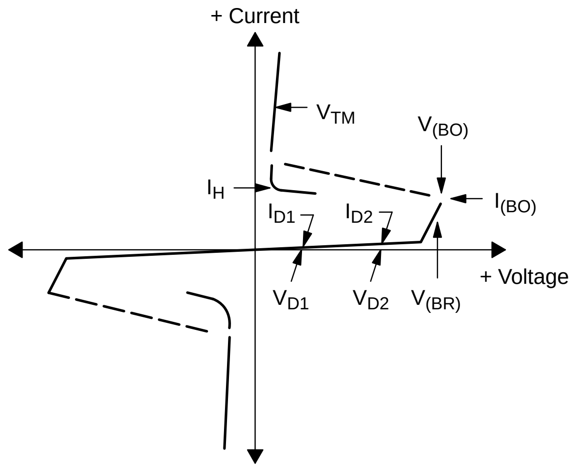
Devices are bidirectional. All electrical parameters apply to forward and reverse polarities.

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)	$V_{(BO)}$	 – –	 – –	 80 82	Volts
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)	$V_{(BO)}$	 – –	 – –	 80 82	Volts
Breakover Voltage Temperature Coefficient	$dV_{(BO)}/dT_J$	–	0.054	–	V/°C
Breakdown Voltage ($I_{(BR)}$ = 1.0 mA) Both polarities	$V_{(BR)}$	–	72	–	Volts
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	–	1.50	3.0	Volts
Breakover Current (f = 60 Hz, V_{DM} = 1000 V(rms), R_S = 1.0 kΩ) Both polarities	I_{BO}	–	91	–	mA
Holding Current (Both polarities) (Note 3) V_S = 500 Volts; I_T (Initiating Current) = ± 1.0 Amp (+65°C)	I_H	175 130	300 –	– –	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	– –	42 81	– 85	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



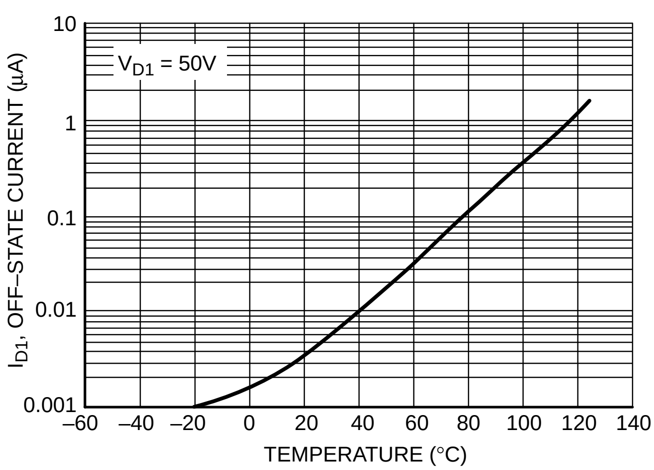


Figure 1. Typical Off–State Current versus Temperature

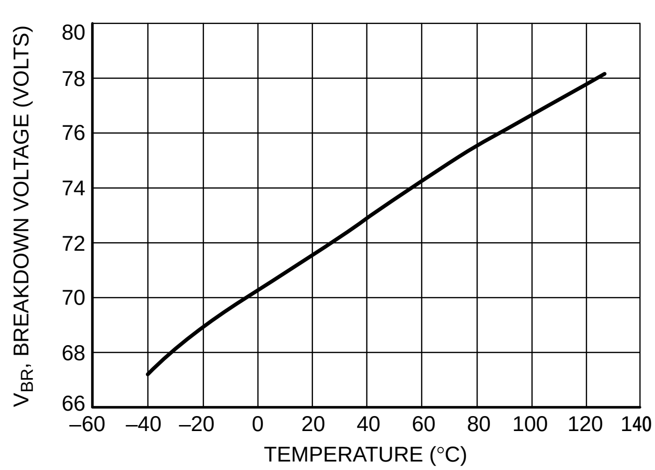


Figure 2. Typical Breakdown Voltage versus Temperature

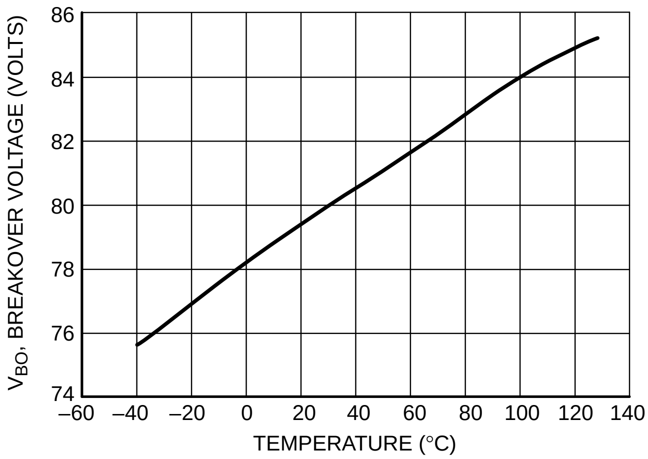


Figure 3. Maximum Breakover Voltage versus Temperature

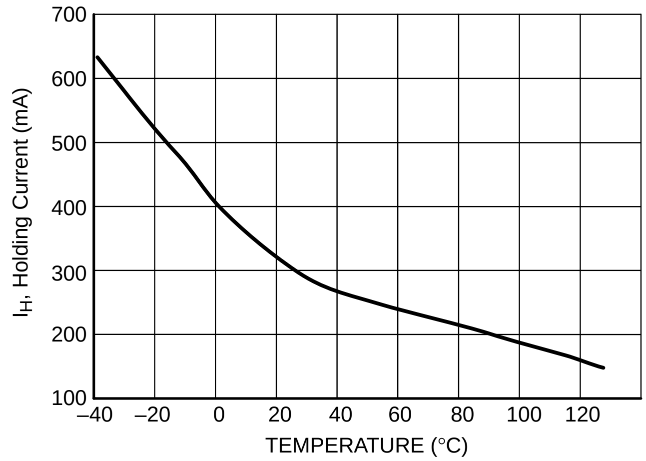


Figure 4. Typical Holding Current versus Temperature

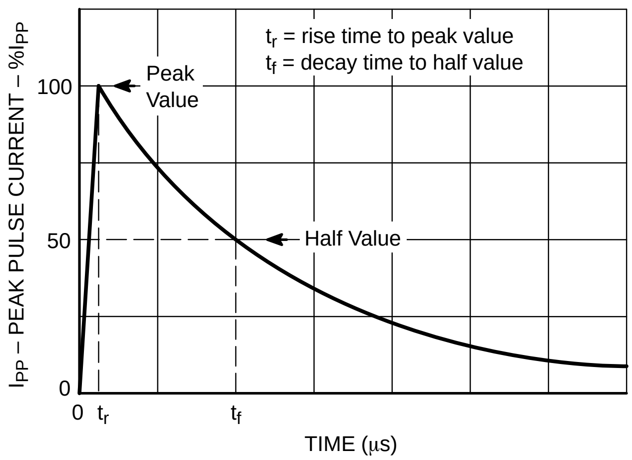


Figure 5. Exponential Decay Pulse Waveform

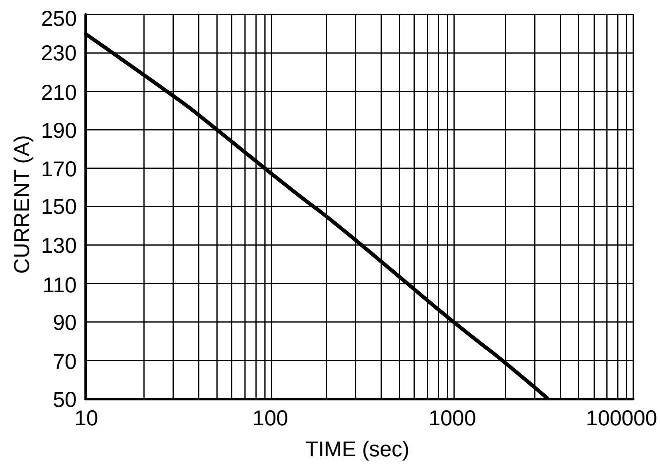
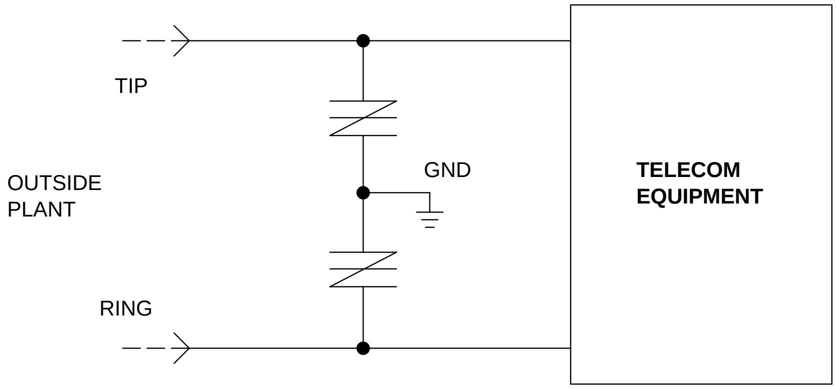
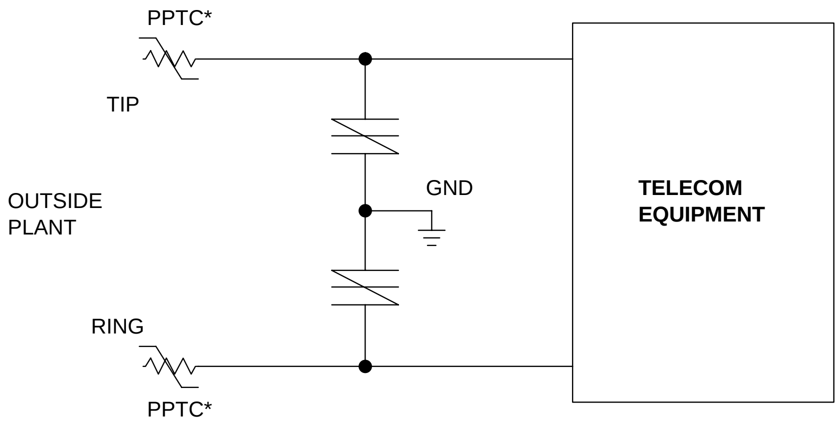
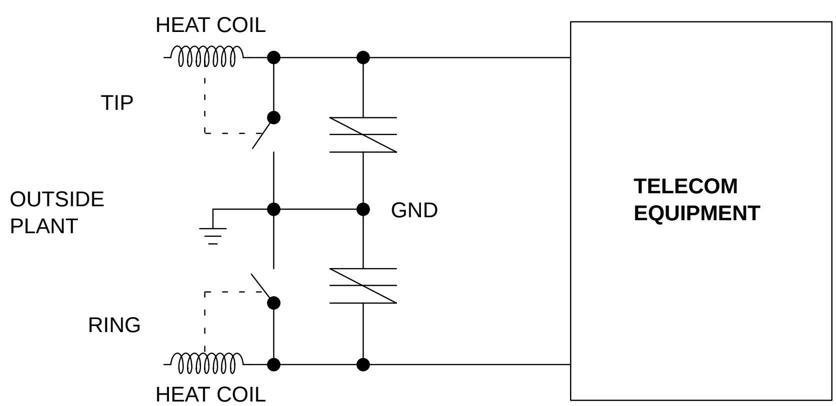


Figure 6. Peak Surge On–State Current versus Surge Current Duration, Sinusoidal Waveform



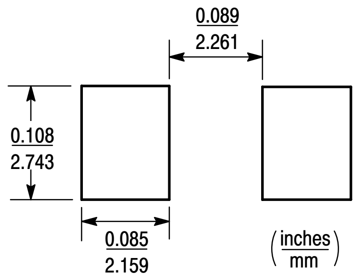


*Polymeric PTC (positive temperature coefficient) overcurrent protection device



MINIMUM RECOMMENDED FOOTPRINT FOR SURFACE MOUNTED APPLICATIONS

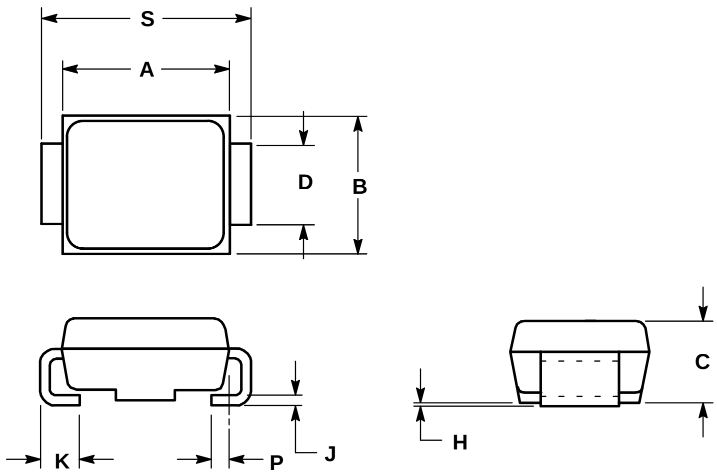
Surface mount board layout is a critical portion of the total design. The footprint for the semiconductor packages must be the correct size to insure proper solder connection interface between the board and the package. With the correct pad geometry, the packages will self align when subjected to a solder reflow process.



SMB

PACKAGE DIMENSIONS

SMB
(No Polarity)
(Essentially JEDEC DO–214AA)
CASE 403C–01
ISSUE O



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

DIM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS 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

PUBLICATION ORDERING INFORMATION

Literature Fulfillment:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303–675–2175 or 800–344–3860 Toll Free USA/Canada
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For additional information, please contact your local
Sales Representative.