

Advance Information

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
- 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)
- Supplied in 12mm Tape and Reel, 2500 units per reel. (T3 suffix)

MMT05B230T3
MMT05B260T3
MMT05B310T3

Motorola preferred devices

**BIDIRECTIONAL
THYRISTOR SURGE
PROTECTOR**



CASE 403C-01
SMB

DEVICE RATINGS: @ 25°C unless otherwise noted

Parameter	Symbol	Value	Unit
Off-State Voltage — Maximum MMT05B230T3 MMT05B260T3 MMT05B310T3	V_{DM}	± 170 ± 200 ± 270	Volts
Impulse Surge Short Circuit Current Maximum Non-Repetitive double exponential wave, Notes 1, 2 10 x 1000 μ sec 8 x 20 μ sec 10 x 160 μ sec 10 x 560 μ sec	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 μ H, C = 1.67 μ F, $I_{PK} = 110$ A	di/dt	± 150	A/ μ s

DEVICE THERMAL RATINGS

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, 10x100 μ sec @ 25°C)	P_{PK}	2000	W

This document contains information on a new product. Specifications and information herein are subject to change without notice.

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

MMT05B230T3 MMT05B280T3 MMT05B330T3

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

Characteristics	Symbol	Min	Typ	Max	Unit
Breakover Voltage (Both polarities) (dv/dt = 100 V/μs, I _{SC} = 1.0 A, V _{dc} = 1000 V) (+65°C)	V _(BO)	—	—	265 320 365 280 340 400	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 2) (+65°C)	V _(BO)	—	—	265 320 365 280 340 400	Volts
Breakover Voltage Temperature Coefficient	dV _(BO) /dT _J	—	0.08	—	%/°C
Breakdown Voltage (I _(BR) = 1.0 mA) Both polarities	V _(BR)	—	190 240 280	—	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 2)	V _T	—	1.53	3.0	Volts
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) (+65°C)	I _H	175 130	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 V, 1.0 V) (f = 1.0 MHz, 2.0 V, 15 mV)	C _O	—	22 53	— 75	pF

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

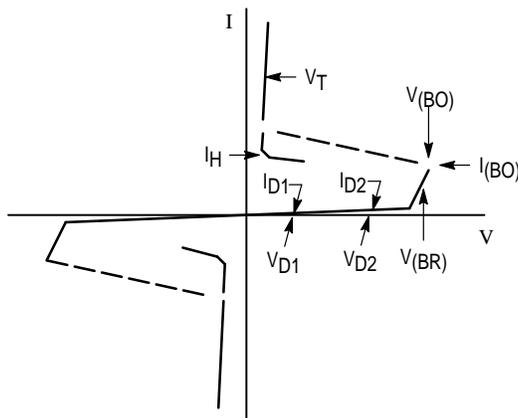


Figure 1. Voltage – Current Characteristics

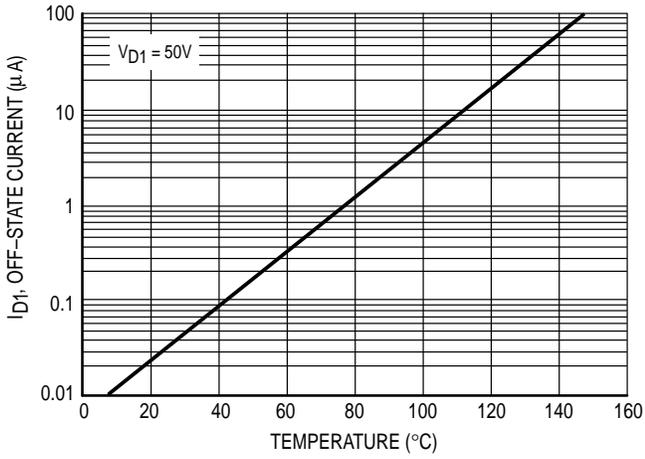


Figure 2. Off-State Current versus Temperature

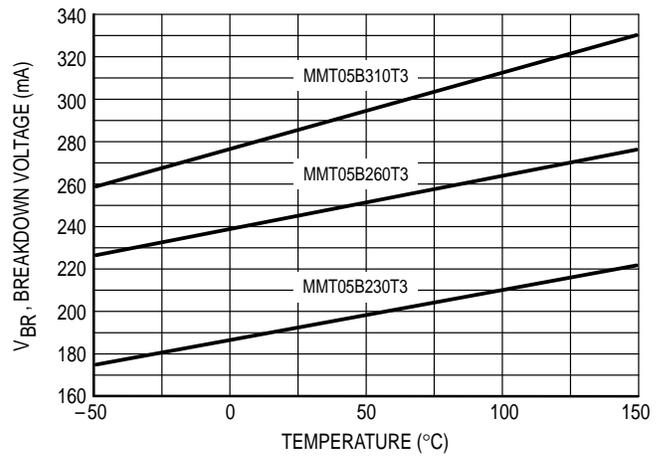


Figure 3. Breakdown Voltage versus Temperature

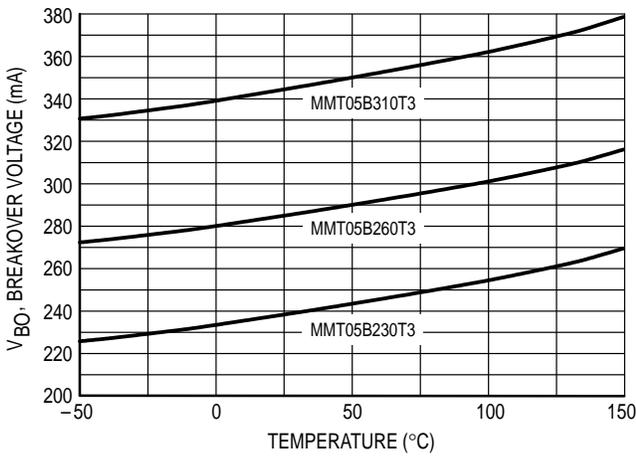


Figure 4. Breakover Voltage versus Temperature

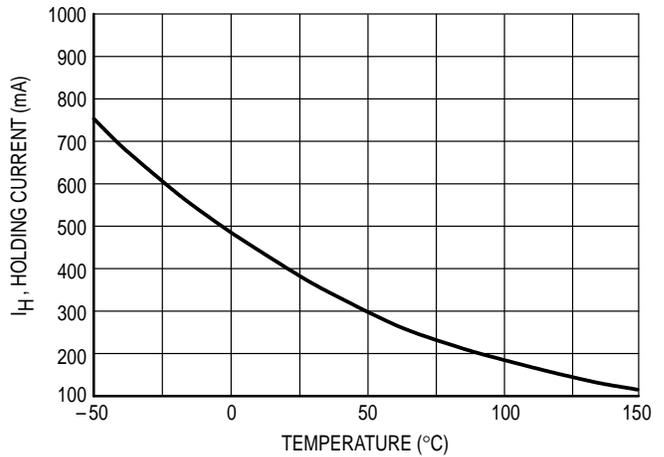


Figure 5. Holding Current versus Temperature

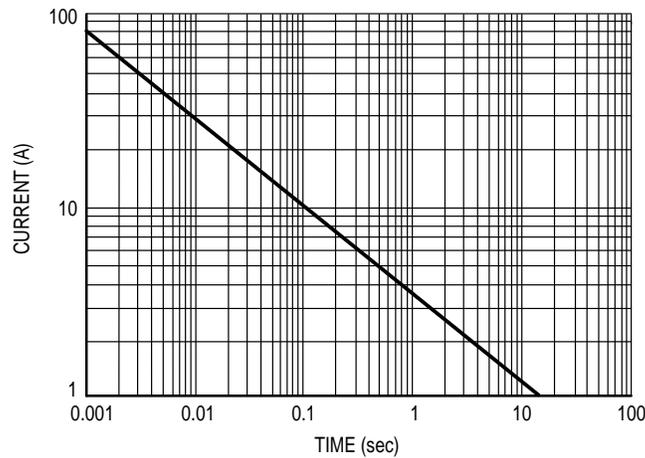
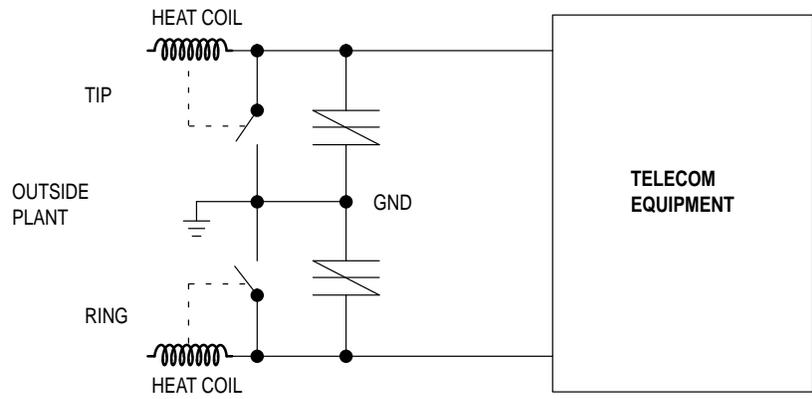
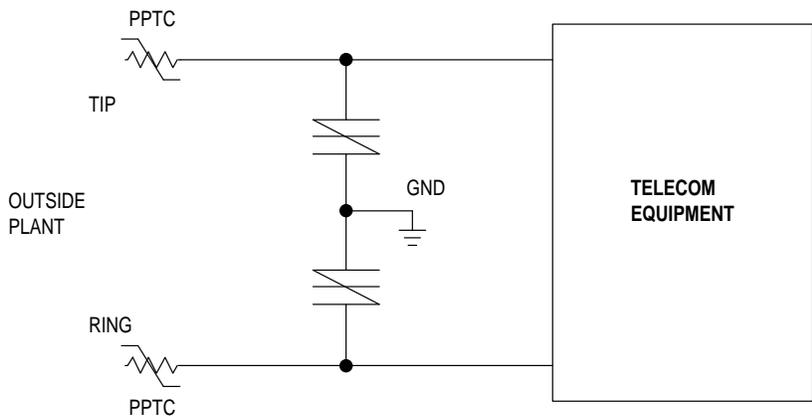
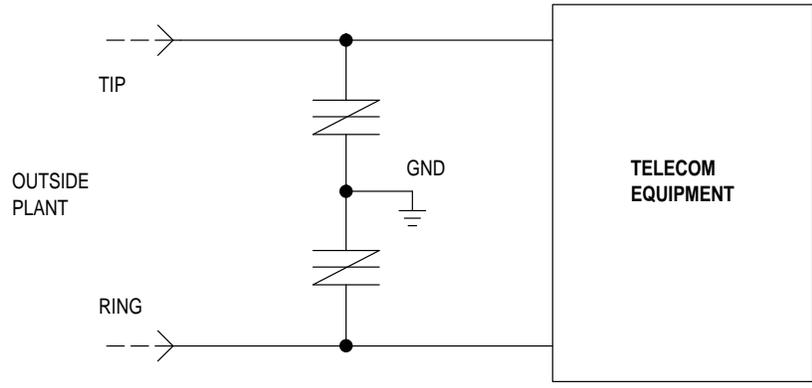
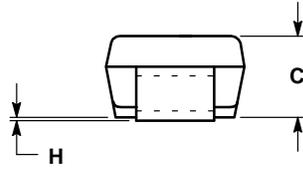
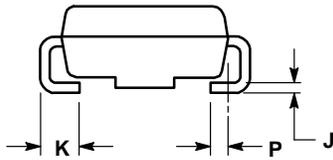
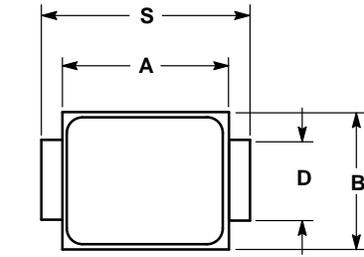


Figure 6. Peak Surge On-State Current versus Surge Current Duration

MMT05B230T3 MMT05B280T3 MMT05B330T3



PACKAGE DIMENSIONS



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		MILLIMETERS	
	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

CASE 403C-01
ISSUE O

NOTES

NOTES

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