

# T2800D

## Triacs

### Silicon Bidirectional Thyristors

Designed primarily for full-wave ac control applications, such as light dimmers, motor controls, heating controls and power supplies.

- Blocking Voltage to 400 Volts
- All Diffused and Glass Passivated Junctions for Greater Parameter Uniformity and Stability
- Small, Rugged, Thermowatt Construction for Low Thermal Resistance, High Heat Dissipation and Durability
- Four Quadrant Gating
- Device Marking: Logo, Device Type, e.g., T2800D, Date Code

#### MAXIMUM RATINGS ( $T_J = 25^\circ\text{C}$ unless otherwise noted)

Rating	Symbol	Value	Unit
Peak Repetitive Off-State Voltage <sup>(1)</sup> ( $T_J = -40$ to $+125^\circ\text{C}$ , Gate Open)	$V_{DRM}$ , $V_{RRM}$	400	Volts
On-State RMS Current (All Conduction Angles, $T_C = +80^\circ\text{C}$ )	$I_T(\text{RMS})$	8.0	Amps
Peak Non-Repetitive Surge Current (One Full Cycle Sine Wave, 60 Hz, $T_J = +80^\circ\text{C}$ )	$I_{TSM}$	100	Amps
Circuit Fusing Consideration ( $t = 8.3$ ms)	$I^2t$	40	$\text{A}^2\text{s}$
Peak Gate Power (Pulse Width = 10 $\mu\text{s}$ , $T_C = +80^\circ\text{C}$ )	$P_{GM}$	16	Watts
Average Gate Power ( $t = 8.3$ ms, $T_C = +80^\circ\text{C}$ )	$P_{G(AV)}$	0.35	Watt
Peak Gate Current (Pulse Width = 10 $\mu\text{s}$ , $T_C = +80^\circ\text{C}$ )	$I_{GM}$	4.0	Amps
Operating Junction Temperature Range	$T_J$	-40 to +125	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-40 to +150	$^\circ\text{C}$

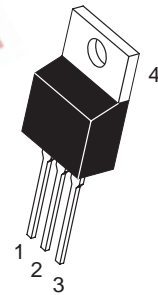
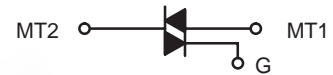
(1)  $V_{DRM}$  and  $V_{RRM}$  for all types can be applied on a continuous basis. Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded.



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**TRIACS**  
**8 AMPERES RMS**  
**400 VOLTS**



**TO-220AB**  
**CASE 221A**  
**STYLE 4**

#### PIN ASSIGNMENT

Pin	Assignment
1	Main Terminal 1
2	Main Terminal 2
3	Gate
4	Main Terminal 2

#### ORDERING INFORMATION

Device	Package	Shipping
T2800D	TO220AB	500/Box

## T2800D

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	2.2	$^{\circ}C/W$
Maximum Lead Temperature for Soldering Purposes 1/8" from Case for 10 Seconds	$T_L$	260	$^{\circ}C$

### ELECTRICAL CHARACTERISTICS ( $T_C = 25^{\circ}C$ unless otherwise noted; Electricals apply in both directions)

Characteristic	Symbol	Min	Typ	Max	Unit
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### OFF CHARACTERISTICS

Peak Repetitive Blocking Current ( $V_D = \text{Rated } V_{DRM}, V_{RRM}$ ; Gate Open)	$I_{DRM}, I_{RRM}$	$T_C = 25^{\circ}C$	—	—	10	$\mu A$
		$T_C = 100^{\circ}C$	—	—	2.0	mA

### ON CHARACTERISTICS

Peak On-State Voltage <sup>(1)</sup> ( $I_T = \pm 30 A$ Peak)	$V_{TM}$	—	1.7	2.0	Volts
Gate Trigger Current (Continuous dc) ( $V_D = 12 V_{dc}, R_L = 100 \text{ Ohms}$ )	$I_{GT}$	—	—	—	mA
MT2(+), G(+)		—	10	25	
MT2(+), G(-)		—	20	60	
MT2(-), G(-)		—	15	25	
MT2(-), G(+)		—	30	60	
Gate Trigger Voltage (Continuous dc) (All Quadrants) ( $V_D = 12 V_{dc}, R_L = 100 \text{ Ohms}$ )	$V_{GT}$	—	1.25	2.5	Volts
Gate Non-Trigger Voltage (Continuous dc) ( $V_D = 12 V, R_L = 100 \text{ Ohms}, T_C = 100^{\circ}C$ )	$V_{GD}$	0.2	—	—	Volts
Holding Current ( $V_D = 12 V_{dc}, \text{Initiating Current} = \pm 200 \text{ mA}, \text{Gate Open}$ )	$I_H$	—	15	30	mA
Gate Controlled Turn-On Time ( $V_D = \text{Rated } V_{DRM}, I_T = 10 A, I_{GT} = 80 \text{ mA}, \text{Rise Time} = 0.1 \mu s$ )	$t_{gt}$	—	1.6	—	$\mu s$

### DYNAMIC CHARACTERISTICS

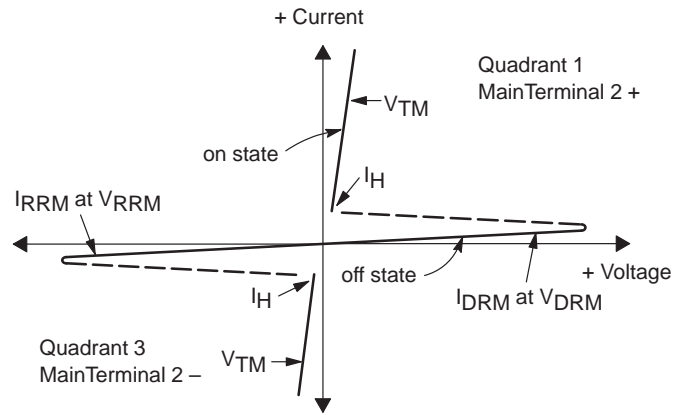
Critical Rate-of-Rise of Commutation Voltage ( $V_D = \text{Rated } V_{DRM}, I_{T(RMS)} = 8 A, \text{Commutating } di/dt = 4.1 A/ms, \text{Gate Unenergized}, T_C = 80^{\circ}C$ )	$dv/dt(c)$	—	10	—	$V/\mu s$
Critical Rate-of-Rise of Off-State Voltage ( $V_D = \text{Rated } V_{DRM}, \text{Exponential Voltage Rise}, \text{Gate Open}, T_C = 100^{\circ}C$ )	$dv/dt$	60	—	—	$V/\mu s$

(1) Pulse Test: Pulse Width  $\leq 2.0 \text{ ms}$ , Duty Cycle  $\leq 2\%$ .

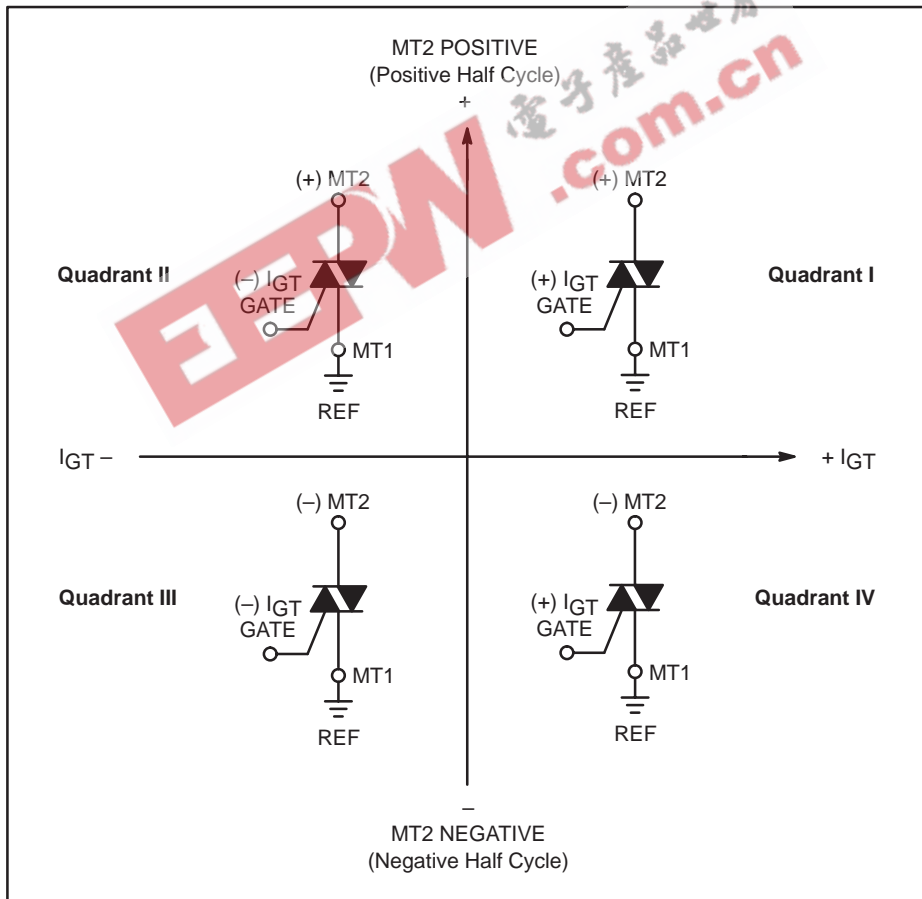
# T2800D

## Voltage Current Characteristic of Triacs (Bidirectional Device)

Symbol	Parameter
$V_{DRM}$	Peak Repetitive Forward Off State Voltage
$I_{DRM}$	Peak Forward Blocking Current
$V_{RRM}$	Peak Repetitive Reverse Off State Voltage
$I_{RRM}$	Peak Reverse Blocking Current
$V_{TM}$	Maximum On State Voltage
$I_H$	Holding Current



### Quadrant Definitions for a Triac



All polarities are referenced to MT1.

With in-phase signals (using standard AC lines) quadrants I and III are used.

# T2800D

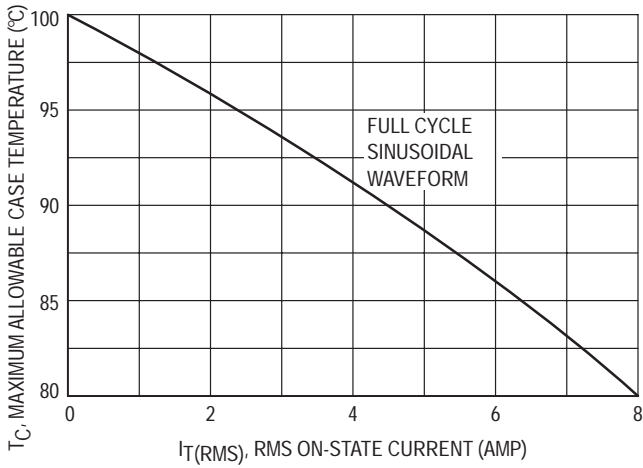


Figure 1. Current Derating

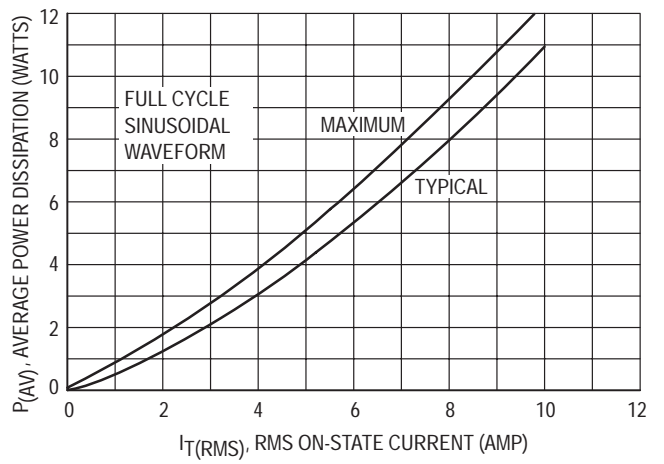


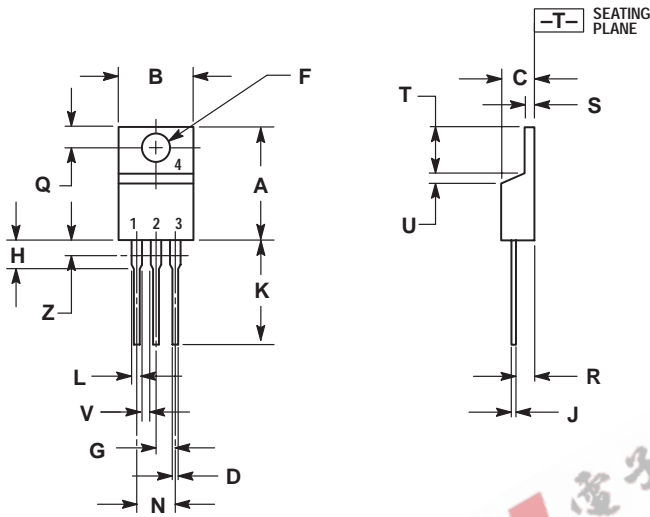
Figure 2. Power Dissipation

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## PACKAGE DIMENSIONS

TO-220AB  
CASE 221A-07  
ISSUE Z



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.570	0.620	14.48	15.75
B	0.380	0.405	9.66	10.28
C	0.160	0.190	4.07	4.82
D	0.025	0.035	0.64	0.88
F	0.142	0.147	3.61	3.73
G	0.095	0.105	2.42	2.66
H	0.110	0.155	2.80	3.93
J	0.014	0.022	0.36	0.55
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.15	1.52
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.15	1.39
T	0.235	0.255	5.97	6.47
U	0.000	0.050	0.00	1.27
V	0.045	---	1.15	---
Z	---	0.080	---	2.04

STYLE 4:

- PIN 1. MAIN TERMINAL 1
2. MAIN TERMINAL 2
3. GATE
4. MAIN TERMINAL 2


Notes

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Notes

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#### JAPAN: ON Semiconductor, Japan Customer Focus Center

4-32-1 Nishi-Gotanda, Shinagawa-ku, Tokyo, Japan 141-8549  
**Phone:** 81-3-5740-2745  
**Email:** r14525@onsemi.com

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