T2500D

Triacs

Silicon Bidirectional Thyristors

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

Features

- Blocking Voltage 400 V
- 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
- High Surge Current Capability 60 A Peak at T_C = 80°C
- Pb−Free Package is Available*

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

Rating	Symbol	Value	Unit
Peak Repetitive Off−State Voltage (Note 1) (Sine Wave 50 to 60 Hz, T_J = −40 to +100°C, Gate Open)	V_{DRM}, V_{RRM}	400	V
On−State RMS Current (T_C = +80°C) (Full Cycle Sine Wave 50 to 60 Hz)	$I_{T(RMS)}$	6.0	A
Peak Non−repetitive Surge Current (One Full Cycle, 60 Hz, T_C = +80°C)	I_{TSM}	60	A
Circuit Fusing Considerations (t = 8.3 ms)	I^2t	15	A^2s
Peak Gate Power (T_C = +80°C, Pulse Width = 10 μsec)	P_{GM}	16	W
Average Gate Power (T_C = +80°C, t = 8.3 ms)	$P_{G(AV)}$	0.2	W
Peak Gate Current (Pulse Width = 10 μsec)	I_{GM}	4.0	A
Operating Junction Temperature Range	T_J	−40 to +125	°C
Storage Temperature Range	T_{stg}	−40 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction−to−Case	$R_{\theta JC}$	2.7	°C/W
Maximum Lead Temperature for Soldering Purposes 1/8″ from Case for 10 Seconds	T_L	260	°C

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. V_{DRM}, 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.

*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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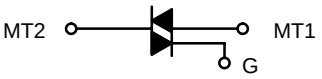
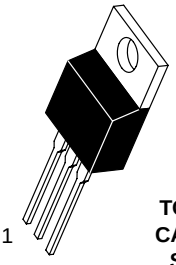
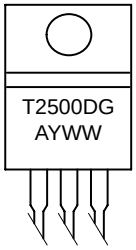
TRIACS
6 AMPERES RMS
400 VOLTS





TO−220AB
CASE 221A
STYLE 4

MARKING DIAGRAM



A = Assembly Location
Y = Year
WW = Work Week
G = Pb−Free Package

PIN ASSIGNMENT	
1	Main Terminal 1
2	Main Terminal 2
3	Gate
4	Main Terminal 2

ORDERING INFORMATION

Device	Package	Shipping
T2500D	TO220AB	500 Units / Box
T2500DG	TO220AB (Pb−Free)	500 Units / Box

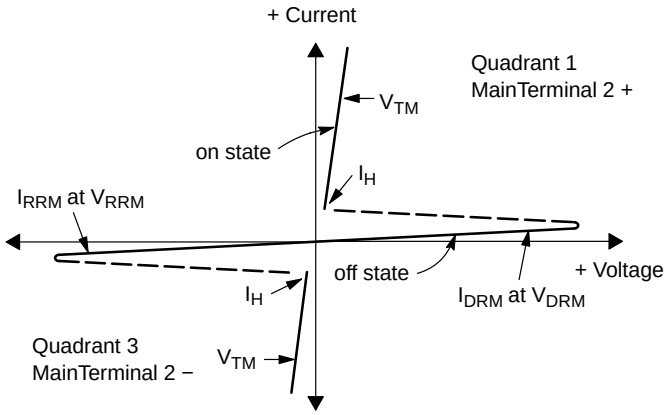
ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted; Electricals apply in both directions)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Peak Repetitive Blocking Current T_J = 25°C (Rated V_{DRM}, V_{RRM}; Gate Open) T_J = 100°C	I_{DRM}, I_{RRM}	−	−	10 2.0	μA mA
ON CHARACTERISTICS					
Peak On-State Voltage (Note 2) (I_{TM} = ±30 A Peak)	V_{TM}	−	−	2.0	V
Gate Trigger Current (Continuous dc) (V_D = 12 Vdc, R_L = 100 Ω) MT2(+), G(+) MT2(+), G(−) MT2(−), G(−) MT2(−), G(+)	I_{GT}	 − − − −	 10 20 15 30	 25 60 25 60	mA
Gate Trigger Voltage (Continuous dc) (All Four Quadrants) (V_D = 12 Vdc, R_L = 100 Ω)	V_{GT}	−	1.25	2.5	V
Gate Non−Trigger Voltage (V_D = 12 V, R_L = 100 Ω, T_C = 100°C)	V_{GD}	0.2	−	−	V
Holding Current (Main Terminal Voltage = 12 Vdc, Gate Open, Initiating Current = ±200 mA)	I_H	−	15	30	mA
Gate Controlled Turn-On Time (Rated V_{DRM}, I_T = 10 A , I_{GT} = 160 mA, Rise Time = 0.1 μs)	t_{gt}	−	1.6	−	μs
DYNAMIC CHARACTERISTICS					
Critical Rate-of-Rise of Commutation Voltage (Rated V_{DRM}, $I_{T(RMS)}$ = 6 A, Commutating di/dt = 3.2 A/ms, Gate Unenergized, T_C = 80°C)	dv/dt(c)	−	10	−	V/μs
Critical Rate-of-Rise of Off-State Voltage (Rated V_{DRM}, Exponential Voltage Rise, Gate Open, T_C = 100°C)	dv/dt	−	75	−	V/μs

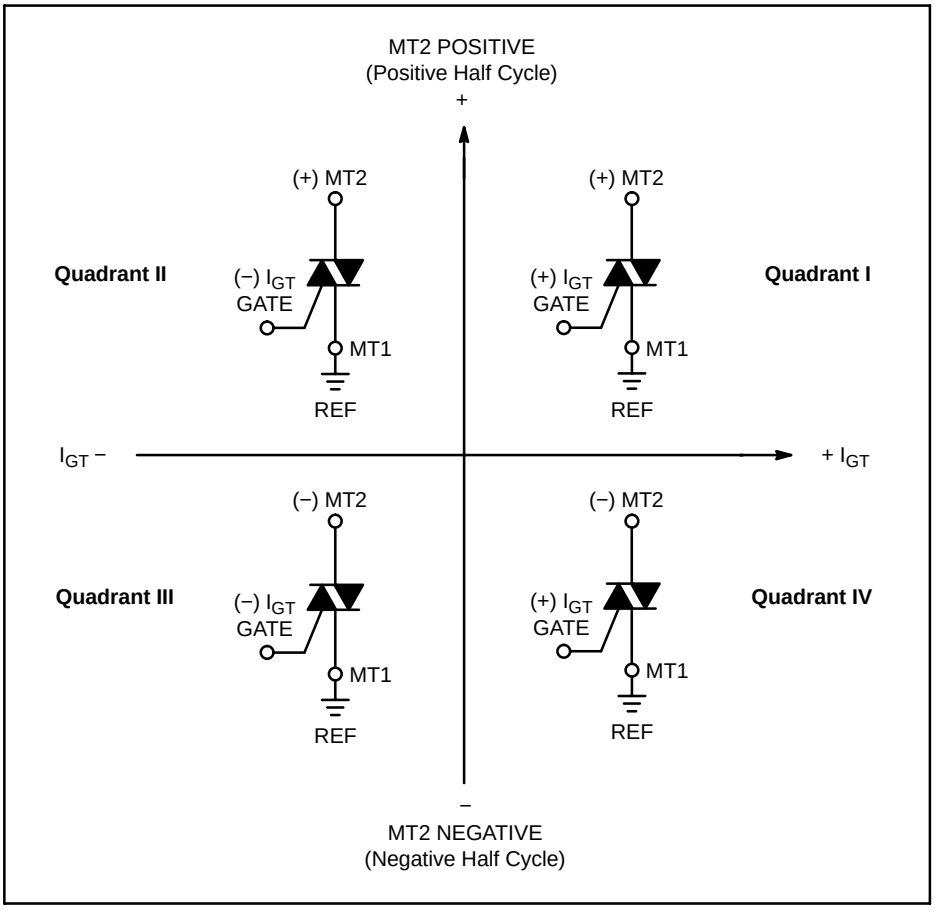
2. Pulse Test: Pulse Width ≤ 2.0 ms, Duty Cycle ≤ 2%.

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



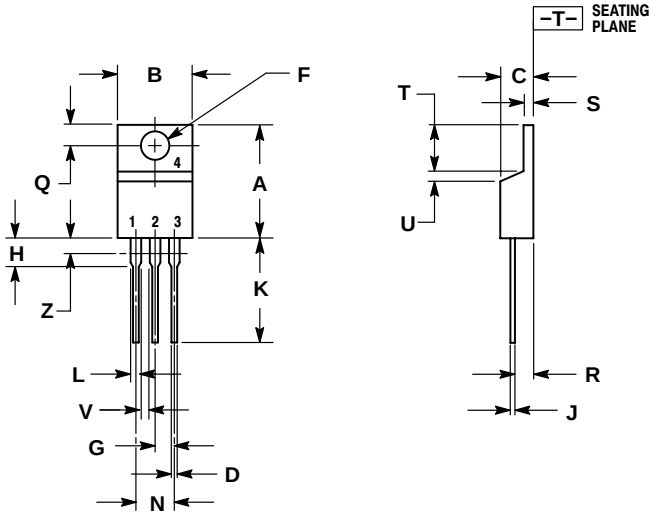
Quadrant Definitions for a Triac



All polarities are referenced to MT1.
With in−phase signals (using standard AC lines) quadrants I and III are used.

PACKAGE DIMENSIONS

TO−220
CASE 221A−07
ISSUE AA



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.

	INCHES		MILLIMETERS	
DIM	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

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
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