

4855452 INTERNATIONAL RECTIFIER

55C 04870 D

Data Sheet No. E2584B

INTERNATIONAL RECTIFIER



T-25-15

T50AC-A, 50AC-A SERIES

50A power triacs

A

Major Ratings and Characteristics

| | T50AC-A | 50AC-A | Units |
|-----------------------|----------------------------|-------------|------------------------|
| $I_T(\text{RMS})$ | @ $T_c = 85^\circ\text{C}$ | — | A |
| | @ $T_c = 75^\circ\text{C}$ | 50 | A |
| I_{TSM} | 50Hz | 520 | A |
| | 60Hz | 550 | A |
| i^2t | 50Hz | 1350 | A^2s |
| | 60Hz | 1250 | A^2s |
| di/dt | | 100 | $\text{A}/\mu\text{s}$ |
| I_{GT} | | 200 | mA |
| dv/dt (commutating) | | 15 | $\text{V}/\mu\text{s}$ |
| T_J | | -40 to 125 | $^\circ\text{C}$ |
| V_{RRM}, V_{DRM} | | 400 to 1200 | V |

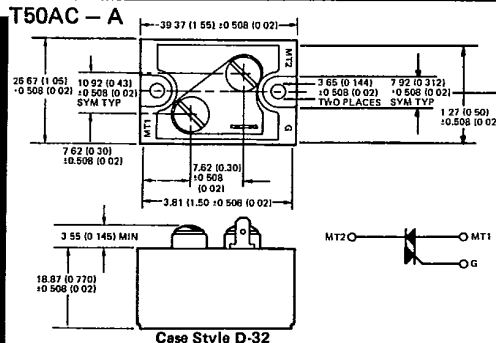
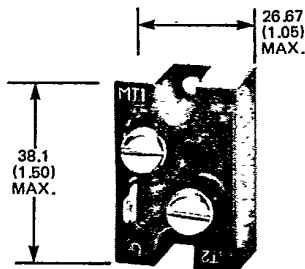
Description

International Rectifier offers two ranges of 50A power triacs, the first is the 50AC-A range in a standard TO-65 package and the second is the T50AC-A range in the isolated base package. Applications include lamp dimmers and other industrial equipment.

Features

- High surge capability
- Choice of package style
 - 1/4" stud
 - Isolated base
- Available up to 1200V V_{RRM}, V_{DRM}
- High dynamic characteristics.

CASE STYLE AND DIMENSIONS



Case Style D-32
All Dimensions in Millimeters and (Inches)
For 50AC-A case style see page A-77.

4855452 INTERNATIONAL RECTIFIER
T50AC-A, 50AC-A Series

55C 04871 D
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T-25-15

ELECTRICAL SPECIFICATIONS

Voltage ratings

| Part Number | | V _{RRM} , V _{DRM} , Maximum repetitive peak reverse and off-state voltage gate open circuited | V _{RSM} Maximum non-repetitive peak reverse voltage |
|-------------|----------|---|--|
| | | V | V |
| T50AC40A | 50AC40A | 400 | 500 |
| T50AC80A | 50AC80A | 800 | 700 |
| T50AC80A | 50AC80A | 800 | 900 |
| T50AC100A | 50AC100A | 1000 | 1100 |
| T50AC120A | 50AC120A | 1200 | 1300 |

On-State

| | | T50AC-A | 50AC-A | Units | Conditions | |
|---------------------|--|---------|--------|-------------------|--|--|
| I _{T(RMS)} | Maximum RMS on-state current | 50 | | A | Max. T _C = 85°C : 50AC-A. Max. T _C = 75°C : T50AC-A | |
| I _{TSM} | Maximum peak one cycle non-repetitive surge current | 380 | | A | t = 20ms | Sinusoidal full-wave, Initial T _J = 125°C, rated V _{RRM} reapplied |
| | | 400 | | A | t = 16.7ms | |
| I _{TSM} | Maximum peak one half-cycle non-repetitive surge current | 620 | | A | t = 10ms | 100% rated V _{RRM} reapplied |
| | | 550 | | A | t = 8.3ms | Sinusoidal half-wave Initial T _J = 125°C Either direction |
| | | 620 | | A | t = 10ms | |
| | | 650 | | A | t = 8.3ms | |
| I ² t | Maximum I ² t capability for fusing | 1350 | | A ² s | t = 10ms | 100% rated V _{RRM} reapplied |
| | | 1250 | | A ² s | t = 8.3ms | Initial T _J = 125°C Either direction |
| | | 1900 | | A ² s | t = 10ms | |
| | | 1780 | | A ² s | t = 8.3ms | |
| I ² √t | Maximum I ² √t capability for fusing ① | 24 000 | | A ² √s | t = 0.1 to 10ms. No voltage reapplied, Initial T _J < 125°C. | |
| V _{TM} | Maximum peak on-state voltage | 2.0 | | V | T _J = 25°C, I _{TM} = 70A _{pk} , either direction | |
| I _H | Maximum holding current | 90 | | mA | T _J = 25°C, anode supply = 22V, Initial I _T = 2A in either direction | |

Off-State

| | | | | | |
|------------------|--|------|--|------|---|
| dv/dt | Maximum critical rate-of-rise of commutation voltage | 15 | | V/μs | T _J = 125°C, Rated V _{RRM} , either direction |
| dv/dt | Maximum critical rate-of-rise of on-state voltage | 200 | | V/μs | T _J = 125°C, Exponential to 100% rated V _{RRM} , either direction |
| I _{DM} | Maximum peak off-state current | 10 | | mA | T _J = 125°C, Rated V _{RRM} , either direction |
| V _{ins} | RMS isolation voltage* | 2500 | | V | Circuit to base, all terminals shorted |

Switching

| | | | | | |
|-------|--|-----|--|------|--|
| di/dt | Maximum non-repetitive rate-of-rise of turned-on current | 100 | | A/μs | T _J = 125°C, V _{DRM} = rated V _{DRM} , I _{TM} = 100A, gate pulse: 20V, 15μs, t _p > 10μs. Per JEDEC standard RS - 397, 5.2.2.6 |
|-------|--|-----|--|------|--|

Triggering

| | | | | | |
|---|--|-----|--|----|---------------------------------------|
| P _{GM} | Maximum peak gate power | 10 | | W | 2.0ms pulse width |
| P _{G(AV)} | Maximum average gate power | 2 | | W | |
| I _{GM} | Maximum peak positive or negative gate current | 3 | | A | |
| V _{GM} | Maximum peak positive or negative gate voltage | 20 | | V | |
| I _{GT} | Maximum DC gate current required to trigger | 200 | | mA | MT2+ gate + |
| | | 200 | | mA | MT2- gate - |
| | | 200 | | mA | MT2+ gate - |
| | | 200 | | mA | MT2- gate + |
| T _J = 25°C, 12V MT1 to MT2 for other temperatures refer to Fig. 8. | | | | | |
| V _{GT} | Maximum DC gate voltage required to trigger | 2.5 | | V | T _J = 25°C, 12V MT1 to MT2 |
| V _{GD} | Maximum required gate voltage not to trigger | 0.2 | | V | |

* This refers to T50AC-A series only.

① I²t for time t_x = I²√t_x · √t_x

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55C 04872 D



T50AC-A, 50AC-A Series

T-25-15

Thermal and Mechanical Specifications

| | | T50AC-A | 50AC-A | Units | Conditions | | |
|------------|---|--------------------|-----------------------|------------------|---|----------|--------|
| T_J | Maximum operating temperature range | -40 to 125 | | °C | | | |
| T_{stg} | Maximum storage temperature range | -40 to 125 | | °C | | | |
| R_{thJC} | Maximum internal thermal resistance, junction to case | 0.70 | 0.45 | K/W | DC operation | | |
| R_{thCS} | Maximum thermal resistance, case to heatsink | 0.25 | 0.25 | K/W | Mounting surface smooth, flat and greased | | |
| T | Mounting torque | Device to heatsink | | 15 | 20(27.5) | lbf.in | |
| | | | | 0.18 | 0.23(0.32) | kgf.m | |
| | $\pm 10\%$ | | Terminals MT1 and MT2 | | 1.7 | 2.3(3.1) | Nm |
| | | | | | 4.5 | — | lbf.in |
| | | | | | 0.13 | — | kgf.m |
| | | | | 1.3 | — | Nm | |
| Case style | | — | | TO-208AC (TO-65) | — | JEDEC | |
| wt | Approximate weight | 54 (1.9) | 28 (1.0) | g (oz) | | | |

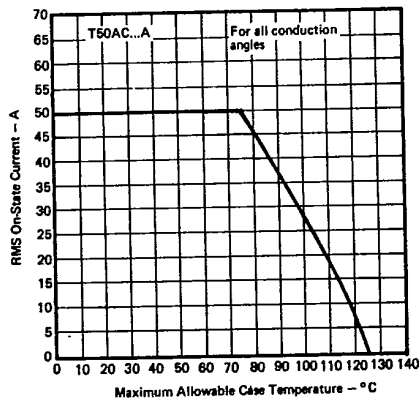
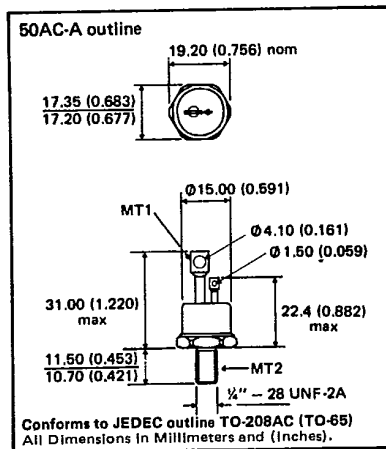


Fig. 1 - RMS On-State Current Vs. Maximum Allowable Case Temperature, T50AC-A Series

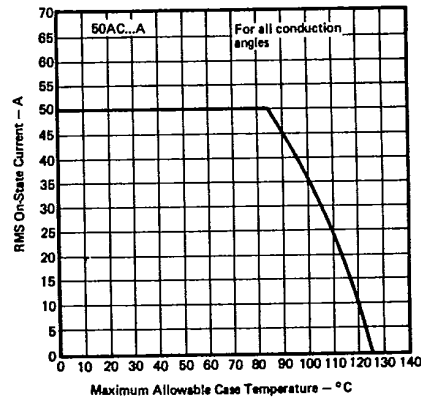


Fig. 2 - RMS On-State Current Vs. Maximum Allowable Case Temperature, 50AC-A Series

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T50AC-A, 50AC-A Series

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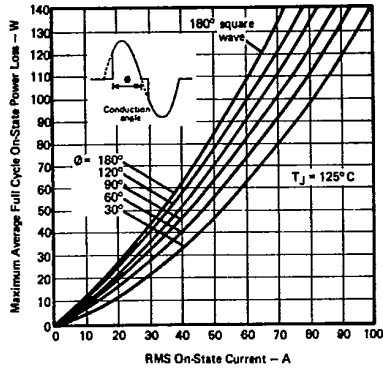


Fig. 3 - Maximum Low Level On-State Power Loss Vs. RMS On-State Current, Both Series

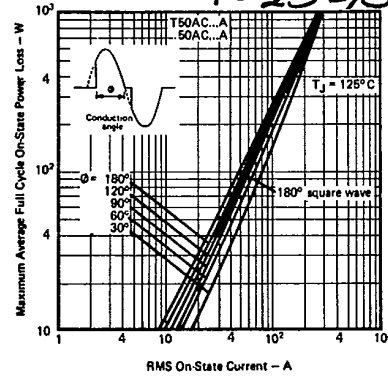


Fig. 4 - Maximum High Level On-State Power Loss Vs. RMS On-State Current, Both Series

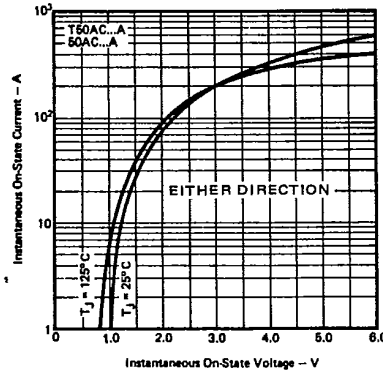


Fig. 5 - Maximum Instantaneous On-State Voltage Vs. Instantaneous On-State Current, Both Series

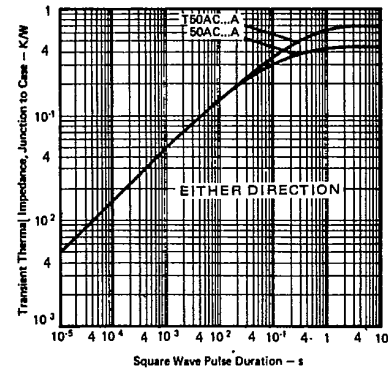


Fig. 6 - Maximum Transient Thermal Impedance Vs. Square Wave Pulse Duration, Both Series

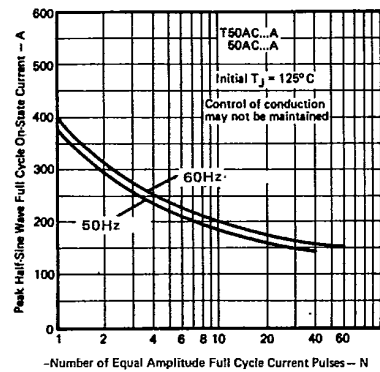


Fig. 7 - Maximum Non-Repetitive Surge Current Vs. Number of Current Pulses, Both Series

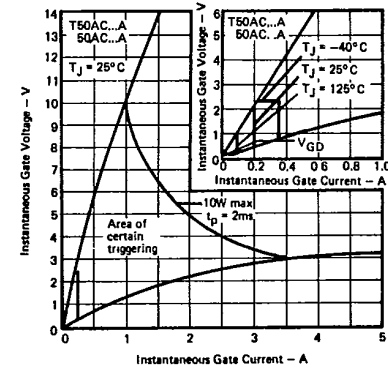


Fig. 8 - Gate Characteristics, Both Series