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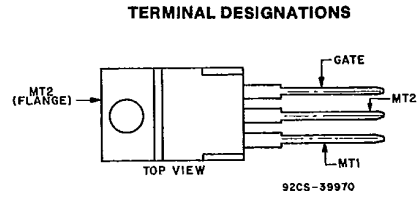
T2500 Series

High Voltage, 6-A Silicon Triacs

For Power-Control and Power-Switching Applications

Features:

- 800V, 125 Deg. C T_J Operating
- High dv/dt and di/dt Capability
- Low Switching Losses
- High Pulse Current Capability
- Low Forward and Reverse Leakage
- Spos Oxide Glass Multilayer Passivation System
- Advanced Unisurface Construction
- Precise Ion Implanted Diffusion Source



JEDEC TO-220AB

The T2500-series are gate-controlled full-wave silicon triacs utilizing a plastic case with three leads to facilitate mounting on printed-circuit boards. They are intended for the control of ac loads in such applications as motor controls, heating controls, relay replacement, solenoid drivers, static switching, and power-switching systems.

These devices are designed to switch from an off-state to an on-state for either polarity of applied voltage and with positive or negative gate triggering voltages. They have an on-state current rating of 6 amperes at a T_C of 80°C.

All types utilize the JEDEC TO-220AB package.

MAXIMUM RATINGS, Absolute-Maximum Values:

| | T2500B | T2500D | T2500M | T2500N | |
|--|--------|--------|------------|--------|------------------|
| V _{DRM} * | 200 | 400 | 600 | 800 | V |
| I _{T(RMS)} (T _C = 105°C) | | | 6 | | A |
| I _{TSM} (for 1 full cycle) 60 Hz | | | 60 | | A |
| di/dt | | | 70 | | A/μs |
| I ² T (at 8.3 ms) | | | 18 | | A ² s |
| I _{GTM} ■ | | | 4 | | A |
| P _{GM} (for 10μs max.) | | | 16 | | W |
| P _{Q(AV)} (Averaging time 10ms max.) | | | 0.2 | | W |
| T Storage ▲ | | | -65 to 150 | | °C |
| T _C | | | -65 to 125 | | °C |
| T _T (During soldering): For 10 s max. (terminals and case) | | | 225 | | °C |

*For either polarity of main terminal 2 voltage (V_{MT2}) with reference to main terminal 1.

■For either polarity of gate voltage (V_G) with reference to main terminal 1.

▲For temperature measurement reference point, see *Dimensional Outline*.

Triacs

T2500 Series

ELECTRICAL CHARACTERISTICS

At Maximum Ratings and at Indicated Case Temperature (T_C) Unless Otherwise Specified

| CHARACTERISTIC | SYMBOL | LIMITS | | | UNITS |
|---|-------------------|--|--------------------------|----------------------|-------|
| | | For All Types Unless Otherwise Specified | | | |
| | | Min. | Typ. | Max. | |
| Peak Off-State Current: Gate open, T _J = 125°C, V _{DROM} = Max. rated value | I _{DROM} | — | 0.1 | 2 | mA |
| Maximum On-State Voltage: For I _T = 30 A (peak), T _C = 25°C | V _{TM} | — | 1.7 | 2 | V |
| DC Holding Current: Gate open, Initial principal current = 150 mA (DC), v _D = 12V: T _C = 25°C For other case temperatures | I _{HO} | — | 15 See Fig. 5 | — | mA |
| Critical Rate-of-Rise of Commutation Voltage: For V _D = V _{DROM} , I _{T(RMS)} = 6 A, Commutating di/dt = 3.2 A/ms, and gate unenergized At T _C = 80°C | dv/dt | — | 10 | — | V/μs |
| Critical Rate of Rise of Off-State Voltage: For V _D = V _{DROM} , exponential voltage rise, and gate open At T _C = 125°C T2500B T2500D T2500M T2500N For other case temperatures | dv/dt | 100 75 60 40 | 300 250 200 100 | — — — — | V/μs |
| DC Gate-Trigger Current: † For v _D = 12 V (dc), R _L = 30 Ω T _C = 25°C, and specified triggering mode: I ⁺ Mode: V _{MT2} positive, V _G positive III ⁻ Mode: V _{MT2} negative, V _G negative I ⁻ Mode: V _{MT2} positive, V _G negative III ⁺ Mode: V _{MT2} negative, V _G positive For other case temperatures | I _{GT} | — — — — | 10 20 20 30 | 25 30 60 60 | mA |
| DC Gate-Trigger Voltage: † For v _D = 12 V (DC) and R _L = 30 Ω T _C = 25°C For other case temperatures For V _D = V _{DROM} , R _L = 125 Ω, T _C = 125°C | V _{GT} | — 0.2 | 1.25 See Fig. 9 — | 2.5 — | V |
| Gate-Controlled Turn-On Time: (Delay Time + Rise Time) For V _D = V _{DROM} , I _G = 160 mA, t _r = 0.1 μs, I _T = 10 A (peak), T _C = 25°C (See Fig. 15) | t _{g1} | — | 1.6 | — | μs |
| Thermal Resistance: Junction-to-Case | R _{θJC} | — | — | 2.7 | °C/W |
| Thermal Resistance: Junction-to-Ambient | R _{θJA} | — | — | 60 | °C/W |

*For either polarity of main terminal 2 voltage (V_{MT2}) with reference to main terminal 1.

†For either polarity of gate voltage (V_G) with reference to main terminal 1.

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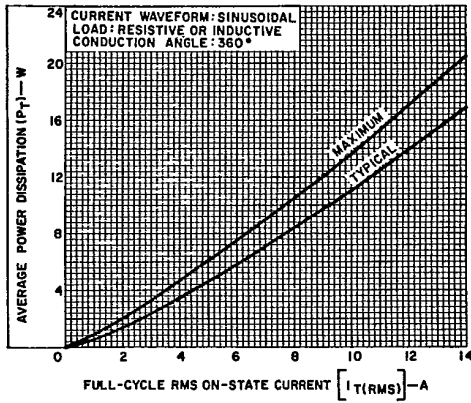


Fig. 1 — Power dissipation vs. on-state current.

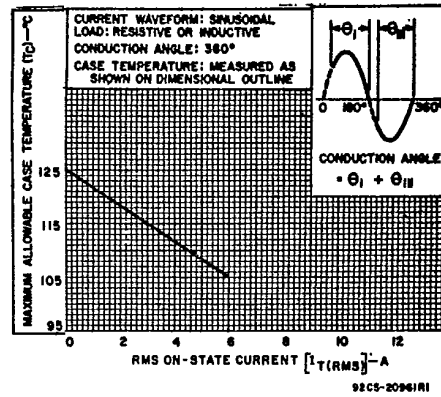


Fig. 2 — Allowable case temperature vs. on-state current.

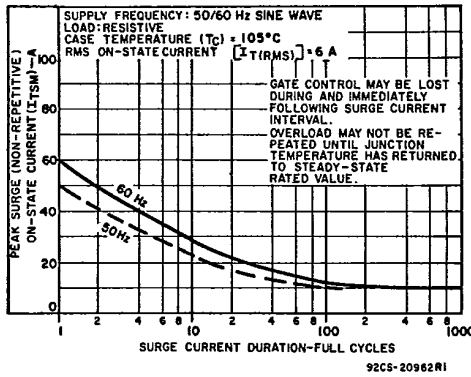


Fig. 3 — Peak surge on-state current vs. surge current duration.

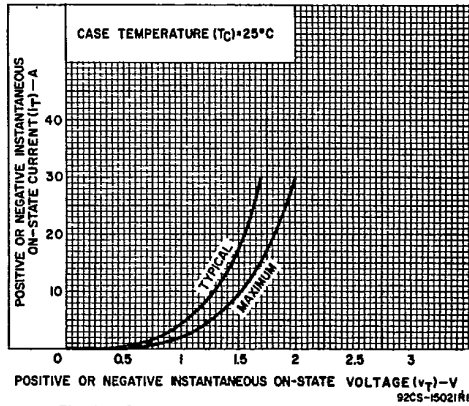


Fig. 4 — On-state current vs. on-state voltage.

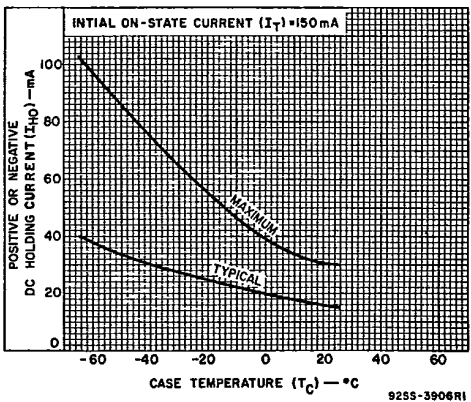


Fig. 5 — DC holding current for either direction of on-state current vs. case temperature.

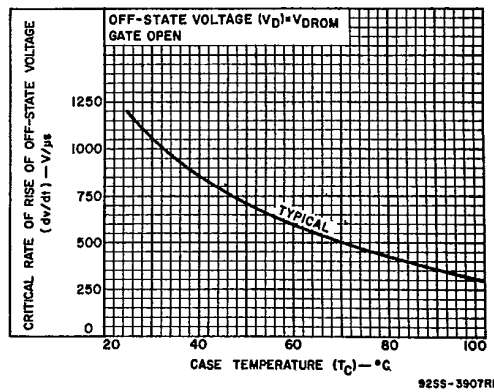


Fig. 6 — Critical rate of rise of off-state voltage vs. case temperature.

Triacs

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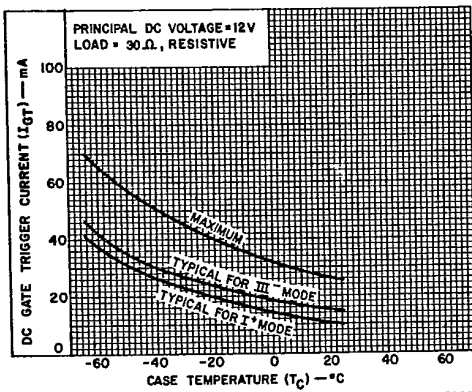


Fig. 7 — DC gate-trigger current (for I^+ and III^- triggering modes) vs. case temperature.

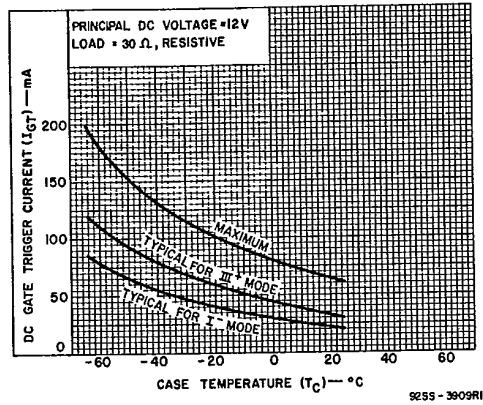


Fig. 8 — DC gate-trigger current (for I^- and III^+ triggering modes) vs. temperature.

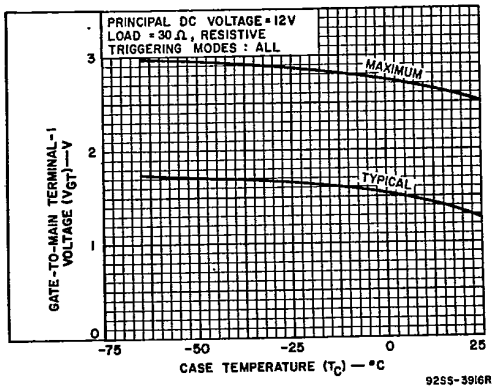


Fig. 9 — DC gate-trigger voltage vs. case temperature.

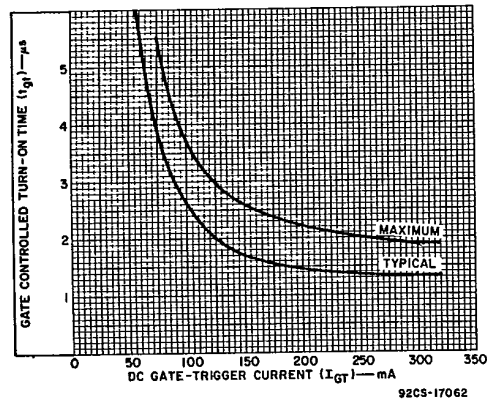


Fig. 10 — Typical turn-on time vs. gate-trigger current.

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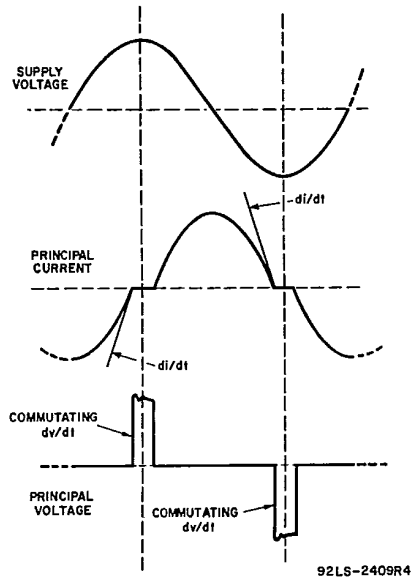


Fig. 11 — Oscilloscope display of commutating dv/dt.

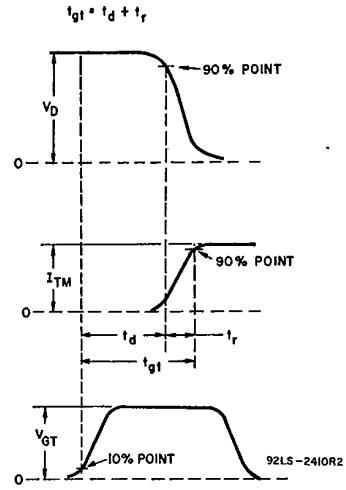


Fig. 12 — Oscilloscope display for measurement of gate-controlled turn-on time (t_{gt}).