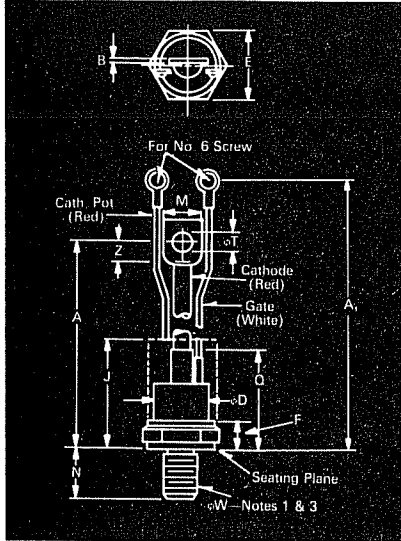




Fast Switching SCR T507-70

70A Avg.
(110 RMS)
Up to 1400 Volts
10-50 μ s



Conforms to TO-94 Outline

| Symbol | Inches | | Millimeters | |
|----------------|---------------|-------|-------------|--------|
| | Min. | Max. | Min. | Max. |
| A | 5.775 | 6.265 | 146.69 | 159.13 |
| A ₁ | 6.850 | 7.500 | 173.99 | 190.50 |
| B | .055 | .075 | 1.40 | 1.91 |
| ϕ D | .860 | 1.000 | 21.84 | 25.40 |
| E | 1.031 | 1.063 | 26.19 | 27.00 |
| F | .255 | .400 | 6.48 | 10.16 |
| J | 2.50 | | 63.50 | |
| M | .437 | .650 | 11.10 | 16.51 |
| N | .796 | .827 | 20.24 | 21.01 |
| Q | | 1.675 | | 42.55 |
| ϕ T | .260 | .291 | 6.60 | 7.39 |
| Z | .250 | | 6.35 | |
| ϕ W | 1/2-20 UNF-2A | | | |

Creep & Strike Distance.
T500—50 in. min. (12.85 mm).
(In accordance with NEMA standards.)
Finish—Nickel Plate.
Approx. Weight—5 oz. (142 g).

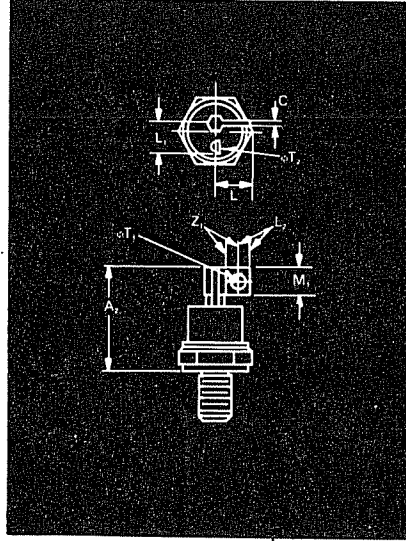
- Complete threads to extend to within 2 1/2 threads of seating plane.
- Angular orientation of terminals is undefined.
- Pitch diameter of 1/2-20 UNF-2A (coated) threads (ASA B1.1-1960).
- Dimension "J" denotes seated height with leads bent at right angles.

*for 10 μ sec turn-off, consult factory

Example

Obtain optimum device performance for your application by selecting proper Order Code.

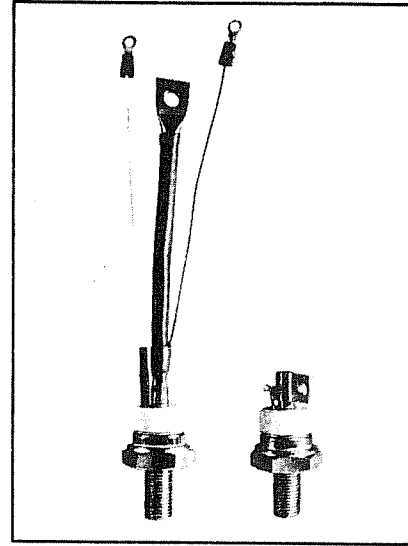
Type T 507 rated at 70 A average with $V_{DRM} = 800V$.
 $I_{GT} = .150$ ma, $t_q = 20 \mu$ sec max. and flex leads—order as:



Conforms to TO-83 Outline

| Symbol | Inches | | Millimeters | |
|-----------------------|---------------|-------|-------------|-------|
| | Min. | Max. | Min. | Max. |
| A ₂ | | 1.810 | | 45.97 |
| C | .070 | .110 | 1.78 | 2.79 |
| L | | .650 | | 16.51 |
| L ₁ | .420 | .520 | 10.67 | 13.21 |
| L ₂ | .180 | | 4.57 | |
| M ₁ | .360 | .470 | 9.14 | 11.94 |
| ϕ T ₁ | .190 | .235 | 4.83 | 5.97 |
| ϕ T ₂ | .060 | .080 | 1.52 | 2.03 |
| Z ₁ | .180 | | 4.57 | |
| ϕ W | 1/2-20 UNF-2A | | | |

Approx. Weight—4 oz. (114 g).
1. Basic dimensions of TO-94 and TO-83 are same except as noted.



Features:

- Center fired di/damic
- High di/dt with soft gate control
- High frequency operation
- Sinusoidal waveform operation to 20 KHz
- Rectangular waveform operation to 20 KHz
- Low dynamic forward voltage drop
- Low switching losses at high frequency
- Lifetime Guarantee

Applications:

- Inverters for UPS
- Induction Heating
- AC Motor Control
- Switching power supplies
- Cycloconverters
- Choppers
- Crowbars

Ordering Information

| Type | Voltage | | Current | | Turn-off | | Gate current | | Leads | |
|------|-----------------------------|------|---------------|------|--------------------|------|---------------|------|-------|------|
| | V_{DRM} and V_{RRM} (V) | Code | $I_T(av)$ (A) | Code | t_q (μ sec) | Code | I_{GT} (ma) | Code | Case | Code |
| T507 | 100 | 01 | 70 | 70 | 10 | 0 | 150 | 4 | TO-94 | AQ |
| | 200 | 02 | | | 15 | 7 | | | | |
| | 300 | 03 | | | 20 | 8 | | | | |
| | 400 | 04 | | | 25 | 9 | | | | |
| | 500 | 05 | | | 30 | 0 | | | | |
| | 600 | 06 | | | 40 | 1 | | | | |
| | 700 | 07 | | | 50 | 2 | | | TO-83 | AB |
| | 800 | 08 | | | | 3 | | | | |
| | 900 | 09 | | | | | | | | |
| | 1000 | 10 | | | | | | | | |
| | 1100 | 11 | | | | | | | | |
| | 1200 | 12 | | | | | | | | |
| | 1400 | *14 | | | | | | | | |

| Type | Voltage | Current | Turn Off | Gate Current | Leads |
|-----------|---------|---------|----------|--------------|-------|
| T 5 0 7 0 | 8 | 9 0 | 6 | 4 | A Q |

**70A Avg.
(110 RMS)
Up to 1400 Volts
10-50 μ s**

**Fast Switching
SCR
T507_70**



Voltage

Blocking State Maximums @ ($T_J = 125^\circ\text{C}$)

| Symbol | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1400 |
|--|--------|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| Repetitive peak forward blocking voltage, V_{DRM} | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1400 |
| Repetitive peak reverse voltage, V_{RRM} | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1400 |
| Non-repetitive transient peak reverse voltage, V_{RSM} $t \leq 5.0$ msec, V | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1500 |
| Forward leakage current, mA peak, I_{DRM} | ← 15 → | | | | | | | | | | | | |
| Reverse leakage current, mA peak, I_{RRM} | ← 15 → | | | | | | | | | | | | |

Current

Conducting State Maximums
($T_J = 125^\circ\text{C}$)

| Symbol | T507_70 |
|---|---------|
| RMS forward current, A, $I_T(\text{rms})$ | 110 |
| Ave. forward current, A, $I_T(\text{av})$ | 70 |
| One-half cycle surge current, A, I_{TSM} | 1200 |
| I^2t for fusing (for times ≥ 8.3 ms) A ² sec, I^2t | 6000 |
| Forward voltage drop at $I_{TM} = 500A$ and $T_J = 25^\circ\text{C}$, V, V_{TM} | 3.5 |
| Min. repetitive di/dt , A/ μ sec, di/dt | 100 |

Switching

($T_J = 25^\circ\text{C}$)

| Symbol | |
|--|----------|
| Max. turn-off time, $I_T = 50A$, $T_J = 125^\circ\text{C}$, $di_R/dt = 5$ A/ μ sec, reappplied $dv/dt =$ $20V/\mu$ sec linear to $0.8 V_{DRM}$, μ sec, t_q | 10 to 50 |
| Typ. turn-on-time, $I_T = 100A$, $V_D = 100V$, μ sec, t_{on} | 3.5 |
| Min. critical dv/dt , exponential to V_{DRM} , $T_J = 125^\circ\text{C}$, V/ μ sec, dv/dt | 200 |
| Min. di/dt non-repetitive, A/ μ sec, di/dt | 800 |

Gate

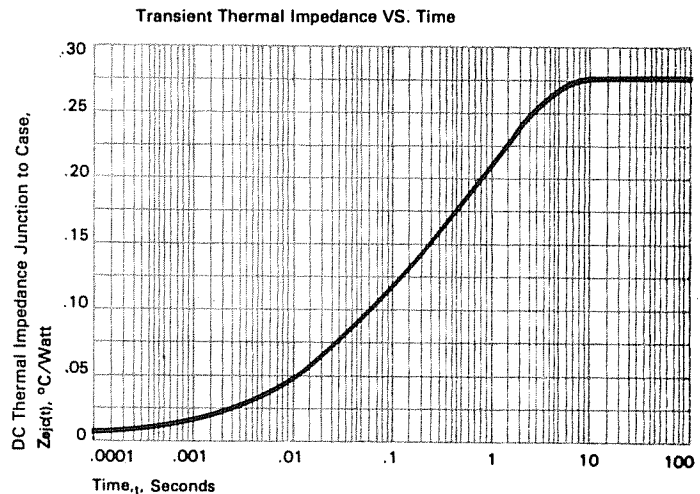
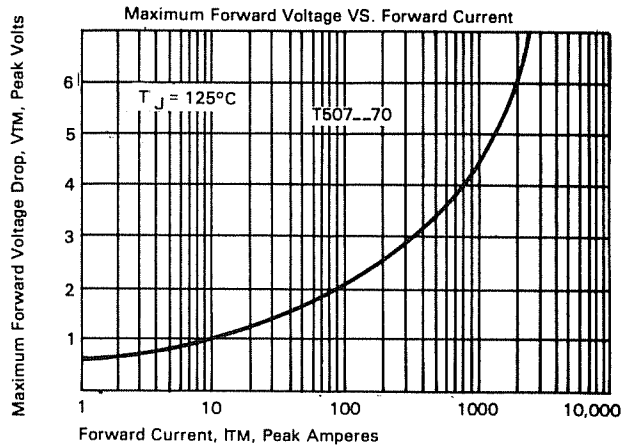
Maximum Parameters
($T_J = 25^\circ\text{C}$)

| Symbol | |
|--|------|
| Gate current to trigger at $V_D = 12V$, mA, I_{GT} | 150 |
| Gate voltage to trigger at $V_D = 12V$, V, V_{GT} | 3 |
| Non-triggering gate voltage, $T_J = 125^\circ\text{C}$, and rated V_{DRM} , V, V_{GDM} | 0.15 |
| Peak forward gate current, A, I_{GTM} | 4 |
| Peak reverse gate voltage, V, V_{GRM} | 5 |
| Peak gate power, Watts, PGM | 16 |
| Average gate power, Watts, PG(av) | 3 |

Thermal and Mechanical

| Symbol | |
|--|-------------|
| Min., Max. oper. junction temp., $^\circ\text{C}$, T_J | -40 to +125 |
| Min., Max. storage temp., $^\circ\text{C}$, T_{stg} | -40 to +150 |
| Max. mounting torque, in lb., \odot | 130 |
| Max. Thermal resistance, $^\circ\text{C}/\text{Watt}$ | |
| Junction to case, $^\circ\text{C}/\text{Watt}$, $R_{\theta JC}$ | .28 |
| Case to sink, lubricated, $^\circ\text{C}/\text{Watt}$, $R_{\theta CS}$ | .12 |

- ① Consult recommended mounting procedures.
- ② Applies for zero or negative gate bias.
- ③ Per JEDEC RS-397, 5.2.2.1.
- ④ With recommended gate drive.
- ⑤ Higher dv/dt ratings available, consult factory.
- ⑥ Per JEDEC standard RS-397, 5.2.2.6.
- ⑦ For operation with antiparallel diode, consult factory.



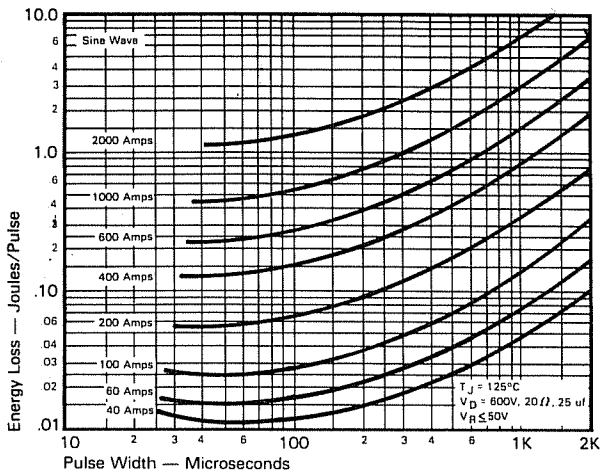
FAST SWITCHING
THYRISTORS



Fast Switching SCR T507_70

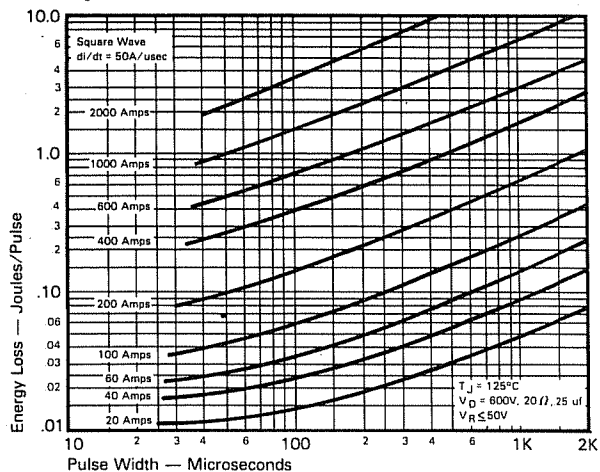
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Sinusoidal Current Data

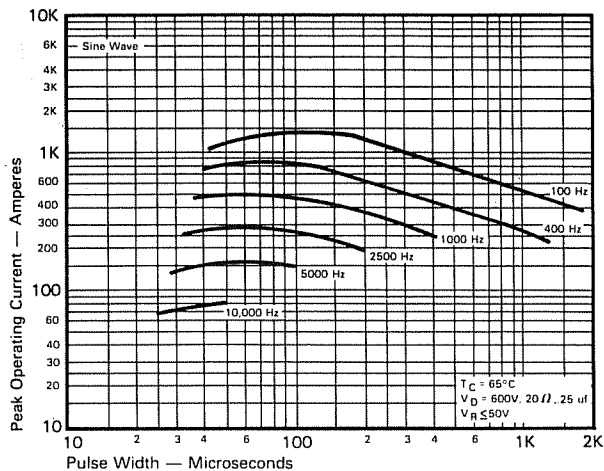


ENERGY PER PULSE FOR SINUSOIDAL PULSES

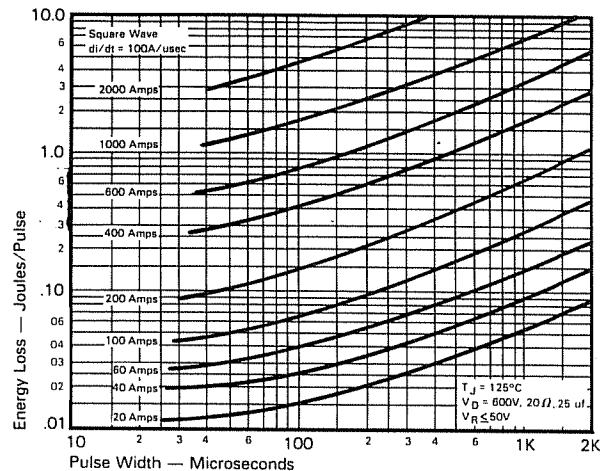
Trapezoidal Wave Current Data



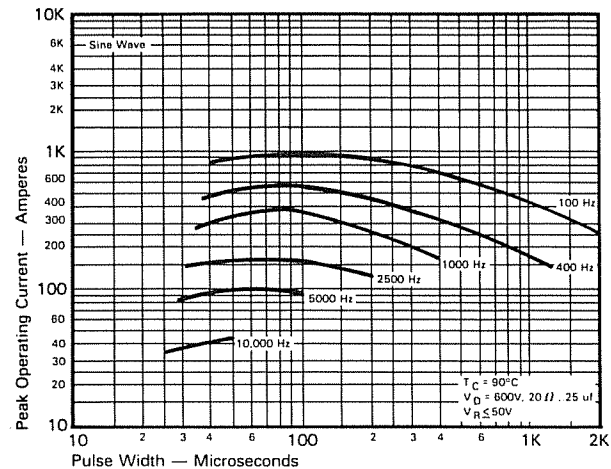
ENERGY PER PULSE FOR TRAPEZOIDAL PULSES
($di/dt = 50A/usec$)



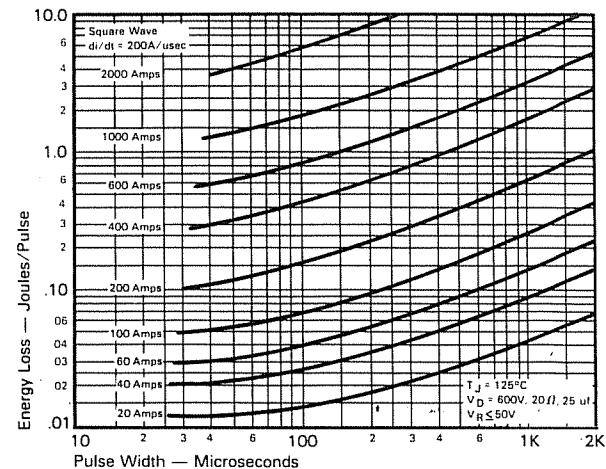
MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT
vs. PULSE WIDTH ($T_C = 65^\circ C$)



ENERGY PER PULSE FOR TRAPEZOIDAL PULSES
($di/dt = 100A/usec$)



MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT
vs. PULSE WIDTH ($T_C = 90^\circ C$)



ENERGY PER PULSE FOR TRAPEZOIDAL PULSES
($di/dt = 200A/usec$)

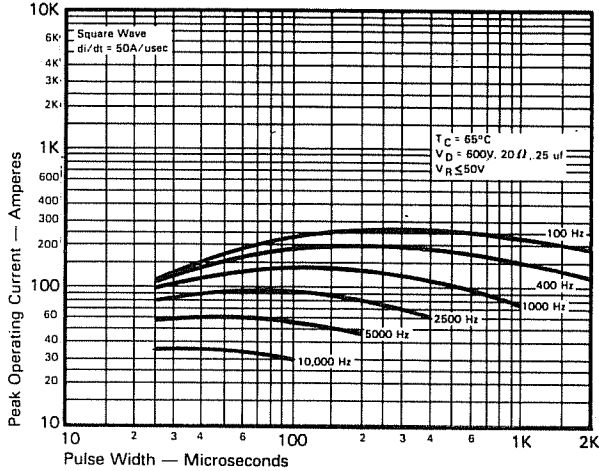
FAST SWITCHING
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T507_70

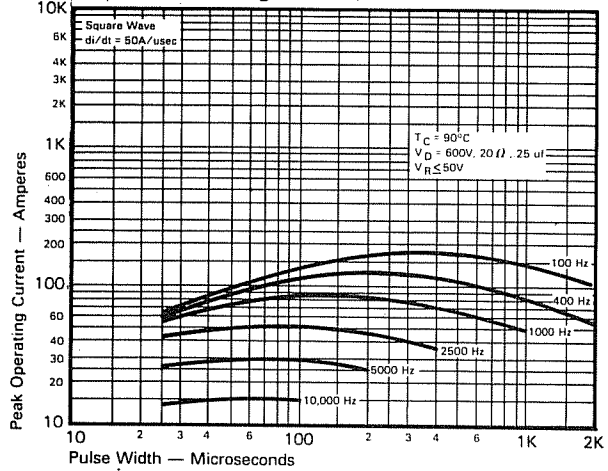


Trapezoidal Wave Current Data
($T_C = 65^\circ\text{C}$)

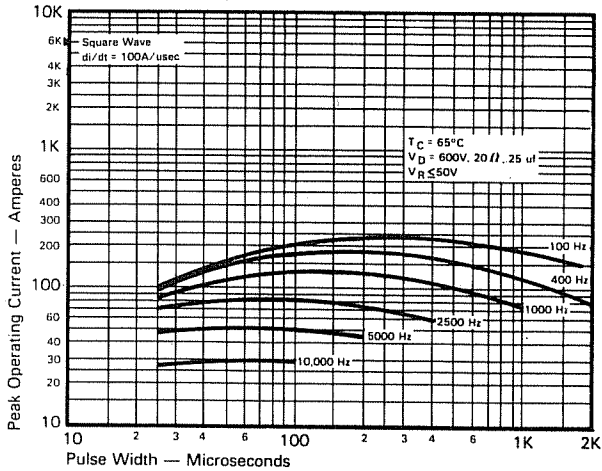


MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ($di/dt = 50A/usec$)

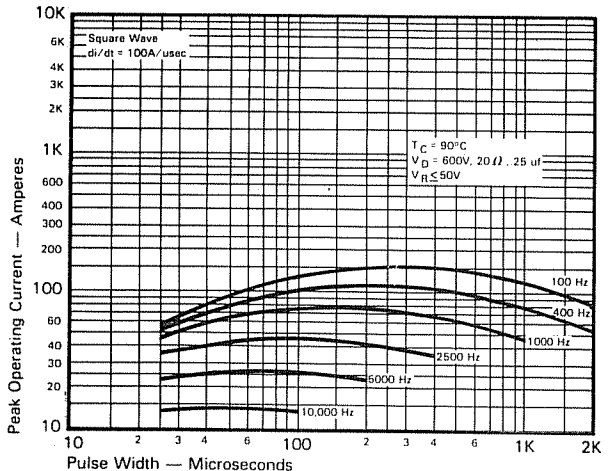
Trapezoidal Wave Current Data
($T_C = 90^\circ\text{C}$)



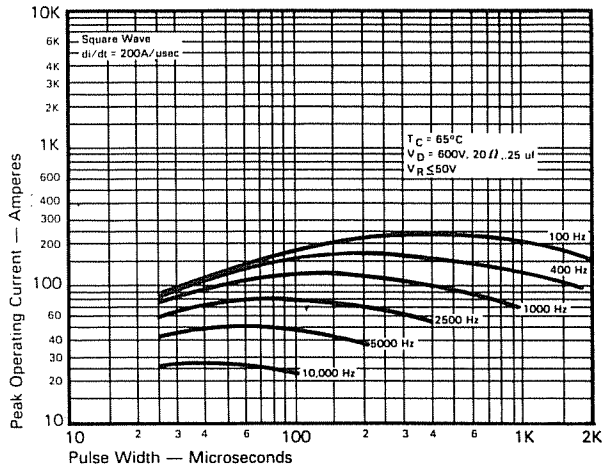
MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ($di/dt = 50A/usec$)



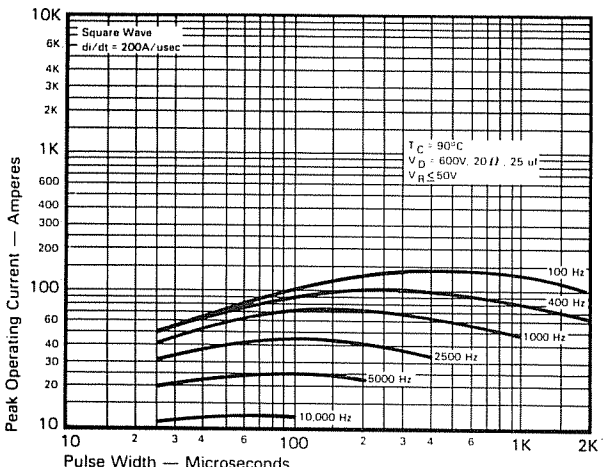
MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ($di/dt = 100A/usec$)



MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ($di/dt = 100A/usec$)



MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ($di/dt = 200A/usec$)



MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ($di/dt = 200A/usec$)

FAST SWITCHING THYRISTORS