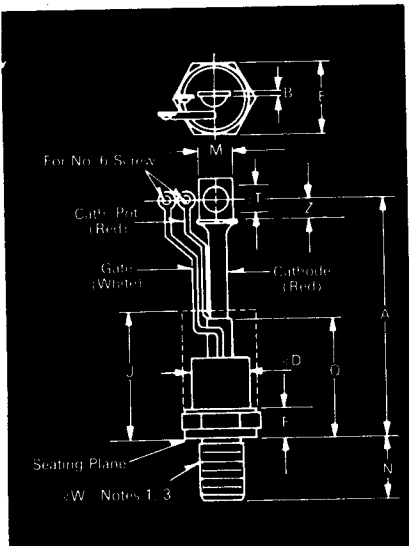


# Fast Switching SCR T607\_\_15

150A Avg.  
(235 RMS)  
Up to 1200 Volts  
10-50  $\mu$ s



Conforms to TO-93 Outline

**Features:**

- Center fire, di/namic gate
- 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
- Westinghouse Lifetime Guarantee

| Symbol         | Inches |       | Millimeters |        |
|----------------|--------|-------|-------------|--------|
|                | Min.   | Max.  | Min.        | Max.   |
| A              | 7.750  | 8.100 | 196.85      | 205.74 |
| A <sub>1</sub> | 7.750  | 8.100 | 196.85      | 205.74 |
| B              | .063   | .172  | 1.60        | 4.37   |
| $\phi$ D       | .980   | 1.090 | 24.89       | 27.69  |
| E              | 1.212  | 1.250 | 30.78       | 31.75  |
| F              | .250   | .630  | 6.35        | 16.00  |
| J              | 3.25   |       | 82.55       |        |
| M              | .530   | .755  | 13.46       | 19.18  |
| N              | 1.040  | 1.077 | 26.42       | 27.36  |
| Q              |        | 2.250 |             | 57.15  |
| $\phi$ T       | .260   | .290  | 6.60        | 7.37   |
| Z              | .340   |       | 8.64        |        |

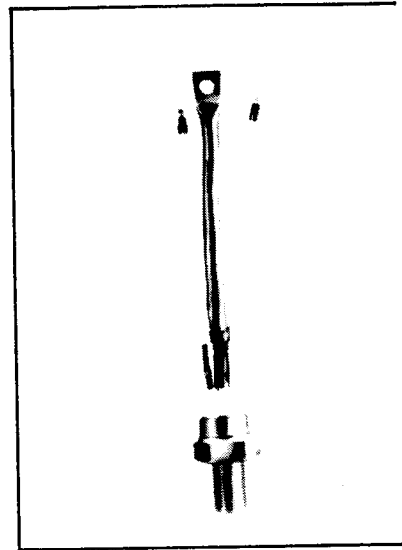
$\phi$ W  $\frac{3}{4}$ -16 UNF-2A  
Creep Distance—.75 in. min. (19.05 mm).  
Strike Distance—.89 in. min. (17.53 mm).

(In accordance with NEMA standards.)  
Finish—Nickel Plate.  
Approx. Weight—8 oz. (227 g).

1. Complete threads to extend to within 2½ threads of seating plane.
2. Angular orientation of terminals is undefined.
3. Pitch diameter of  $\frac{3}{4}$ -16 UNF-2A (coated) threads (ASA B1.1—1960).
4. Dimension "J" denotes seated height with leads bent at right angles.

**Applications:**

- Inverters for UPS
- AC motor control
- Induction heating
- Cycloconverters
- Choppers



**Ordering Information**

| Type | Voltage   | Current                | Turn off                               | Gate Current         | Leads     |
|------|---|------------------------|--|----------------------|-----------|
| Code | V <sub>DRM</sub> and V <sub>RRM</sub> (V)   | I <sub>T(av)</sub> (A) | t <sub>q</sub> $\mu$ sec               | I <sub>GT</sub> (ma) | Case Code |
| T607 | 100<br>200<br>300<br>400<br>500<br>600<br>700<br>800<br>900<br>1000<br>1100<br>1200 | 150                    | 10<br>15<br>20<br>25<br>30<br>40<br>50 | 150                  | TO-93 BT  |

**Example**

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

Type T607 rated at 150A average with V<sub>DRM</sub> = 1000V, I<sub>GT</sub> = 150 ma, t<sub>q</sub> = 30  $\mu$ sec and standard flex lead — order as

\*for 10  $\mu$ sec turn-off, consult factory

| Type    | Voltage | Current | Turn Off | Gate Current | Leads |
|---------|---------|---------|----------|--------------|-------|
| T 6 0 7 | 1 0     | 1 5     | 5        | 4            | B T   |

FAST SWITCHING  
THYRISTORS

**150A Avg.  
(235 RMS)  
Up to 1200 Volts  
10-50  $\mu$ s**

**Fast Switching  
SCR  
T607\_15**

**Voltage**

Blocking State Maximums  $\textcircled{2}$  ( $T_J = 125^\circ\text{C}$ )

Repetitive peak forward blocking voltage, V  $\dots$   $V_{DRM}$   
 Repetitive peak reverse voltage, V  $\dots$   $V_{RRM}$   
 Non-repetitive transient peak reverse voltage,  
 $t \leq 5.0$  msec, V  $\dots$   $V_{RSM}$

Symbol

|           |     |     |     |     |     |     |     |     |      |      |      |      |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|
| $V_{DRM}$ | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900  | 1000 | 1100 | 1200 |
| $V_{RRM}$ | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900  | 1000 | 1100 | 1200 |
| $V_{RSM}$ | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1300 |

Forward leakage current, mA peak  $\dots$   $I_{DRM}$   
 Reverse leakage current, mA peak  $\dots$   $I_{RRM}$



**Current**

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

RMS forward current, A  $\dots$   $I_T(\text{rms})$   
 Ave. forward current, A  $\dots$   $I_T(\text{av})$   
 One-half cycle surge current  $\textcircled{3}$ , A  $\dots$   $I_{TSM}$   
 $I^2t$  for fusing (for times  $\geq 8.3$  ms),  
 $\text{A}^2\text{-sec.}$   $\dots$   $I^2t$   
 Forward voltage drop at  $I_{TM} = 625\text{A}$   
 and  $T_J = 25^\circ\text{C}$ , V  $\dots$   $V_{TM}$   
 Min. repetitive  $di/dt$   $\textcircled{4}$   $\textcircled{5}$ , A/ $\mu$ sec  $\dots$   $di/dt$

Symbol **T607\_15**

|                   |        |
|-------------------|--------|
| $I_T(\text{rms})$ | 235    |
| $I_T(\text{av})$  | 150    |
| $I_{TSM}$         | 4000   |
| $I^2t$            | 65,000 |
| $V_{TM}$          | 2.1    |
| $di/dt$           | 250    |

**Switching**

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

Max. turn-off time,  $I_T = 150\text{A}$ ,  
 $T_J = 125^\circ\text{C}$ ,  $di/dt = 12.5$   
 $\text{A}/\mu\text{sec}$ , reapplied  $dv/dt =$   
 $20\text{V}/\mu\text{sec}$  linear to .8V DRM,  $\mu\text{sec}$   $\textcircled{4}$   $\textcircled{5}$   $\dots$   $t_q$   
 Typ. turn-on-time,  $I_T = 100\text{A}$ ,  
 $V_D = 100\text{V}$ ,  $\mu\text{sec}$   $\dots$   $t_{on}$   
 Min. critical  $dv/dt$ , exponential to  $V_{DRM}$ ,  
 $T_J = 125^\circ\text{C}$ , V/ $\mu\text{sec}$   $\textcircled{4}$   $\dots$   $dv/dt$   
 Min.  $di/dt$  non-repetitive,  
 $\textcircled{4}$   $\textcircled{5}$ , A/ $\mu\text{sec}$   $\dots$   $di/dt$

Symbol

|          |          |
|----------|----------|
| $t_q$    | 10 to 50 |
| $t_{on}$ | 3.5      |
| $dv/dt$  | 300      |
| $di/dt$  | 800      |

**Gate**

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

Gate current to trigger at  $V_D = 12\text{V}$ , mA  $\dots$   $I_{GT}$   
 Gate voltage to trigger at  $V_D = 12\text{V}$ , V  $\dots$   $V_{GT}$   
 Non-triggering gate voltage,  $T_J = 125^\circ\text{C}$ ,  
 and rated  $V_{DRM}$ , V  $\dots$   $V_{GDM}$   
 Peak forward gate current, A  $\dots$   $I_{GTM}$   
 Peak reverse gate voltage, V  $\dots$   $V_{GRM}$   
 Peak gate power, Watts  $\dots$   $P_{GM}$   
 Average gate power, Watts  $\dots$   $P_{G(av)}$

Symbol

|             |      |
|-------------|------|
| $I_{GT}$    | 150  |
| $V_{GT}$    | 3    |
| $V_{GDM}$   | 0.15 |
| $I_{GTM}$   | 4    |
| $V_{GRM}$   | 5    |
| $P_{GM}$    | 16   |
| $P_{G(av)}$ | 3    |

**Thermal and Mechanical**

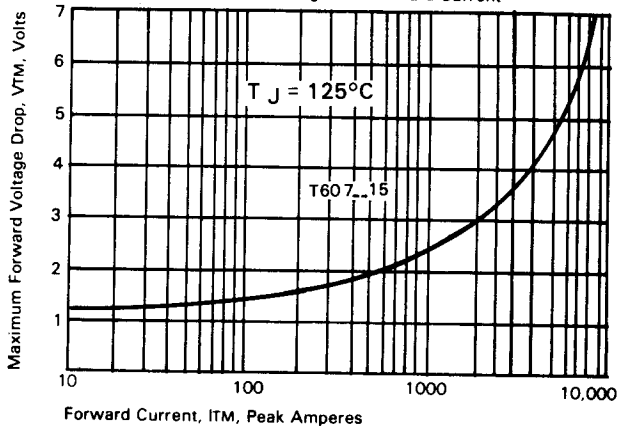
Min., Max. oper. junction temp.,  $^\circ\text{C}$   $\dots$   $T_J$   
 Min., Max. storage temp.,  $^\circ\text{C}$   $\dots$   $T_{stg}$   
 Max. mounting torque, in lb.  $\textcircled{6}$   $\dots$   
 Max. Thermal resistance  $\textcircled{7}$   
 Junction to case,  $^\circ\text{C}/\text{Watt}$   $\dots$   $R_{\theta JC}$   
 Case to sink, lubricated,  $^\circ\text{C}/\text{Watt}$   $\dots$   $R_{\theta CS}$

Symbol

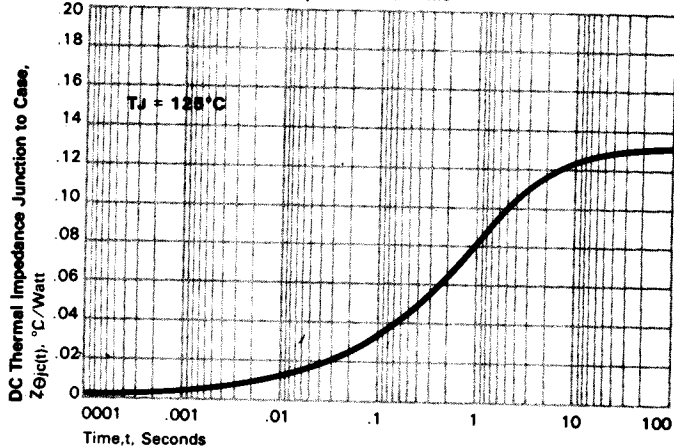
|                 |             |
|-----------------|-------------|
| $T_J$           | -40 to +125 |
| $T_{stg}$       | -40 to +150 |
| $R_{\theta JC}$ | .13         |
| $R_{\theta CS}$ | .08         |

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

Maximum Forward Voltage VS. Forward Current



Transient Thermal Impedance VS. Time

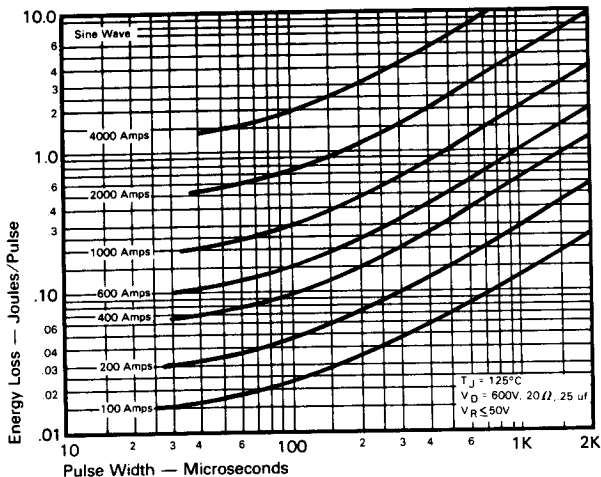


FAST SWITCHING THYRISTORS

# Fast Switching SCR T607-15

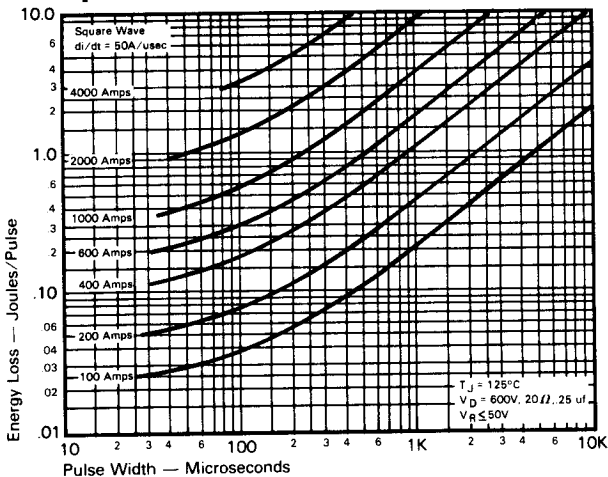
150A Avg.  
(235 RMS)  
Up to 1200 Volts  
10-50  $\mu$ s

## Sinusoidal Current Data

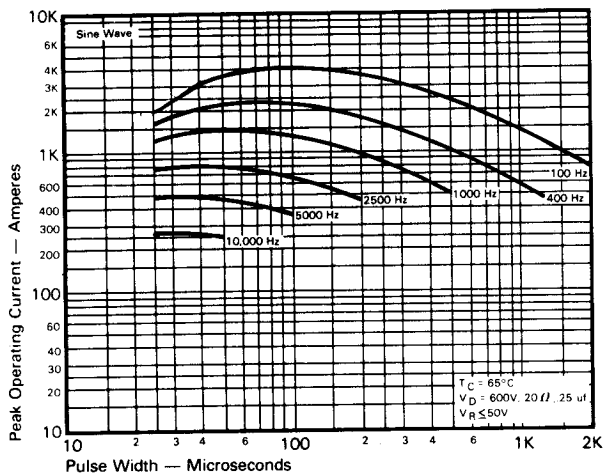


ENERGY PER PULSE FOR SINUSOIDAL PULSES

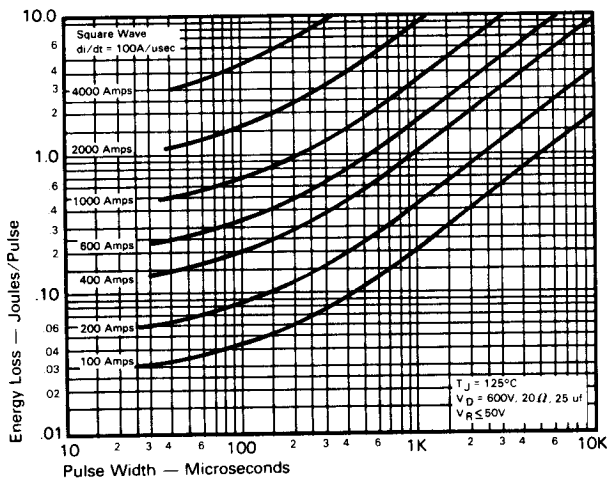
## Trapezoidal Wave Current Data



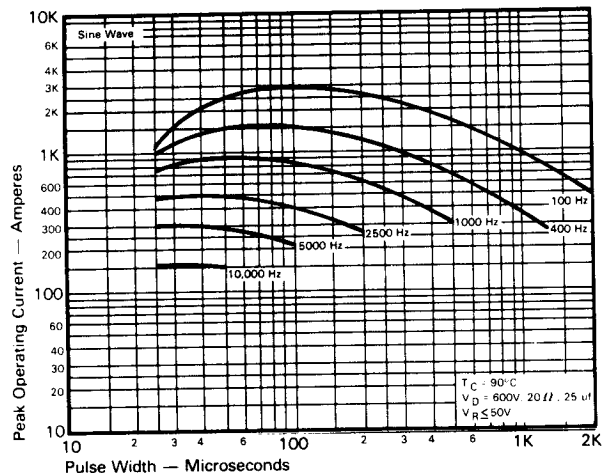
ENERGY PER PULSE FOR TRAPEZOIDAL PULSES  
( $di/dt = 50A/usec$ )



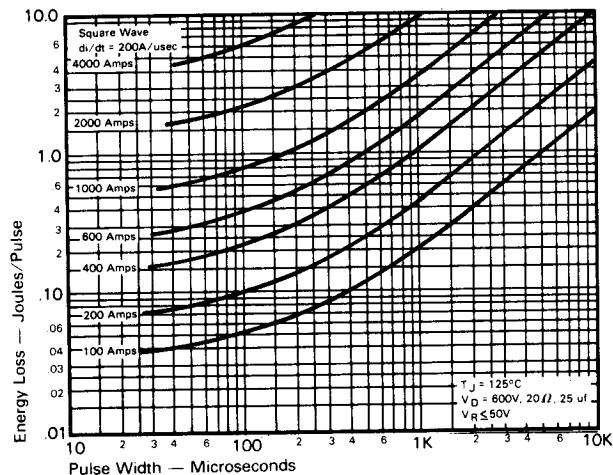
MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT  
vs. PULSE WIDTH ( $T_C = 65^\circ C$ )



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



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

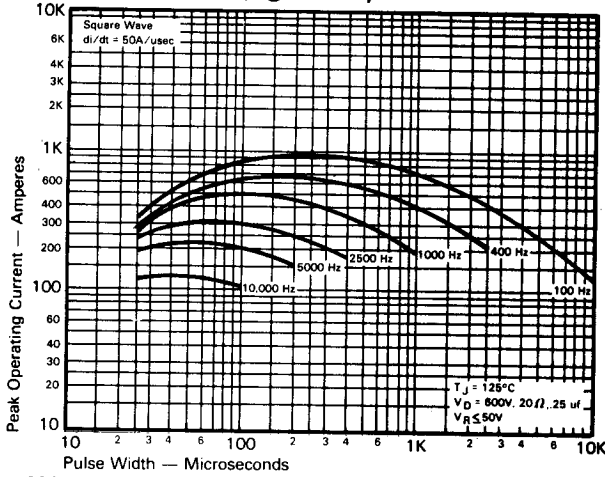


ENERGY PER PULSE FOR TRAPEZOIDAL PULSES  
( $di/dt = 200A/usec$ )

150A Avg.  
(235 RMS)  
Up to 1200 Volts  
10-50  $\mu$ s

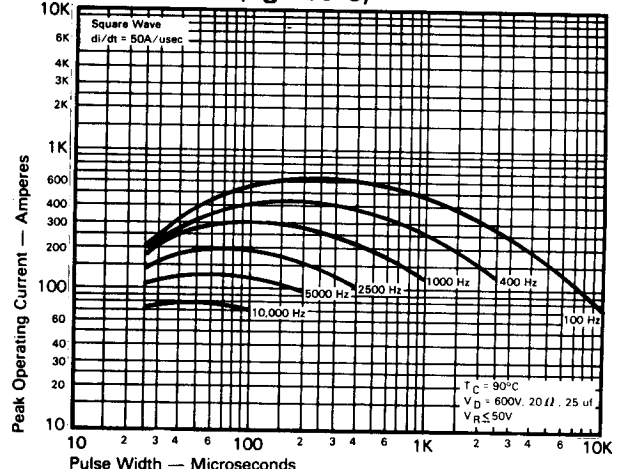
Fast Switching  
SCR  
T607\_15

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

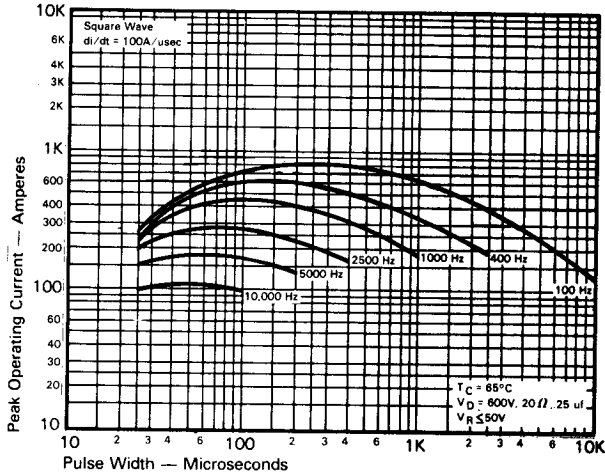


MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ( $di/dt = 50A/usec$ )

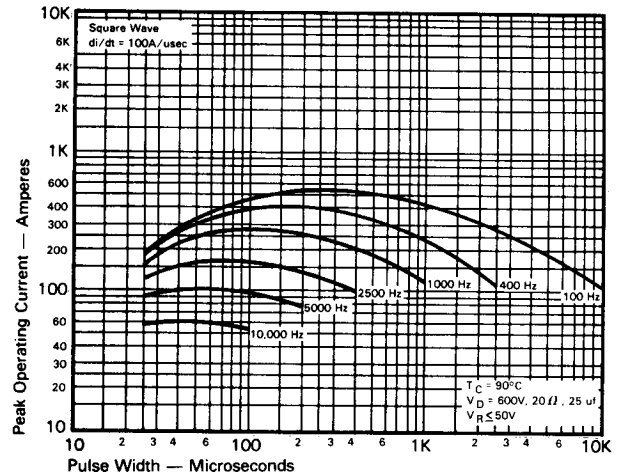
Trapezoidal Wave Current Data  
( $T_C = 90^\circ\text{C}$ )



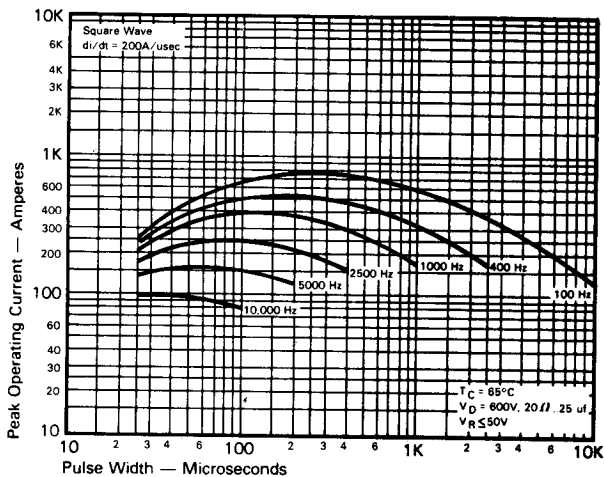
MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ( $di/dt = 50A/usec$ )



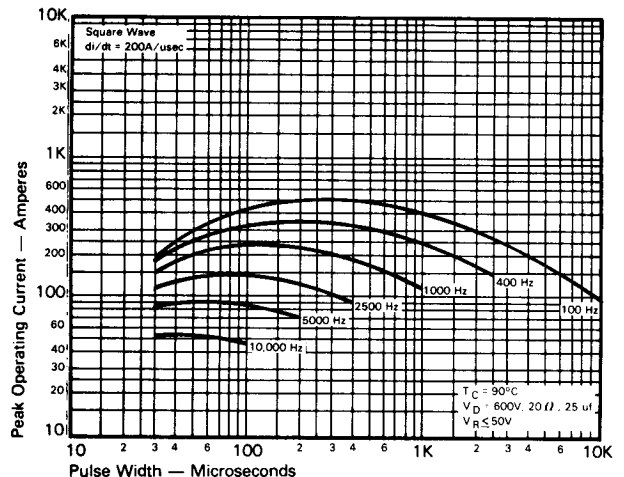
MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ( $di/dt = 100A/usec$ )



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

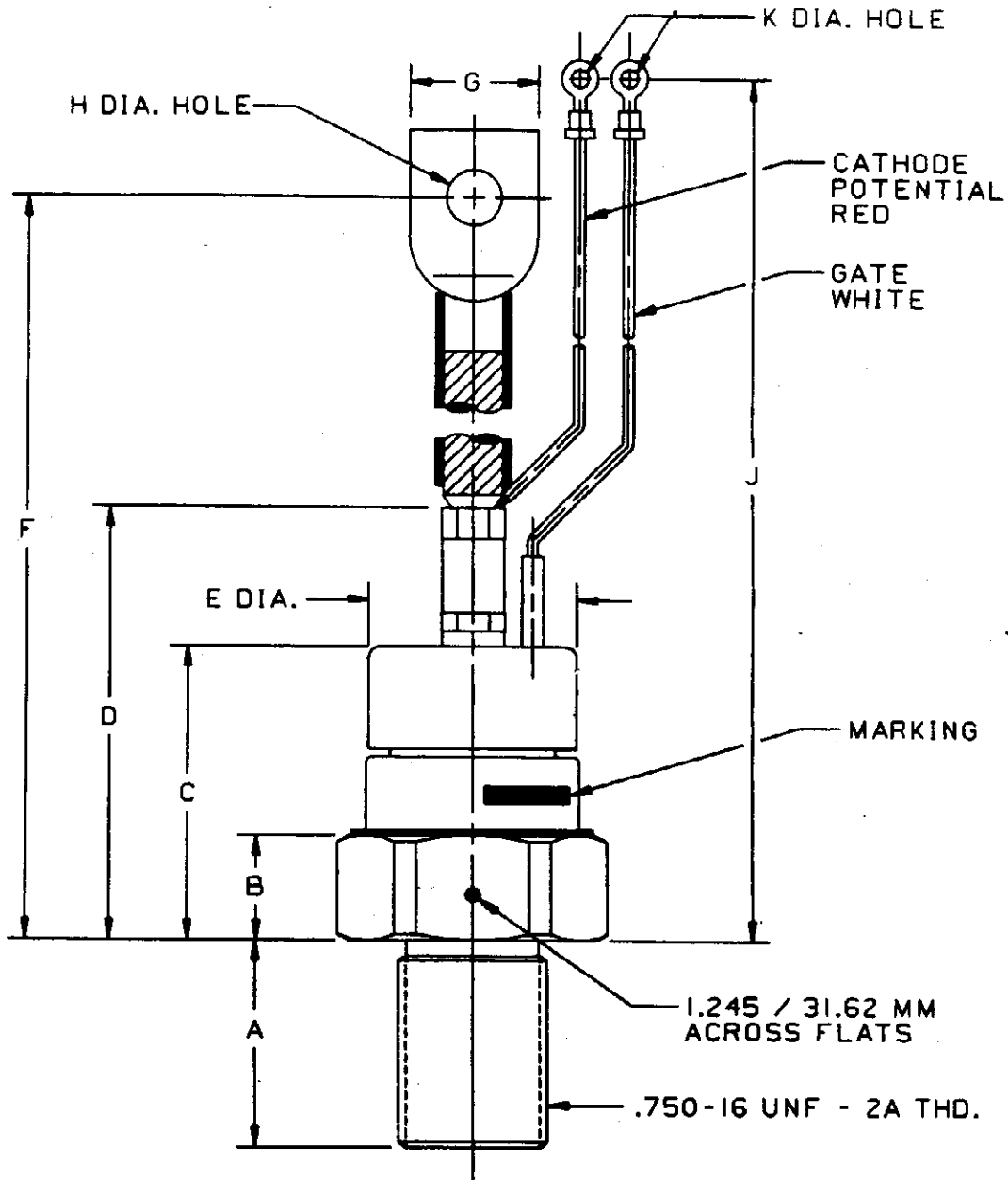


MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ( $di/dt = 200A/usec$ )



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

FAST SWITCHING  
THYRISTORS



CASE NUMBER T60  
 NOMINAL DIMENSIONS

STRIKE DISTANCE = .65 INCH / 16.5 MM MIN.  
 CREEPAGE DISTANCE = .65 INCH / 16.5 MM MIN.

| SYM.   | A    | B    | C    | D    | E    | F     | G    | H    | J     | K    |
|--------|------|------|------|------|------|-------|------|------|-------|------|
| INCHES | 1.06 | .55  | 1.50 | 2.25 | 1.07 | 7.91  | .63  | .281 | 7.91  | .146 |
| MM     | 26.9 | 14.0 | 38.1 | 57.2 | 27.2 | 200.9 | 16.0 | 7.14 | 200.9 | 3.71 |

ALL DIMENSIONS ARE REFERENCE