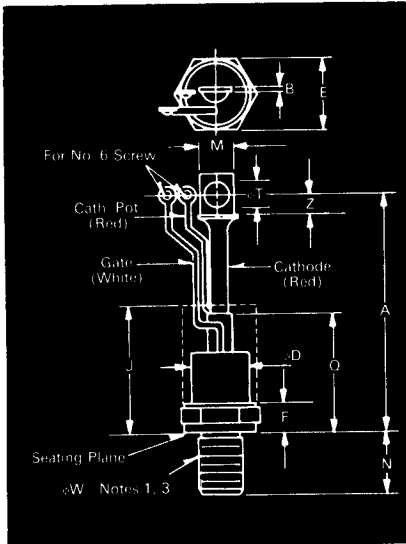


# Fast Switching SCR T607\_18

175A Avg.  
(275 RMS)  
Up to 1200 Volts  
10-50  $\mu$ s



Conforms to TO-93 Outline

### Features:

- Center fire, di/damic 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	¼-16 UNF-2A			

Creep Distance—75 in. min. (19.05 mm).  
Strike Distance—69 in. min. (17.53 mm).

(In accordance with NEMA standards.)

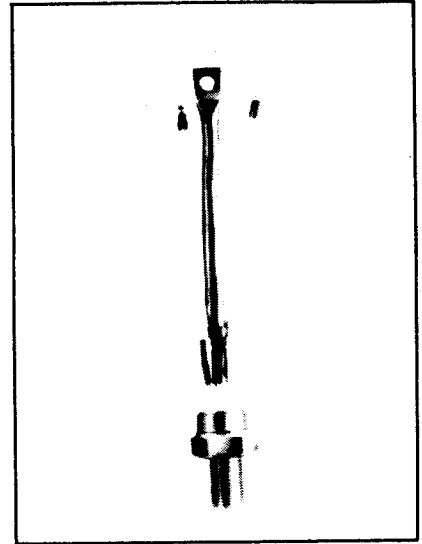
Finish—Nickel Plate.

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 ¼-16 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)	Code	I <sub>T(av)</sub> (A)	t <sub>q</sub> $\mu$ sec	Code	I <sub>GT</sub> (ma)	Code	Case	Code	
T607		100	01	175	18	10	150	4	TO-93	BT	
		200	02			15					7
		300	03			20					6
		400	04			25					5
		500	05			30					5
		600	06			40					4
		700	07			50					3
		800	08								
		900	09								
		1000	10								
		1100	11								
		1200	*12								

### Example

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

Type T 607 rated at 175A 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 8	5	4	B T

FAST SWITCHING THYRISTORS

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**Fast Switching  
SCR  
T607\_18**

**Voltage**

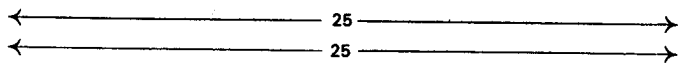
Blocking State Maximums  $\textcircled{2}$  ( $T_J = 125^\circ\text{C}$ )

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

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 ...  $I_{DRM}$   
 Reverse leakage current, mA peak ...  $I_{RRM}$



**Current**

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

Symbol

**T607\_18**

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

$I_T(rms)$	275
$I_T(av)$	175
$I_TSM$	4500
$I^2t$	84,000
$V_{TM}$	1.85
$di/dt$	300

**Switching**

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

Symbol

Max. turn-off time,  $I_T = 150A$ ,  
 $T_J = 125^\circ\text{C}$ ,  $di/dt = 12.5$   
 $A/\mu\text{sec}$ , reapplied  $dv/dt =$   
 $20V/\mu\text{sec}$  linear to .8V  $DRM$ ,  $\mu\text{sec}$   $\textcircled{6}$   $\textcircled{7}$  ...  $t_q$   
 Typ. turn-on-time,  $I_T = 100A$   
 $V_D = 100V$   $\textcircled{8}$ ,  $\mu\text{sec}$  ...  $t_{on}$   
 Min. critical  $dv/dt$ , exponential to  $V_{DRM}$ ,  
 $T_J = 125^\circ\text{C}$ , V/ $\mu\text{sec}$   $\textcircled{9}$   $\textcircled{10}$  ...  $dv/dt$   
 Min.  $di/dt$  non-repetitive,  
 $\textcircled{11}$   $\textcircled{12}$ , A/ $\mu\text{sec}$  ...  $di/dt$

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

**Gate**

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

Symbol

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

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

**Thermal and Mechanical**

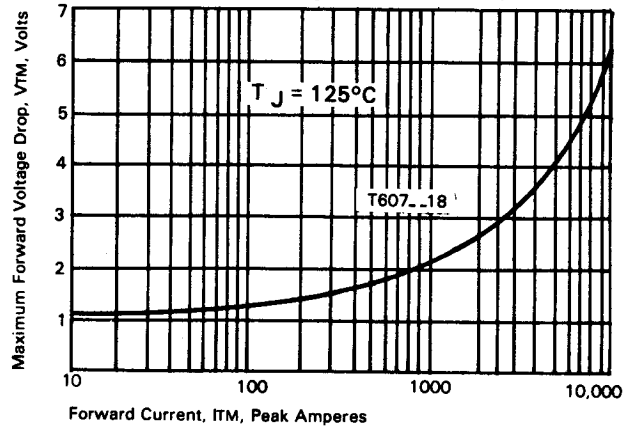
Symbol

Min., Max. oper. junction temp.,  $^\circ\text{C}$  ...  $T_J$   
 Min., Max. storage temp.,  $^\circ\text{C}$  ...  $T_{stg}$   
 Max. mounting torque, in lb  $\textcircled{13}$  ... 300  
 Max. Thermal resistance  $\textcircled{14}$   
 Junction to case,  $^\circ\text{C}/\text{Watt}$  ...  $R_{\theta JC}$   
 Case to sink, lubricated,  $^\circ\text{C}/\text{Watt}$  ...  $R_{\theta CS}$

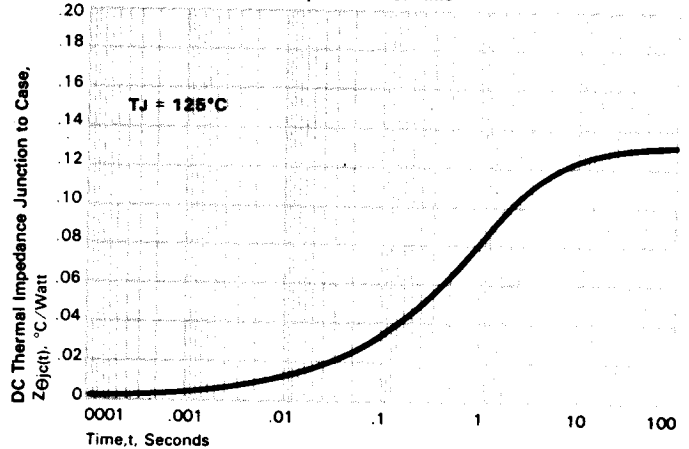
$T_J$	-40 to +125
$T_{stg}$	-40 to +150
300	300
$R_{\theta JC}$	.13
$R_{\theta CS}$	.08

- $\textcircled{1}$  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

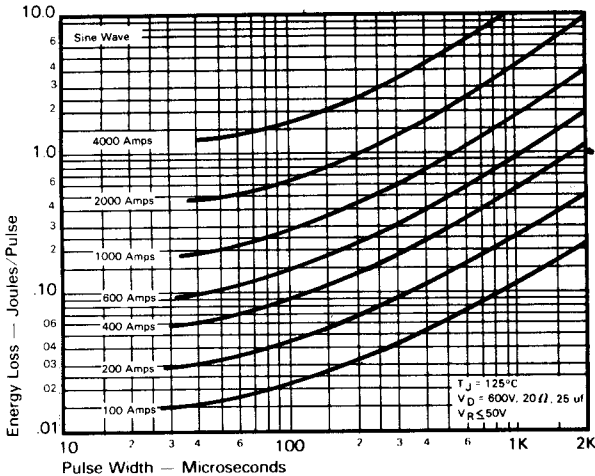


FAST SWITCHING  
THYRISTORS

# Fast Switching SCR T607-18

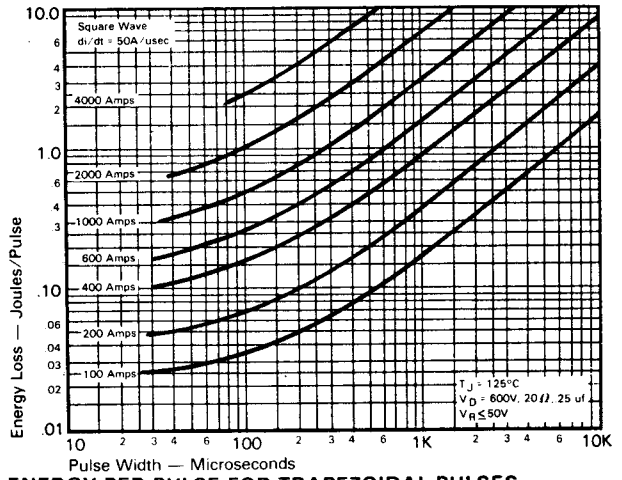
175A Avg.  
(275 RMS)  
Up to 1200 Volts  
10-50  $\mu$ s

## Sinusoidal Current Data

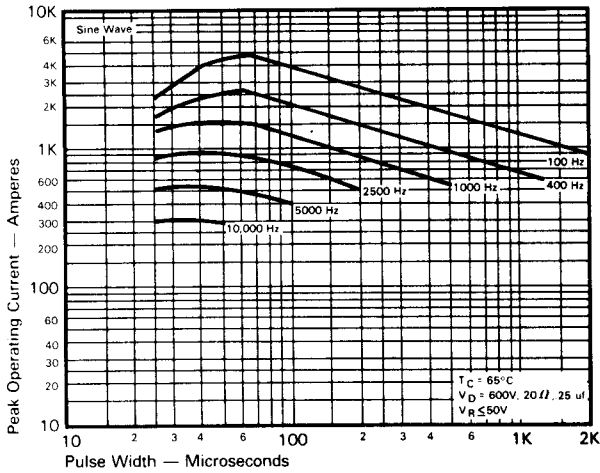


ENERGY PER PULSE FOR SINUSOIDAL PULSES

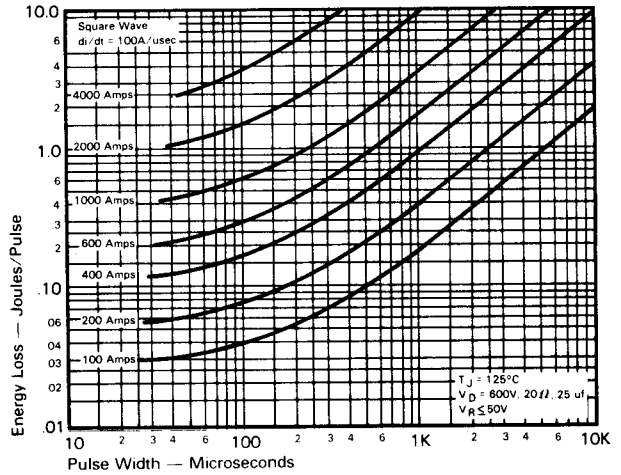
## Trapezoidal Wave Current Data



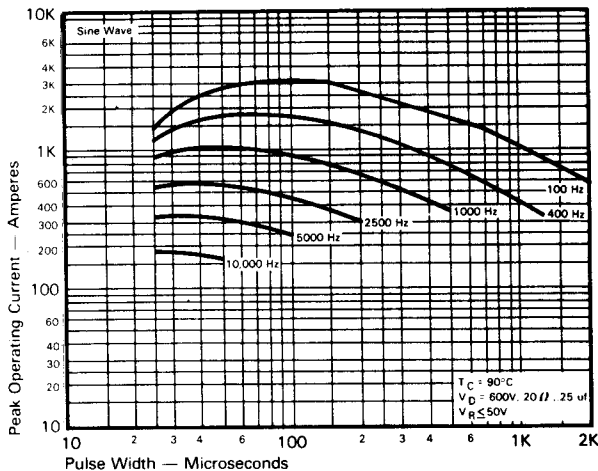
ENERGY PER PULSE FOR TRAPEZOIDAL PULSES  
( $di/dt = 50\text{A}/\mu\text{sec}$ )



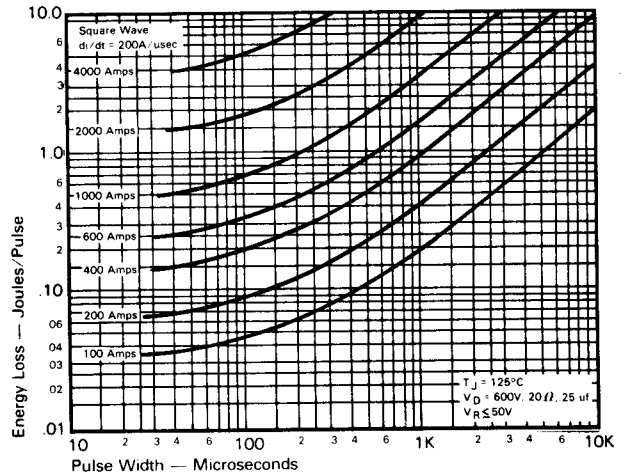
MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT  
vs. PULSE WIDTH ( $T_C = 65^\circ\text{C}$ )



ENERGY PER PULSE FOR TRAPEZOIDAL PULSES  
( $di/dt = 100\text{A}/\mu\text{sec}$ )



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

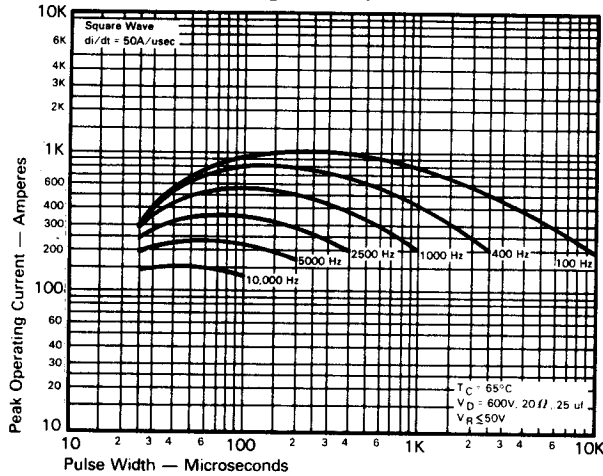


ENERGY PER PULSE FOR TRAPEZOIDAL PULSES  
( $di/dt = 200\text{A}/\mu\text{sec}$ )

175A Avg.  
(275 RMS)  
Up to 1200 Volts  
10-50  $\mu$ s

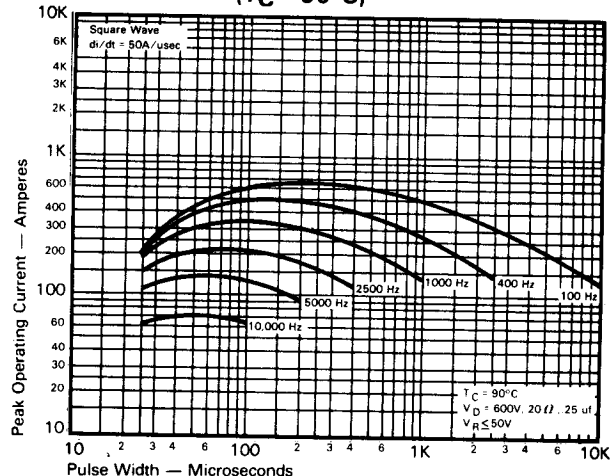
Fast Switching  
SCR  
T607\_18

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

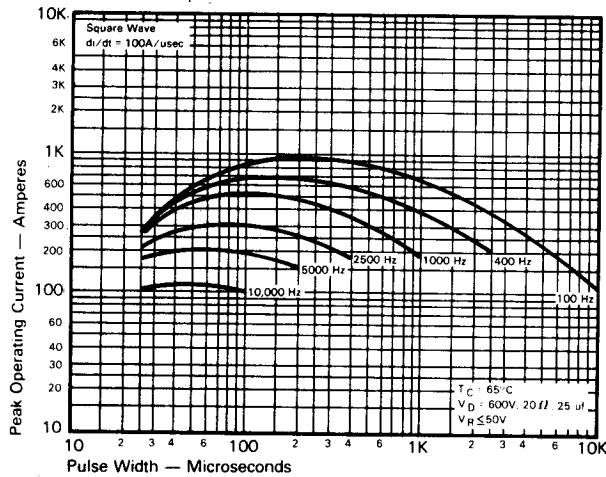


**MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ( $di/dt = 50A/us$ )**

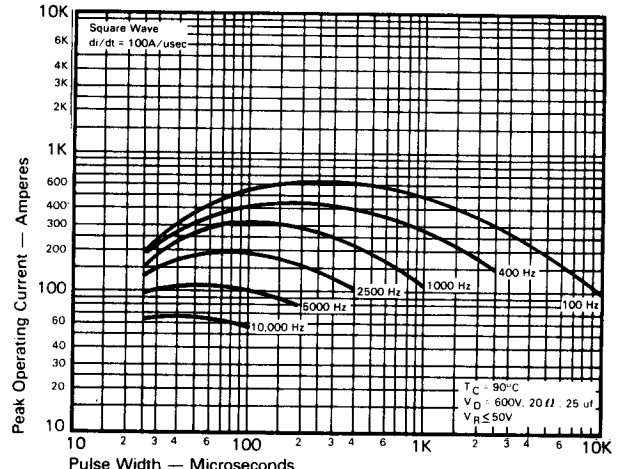
**Trapezoidal Wave Current Data**  
( $T_C = 90^\circ\text{C}$ )



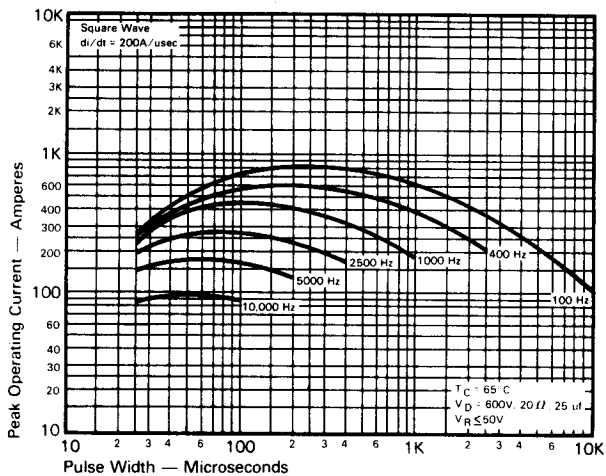
**MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ( $di/dt = 50A/us$ )**



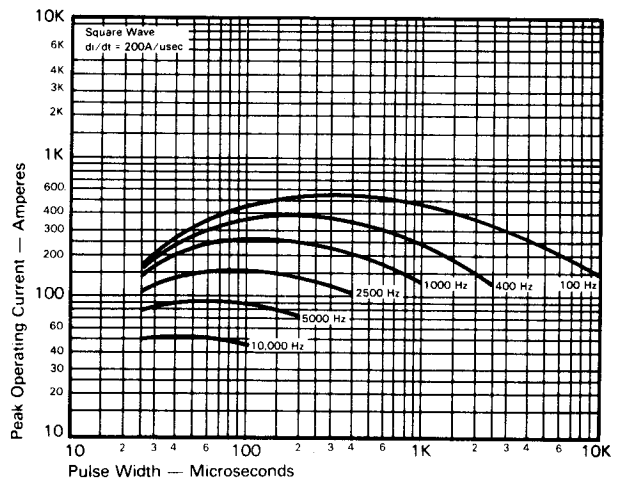
**MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ( $di/dt = 100A/us$ )**



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

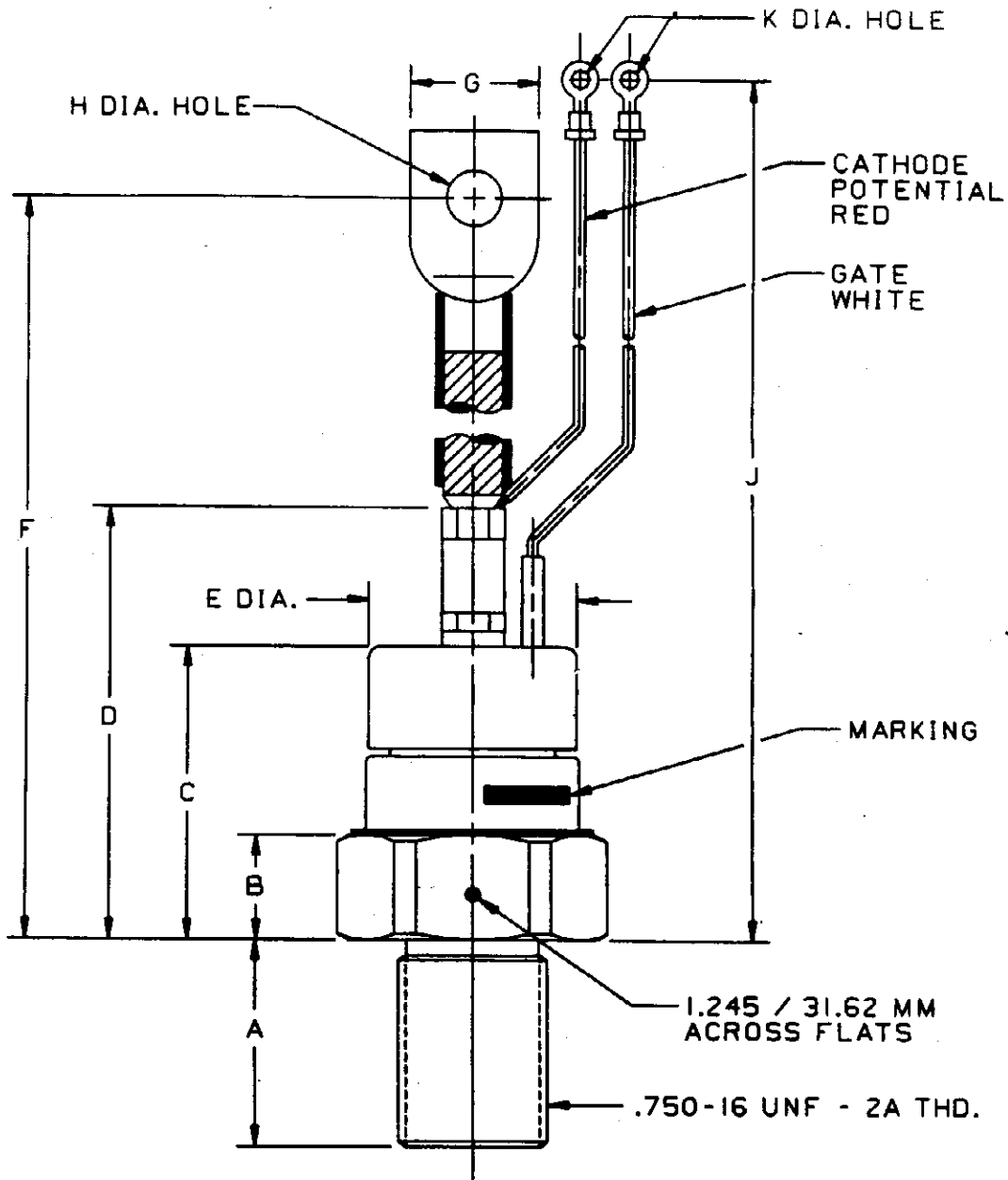


**MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ( $di/dt = 200A/us$ )**



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

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