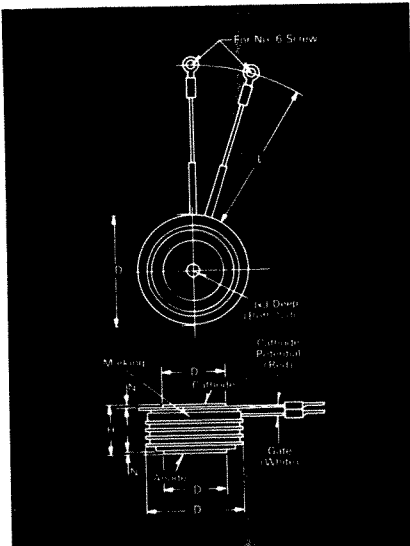


# Fast Switching SCR T9GH\_10

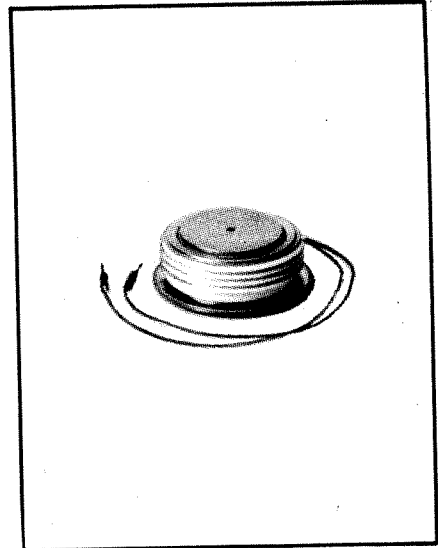
1000A Avg.  
(1570 RMS)  
Up to 1200 Volts  
20-60  $\mu$ s



Symbol	Inches		Millimeters	
	Min.	Max.	Min.	Max.
$\phi D$	2.850	2.900	72.39	73.66
$\phi D_1$	1.845	1.855	46.86	47.12
$\phi D_2$	2.560	2.640	65.02	67.06
H	1.030	1.070	26.16	27.18
$\phi J$	.135	.145	3.43	3.68
$J_1$	.075	.090	1.91	2.29
L	11.50	12.50	292.10	317.50
N	.050		1.27	

Creep Distance—1.20 in. min. (30.48 mm).  
Strike Distance—.70 in. min. (17.78 mm).  
(In accordance with NEMA standards.)  
Finish—Nickel Plate.  
Approx. Weight—2 lb. (908 g).

1. Dimension "H" is a clamped dimension.



## T9G Outline

### Features:

- Interdigitated, di/namic Gate Structure
- Hard Commutation Turn-Off
- Forward Blocking Capabilities to 1200
- Low Switching Losses at High Frequency
- Soft Commutation (Feedback Diode)
- Testing Available
- High di/dt with soft gate control

### Applications:

- Induction Heating
- Transportation
- Inverters

## Ordering Information

Type	Voltage		Current		Turn-off		Gate current		Leads	
	Code	VDRM and VRRM * (V)	Code	IT(av) (A)	Code	tq usec	Code	IGT (ma)	Case	Code
T9GH	06	600	10	1000	20	8	300	2	T9G	DH
	08	800								
	10	1000								
	12	1200								
		30	4							
		40	3							
		50	2							
		60								

## Example

Obtain optimum device performance for your application by selecting proper order code.

Type T9GH rated at 1000A average with VDRM = 1000V  
tq = 30 usec.

IGT = 300 ma, and standard 12 inch leads -- order as:

\*for lower voltages consult factory

Type	Voltage	Current	Turn Off	Gate Current	Leads
T 9 G H	1 0	1 0	5	2	D H

FAST SWITCHING  
THYRISTORS

**1000A Avg.  
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20-60  $\mu$ s**

**Fast Switching  
SCR  
T9GH\_10**

**Voltage**

Blocking State Maximums <sup>②</sup> ( $T_J = 125^\circ\text{C}$ )

Repetitive peak forward blocking voltage,  $V_{DRM}$  ...  
 Repetitive peak reverse voltage,  $V_{RRM}$  ...  
 Non-repetitive transient peak reverse voltage,  
 $t \leq 5.0$  msec,  $V_{RSM}$  ...  
 Forward leakage current, mA peak ...  
 Reverse leakage current, mA peak ...

Symbol	600	800	1000	1200
$V_{DRM}$	600	800	1000	1200
$V_{RRM}$	600	800	1000	1200
$V_{RSM}$	700	900	1100	1300
$I_{DRM}$	← 60 →			
$I_{RRM}$	← 60 →			

**Current**

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

Symbol	T9GH_10
RMS forward current, A $I_T(\text{rms})$	1570
Ave. forward current, A $I_T(\text{av})$	1000
One-half cycle surge current <sup>③</sup> , A $I_{TSM}$	15,000
$I^2t$ for fusing ( $t=8.3$ ms) $A^2\text{sec}$ $I^2t$	937,000
Max $I^2t$ of package ( $t=8.3$ ms), $A^2\text{sec}$ $I^2t$	$90 \times 10^6$
Forward voltage drop at $I_{TM} = 1500\text{A}$ and $T_J = 25^\circ\text{C}$ , V $V_{TM}$	2.10
Min. Repetitive $di/dt$ A/usec. <sup>①</sup> <sup>④</sup> <sup>⑤</sup> $di/dt$	500

**Gate**

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

Symbol	Min	Typ	Max
Gate current to trigger at $V_D = 12\text{V}$ , mA $I_{GT}$		200	300
Gate voltage to trigger at $V_D = 12\text{V}$ , V $V_{GT}$		1.5	3.0
Non-triggering gate voltage, $T_J = 125^\circ\text{C}$ , and rated $V_{DRM}$ , V $V_{GDM}$			.15
Non-triggering Gate Current at $V_D = 12\text{V}$ , mA $I_{GNT}$		20	
Peak forward gate current, A $I_{GTM}$			10
Peak reverse gate voltage, V $V_{GRM}$			5
Peak gate power, Watts $P_{GM}$			60
Average gate power, Watts $P_{G(av)}$			3

**Switching**

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

**HARD COMMUTATION:** <sup>①</sup>

Typical Turn-off time,  $t_T = 1000\text{A}$   
 $50\text{V} \leq V_R \leq V_{RRM}$   
 $T_J = 125^\circ\text{C}$ ,  $di/dt = 100\text{A}/\text{usec}$   
 reapplied  $dv/dt = 200\text{V}/\text{usec}$  linear to  $0.8 V_{DRM}$ , usec

Typical Turn-On and Delay Time

$I_{TM} = 1000\text{A}$ ,  $t_p = 450$  usec  $t_{on}$   
 $V_D = 1100\text{V}$ , usec  $t_d$

Typical Reverse recovery charge for 40 usec device.

$I_T = 1000\text{A}$ ,  $di/dt = 100\text{A}/\text{usec}$

$T_J = 125^\circ\text{C}$ ,  $t_p = 100$  usec,  $u_{col}$   $Q_{RR}$

Minimum Critical  $dv/dt$  exponential to  $V_{DRM}$

$T_J = 125^\circ\text{C}$ ,  $V/\text{usec}$  <sup>②</sup> <sup>③</sup>  $dv/dt$

Minimum  $di/dt$  @ non-repetitive,  $di/dt$

<sup>①</sup> <sup>④</sup> <sup>⑤</sup> A/usec

Latching Current

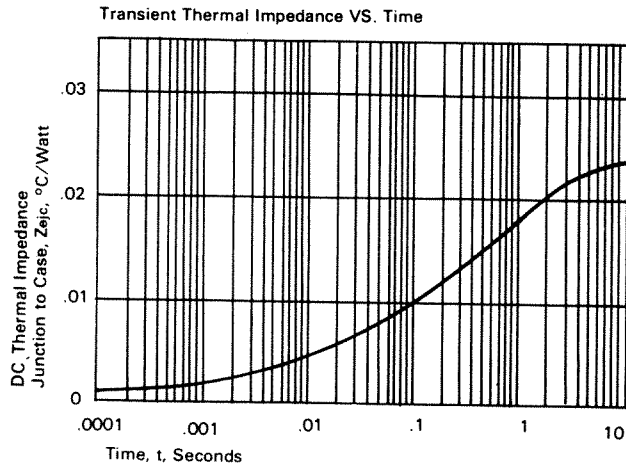
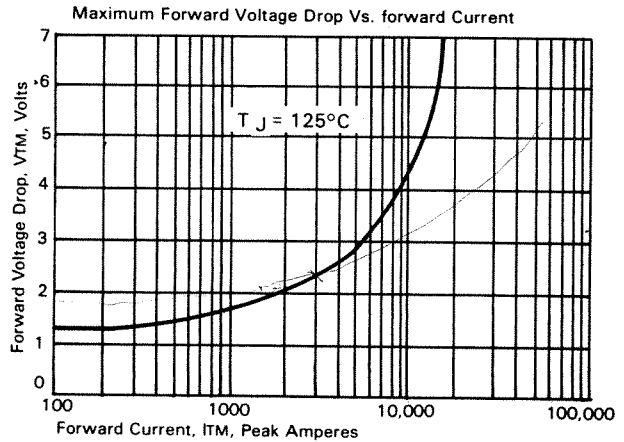
$V_D = 75\text{V}$ , mA  $I_L$

Holding Current

$V_D = 75\text{V}$ , ma  $I_H$

**Thermal and Mechanical**

Symbol	Min	Typ	Max
Oper. junction temp., $^\circ\text{C}$ $T_J$	-40		125
Storage temp., $^\circ\text{C}$ $T_{stg}$	-40		150
Mounting force, lb. $F$	5000		5500
Thermal resistance with double sided cooling <sup>①</sup>			
Junction to case, $^\circ\text{C}/\text{Watt}$ $R_{\theta JC}$			.023
Case to sink, lubricated, $^\circ\text{C}/\text{Watt}$ $R_{\theta CS}$	.006		.0075



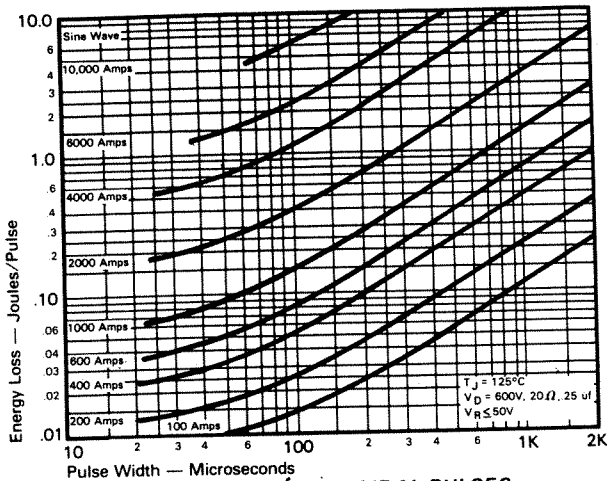
- ① Consult recommended mounting procedures.
- ② Applies for zero or negative gate bias.
- ③ Per JEDEC RS-397, 5.2.2.1.
- ④ With recommended gate drive.
- ⑤ For different turn-off values or conditions, consult factory.
- ⑥ Per JEDEC standard RS-397, 5.2.2.6.
- ⑦ For operation with antiparallel diode, consult factory.

FAST SWITCHING THYRISTORS

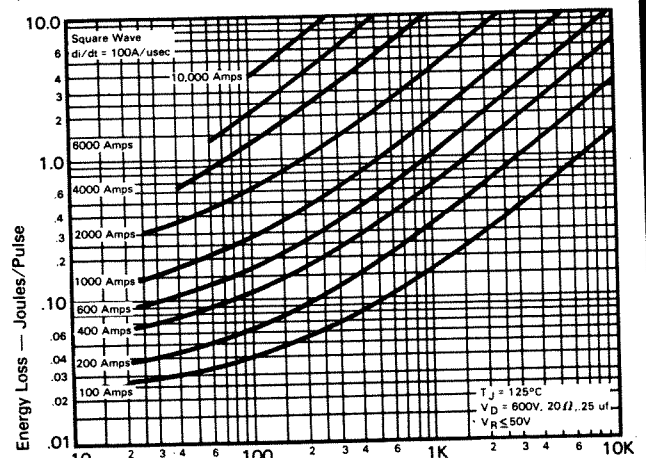
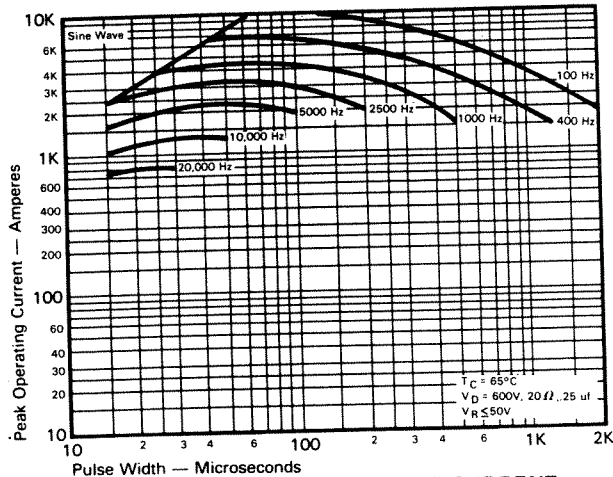
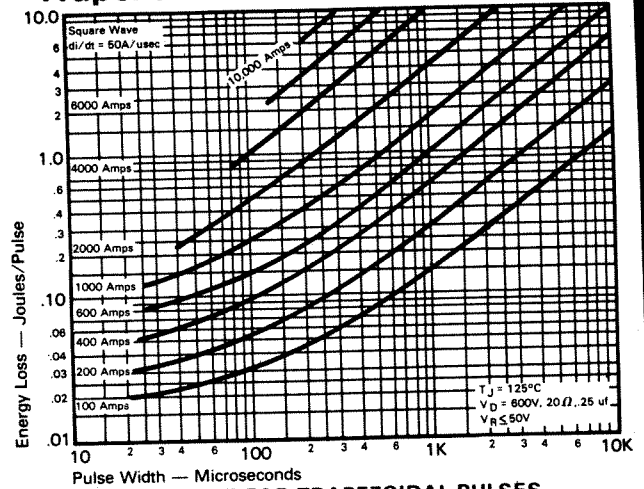
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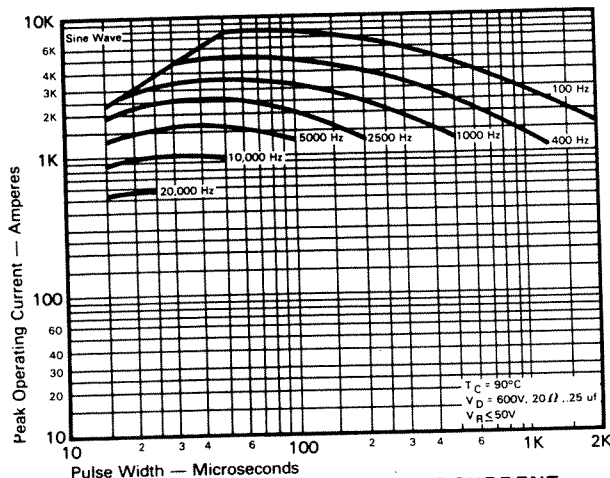
## Sinusoidal Current Data



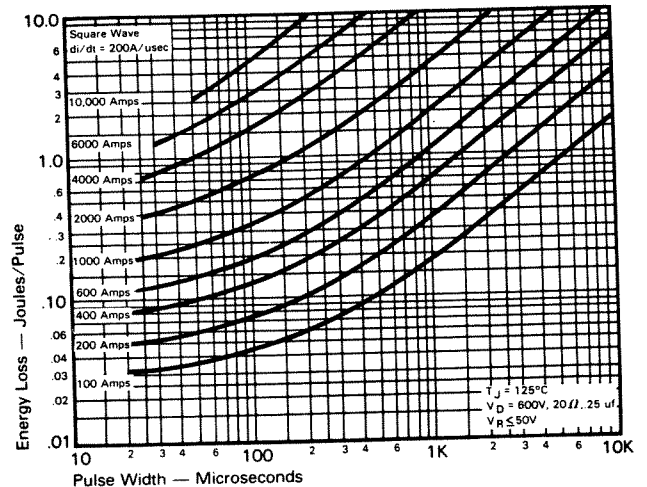
## Trapezoidal Wave Current Data



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



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



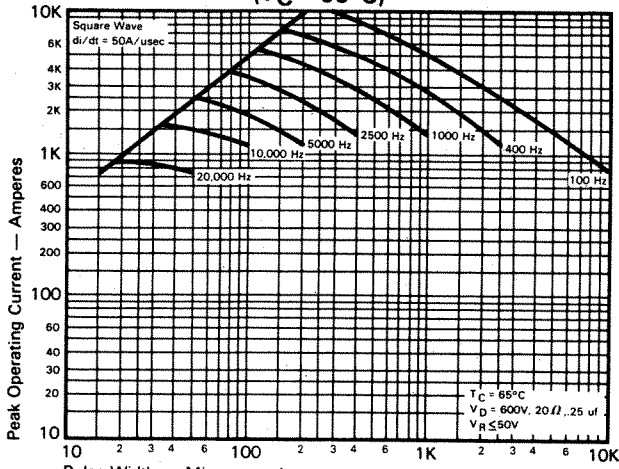
ENERGY PER PULSE FOR TRAPEZOIDAL PULSES  
( $di/dt = 200\text{A/usec}$ )

FAST SWITCHING  
THYRISTORS

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Up to 1200 Volts  
20-60  $\mu$ s

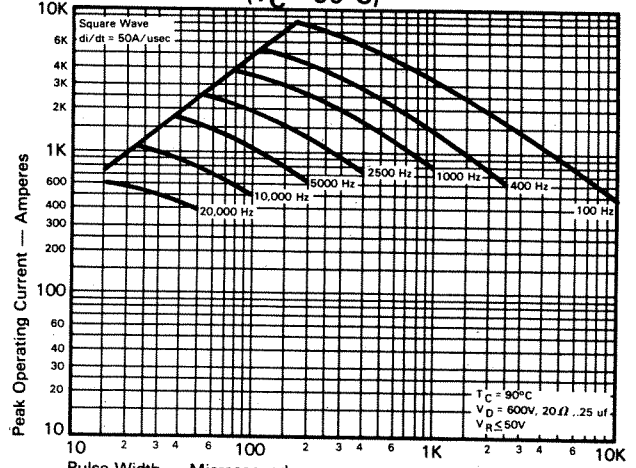
Fast Switching  
SCR  
T9GH\_10

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

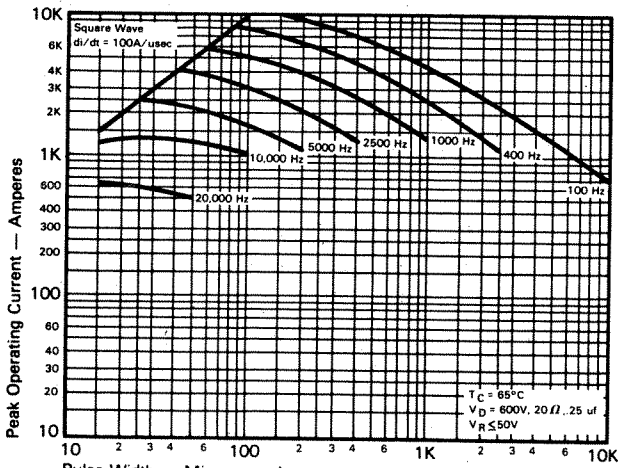


MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ( $di/dt = 50A/usec$ )

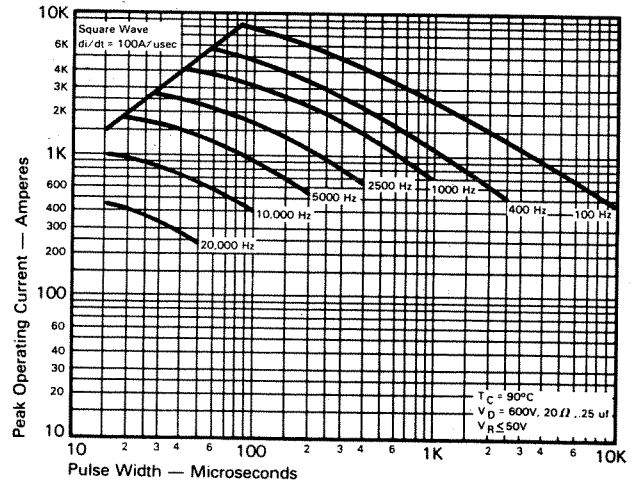
Trapezoidal Wave Current Data  
( $T_C = 90^\circ\text{C}$ )



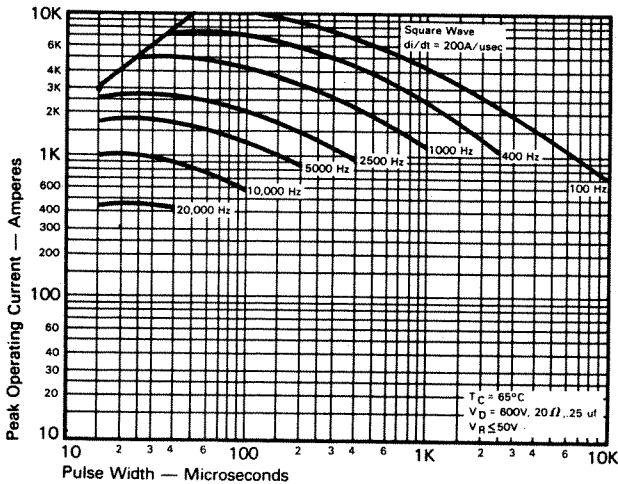
MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ( $di/dt = 50A/usec$ )



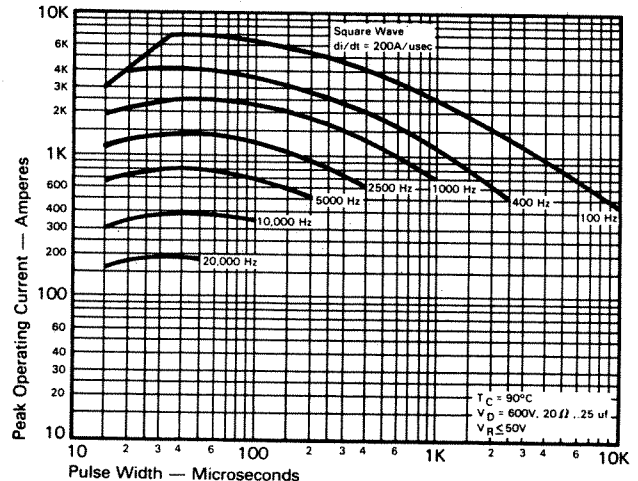
MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ( $di/dt = 100A/usec$ )



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