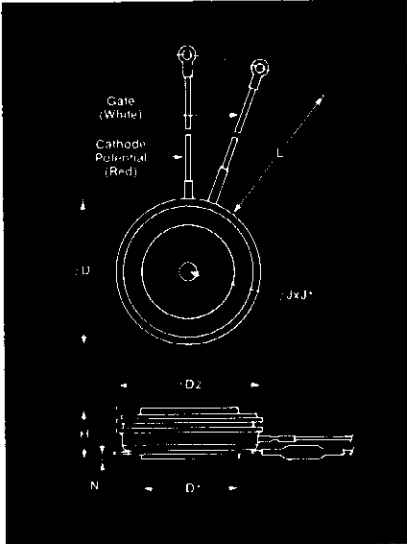


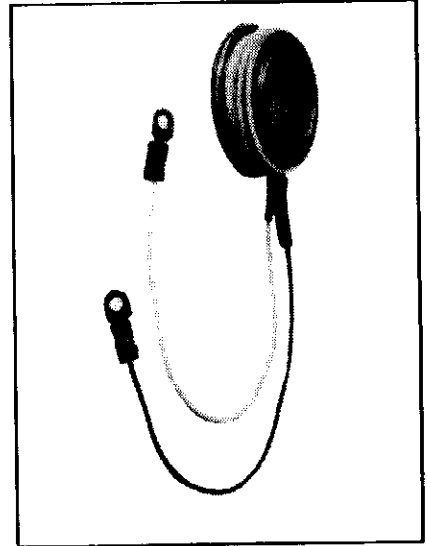
# Fast Switching SCR T7SH \_\_ 46

460A Avg.  
(720A RMS)  
1400-1800 Volts  
80-100  $\mu$ sec



Symbol	Inches		Millimeters	
	Min.	Max.	Min.	Max.
$\phi D$	1.850	1.900	45.72	48.26
$\phi D_1$	1.140	1.180	28.96	29.97
$\phi D_2$	1.760	1.850	44.70	46.99
H	.545	.605	13.84	15.37
$\phi J$	.135	.145	3.43	3.68
$J_1$	.072	.082	1.83	2.08
L	7.75	8.50	196.85	215.90
N	.025		.64	

Creep Distance— .408 in min. (10.36 mm).  
Strike Distance— .203 in min. (5.16 mm).  
Finish— Nickel Plate.  
Approx. Weight— 4 oz. (113 g).  
1. Dimension "H" is a clamped dimension.



## T7S Outline

### Features:

- Interdigitated, di/namic Gate Structure
- Hard Commutation Turn-Off
- Forward Blocking Voltage Capabilities to 1800 Volts
- Low Switching Losses at High Frequency
- Soft Cummutation (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
	$V_{DRM}$ and $V_{RRM}$ (V)	$I_{T(av)}$ (A)	$t_q$ $\mu$ sec	$I_{GT}$ (ma)	Case
	1400 1600 1800	460	80 100	150	T7S

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

Type T7SH rated at 460A average with  $V_{DRM} = 1600V$ ,  $I_{GT} = 150$  ma,  $t_q = 80 \mu$ sec max. and leads—order as:

Type	Voltage	Current	Turn Off	Gate Current	Leads
T 7 S H	1 6	4 6	1	4	D N

460A Avg.  
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SCR  
T7SH \_\_ 46

### Voltage ②

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

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

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

1400	1600	1800
1400	1600	1800
1500	1700	1900
← 35 →		
← 35 →		

### Current

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

Symbol	T7SH __ 46
RMS forward current, A ..... $I_T(rms)$	720
Ave. forward current, A ..... $I_T(av)$	460
One-half cycle surge current ③, A ..... $I_{TSM}$	6800
$I^2t$ for fusing (for times $\geq 8.3$ ms) A <sup>2</sup> sec ..... $I^2t$	301,000
Forward voltage drop at $I_{TM} = 1500A$ and $T_J = 25^\circ\text{C}$ , V ..... $V_{TM}$	2.2
Min. repetitive $di/dt$ ④⑤ A/ $\mu$ sec ..... $di/dt$	400

### Switching

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

Symbol	
Max. turn-off time, $I_T = 400A$ , $T_J = 125^\circ\text{C}$ , $t_p = 100 \mu$ sec. $di/dt = 25$ A/ $\mu$ sec., reappplied $dv/dt =$ 200 V/ $\mu$ sec linear to 0.8 V $_{DRM}$ , $\mu$ sec. ⑥⑦ .. $t_q$	80 to 100
Typ. delay time, $I_{TM} = 1000A$ ..... $t_d$	2.0
$T_D = 8$ V $_{DRM}$ ⑧, $\mu$ sec ⑨	
Typ. turn-on-time $I_{TM} = 1000A$ , $\mu$ sec ..... $t_{on}$	3.0
Min. critical $dv/dt$ exponential to .8 V $_{DRM}$ , $T_J = 125^\circ\text{C}$ , V/ $\mu$ sec ⑩⑪ ..... $dv/dt$	300
Min. $di/dt$ , non-repetitive, A/ $\mu$ sec ⑫⑬ ..... $di/dt$	800

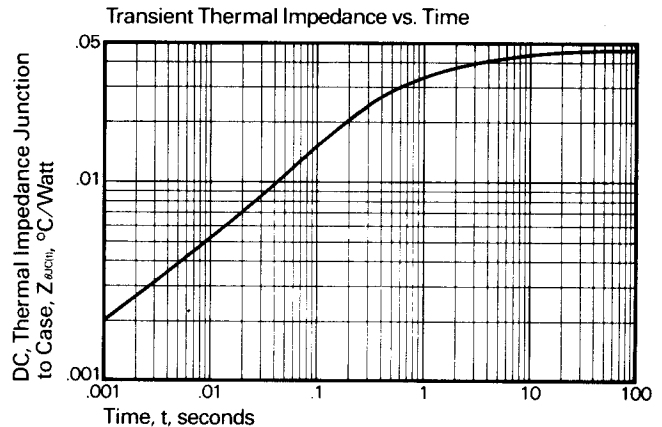
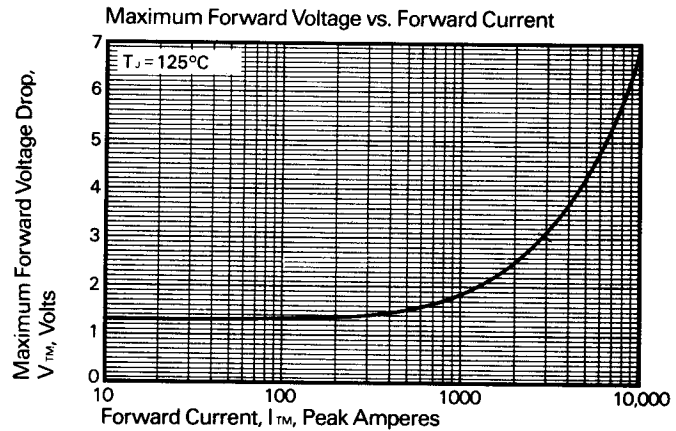
### Gate

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 ..... $V_{GDM}$	25
Peak forward gate current, A ..... $I_{GTM}$	4
Peak reverse gate voltage, V ..... $V_{GRM}$	5
Peak gate power, Watts ..... $P_{GM}$	16
Average gate power, Watts ..... $P_{G(av)}$	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 force, lb. .... ⑭ ..... $F$	2000 to 2400
Thermal resistance ⑮, double- side cooling, junction to case, $^\circ\text{C}/\text{Watt}$ ..... $R_{\theta JC}$	.045
Case to sink, lubricated, $^\circ\text{C}/\text{Watt}$ ..... $R_{\theta CS}$	.02

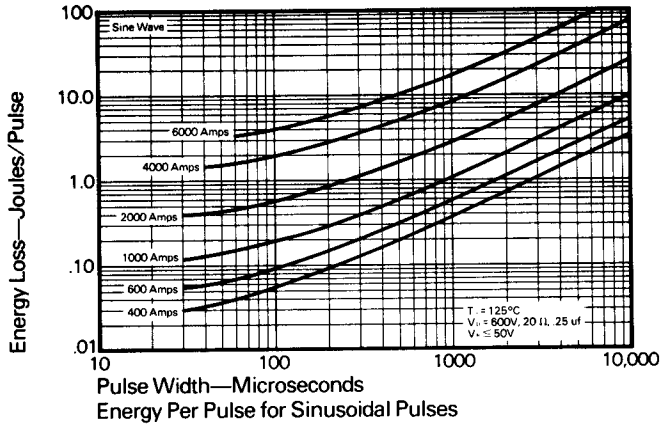


- ① Consult recommended mounting procedures.
- ② Applies for zero or negative gate bias.
- ③ Per JEDEC RS-397, 5.2.2.1.
- ④ With recommended gate drive.
- ⑤ Higher  $dv/dt$  ratings available, consult factory.
- ⑥ Per JEDEC standard RS-397, 5.2.2.6.
- ⑦ For operation with antiparallel diode, consult factory.
- ⑧ Other  $t_q$  and  $t_{on}$  combinations available consult factory.

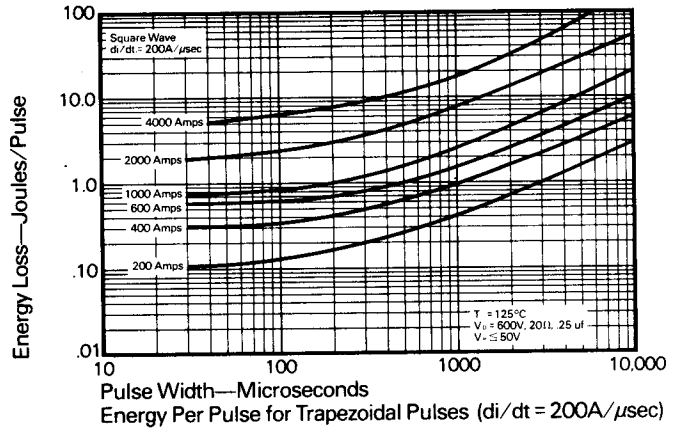
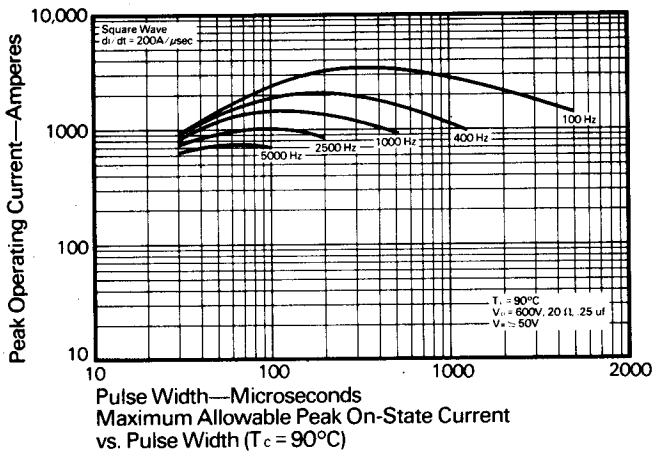
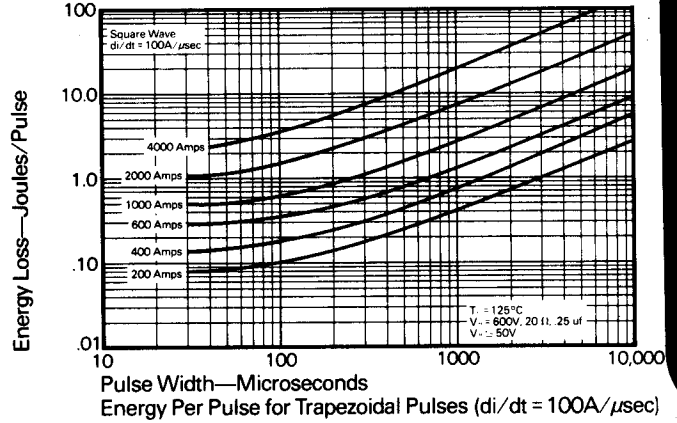
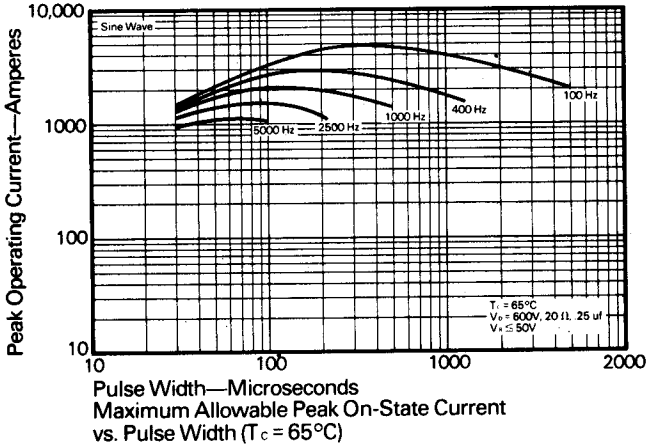
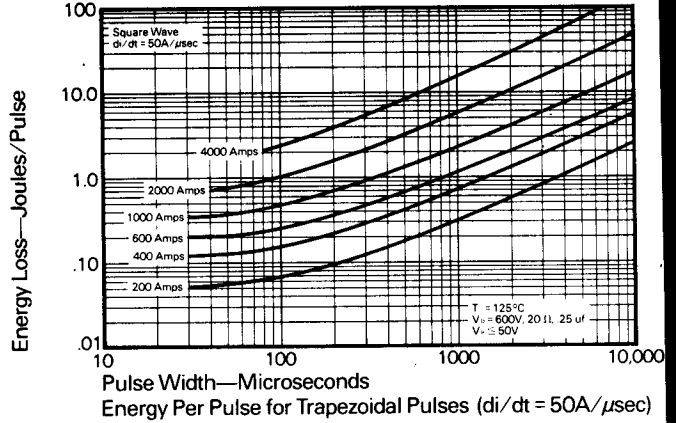
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Sinusoidal Current Data



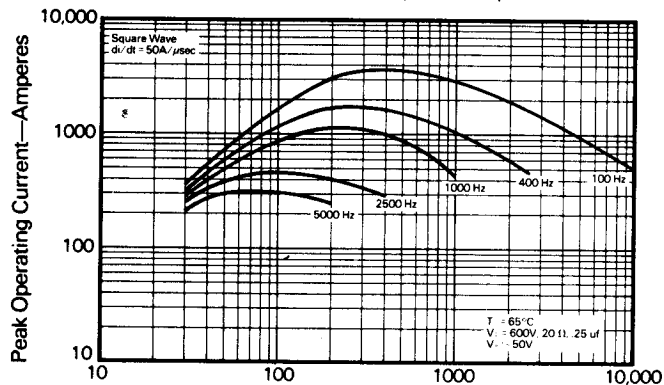
Trapezoidal Wave Current Data



460A Avg.  
 (720A RMS)  
 1400-1800 Volts  
 80-100  $\mu$ sec

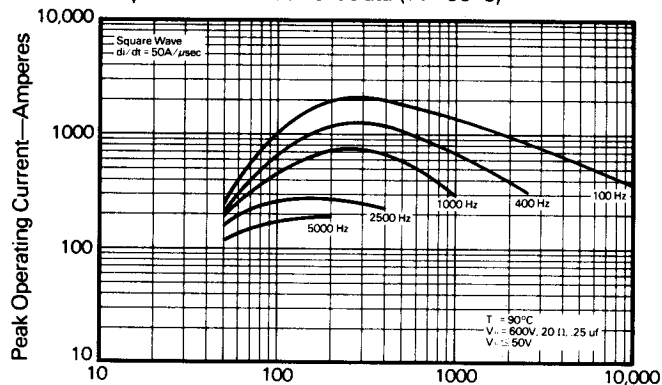
Fast Switching  
 SCR  
 T7SH \_\_ 46

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

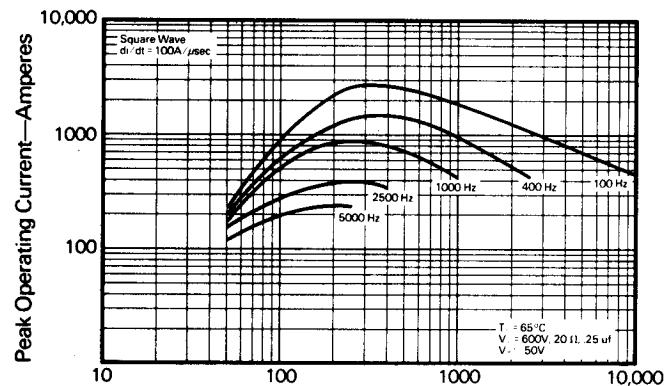


Pulse Width—Microseconds  
 Maximum Allowable Peak On-State Current  
 vs. Pulse Width ( $di/dt = 50\text{A}/\mu\text{sec}$ )

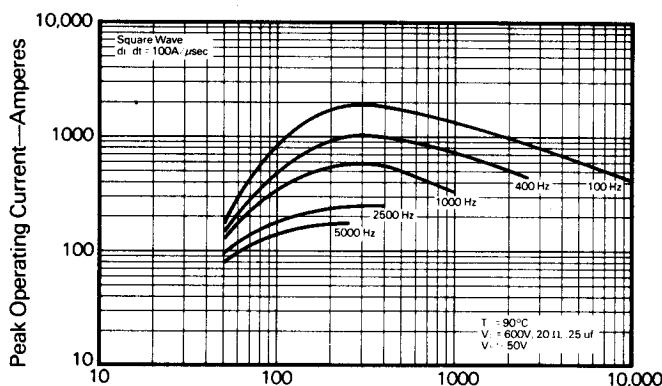
Trapezoidal Wave Current Data ( $T_c = 90^\circ\text{C}$ )



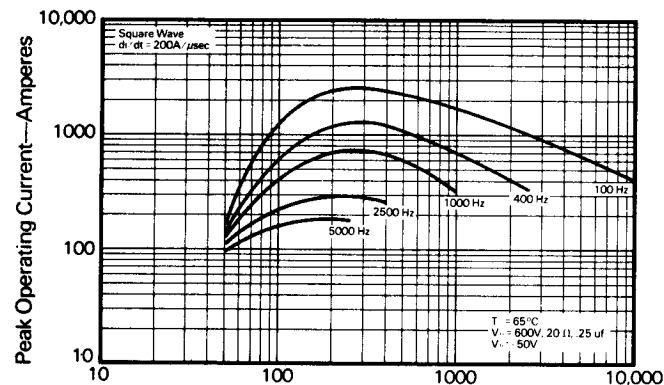
Pulse Width—Microseconds  
 Maximum Allowable Peak On-State Current  
 vs. Pulse Width ( $di/dt = 50\text{A}/\mu\text{sec}$ )



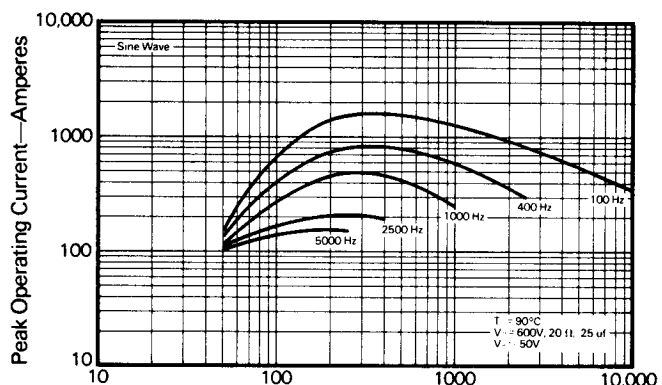
Pulse Width—Microseconds  
 Maximum Allowable Peak On-State Current  
 vs. Pulse Width ( $di/dt = 100\text{A}/\mu\text{sec}$ )



Pulse Width—Microseconds  
 Maximum Allowable Peak On-State Current  
 vs. Pulse Width ( $di/dt = 100\text{A}/\mu\text{sec}$ )



Pulse Width—Microseconds  
 Maximum Allowable Peak On-State Current  
 vs. Pulse Width ( $di/dt = 200\text{A}/\mu\text{sec}$ )



Pulse Width—Microseconds  
 Maximum Allowable Peak On-State Current  
 vs. Pulse Width ( $di/dt = 200\text{A}/\mu\text{sec}$ )