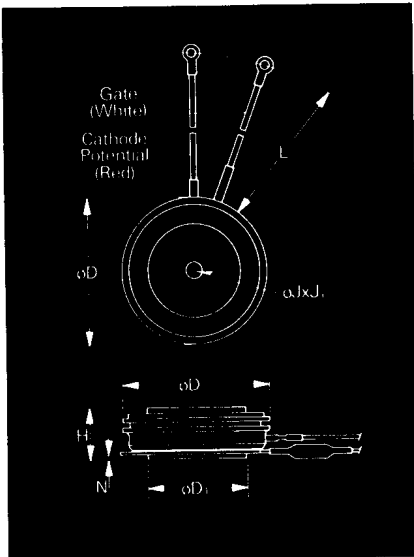


# Fast Switching SCR T7S7\_65

650A Avg.  
(1026 RMS)  
Up to 800 Volts  
10-50  $\mu$ s



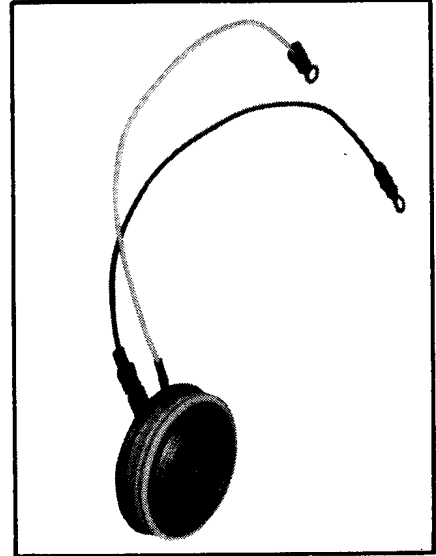
T7S Outline

**Features:**

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

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 <sub>1</sub>	.072	.082	1.83	2.08
L	7.75	8.50	196.85	215.90
N	.025		.64	

Creep Distance—.41 in. min. (10.41 mm).  
Strike Distance—.35 in. min. (8.89 mm).  
Finish-Nickel Plate.  
Approx. Weight—4 oz. (113 g.)  
1. Dimension "H" is a clamped dimension.



**Applications:**

- Inverters
- UPS
- Induction heating
- AC motor drives
- Cycloconverters
- Choppers
- Crowbars

**Ordering Information**

Type	Voltage		Current		Turn-off		Gate current		Leads	
	V <sub>DRM</sub> and V <sub>RRM</sub> (V)	Code	I <sub>T(av)</sub> (A)	Code	t <sub>q</sub> usec	Code	I <sub>GT</sub> (ma)	Code	Case	Code
T7S7	100	01	650	65	10	5	150	4	T7S	DN
	200	02			15					
	300	03			20					
	400	04			25					
	500	05			30					
	600	06			40					
	700	07			50					
	800	08								

**Example**

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

Type T7S7 rated at 650 A average with V<sub>DRM</sub> = 600V. I<sub>GT</sub> = 150 ma, t<sub>q</sub> = 30  $\mu$ sec max. and standard control leads—order as:

Type	Voltage	Current	Turn Off	Gate Current	Leads
T 7 S 7	0 6	6 5	5	4	D N

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**Voltage**

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

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

Symbol

100	200	300	400	500	600	700	800	
100	200	300	400	500	600	700	800	
200	300	400	500	600	700	800	900	
				30				
				30				

**Current**

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

Symbol	T7S7_65
RMS forward current, A ... $I_T(\text{rms})$	1026
Ave. forward current, A ... $I_T(\text{av})$	650
One-half cycle surge current <sup>③</sup> , A ... $I_{TSM}$	9500
$I^2t$ for fusing (for times $\geq 8.3$ ms) A <sup>2</sup> sec. ... $I^2t$	376,000
Forward voltage drop at $I_{TM} = 625$ A and $T_J = 25^\circ\text{C}$ , V ... $V_{TM}$	1.40
Min. repetitive di/dt A/ $\mu$ sec ... $\text{di/dt}$	400

**Switching**

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

Symbol	
Max. turn-off time, $I_T = 400$ A $T_J = 125^\circ\text{C}$ , $\text{di/dt} = 25$ A/ $\mu$ sec, reappplied $\text{dv/dt} = 20$ V/ $\mu$ sec linear to $0.8 V_{DRM}$ , $\mu$ sec ... $t_q$	10 to 50
Typ. turn-on-time, $I_T = 1000$ A $V_D = 300$ V, $\mu$ sec ... $t_{on}$	3.0
Min. critical $\text{dv/dt}$ , exponential to $V_{DRM}$ , $T_J = 125^\circ\text{C}$ , V/ $\mu$ sec <sup>④</sup> ... $\text{dv/dt}$	300
Min. di/dt non-repetitive, A/ $\mu$ sec <sup>④</sup> ... $\text{di/dt}$	800

**Gate**

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

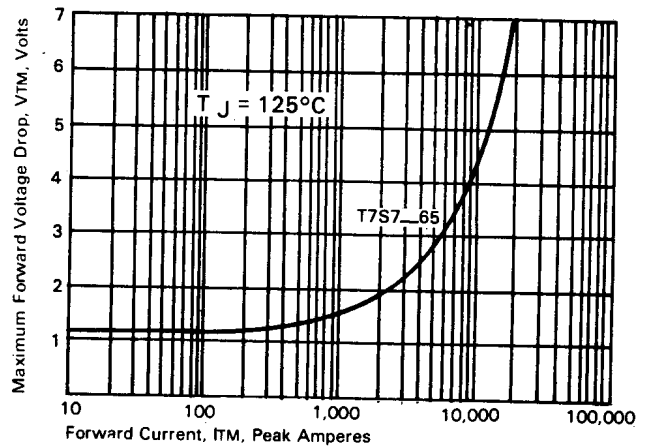
Symbol	
Gate current to trigger at $V_D = 12$ V, mA ... $I_{GT}$	150
Gate voltage to trigger at $V_D = 12$ V, V ... $V_{GT}$	3
Non-triggering gate voltage, $T_J = 125^\circ\text{C}$ , and rated $V_{DRM}$ , V ... $V_{GDM}$	0.15
Peak forward gate current, A ... $I_{GTM}$	4
Peak reverse gate voltage, V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

**Thermal and Mechanical**

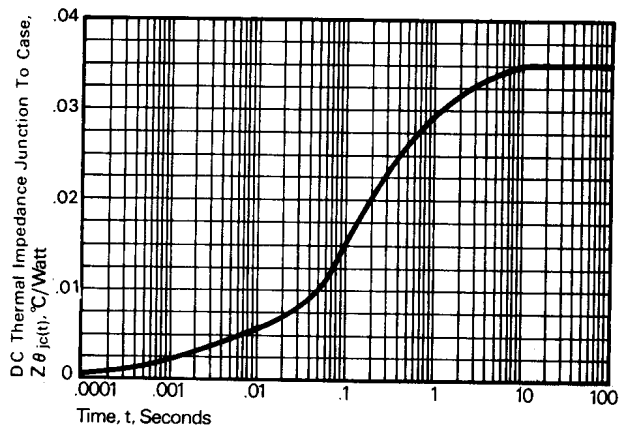
Symbol	
Min., Max. oper. junction temp., $^\circ\text{C}$ ... $T_J$	-40 to +125
Min., Max. storage temp., $^\circ\text{C}$ ... $T_{stg}$	-40 to +150
Max. mounting force lb. ...	2000 to 2400
Max. Thermal resistance <sup>①</sup> Double side cooled Junction to case, $^\circ\text{C/Watt}$ ... $R_{\theta JC}$	.035
Case to sink, lubricated, $^\circ\text{C/Watt}$ ... $R_{\theta CS}$	.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  $\text{dv/dt}$  ratings available, consult factory.
- ⑥ Per JEDEC standard RS-397, 5.2.2.6.
- ⑦ For operation with antiparallel diode, consult factory.

Maximum Forward Voltage Drop VS Forward Current



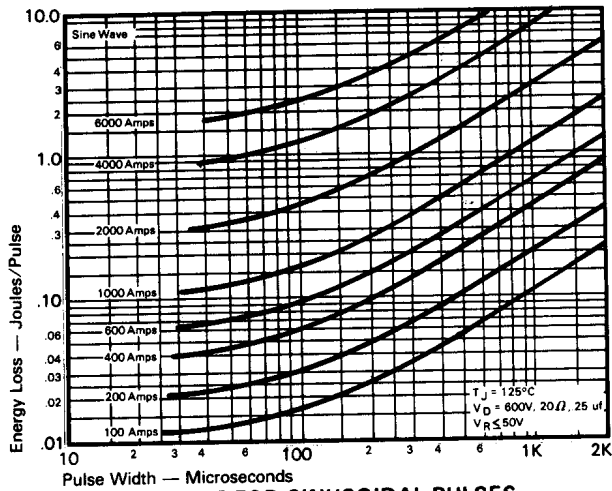
Transient Thermal Impedance VS. Time



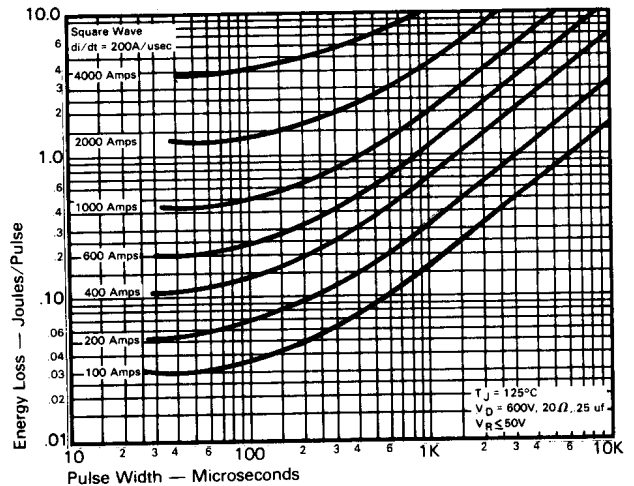
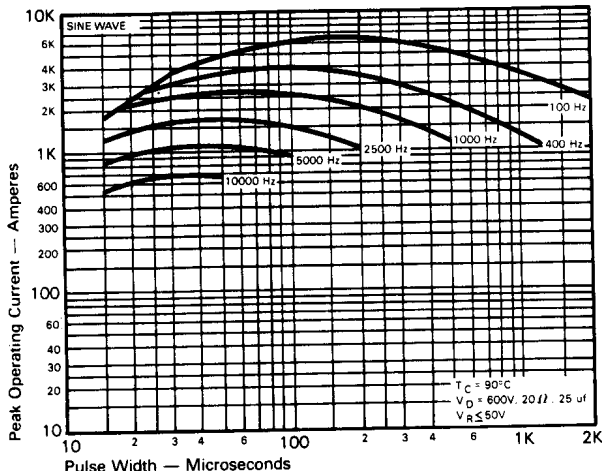
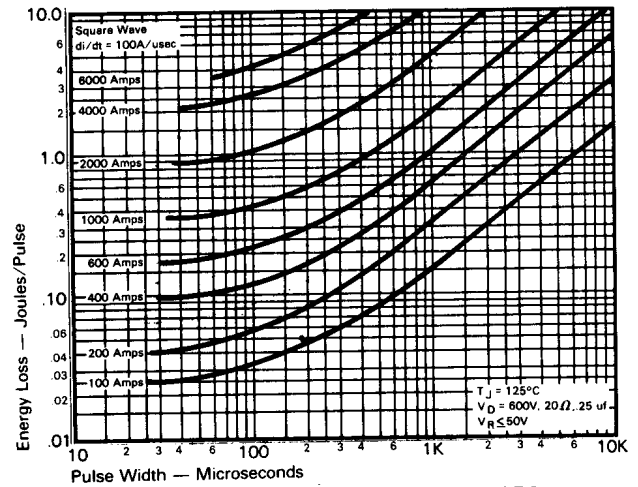
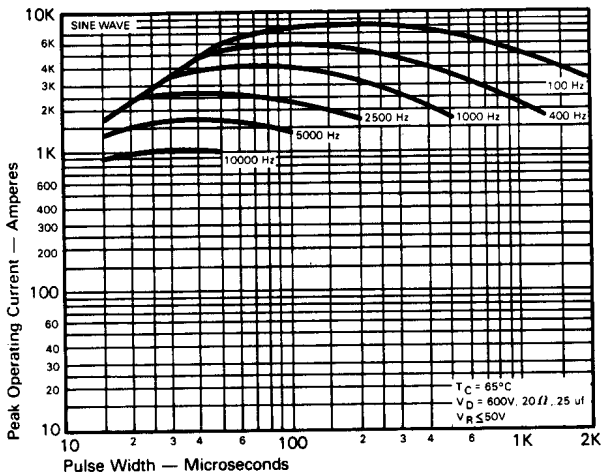
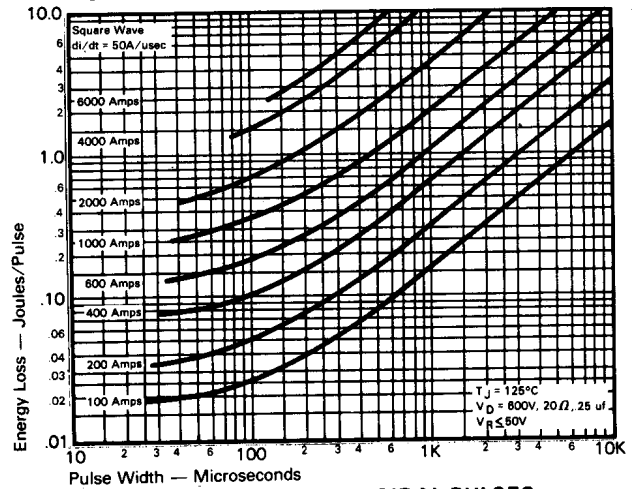
# Fast Switching SCR T7S7\_65

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## Sinusoidal Current Data



## Trapezoidal Wave Current Data

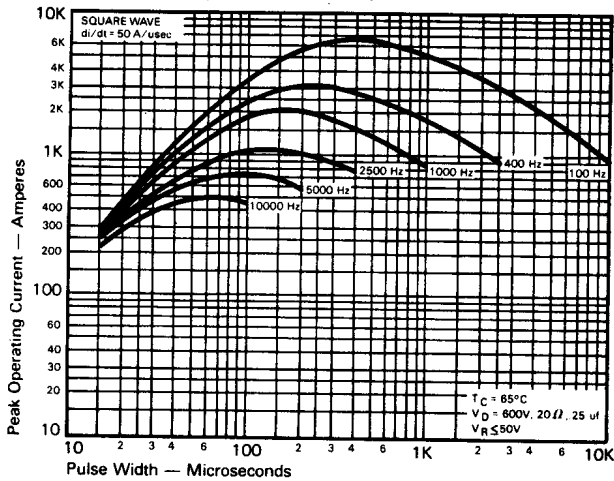


FAST SWITCHING  
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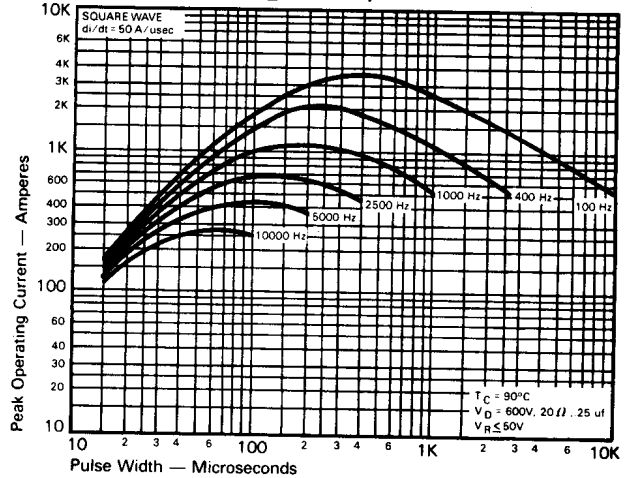
Fast Switching  
SCR  
T7S7\_65

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

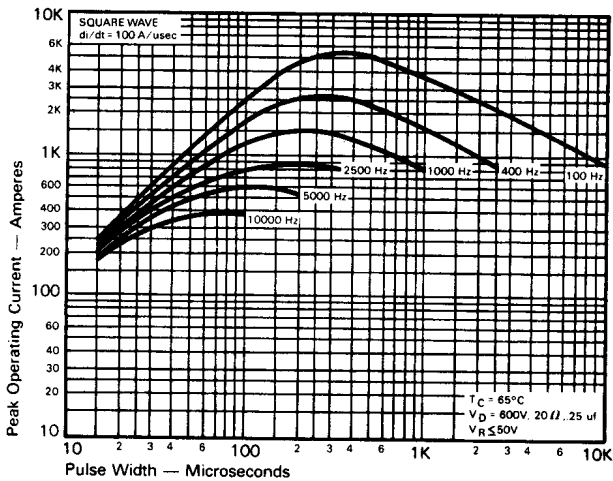


**MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ( $di/dt = 50\text{A/usec}$ )**

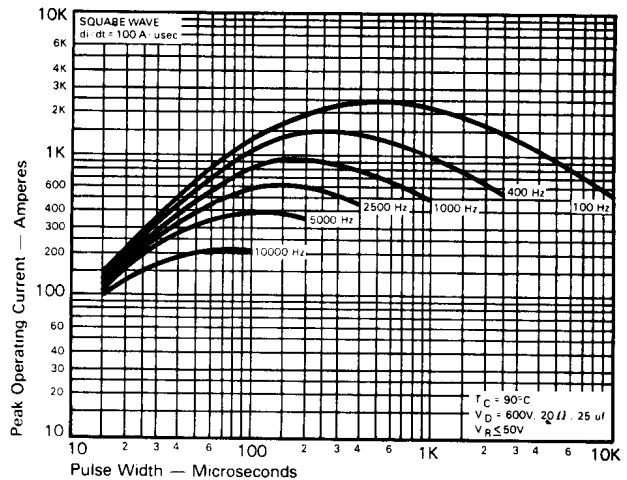
**Trapezoidal Wave Current Data**  
( $T_C = 90^\circ\text{C}$ )



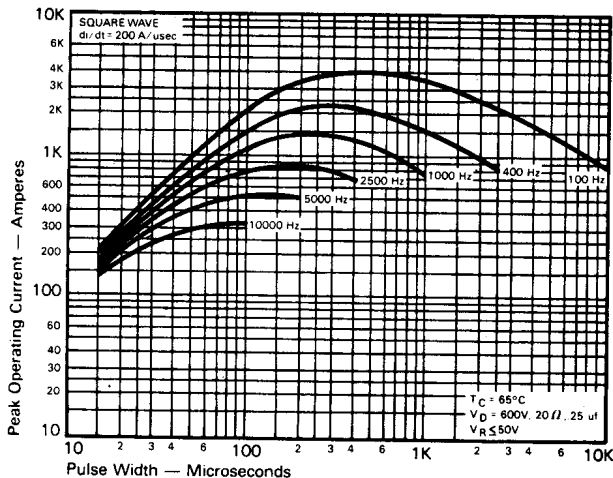
**MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ( $di/dt = 50\text{A/usec}$ )**



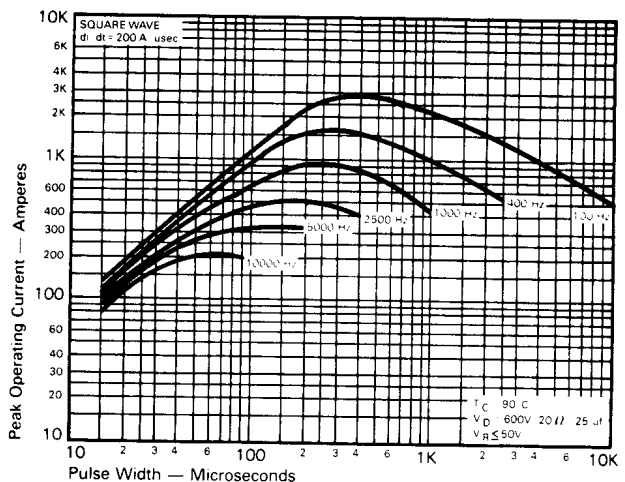
**MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ( $di/dt = 100\text{A/usec}$ )**



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



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



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

FAST SWITCHING THYRISTORS