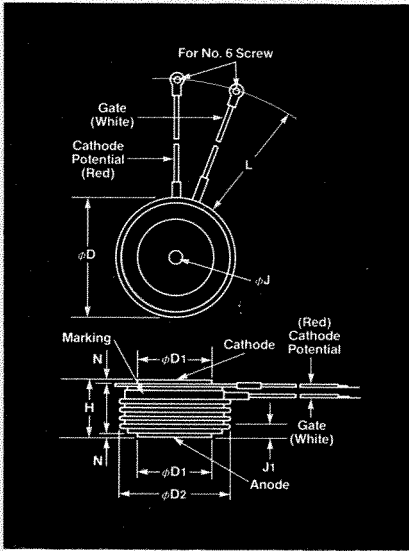




# Fast Switching SCR T72H\_42

420A Avg.  
(650A RMS)  
Up to 1800 Volts  
80-100  $\mu$ s



Symbol	Inches		Millimeters	
	Min.	Max.	Min.	Max.
$\phi D$	2.250	2.290	57.15	58.17
$\phi D_1$	1.333	1.343	33.86	34.11
$\phi D_2$	2.030	2.090	51.56	53.09
H	1.020	1.060	25.91	26.92
$\phi J$	.135	.145	3.43	3.68
$J_1$	.075	.090	1.91	2.29
L	7.75	8.50	196.85	215.90
N	.040		1.02	

Creep Distance—1.00 in. min. (25.40 mm).  
Strike Distance—1.02 in. min. (25.91 mm).  
(In accordance with NEMA standards.)

Finish—Nickel Plate.

Approx. Weight—8 oz. (227 g).

1. Dimension "H" is a clamped dimension.



## T72 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

### Applications:

- Induction Heating
- Transportation
- Inverters

## Ordering Information

Type	Voltage		Current		Turn-off		Gate current		Leads	
	$V_{DRM}$ and $V_{RRM}$ (V)	Code	$I_{T(av)}$ (A)	Code	$t_q$ $\mu$ sec	Code	$I_{GT}$ (ma)	Code	Case	Code
T72H	1400 1600 1800	14 16 18	420	42	80 100	1 K	150	4	T72	DN

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

Type T72H rated at 420 A 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 2 H	1 6	4 2	1	4	D N

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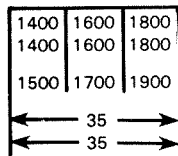
**Fast Switching  
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**Voltage** ②

**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 .....  $I_{RRM}$



**Current**

**Conducting State Maximums** ( $T_J = 125^\circ\text{C}$ )      **Symbol**      **T72H\_\_42**

RMS forward current, A .....  $I_T$  (rms)      650  
 Ave. forward current, A .....  $I_T$  (av)      420  
 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 .....  $I^2t$       205,000  
 Forward voltage drop at  $I_{TM} = 1500\text{A}$   
 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,  $I_T = 1000\text{A}$ ,  $T_J = 125^\circ\text{C}$ ,  
 $t_p = 100 \mu\text{sec}$ ,  $diR/dt = 50$       ③  
 A/ $\mu$ sec., reapplied  $dv/dt =$   
 200 V/ $\mu$ sec linear to 0.8 V  $V_{DRM}$ ,  $\mu\text{sec}$ . ⑤⑦⑧ ..  $t_q$       80 to 100  
 Typ. delay time,  $I_{TM} = 1000\text{A}$  .....  $t_d$       2.0  
 $T_D = .8$  V  $V_{DRM}$  ④,  $\mu\text{sec}$  ④  
 Typ. turn-on-time  $I_{TM} = 1000\text{A}$ ,  $\mu\text{sec}$        $t_{on}$       3.0  
 Min. critical  $dv/dt$  exponential to .8  
 $V_{DRM}$   $T_J = 125^\circ\text{C}$ , V/ $\mu$ sec ②③ .....  $dv/dt$       300  
 Min.  $di/dt$  non-repetitive, A/ $\mu$ sec ①④⑥ .....  $di/dt$       1200

**Gate**

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

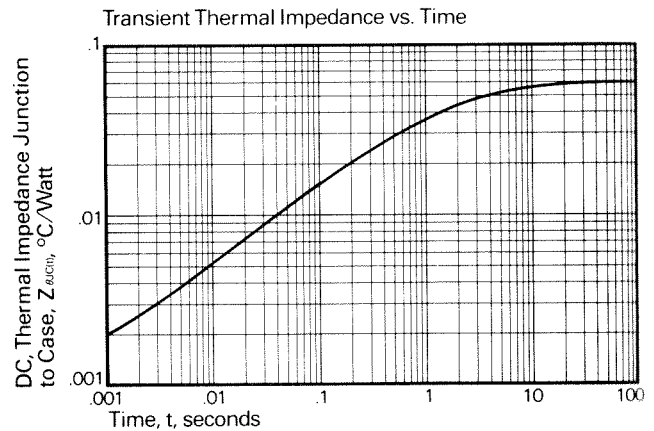
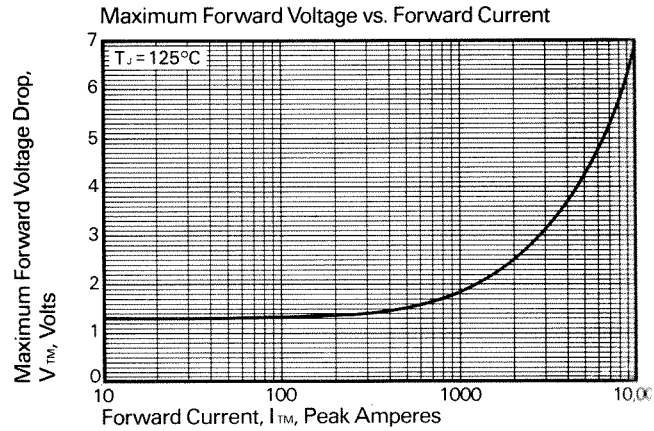
Gate current to trigger at  $V_D = 12\text{V}$ , mA .....  $I_{GT}$       150  
 Gate voltage to trigger at  $V_D = 12\text{V}$ , V .....  $V_{GT}$       3  
 Non-triggering gate voltage,  $T_J = 125^\circ\text{C}$ ,  
 and rated  $V_{DRM}$ , V .....  $V_{GDM}$       .25  
 Peak forward gate current, 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. .... ① ..... 2000 to 2400  
 Thermal resistance ①, double-  
 side cooling,  
 junction to case,  $^\circ\text{C}/\text{Watt}$  .....  $R_{\theta JC}$       .06  
 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  $u_t$  combinations available consult factory.



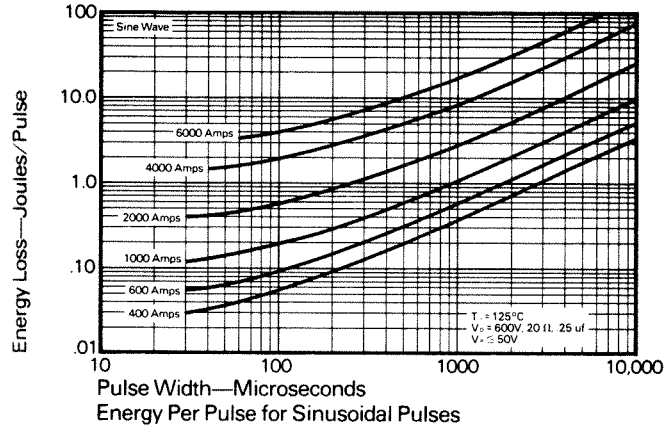
FAST SWITCHING THYRISTORS



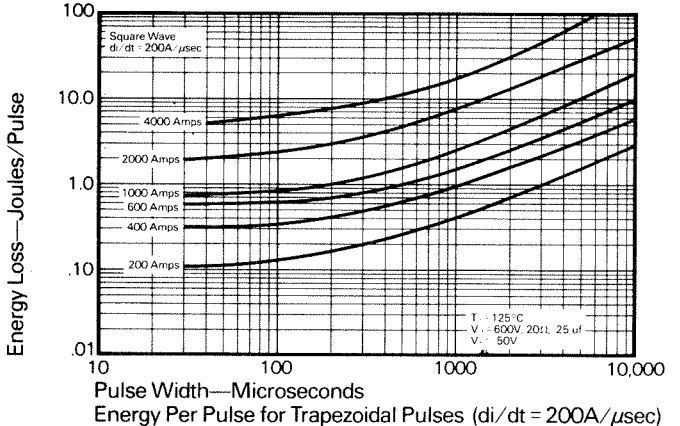
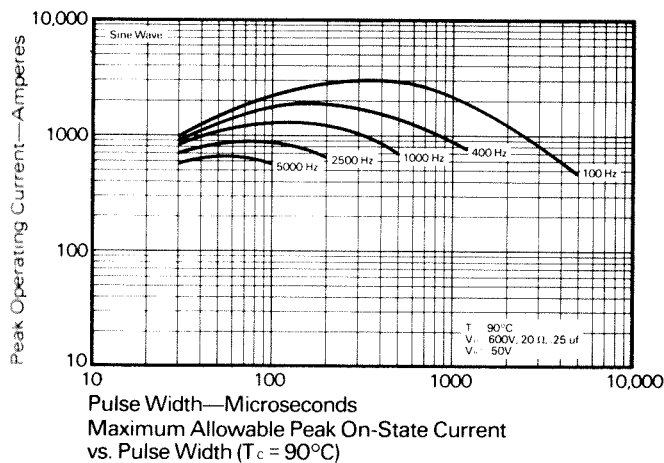
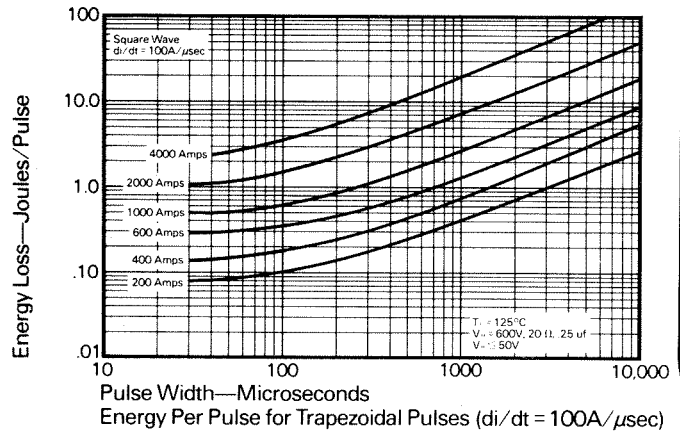
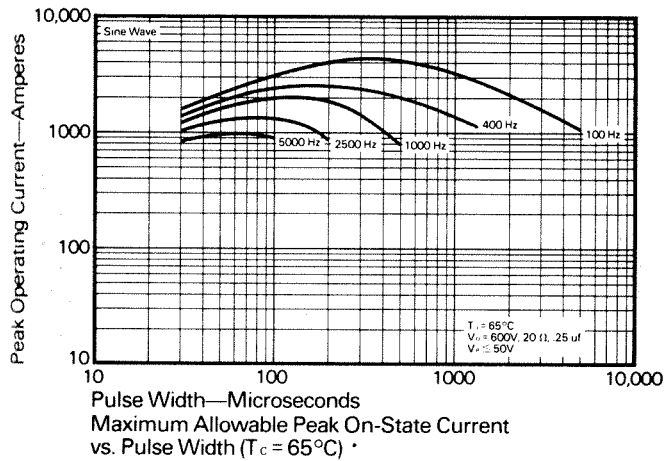
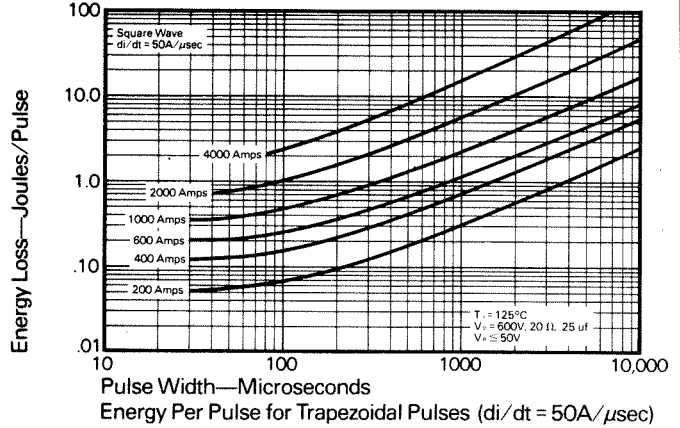
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Sinusoidal Current Data



Trapezoidal Wave Current Data



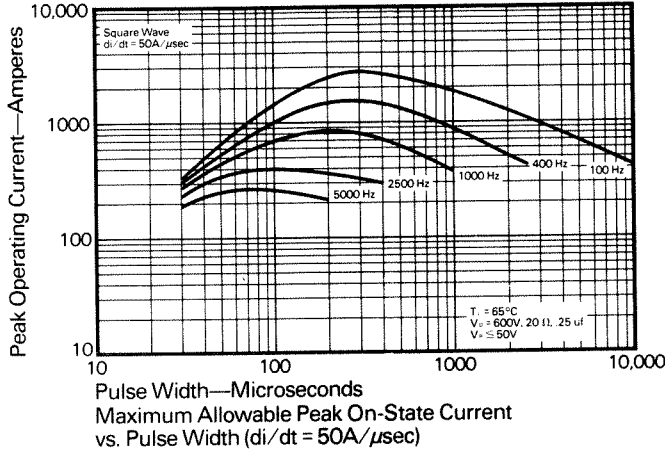
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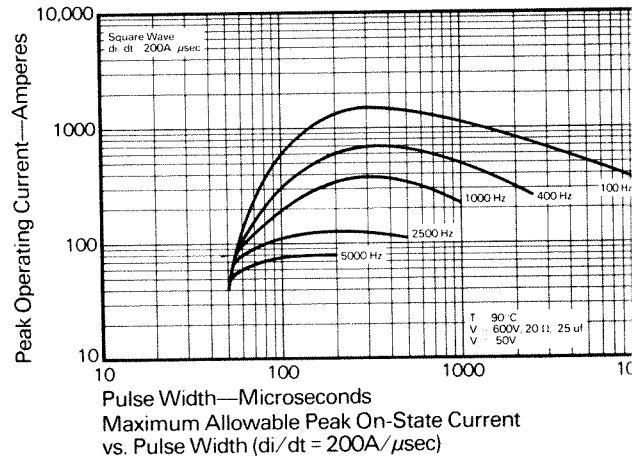
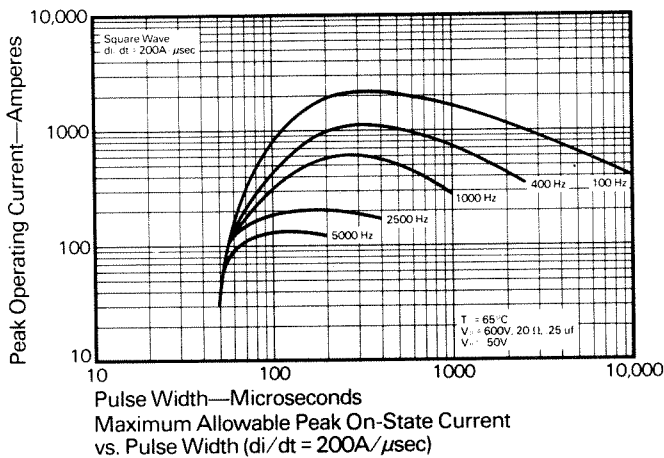
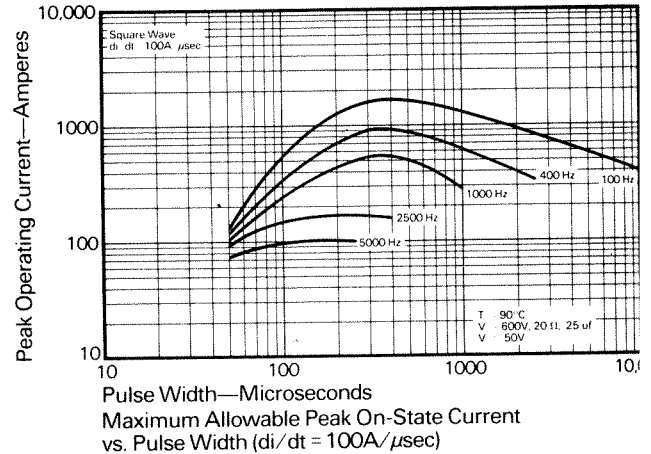
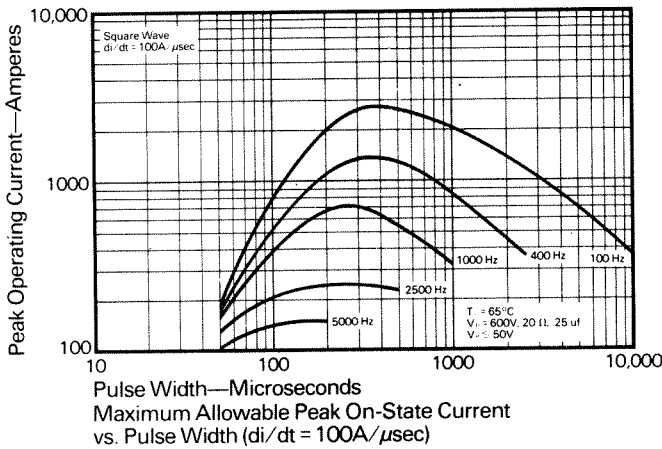
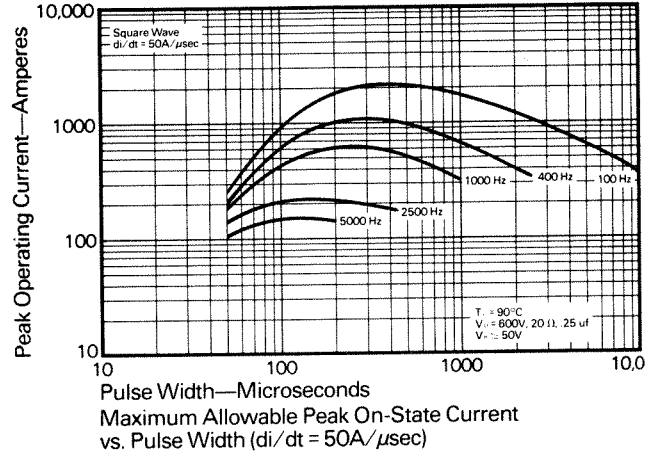
Fast Switching  
SCR  
T72H\_42



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



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



FAST SWITCHING  
THYRISTORS