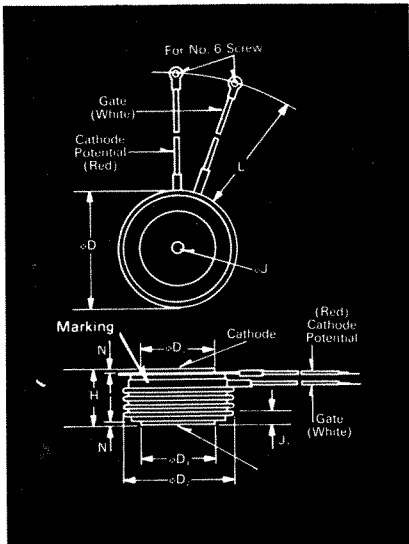


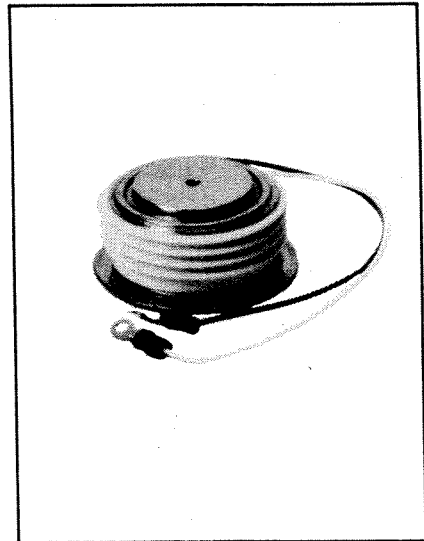
# Fast Switching SCR T72H\_40

400A Avg.  
(625 RMS)  
Up to 800 Volts  
10-20  $\mu$ 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—.69 in. min. (17.53 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 800 Volts
- 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	$I_{T(av)}$ (A)	$t_q$ usec	Code	$I_{GT}$ (ma)	Code	Case	Code	
T72H		100	01	400	40	10	8	150	4	T72	DN
		200	02								
		300	03								
		400	04								
		500	05								
		600	06								
		700	07								
		800	08								

## Example

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

Type T72H rated at 400 A average with  $V_{DRM} = 600V$   
 $I_{GT} = 150 \text{ ma}$ ,  $t_q = 15 \mu\text{sec}$  max. and leads—order as:

Type	Voltage	Current	Turn Off	Gate Current	Leads
T 7 2 H	0 6	4 0	7	4	D N

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**Voltage** ①

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

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

← 35 →  
← 35 →

**Current**

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

RMS forward current, A .....  $I_T(\text{rms})$   
 Ave. forward current, A .....  $I_T(\text{av})$   
 One-half cycle surge current②, A .....  $I_{TSM}$   
 $I^2t$  for fusing (for times  $\geq 8.3$  ms)  
 A<sup>2</sup> sec. .....  $I^2t$   
 Forward voltage drop at  $I_{TM} = 1500\text{A}$   
 and  $T_J = 25^\circ\text{C}$ , V .....  $V_{TM}$   
 Min. repetitive  $di/dt$ ③④⑤ A/ $\mu$ sec .....  $di/dt$

Symbol

**T72H\_40**

625  
400  
7000  
205,000  
2.0  
500

**Switching**

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

Max. turn-off time,  $I_T = 400\text{A}$ ,  $T_J = 125^\circ\text{C}$

$t_p = 100$   $\mu$ sec,  $di/dt = 25$   
 A/ $\mu$ sec., reapplied  $dv/dt =$   
 $\approx 200\text{V}/\mu$ sec. linear to  $0.8 V_{DRM}$ ,  $\mu$ sec. ①②  $t_q$

Typ. delay time,  $I_{TM} = 1000\text{A}$  .....  $t_d$   
 $T_D = .8 V_{DRM}$ ,  $\mu$ sec ③  $t_{on}$

Typ turn-on-time  $I_{TM} = 1000\text{A}$ ,  $\mu$ sec .....  $t_{on}$

Min. critical  $dv/dt$  exponential to .8

$V_{DRM}$ ,  $T_J = 125^\circ\text{C}$ , V/ $\mu$ sec ④⑤  $dv/dt$

Min.  $di/dt$ , non-repetitive, A/ $\mu$ sec ⑥⑦⑧  $di/dt$

Symbol

10 to 20  
.5  
3.0  
300  
1200

**Gate**

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

Gate current to trigger at  $V_D = 12\text{V}$ , mA .....  $I_{GT}$

Gate voltage to trigger at  $V_D = 12\text{V}$ , 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 .....  $P_{G(av)}$

Symbol

150  
3  
.25  
4  
5  
16  
3

**Thermal and Mechanical**

Min., Max. oper. junction temp.,  $^\circ\text{C}$  .....  $T_J$

Min., Max. storage temp.,  $^\circ\text{C}$  .....  $T_{stg}$

Max. mounting force, lb. .... ①

Thermal resistance①, double-

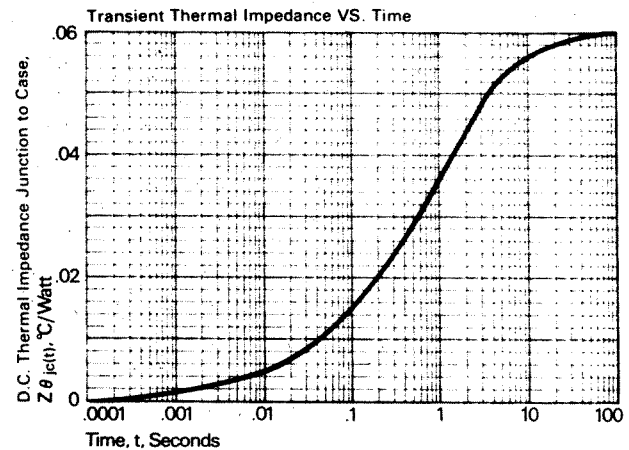
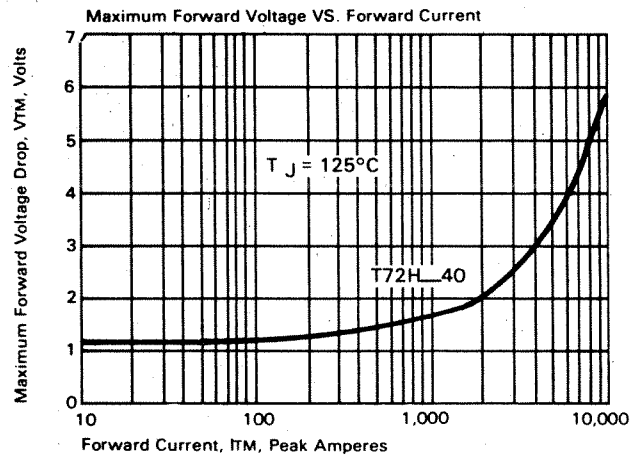
side cooling, junction to case,  
 $^\circ\text{C}/\text{Watt}$  .....  $R_{\theta JC}$

Case to sink, lubricated,  $^\circ\text{C}/\text{Watt}$  .....  $R_{\theta CS}$

Symbol

-40 to +125  
-40 to +150  
2000 to 2400  
.06  
.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.

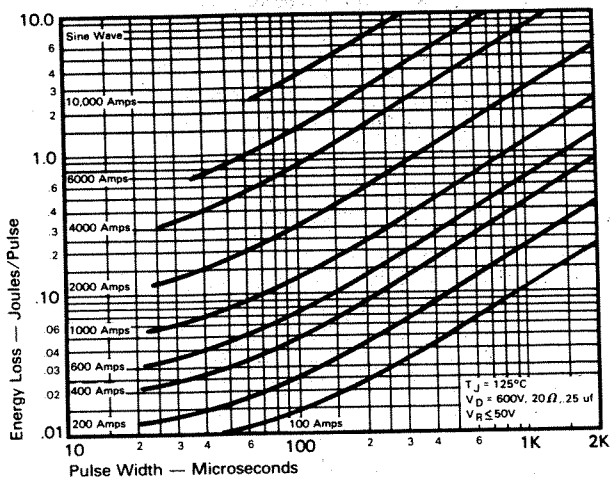


FAST SWITCHING  
THYRISTORS

# Fast Switching SCR T72H\_40

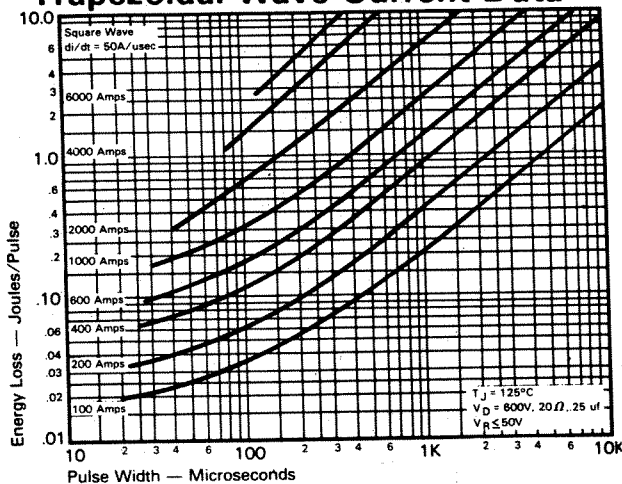
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## Sinusoidal Current Data

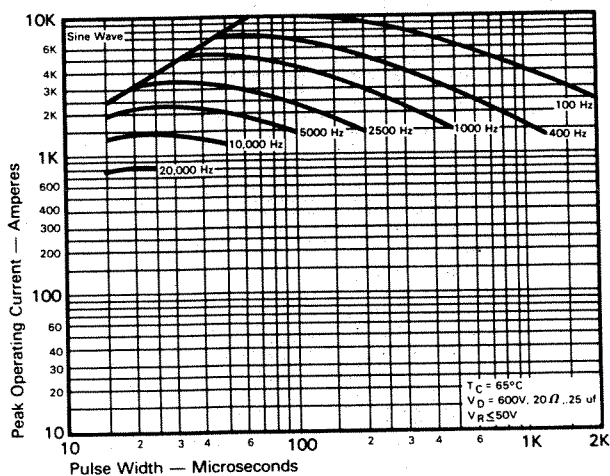


ENERGY PER PULSE FOR SINUSOIDAL PULSES

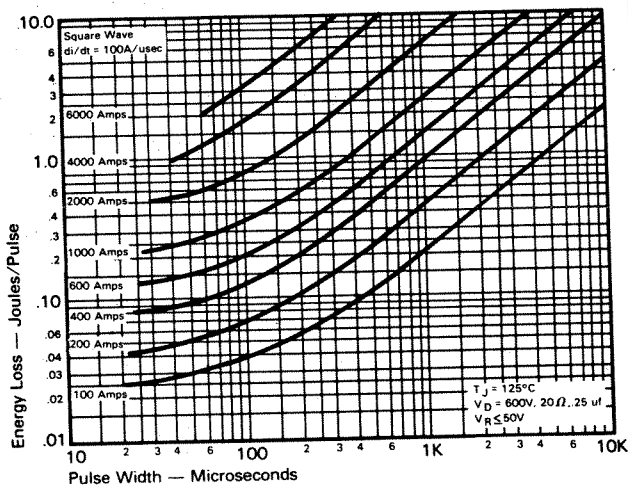
## Trapezoidal Wave Current Data



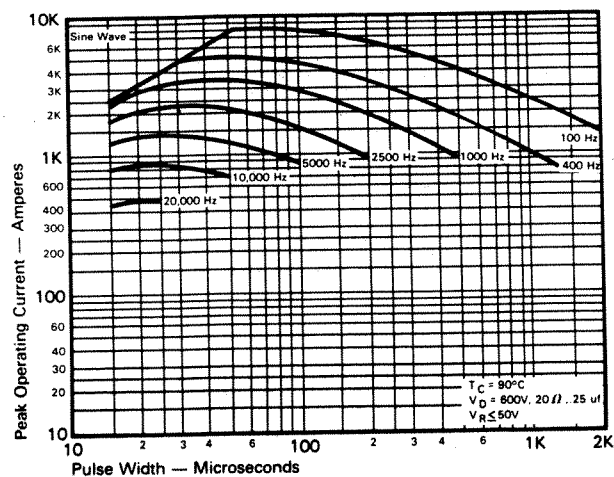
ENERGY PER PULSE FOR TRAPEZOIDAL PULSES  
(di/dt = 50A/usec)



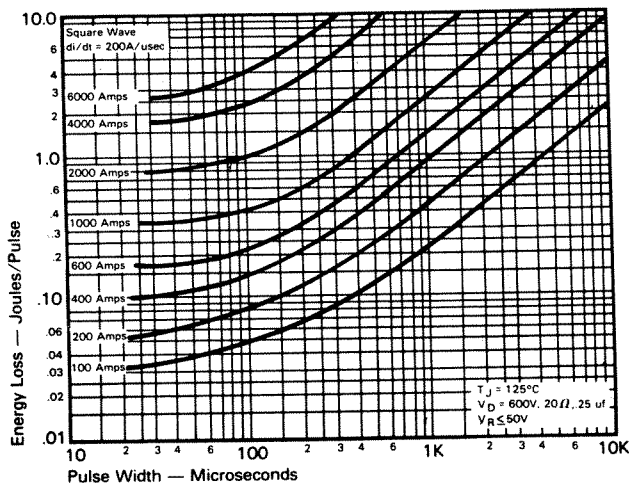
MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT  
vs. PULSE WIDTH ( $T_C = 65^\circ\text{C}$ )



ENERGY PER PULSE FOR TRAPEZOIDAL PULSES  
(di/dt = 100A/usec)



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



ENERGY PER PULSE FOR TRAPEZOIDAL PULSES  
(di/dt = 200A/usec)

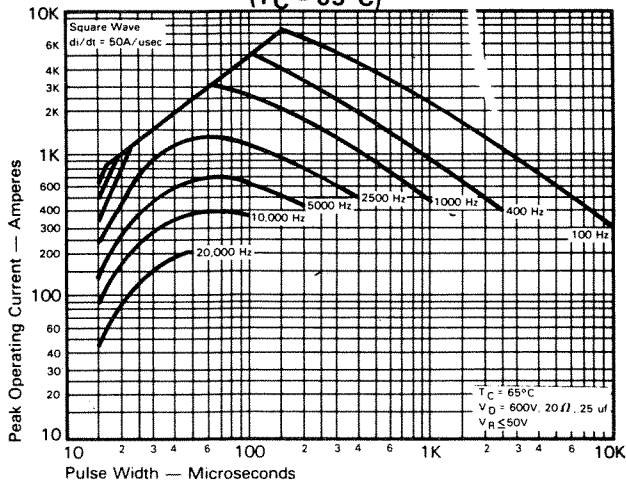
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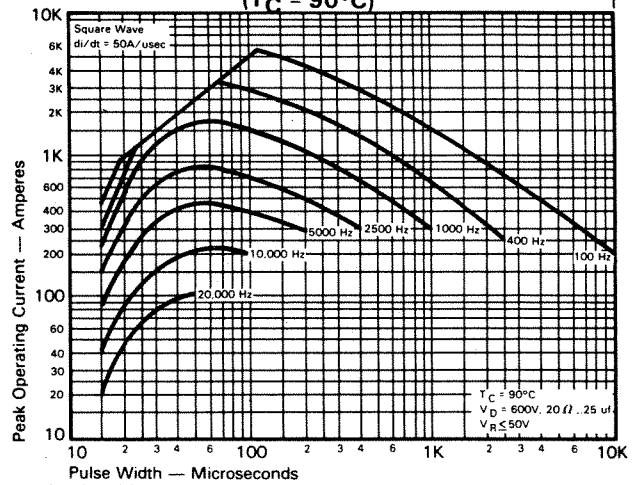
**Fast Switching  
SCR  
T72H\_40**

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

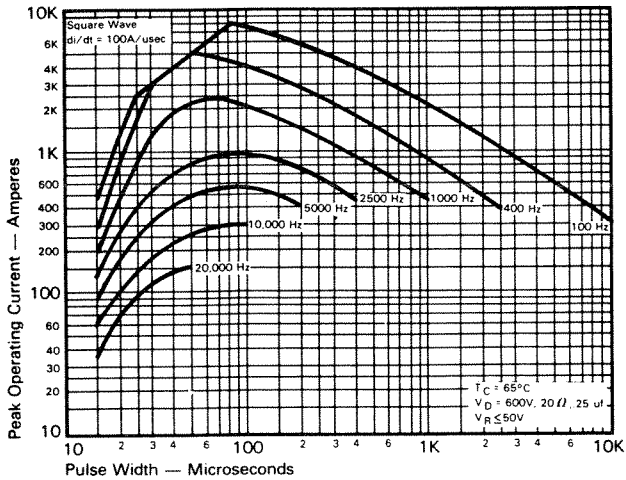


**MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ( $di/dt = 50\text{A}/\mu\text{sec}$ )**

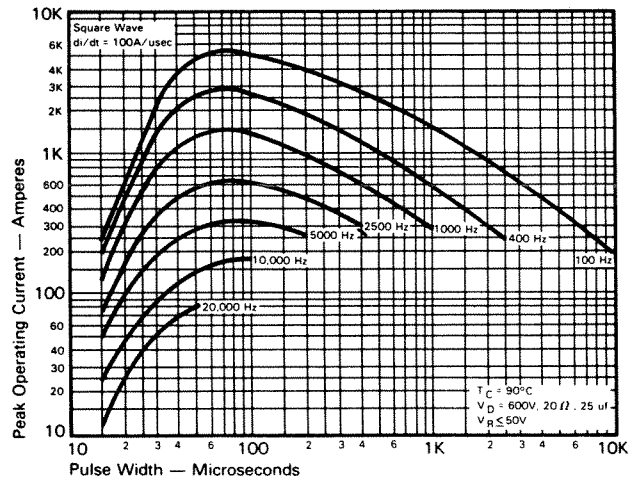
**Trapezoidal Wave Current Data  
( $T_C = 90^\circ\text{C}$ )**



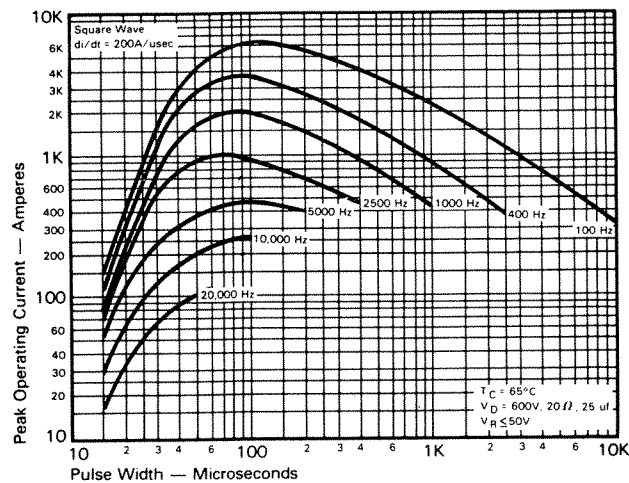
**MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ( $di/dt = 50\text{A}/\mu\text{sec}$ )**



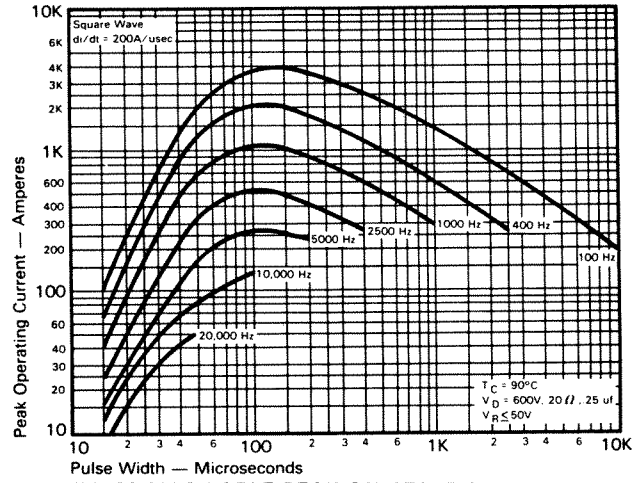
**MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ( $di/dt = 100\text{A}/\mu\text{sec}$ )**



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



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



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

FAST SWITCHING THYRISTORS