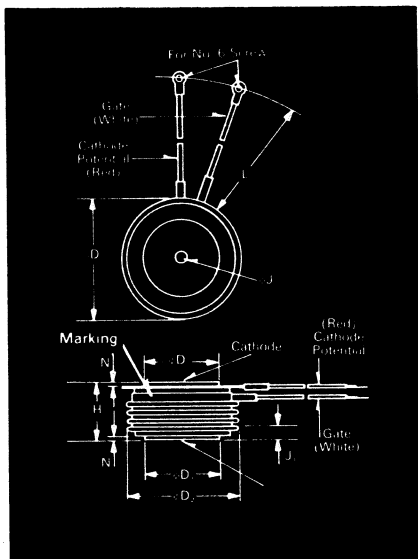


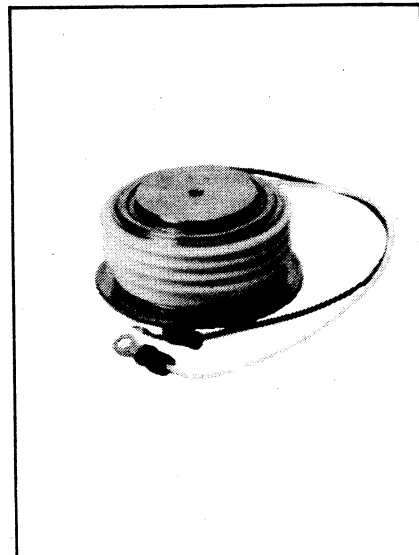
# Fast Switching SCR T72H\_48

475A Avg.  
(750 RMS)  
Up to 800 Volts  
20-40  $\mu$ 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 | IT(av) (A) | Code | tq usec  | Code | IGT (ma)     | Code | Case  | Code |
| T72H | 100               | 01   | 475        | 48   | 20       | 6    | 150          | 4    | T72   | DN   |
|      | 200               | 02   |            |      | 25       | 8    |              |      |       |      |
|      | 300               | 03   |            |      | 30       | 5    |              |      |       |      |
|      | 400               | 04   |            |      | 40       | 4    |              |      |       |      |
|      | 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 475 A average with VDRM = 400V  
IGT = 150 ma, tq = 30  $\mu$ sec max. and leads—order as:

| Type    | Voltage | Current | Turn Off | Gate Current | Leads |
|---------|---------|---------|----------|--------------|-------|
| T 7 2 H | 0 4     | 4 8     | 5        | 4            | D N   |

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**Fast Switching  
SCR  
T72H\_48**

## Voltage ①

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

Repetitive peak forward blocking voltage, V ...  
Repetitive peak reverse voltage, V ...  
Non-repetitive transient peak reverse voltage,  
 $t \leq 5.0$  msec, V ...

Symbol

$V_{DRM}$

$V_{RRM}$

$V_{RSM}$

$I_{DRM}$

$I_{RRM}$

|     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|
| 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 |
| 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 |
| 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 |

## Current

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

Symbol

**T72H\_48**

RMS forward current, A ...

$I_{T(rms)}$

750

Ave. forward current, A ...

$I_{T(av)}$

475

One-half cycle surge current②, A ...

$I_{TSM}$

8000

$I^2t$  for fusing (for times  $\geq 8.3$  ms)  
A<sup>2</sup> sec.

$I^2t$

265,000

Forward voltage drop at  $I_{TM} = 1500\text{A}$

and  $T_J = 25^\circ\text{C}$ , V ...

$V_{TM}$

1.55

Min. repetitive  $di/dt$ ③④⑤ A/ $\mu$ sec ...

$di/dt$

600

## Switching

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

Symbol

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

$t_p = 100$   $\mu$ sec,  $dirR/dt = 25$

A/ $\mu$ sec., reapplied  $dv/dt =$

200V/ $\mu$ sec. linear to 0.8  $V_{DRM}$ ,  $\mu$ sec. ①①

$t_q$

20 to 40

Typ. delay time,  $I_{TM} = 1000\text{A}$

$t_d = .8 V_{DRM}$ ,  $\mu$ sec

$t_d$

.5

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

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

$V_{DRM}$ ,  $T_J = 125^\circ\text{C}$ , V/ $\mu$ sec ⑦⑧

$dv/dt$

300

Min.  $di/dt$ , non-repetitive, A/ $\mu$ sec ①④⑤

$di/dt$

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 resistance①, 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.

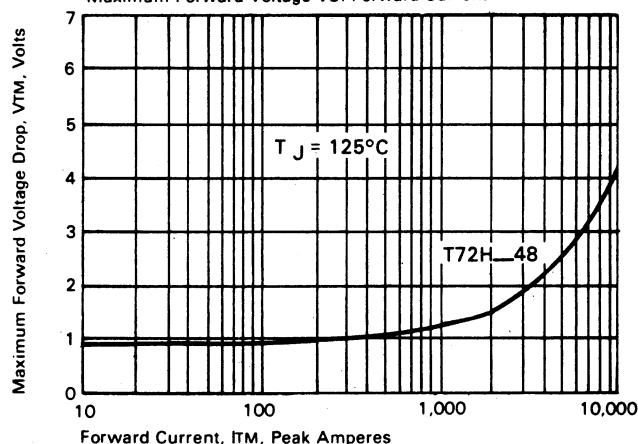
④ With recommended gate drive.

⑤ Higher  $dv/dt$  ratings available, consult factory.

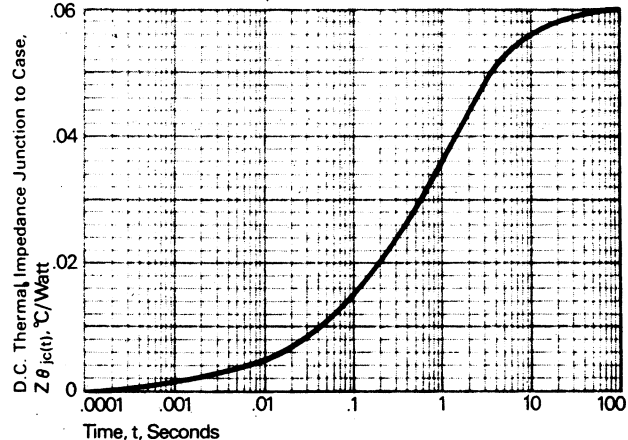
⑥ Per JEDEC standard RS-397, 5.2.2.6.

⑦ For operation with antiparallel diode, consult factory.

Maximum Forward Voltage VS. Forward Current



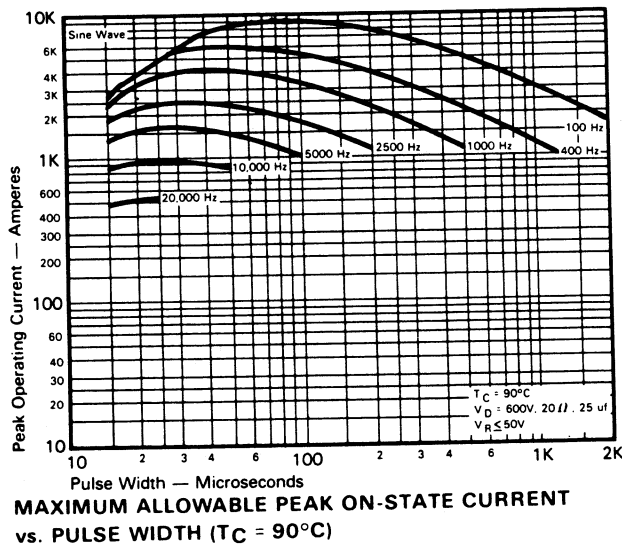
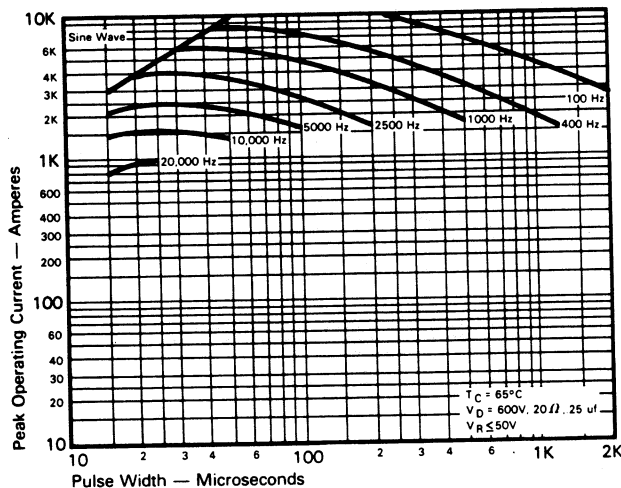
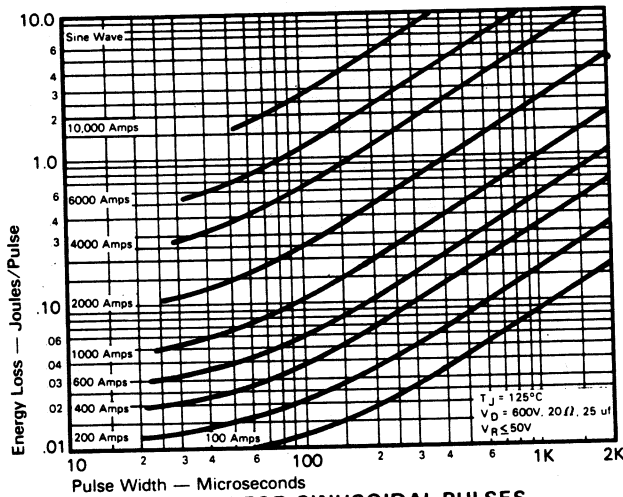
Transient Thermal Impedance VS. Time



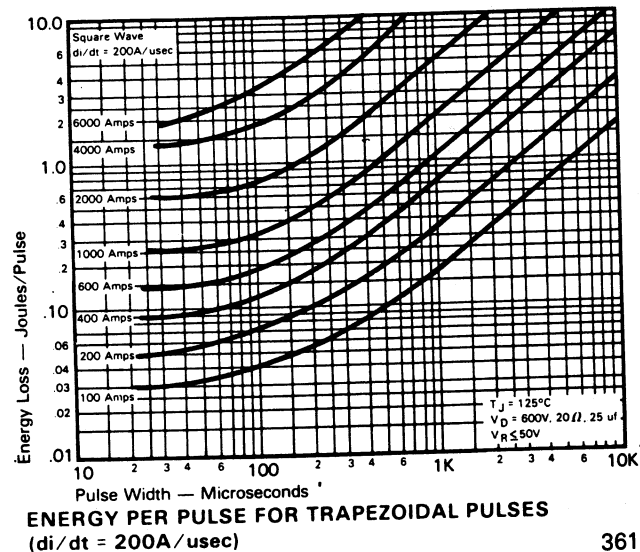
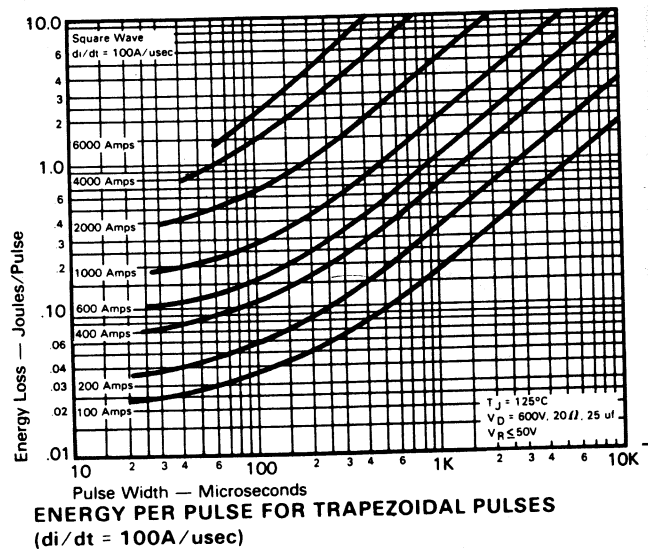
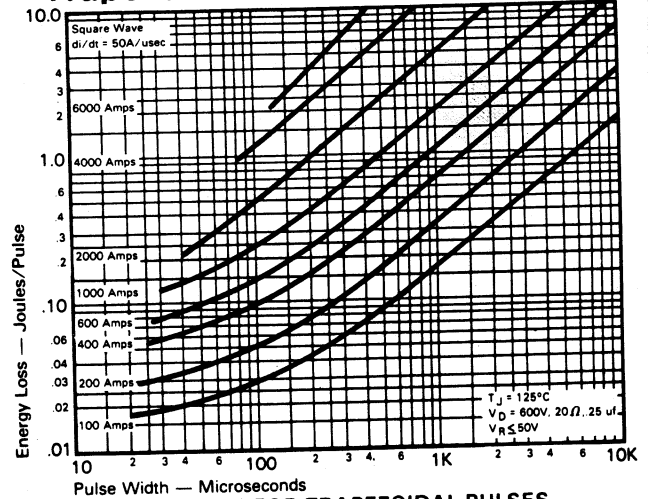
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## Sinusoidal Current Data



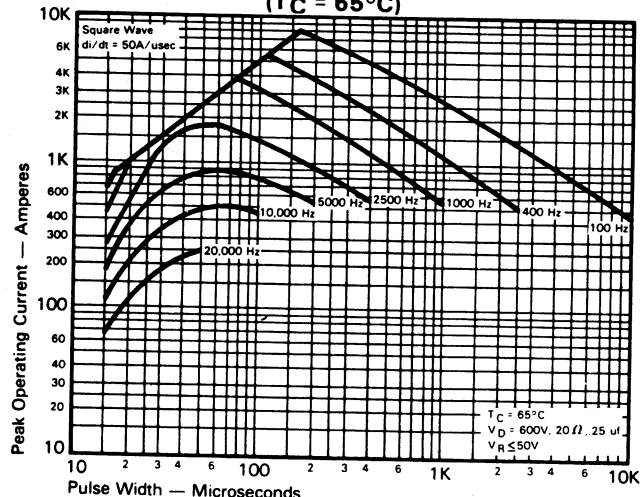
## Trapezoidal Wave Current Data



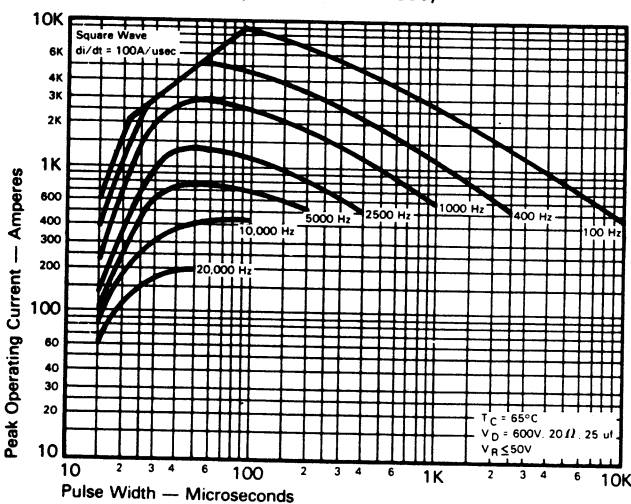
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Fast Switching  
SCR  
T72H\_48

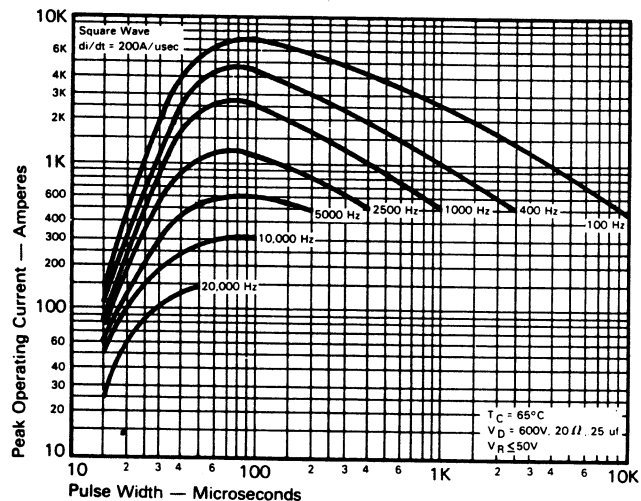
### Trapezoidal Wave Current Data ( $T_C = 65^\circ\text{C}$ )



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

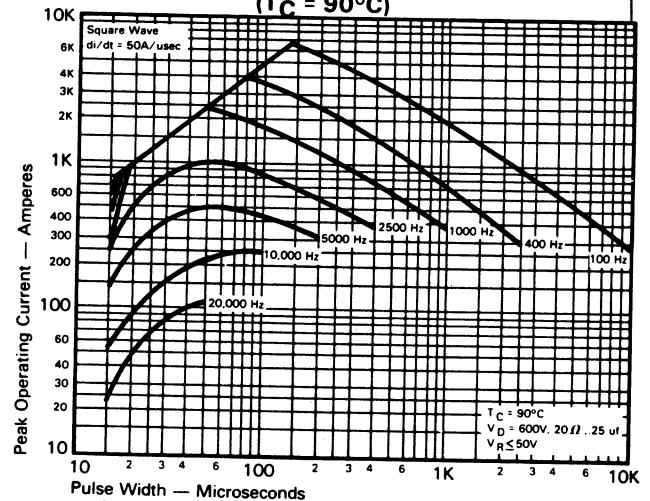


MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT  
vs. PULSE WIDTH ( $di/dt = 100\text{A/usec}$ )

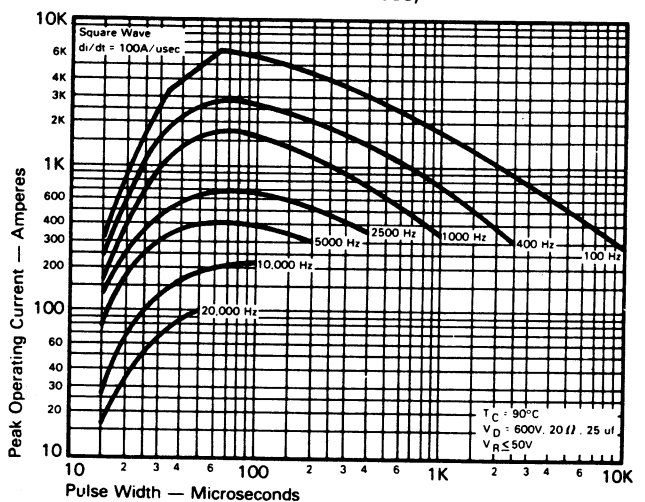


MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT  
vs. PULSE WIDTH ( $di/dt = 200\text{A/usec}$ )

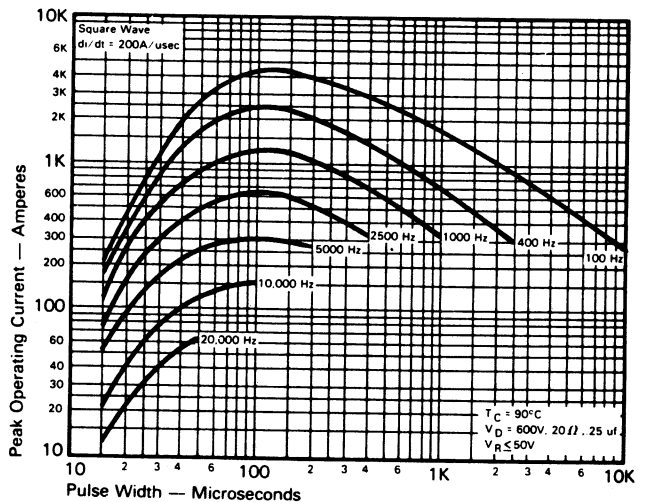
### Trapezoidal Wave Current Data ( $T_C = 90^\circ\text{C}$ )



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 ( $di/dt = 200\text{A/usec}$ )