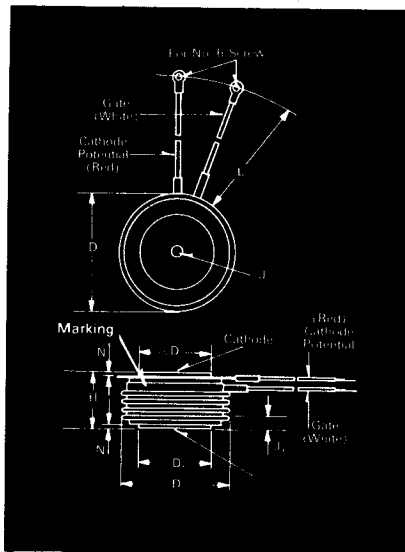


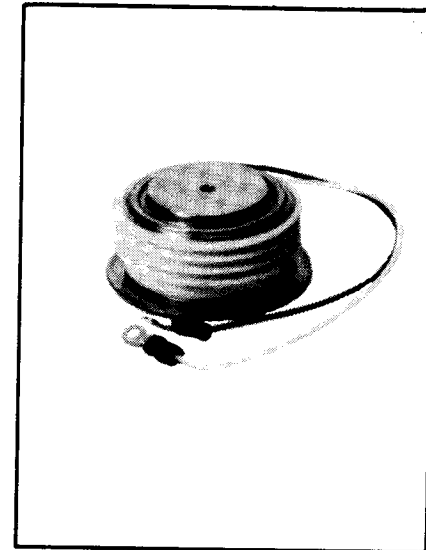
# Fast Switching SCR T727\_48

475A Avg.  
(750 RMS)  
Up to 800 Volts  
10-50  $\mu$ 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:

- Center fired di/namic 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

### Applications:

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

## Ordering Information

| Type | Voltage                                   |      | Current                |      | Turn-off                 |      | Gate current         |      | Leads |      |
|------|-------------------------------------------|------|------------------------|------|--------------------------|------|----------------------|------|-------|------|
| Code | V <sub>DRM</sub> and V <sub>RRM</sub> (V) | Code | I <sub>T(av)</sub> (A) | Code | t <sub>q</sub> $\mu$ sec | Code | I <sub>GT</sub> (ma) | Code | Case  | Code |
| T727 | 100                                       | 01   | 475                    | 48   | 10                       | 8    | 150                  | 4    | T72   | 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 T727 rated at 475 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 2 7 | 0 6     | 4 8     | 5        | 4            | D N   |

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THYRISTORS

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## Voltage

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

Repetitive peak forward blocking voltage, V ...  
Repetitive peak reverse voltage, V ...  
Non-repetitive transient peak reverse voltage,  
 $t \leq 5.0$  msec, V ...  
Forward leakage current, mA peak ...  
Reverse leakage current, mA peak ...

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 |
|     |     |     |     | 30  |     |     |     |
|     |     |     |     | 30  |     |     |     |

## Current

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

RMS forward current, A ...  
Ave. forward current, A ...  
One-half cycle surge current<sup>③</sup>, A ...  
 $I^2t$  for fusing (for times  $\geq 8.3$  ms)  
A<sup>2</sup> sec. ...  
Forward voltage drop at  $I_{TM} = 3000A$   
and  $T_J = 25^\circ\text{C}$ , V ...  
Min. repetitive  $di/dt$  A/ $\mu$ sec ... ①④⑤

Symbol

$I_{T(rms)}$   
 $I_{T(av)}$   
 $I_{TSM}$   
 $I^2t$   
 $V_{TM}$   
 $di/dt$

T727—48

750  
475  
8000  
265,000  
2.30  
400

## Switching

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

Max. turn-off time,  $I_T = 400A$   
 $T_J = 125^\circ\text{C}$ ,  $di/dt = 25$   
A/ $\mu$ sec, reappplied  $dv/dt =$   
20V/ $\mu$ sec linear to 0.8  $V_{DRM}$ ,  $\mu$  sec ... ④⑤  
Typ. turn-on time,  $I_T = 1000A$   
 $V_D = 300V$  ④,  $\mu$ sec ...  
Min. critical  $dv/dt$ , exponential to  $V_{DRM}$   
 $T_J = 125^\circ\text{C}$ , V/ $\mu$ sec ④⑤  
Min.  $di/dt$  non-repetitive,  
A/ $\mu$ sec ④④⑤

Symbol

$t_q$   
 $t_{on}$   
 $dv/dt$   
 $di/dt$

10 to 50  
3.0  
300  
800

## Gate

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

Gate current to trigger at  $V_D = 12V$ , mA ...  
Gate voltage to trigger at  $V_D = 12V$ , V ...  
Non-triggering gate voltage,  $T_J = 125^\circ\text{C}$ ,  
and rated  $V_{DRM}$ , V ...  
Peak forward gate current, A ...  
Peak reverse gate voltage, V ...  
Peak gate power, Watts ...  
Average gate power, Watts ...

Symbol

$I_{GT}$   
 $V_{GT}$   
 $V_{GDM}$   
 $I_{GTM}$   
 $V_{GRM}$   
 $P_{GM}$   
 $P_{G(av)}$

150  
3  
0.15  
4  
5  
16  
3

## Thermal and Mechanical

Min., Max. oper. junction temp.,  $^\circ\text{C}$  ...  
Min., Max. storage temp.,  $^\circ\text{C}$  ...  
Max. mounting torque, in lb. ① ...  
Max. Thermal resistance ① Double side cooled  
junction to case,  $^\circ\text{C}/\text{Watt}$  ...  
Case to sink, lubricated,  $^\circ\text{C}/\text{Watt}$  ...

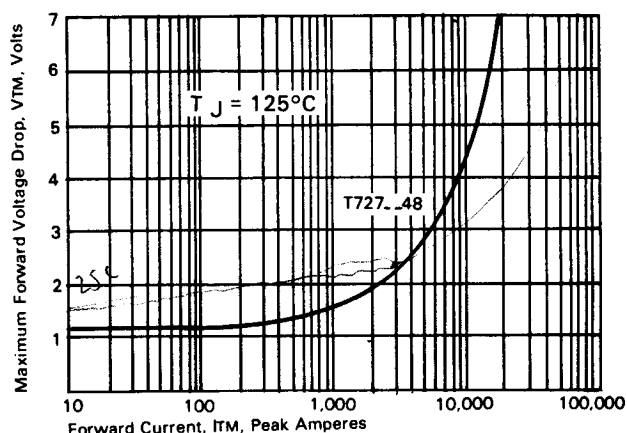
Symbol

$T_J$   
 $T_{stg}$   
 $R_{\theta JC}$   
 $R_{\theta CS}$

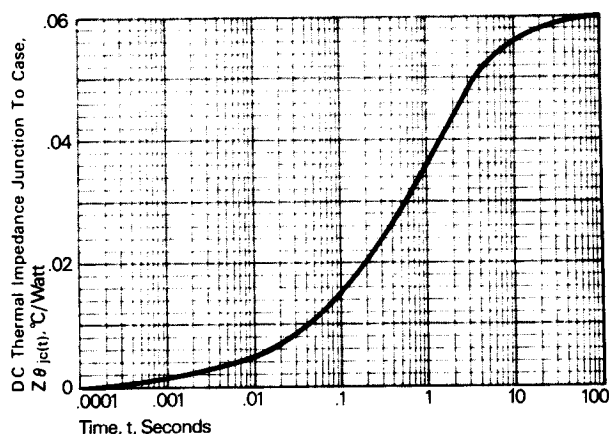
-40 to +125  
-40 to +150  
2000 to 2400  
.06  
.02

- 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.

Maximum Forward Voltage Drop VS Forward Current



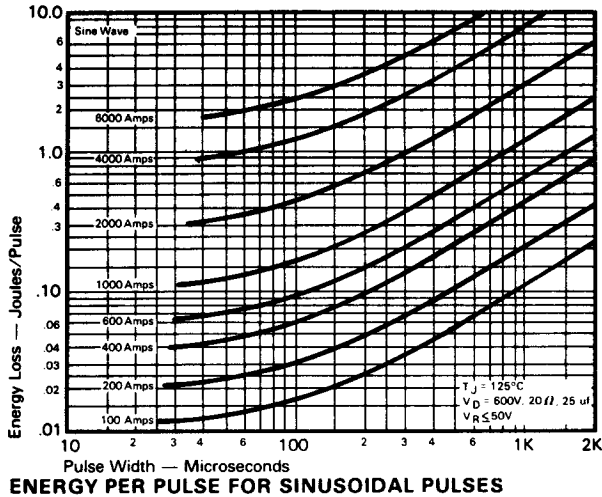
Transient Thermal Impedance VS. Time



# Fast Switching SCR T727\_48

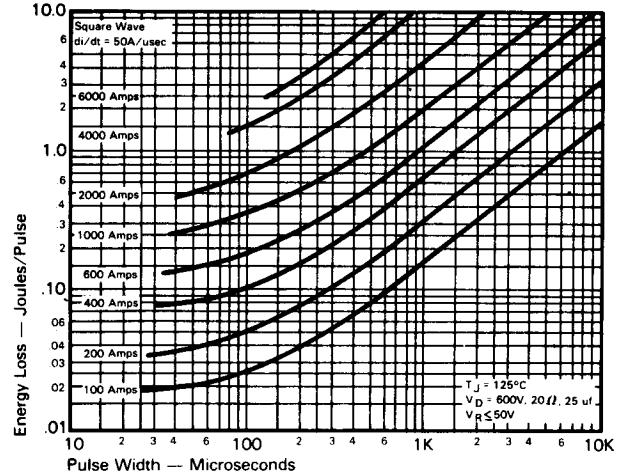
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## Sinusoidal Current Data

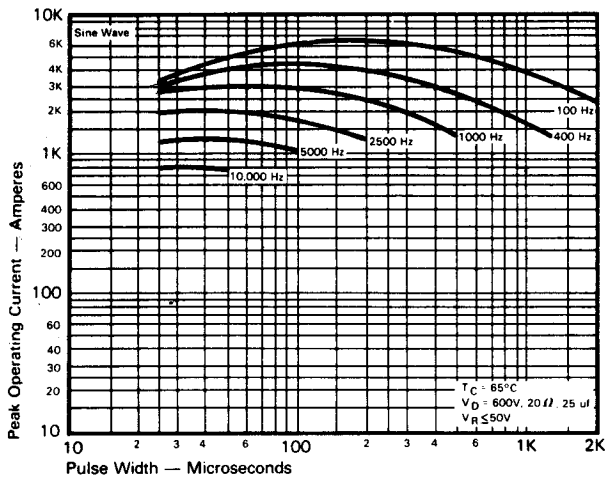


ENERGY PER PULSE FOR SINUSOIDAL PULSES

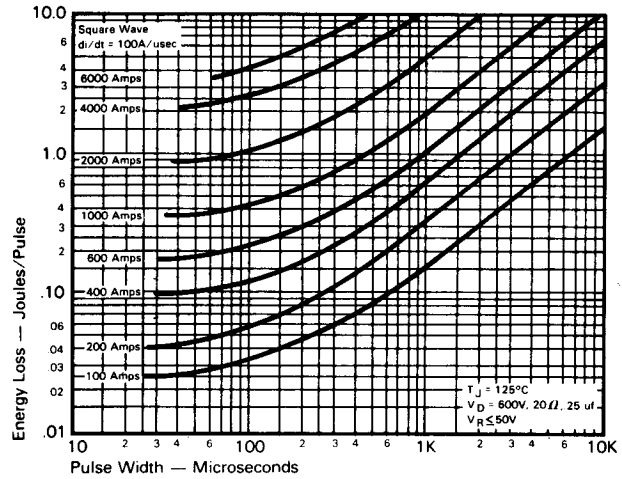
## Trapezoidal Wave Current Data



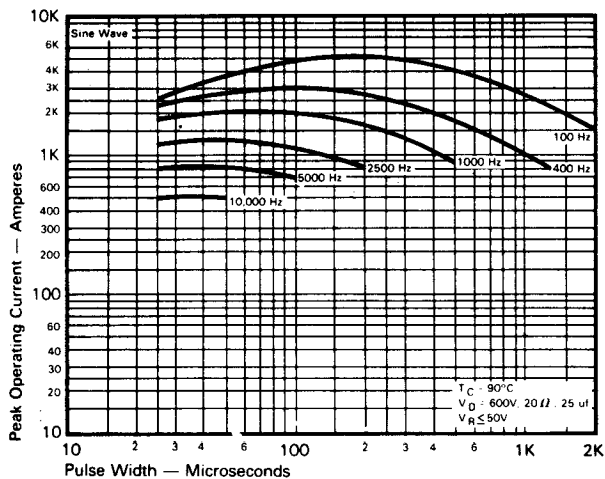
ENERGY PER PULSE FOR TRAPEZOIDAL PULSES  
( $di/dt = 50\text{A}/\mu\text{sec}$ )



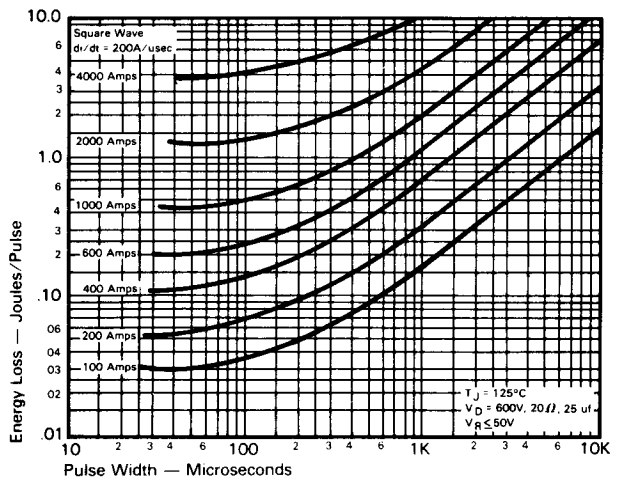
MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT  
vs. PULSE WIDTH ( $T_C = 65^\circ\text{C}$ )



ENERGY PER PULSE FOR TRAPEZOIDAL PULSES  
( $di/dt = 100\text{A}/\mu\text{sec}$ )



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



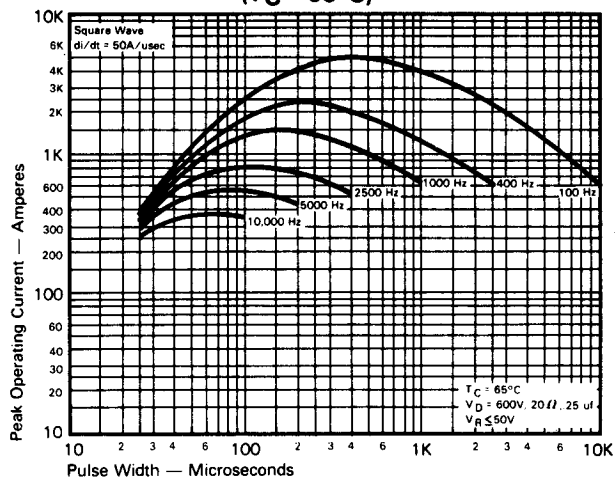
ENERGY PER PULSE FOR TRAPEZOIDAL PULSES  
( $di/dt = 200\text{A}/\mu\text{sec}$ )

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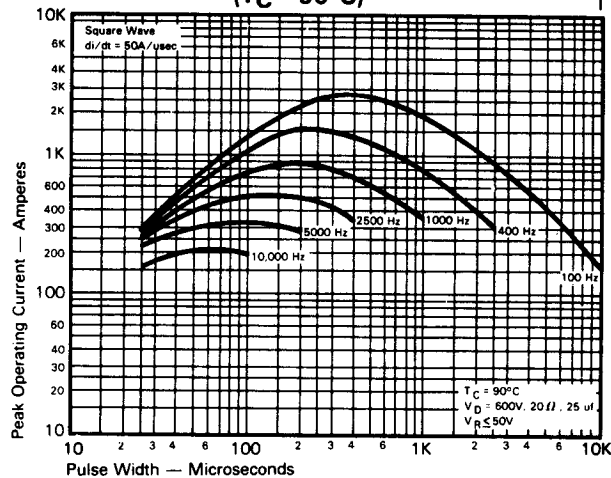
Fast Switching  
SCR  
T727\_48

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

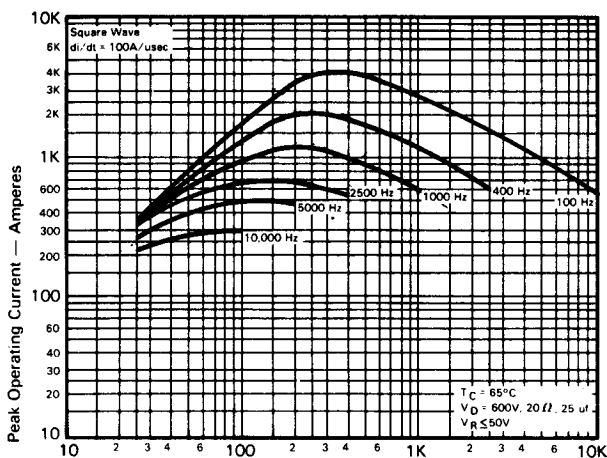


**MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ( $di/dt = 50\text{A}/\mu\text{sec}$ )**

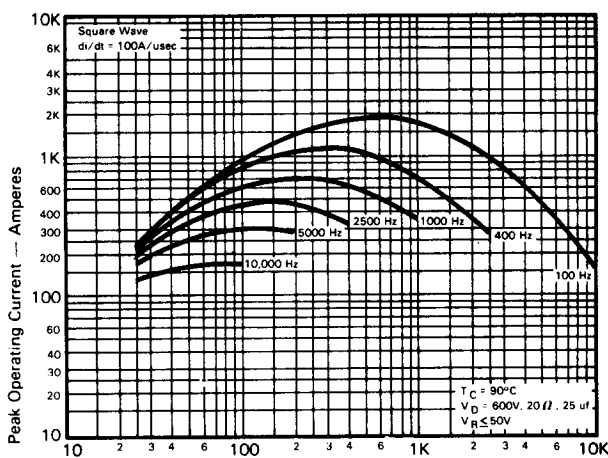
### Trapezoidal Wave Current Data ( $T_C = 90^\circ\text{C}$ )



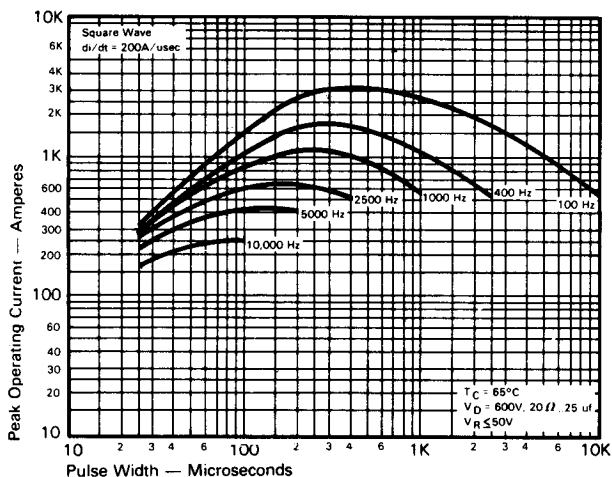
**MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ( $di/dt = 50\text{A}/\mu\text{sec}$ )**



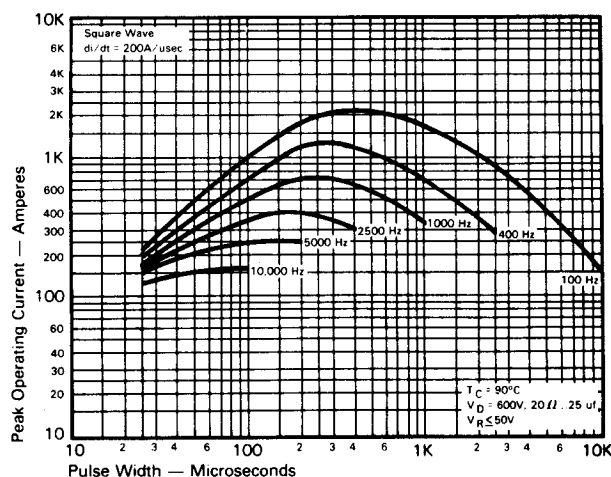
**MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ( $di/dt = 100\text{A}/\mu\text{sec}$ )**



**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 ( $di/dt = 200\text{A}/\mu\text{sec}$ )**