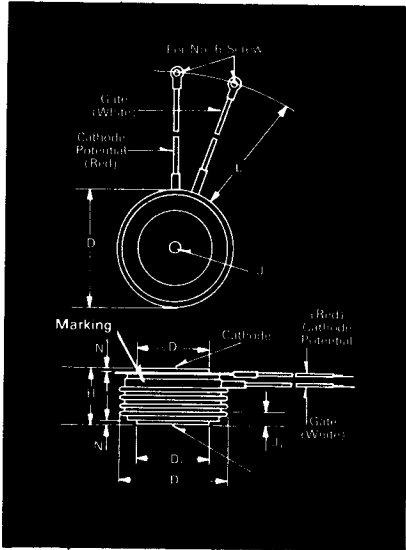


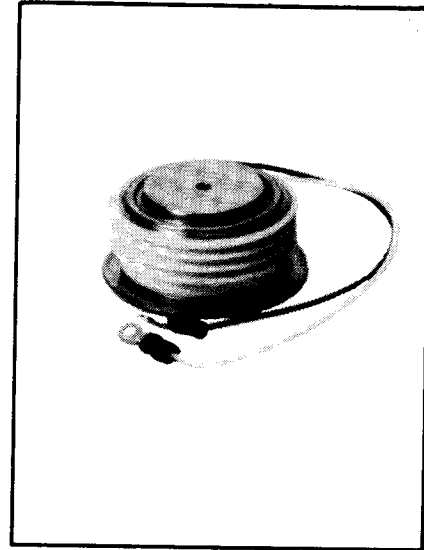
# Fast Switching SCR T727\_48

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 <sub>1</sub>	1.333	1.343	33.86	34.11
$\phi$ D <sub>2</sub>	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 <sub>1</sub>	.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> usec	Code	I <sub>GT</sub> (ma)	Case	Code		
T727		100	01	475	48	10	8	150	4	T72	DN	
		200	02			15						7
		300	03			20						6
		400	04			25						5
		500	05			30						5
		600	06			40						4
		700	07			50						3
		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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**Voltage**

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

	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	$I_{RRM}$

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	T727--48
RMS forward current, A	$I_{T(rms)}$	750
Ave. forward current, A	$I_{T(av)}$	475
One-half cycle surge current <sup>③</sup> , 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 $I_{TM} = 3000A$ and $T_J = 25^\circ\text{C}$ , V	$V_{TM}$	2.30
Min. repetitive $di/dt$ A/ $\mu$ sec <sup>①④⑤</sup>	$di/dt$	400

**Switching**

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

	Symbol	
Max. turn-off time, $I_T = 400A$ $T_J = 125^\circ\text{C}$ , $di_R/dt = 25$ A/ $\mu$ sec, reappplied $dv/dt = 20V/\mu$ sec linear to $0.8 V_{DRM}$ , $\mu$ sec <sup>④⑤</sup>	$t_q$	10 to 50
Typ. turn-on-time, $I_T = 1000A$ $V_D = 300V$ <sup>④</sup> , $\mu$ sec	$t_{on}$	3.0
Min. critical $dv/dt$ , exponential to $V_{DRM}$ $T_J = 125^\circ\text{C}$ , V/ $\mu$ sec <sup>②⑥</sup>	$dv/dt$	300
Min. $di/dt$ non-repetitive, A/ $\mu$ sec <sup>①④⑤</sup>	$di/dt$	800

**Gate**

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

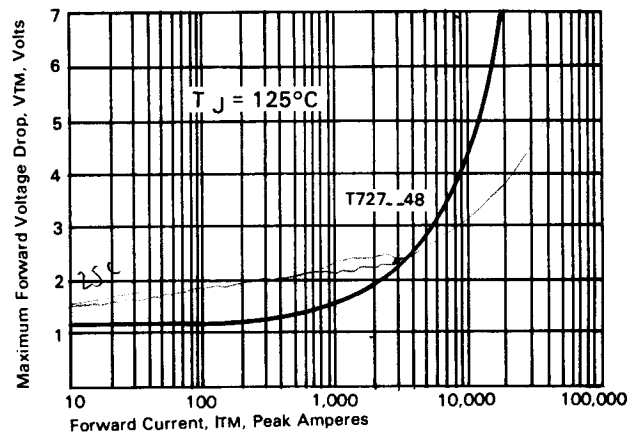
	Symbol	
Gate current to trigger at $V_D = 12V$ , mA	$I_{GT}$	150
Gate voltage to trigger at $V_D = 12V$ , V	$V_{GT}$	3
Non-triggering gate voltage, $T_J = 125^\circ\text{C}$ , and rated $V_{DRM}$ , V	$V_{GDM}$	0.15
Peak forward gate current, A	$I_{GTM}$	4
Peak reverse gate voltage, V	$V_{GRM}$	5
Peak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

**Thermal and Mechanical**

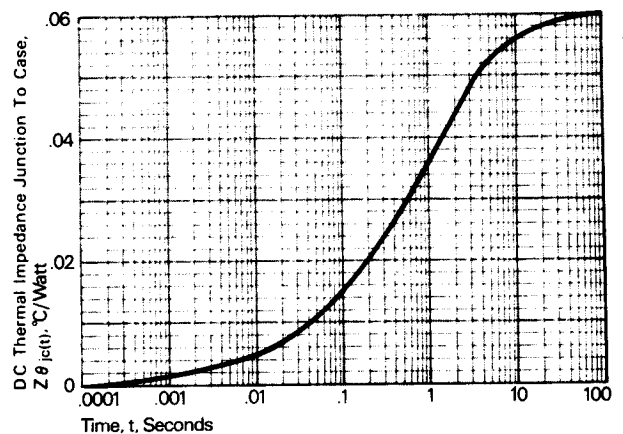
	Symbol	
Min., Max. oper. junction temp., $^\circ\text{C}$	$T_J$	-40 to +125
Min., Max. storage temp., $^\circ\text{C}$	$T_{stg}$	-40 to +150
Max. mounting torque, in lb. <sup>①</sup>		2000 to 2400
Max. Thermal resistance <sup>①</sup> Double side cooled junction to case, $^\circ\text{C}/\text{Watt}$	$R_{\theta JC}$	.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 Drop VS Forward Current



Transient Thermal Impedance VS. Time

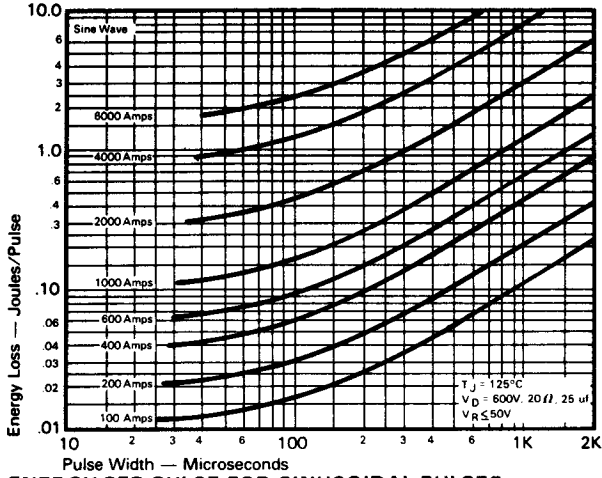


FAST SWITCHING THYRISTORS

# Fast Switching SCR T727\_48

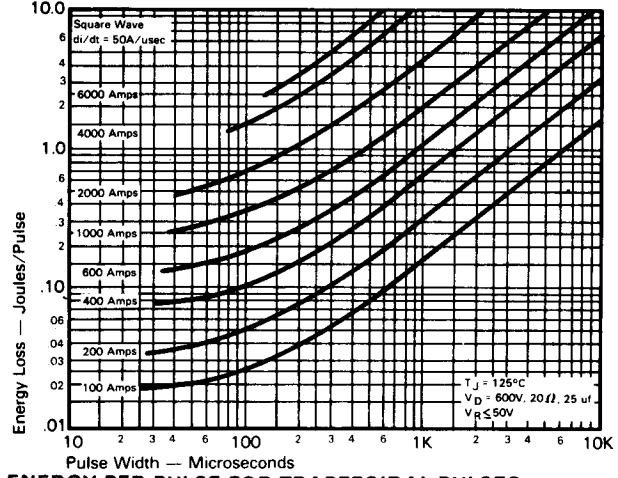
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## Sinusoidal Current Data

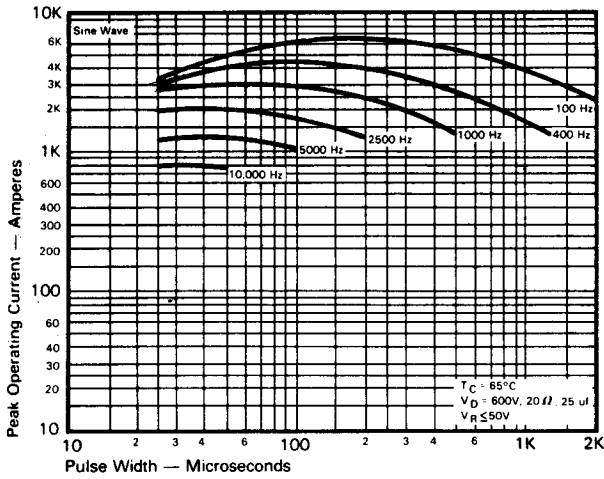


ENERGY PER PULSE FOR SINUSOIDAL PULSES

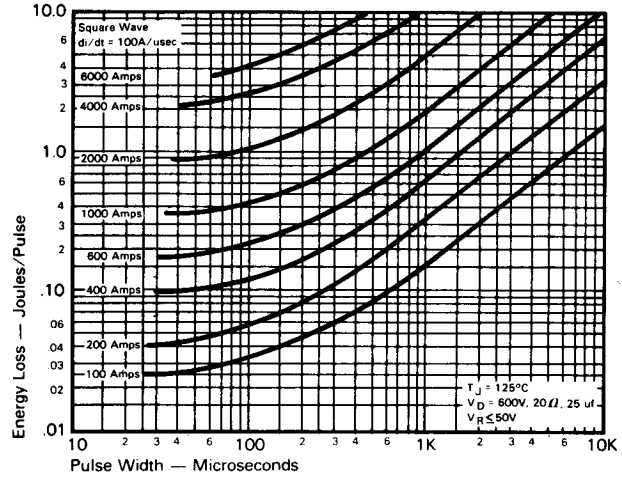
## Trapezoidal Wave Current Data



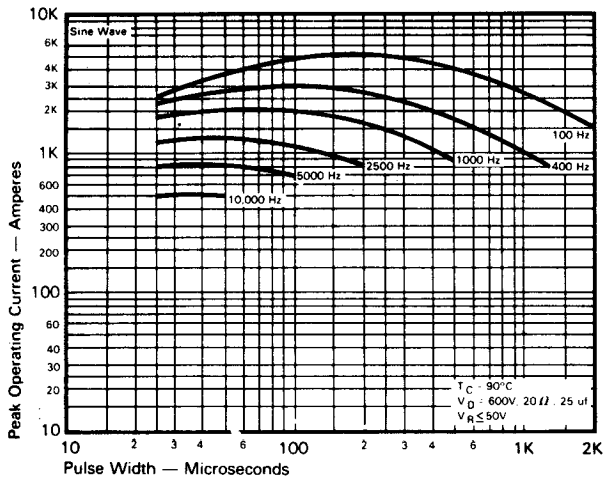
ENERGY PER PULSE FOR TRAPEZOIDAL PULSES  
( $di/dt = 50\text{A}/\mu\text{sec}$ )



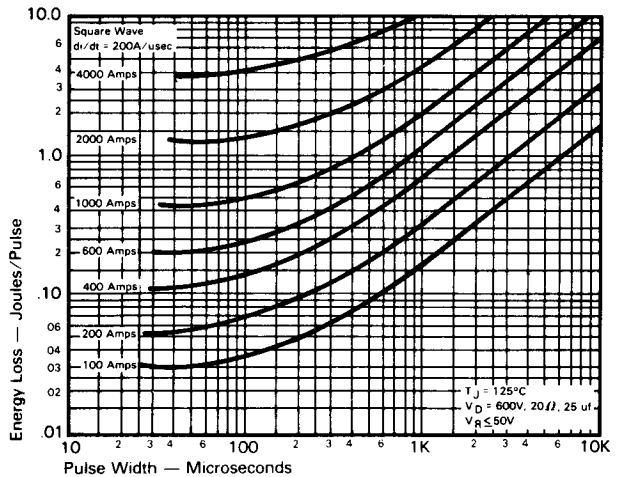
MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT  
vs. PULSE WIDTH ( $T_C = 65^\circ\text{C}$ )



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



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



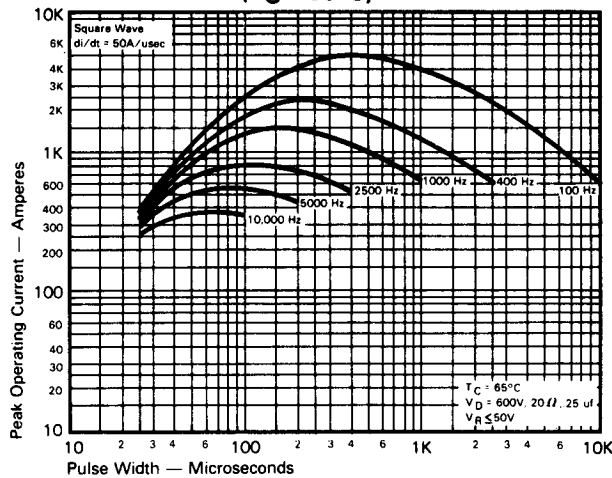
ENERGY PER PULSE FOR TRAPEZOIDAL PULSES  
( $di/dt = 200\text{A}/\mu\text{sec}$ )

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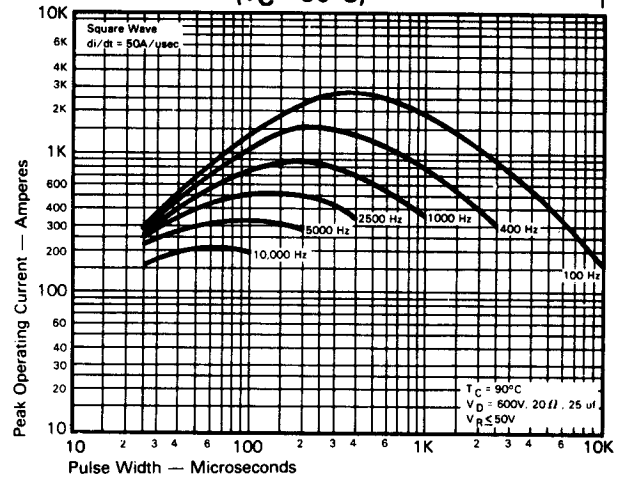
Fast Switching  
SCR  
T727\_48

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

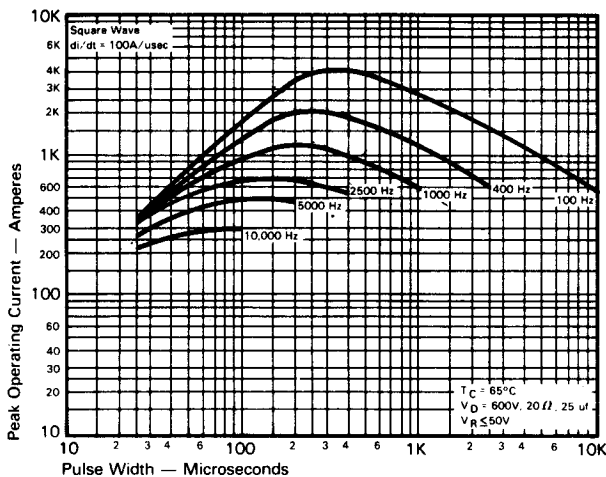


**MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ( $di/dt = 50A/us$ )**

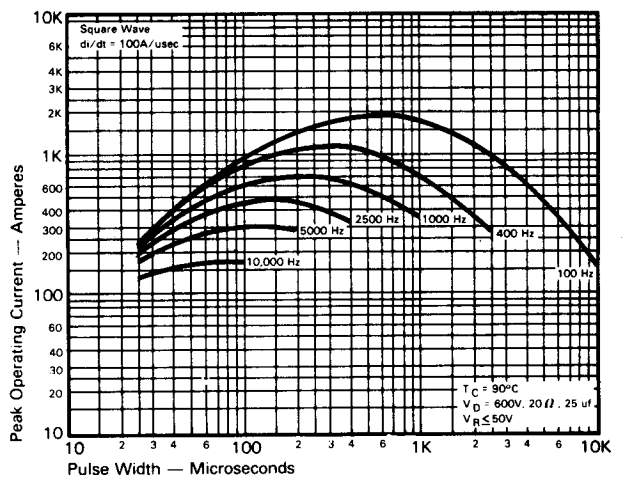
**Trapezoidal Wave Current Data**  
( $T_C = 90^\circ\text{C}$ )



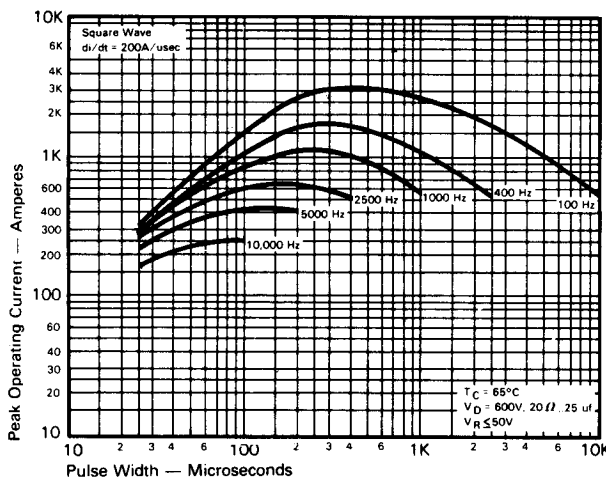
**MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ( $di/dt = 50A/us$ )**



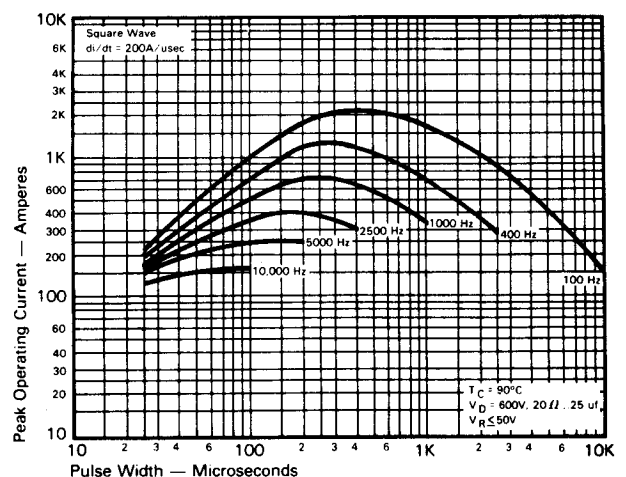
**MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ( $di/dt = 100A/us$ )**



**MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ( $di/dt = 100A/us$ )**



**MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ( $di/dt = 200A/us$ )**



**MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ( $di/dt = 200A/us$ )**

FAST SWITCHING  
THYRISTORS