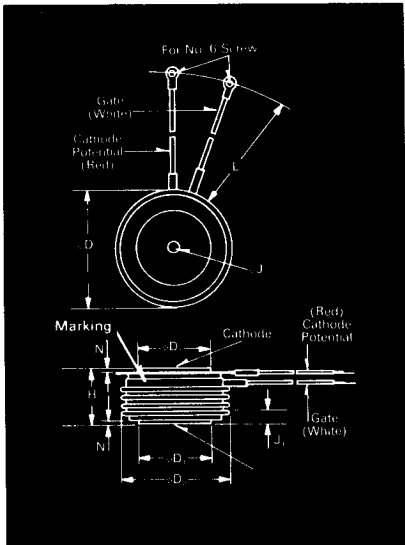


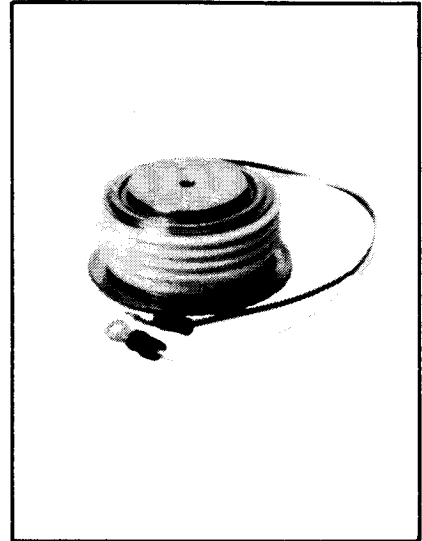
# Fast Switching SCR T72\_45

450A Avg.  
(700 RMS)  
Up to 1200 Volts  
15-60  $\mu$ 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/dynamic 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	$V_{DRM}$ and $V_{RRM}$ (V)	Code	$I_{T(av)}$ (A)	Code	tq $\mu$ sec	Code	$I_{GT}$ (ma)	Code	Case	Code
T727	100	01	450	45	15	7	150	4	T72	DN
	200	02			20	6				
	300	03			25	8				
	400	04			30	5				
	500	05			40	4				
	600	06			50	3				
	700	07			60	2				
	800	08								
	900	09								
	1000	10								
	1100	11								
	1200	12								
	1400	*14								

## Example

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

Type T727 rated at 450 A average with  $V_{DRM} = 1000V$ ,  
 $I_{GT} = 150$  ma, tq = 30  $\mu$ sec max. and standard control leads—order as:

Type	Voltage	Current	Turn Off	Gate Current	Leads
T 7 2 7	1 0	4 5	5	4	D N

\*for 15 and 20  $\mu$ sec V F data,  
consult factory

**450A Avg.  
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**Fast Switching  
SCR  
T727\_45**

**Voltage**

**Blocking State Maximums** <sup>(1)</sup> ( $T_J = 125^\circ\text{C}$ )

Repetitive peak forward blocking voltage, V	$V_{DRM}$	100	200	300	400	500	600	700	800	900	1000	1100	1200	1400
Repetitive peak reverse voltage, V	$V_{RRM}$	100	200	300	400	500	600	700	800	900	1000	1100	1200	1400
Non-repetitive transient peak reverse voltage, $t \leq 5.0$ msec, V	$V_{RSM}$	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1500
Forward leakage current, mA peak	$I_{DRM}$	30												
Reverse leakage current, mA peak	$I_{RRM}$	30												

100	200	300	400	500	600	700	800	900	1000	1100	1200	1400
100	200	300	400	500	600	700	800	900	1000	1100	1200	1400
200	300	400	500	600	700	800	900	1000	1100	1200	1300	1500

**Current**

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

	Symbol	T727--45
RMS forward current, A	$I_T(\text{rms})$	700
Ave. forward current, A	$I_T(\text{av})$	450
One-half cycle surge current <sup>(1)</sup> , A	$I_{TSM}$	8000
$I^2t$ for fusing (for times $\geq 8.3$ ms) $A^2$ sec.	$I^2t$	265,000
Forward voltage drop at $I_{TM} = 625$ A and $T_J = 25^\circ\text{C}$ , V	$V_{TM}$	1.45
Min. repetitive $di/dt$ $A/\mu\text{sec}$ <sup>(1)(4)(5)</sup>	$di/dt$	400

**Switching**

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

	Symbol	
Max. turn-off time, $I_T = 400$ A, $T_J = 125^\circ\text{C}$ , $di/dt = 25$ A/ $\mu\text{sec}$ , reappplied $dv/dt = 20$ V/ $\mu\text{sec}$ linear to $0.8 V_{DRM}$ , $\mu\text{sec}$ <sup>(1)(4)</sup>	$t_q$	15 to 60
Typ. turn-on time, $I_T = 1000$ A, $V_D = 300$ V <sup>(1)</sup> , $\mu\text{sec}$	$t_{on}$	3.0
Min. critical $dv/dt$ , exponential to $V_{DRM}$ , $T_J = 125^\circ\text{C}$ , V/ $\mu\text{sec}$ <sup>(1)(4)</sup>	$dv/dt$	300
Min. $di/dt$ non-repetitive, A/ $\mu\text{sec}$ <sup>(1)(4)(5)</sup>	$di/dt$	800

**Gate**

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

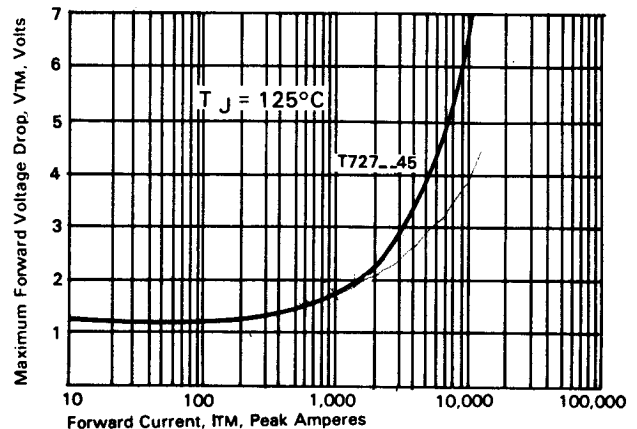
	Symbol	
Gate current to trigger at $V_D = 12$ V, mA	$I_{GT}$	150
Gate voltage to trigger at $V_D = 12$ V, V	$V_{GT}$	3
Non-triggering gate voltage, $T_J = 125^\circ\text{C}$ , and rated $V_{DRM}$ , V	$V_{GDM}$	0.15
Peak forward gate current, A	$I_{GTM}$	4
Peak reverse gate voltage, V	$V_{GRM}$	5
Peak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

**Thermal and Mechanical**

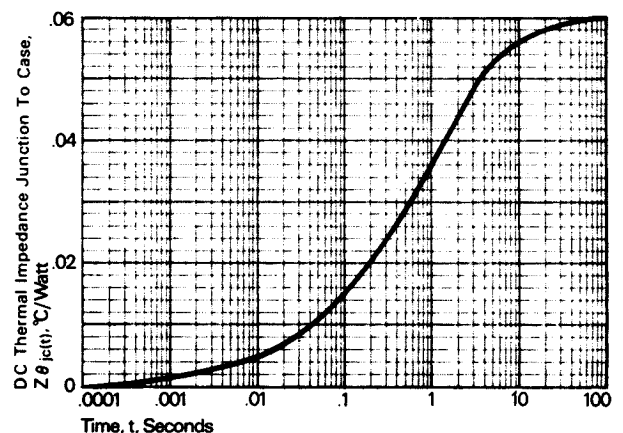
	Symbol	
Min., Max. oper. junction temp., $^\circ\text{C}$	$T_J$	-40 to +125
Min., Max. storage temp., $^\circ\text{C}$	$T_{stg}$	-40 to +150
Max. mounting torque, in lb. <sup>(1)</sup>		2000 to 2400
Max. thermal resistance <sup>(1)</sup> Double side cooled Junction to case, $^\circ\text{C}/\text{Watt}$	$R_{\theta JC}$	.06
Case to sink, lubricated, $^\circ\text{C}/\text{Watt}$	$R_{\theta CS}$	.02

- <sup>(1)</sup> Consult recommended mounting procedures.
- <sup>(2)</sup> Applies for zero or negative gate bias.
- <sup>(3)</sup> Per JEDEC RS-397, 5.2.2.1.
- <sup>(4)</sup> With recommended gate drive.
- <sup>(5)</sup> Higher  $dv/dt$  ratings available, consult factory.
- <sup>(6)</sup> Per JEDEC standard RS-397, 5.2.2.6.
- <sup>(7)</sup> For operation with antiparallel diode, consult factory.

Maximum Forward Voltage Drop VS Forward Current



Transient Thermal Impedance VS. Time

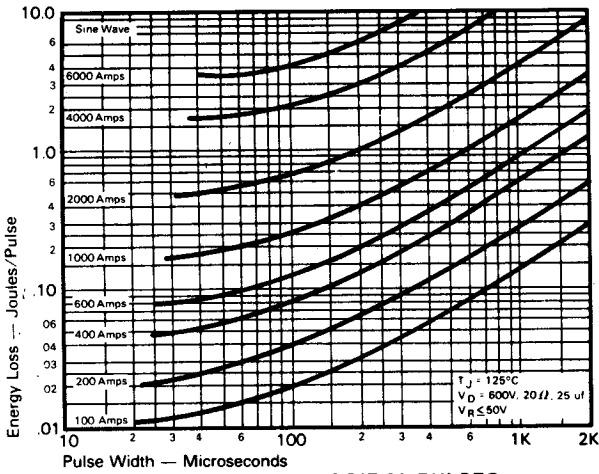


FAST SWITCHING THYRISTORS

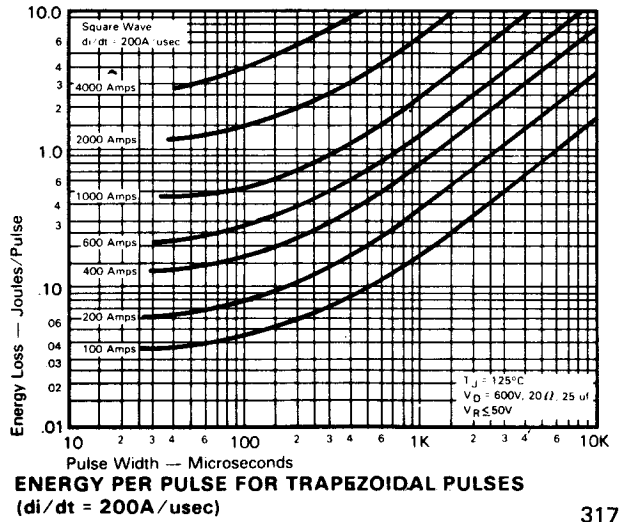
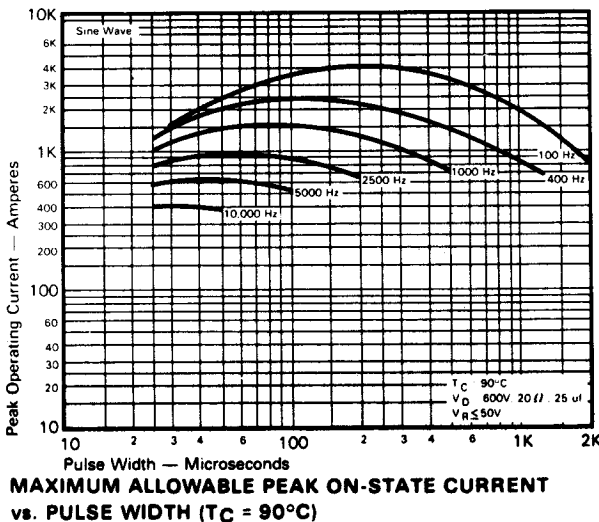
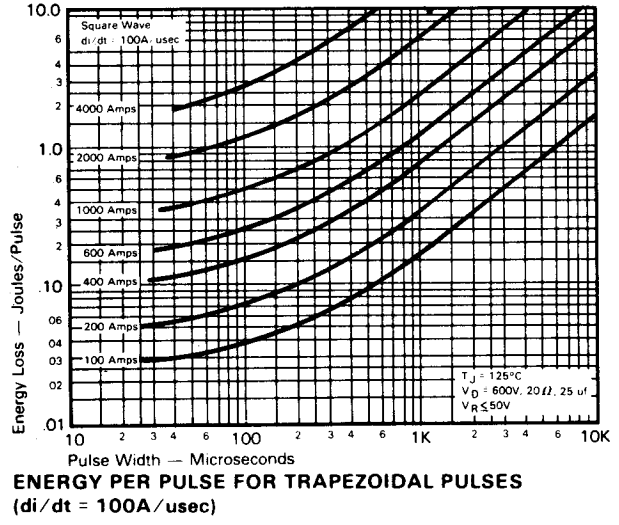
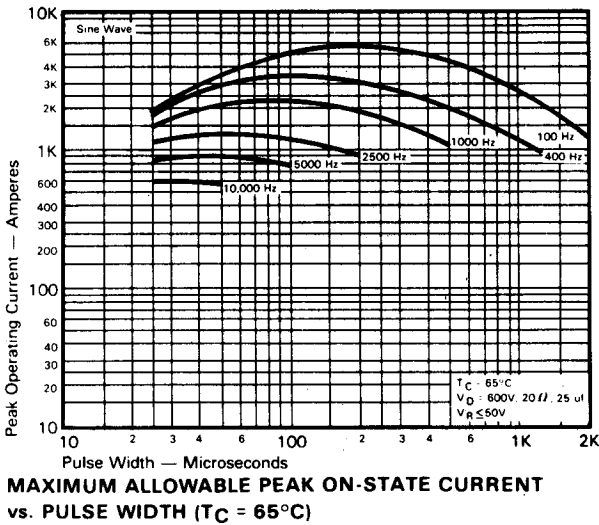
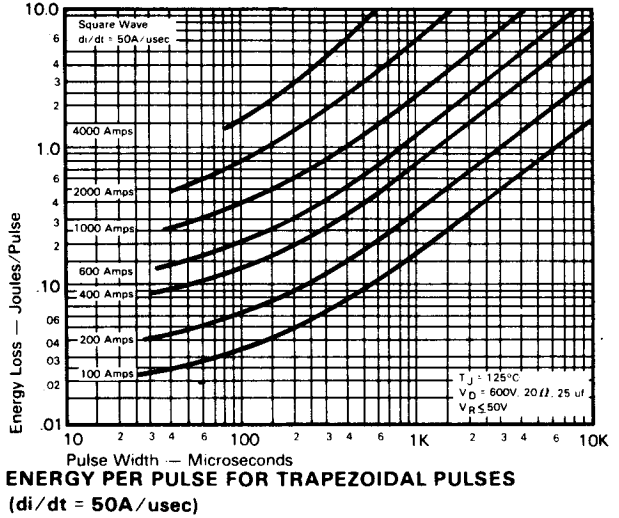
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## Sinusoidal Current Data



## Trapezoidal Wave Current Data

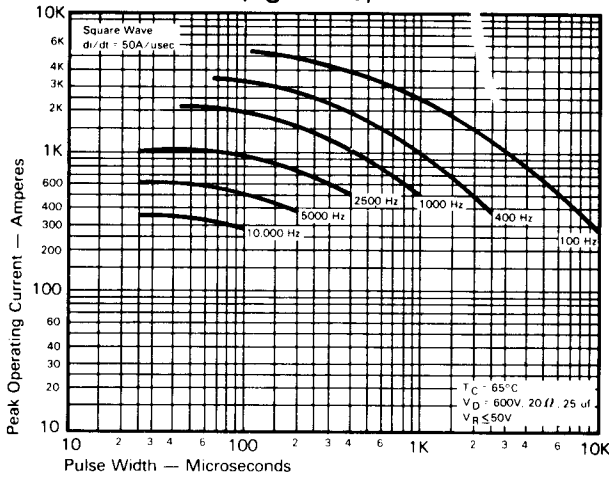


FAST SWITCHING  
THYRISTORS

450A Avg.  
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Up to 1200 Volts  
15-60  $\mu$ s

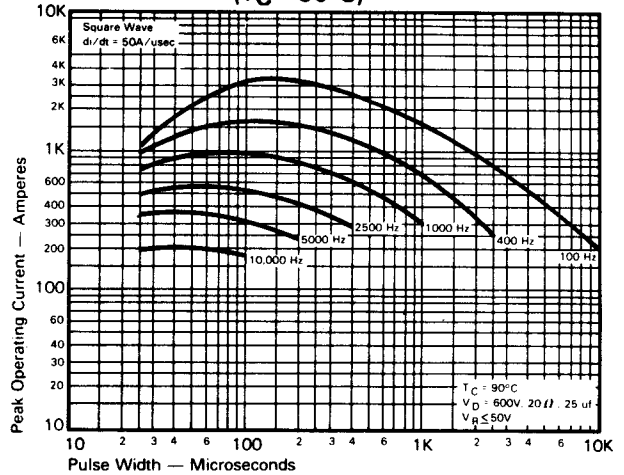
Fast Switching  
SCR  
T727\_45

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

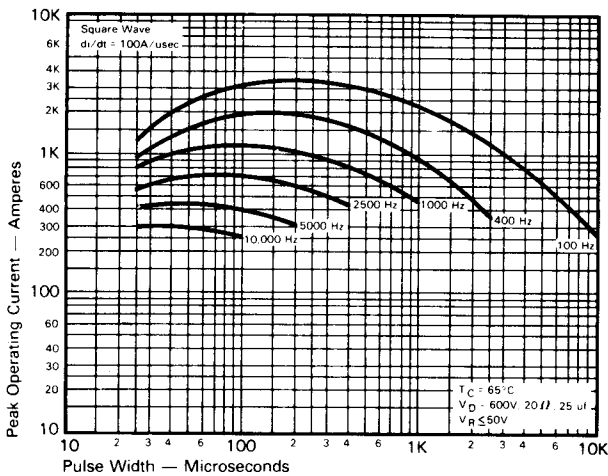


**MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ( $di/dt = 50\text{A}/\mu\text{sec}$ )**

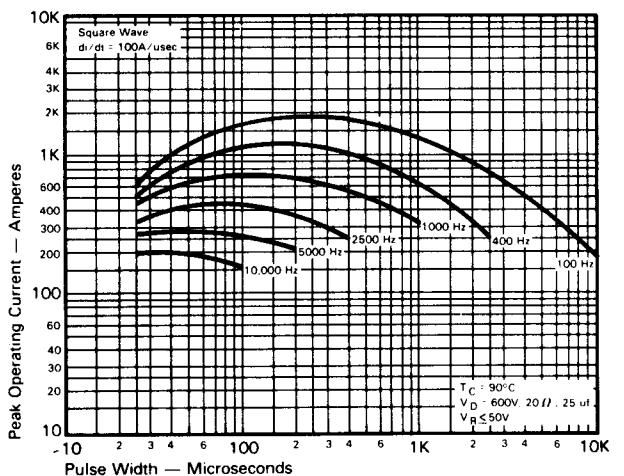
**Trapezoidal Wave Current Data**  
( $T_C = 90^\circ\text{C}$ )



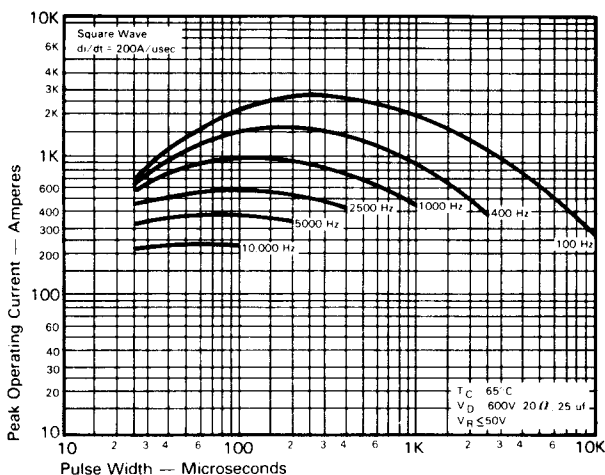
**MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ( $di/dt = 50\text{A}/\mu\text{sec}$ )**



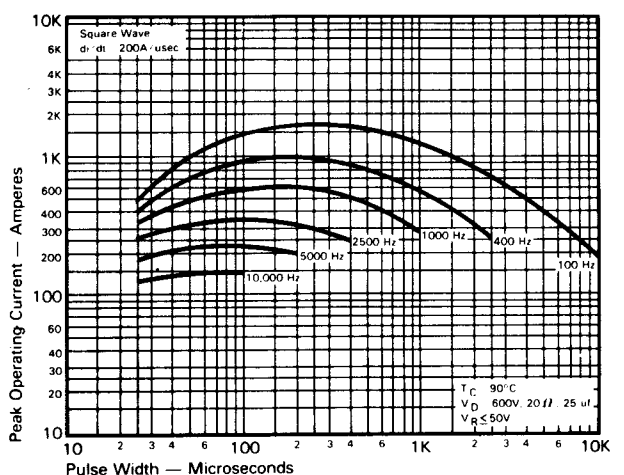
**MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ( $di/dt = 100\text{A}/\mu\text{sec}$ )**



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

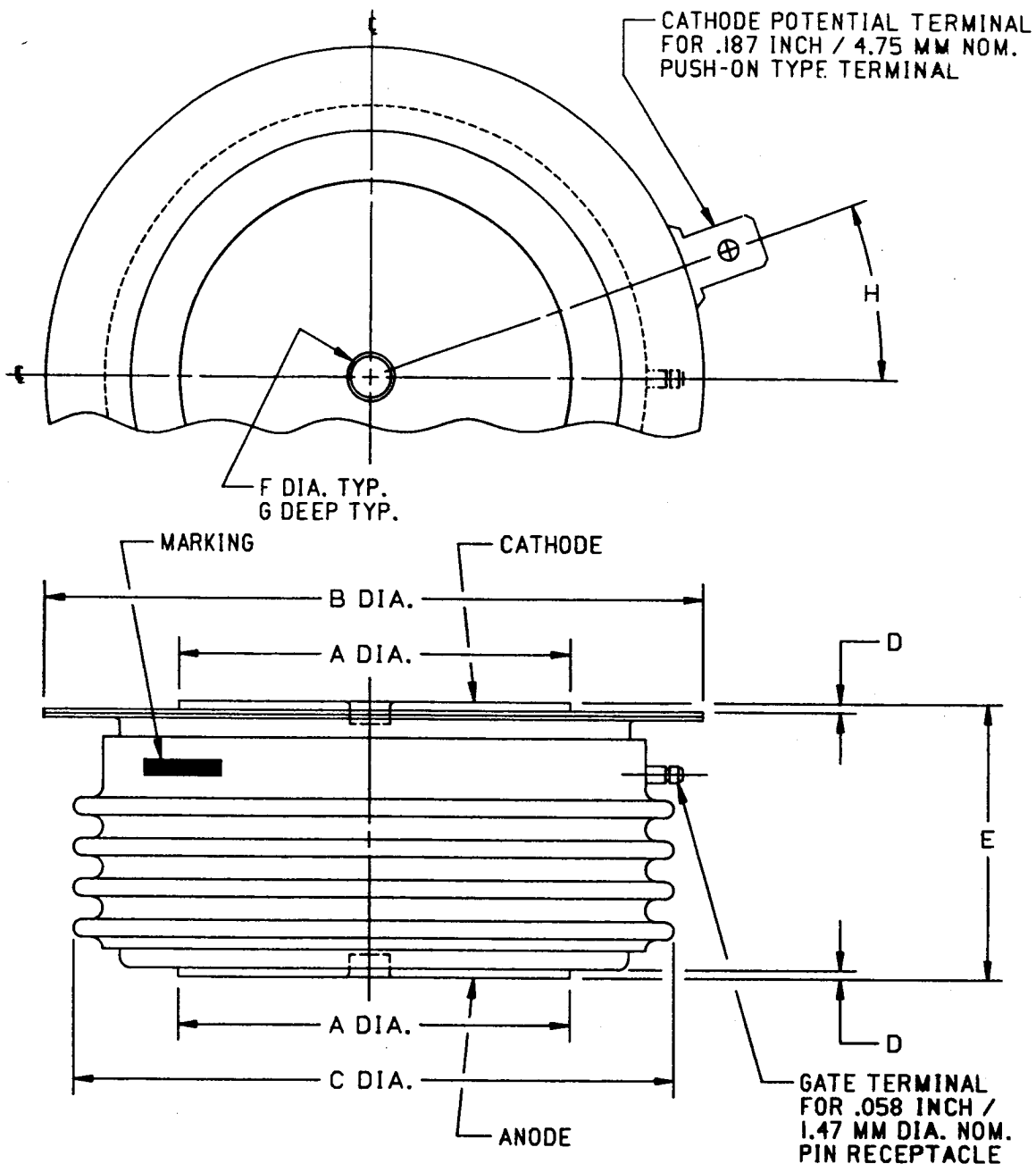


**MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ( $di/dt = 200\text{A}/\mu\text{sec}$ )**



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

FAST SWITCHING THYRISTORS



CASE NUMBER T72  
 NOMINAL DIMENSIONS

STRIKE DISTANCE = .58 INCH / 14.7 MM MIN.  
 CREEPAGE DISTANCE = 1.00 INCH / 25.4 MM MIN.

SYM.	A	B	C	D	E	F	G	H
INCHES	1.34	2.28	2.05	.030	1.020/1.060	.140	.080	20°
MM	34.0	57.9	52.1	0.76	25.91/26.92	3.56	2.03	20°

ALL DIMENSIONS ARE REFERENCE