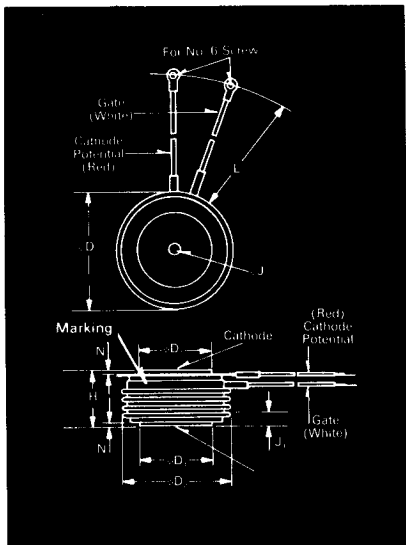


Fast Switching SCR T727_45

450A Avg.
(700 RMS)
Up to 1200 Volts
15-60 μ s



Symbol	Inches		Millimeters	
	Min.	Max.	Min.	Max.
ϕD	2.250	2.290	57.15	58.17
ϕD_1	1.333	1.343	33.86	34.11
ϕD_2	2.030	2.090	51.56	53.09
H	1.020	1.060	25.91	26.92
ϕJ	.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).

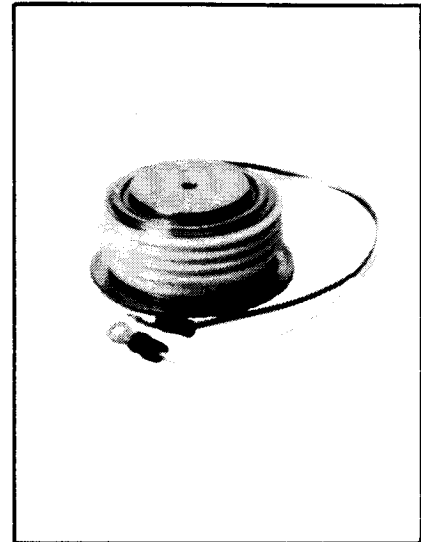
Strike Distance—.69 in. min. (17.53 mm).

(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	t _q μ 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, t_q = 30 μ 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 μ sec V_F data, consult factory

**450A Avg.
(700 RMS)
Up to 1200 Volts
15-60 μ s**

**Fast Switching
SCR
T727..45**

Voltage

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

Symbol	
Repetitive peak forward blocking voltage, V	V_{DRM}
Repetitive peak reverse voltage, V	V_{RRM}
Non-repetitive transient peak reverse voltage, $t \leq 5.0 \text{ msec}$, 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	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
30						30						

Current

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

Symbol	T727—45
RMS forward current, A	$I_{T(rms)}$ 700
Ave. forward current, A	$I_{T(av)}$ 450
One-half cycle surge current ^③ , A	I_{TSM} 8000
I^2t for fusing (for times $\geq 8.3 \text{ ms}$) A ² sec.	I^2t 265,000
Forward voltage drop at $I_T = 625 \text{ A}$ and $T_J = 25^\circ\text{C}$, V	V_{TM} 1.45
Min. repetitive di/dt A/ μsec ^{①④⑤}	di/dt 400

Switching

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

Symbol	
Max. turn-off time, $I_T = 400 \text{ A}$ $T_J = 125^\circ\text{C}$, $di/dt = 25$ A/ μsec , reappplied $dv/dt =$ 20V/ μsec linear to $0.8 V_{DRM}$, μsec ^{①④}	t_q 15 to 60
Typ. turn-on-time, $I_T = 1000 \text{ A}$ $V_D = 300 \text{ V}$ ^④ , μsec	t_{on} 3.0
Min. critical dv/dt , exponential to V_{DRM} $T_J = 125^\circ\text{C}$, V/ μsec ^{②⑤}	dv/dt 300
Min. di/dt non-repetitive, A/ μsec ^{①④⑤}	di/dt 800

Gate

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

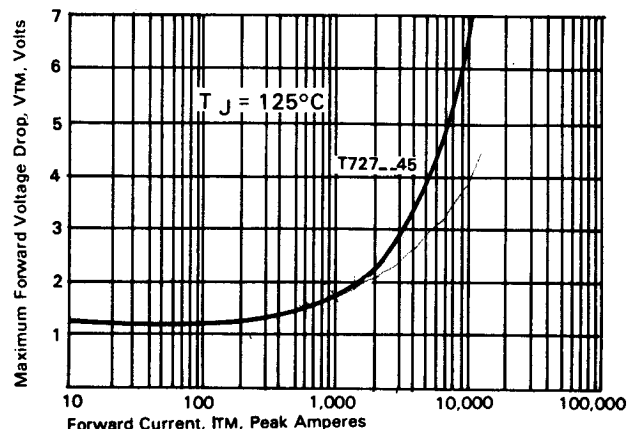
Symbol	
Gate current to trigger at $V_D = 12 \text{ V}$, mA	I_{GT} 150
Gate voltage to trigger at $V_D = 12 \text{ V}$, V	V_{GT} 3
Non-triggering gate voltage, $T_J = 125^\circ\text{C}$, and rated V_{DRM} , V	V_{GDM} 0.15
Peak forward gate current, A	I_{GTM} 4
Peak reverse gate voltage, V	V_{GRM} 5
Peak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

Thermal and Mechanical

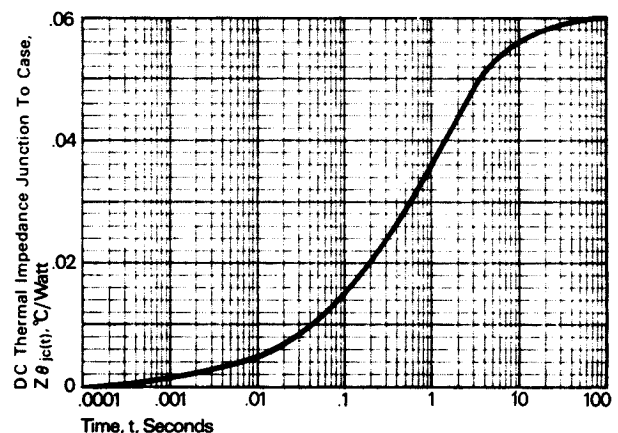
Symbol	
Min., Max. oper. junction temp., $^\circ\text{C}$	T_J -40 to +125
Min., Max. storage temp., $^\circ\text{C}$	T_{stg} -40 to +150
Max. mounting torque, in lb. ^①	2000 to 2400
Max. thermal resistance ^① Double side cooled Junction to case, $^\circ\text{C}/\text{Watt}$	$R_{\theta JC}$.06
Case to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



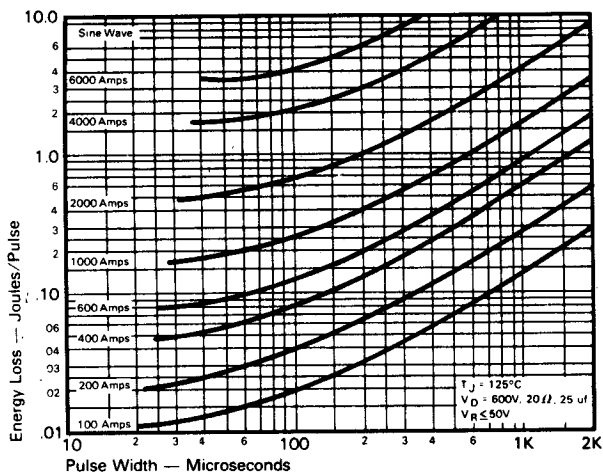
Transient Thermal Impedance VS. Time



Fast Switching SCR T727_45

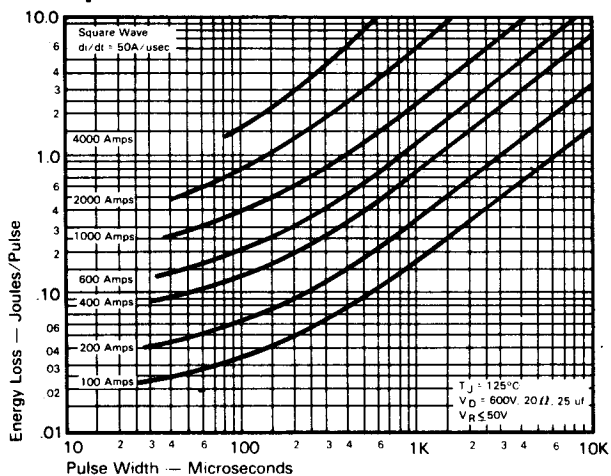
450A Avg.
(700 RMS)
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15-60 μ s

Sinusoidal Current Data

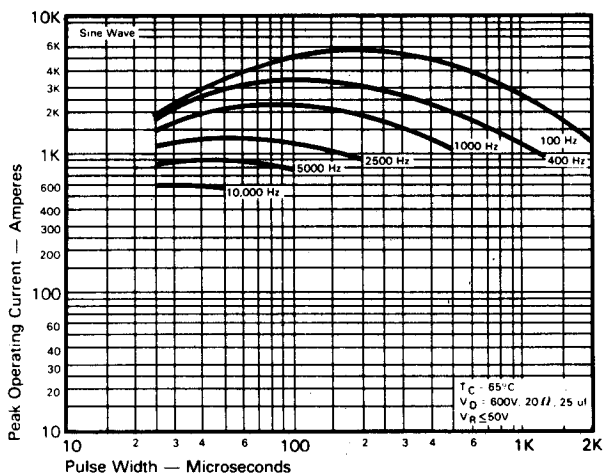


ENERGY PER PULSE FOR SINUSOIDAL PULSES

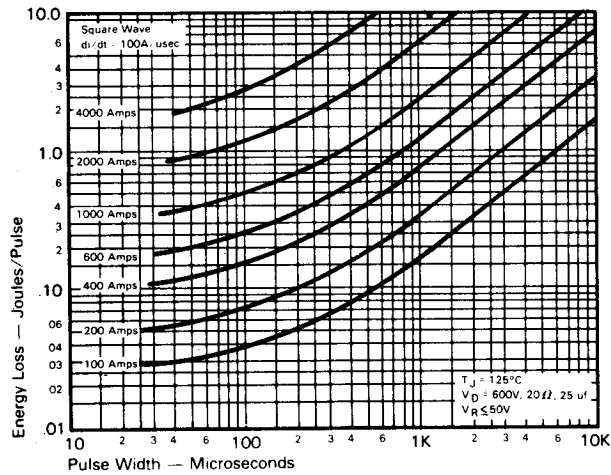
Trapezoidal Wave Current Data



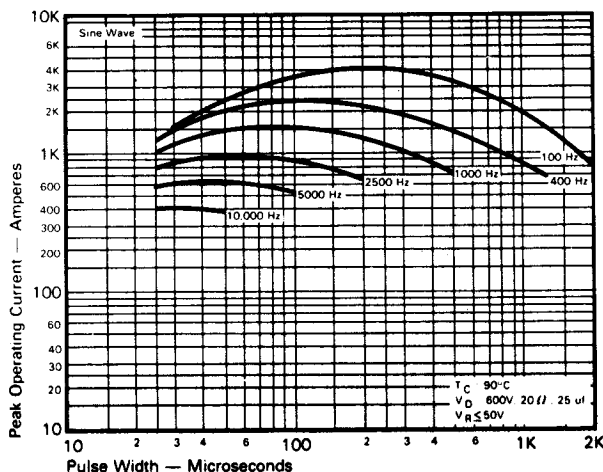
ENERGY PER PULSE FOR TRAPEZOIDAL PULSES
($di/dt = 50\text{A}/\mu\text{sec}$)



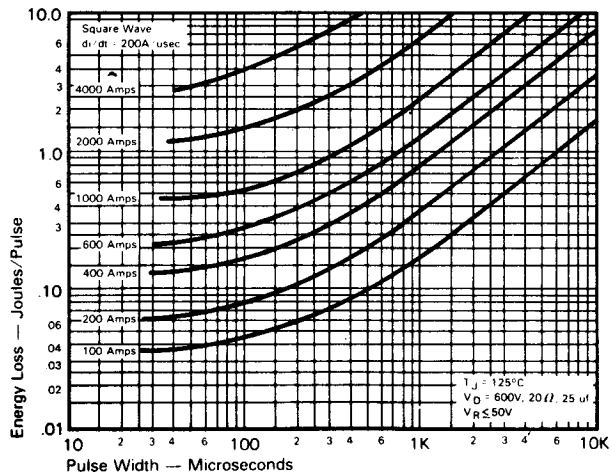
MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT
vs. PULSE WIDTH ($T_C = 65^\circ\text{C}$)



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



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

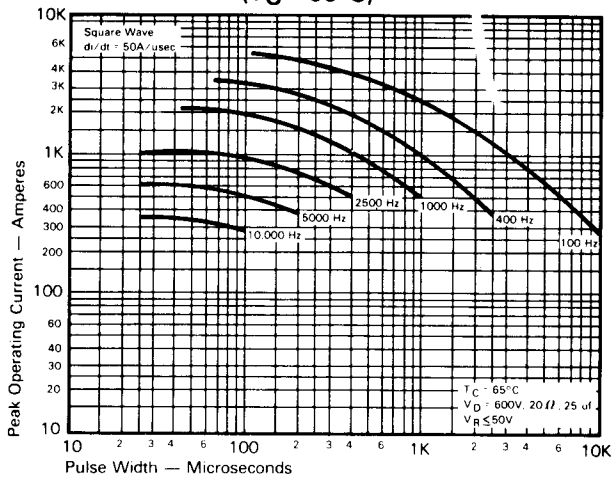


ENERGY PER PULSE FOR TRAPEZOIDAL PULSES
($di/dt = 200\text{A}/\mu\text{sec}$)

**450A Avg.
(700 RMS)
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15-60 μ s**

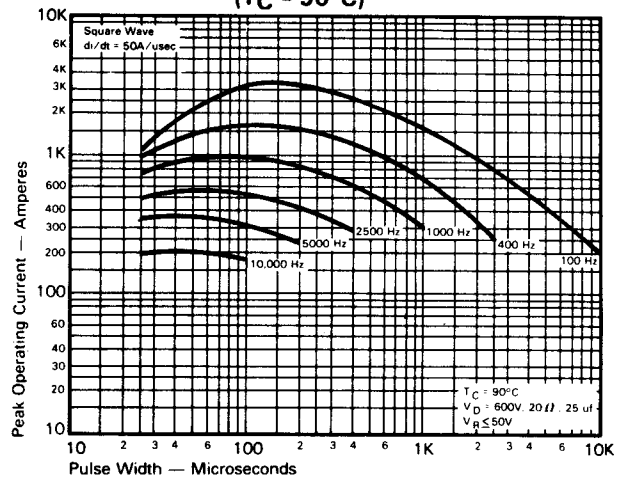
**Fast Switching
SCR
T727_45**

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

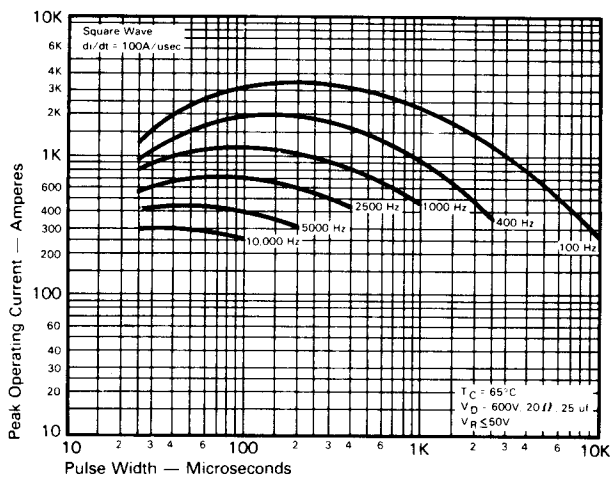


**MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT
vs. PULSE WIDTH ($di/dt = 50\text{A}/\mu\text{sec}$)**

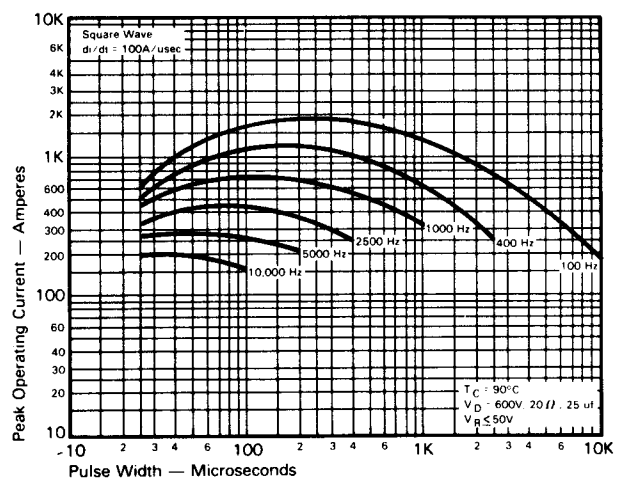
Trapezoidal Wave Current Data ($T_C = 90^\circ\text{C}$)



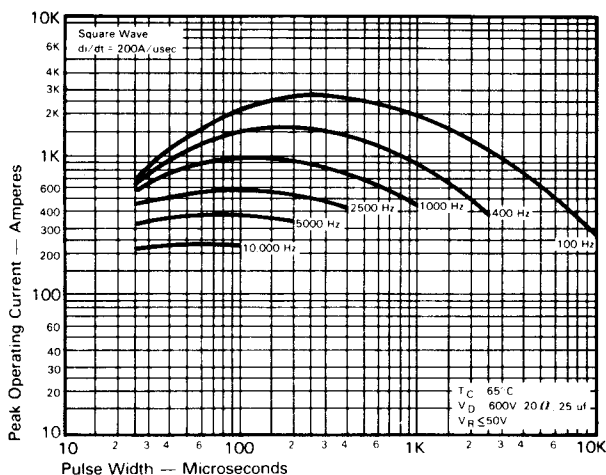
**MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT
vs. PULSE WIDTH ($di/dt = 50\text{A}/\mu\text{sec}$)**



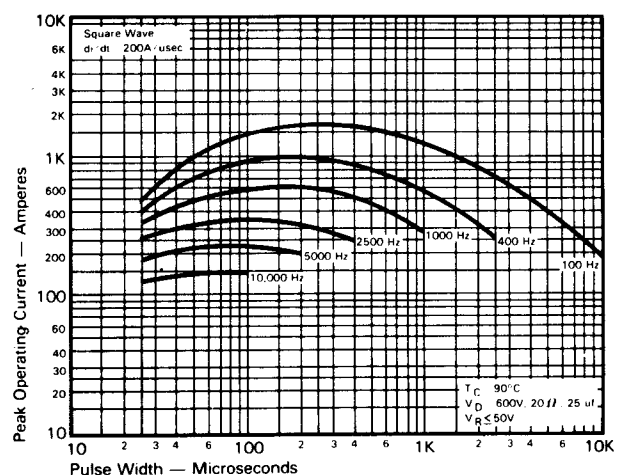
**MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT
vs. PULSE WIDTH ($di/dt = 100\text{A}/\mu\text{sec}$)**



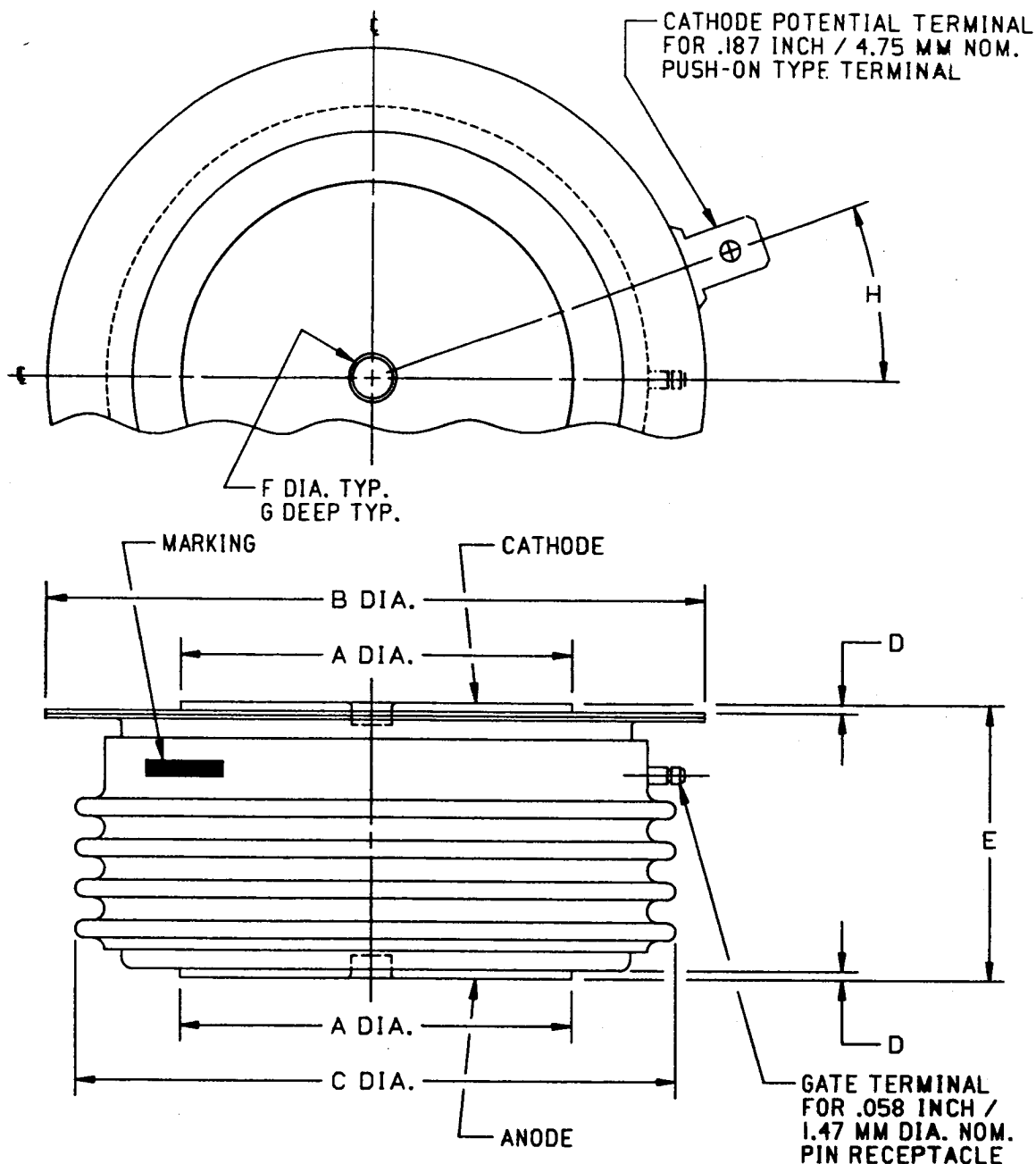
**MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT
vs. PULSE WIDTH ($di/dt = 100\text{A}/\mu\text{sec}$)**



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



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