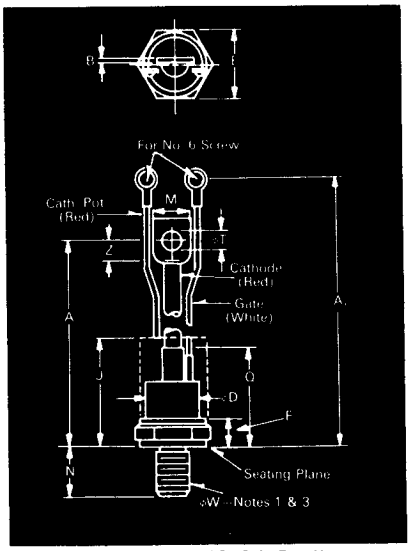
POWEREX 173 Pavilion Lane, Youngwood, PA 15697 www.pwrx.com

Fast Switching SCR T507__80

80A Avg. (125 RMS) Up to 1400 Volts 10-50 μs

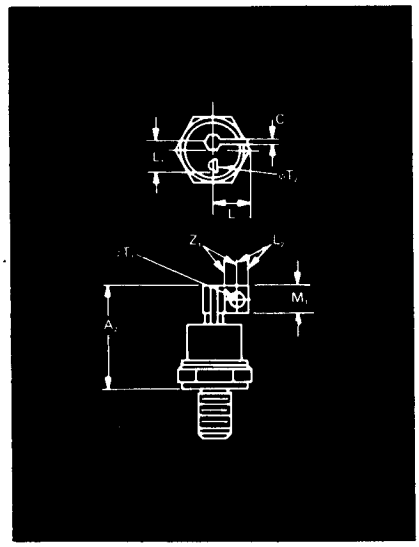


Conforms to TO-94 Outline

Symbol	Inches		Millimeters	
	Min.	Max.	Min.	Max.
A	5.775	6.265	146.69	159.13
A_1	6.850	7.500	173.99	190.50
B	.055	.075	1.40	1.91
φD	.860	1.000	21.84	25.40
E	1.031	1.063	26.19	27.00
F	.255	.400	6.48	10.16
J	2.50		63.50	
M	.437	.650	11.10	16.51
N	.796	.827	20.24	21.01
Q		1.675		42.55
φT	.260	.291	6.60	7.39
Z	.250		6.35	
φW	½-20 UNF-2A			

Creep & Strike Distance.
T500—.50 in. min. (12.85 mm).
(In accordance with NEMA standards.)
Finish—Nickel Plate.
Approx. Weight—5 oz. (142 g).

1. Complete threads to extend to within 2½ threads of seating plane.
2. Angular orientation of terminals is undefined.
3. Pitch diameter of ½-20 UNF-2A (coated) threads (ASA B1.1-1960).
4. Dimension "J" denotes seated height with leads bent at right angles.

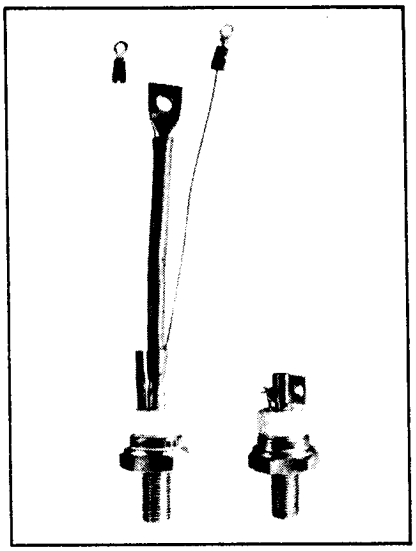


Conforms to TO-83 Outline

Symbol	Inches		Millimeters	
	Min.	Max.	Min.	Max.
A_2		1.810		45.97
C	.070	.110	1.78	2.79
L		.650		16.51
L_1	.420	.520	10.67	13.21
L_2	.180		4.57	
M_1	.360	.470	9.14	11.94
φT₁	.190	.235	4.83	5.97
φT₂	.060	.080	1.52	2.03
Z_1	.180		4.57	
φW	½-20 UNF-2A			

Approx. Weight—4 oz. (114 g).

1. Basic dimensions of TO-94 and TO-83 are same except as noted.



Features:
- Center fired di/namic
- High di/dt with soft gate control
- High frequency operation
- Sinusoidal waveform operation to 20 KHz
- Rectangular waveform operation to 20 KH
- Low dynamic forward voltage drop
- Low switching losses at high frequency
- Lifetime Guarantee

Applications:
- Inverters for
  - UPS
  - Induction Heating
  - AC Motor Control
- Switching power supplies
- Cycloconverters
- Choppers
- Crowbars

FAST SWITCHING THYRISTORS

Ordering Information

Type	Voltage		Current		Turn-off		Gate-current		Leads	
Case	V_{DRM} and V_{RRM} (V)	Code	$I_{T(av)}$ (A)	Code	t_q (μsec)	Code	I_{GT} (ma)	Code	Case	Code
T507	100	01	80	80	10	8	150	4	TO-94	AQ
	200	02			15	7			TO-83	AS
	300	03			20	6				
	400	04			25	5				
	500	05			30	5				
	600	06			40	4				
	700	07			50	3				
	800	08			70	C				
	900	09								
	1000	10								
	1100	11								
	1200	12								
	1400	*14								

*for 10 μsec turn-off, consult factory

Example

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

Type T 507 rated at 80 A average with $V_{DRM} = 1000V$, $I_{GT} = 150$ ma, $t_q = 30$ μsec max. and flex leads—order as:

Type				Voltage	Current		Turn Off	Gate Current	Leads	
T	5	0	7	1	0	8	0	5	4	A	Q

80A Avg. (125 RMS) Up to 1400 Volts 10-50 μs

Fast Switching SCR T507__80

Voltage

Blocking State Maximums ② (T_J = 125°C)

	Symbol													
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}	← 15 →												
Reverse leakage current, mA peak	I_{RRM}	← 15 →												

Current

Conducting State Maximums (T_J = 125°C)	Symbol	T507__80
RMS forward current, A	$I_{T(rms)}$	125
Ave. forward current, A	$I_{T(av)}$	80
One-half cycle surge current③, A	I_{TSM}	1400
I^2t for fusing (for times $\geq$ 8.3 ms) A^2 sec.	I^2t	8150
Forward voltage drop at I_{TM} = 500A and T_J = 25°C, V	V_{TM}	3.2
Min. repetitive di/dt①④⑥, A/μsec	di/dt	150

Switching

(T_J = 25°C)	Symbol	
Max. turn-off time, I_T = 50A, T_J = 125°C, di_R/dt = 5 A/μsec, reapplied dv/dt = 20V/μsec linear to 0.8 V_{DRM}, μsec ⑤⑦	t_q	10 to 50
Typ. turn-on-time, I_T = 100A V_D = 100V④, μsec	t_{on}	3.5
Min. critical dv/dt, exponential to V_{DRM}, T_J = 125°C, V/μsec②③	dv/dt	200
Min. di/dt non-repetitive, A/μsec ①④⑥	di/dt	800

Gate

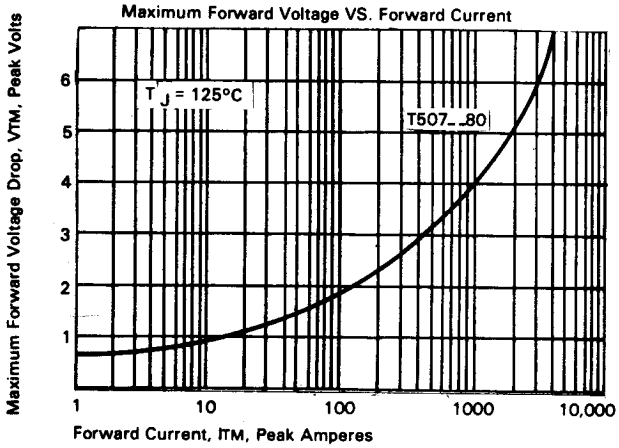
Maximum Parameters (T_J = 25°C)	Symbol	
Gate current to trigger at V_D = 12V, mA	I_{GT}	150
Gate voltage to trigger at V_D = 12V, V	V_{GT}	3
Non-triggering gate voltage, T_J = 125°C, and rated V_{DRM}, V	V_{GDM}	0.15
Peak forward gate current, A	I_{GTM}	4
Peak reverse gate voltage, V	V_{GRM}	5
Peak gate power, Watts	P_{GM}	16
Average gate power, Watts	$P_{G(av)}$	3

Thermal and Mechanical

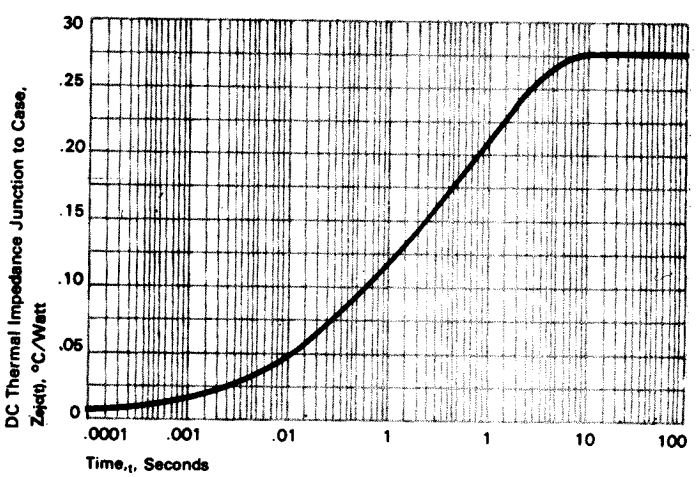
	Symbol	
Min., Max. oper. junction temp., °C	T_J	−40 to +125
Min., Max. storage temp., °C	Tstg	−40 to +150
Max. mounting torque, in lb. ①		130
Max. Thermal resistance ① Junction to case, °C/Watt	$R_{\theta JC}$	.28
Case to sink, lubricated, °C/Watt	$R_{\theta CS}$	.12

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

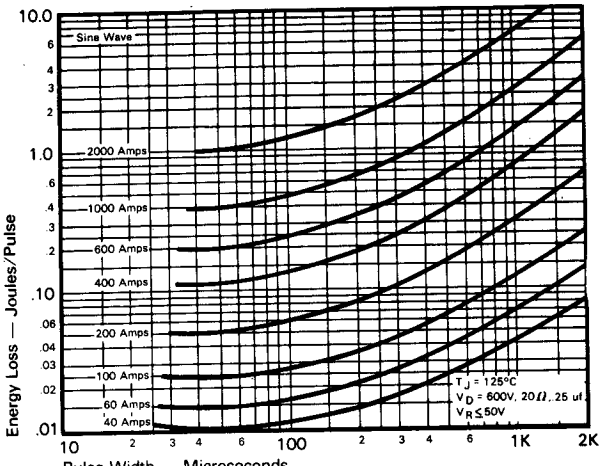


FAST SWITCHING THYRISTORS

Fast Switching SCR T507__80

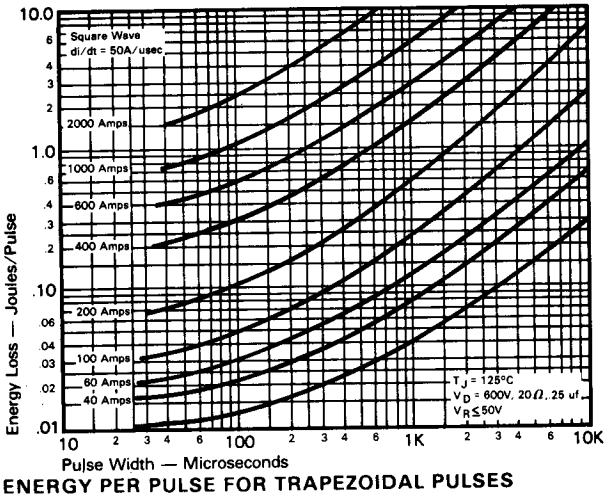
80A Avg.
(125 RMS)
Up to 1400 Volts
10-50 μs

Sinusoidal Current Data

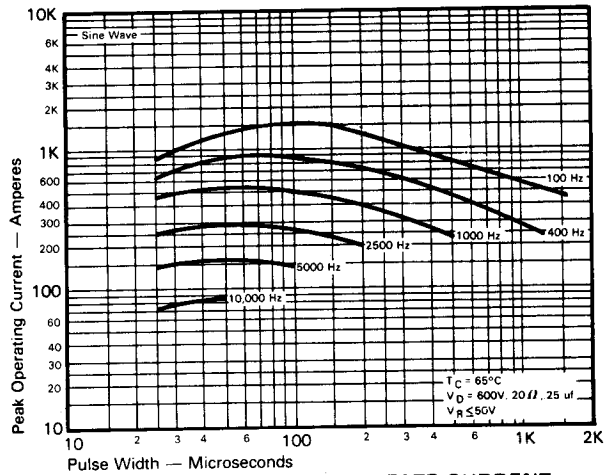


ENERGY PER PULSE FOR SINUSOIDAL PULSES

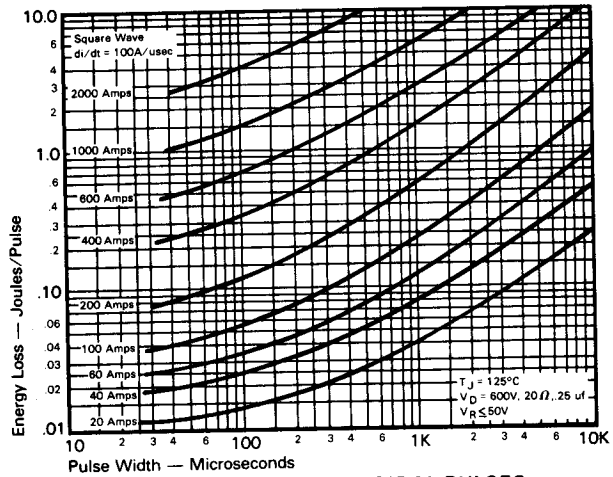
Trapezoidal Wave Current Data



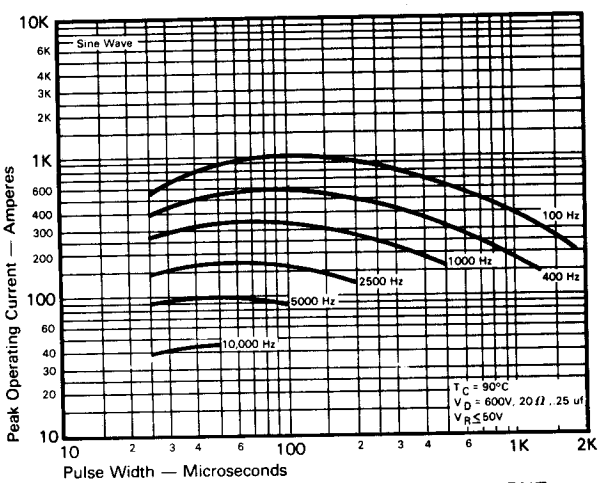
ENERGY PER PULSE FOR TRAPEZOIDAL PULSES
(di/dt = 50A/usec)



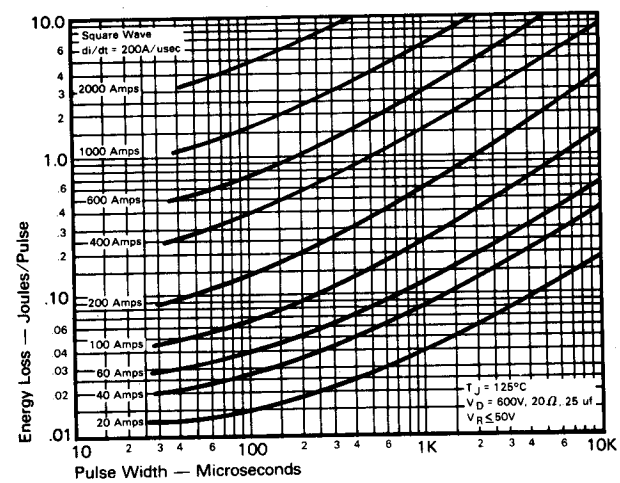
MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT
vs. PULSE WIDTH (T_C = 65°C)



ENERGY PER PULSE FOR TRAPEZOIDAL PULSES
(di/dt = 100A/usec)



MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT
vs. PULSE WIDTH (T_C = 90°C)

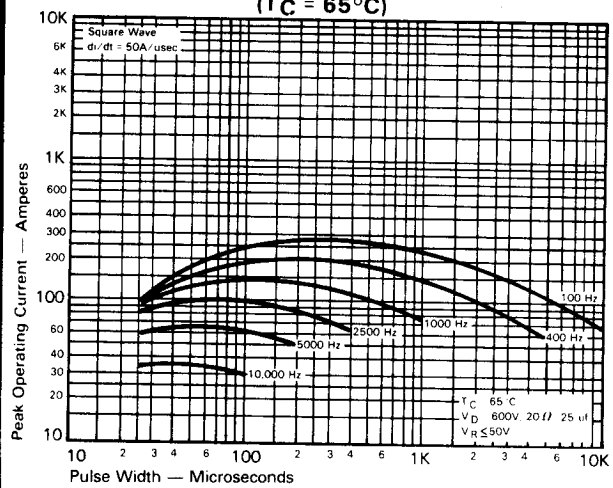


ENERGY PER PULSE FOR TRAPEZOIDAL PULSES
(di/dt = 200A/usec)

80A Avg. (125 RMS) Up to 1400 Volts 10-50 μs

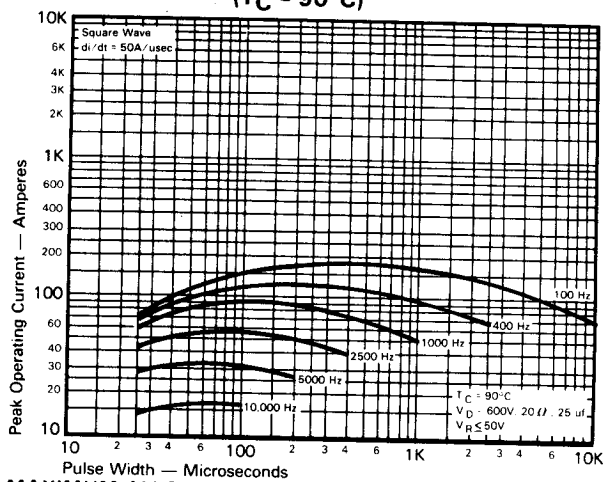
Fast Switching SCR T507_ _80

Trapezoidal Wave Current Data (T_C = 65°C)

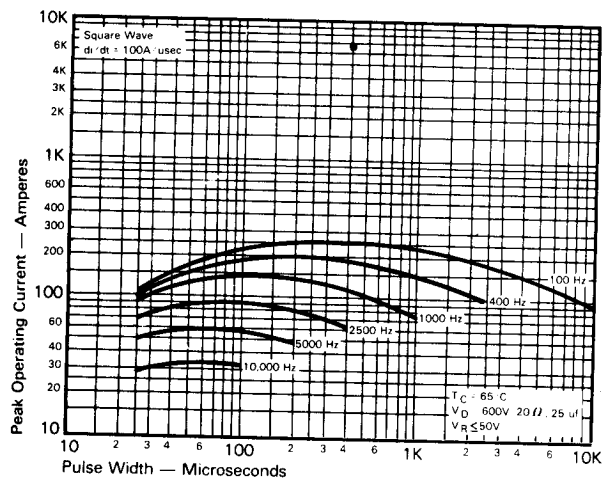


MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH (di/dt = 50A/usec)

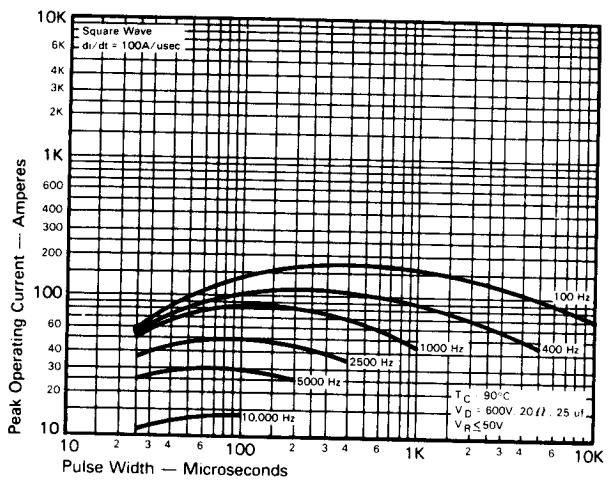
Trapezoidal Wave Current Data (T_C = 90°C)



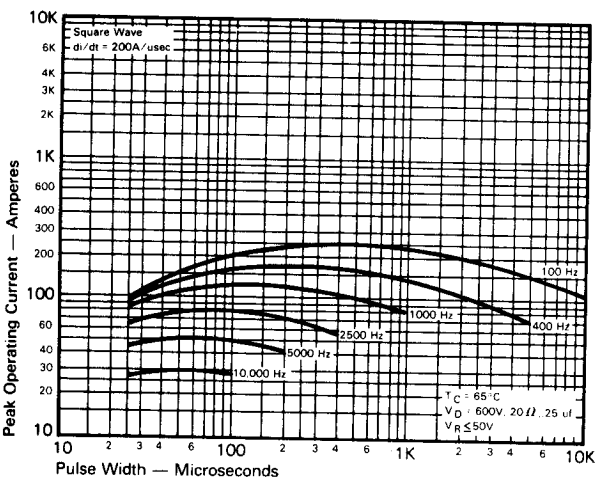
MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH (di/dt = 50A/usec)



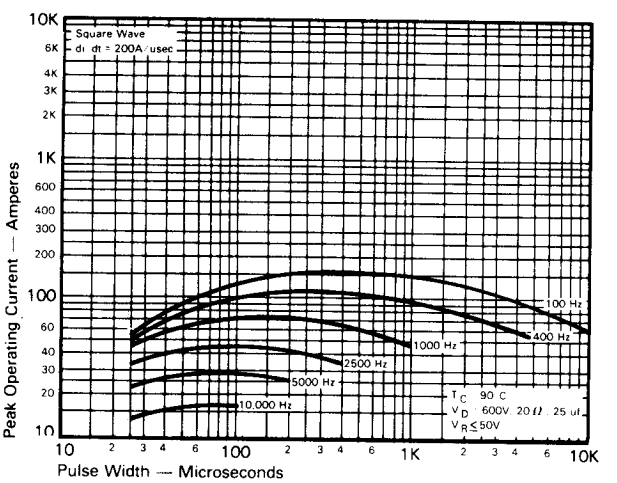
MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH (di/dt = 100A/usec)



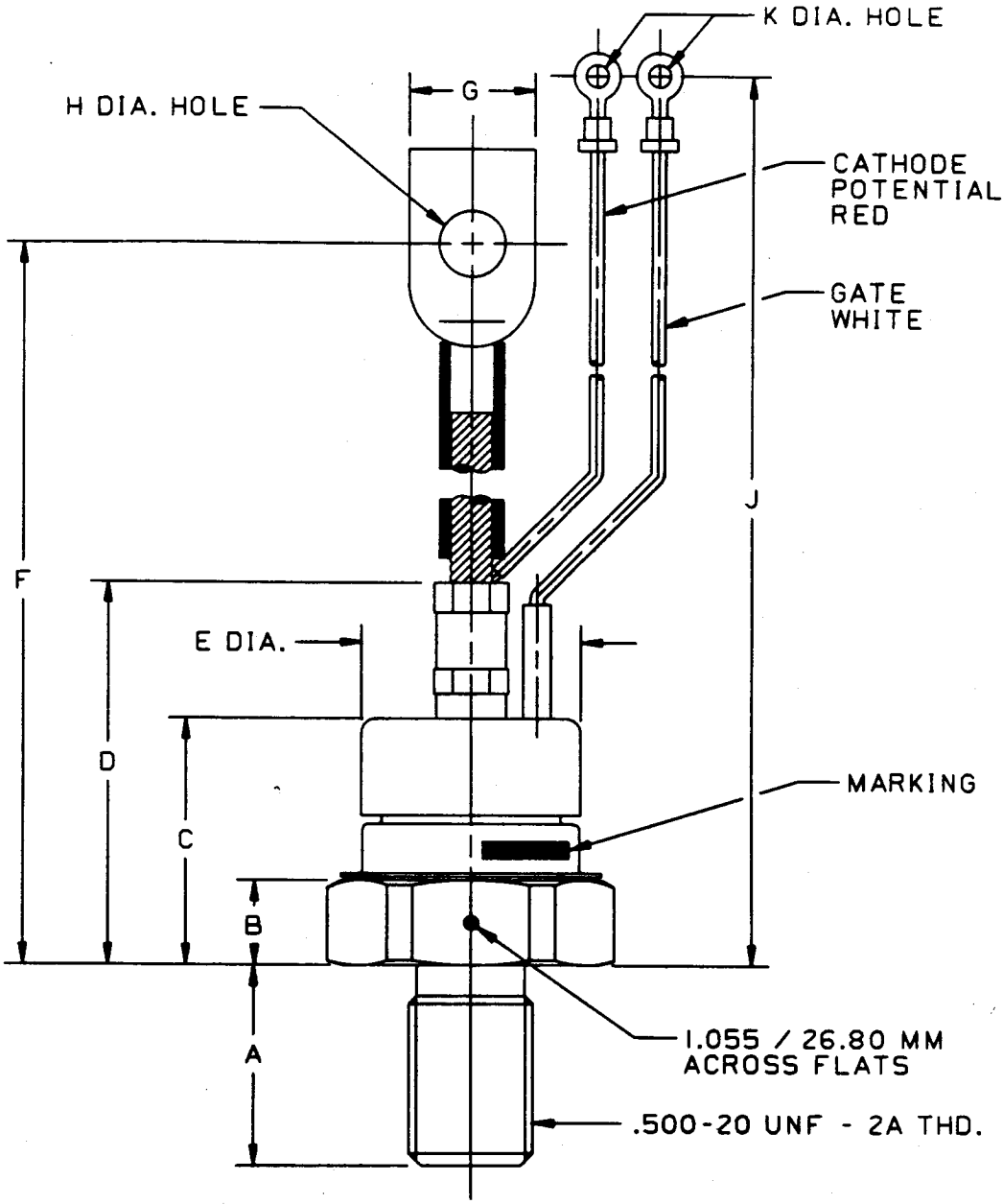
MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH (di/dt = 100A/usec)



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



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



CASE NUMBER T50
NOMINAL DIMENSIONS

STRIKE DISTANCE = .44 INCH / 11.2 MM MIN.
CREEPAGE DISTANCE = .44 INCH / 11.2 MM MIN.

SYM.	A	B	C	D	E	F	G	H	J	K
INCHES	.81	.34	.98	1.58	.89	6.12	.48	.266	7.44	.146
MM	20.6	8.6	24.9	40.1	22.6	155.4	12.2	6.76	189.0	3.71

ALL DIMENSIONS ARE REFERENCE