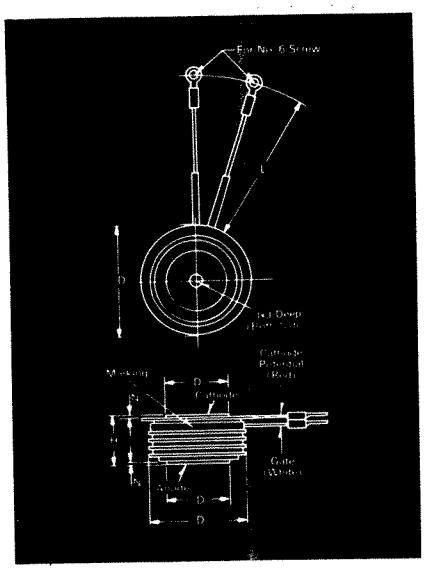
POWEREX 173 Pavilion Lane, Youngwood, PA 15697 www.pwrx.com

Fast Switching SCR T9GH__10

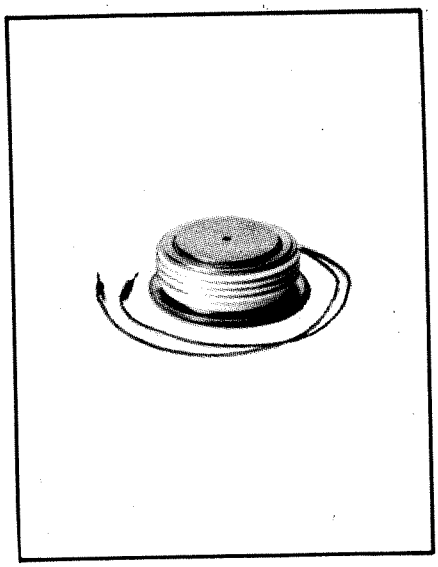
1000A Avg. (1570 RMS) Up to 1200 Volts 20-60 μs



T9G Outline

Symbol	Inches		Millimeters	
	Min.	Max.	Min.	Max.
ϕD	2.850	2.900	72.39	73.66
ϕD_1	1.845	1.855	46.86	47.12
ϕD_2	2.560	2.640	65.02	67.06
H	1.030	1.070	26.16	27.18
ϕJ	.135	.145	3.43	3.68
J_1	.075	.090	1.91	2.29
L	11.50	12.50	292.10	317.50
N	.050		1.27	

Creep Distance—1.20 in. min. (30.48 mm).
Strike Distance—.70 in. min. (17.78 mm).
(In accordance with NEMA standards.)
Finish—Nickel Plate.
Approx. Weight—2 lb. (908 g).
1. Dimension "H" is a clamped dimension.



Features:
- Interdigitated, di/namic Gate Structure
- Hard Commutation Turn-Off
- Forward Blocking Capabilities to 1200
- Low Switching Losses at High Frequency
- Soft Commutation (Feedback Diode) Testing Available
- High di/dt with soft gate control

Applications:
- Induction Heating
- Transportation
- Inverters

Ordering Information

Type	Voltage		Current		Turn-off		Gate current		Leads	
Code	V_{DRM} and V_{RRM} * (V)	Code	$I_{T(av)}$ (A)	Code	tq usec	Code	I_{GT} (ma)	Code	Case	Code
T9GH	600	06	1000	10	20	6	300	2	T9G	DH
	800	08			25	8				
	1000	10			30	5				
	1200	12			40	4				
					50	3				
					60	2				

Example

Obtain optimum device performance for your application by selecting proper order code.

Type T9GH rated at 1000A average with V_{DRM} = 1000V
tq = 30 usec.
I_{GT} = 300 ma, and standard 12 inch leads -- order as:

Type				Voltage		Current		Turn Off	Gate Current	Leads	
T	9	G	H	1	0	1	0	5	2	D	H

*for lower voltages consult factory

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Voltage

Blocking State Maximums ① (T_J = 125°C)

	Symbol				
Repetitive peak forward blocking voltage, V	V_{DRM}	600	800	1000	1200
Repetitive peak reverse voltage, V	V_{RRM}	600	800	1000	1200
Non-repetitive transient peak reverse voltage, t ≤ 5.0 msec, V	V_{RSM}	700	900	1100	1300
Forward leakage current, mA peak	I_{DRM}	← 60 →			
Reverse leakage current, mA peak	I_{RRM}	← 60 →			

Current

Conducting State Maximums (T_J = 125°C)	Symbol	T9GH__10
RMS forward current, A	$I_{T(rms)}$	1570
Ave. forward current, A	$I_{T(av)}$	1000
One-half cycle surge current③, A	I_{TSM}	15,000
I^2t for fusing (t=8.3 ms) A^2sec	I^2t	937,000
Max I^2t of package (t=8.3 ms), A^2sec	I^2t	90 x 10^6
Forward voltage drop at ITM = 1500A and TJ = 25°C, V	V_{TM}	2.10
Min. Repetitive di/dt A/usec. ① ④ ⑤ di/dt		500

Gate

(T_J=25°C)	Symbol	Min	Typ	Max
Gate current to trigger at V_D=12V, mA	I_{GT}		200	300
Gate voltage to trigger at V_D=12V, V	V_{GT}		1.5	3.0
Non-triggering gate voltage, T_J=125°C, and rated V_{DRM}, V	V_{GDM}			.15
Non-triggering Gate Current at V_D=12V, mA	I_{GNT}		20	
Peak forward gate current, A	I_{GTM}			10
Peak reverse gate voltage, V	V_{GRM}			5
Peak gate power, Watts	P_{GM}			60
Average gate power, Watts	$P_{G(av)}$			3

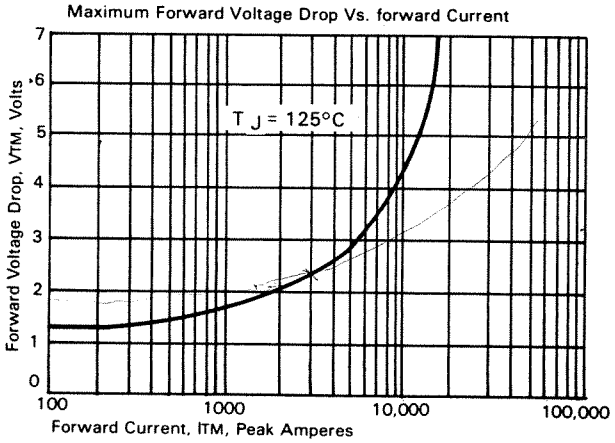
Switching

(T_J=25°C)	Symbol	
HARD COMMUTATION: ①		
Typical Turn-off time, IT = 1000A 50V≤VR≤VRRM T_J = 125°C, di R/dt = 100A/usec reapplied dv/dt = 200V/usec linear to 0.8 V_{DRM}, usec		20-60
Typical Turn-On and Delay Time ITM = 1000A, tp = 450 usec ④	ton	3.0
VD = 1100V, usec	td	1.5
Typical Reverse recovery charge for 40 usec device. IT = 1000A, di R/dt = 100A/usec T_J = 125°C, tp = 100 usec, ucol	Q_{RR}	260
Minimum Critical dv/dt exponential to V_{DRM} T_J = 125°C, V/usec ② ⑤	dv/dt	400
Minimum di/dt @ non-repetitive, ① ④ ⑤ A/usec	di/dt	1000
Latching Current VD = 75V, mA	Typ I_L	500
Holding Current VD = 75V, ma	Max I_L	1000
	Typ I_H	300
	Max I_H	800

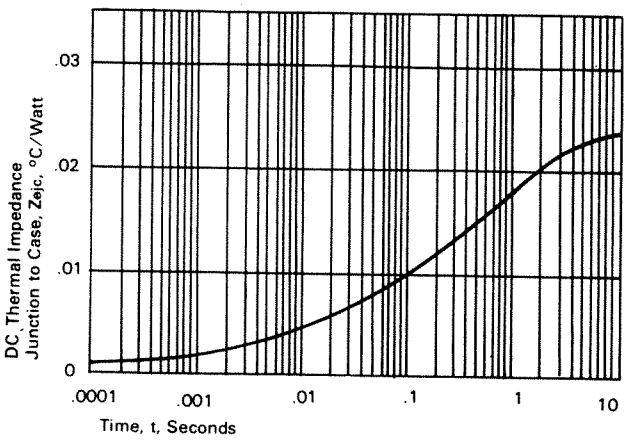
Thermal and Mechanical

	Symbol	Min	Typ	Max
Oper. junction temp., °C	T_J	—40		125
Storage temp., °C	T_{stg}	—40		150
Mounting force, lb. ⑥		5000		5500
Thermal resistance with double sided cooling ⑦ Junction to case, °C/Watt	R#JC			.023
Case to sink, lubricated, °C/Watt	R#CS	.006		.0075

Maximum Forward Voltage Drop Vs. forward Current



Transient Thermal Impedance VS. Time



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 For different turn-off values or conditions, consult factory.
⑥ Per JEDEC standard RS-397, 5.2.2.6.
⑦ For operation with antiparallel diode, consult factory.

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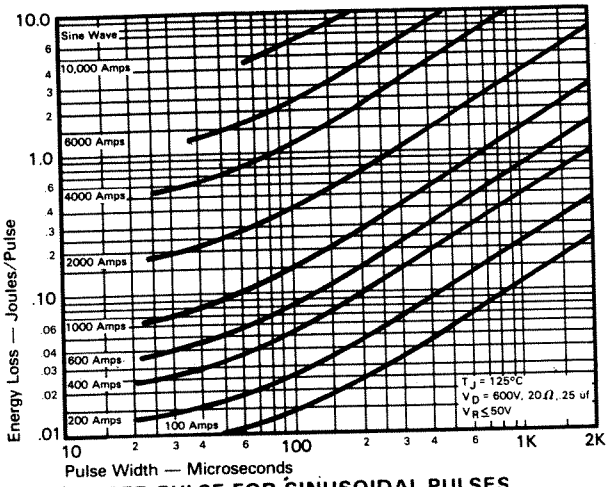
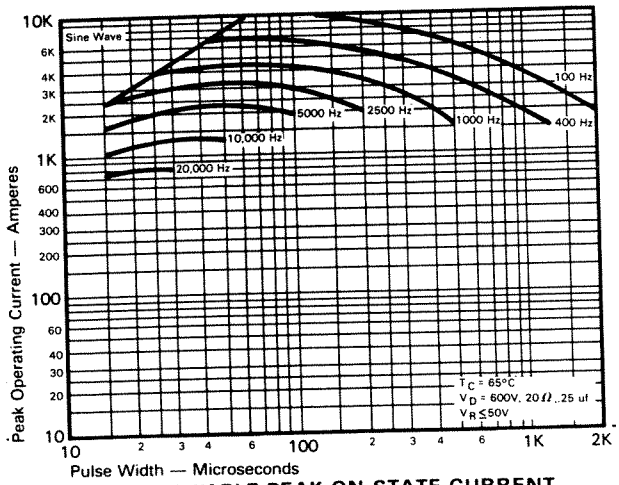
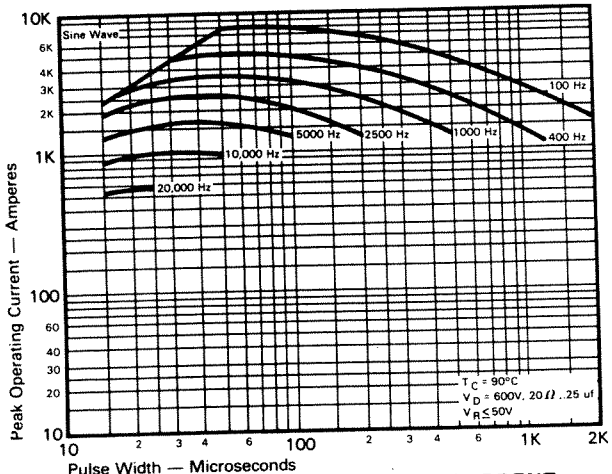
Sinusoidal Current Data



ENERGY PER PULSE FOR SINUSOIDAL PULSES

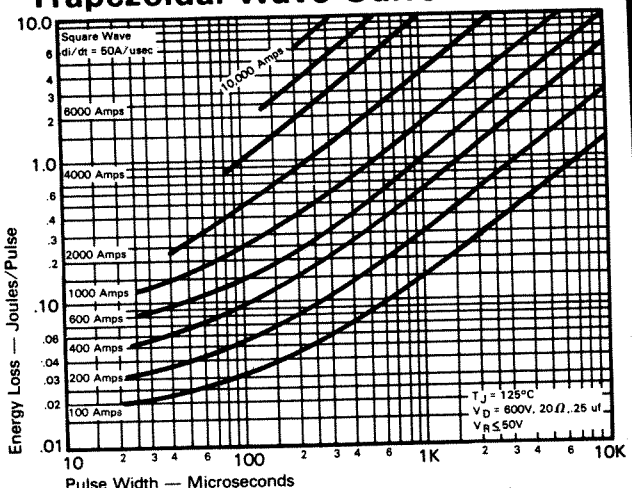


MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH (T_C = 65°C)

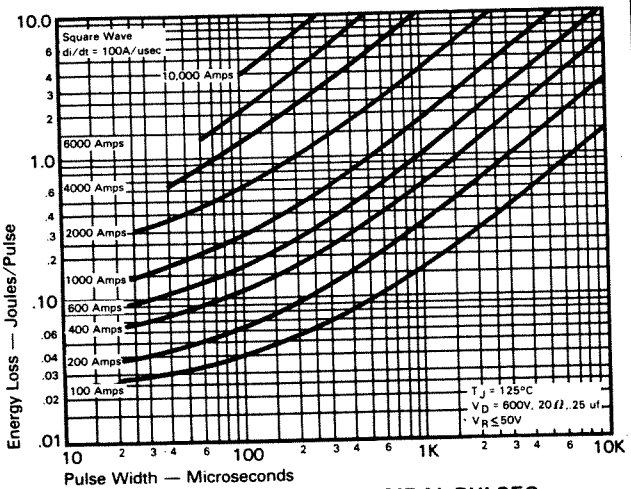


MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH (T_C = 90°C)

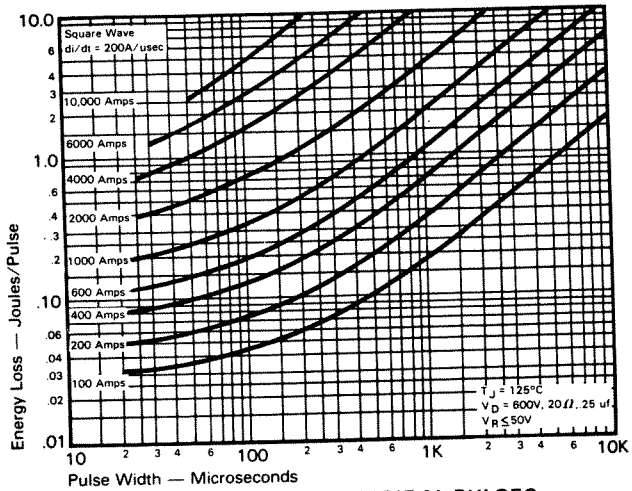
Trapezoidal Wave Current Data



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



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



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

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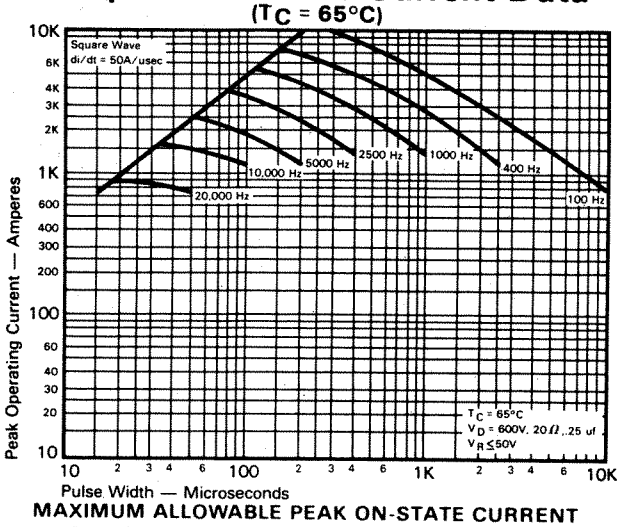
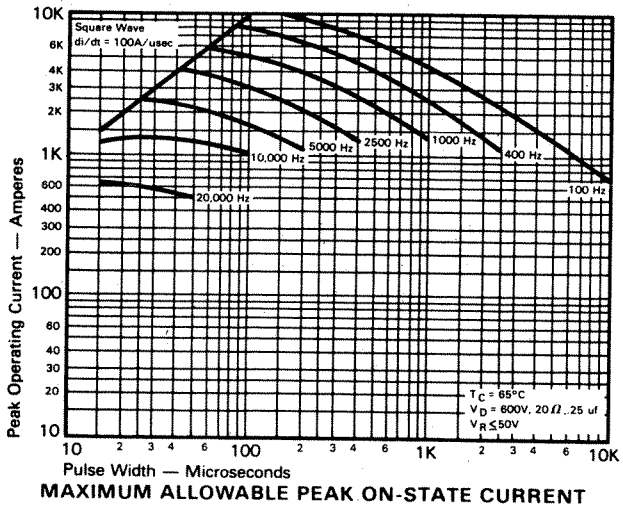
(T_C = 65°C)



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



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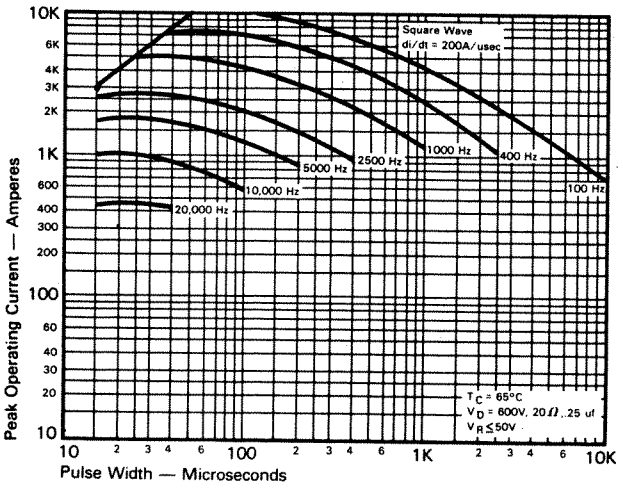
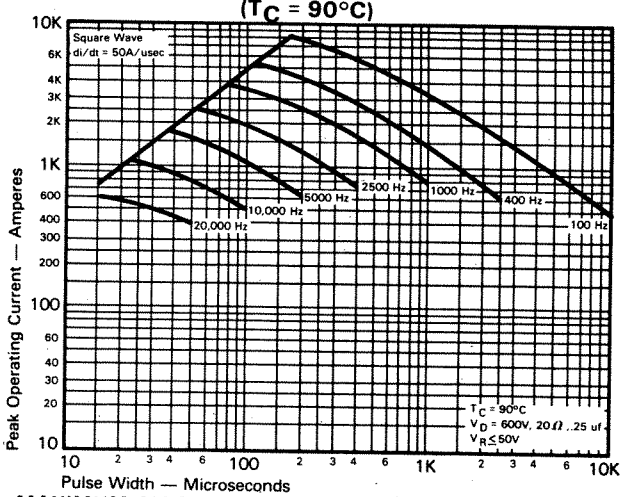
vs. PULSE WIDTH (di/dt = 100A/usec)



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

Trapezoidal Wave Current Data
(T_C = 90°C)



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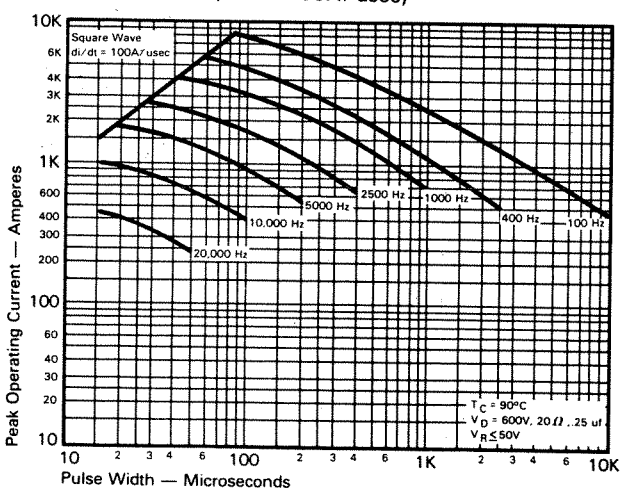
vs. PULSE WIDTH (di/dt = 50A/usec)



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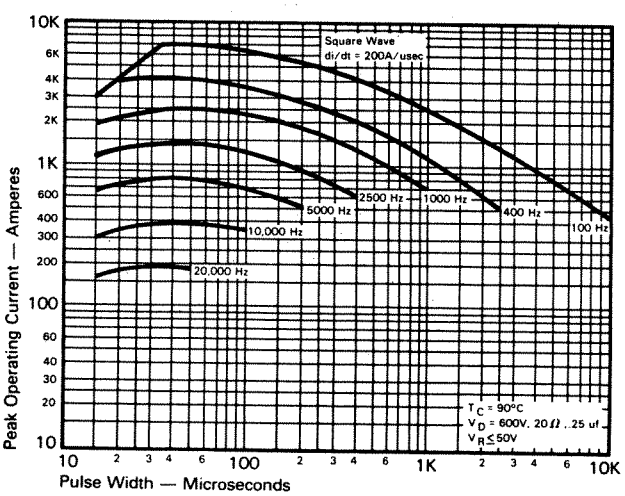
vs. PULSE WIDTH (di/dt = 100A/usec)



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