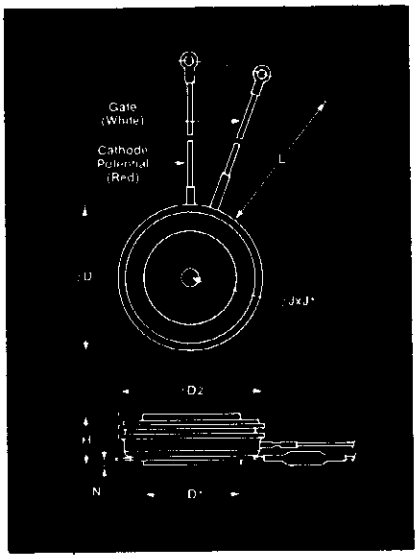
Fast Switching SCR T7SH __46

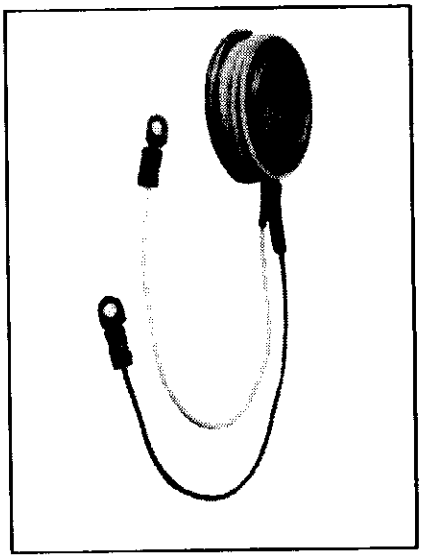
460A Avg. (720A RMS) 1400-1800 Volts 80-100 μsec



T7S Outline

Symbol	Inches		Millimeters	
	Min.	Max.	Min.	Max.
ϕD	1.850	1.900	45.72	48.26
ϕD_1	1.140	1.180	28.96	29.97
ϕD_2	1.760	1.850	44.70	46.99
H	.545	.605	13.84	15.37
ϕJ	.135	.145	3.43	3.68
J_1	.072	.082	1.83	2.08
L	7.75	8.50	196.85	215.90
N	.025		.64	

Creep Distance—.408 in min. (10.36 mm).
Strike Distance—.203 in min. (5.16 mm).
Finish—Nickel Plate.
Approx. Weight—4 oz. (113 g).
1. Dimension "H" is a clamped dimension.



Features:
- Interdigitated, di/namic Gate Structure
- Hard Commutation Turn-Off
- Forward Blocking Voltage Capabilities to 1800 Volts
- Low Switching Losses at High Frequency
- Soft Cummutation (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	
	V_{DRM} and V_{RRM} (V)		$I_{T(av)}$ (A)	tq μsec		I_{GT} (ma)	Case	
T7SH	1400	14	460	80	8	150	T7S	
	1600	16		100	10			
	1800	18						

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

Type T7SH rated at 460A average with V_{DRM} = 1600V, I_{GT} = 150 ma, tq = 80 μsec max. and leads—order as:

Type				Voltage		Current		Turn Off	Gate Current	Leads	
T	7	S	H	1	6	4	6	1	4	D	N

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Voltage ②

Blocking State Maximums (T_J = 125°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}

1400	1600	1800
1400	1600	1800
1500	1700	1900

35
35

Current

Conducting State Maximums (T_J = 125°C)	Symbol	T7SH__46
RMS forward current, A	$I_{T(rms)}$	720
Ave. forward current, A	$I_{T(av)}$	460
One-half cycle surge current ③, A	I_{TSM}	6800
I^2t for fusing (for times ≥ 8.3 ms) A^2 sec	I^2t	301,000
Forward voltage drop at I_{TM} = 1500A and T_J = 25°C, V	V_{TM}	2.2
Min. repetitive di/dt ①④⑥ A/μsec	di/dt	400

Switching

(T_J = 25°C)	Symbol	
Max. turn-off time, I_T = 400A, T_J = 125°C, tp = 100 μsec. di_R/dt = 25 A/μsec., reapplied dv/dt = 200 V/μsec linear to 0.8 V_{DRM}, μsec. ⑤⑦⑧	tq	80 to 100
Typ. delay time, I_{TM} = 1000A T_D = .8 V_{DRM} ④, μsec ④	td	2.0
Typ. turn-on-time I_{TM} = 1000A, μsec	t on	3.0
Min. critical dv/dt exponential to .8 V_{DRM}, T_J = 125°C, V/μsec ②⑤	dv/dt	300
Min. di/dt, non-repetitive, A/μsec ①④⑥	di/dt	800

Gate

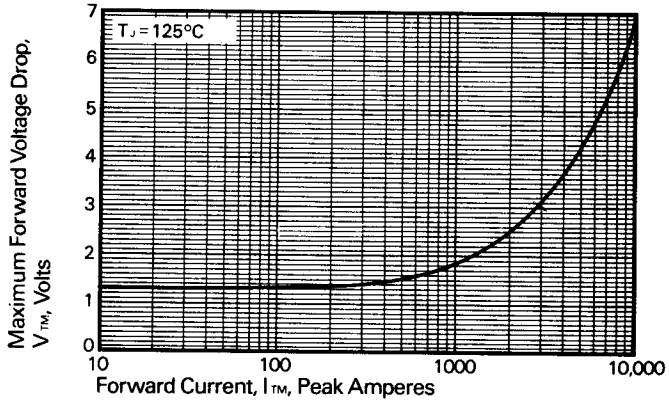
Maximum Parameters (T_J = 25°C)	Symbol	
Gate current to trigger at V_D = 12V, mA	I_{GT}	150
Gate voltage to trigger at V_D = 12V, V	V_{GT}	3
Non-triggering gate voltage, T_J = 125°C, and rated V_{DRM}, V	V_{GDM}	.25
Peak forward gate current, A	I_{GTM}	4
Peak reverse gate voltage, V	V_{GRM}	5
Peak gate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

Thermal and Mechanical

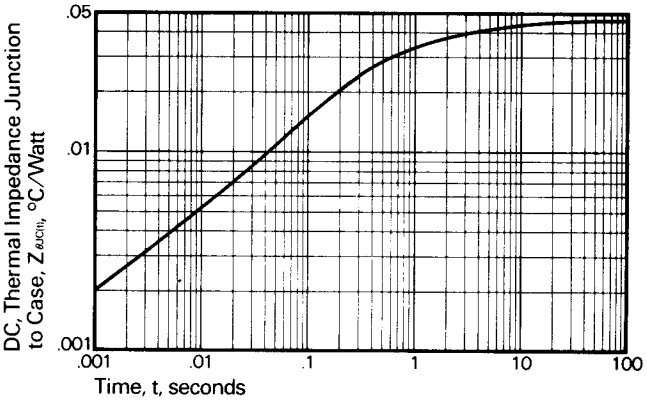
	Symbol	
Min., Max. oper. junction temp., °C	T_J	-40 to +125
Min., Max. storage temp., °C	T_{stg}	-40 to +150
Max. mounting force, lb.... ①		2000 to 2400
Thermal resistance ①, double-side cooling, junction to case, °C/Watt	$R_{\theta JC}$	.045
Case to sink, lubricated, °C/Watt	$R_{\theta CS}$	.02

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.
⑧ Other tq and ut combinations available consult factory.

Maximum Forward Voltage vs. Forward Current



Transient Thermal Impedance vs. Time



FAST SWITCHING THYRISTORS

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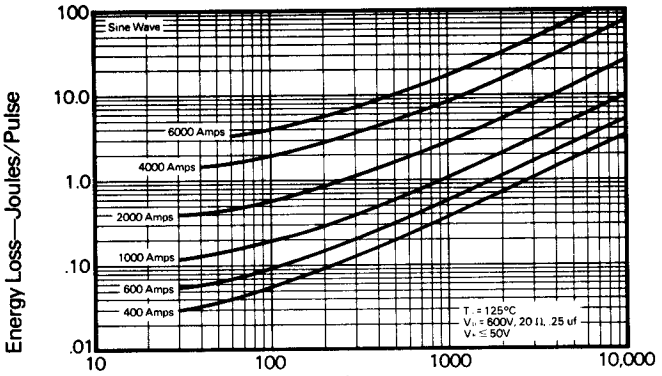
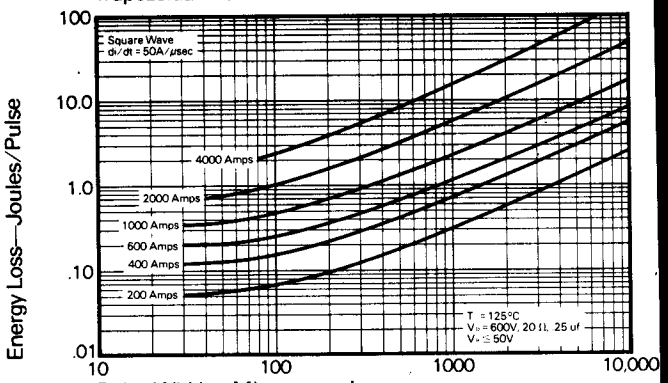
460A Avg.
(720A RMS)
1400-1800 Volts
80-100 μsec

Sinusoidal Current Data

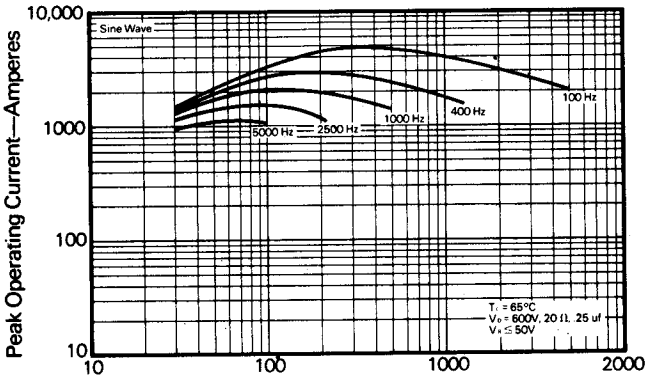


Energy Per Pulse for Sinusoidal Pulses

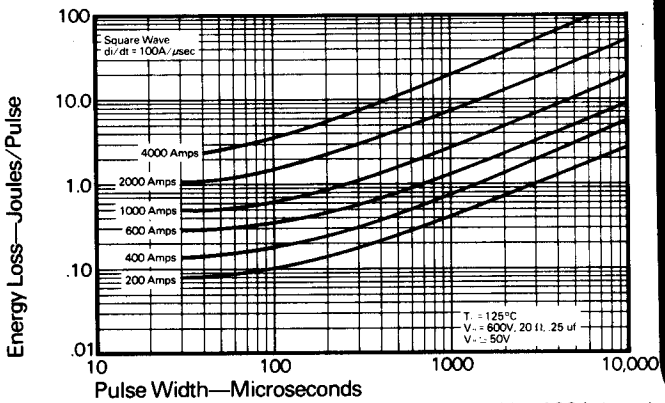
Trapezoidal Wave Current Data



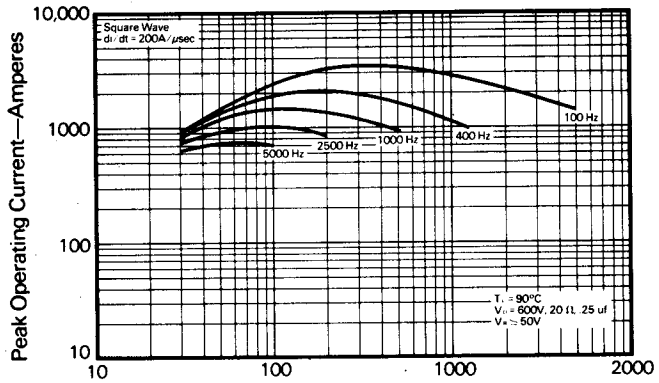
Energy Per Pulse for Trapezoidal Pulses (di/dt = 50A/μsec)



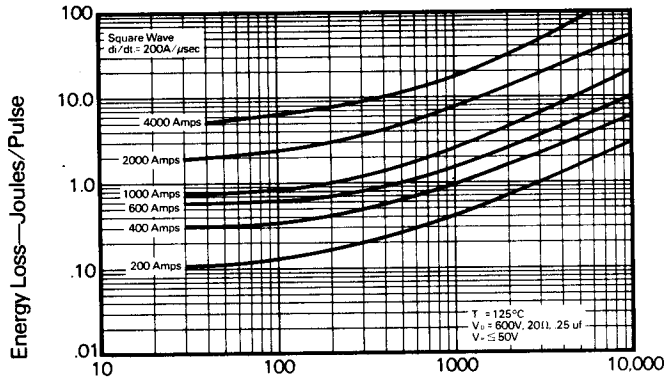
Maximum Allowable Peak On-State Current
vs. Pulse Width (T_C = 65°C)



Energy Per Pulse for Trapezoidal Pulses (di/dt = 100A/μsec)



Maximum Allowable Peak On-State Current
vs. Pulse Width (T_C = 90°C)



Energy Per Pulse for Trapezoidal Pulses (di/dt = 200A/μsec)

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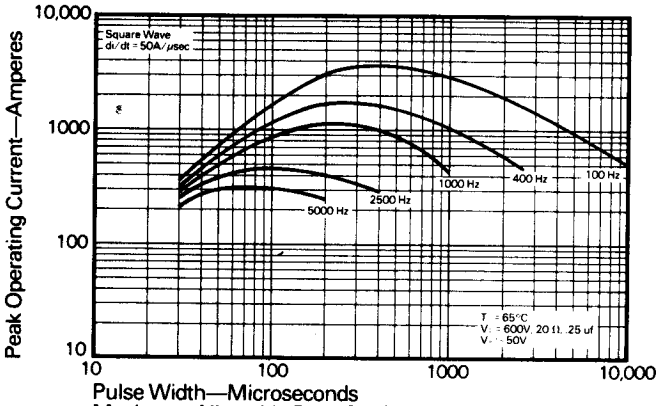
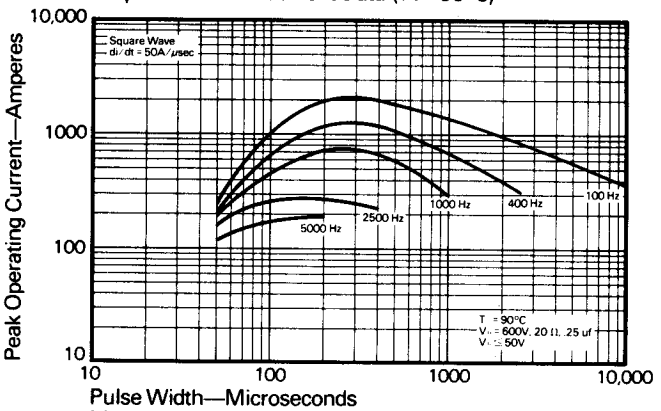
Trapezoidal Wave Current Data (T_C = 65°C)

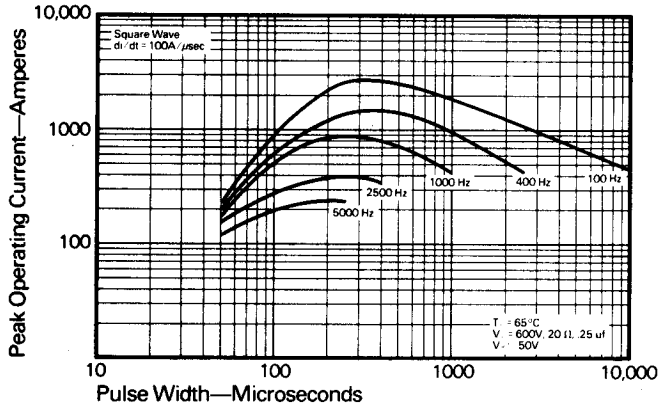


Maximum Allowable Peak On-State Current vs. Pulse Width (di/dt = 50A/μsec)

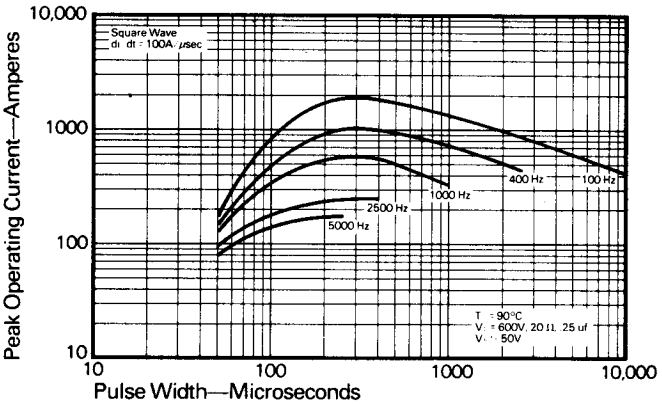
Trapezoidal Wave Current Data (T_C = 90°C)



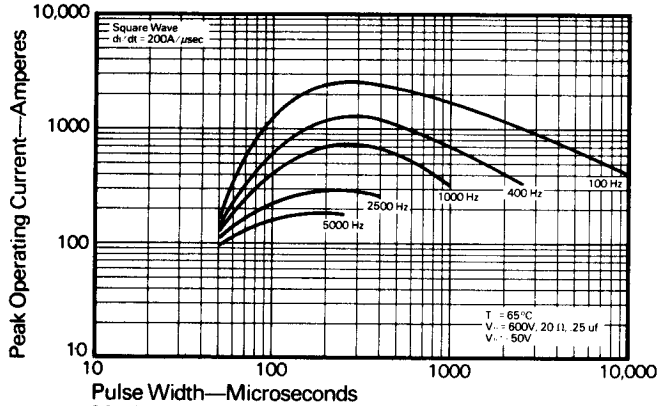
Maximum Allowable Peak On-State Current vs. Pulse Width (di/dt = 50A/μsec)



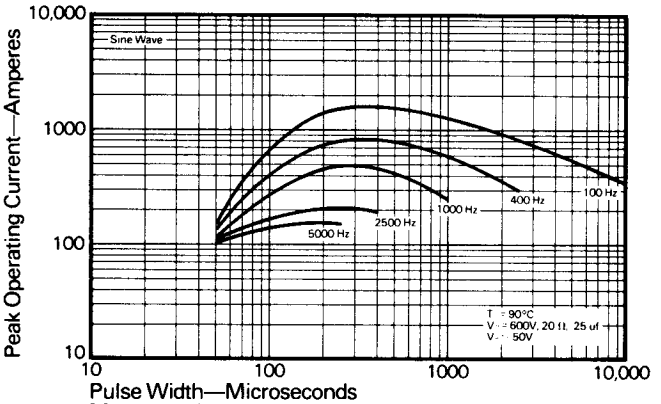
Maximum Allowable Peak On-State Current vs. Pulse Width (di/dt = 100A/μsec)



Maximum Allowable Peak On-State Current vs. Pulse Width (di/dt = 100A/μsec)



Maximum Allowable Peak On-State Current vs. Pulse Width (di/dt = 200A/μsec)



Maximum Allowable Peak On-State Current vs. Pulse Width (di/dt = 200A/μsec)