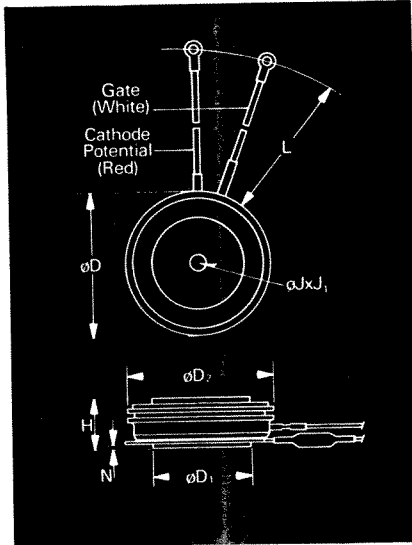


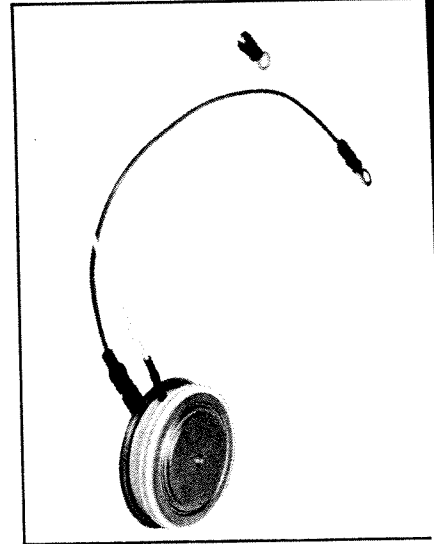
Fast Switching SCR T7SH_40

**400A Avg.
(700 RMS)
Up to 1200 Volts
10-50 μ s**



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— .41 in. min. (10.41 mm).
Strike Distance— .35 in. min. (8.89 mm).
Finish-Nickel Plate.
Approx. Weight—4 oz. (113 g.)
1. Dimension "H" is a clamped dimension.



T7S Outline

Features:

- Interdigitated, di/namic Gate structure
- Hard Commutation Turn-Off
- Forward Blocking Voltage Capabilities to 1200 Volts
- Low Switching Losses at High Frequency
- Soft Commutation (Feedback Diode) Testing Available
- High di/dt with softgate control

Applications:

- Induction Heating
- Transportation
- Inverters
- Crowbars
- Cycloconverters

Ordering Information

Type	Voltage		Current		Turn-off		Gate current		Leads		
	V _{DRM} and V _R (V)	Code	I _{T(av)} (A)	Code	t _q usec	Code	I _{GT} (ma)	Code	Case	Code	
T7SH	100	01	400	40	10	8	~ 150	4	T7S	DN	
	200	02			15						7
	300	03			20						6
	400	04			25						5
	500	05			30						4
	600	06			40						3
	700	07			50						
	800	08									
	900	09									
	1000	10									
	1100	11									
	1200	12									

Example

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

Type T72H rated at 400A average with V_{DRM} = 1000V, I_{GT} = 150 ma, t_q = 30 μ sec max. and leads—order as:

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

**400A Avg.
(700 RMS)
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SCR
T7SH_40**

Voltage ②

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

Symbol	100	200	300	400	500	600	700	800	900	1000	1100	1200
Repetitive peak forward blocking voltage, V V_{DRM}	100	200	300	400	500	600	700	800	900	1000	1100	1200
Repetitive peak reverse voltage, V V_{RRM}	100	200	300	400	500	600	700	800	900	1000	1100	1200
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
Forward leakage current, mA peak I_{DRM}	← 35 →											
Reverse leakage current, mA peak I_{RRM}	← 35 →											

Current

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

Symbol	T7SH_40
RMS forward current, A $I_T(\text{rms})$	628
Ave. forward current, A $I_T(\text{av})$	400
One-half cycle surge current ^③ , A I_{TSM}	8000
3 cycle surge current ^③ , A I_{TSM}	5765
10 cycle surge current ^③ , A I_{TSM}	4980
I^2t for fusing (for times ≥ 8.3 ms) I^2t	267,000
Forward voltage drop at $I_{TM} = 1500\text{A}$ and $T_J = 25^\circ\text{C}$, V V_{TM}	3.15
Min. repetitive di/dt ^{①④⑤} A/ μ sec di/dt	500

Switching

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

Symbol	
Max. turn-off time, $I_T = 1000\text{A}$, $T_J = 125^\circ\text{C}$ $t_p = 100 \mu\text{sec}$, $di/dt = 50$ A/ μ sec., reappplied $dv/dt = 200\text{V}/\mu\text{sec}$. linear to $0.8 V_{DRM}$, μsec . ^{③④} t_q	10 to 50
Typ. delay time, $I_{TM} = 1000\text{A}$ $T_D = .8 V_{DRM}$ ^④ , μsec t_d	.5
Min. critical dv/dt exponential to $.8 V_{DRM}$, $T_J = 125^\circ\text{C}$, V/ μ sec ^{③④} dv/dt	300
Min. di/dt , non-repetitive, A/ μ sec ^{①④⑤} di/dt	1200

Gate

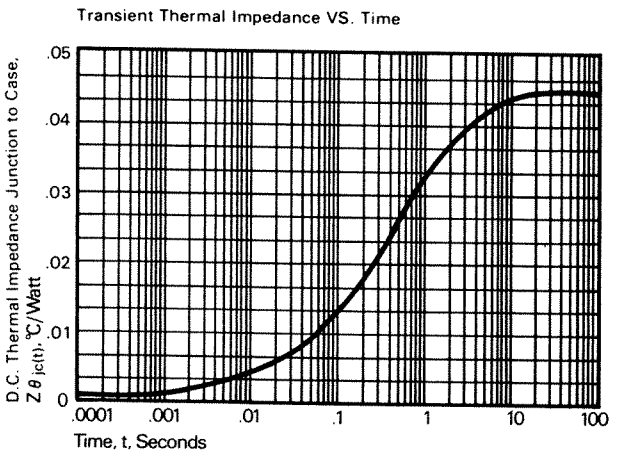
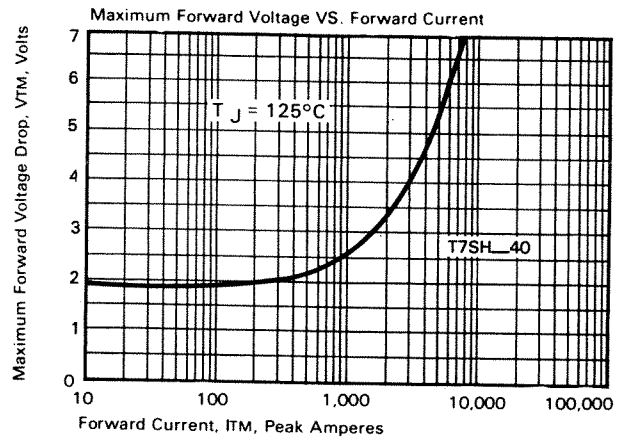
Maximum Parameters ($T_J = 25^\circ\text{C}$)

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}	.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 $P_{G(\text{av})}$	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 force, lb. ^①	2000 to 2400
Thermal resistance ^② , double-side cooling, junction to case, $^\circ\text{C}/\text{Watt}$ $R_{\theta JC}$.045
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.

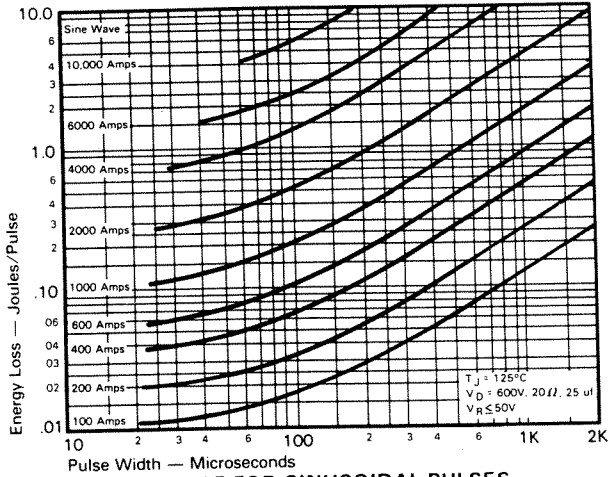


FAST SWITCHING THYRISTORS

Fast Switching SCR T7SH_40

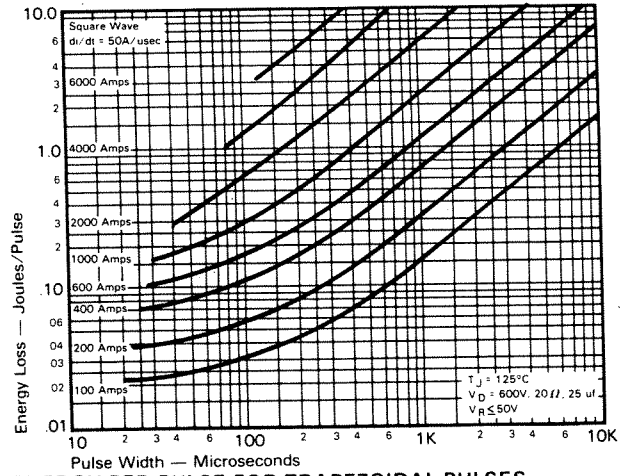
400A Avg.
(700 RMS)
Up to 1200 Volts
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Sinusoidal Current Data

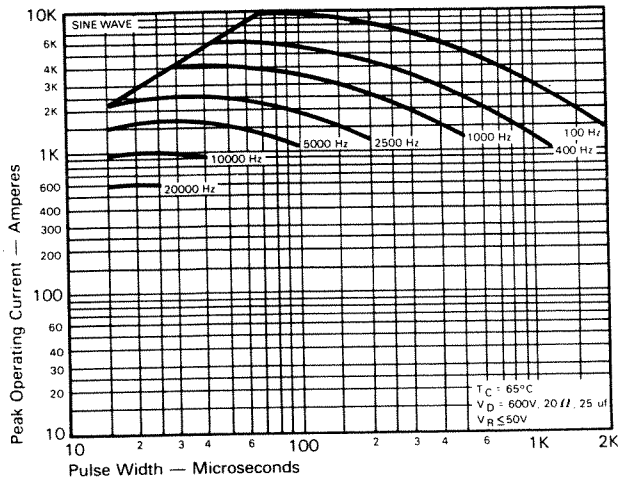


ENERGY PER PULSE FOR SINUSOIDAL PULSES

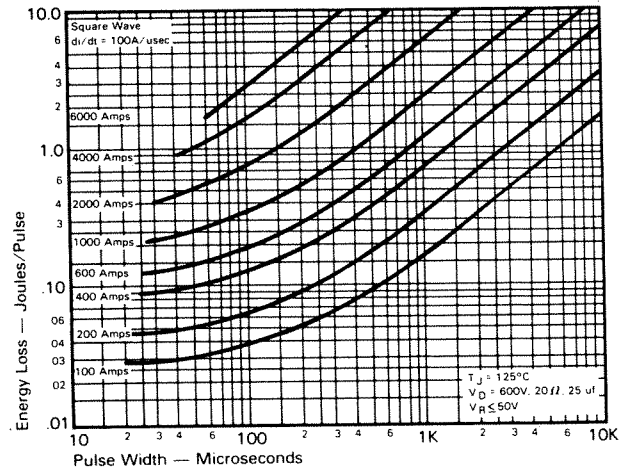
Trapezoidal Wave Current Data



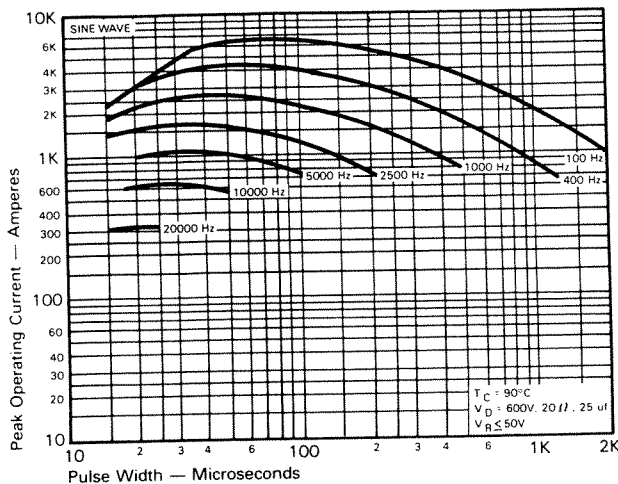
ENERGY PER PULSE FOR TRAPEZOIDAL PULSES
($di/dt = 50\text{A/usec}$)



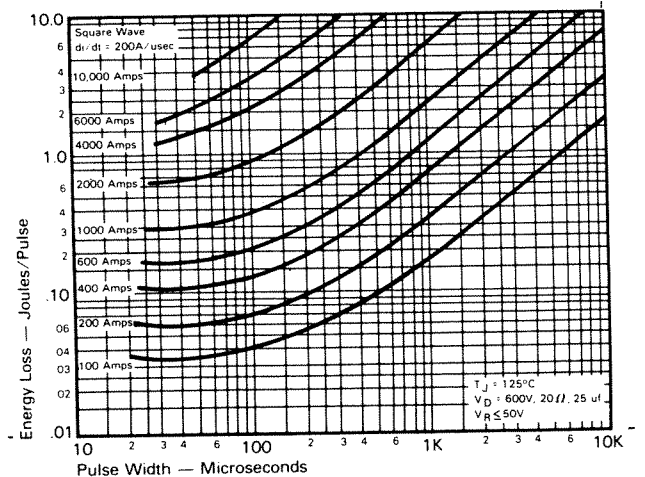
MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT
vs. PULSE WIDTH ($T_C = 65^\circ\text{C}$)



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



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

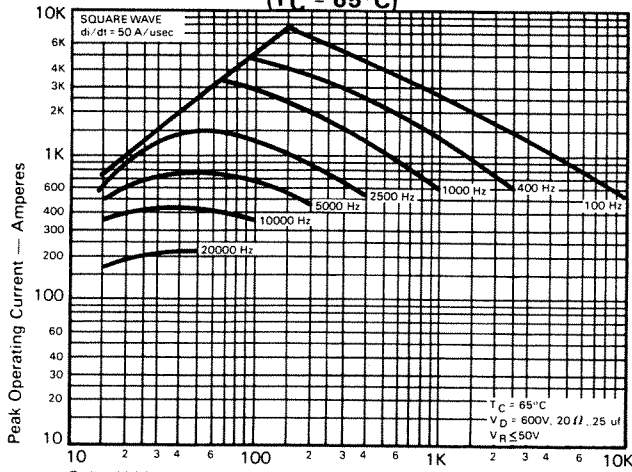


ENERGY PER PULSE FOR TRAPEZOIDAL PULSES
($di/dt = 200\text{A/usec}$)

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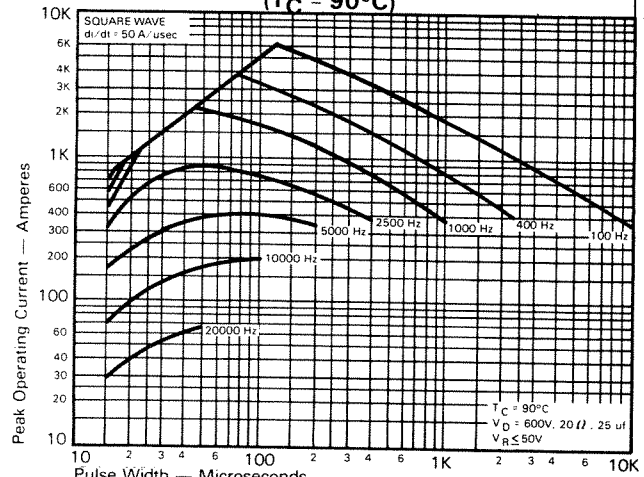
**Fast Switching
SCR
T7SH_40**

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

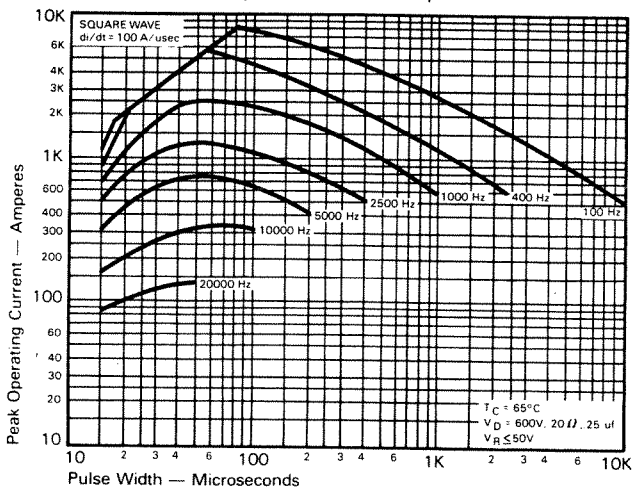


MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ($di/dt = 50\text{A/usec}$)

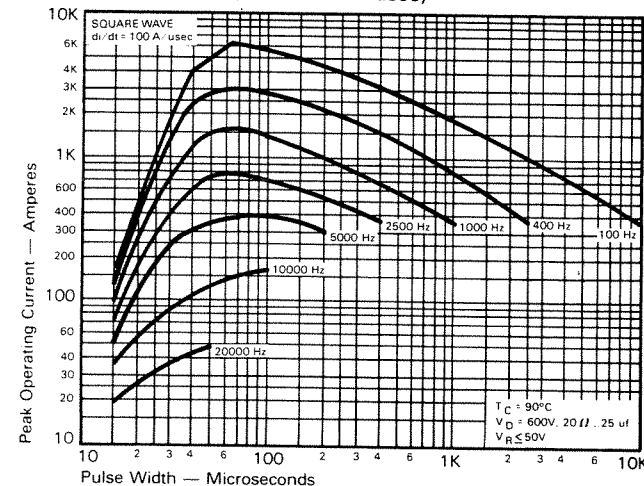
**Trapezoidal Wave Current Data
($T_C = 90^\circ\text{C}$)**



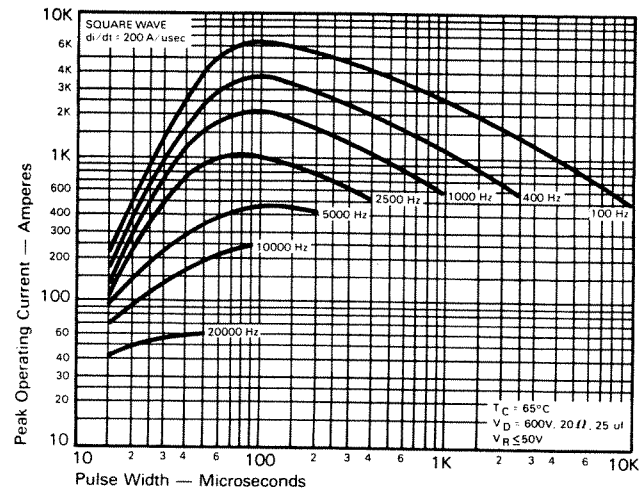
MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ($di/dt = 50\text{A/usec}$)



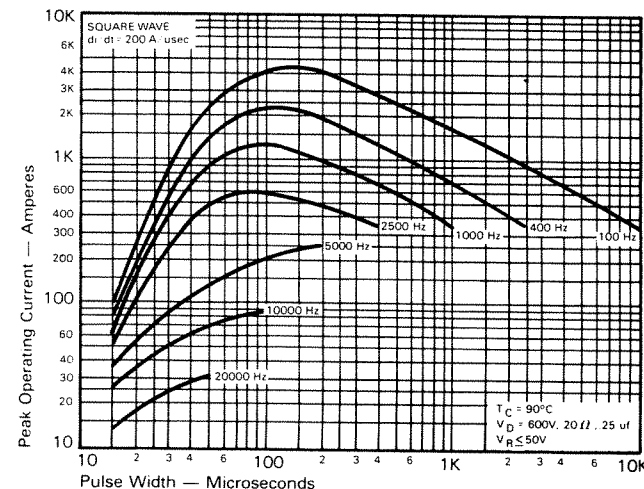
MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ($di/dt = 100\text{A/usec}$)



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



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



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

FAST SWITCHING
THYRISTORS