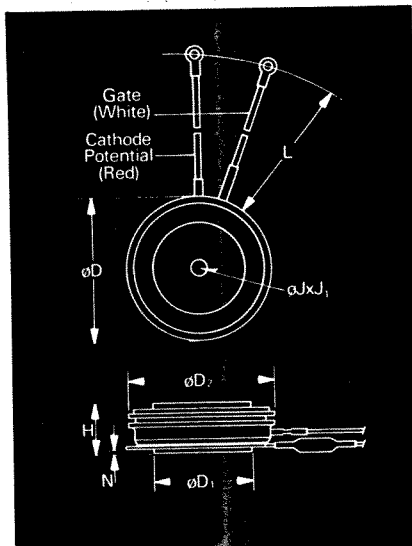


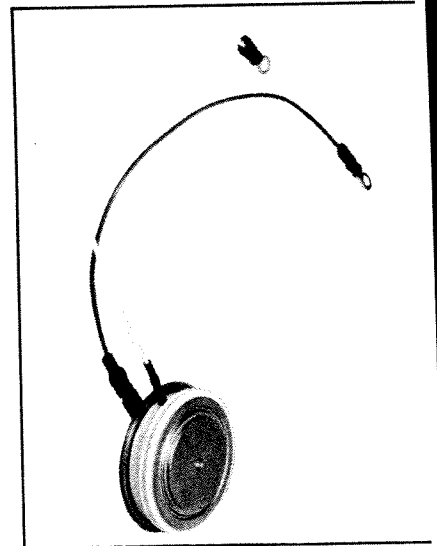
Fast Switching SCR T7SH_40

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	
Code	V _{DRM} and V _{RRM} (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					
	300	03			20					
	400	04			25					
	500	05			30					
	600	06			40					
	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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**Fast Switching
SCR
T7SH_40**

Voltage ②

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

Repetitive peak forward blocking voltage, V ...

Repetitive peak reverse voltage, V ...

Non-repetitive transient peak reverse voltage,
 $t \leq 5.0$ msec, V ...

Forward leakage current, mA peak ...

Reverse leakage current, mA peak ...

Symbol

V_{DRM}

V_{RRM}

V_{RSM}

I_{DRM}

I_{RRM}

100	200	300	400	500	600	700	800	900	1000	1100	1200
100	200	300	400	500	600	700	800	900	1000	1100	1200
200	300	400	500	600	700	800	900	1000	1100	1200	1300

Current

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

RMS forward current, A ...

Ave. forward current, A ...

One-half cycle surge current③, A ...

3 cycle surge current③, A ...

10 cycle surge current③, A ...

I^2t for fusing (for times ≥ 8.3 ms)
A² sec.

Forward voltage drop at $I_{FM} = 1500\text{A}$
and $T_J = 125^\circ\text{C}$, V ...

Min. repetitive di/dt ①④⑤ A/ μ sec ...

Symbol

$I_T(\text{rms})$

$I_T(\text{av})$

I_{TSM}

I_{TSM}

I_{TSM}

I^2t

V_{TM}

di/dt

T7SH_40

628

400

8000

5765

4980

267,000

3.15

500

Switching

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

Max. turn-off time, $I_T = 1000\text{A}$, $T_J = 125^\circ\text{C}$

$t_p = 100$ μ sec, $di/dt = 50$

A/ μ sec., reapplied $dv/dt =$

200V/ μ sec. linear to 0.8 VDRM, μ sec. ③④

Typ. delay time, $I_{TM} = 1000\text{A}$

$t_d = .8$ VDRM④, μ sec

Min. critical dv/dt exponential to .8

VDRM, $T_J = 125^\circ\text{C}$, V/ μ sec ②⑤

Min. di/dt , non-repetitive, A/ μ sec ①④⑤

Symbol

t_q

t_d

dv/dt

di/dt

10 to 50

.5

300

1200

Gate

Maximum Parameters
($T_J = 125^\circ\text{C}$)

Gate current to trigger at $V_D = 12\text{V}$, mA

Gate voltage to trigger at $V_D = 12\text{V}$, V ...

Non-triggering gate voltage, $T_J = 125^\circ\text{C}$,
and rated VDRM, V ...

Peak forward gate current, A ...

Peak reverse gate voltage, V ...

Peak gate power, Watts ...

Average gate power, Watts ...

Symbol

I_{GT}

V_{GT}

V_{GDM}

I_{GTM}

V_{GRM}

P_{GM}

$P_{G(\text{av})}$

150

3

.25

4

5

16

3

Thermal and Mechanical

Min., Max. oper. junction temp., $^\circ\text{C}$...

Min., Max. storage temp., $^\circ\text{C}$...

Max. mounting force, lb. ... ①

Thermal resistance⑦, double-

side cooling, junction to case,
 $^\circ\text{C}/\text{Watt}$...

Case to sink, lubricated, $^\circ\text{C}/\text{Watt}$...

Symbol

T_J

T_{stg}

$R_{\theta JC}$

$R_{\theta CS}$

-40 to +125

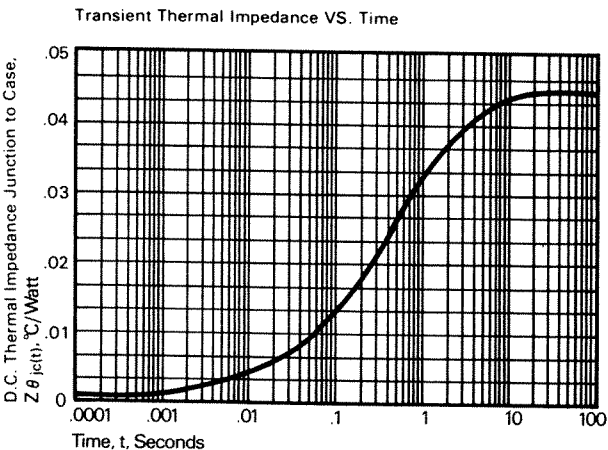
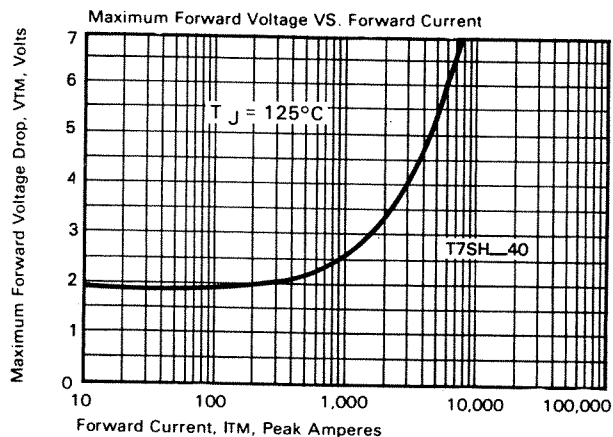
-40 to +150

2000 to 2400

.045

.02

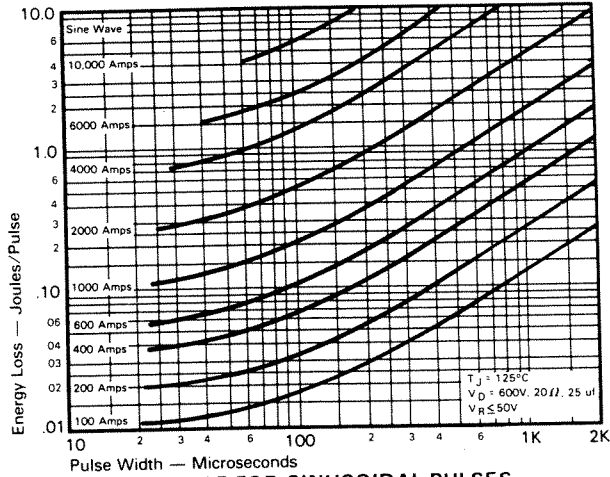
- ① Consult recommended mounting procedures.
- ② Applies for zero or negative gate bias.
- ③ Per JEDEC RS-397, 5.2.2.1.
- ④ With recommended gate drive.
- ⑤ Higher dv/dt ratings available, consult factory.
- ⑥ Per JEDEC standard RS-397, 5.2.2.6.
- ⑦ For operation with antiparallel diode, consult factory.



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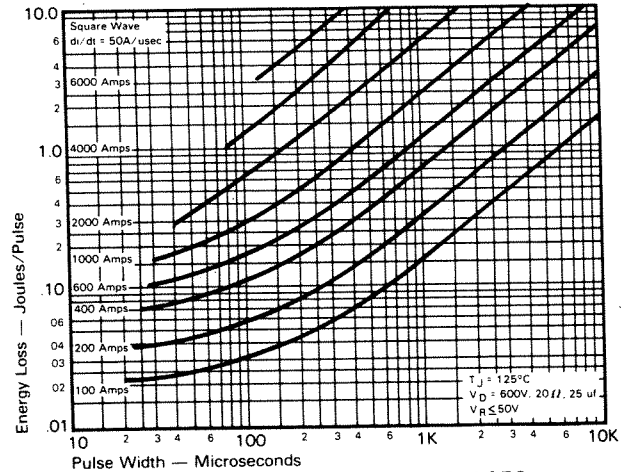
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Sinusoidal Current Data

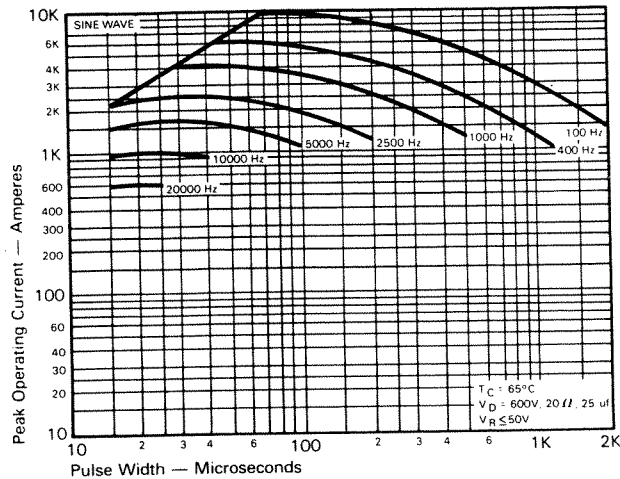


ENERGY PER PULSE FOR SINUSOIDAL PULSES

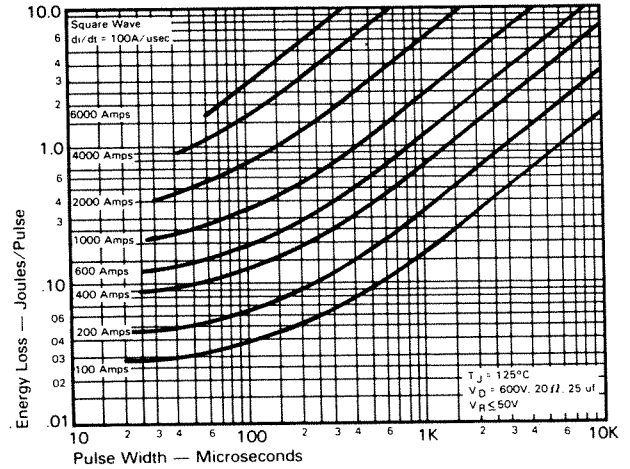
Trapezoidal Wave Current Data



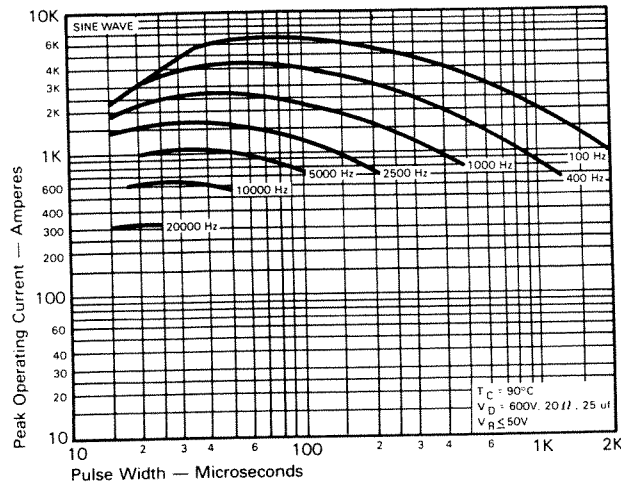
ENERGY PER PULSE FOR TRAPEZOIDAL PULSES
($di/dt = 50\text{A/usec}$)



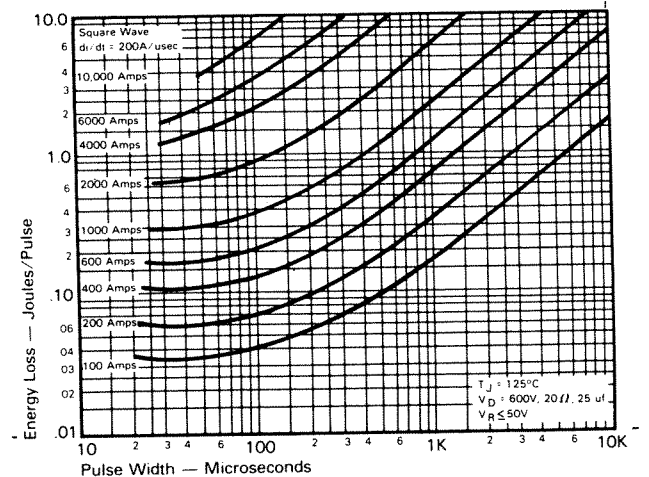
MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT
vs. PULSE WIDTH ($T_C = 65^\circ\text{C}$)



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



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

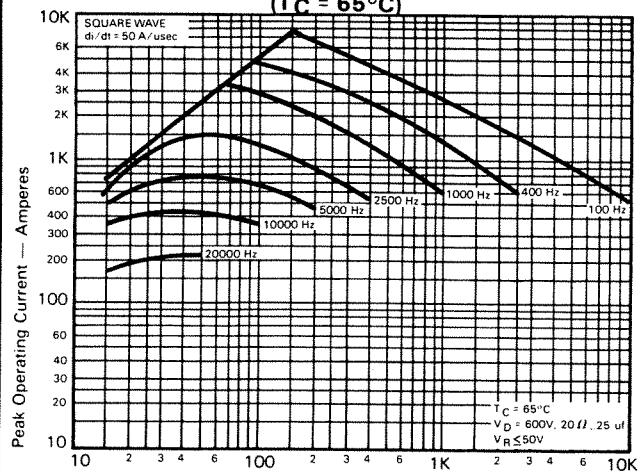


ENERGY PER PULSE FOR TRAPEZOIDAL PULSES
($di/dt = 200\text{A/usec}$)

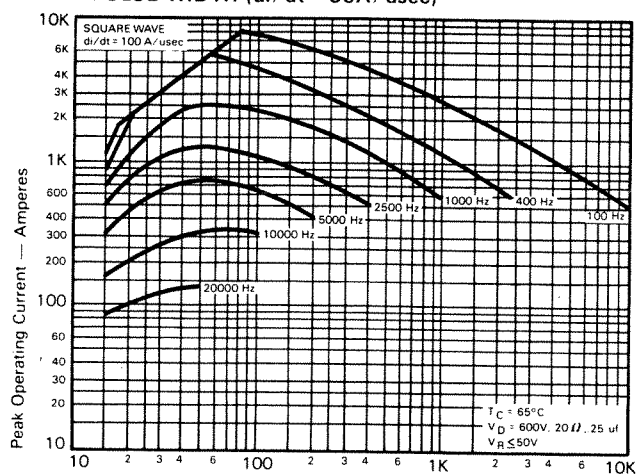
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**Fast Switching
SCR
T7SH_40**

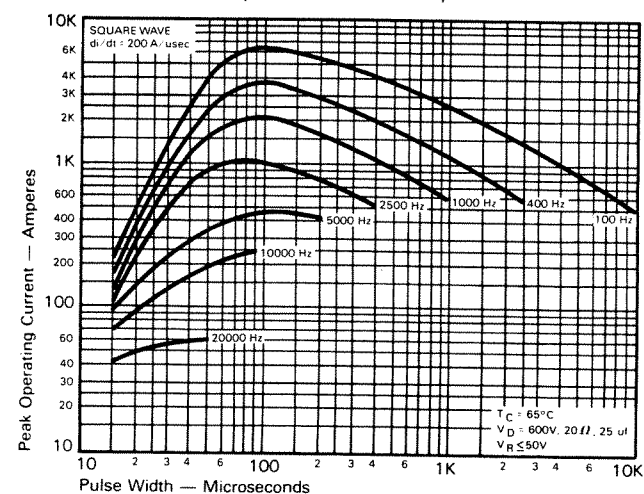
**Trapezoidal Wave Current Data
($T_C = 65^\circ\text{C}$)**



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

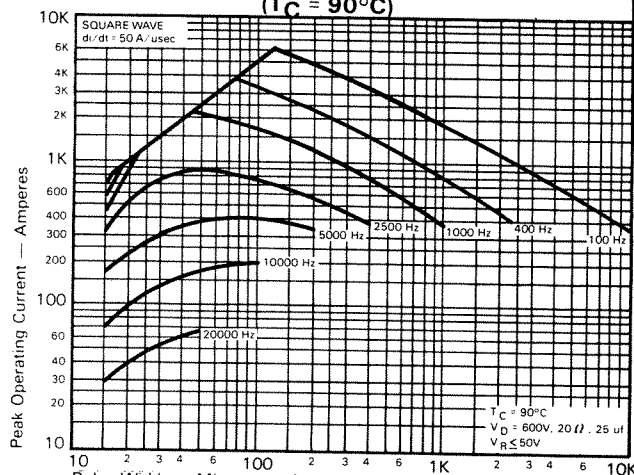


**MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT
vs. PULSE WIDTH ($di/dt = 100\text{A/u sec}$)**

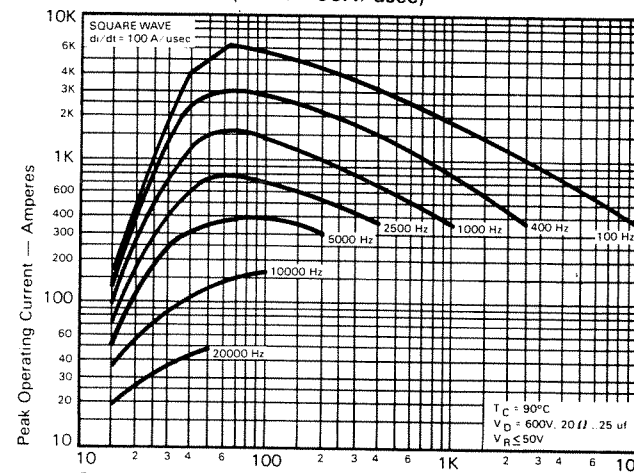


**MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT
vs. PULSE WIDTH ($di/dt = 200\text{A/u sec}$)**

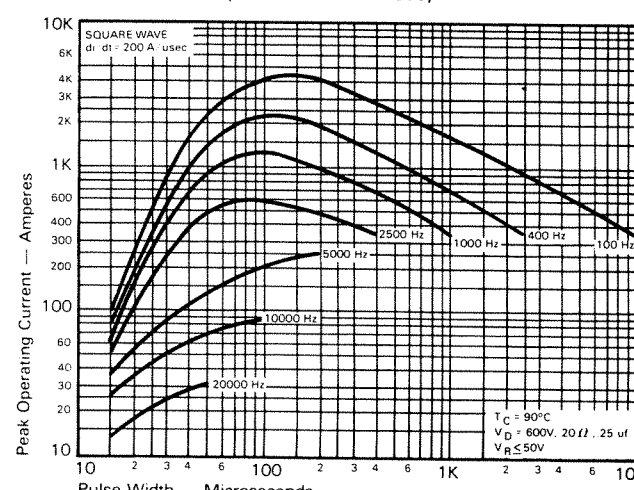
**Trapezoidal Wave Current Data
($T_C = 90^\circ\text{C}$)**



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



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



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