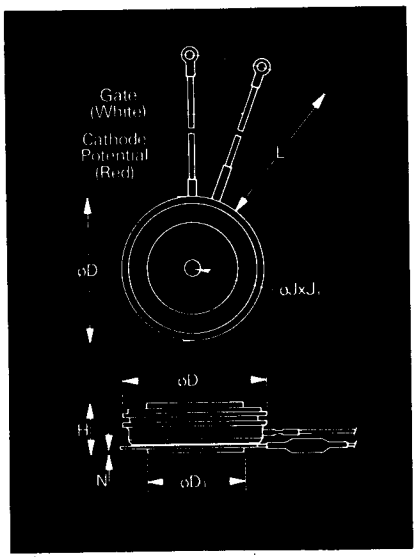
Fast Switching SCR T7S7_65

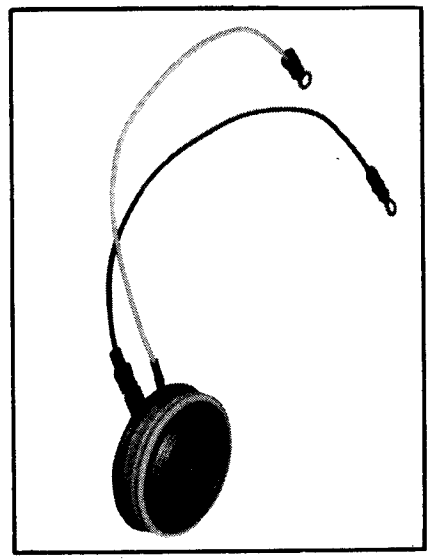
650A Avg. (1026 RMS) Up to 800 Volts 10-50 μs



T7S Outline

Symbol	Inches		Millimeters	
	Min.	Max.	Min.	Max.
øD	1.850	1.900	45.72	48.26
øD1	1.140	1.180	28.96	29.97
øD2	1.760	1.850	44.70	46.99
H	.545	.605	13.84	15.37
øJ	.135	.145	3.43	3.68
J1	.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.



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

Applications:
- Inverters
  UPS
  Induction heating
  AC motor drives
- Cycloconverters
- Choppers
- Crowbars

Ordering Information

Type	Voltage		Current		Turn-off		Gate current		Leads	
Code	VDRM and VRRM (V)	Code	IT(av) (A)	Code	tq usec	Code	IGT (ma)	Code	Case	Code
T7S7	100	01	650	65	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	4				
	700	07			50	3				
	800	08								

Example

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

Type T7S7 rated at 650 A average with V_{DRM} = 600V.
I_{GT} = 150 ma, tq = 30 μsec max. and standard control leads—order as:

Type				Voltage		Current		Turn Off	Gate Current	Leads	
T	7	S	7	0	6	6	5	5	4	D	N

650A Avg. (1026 RMS) Up to 800 Volts 10-50 μs

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Voltage

Blocking State Maximums ② (T_J = 125°C)

	Symbol	T7S7__65							
Repetitive peak forward blocking voltage, V	V_{DRM}	100	200	300	400	500	600	700	800
Repetitive peak reverse voltage, V	V_{RRM}	100	200	300	400	500	600	700	800
Non-repetitive transient peak reverse voltage, t ≤ 5.0 msec, V	V_{RSM}	200	300	400	500	600	700	800	900
Forward leakage current, mA peak	I_{DRM}	30							
Reverse leakage current, mA peak	I_{RRM}	30							

Current

Conducting State Maximums (T_J = 125°C)	Symbol	T7S7__65
RMS forward current, A	$I_{T(rms)}$	1026
Ave. forward current, A	$I_{T(av)}$	650
One-half cycle surge current ③, A	I_{TSM}	9500
I^2t for fusing (for times ≥ 8.3 ms) A^2 sec.	I^2t	376,000
Forward voltage drop at ITM = 625 A and TJ = 25°C, V	V_{TM}	1.40
Min. repetitive di/dt A/μsec ①④⑥	di/dt	400

Switching

(T_J = 25°C)	Symbol	
Max. turn-off time, I_T = 400A T_J = 125°C, di_R/dt = 25 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 = 1000A V_D = 300V ④, μsec	t_{on}	3.0
Min. critical dv/dt, exponential to V_{DRM}, T_J = 125°C, V/μsec ②⑤	dv/dt	300
Min. di/dt non-repetitive, A/μsec ①④⑥	di/dt	800

Gate

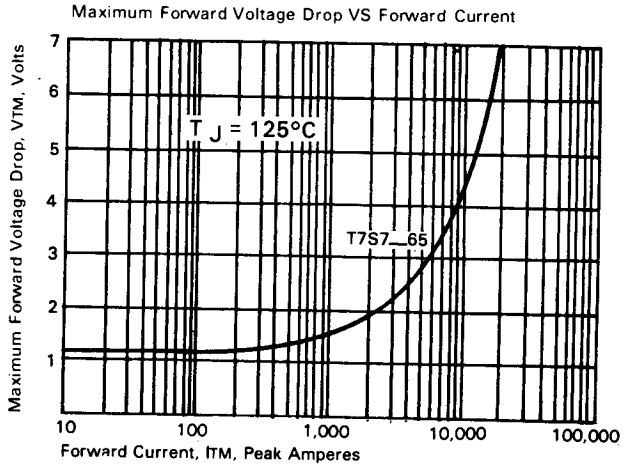
Maximum Parameters (T_J = 25°C)	Symbol	
Gate current to trigger at V_D = 12V, mA	I_{GT}	150
Gate voltage to trigger at V_D = 12V, V	V_{GT}	3
Non-triggering gate voltage, T_J = 125°C, and rated V_{DRM}, V	V_{GDM}	0.15
Peak forward gate current, A	I_{GTM}	4
Peak reverse gate voltage, V	V_{GRM}	5
Peak gate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

Thermal and Mechanical

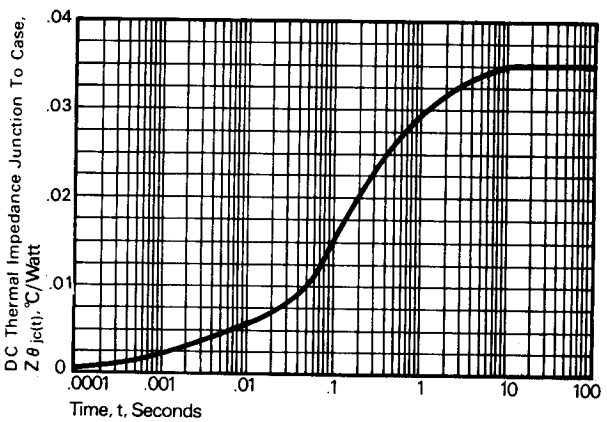
	Symbol	
Min., Max. oper. junction temp., °C	T_J	−40 to +125
Min., Max. storage temp., °C	Tstg	−40 to +150
Max. mounting force lb. ①		2000 to 2400
Max. Thermal resistance ⑦ Double side cooled Junction to case, °C/Watt	$R_{\theta JC}$	.035
Case to sink, lubricated, °C/Watt	$R_{\theta CS}$	.02

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.

Maximum Forward Voltage Drop VS Forward Current



Transient Thermal Impedance VS. Time

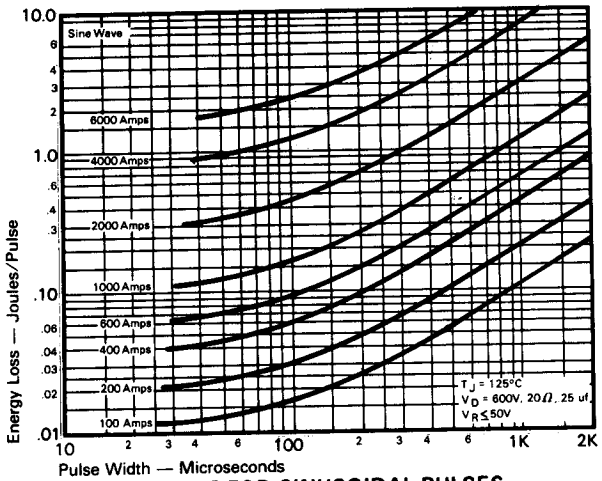


FAST SWITCHING THYRISTORS

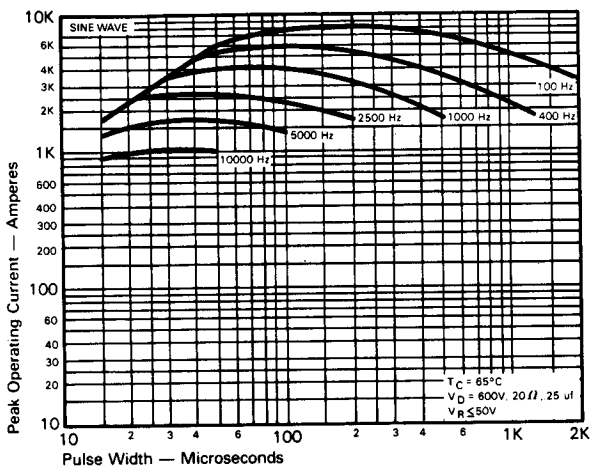
Fast Switching SCR T7S7__65

650A Avg.
(1026 RMS)
Up to 800 Volts
10-50 μs

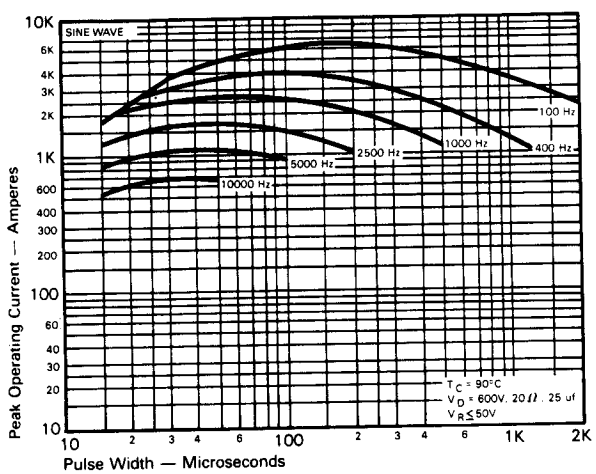
Sinusoidal Current Data



ENERGY PER PULSE FOR SINUSOIDAL PULSES

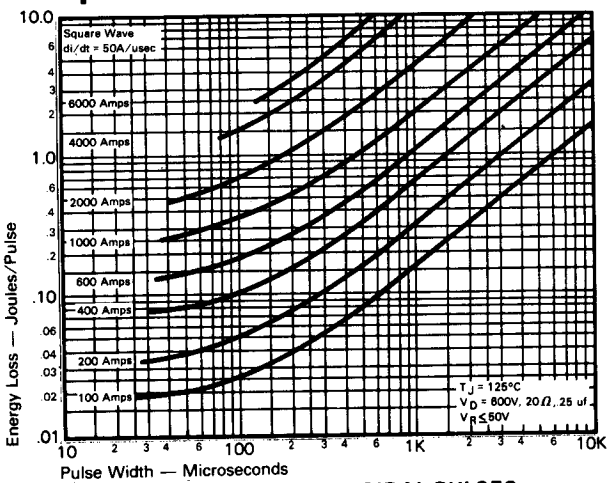


MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH (T_C = 65°C)

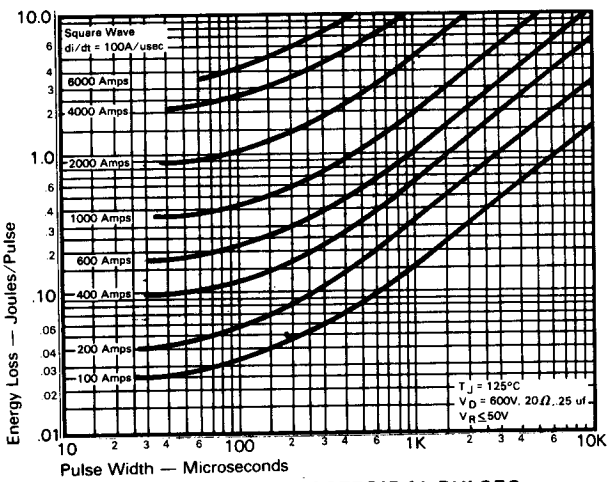


MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH (T_C = 90°C)

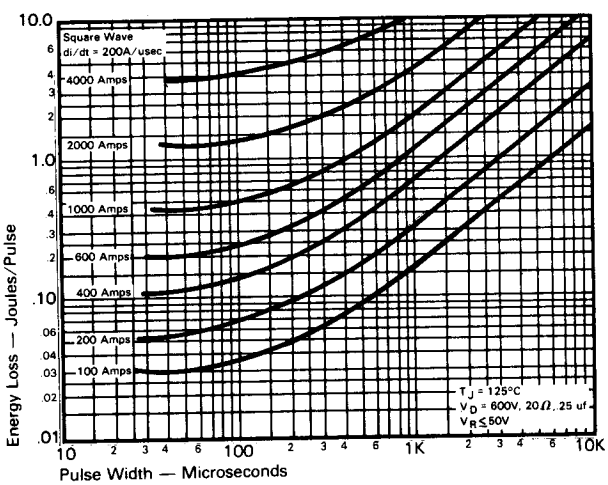
Trapezoidal Wave Current Data



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



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

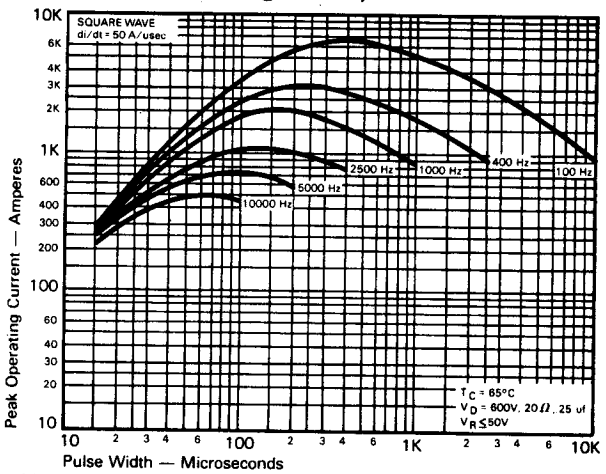


ENERGY PER PULSE FOR TRAPEZOIDAL PULSES (di/dt = 200A/usec)

650A Avg. (1026 RMS) Up to 800 Volts 10-50 μs

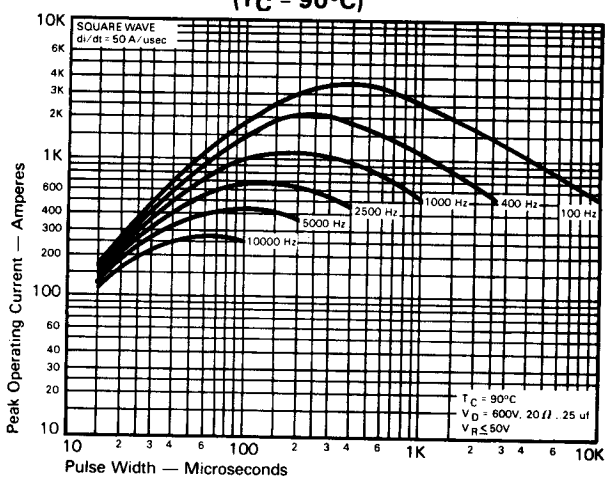
Fast Switching SCR T7S7__65

Trapezoidal Wave Current Data
(T_C = 65°C)

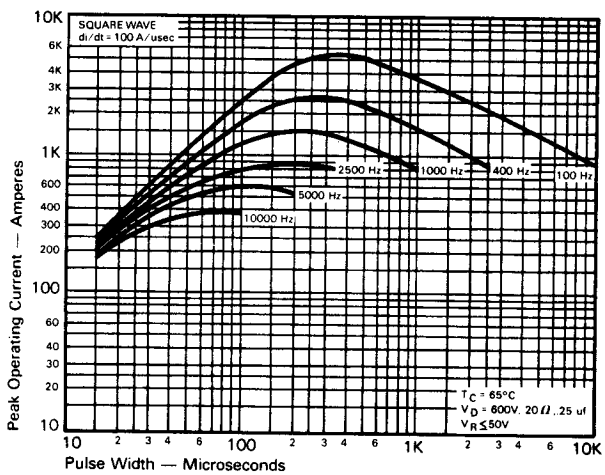


MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH (di/dt = 50A/usec)

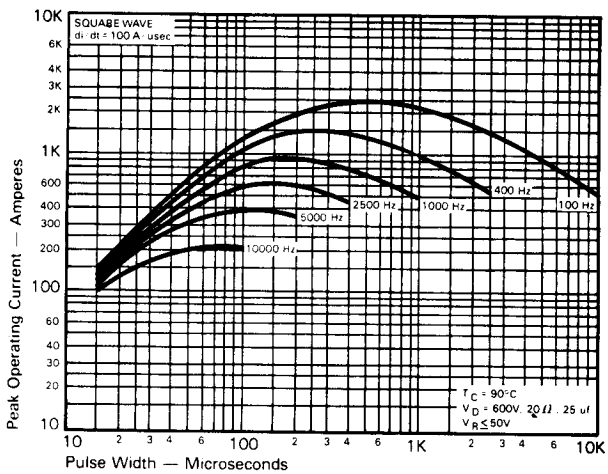
Trapezoidal Wave Current Data
(T_C = 90°C)



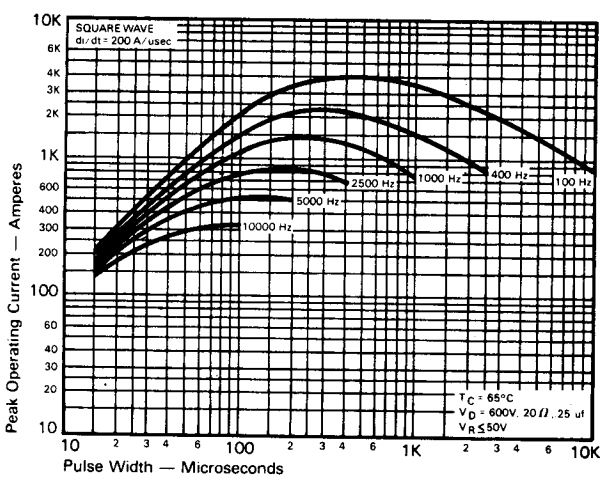
MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH (di/dt = 50A/usec)



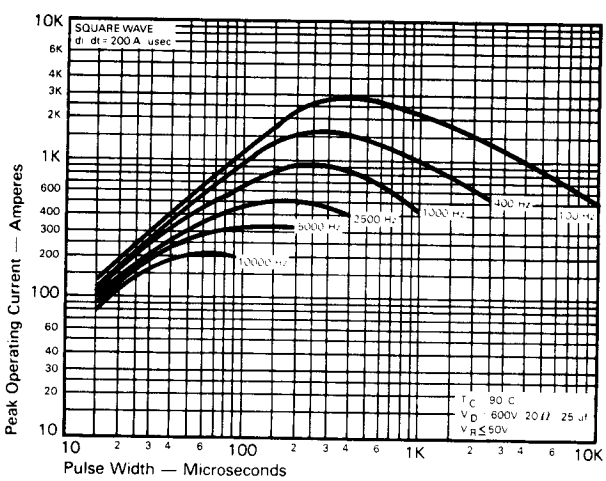
MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH (di/dt = 100A/usec)



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)

FAST SWITCHING THYRISTORS