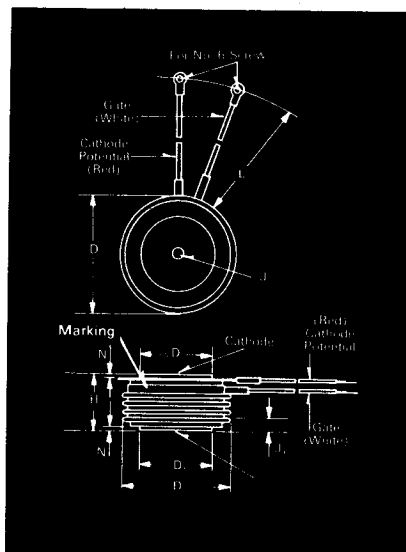


Fast Switching SCR T727_48

475A Avg.
(750 RMS)
Up to 800 Volts
10-50 μ s



T72 Outline

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

Symbol	Inches		Millimeters	
	Min.	Max.	Min.	Max.
ϕD	2.250	2.290	57.15	58.17
ϕD_1	1.333	1.343	33.86	34.11
ϕD_2	2.030	2.090	51.56	53.09
H	1.020	1.060	25.91	26.92
ϕJ	.135	.145	3.43	3.68
J_1	.075	.090	1.91	2.29
L	7.75	8.50	196.85	215.90
N	.040		1.02	

Creep Distance—1.00 in. min. (25.40 mm).

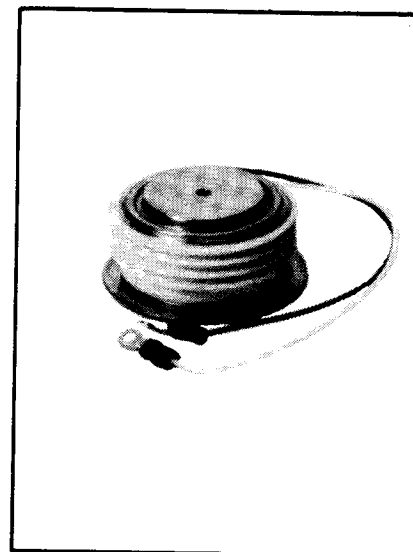
Strike Distance—.69 in. min. (17.53 mm).

(In accordance with NEMA standards.)

Finish—Nickel Plate.

Approx. Weight—8 oz. (227 g).

1. Dimension "H" is a clamped dimension.



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 μ sec	Code	I _{GT} (ma)	Code	Case	Code
T727	100	01	475	48	10	8	150	4	T72	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								

Example

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

Type T727 rated at 475 A average with V_{DRM} = 600V.

I_{GT} = 150 ma, t_q = 30 μ sec max. and standard control leads—order as:

Type	Voltage	Current	Turn Off	Gate Current	Leads
T 7 2 7	0 6	4 8	5	4	D N

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Voltage

Blocking State Maximums ^② ($T_J = 125^\circ\text{C}$)

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
100	200	300	400	500	600	700	800
200	300	400	500	600	700	800	900
				30			
				30			

Current

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

RMS forward current, A ...
Ave. forward current, A ...
One-half cycle surge current^③, A ...
 I^2t for fusing (for times ≥ 8.3 ms)
A² sec.
Forward voltage drop at $I_{TM} = 3000$ A
and $T_J = 25^\circ\text{C}$, V ...
Min. repetitive di/dt A/ μ sec ... ①④⑤

Symbol

$I_{T(rms)}$
 $I_{T(av)}$
 I_{TSM}
 I^2t
 V_{TM}
 di/dt

T727—48

750
475
8000
265,000
2.30
400

Switching

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

Max. turn-off time, $I_T = 400$ A
 $T_J = 125^\circ\text{C}$, $di/dt = 25$
A/ μ sec, reappplied $dv/dt =$
20V/ μ sec linear to 0.8 V_{DRM} , μ sec ... ③④
Typ. turn-on time, $I_T = 1000$ A
 $V_D = 300$ V ④, μ sec ...
Min. critical dv/dt , exponential to V_{DRM}
 $T_J = 125^\circ\text{C}$, V/ μ sec ③④
Min. di/dt non-repetitive,
A/ μ sec ①④⑤

Symbol

t_q
 t_{on}
 dv/dt
 di/dt

10 to 50
3.0
300
800

Gate

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

Gate current to trigger at $V_D = 12$ V, mA ...
Gate voltage to trigger at $V_D = 12$ V, V ...
Non-triggering gate voltage, $T_J = 125^\circ\text{C}$,
and rated V_{DRM} , 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}
 $P_{G(av)}$

150
3
0.15
4
5
16
3

Thermal and Mechanical

Min., Max. oper. junction temp., $^\circ\text{C}$...
Min., Max. storage temp., $^\circ\text{C}$...
Max. mounting torque, in lb. ①
Max. Thermal resistance ① Double side cooled
junction to case, $^\circ\text{C}/\text{Watt}$...
Case to sink, lubricated, $^\circ\text{C}/\text{Watt}$...

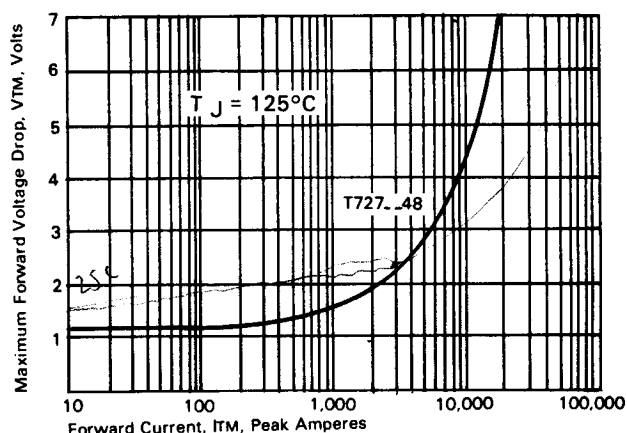
Symbol

T_J
 T_{stg}
 $R_{\theta JC}$
 $R_{\theta CS}$

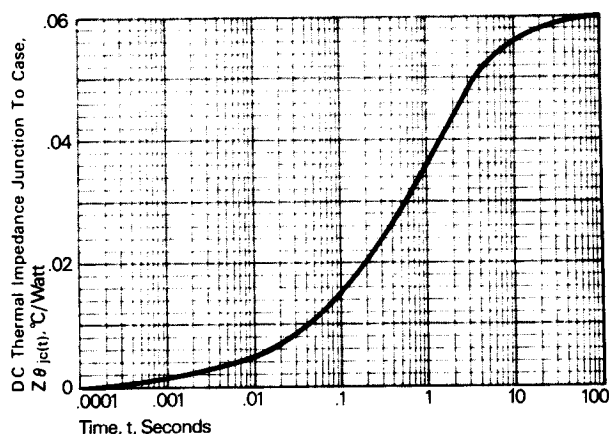
-40 to +125
-40 to +150
2000 to 2400
.06
.02

- 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



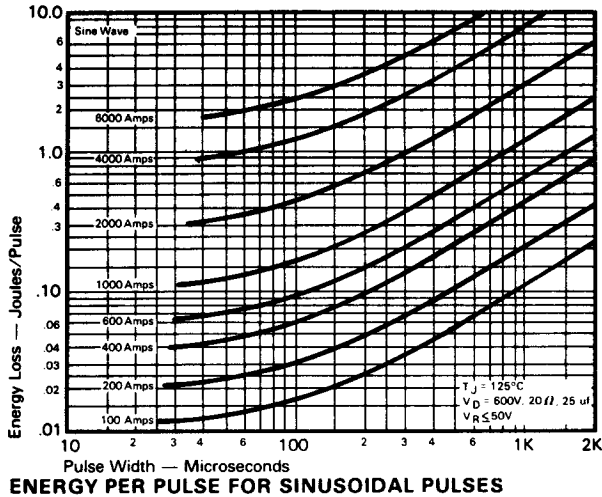
Transient Thermal Impedance VS. Time



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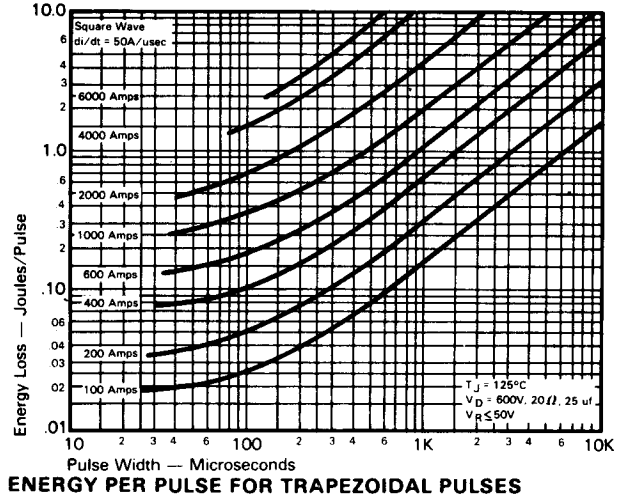
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Sinusoidal Current Data

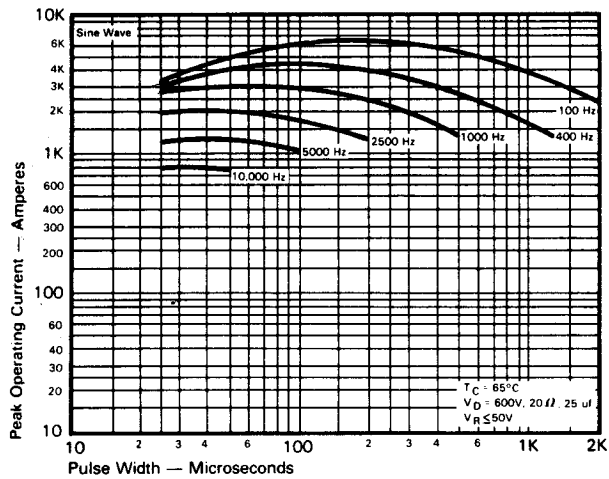


ENERGY PER PULSE FOR SINUSOIDAL PULSES

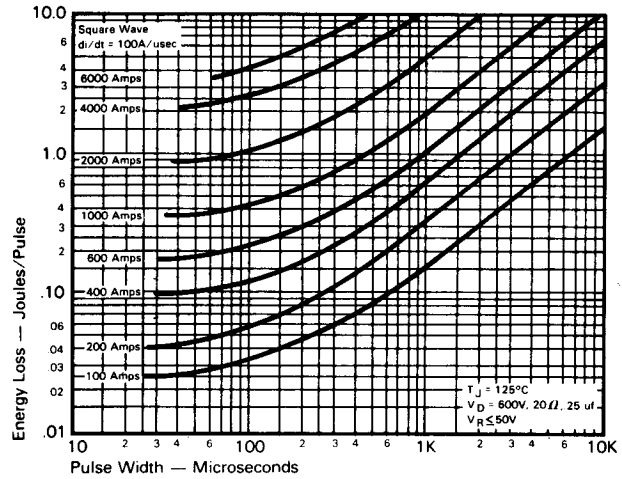
Trapezoidal Wave Current Data



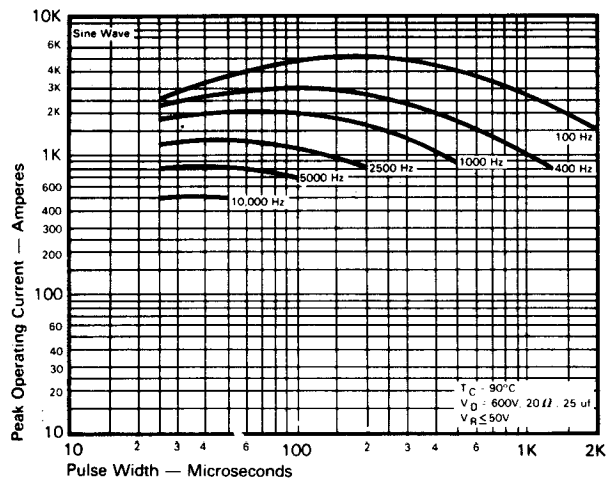
ENERGY PER PULSE FOR TRAPEZOIDAL PULSES
($di/dt = 50\text{A}/\mu\text{sec}$)



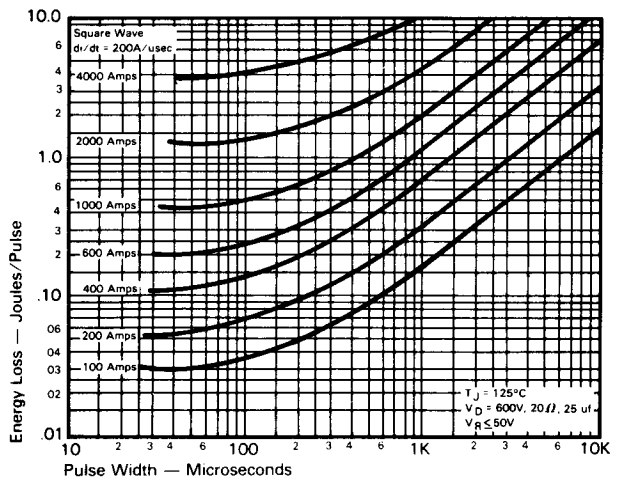
MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT
vs. PULSE WIDTH ($T_C = 65^\circ\text{C}$)



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



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



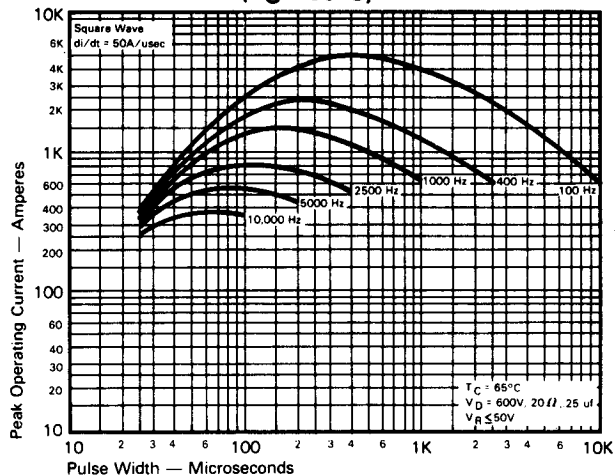
ENERGY PER PULSE FOR TRAPEZOIDAL PULSES
($di/dt = 200\text{A}/\mu\text{sec}$)

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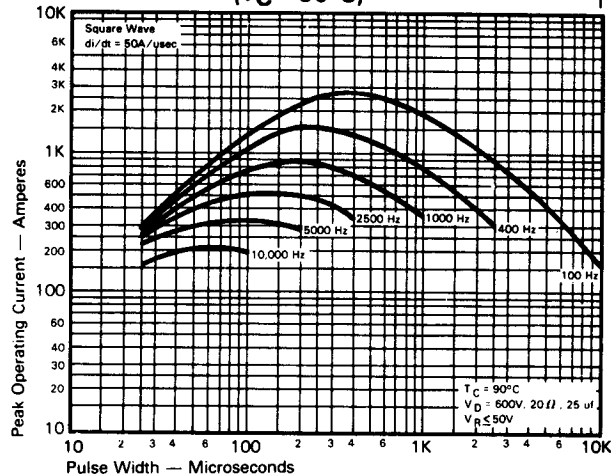
Fast Switching
SCR
T727_48

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

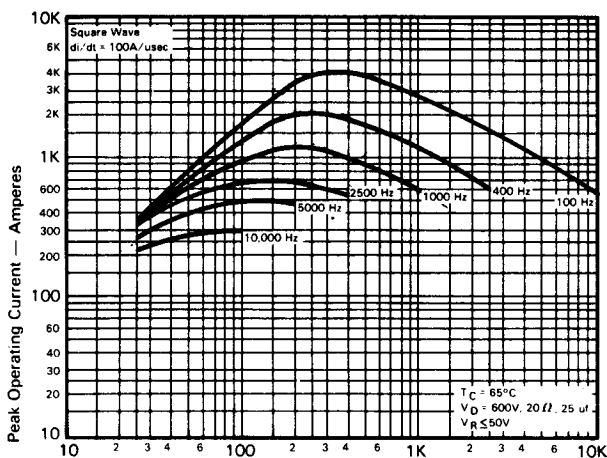


MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ($di/dt = 50\text{A/us}$)

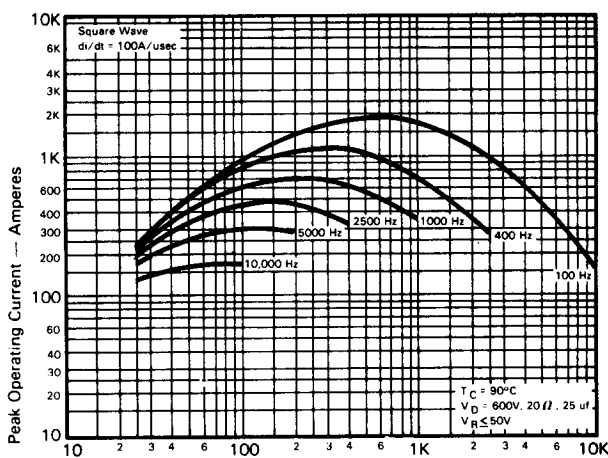
Trapezoidal Wave Current Data ($T_C = 90^\circ\text{C}$)



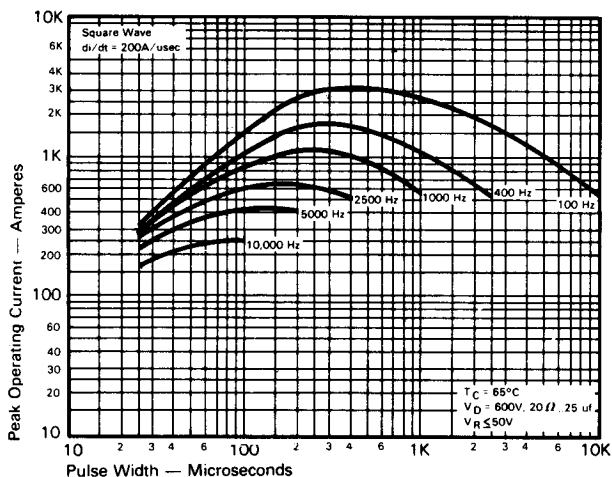
MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ($di/dt = 50\text{A/us}$)



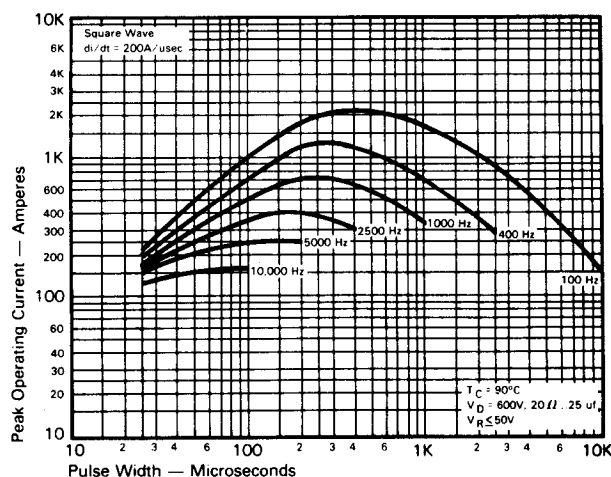
MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT vs. PULSE WIDTH ($di/dt = 100\text{A/us}$)



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



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



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

FAST SWITCHING
THYRISTORS