

The T820 SCR employs a Center-Fired amplifying gate structure which allows the SCR to be reliably operated at high di/dt and high dv/dt conditions in phase control applications.

**FEATURES:**

- Low On-State Voltage
- High di/dt Capability
- High dv/dt Capability
- Hermetic Ceramic Package
- Excellent Surge and  $I^2t$  Ratings

**APPLICATIONS:**

- DC Power Supplies
- Plating Supplies
- Welding Supplies

**ORDERING INFORMATION**

Select the complete 12 digit Part Number using the table below.  
 EXAMPLE: **T820081404DH** is an 800V-1450A SCR with 150ma IGT and 12 inch gate and cathode potential leads.

PART	Voltage Rating $V_{DRM}-V_{RRM}$	Voltage Code	Current Rating $I_{TAVG}$	Current Code	Turn-Off $T_q$	Gate $I_{GT}$	Leads
<b>T820</b>	800V	<b>08</b>	1450A	<b>14</b>	<b>0</b>	<b>4</b>	<b>DH</b>
	600V	<b>06</b>					
	400V	<b>04</b>			400us typ.	150ma	12"

Revised: 10/7/2009

**Absolute Maximum Ratings**

Characteristic	Symbol	Rating	Units
Repetitive Peak Voltage	$V_{DRM}-V_{RRM}$	400 - 800	Volts
Average On-State Current, $T_C=70^{\circ}C$	$I_{T(Avg.)}$	1450	A
RMS On-State Current, $T_C=70^{\circ}C$	$I_{T(RMS)}$	2278	A
Average On-State Current, $T_C=55^{\circ}C$	$I_{T(Avg.)}$	1640	A
RMS On-State Current, $T_C=55^{\circ}C$	$I_{T(RMS)}$	2576	A
Peak One Cycle Surge Current, 60Hz, $V_R=0V$	$I_{TSM}$	18,300	A
Peak One Cycle Surge Current, 50Hz, $V_R=0V$	$I_{TSM}$	17,253	A
Fuse Coordination $I^2t$ , 60Hz	$I^2t$	1.40E+06	$A^2s$
Fuse Coordination $I^2t$ , 50Hz	$I^2t$	1.49E+06	$A^2s$
Critical Rate-of-Rise of On-State Current Repetitive	di/dt	100	A/us
Critical Rate-of-Rise of On-State Current Non-Repetitive	di/dt	200	A/us
Critical Rate-of-Rise of Off-State Voltage Linear to $\frac{2}{3} \cdot V_{DRM}$	dv/dt	600	V/us
Peak Gate Power, 100us	$P_{GM}$	16	Watts
Average Gate Power	$P_{G(avg)}$	5	Watts
Operating Temperature	$T_j$	-20 to+140	$^{\circ}C$
Storage Temperature	$T_{Stg.}$	-50 to+150	$^{\circ}C$
Approximate Weight		0.6	lb
		0.27	Kg
Mounting Force		3000 - 3500	lbs
		13.3 - 15.5	Knewtons

Information presented is based upon limited testing or projected capabilities. This information is subject to change without notice. The manufacturer makes no claim as to suitability for use, reliability, capability or future availability of this product.

**Electrical Characteristics, Tj=25°C unless otherwise specified**

Characteristic	Symbol	Test Conditions	Rating			Units
			min	typ	max	
Repetitive Peak Leakage Current	$I_{DRM}/I_{RRM}$	Tj=140°C, $V_{DRM}$ =Rated			150	ma
Peak On-State Voltage	$V_{TM}$	Tj=25°C, $I_{TM}$ =1500A			1.20	V
$V_{TM}$ Model, Low Level	$V_0$	Tj=140°C			0.790	V
$V_{TM} = V_0 + r \cdot I_{TM}$	r	15% $I_{TM}$ - $\pi \cdot I_{TM}$			0.1218	mΩ
$V_{TM}$ Model, High Level	$V_0$	Tj=140°C			0.640	V
$V_{TM} = V_0 + r \cdot I_{TM}$	r	$\pi \cdot I_{TM} - I_{TSM}$			0.1443	mΩ
$V_{TM}$ Model, Hiç4-Term	A	Tj=140°C			0.397	
$V_{TM} = A + B \cdot \ln(I_{TM}) +$	B	15% $I_{TM} - I_{TSM}$			0.096	
$C \cdot (I_{TM}) + D \cdot (I_{TM})^{1/2}$	C				1.81E-04	
	D				-0.01012	
Turn-On Delay Time	$t_d$	$V_D = 0.5 \cdot V_{DRM}$ Gate Drive: 40V - 20Ω			1.5	us
Turn-Off Time	$t_q$	Tj=140°C $dv/dt = 20V/us$ to 80% $V_{DRM}$			400	us
Gate Trigger Current	$I_{GT}$	Tj=25°C $V_D = 12V$	30	90	150	ma
Gate Trigger Voltage	$V_{GT}$		0.6	1.6	3.0	V
Peak Reverse Gate Voltage	$V_{GRM}$				5	V

**Thermal Characteristics**

Characteristic	Symbol	Test Conditions	Rating	
			max	Units
Thermal Resistance				
Junction to Case	$R\theta_{jc}$	Double side cooled	0.037	°C/Watt
Case to Sink	$R\theta_{cs}$	Double side cooled	0.0085	°C/Watt

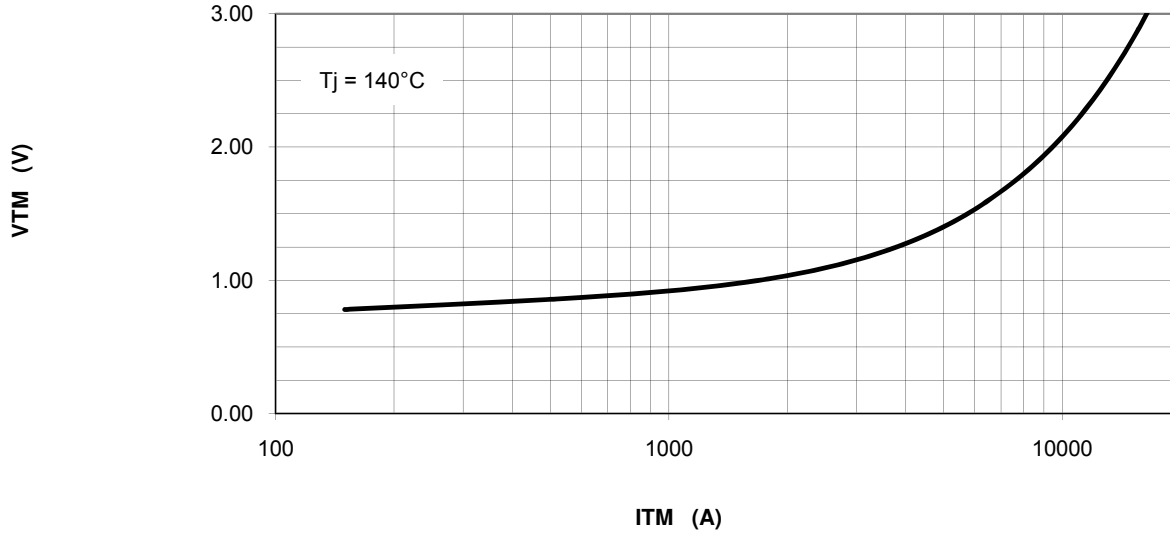
Thermal Impedance Model  $Z\theta_{jc}$  Double side cooled

$$Z\theta_{jc}(t) = \sum(A(N) \cdot (1 - \exp(-t/\text{Tau}(N))))$$

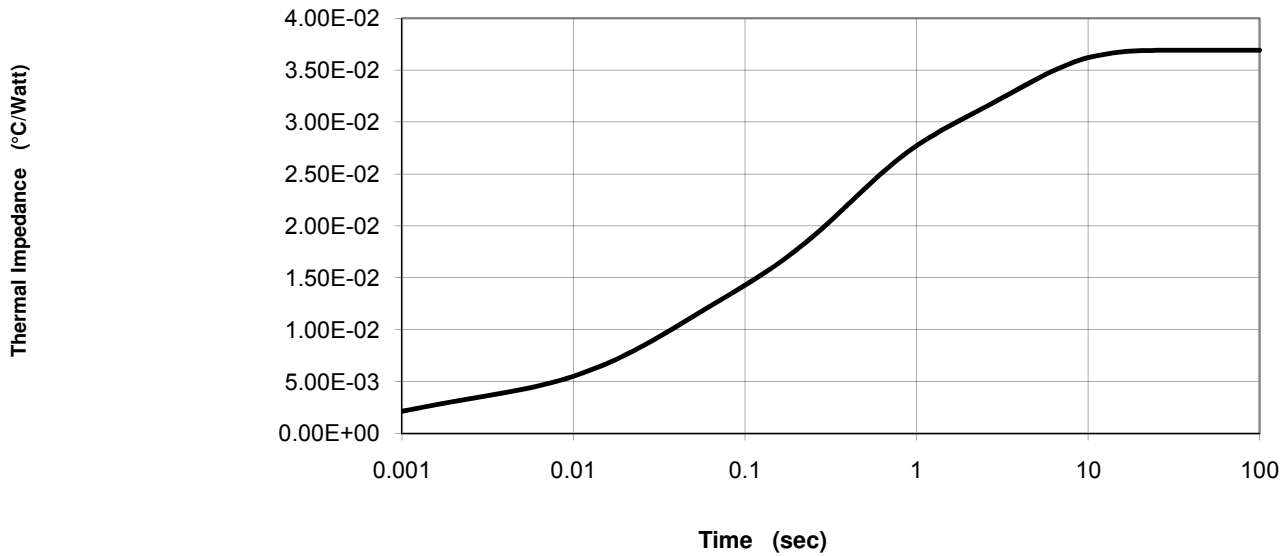
where:

N =	1	2	3	4
A(N) =	2.80E-03	7.59E-03	1.57E-02	1.08E-02
Tau(N) =	9.30E-04	2.83E-02	3.57E-01	3.69E+00

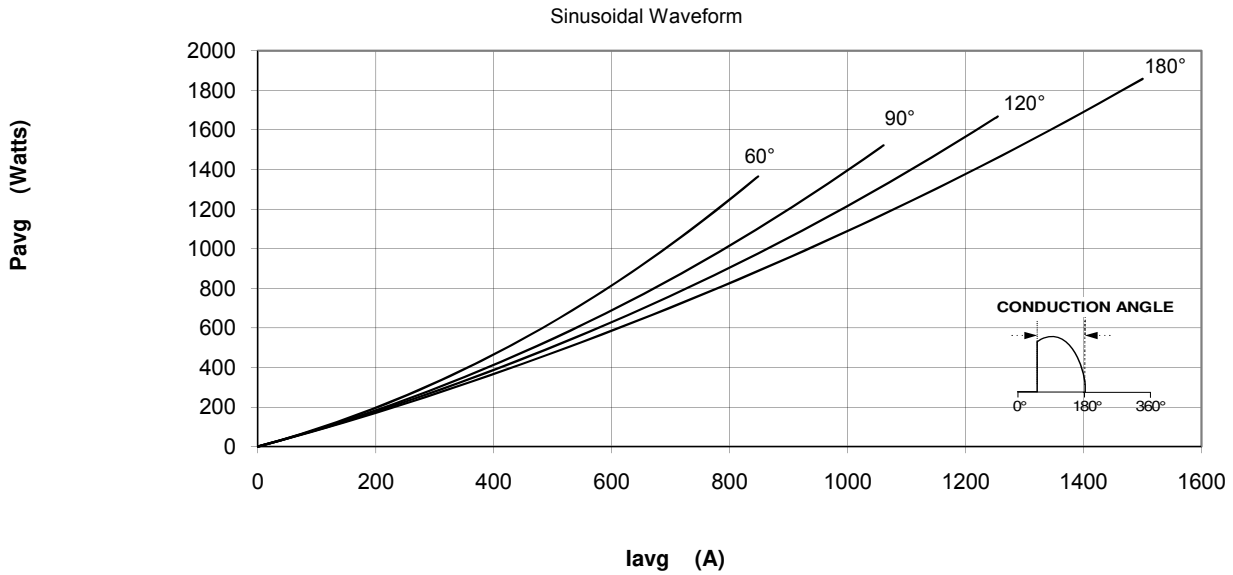
### Maximum On-State Voltage Drop



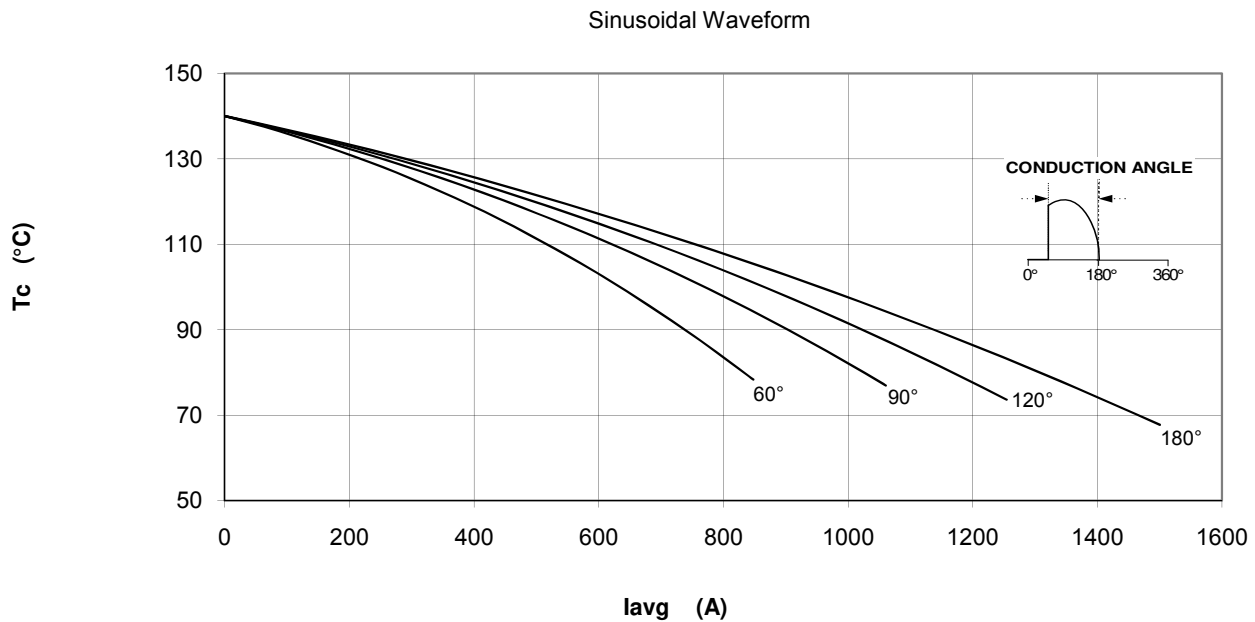
### MAXIMUM TRANSIENT THERMAL IMPEDANCE



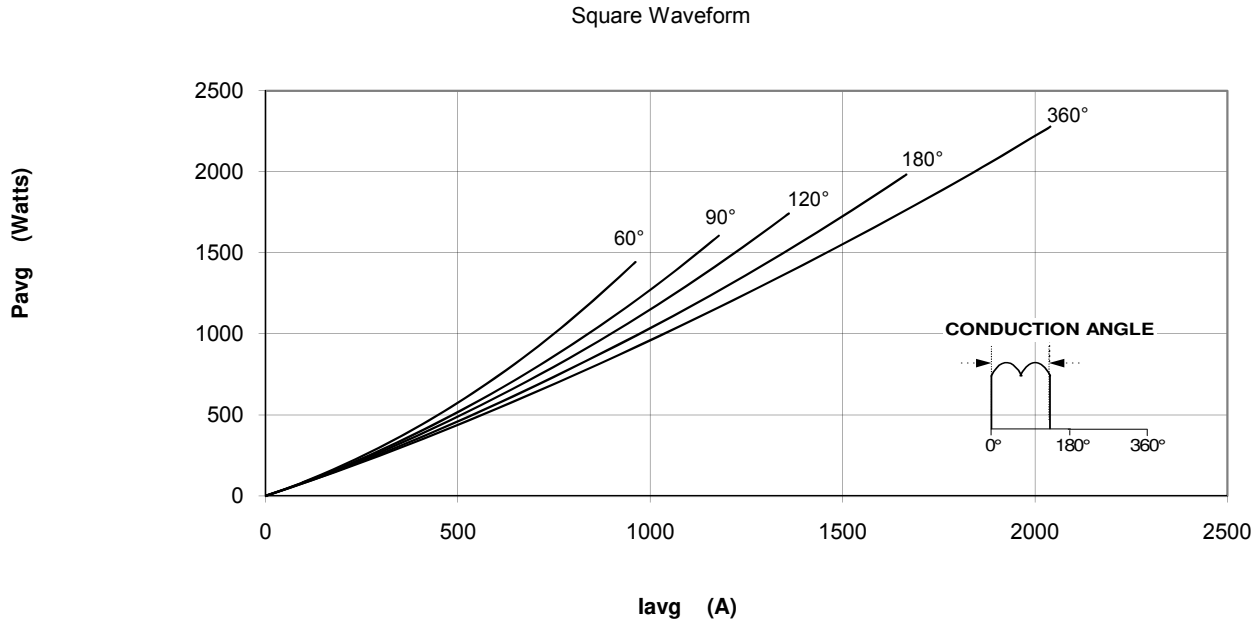
### Maximum On-State Power Dissipation



### Maximum Allowable Case Temperature



## Maximum On-State Power Dissipation



## Maximum Allowable Case Temperature

