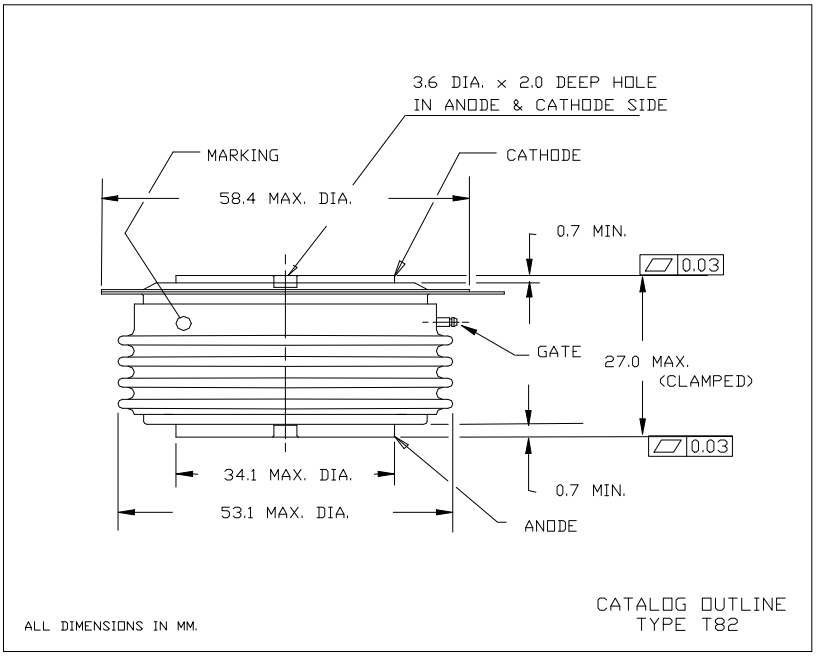
Powerex, Inc., 173 Pavilion Ln, Youngwood, PA 15697-1800 (724)925-7272 www.pwrx.com

T820__8004

Phase Control Thyristor

800 Amperes 1800 Volts



The T820 is a high current disc pack SCR employing a high di/dt gate structure. This gate design allows the SCR to be reliably operated at high di/dt and dv/dt conditions in various 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
- Motor Controls

ORDERING INFORMATION

Select the complete 12 digit Part Number using the table below.
EXAMPLE: T820188004DH is a 1800V-800A SCR with 150ma IGT and 12 inch gate and cathode potential leads.

PART	Voltage Rating	Voltage Code	Current Rating	Current Code	Turn-Off	Gate	Leads
	V_{DRM}-V_{RRM}		I_{tavg}		tq	I_{GT}	
T820	1800	**18**	800	**80**	**0**	**4**	**DH**
	1600	**16**					
	1400	**14**			400us	150ma	12"
					(typ.)	(max)	

Revised: 5/23/2008

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Absolute Maximum Ratings

Characteristic	Symbol	Rating	Units
Repetitive Peak Voltage	V_{DRM}-V_{RRM}	1400 - 1800	Volts
Average On-State Current, T_C=74°C	$I_{T(Avg.)}$	800	A
RMS On-State Current, T_C=74°C	$I_{T(RMS)}$	1257	A
Average On-State Current, T_C=55°C	$I_{T(Avg.)}$	1000	A
RMS On-State Current, T_C=55°C	$I_{T(RMS)}$	1571	A
Peak One Cycle Surge Current, 60Hz, V_R=0V	I_{TSM}	15,000	A
Peak One Cycle Surge Current, 50Hz, V_R=0V	I_{TSM}	14,400	A
Fuse Coordination I^2t, 60Hz	I^2t	9.38E+05	A^2s
Fuse Coordination I^2t, 50Hz	I^2t	1.04E+06	A^2s
Critical Rate-of-Rise of On-State Current Repetitive .67•VDRM	di/dt	100	A/us
Critical Rate-of-Rise of On-State Current Non-Repetitive .67•VDRM	di/dt	200	A/us
Peak Gate Power, 100us	P_{GM}	16	Watts
Average Gate Power	$P_{G(avg)}$	5	Watts
Operating Temperature	Tj	-40 to+125	°C
Storage Temperature	$T_{Stg.}$	-50 to+150	°C
Approximate Weight		0.6	lb
		0.27	Kg
Mounting Force		3000-3500	lbs
		13.3 - 15.5	Knewtons

Electrical Characteristics, Tj=25°C unless otherwise specified

Characteristic	Symbol	Test Conditions	Rating min	Rating typ	Rating max	Units
Repetitive Peak Forward/Reverse Leakage Current	I_{DRM} / I_{RRM}	Tj=125°C, V_{DRM}=V_{RRM}=Rated		45	60	ma
Peak On-State Voltage	V_{TM}	Tj=125°C, I_{TM}=1000A			1.31	V
V_{TM} Model, Low Level	V_0	Tj=125°C			0.893	V
VTM = V_O + r•I_{TM}	r	15% I_{TM} - π•I_{TM}			0.386	mΩ
V_{TM} Model, High Level	V_0	Tj=125°C			1.24	V
VTM = V_O + r•I_{TM}	r	π•I_{TM} - I_{TSM}			0.262	mΩ
V_{TM} Model, 4-Term	A	Tj=125°C			0.588	
V_{TM}= A + B•Ln(I_{TM}) +	B	15%I_{TM} - I_{TSM}			0.0195	
C•(I_{TM}) + D•(I_{TM})^{½}	C				1.87E-04	
	D				0.0125	
Turn-On Delay Time	t_d	V_D = 0.5•V_{DRM} Gate Drive: 40V - 20Ω		2.0	2.5	us
Turn-Off Time	tq	Tj=125°C dv/dt = 20V/us to 67% V_{DRM}		400	500	us
$dv/dt_{(Crit)}$	dv/dt	Tj=125°C V_D =80% Rated	1000			V/us
Gate Trigger Current	I_{GT}	Tj=25°C V_D = 12V	30	100	150	ma
Gate Trigger Voltage	V_{GT}		0.8	1.5	3.0	V
Peak Reverse Gate Voltage	V_{GRM}				5	V

Thermal Characteristics

Characteristic	Symbol	Test Conditions	Rating min	Rating typ	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			0.007	°C/Watt
Thermal Impedance Model	$Z\Theta_{jc}$	Double side cooled				

$Z\Theta_{jc}(t) = \Sigma(A(N)\bullet(1-\exp(-t/Tau(N))))$ 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	2.69E+00

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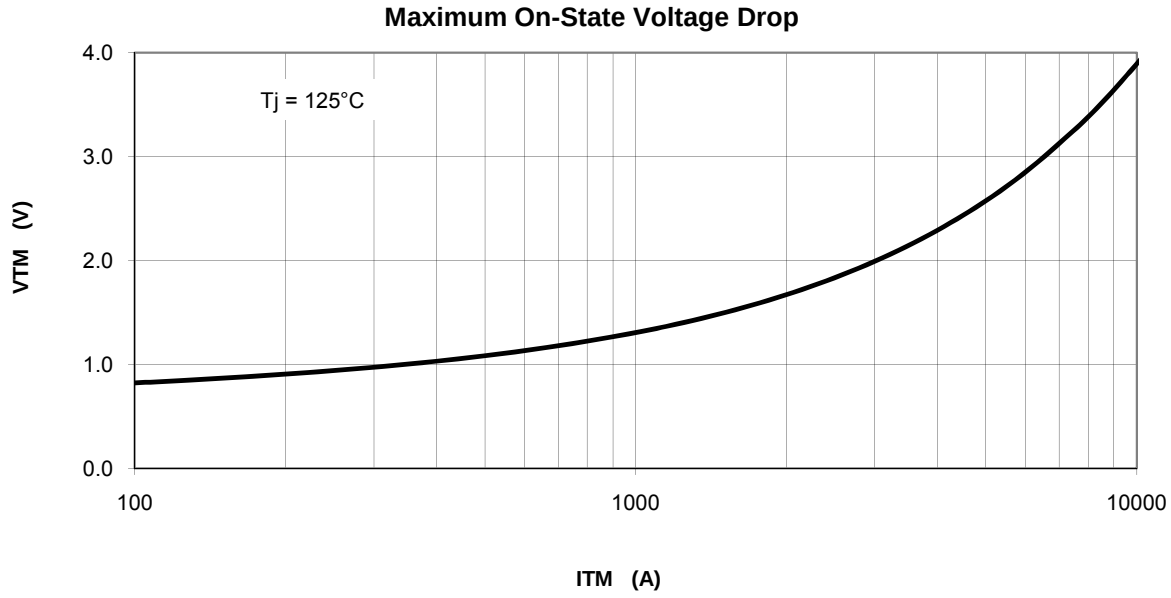

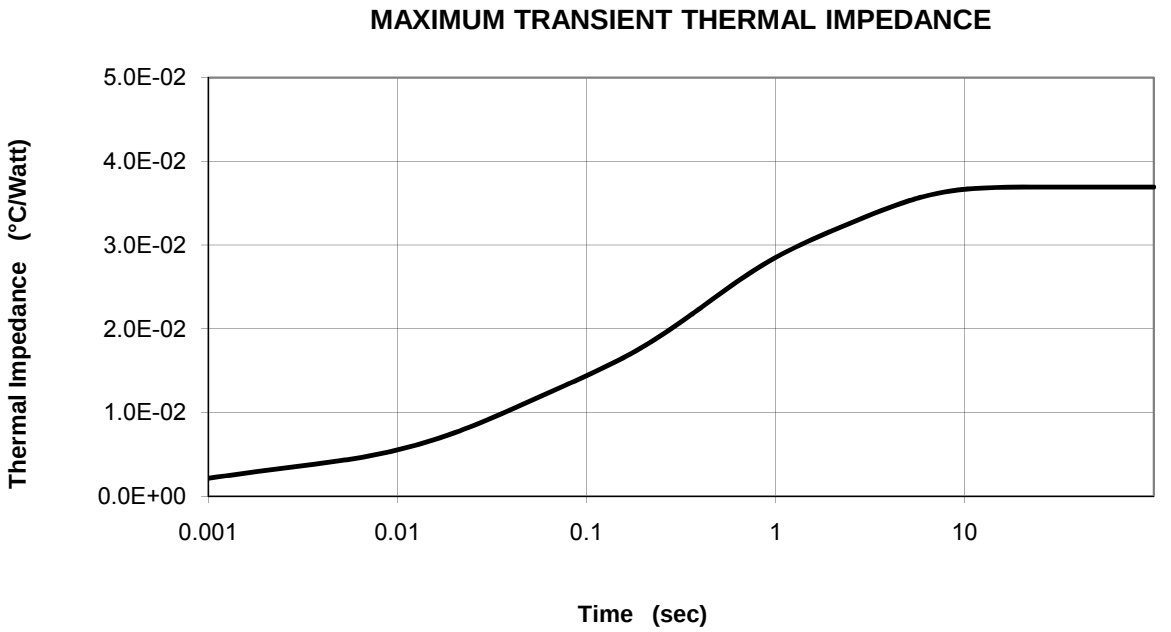

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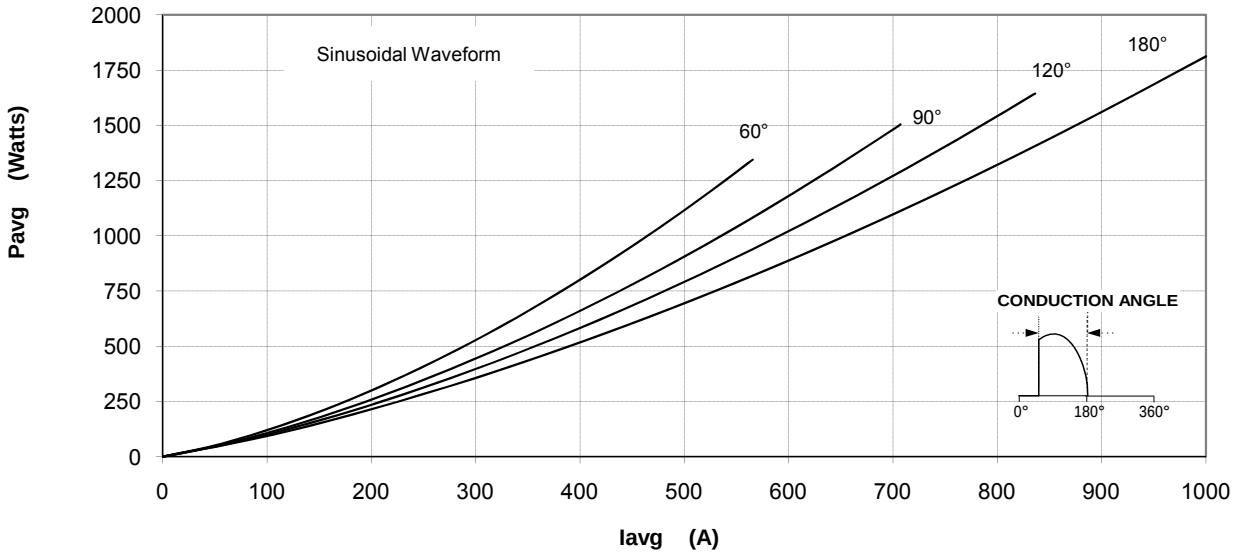
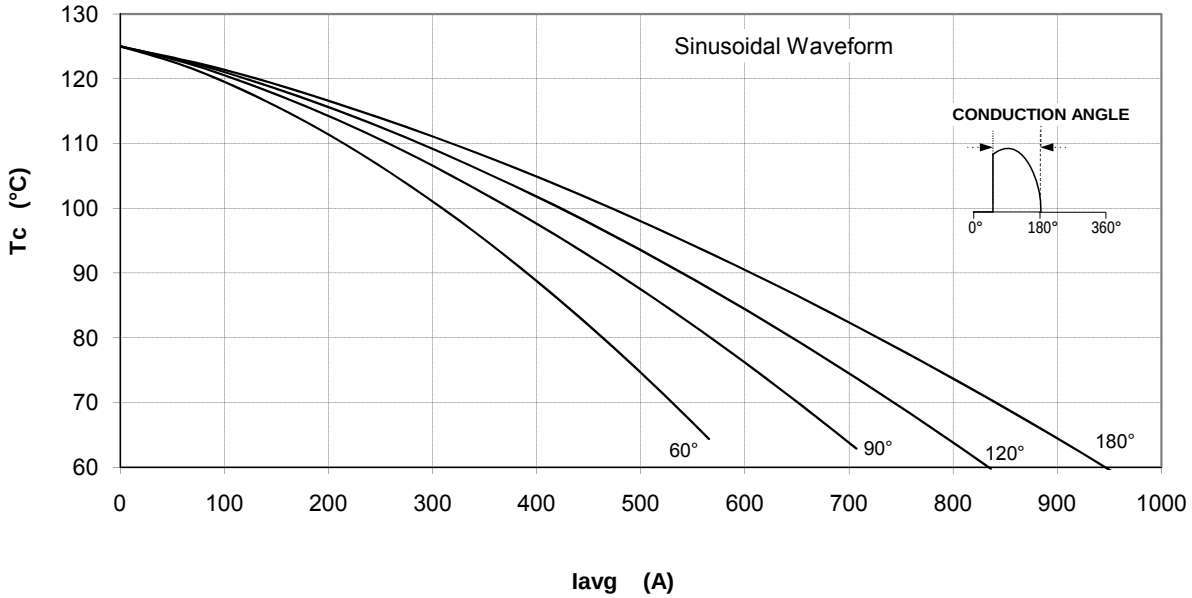
Maximum On-State Power Dissipation



Maximum Allowable Case Temperature



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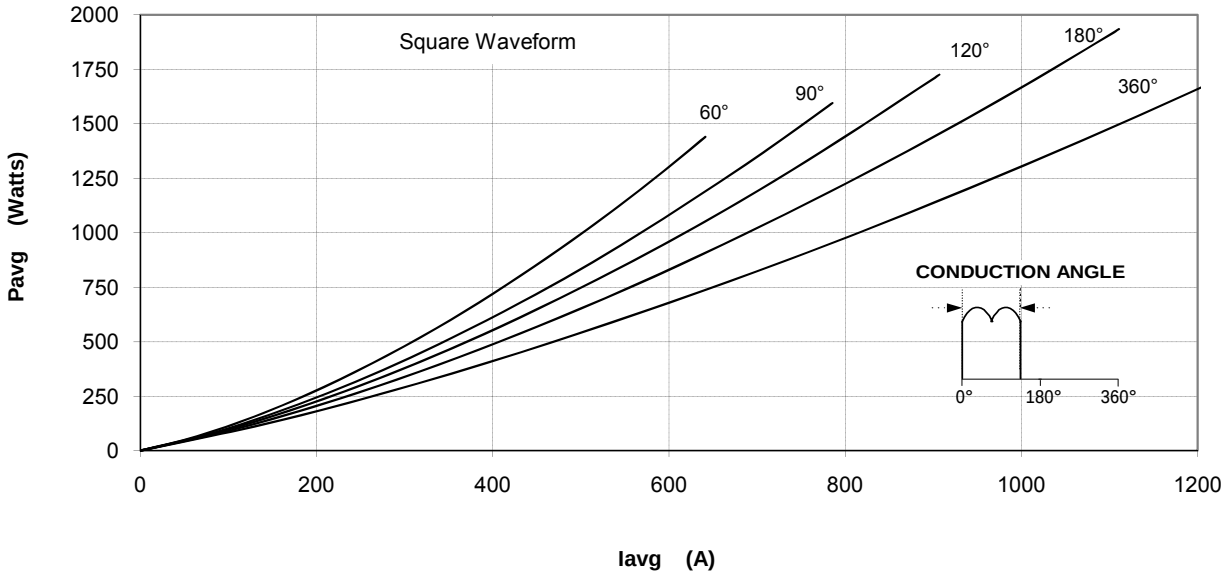

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