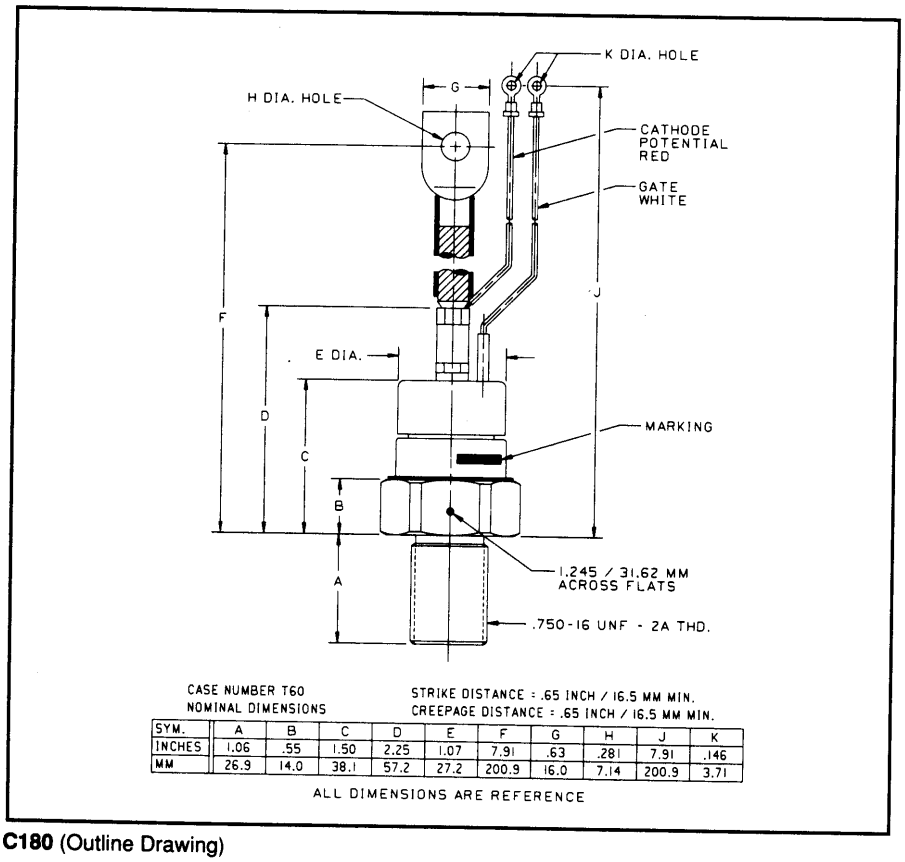
Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272
Powerex, Europe, S.A. 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

C180

Phase Control SCR

150 Amperes Average
1600 Volts



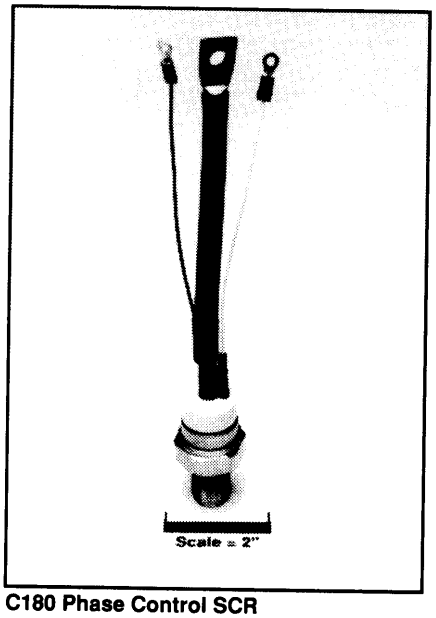
CASE NUMBER T60
NOMINAL DIMENSIONS

STRIKE DISTANCE = .65 INCH / 16.5 MM MIN.
CREEPAGE DISTANCE = .65 INCH / 16.5 MM MIN.

SYM.	A	B	C	D	E	F	G	H	J	K
INCHES	1.06	.55	1.50	2.25	1.07	7.91	.63	.281	7.91	.146
MM	26.9	14.0	38.1	57.2	27.2	200.9	16.0	7.14	200.9	3.71

ALL DIMENSIONS ARE REFERENCE

C180 (Outline Drawing)



C180 Phase Control SCR
150 Amperes Average, 1600 Volts

Ordering Information:

Select the complete five or six digit part number you desire from the table, i.e. C180PM is a 1600 Volt, 150 Ampere Phase Control SCR.

Type	Voltage V_{DRM} V_{RRM}	Code	Current $I_{T(av)}$
C180	200	B	150
	400	D	
	600	M	
	800	N	
	1000	P	
	1200	PB	
	1400	PD	
	1600	PM	

Description:

Powerex Silicon Controlled Rectifiers (SCR) are designed for phase control applications. These are all-diffused, compression bonded encapsulated (CBE) devices employing the field-proven amplifying (di/namic) gate.

Features:

- ☐ Low On-State Voltage
- ☐ High di/dt
- ☐ High dv/dt
- ☐ Hermetic Packaging
- ☐ Excellent Surge and I^2t Ratings

Applications:

- ☐ Power Supplies
- ☐ Battery Chargers
- ☐ Motor Control

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150 Amperes Average, 1600 Volts

Absolute Maximum Ratings

	Symbol	C180	Units
RMS On-State Current @ T_C = 90°C	$I_{T(RMS)}$	235	Amperes
Average On-State Current @ T_C = 90°C	$I_{T(av)}$	150	Amperes
Peak One-Cycle Surge (Non Repetitive) On-State Current (60Hz)	I_{TSM}	3500	Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current (50Hz)	I_{TSM}	3200	Amperes
Critical Rate-of-Rise of On-State Current (Non-Repetitive)	di/dt	800	Amperes/μs
Critical Rate-of-Rise of On-State Current (Repetitive)	di/dt	150	Amperes/μs
I^2t (for Fusing), 8.3 milliseconds	I^2t	50,800	A^2sec
Peak Gate Power Dissipation	P_{GM}	10	Watts
Average Gate Power Dissipation	$P_{G(av)}$	2	Watts
Storage Temperature	T_{STG}	−40 to 150	°C
Operating Temperature	T_J	−40 to 125	°C
Mounting Torque		250 to 300	in.-lb.
Mounting Torque		28 to 34	N-M

Electrical and Thermal Characteristics

Characteristics	Symbol	Test Conditions	C180	Units
Voltage—Blocking State Maximums				
Forward Leakage, Peak	I_{DRM}	T_J = 125°C; V_{DRM} = Rated	20	mA
Reverse Leakage, Peak	I_{RRM}	T_J = 125°C; V_{RRM} = Rated	20	mA
Current—Conducting State Maximums				
Peak On-State Voltage	V_{TM}	T_J = 25°C, I_{TM} = 1500A	2.85	Volts
Switching				
Typical Turn-Off Time	t_q	I_T = 150A, T_J = 125°C, di_R/dt = 12.5A/μsec Reapplied dv/dt = 20V/μsec, Linear to 0.8V_{DRM}, V_R = 50V	100	μsec
Typical Delay Time	t_d	I_T = 100A, V_{DRM} = Rated Gate Supply = 10V Open Ckt, 25Ω, 0.1μsec Rise Time	1.0	μsec
Min. Critical dv/dt exponential to V_{DRM}	dv/dt	T_J = 125°C, Gate Open	200	V/μsec
Thermal				
Maximum Thermal Resistance Junction to Case	$R_{\theta JC}$		0.14	°C/Watt
Case to Sink, Lubricated	$R_{\theta CS}$		0.075	°C/Watt
Gate—Maximum Parameters				
Gate Current to Trigger	I_{GT}	T_C = 25°C: V_D = 6Vdc, R_L = 3Ω	150	mA
Gate Voltage to Trigger	V_{GT}	T_C = −40°C to 125°C, V_D = 6Vdc, R_L = 3Ω	3.0	Volts
Non-Triggering Gate Voltage	V_{GDM}	T_J = 125°C, Rated V_{DRM}, R_L = 1000Ω	0.15	Volts
Peak Forward Gate Current	I_{GTM}		10	Amperes
Peak Reverse Gate Voltage	V_{GRM}		5	Volts

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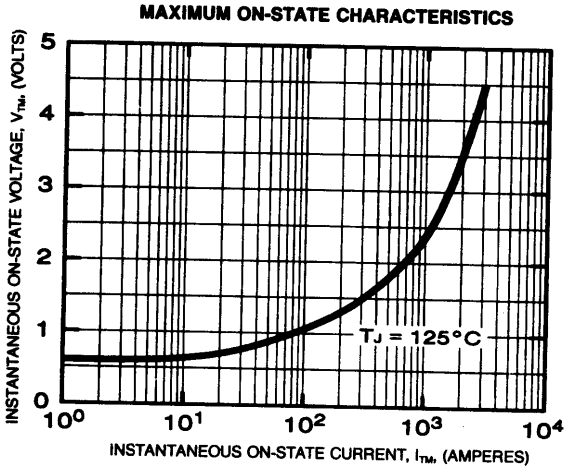
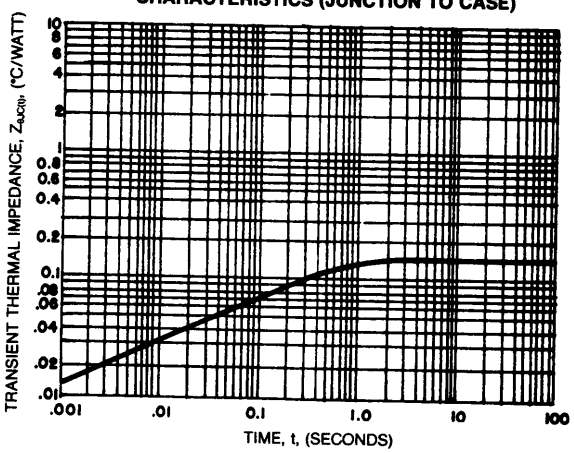
150 Amperes Average, 1600 Volts

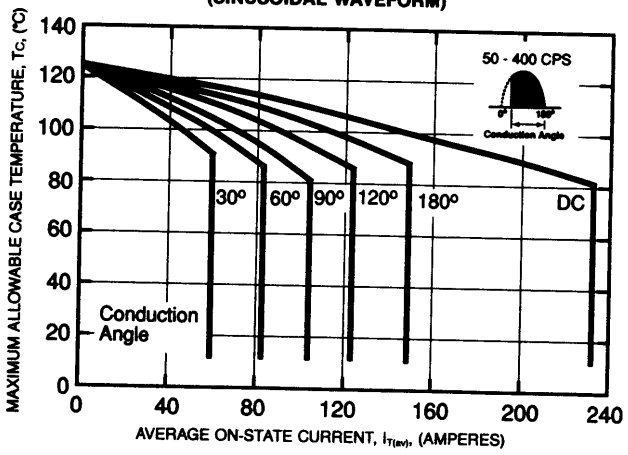
MAXIMUM ON-STATE CHARACTERISTICS



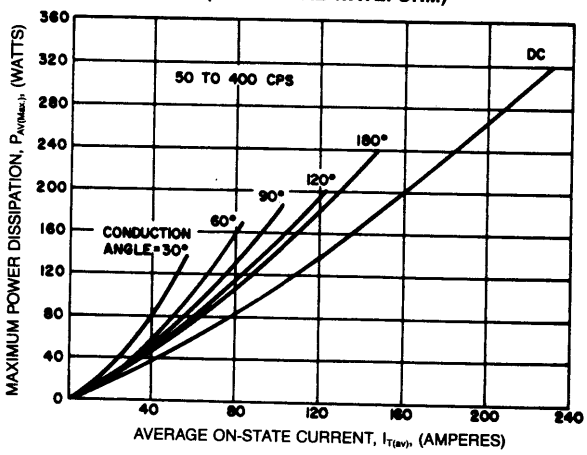
TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)



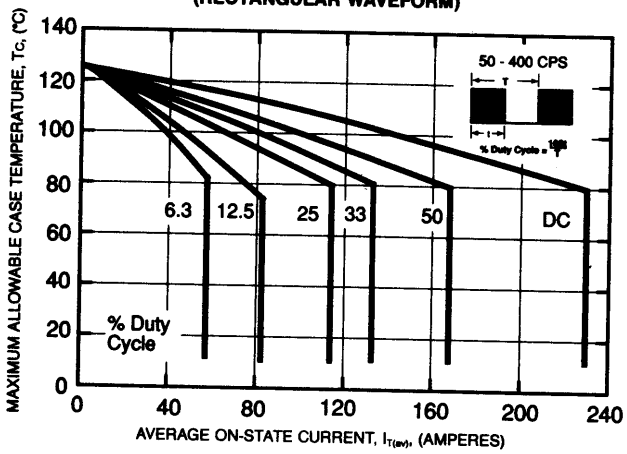
MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)



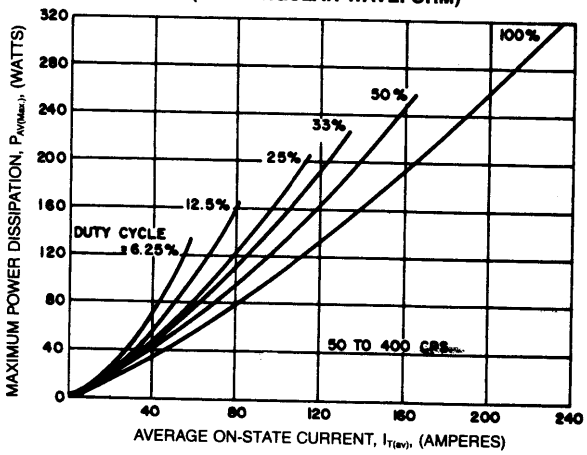
MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM)



MAXIMUM ALLOWABLE CASE TEMPERATURE (RECTANGULAR WAVEFORM)



MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM)



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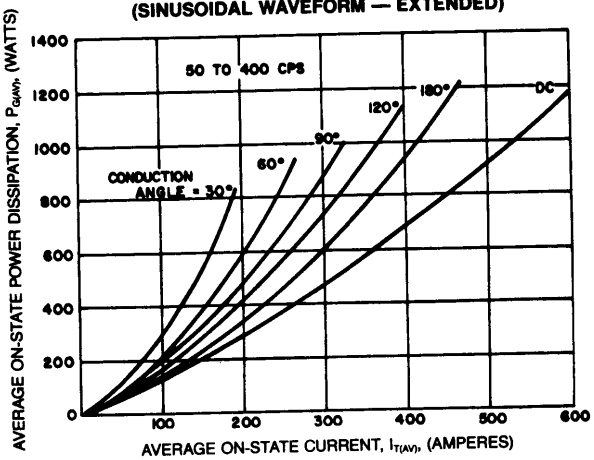
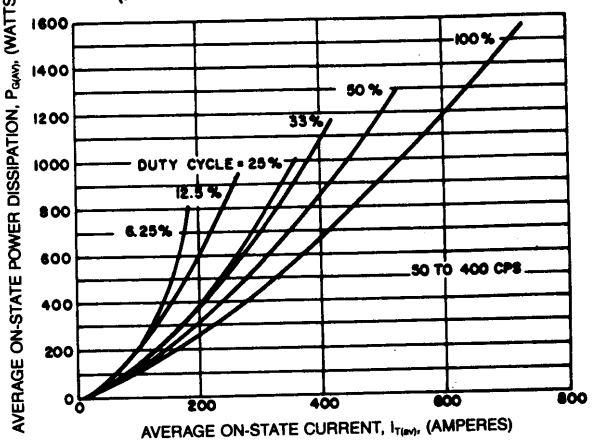
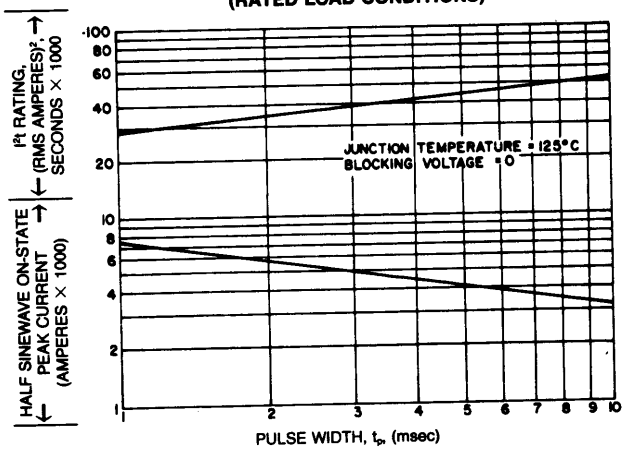
MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM — EXTENDED)



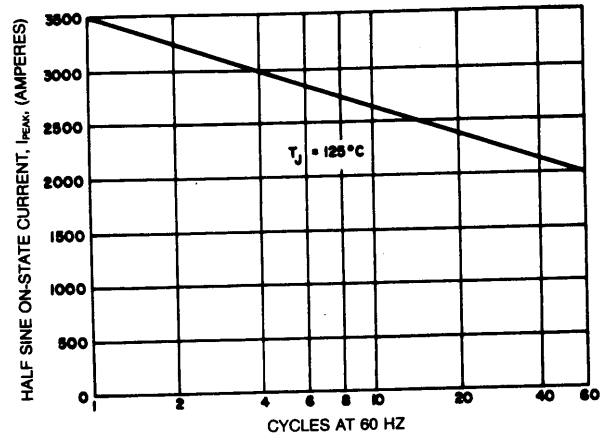
MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM — EXTENDED)



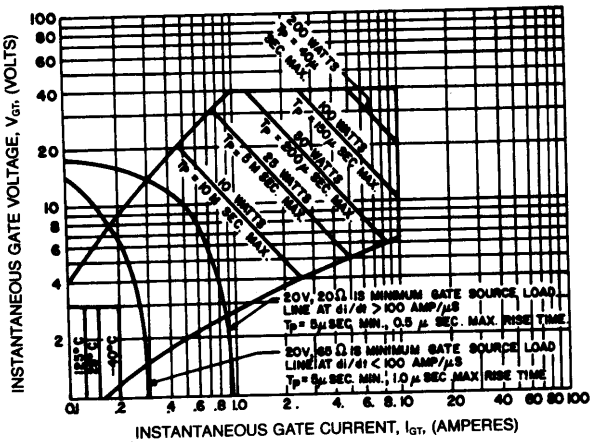
SUB-CYCLE SURGE AND I^2t RATINGS (RATED LOAD CONDITIONS)



MAXIMUM ALLOWABLE SURGE ON-STATE CURRENT (NON-REPETITIVE)



GATE CHARACTERISTICS



NOTES:
1. Maximum allowable average gate dissipation = 5 watts.
2. The locus of possible dc trigger points lie outside the boundaries shown at various case temperatures.
3. Tp = Rectangular gate current pulse width (5μs min. duration; 1.0μs max. rise time for 20V, 65Ω source).
4. 20V – 20Ω is the minimum gate source load line when rate of circuit current rise >100 Amp/μs or anode rate of current rise >200 Amps/μs (t_p = 5μs min., 0.5μs max. rise time).

   Maximum long-term repetitive anode di/dt = 500 Amps/μs with 20V – 20Ω gate source.

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