

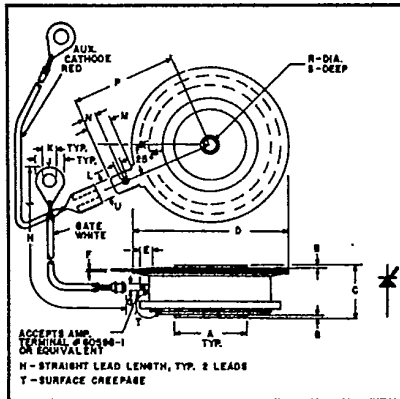
POWEREX INC

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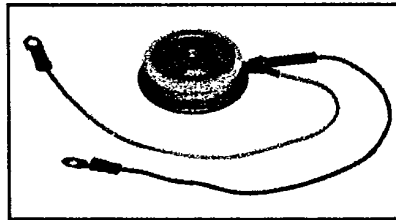
**POWEREX****C350**

Powerex, Inc. Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272

Powerex Europe, S.A., 428 Ave. G. Durand, BP107, 72003 LeMans, France (43) 72.75.15

**Phase Control SCR****115 Amperes Avg  
500-1300 Volts****TO-200  
Outline Drawing**

Dimensions	Inches		Millimeters	
	Min.	Max.	Min.	Max.
A	.744	.752	18.897	19.101
B	.030	.060	.762	1.524
C	.515	.565	13.081	14.351
D	1.600	1.656	40.64	42.06
E	.110	—	2.794	—
F	.013	.017	.330	.432
G	.057	.059	1.447	1.449
H	7.980	8.115	202.70	206.11
J	—	.300	—	7.620
K	.137	.153	3.479	3.886
L	.065	.070	1.651	1.778
M	.245	.260	6.223	6.604
N	.120	.140	3.048	3.556
P	1.090	1.125	27.69	28.55
R	.135	.145	3.429	3.683
S	.067	.083	1.701	2.108
T	.340	—	8.636	—
U	.186	.189	4.724	4.801

**C350  
Phase Control SCR  
115 Amperes/500-1300 Volts****Description**

Powerex Silicon Controlled Rectifiers (SCR) are designed for phase control applications. These are all-diffused, Press-Pak (Pow-R-Disc) 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<sup>2</sup>t Ratings

**Applications:**

- ☐ Power Supplies
- ☐ Battery Chargers
- ☐ Motor Control
- ☐ Light Dimmers
- ☐ VAR Generators

**Ordering Information**

Example: Select the complete five or six digit part number you desire from the table - i.e. C350M is a 600 Volt, 115 Ampere Phase Control SCR.

Type	Voltage		Current
	V <sub>ORM</sub> V <sub>RRM</sub>	Code	
C350	500	E	115
	600	M	
	700	S	
	800	N	
	900	T	
	1000	P	
	1100	PA	
	1200	PB	
	1300	PC	



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### Absolute Maximum Ratings

	Symbol	C350	Units
RMS On-State Current	$I_{T(RMS)}$	180	Amperes
Average On-State Current	$I_{T(av)}$	115	Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current (60Hz)	$I_{TSM}$	1600	Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current (50Hz)	$I_{TSM}$	1480	Amperes
Critical Rate-of-Rise of On-State Current (Non-Repetitive)	$di/dt$	800	Amperes/ $\mu s$
Critical Rate-of-Rise of On-State Current (Repetitive)	$di/dt$	500	Amperes/ $\mu s$
$I^2t$ (for Fusing), 8.3 milliseconds	$I^2t$	10,600	A <sup>2</sup> sec
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 Force <sup>①</sup>		720 to 880	lb.
Mounting Force <sup>①</sup>		3.20 to 3.92	kN

① Consult recommended mounting procedures.



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### C350

#### Phase Control SCR

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### Electrical and Thermal Characteristics

Characteristics	Symbol	Test Conditions	C350	Units
<b>Voltage—Blocking State Maximums</b>				
Forward Leakage, Peak	$I_{DRM}$	$T_J = 125^\circ\text{C}, V = V_{DRM}$	20	mA
Reverse Leakage, Peak	$I_{RRM}$	$T_J = 125^\circ\text{C}, V = V_{RRM}$	20	mA
<b>Current—Conducting State Maximums</b>				
Peak On-State Voltage	$V_{TM}$	$I_{TM} = 500\text{A Peak}, T_C = 25^\circ\text{C}, \text{Duty Cycle} \leq 0.01\%$	2.6	Volts
<b>Switching</b>				
Typical Turn-Off Time	$t_q$	$T_J = 125^\circ\text{C}; I_{TM} = 50\text{Amps Peak};$ $V_R = 50\text{Volts Min.}; V_{DRM} = \text{Rated (Reapplied)};$ Rate-of-Rise of Reapplied Off-State Voltage = $20\text{V}/\mu\text{sec}$ (Linear); Gate Bias = 0 Volts, $100\Omega$ during Turn-Off Interval; Duty Cycle $\leq 0.01\%$	200	$\mu\text{sec}$
Typical Delay Time	$t_d$	$T_C = 25^\circ\text{C}, I_{TM} = 50\text{A}, V_{DRM} = \text{Rated},$ Gate Supply: 10 Volt Open Circuit, 20 Ohm, 0.1 $\mu\text{sec}$ max. rise time	1.0	$\mu\text{sec}$
Min. Critical dv/dt exponential to $V_{DRM}$	dv/dt	$T_J = 125^\circ\text{C}, \text{Gate Open}$	200	V/ $\mu\text{sec}$
<b>Thermal</b>				
Maximum Thermal Resistance <sup>①</sup> , double sided cooling Junction to Case	$R_{\theta JC}$		.135	$^\circ\text{C}/\text{Watt}$
Case to Sink, Lubricated	$R_{\theta CS}$		.04	$^\circ\text{C}/\text{Watt}$
<b>Gate—Maximum Parameters</b>				
Gate Current to Trigger	$I_{GT}$	$V_D = 6\text{V}, T_C = 25^\circ\text{C}, R_L = 3\Omega$	150	mA
Gate Voltage to Trigger	$V_{GT}$	$V_D = 6\text{V}, R_L = 3\Omega, T_J = -40^\circ\text{C to } +120^\circ\text{C}$	3.0	Volts
Non-Triggering Gate Voltage	$V_{GDM}$	$T_C = 120^\circ\text{C}, \text{Rated } V_{DRM}, R_L = 1000\Omega$	.15	Volts
Peak Forward Gate Current	$I_{GTM}$		10	Amperes
Peak Reverse Gate Voltage	$V_{GRM}$		5	Volts

① Consult recommended mounting procedures.



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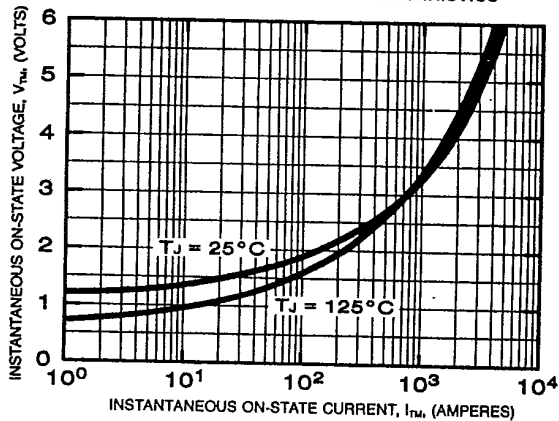
Powerex Europe, S.A., 428 Ave. G. Durand, BP107, 72003 LeMans, France (43) 72.75.15.

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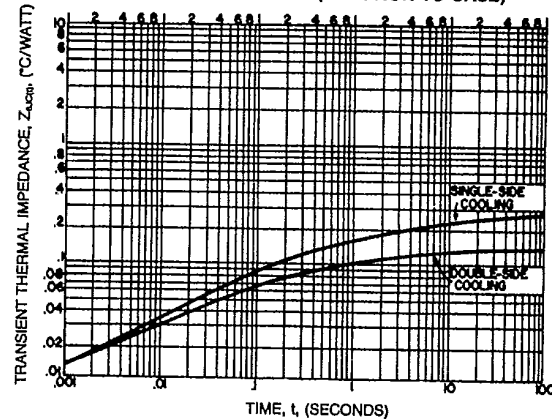
Phase Control SCR

115 Amperes Avg/500-1300 Volts

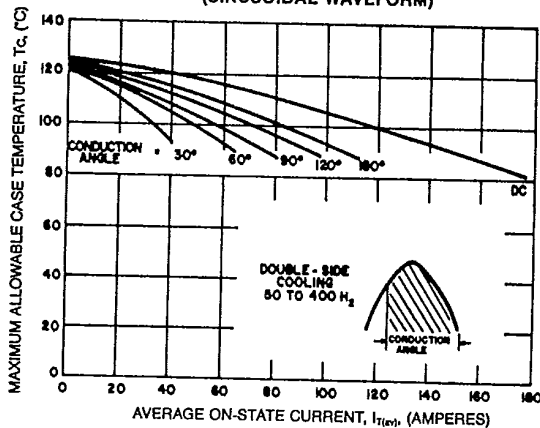
MAXIMUM ON-STATE CHARACTERISTICS



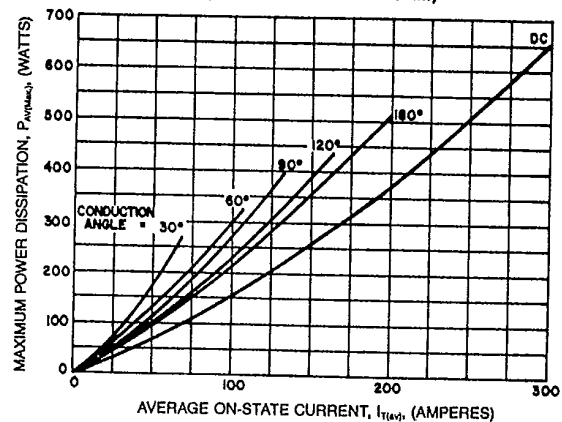
TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)



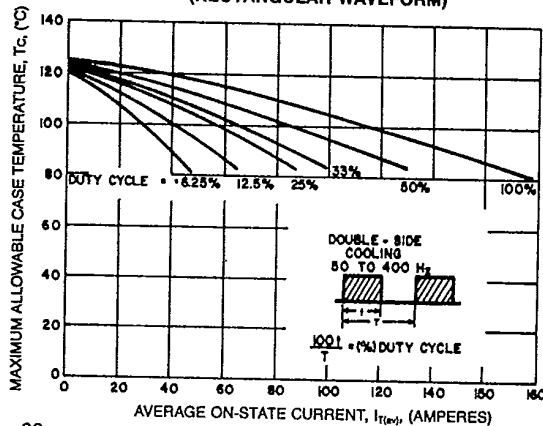
MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)



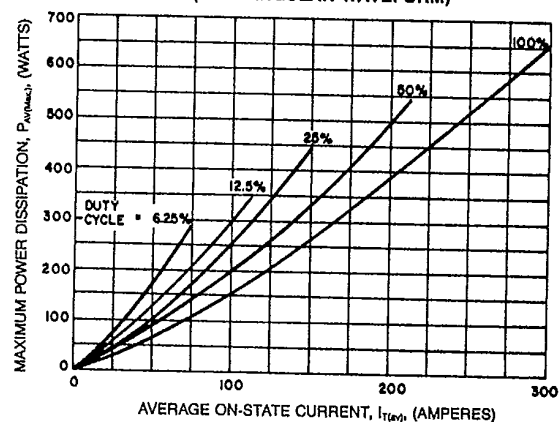
MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM)



MAXIMUM ALLOWABLE CASE TEMPERATURE (RECTANGULAR WAVEFORM)



MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM)





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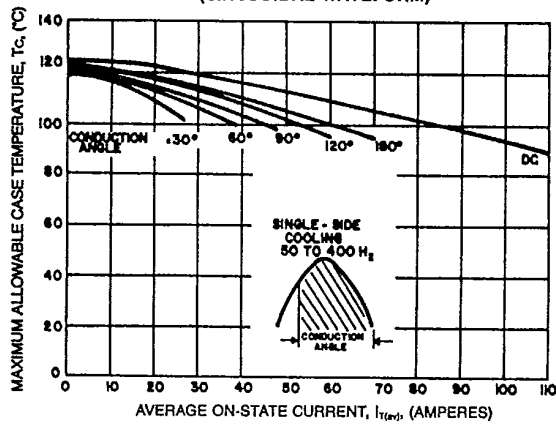
Powerex Europe, S.A., 428 Ave. G. Durand, BP107, 72003 LeMans, France (43) 72.75.15

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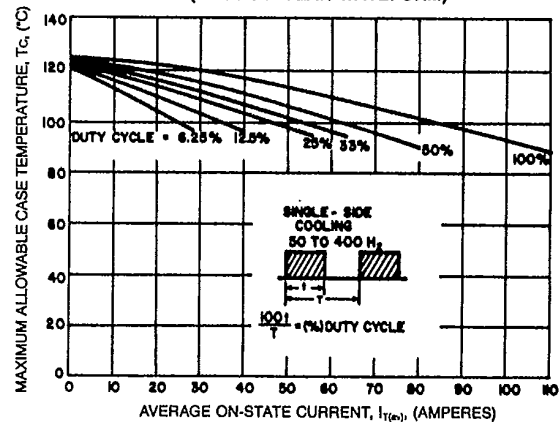
#### Phase Control SCR

115 Amperes Avg/500-1300 Volts

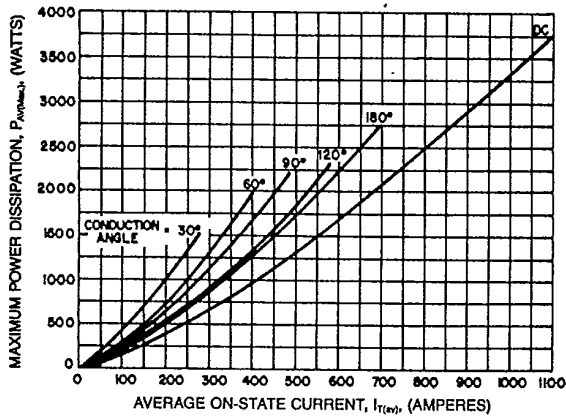
MAXIMUM ALLOWABLE CASE TEMPERATURE  
(SINUSOIDAL WAVEFORM)



MAXIMUM ALLOWABLE CASE TEMPERATURE  
(RECTANGULAR WAVEFORM)



MAXIMUM ON-STATE POWER DISSIPATION  
(SINUSOIDAL WAVEFORM EXTENDED)





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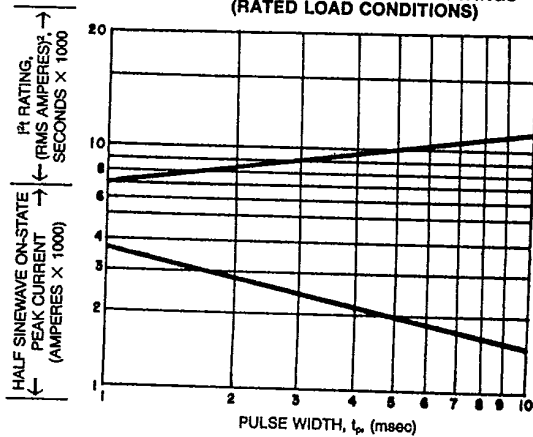
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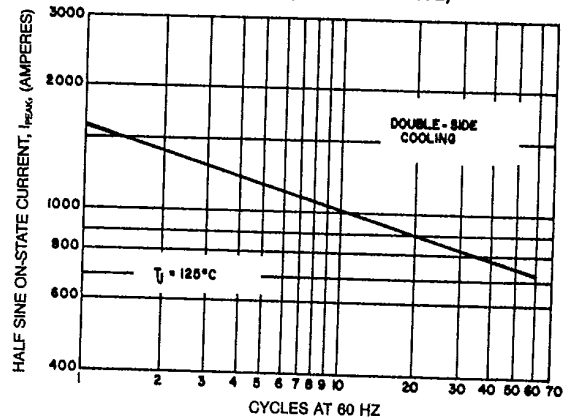
Phase Control SCR

115 Amperes Avg/500-1300 Volts

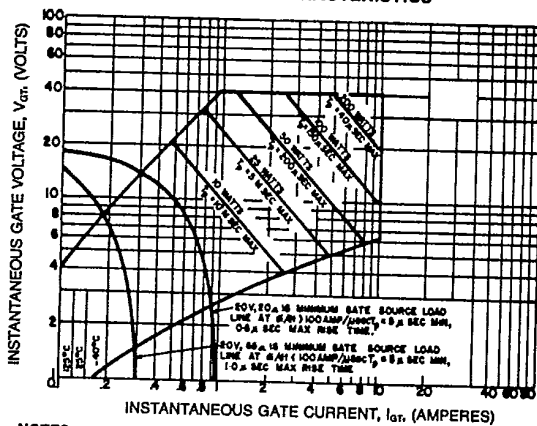
SUB-CYCLE SURGE AND  $I_{T1}$  RATINGS  
(RATED LOAD CONDITIONS)



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



GATE CHARACTERISTICS



NOTES:

1. Maximum allowable gate power dissipation = 2 watts.
2. The focus of possible DC trigger points lie outside the boundaries shown at various case temperatures.
3.  $T_p$  = Rectangular Gate Current Pulse Width.