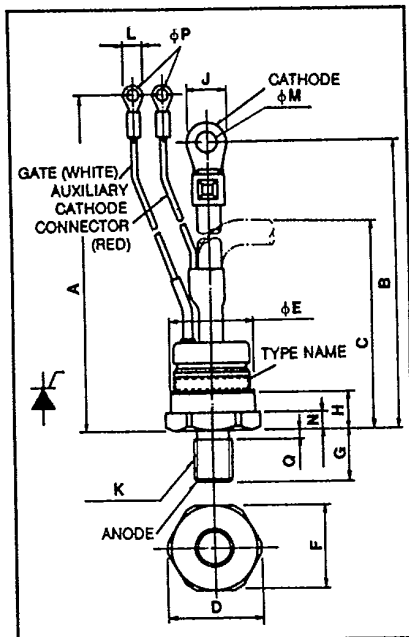


**CR100AL**

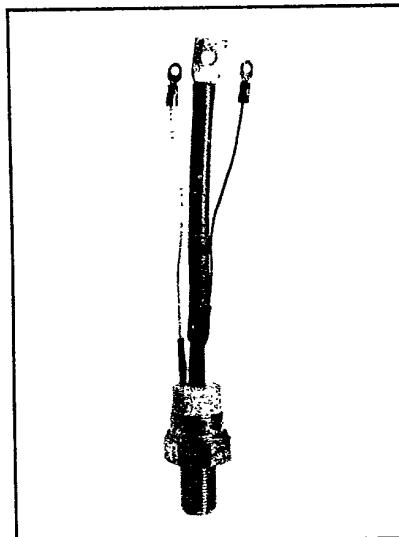
Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272

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

**Phase Control SCR****100 Amperes Avg****200-1200 Volts**

**CR100AL**  
**Outline Drawing**

Dimensions	Inches	Metric
A	7.24 ± .30	184 ± 8
B	6.18 ± .30	157 ± 8
C	2.95 Max	75 Max
D	1.22	31
φE	1.063 Max	27 Max
F	1.06	27
G	.67	17
H	.51	13
J	.47	12
K	M12	M12 × 1.5
L	.26	6.6
φM	.252	6.4
N	.20	5
φP	.169	4.3
Q	.13	3.3



**CR100AL**  
**Phase Control SCR**  
100 Amperes/200-1200 Volts

**Description**

Powerex Silicon Controlled Rectifiers (SCR) are designed for phase control applications. These are all-diffused, compression bonded encapsulated (CBE) devices employing center-fired 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 eight or nine digit part number you desire from the table - i.e. CR100AL-8 is a 400 Volt, 100 Ampere Phase Control SCR.

Type	Voltage*		Current
	V <sub>ORM</sub> V <sub>RRM</sub>	Code	I <sub>T</sub> (avg)
CR100AL	200	-4	100
	300	-6	
	400	-8	
	500	-10	
	600	-12	
	800	-16	
	1000	-20	
	1200	-24	

\*Voltage Classes 8, 12, 16, and 24 are standard products.



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#### CR100AL

Phase Control SCR

100 Amperes Avg/200-1200 Volts

#### Absolute Maximum Ratings

	Symbol	CR100AL	Units
RMS On-State Current	$I_{T(RMS)}$	155	Amperes
Average On-State Current	$I_{T(av)}$	100	Amperes
Peak One-Cycle Surge (Non Repetitive) On-State Current (60Hz)	$I_{TSM}$	2000	Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current (50Hz)	$I_{TSM}$	1800	Amperes
Critical Rate-of-Rise of On-State Current (Non-Repetitive)	$di/dt$	400	Amperes/ $\mu s$
Critical Rate-of-Rise of On-State Current (Repetitive)	$di/dt$	100	Amperes/ $\mu s$
$I^2t$ (for Fusing), one cycle at 60Hz	$I^2t$	$1.7 \times 10^4$	$A^2sec$
Peak Gate Power Dissipation	$P_{GM}$	5.0	Watts
Average Gate Power Dissipation	$P_{G(av)}$	.50	Watts
Storage Temperature	$T_{STG}$	-40 to 150	$^{\circ}C$
Operating Temperature	$T_J$	-40 to 125	$^{\circ}C$
Mounting Torque <sup>①</sup>		120 to 155	in.-lb.
Mounting Torque <sup>①</sup>		140 to 180	kg-cm

① Consult recommended mounting procedures.



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#### CR100AL

#### Phase Control SCR

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### Electrical and Thermal Characteristics

Characteristics	Symbol	Test Conditions	CR100AL	Units
<b>Voltage—Blocking State Maximums</b>				
Forward Leakage, Peak	$I_{DRM}$	$T_J = 125^\circ\text{C}$ , $V_{DRM}$ applied	15	mA
Reverse Leakage, Peak	$I_{RRM}$	$T_J = 125^\circ\text{C}$ , $V_{RRM}$ applied	15	mA
<b>Current—Conducting State Maximums</b>				
Peak On-State Voltage	$V_{TM}$	$T_J = 125^\circ\text{C}$ , $I_{TM} = 310\text{A}$	1.60	Volts
<b>Switching</b>				
Min. Critical dv/dt exponential to $V_{DRM}$	dv/dt	$T_J = 125^\circ\text{C}$ , $V_D = \frac{1}{2}V_{DRM}$	100	V/ $\mu\text{sec}$
<b>Thermal</b>				
Maximum Thermal Resistance <sup>①</sup>				
Junction to Case	$R_{\theta JC}$		.30	$^\circ\text{C}/\text{Watt}$
Case to Sink, Lubricated	$R_{\theta CS}$		.08	$^\circ\text{C}/\text{Watt}$
<b>Gate—Maximum Parameters</b>				
Gate Current to Trigger	$I_{GT}$	$T_J = 25^\circ\text{C}$ , $V_D = 6\text{V}$ , $R_L = 2\Omega$	100	mA
Gate Voltage to Trigger	$V_{GT}$	$T_J = 25^\circ\text{C}$ , $V_D = 6\text{V}$ , $R_L = 2\Omega$	1.5	Volts
Non-Triggering Gate Voltage	$V_{GDM}$	$T_J = 125^\circ\text{C}$ , $V_D = \frac{1}{2}V_{DRM}$	.20	Volts
Peak Forward Gate Current	$I_{GTM}$		2.0	Amperes
Peak Reverse Gate Voltage	$V_{GRM}$		5.0	Volts

① Consult recommended mounting procedures.



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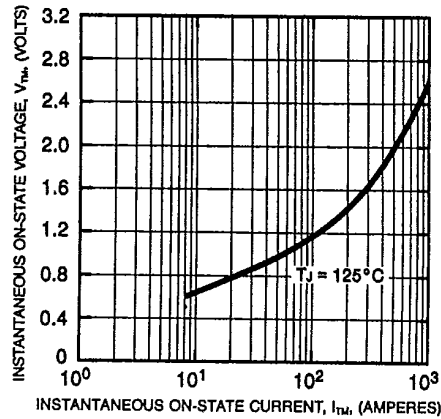
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### CR100AL

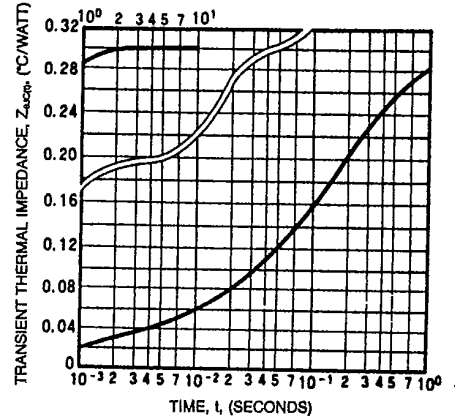
Phase Control SCR

100 Amperes Avg/200-1200 Volts

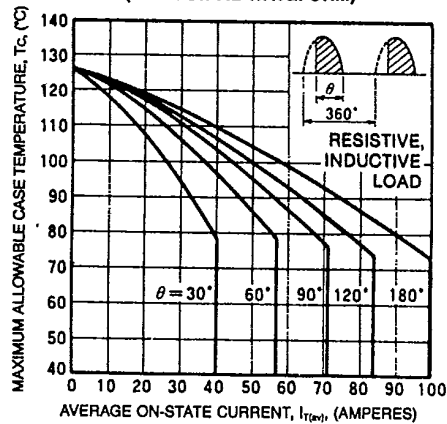
MAXIMUM ON-STATE CHARACTERISTICS



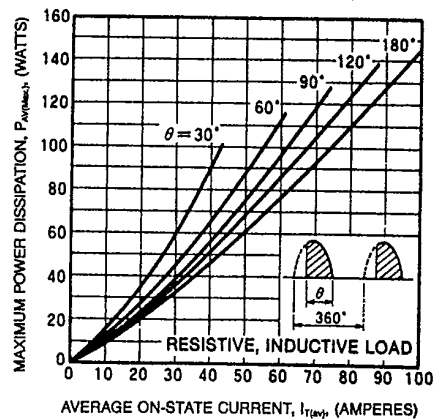
TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)



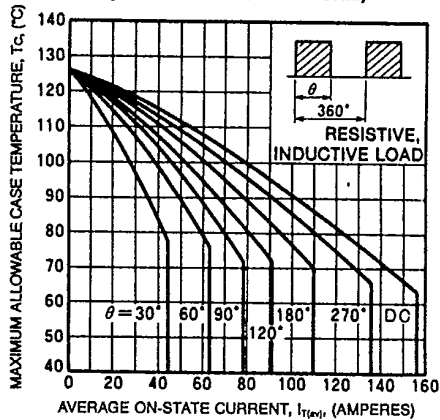
MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)



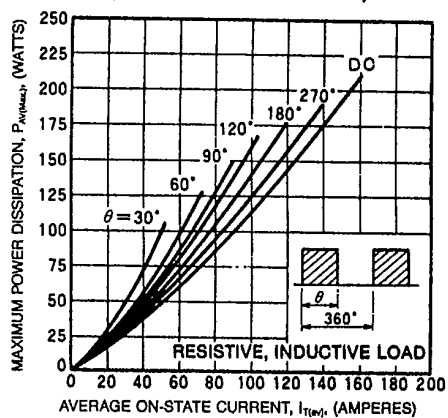
MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM)



MAXIMUM ALLOWABLE CASE TEMPERATURE (RECTANGULAR WAVEFORM)



MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM)





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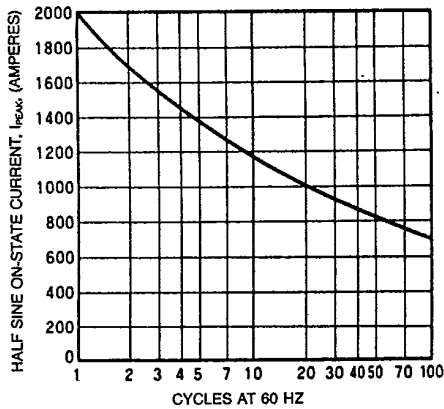
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### CR100AL

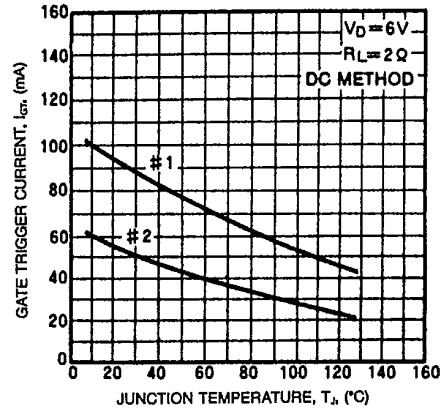
#### Phase Control SCR

100 Amperes Avg/200-1200 Volts

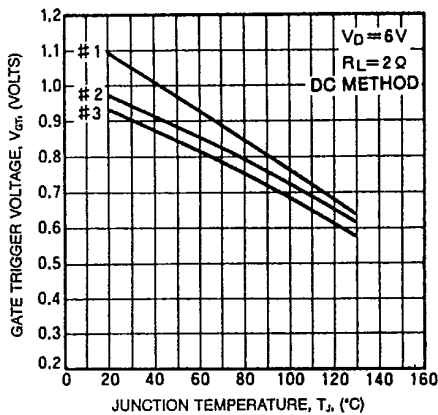
MAXIMUM ALLOWABLE SURGE ON-STATE CURRENT (NON-REPETITIVE)



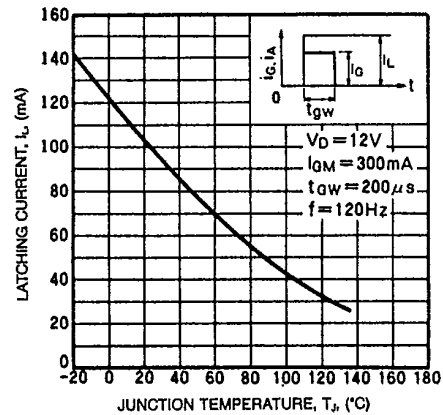
GATE TRIGGER CURRENT (TYPICAL)



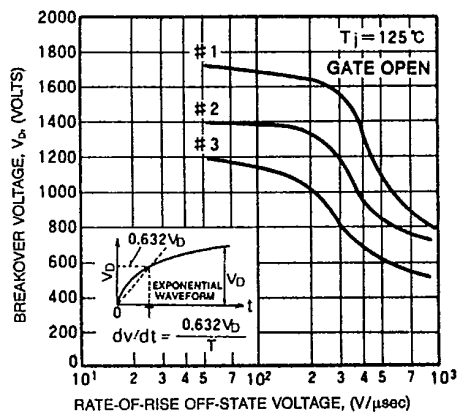
GATE TRIGGER VOLTAGE (TYPICAL)



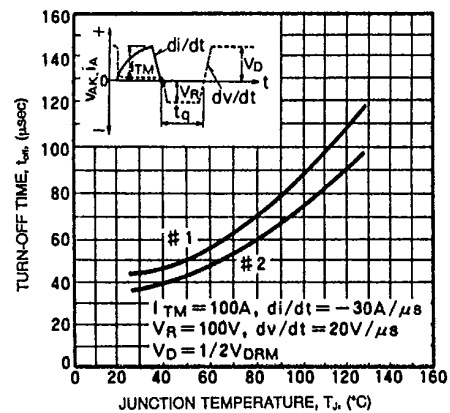
LATCHING CURRENT (TYPICAL)



BREAKOVER VOLTAGE (TYPICAL)



TURN-OFF TIME VS. JUNCTION TEMPERATURE (TYPICAL)





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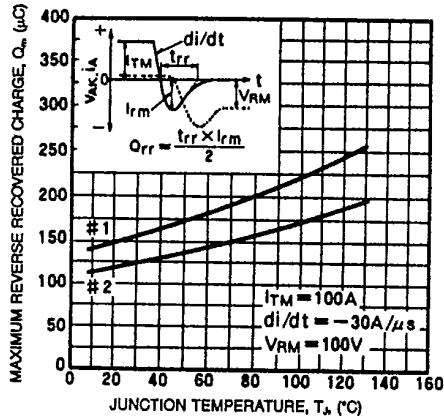
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### CR100AL

Phase Control SCR

100 Amperes Avg/200-1200 Volts

REVERSE RECOVERED CHARGE  
(TYPICAL)



GATE CHARACTERISTICS

