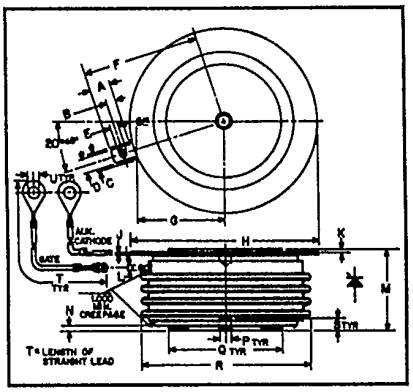
C440

Phase Control SCR

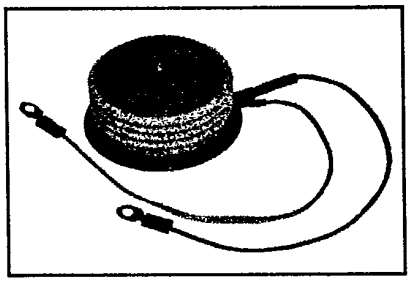
900 Amperes Avg
500-1300 Volts

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



C440
Outline Drawing

Dimensions	Inches		Millimeters	
	Min.	Max.	Min.	Max.
A	.240	.260	6.096	6.604
B	.110	.130	2.794	3.302
C	.245	—	6.223	—
D	.186	.191	4.724	4.851
E	.060	.075	1.524	1.905
F	—	1.430	—	36.32
G	—	1.065	—	27.051
H	2.200	2.500	55.88	63.50
J	.011	.019	2.794	3.483
K	.030	.130	.762	3.302
L	.056	.060	1.422	1.524
M	1.000	1.065	25.40	27.05
N	.030	.096	.762	2.438
P	.130	.150	3.302	3.810
Q	1.300	1.345	33.02	34.16
R	—	2.150	—	54.61
S	.067	.083	1.702	2.110
T	12.200	12.360	309.9	313.9
U	.137	.153	3.480	3.886



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900 Amperes/500-1200 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^2t Ratings

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

Ordering Information
Example: Select the complete five digit part number you desire from the table – i.e. C440M is a 600 Volt, 900 Ampere Phase Control SCR.

Type	Voltage		Current
	V_{DRM} V_{RRM}	Code	I_T (avg)
C440	500	E	900
	600	M	
	700	S	
	800	N	
	900	T	
	1000	P	
	1100	PA	
	1200	PB	
	1300	PC	

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Absolute Maximum Ratings

	Symbol	C440	Units
RMS On-State Current	$I_{T(RMS)}$	1400	Amperes
Average On-State Current	$I_{T(av)}$	900	Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current (60Hz)	I_{TSM}	13,000	Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current (50Hz)	I_{TSM}	12,000	Amperes
Critical Rate-of-Rise of On-State Current (Non-Repetitive)	di/dt	400	Amperes/μs
Critical Rate-of-Rise of On-State Current (Repetitive)	di/dt	150	Amperes/μs
I^2t (for Fusing), One Cycle at 60Hz	I^2t	700,000	A^2sec
Peak Gate Power Dissipation	P_{GM}	200	Watts
Average Gate Power Dissipation	$P_{G(av)}$	5	Watts
Storage Temperature	T_{STG}	−40 to 150	°C
Operating Temperature	T_J	−40 to 125	°C
Mounting Force①		3000 to 3500	lb.
Mounting Force①		13.3 to 15.5	kN

Electrical and Thermal Characteristics

Characteristics	Symbol	Test Conditions	C440	Units
Voltage—Blocking State Maximums②				
Forward Leakage, Peak	I_{DRM}	T_J = 125°C, V = V_{DRM}	35	mA
Reverse Leakage, Peak	I_{RRM}	T_J = 125°C, V = V_{RRM}	35	mA
Current—Conducting State Maximums				
Peak On-State Voltage	V_{TM}	I_{TM} = 3000A Peak, T_J = 25°C, Duty Cycle ≤0.01%	1.65	Volts
Switching				
Typical Turn-Off Time	t_q	T_J = 125°C; I_{TM} = 500A; V_R = 50V Min; 0.8 V_{DRM} Reapplied; dv/dt = 20V/μsec (linear); Commutation di/dt = 25A/μsec; Repetition Rate = 1pps; Gate Bias during Turn-Off Interval = 0V, 100Ω	125	μsec
Typical Delay Time	t_d	T_J = 25°C, I_T = 50A, Gate Supply: 20V, 20Ω, 0.1μsec rise time	.7	μsec
Min. Critical dv/dt exponential to V_{DRM}	dv/dt	T_J = 125°C, V_{DRM} = .8 Rated, Gate Open	200	V/μsec
Thermal				
Maximum Thermal Resistance,① double sided cooling				
Junction to Case	$R_{\theta JC}$		.04	°C/Watt
Case to Sink, Lubricated	$R_{\theta CS}$		.02	°C/Watt
Gate—Maximum Parameters				
Gate Current to Trigger	I_{GT}	T_J = 25°C, V_D = 6Vdc, R_L = 3Ω	150	mA
Gate Voltage to Trigger	V_{GT}	T_J = −40 to 125°C, V_D = 6Vdc, R_L = 3Ω	5	Volts
Non-Triggering Gate Voltage	V_{GDM}	T_J = 125°C, Rated V_{DRM}, R_L = 1000Ω	.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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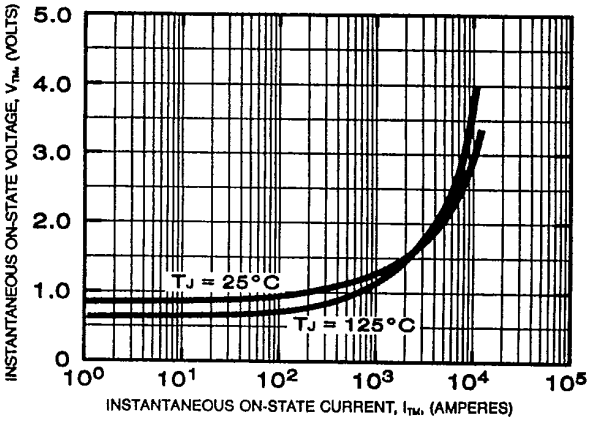
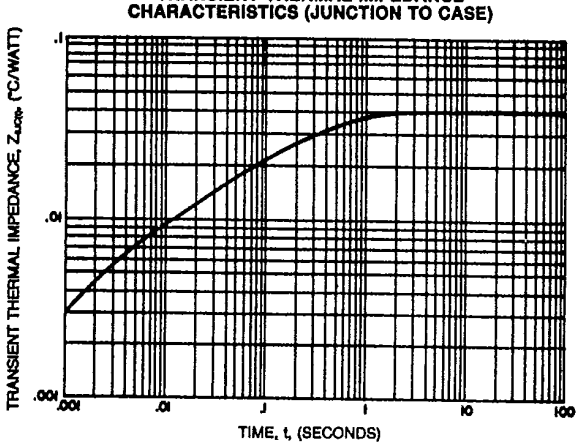
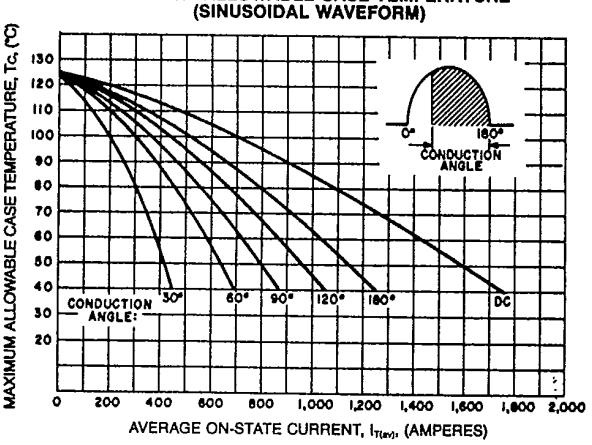
MAXIMUM ON-STATE CHARACTERISTICS



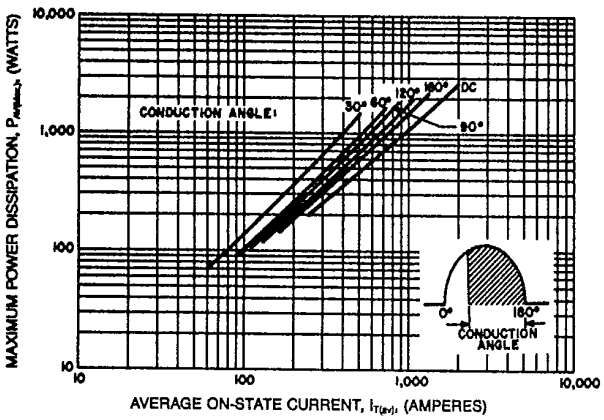
TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)



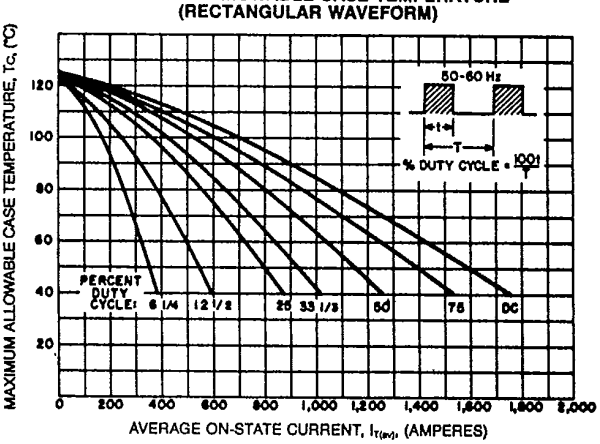
MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)



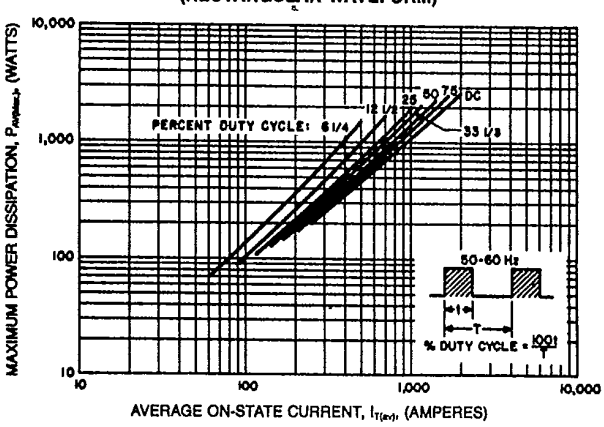
MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM)



MAXIMUM ALLOWABLE CASE TEMPERATURE (RECTANGULAR WAVEFORM)



MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM)



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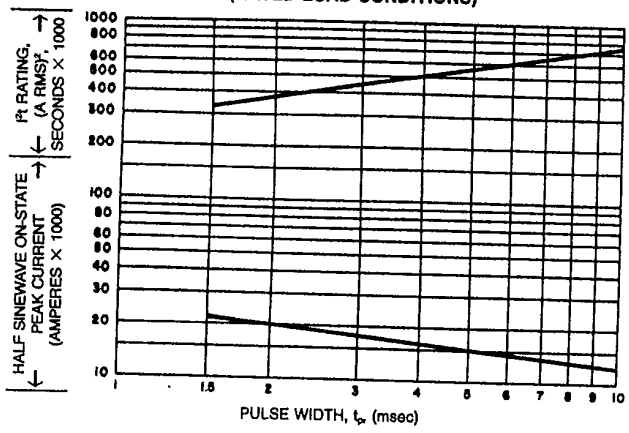
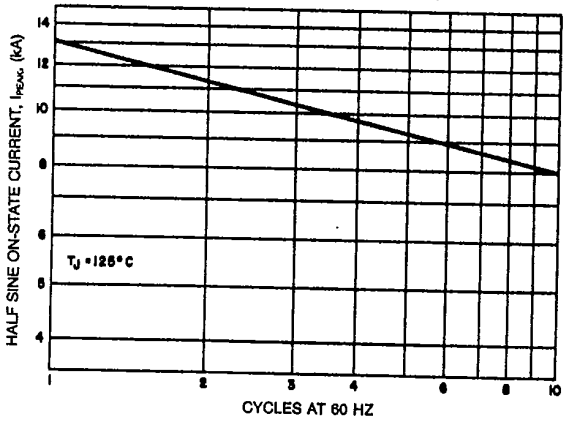
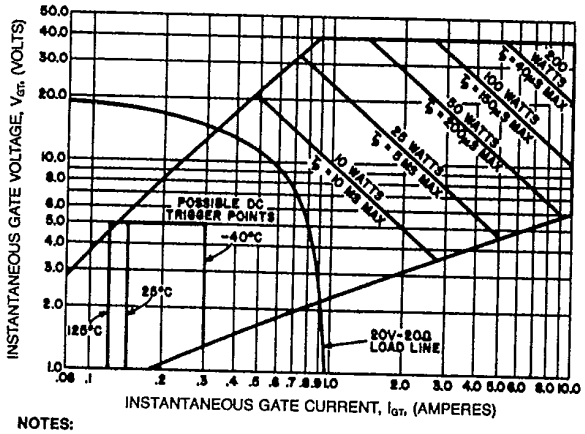
SUB-CYCLE SURGE AND I^2t RATINGS (RATED LOAD CONDITIONS)



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 lies outside the boundaries shown at various case temperatures.
3. Tp = Rectangular Gate Current Pulse Width.