



C441

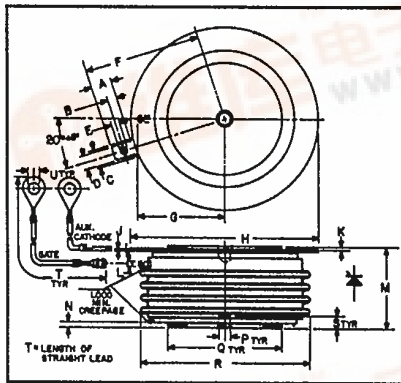
T-25-20

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

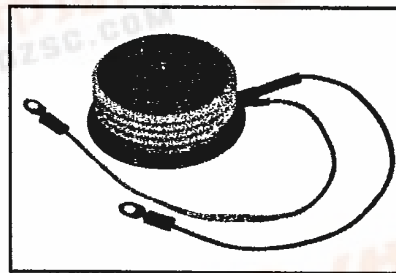
Phase Control SCR

750 Amperes Avg
1300-1800 Volts



C441
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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750 Amperes/1300-1800 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 I²t Ratings

Applications:

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

Ordering Information

Example: Select the complete six digit part number you desire from the table - i.e. C441PM is a 1600 Volt, 750 Ampere Phase Control SCR.

Type	Voltage		Current
	V _{ORM} V _{RRM}	Code	I _T (avg)
C441	1300	PC	750
	1400	PD	
	1500	PE	
	1600	PM	
	1700	PS	
	1800	PN	



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Absolute Maximum Ratings

	Symbol	C441	Units
RMS On-State Current	$I_{T(RMS)}$	1175	Amperes
Average On-State Current	$I_{T(av)}$	750	Amperes
Peak One-Cycle Surge (Non Repetitive) On-State Current (60Hz)	I_{TSM}	11,000	Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current (50Hz)	I_{TSM}	10,000	Amperes
Critical Rate-of-Rise of On-State Current (Non-Repetitive)	di/dt	150	Amperes/ μ s
Critical Rate-of-Rise of On-State Current (Repetitive)	di/dt	75	Amperes/ μ s
I^2t (for Fusing), One Cycle at 60Hz	I^2t	500,000	A ² sec
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 Force ^①		3000 to 3500	lb.
Mounting Force ^①		13.3 to 15.5	kN

Electrical and Thermal Characteristics

Characteristics	Symbol	Test Conditions	C441	Units
Voltage—Blocking State Maximums				
Forward Leakage, Peak	I_{DRM}	$T_J = 125^\circ\text{C}$, $V = V_{DRM}$	35	mA
Reverse Leakage, Peak	I_{RRM}	$T_J = 125^\circ\text{C}$, $V = V_{RRM}$	35	mA
Current—Conducting State Maximums				
Peak On-State Voltage	V_{TM}	$I_{TM} = 3000\text{A Peak}$, $T_C = 25^\circ\text{C}$	2.0	Volts
Switching				
Typical Turn-Off Time	t_q	$T_J = 125^\circ\text{C}$; $I_{TM} = 500\text{A}$, $V_R = 50\text{V Min}$; 0.8 V_{DRM} Reapplied; $dv/dt = 20\text{V}/\mu\text{sec}$ (linear); Commutation $di/dt = 25\text{A}/\mu\text{sec}$; Repetition Rate = 1pps; Gate Bias during Turn-Off Interval = 0V, 100 Ω	125	μsec
Typical Delay Time	t_d	$T_J = 25^\circ\text{C}$, $I_T = 50\text{Adc}$, Gate Supply: 20 Volts, 20 Ω , 0.1 μsec rise time	.7	μsec
Min. Critical dv/dt exponential to V_{DRM}	dv/dt	$T_J = 125^\circ\text{C}$	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}	$V_D = 6\text{V}$, $T_C = 125^\circ\text{C}$, $R_L = 3\Omega$	125	mA
Gate Voltage to Trigger	V_{GT}	$T_J = -40$ to 125°C , $V_D = 6\text{Vdc}$, $R_L = 3\Omega$	5	Volts
Non-Triggering Gate Voltage	V_{GDM}	$T_J = 125^\circ\text{C}$, $V_D = \text{Rated } V_{DRM}$, $R_L = 1000\Omega$	.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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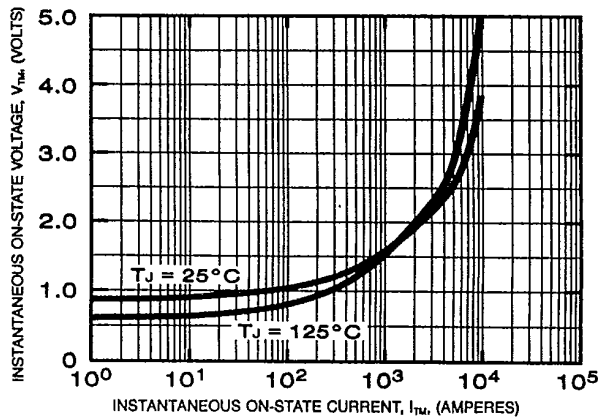
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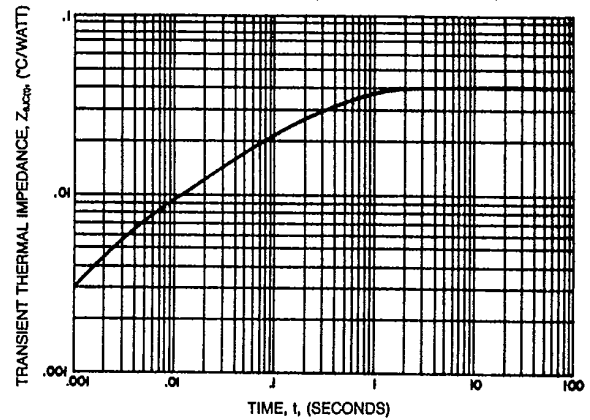
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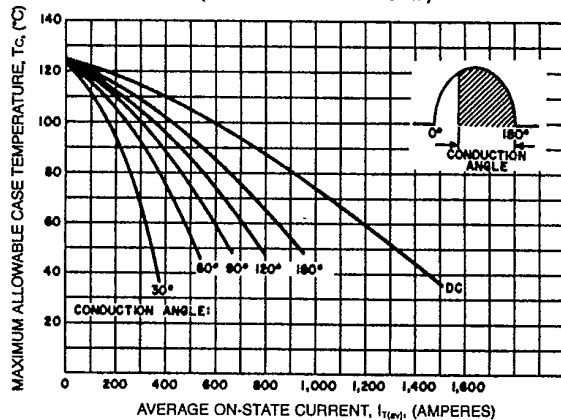
MAXIMUM ON-STATE CHARACTERISTICS



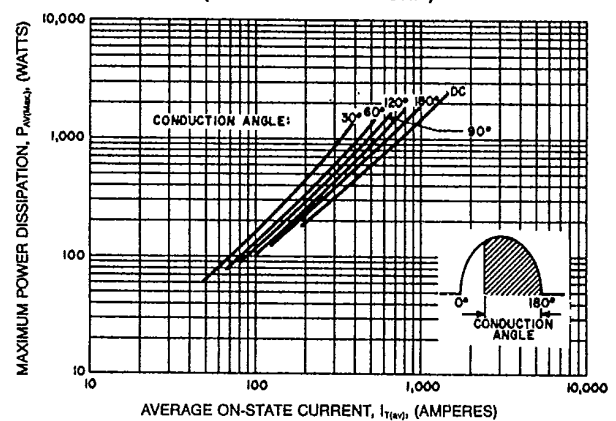
TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)



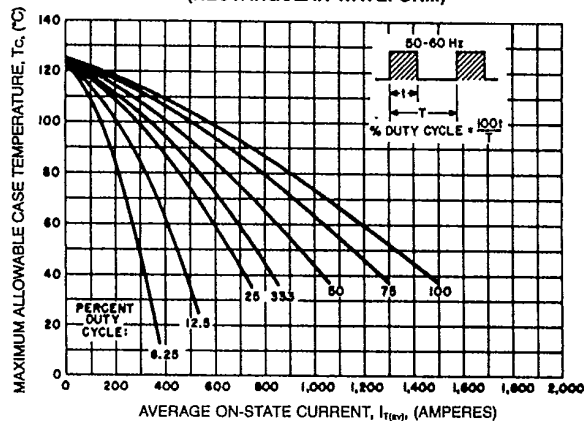
MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)



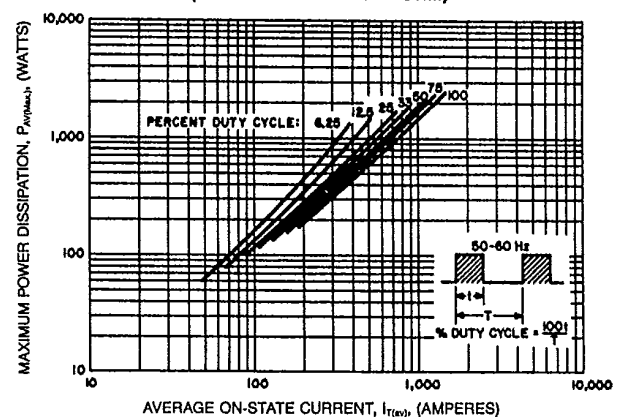
MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM)



MAXIMUM ALLOWABLE CASE TEMPERATURE (RECTANGULAR WAVEFORM)



MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM)





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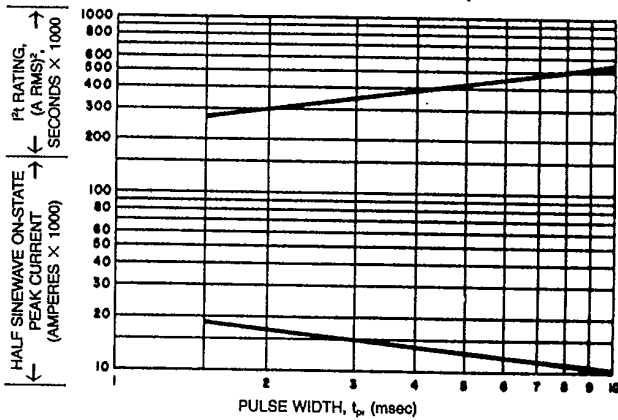
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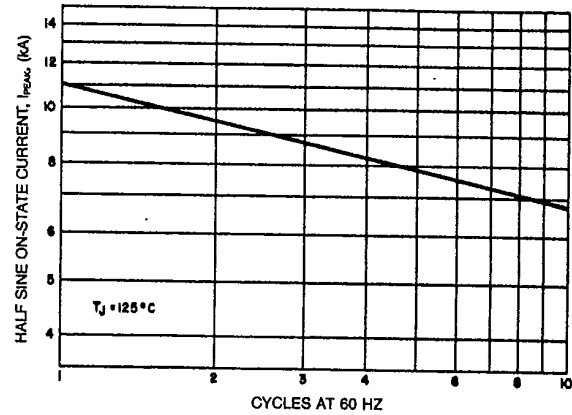
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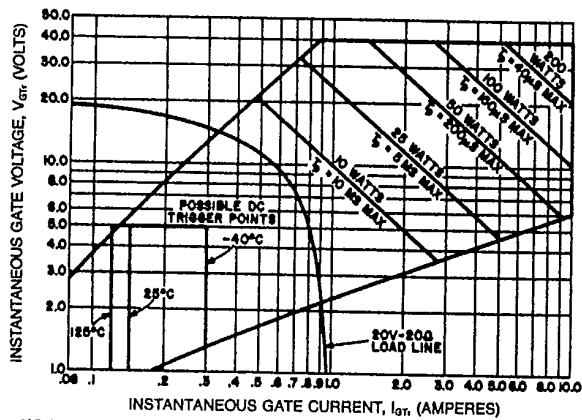
SUB-CYCLE SURGE AND I_{T1} RATINGS
(RATED LOAD CONDITIONS)



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. T_p = Rectangular Gate Current Pulse Width.