

POWEREX INC

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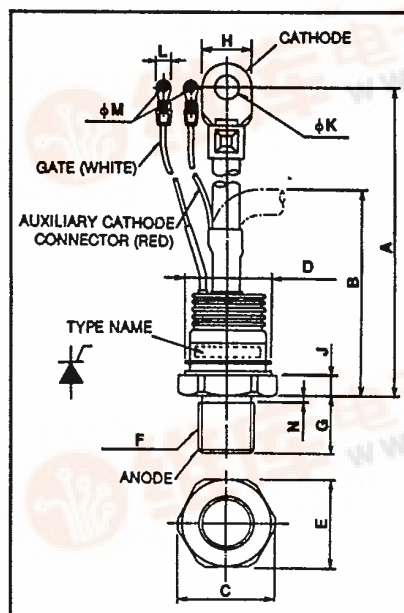
POWEREX

T-25-19

CR400FM

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**400 Amperes Avg****1400-1800 Volts**

CR400FM
Phase Control SCR
 400 Amperes/1400-1800 Volts

CR400FM
Outline Drawing

Dimensions	Inches	Metric
A	9.06 ± .30	230 ± 8
B	4.53 Max	115 Max
C	1.77	45
φD	1.614 Max	41 Max
E	1.62	41
F	M24	M24 × 1.5
G	.95	24
H	.87	22
J	.43	11
φK	.413	10.5
L	.32	8
φM	.173	4.4
N	.13	3.3

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 I²t Ratings

Applications:

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

Ordering Information

Example: Select the complete nine digit part number you desire from the table - i.e. CR400FM-32 is a 1600 Volt, 400 Ampere Phase Control SCR.

Type	Voltage		Current
	V _{ORM} V _{RRM}	Code	
CR400FM	1400	-28	400
	1600	-32	
	1800	-36	



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Absolute Maximum Ratings

	Symbol	CR400FM	Units
RMS On-State Current	$I_{T(RMS)}$	630	Amperes
Average On-State Current	$I_{T(av)}$	400	Amperes
Peak One-Cycle Surge (Non Repetitive) On-State Current (60Hz)	I_{TSM}	7000	Amperes
Peak One-Cycle Surge (Non-Repetitive) On-State Current (50Hz)	I_{TSM}	6400	Amperes
Critical Rate-of-Rise of On-State Current (Non-Repetitive)	di/dt	500	Amperes/ μs
Critical Rate-of-Rise of On-State Current (Repetitive)	di/dt	200	Amperes/ μs
I^2t (for Fusing), One Cycle at 60Hz	I^2t	2.1×10^5	A^2sec
Peak Gate Power Dissipation	P_{GM}	10	Watts
Average Gate Power Dissipation	$P_{G(av)}$	3	Watts
Storage Temperature	T_{STG}	-40 to 150	$^{\circ}C$
Operating Temperature	T_J	-40 to 125	$^{\circ}C$
Mounting Torque [Ⓢ]		390 to 520	in.-lb.
Mounting Torque [Ⓢ]		450 to 600	kg-cm

Ⓢ Consult recommended mounting procedures.



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Electrical and Thermal Characteristics

Characteristics	Symbol	Test Conditions	CR400FM	Units
Voltage—Blocking State Maximums				
Forward Leakage, Peak	I_{DRM}	$T_J = 125^\circ\text{C}$, V_{DRM} applied	30	mA
Reverse Leakage, Peak	I_{RRM}	$T_J = 125^\circ\text{C}$, V_{RRM} applied	30	mA
Current—Conducting State Maximums				
Peak On-State Voltage	V_{TM}	$T_J = 125^\circ\text{C}$, $I_{TM} = 1250\text{A}$	1.95	Volts
Switching				
Min. Critical dv/dt exponential to V_{DRM}	dv/dt	$T_J = 125^\circ\text{C}$, $V_D = \frac{1}{2}V_{DRM}$	200	V/ μsec
Thermal				
Maximum Thermal Resistance ^①				
Junction to Case	$R_{\theta JC}$		.09	$^\circ\text{C}/\text{Watt}$
Case to Sink, Lubricated	$R_{\theta CS}$		.04	$^\circ\text{C}/\text{Watt}$
Gate—Maximum Parameters				
Gate Current to Trigger	I_{GT}	$T_J = 25^\circ\text{C}$, $V_D = 6\text{V}$, $R_L = 2\Omega$	200	mA
Gate Voltage to Trigger	V_{GT}	$T_J = 25^\circ\text{C}$, $V_D = 6\text{V}$, $R_L = 2\Omega$	2.5	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}		4.0	Amperes
Peak Reverse Gate Voltage	V_{GRM}		5.0	Volts

① Consult recommended mounting procedures.



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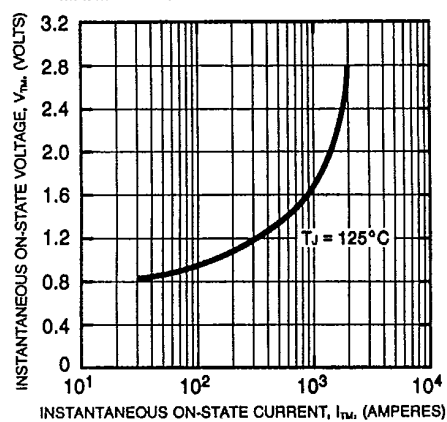
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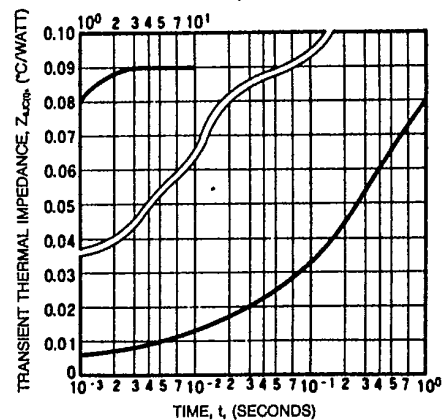
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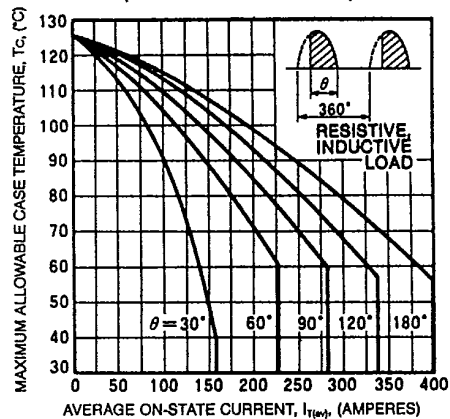
MAXIMUM ON-STATE CHARACTERISTICS



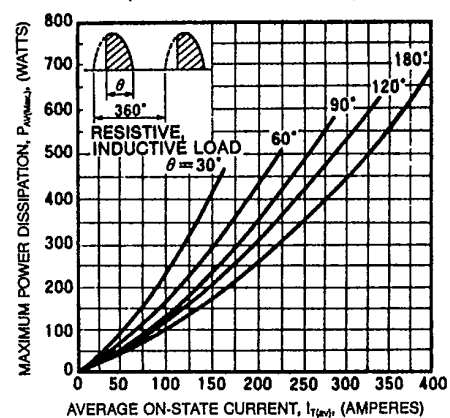
TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)



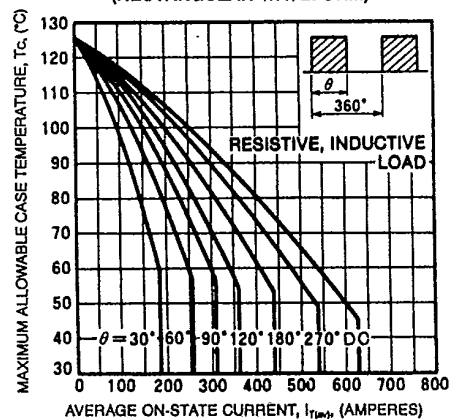
MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)



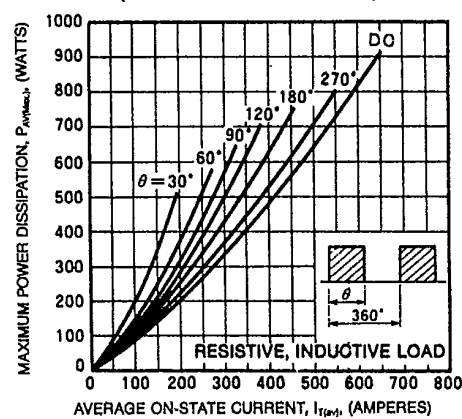
MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM)



MAXIMUM ALLOWABLE CASE TEMPERATURE (RECTANGULAR WAVEFORM)



MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM)





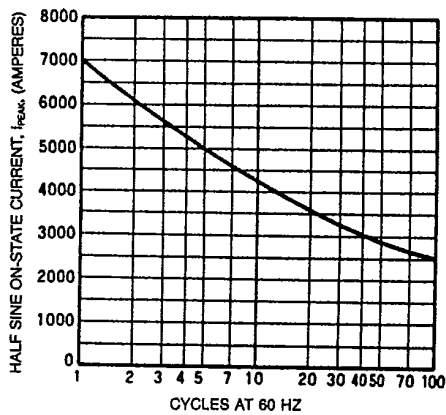
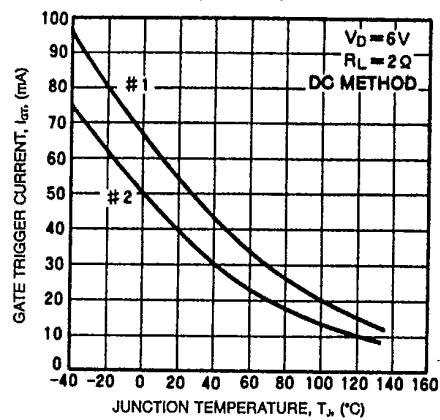
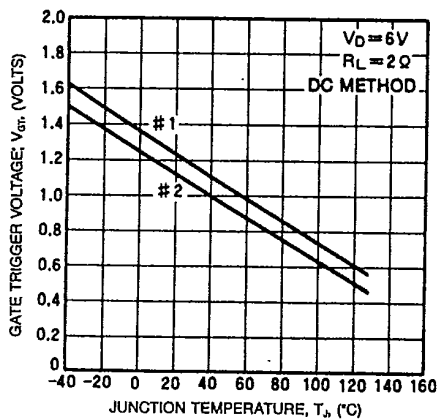
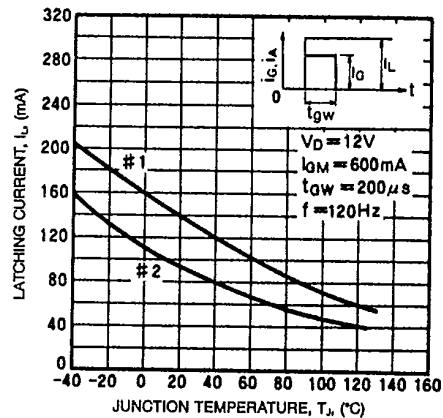
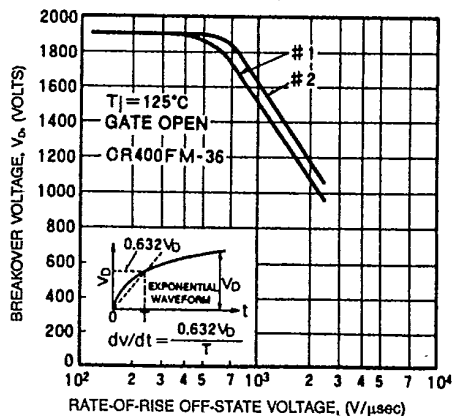
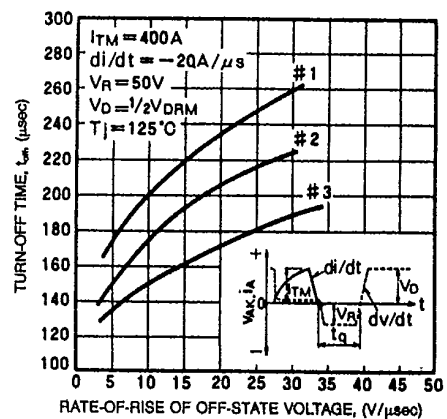
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MAXIMUM ALLOWABLE SURGE ON-STATE CURRENT (NON-REPETITIVE)**GATE TRIGGER CURRENT (TYPICAL)****GATE TRIGGER VOLTAGE (TYPICAL)****LATCHING CURRENT (TYPICAL)****BREAKOVER VOLTAGE (TYPICAL)****TURN-OFF TIME VS. RATE-OF-RISE**



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