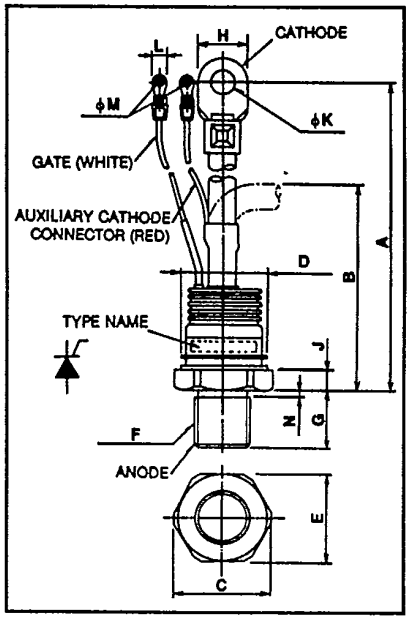
POWEREX

T-25-19

CR400FM

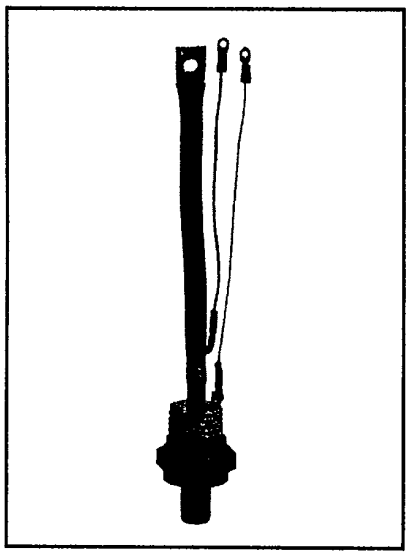
Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272
Powerex Europe, S.A., 428 Ave. G. Durand, BP107, 72003 LeMans, France (43) 72.75.15

Phase Control SCR
400 Amperes Avg
1400-1800 Volts



CR400FM
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



CR400FM
Phase Control SCR
400 Amperes/1400-1800 Volts

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 I^2t 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_{DRM} V_{RRM}	Code	I_T (avg)
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	°C
Operating Temperature	T_J	−40 to 125	°C
Mounting Torque①		390 to 520	in.-lb.
Mounting Torque①		450 to 600	kg-cm

① 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°C, V_{DRM} applied	30	mA
Reverse Leakage, Peak	I_{RRM}	T_J = 125°C, V_{RRM} applied	30	mA
Current—Conducting State Maximums				
Peak On-State Voltage	V_{TM}	T_J = 125°C, I_{TM} = 1250A	1.95	Volts
Switching				
Min. Critical dv/dt exponential to V_{DRM}	dv/dt	T_J = 125°C, V_D = ½V_{DRM}	200	V/µsec
Thermal				
Maximum Thermal Resistance①				
Junction to Case	$R_{\theta JC}$		.09	°C/Watt
Case to Sink, Lubricated	$R_{\theta CS}$		.04	°C/Watt
Gate—Maximum Parameters				
Gate Current to Trigger	I_{GT}	T_J = 25°C, V_D = 6V, R_L = 2Ω	200	mA
Gate Voltage to Trigger	V_{GT}	T_J = 25°C, V_D = 6V, R_L = 2Ω	2.5	Volts
Non-Triggering Gate Voltage	V_{GDM}	T_J = 125°C, V_D = 1/2 V_{DRM}	.20	Volts
Peak Forward Gate Current	I_{GTM}		4.0	Amperes
Peak Reverse Gate Voltage	V_{GRM}		5.0	Volts

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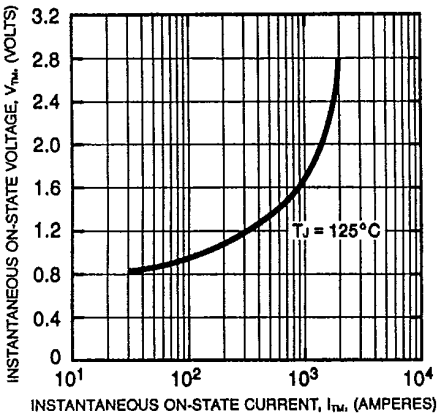
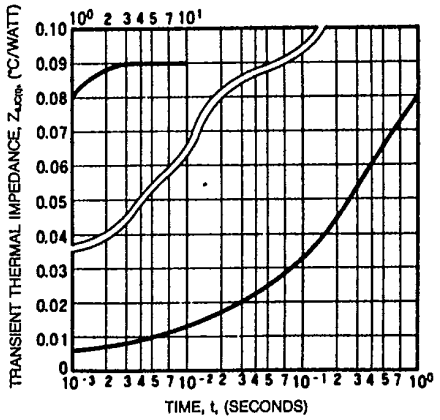
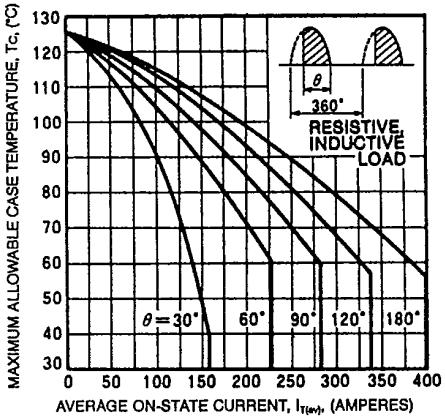
MAXIMUM ON-STATE CHARACTERISTICS



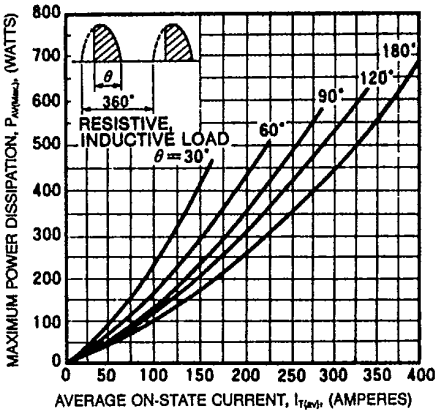
TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)



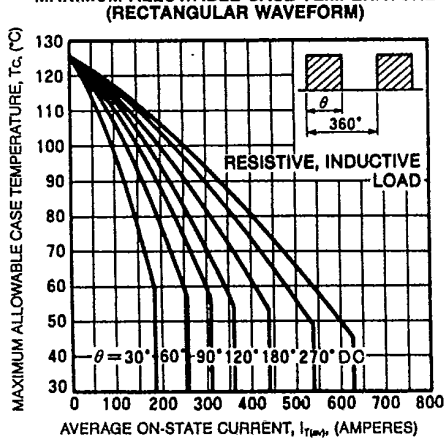
MAXIMUM ALLOWABLE CASE TEMPERATURE (SINUSOIDAL WAVEFORM)



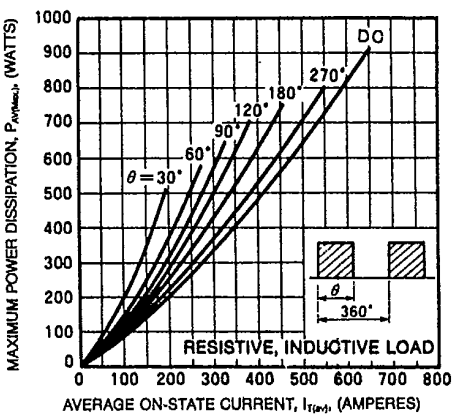
MAXIMUM ON-STATE POWER DISSIPATION (SINUSOIDAL WAVEFORM)



MAXIMUM ALLOWABLE CASE TEMPERATURE (RECTANGULAR WAVEFORM)



MAXIMUM ON-STATE POWER DISSIPATION (RECTANGULAR WAVEFORM)



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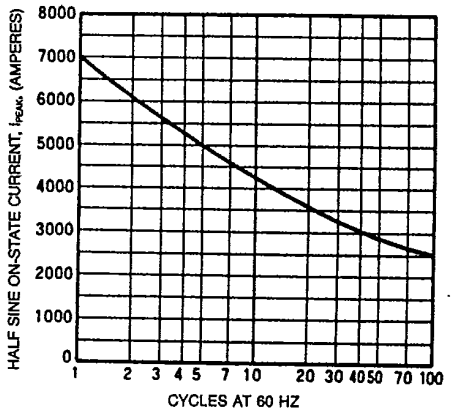
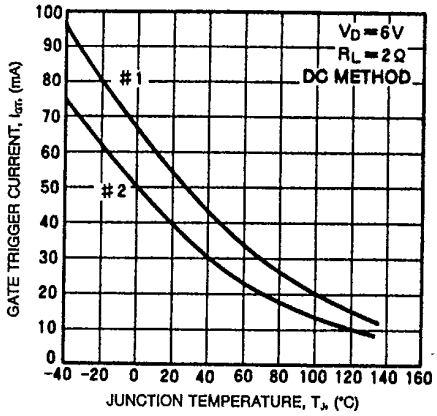
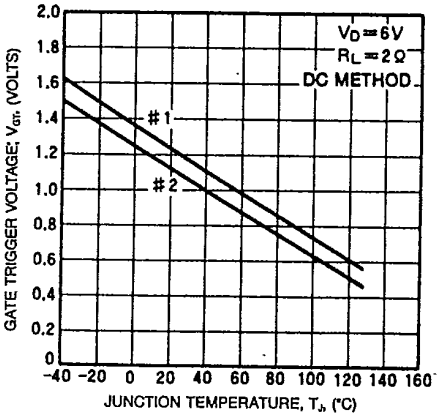
MAXIMUM ALLOWABLE SURGE ON-STATE CURRENT (NON-REPETITIVE)



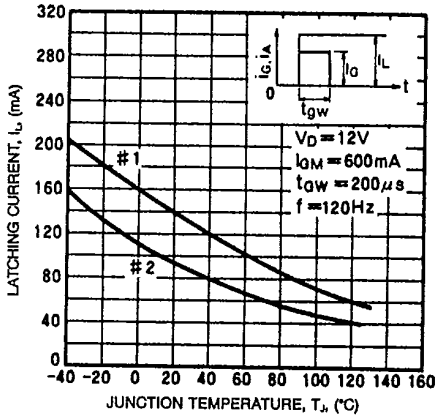
GATE TRIGGER CURRENT (TYPICAL)



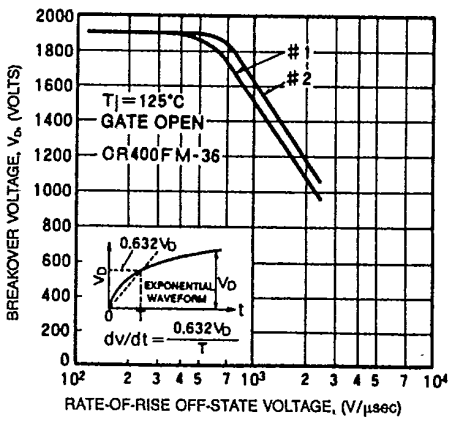
GATE TRIGGER VOLTAGE (TYPICAL)



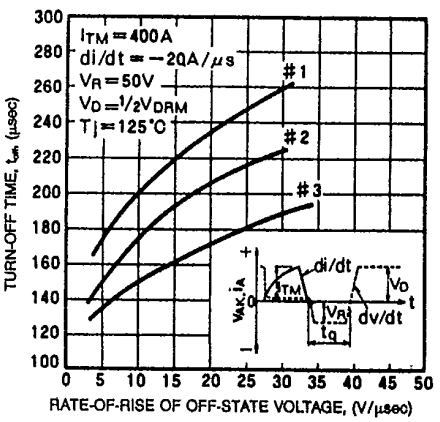
LATCHING CURRENT (TYPICAL)



BREAKOVER VOLTAGE (TYPICAL)



TURN-OFF TIME VS. RATE-OF-RISE



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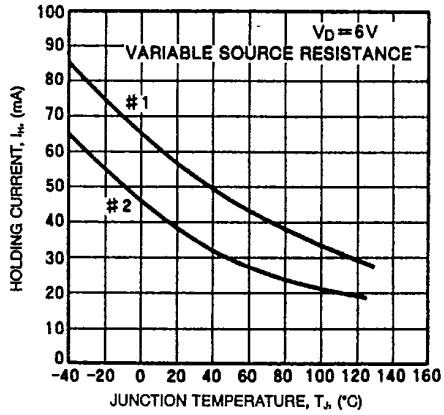
HOLDING CURRENT (TYPICAL)



GATE CHARACTERISTICS

