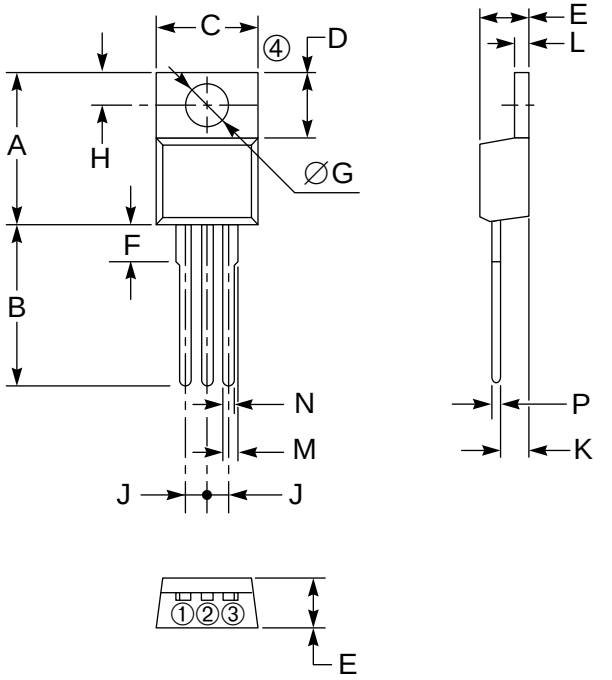
Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272

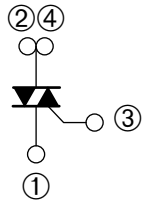
Triac
12 Amperes/400-600 Volts

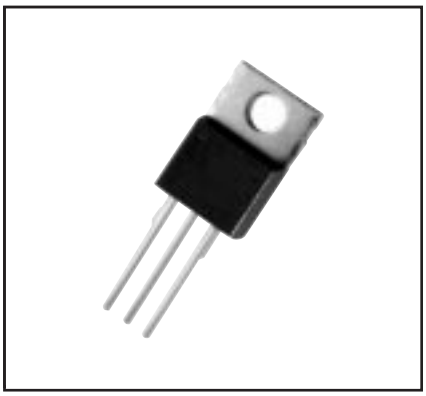
OUTLINE DRAWING



CONNECTION DIAGRAM

① T1 TERMINAL
② T2 TERMINAL
③ GATE
④ T2 TERMINAL





Description:
A triac is a solid state silicon AC switch which may be gate triggered from an off-state to an on-state for either polarity of applied voltage.

Features:
- ☐ Glass Passivation
- ☐ Selected for Inductive Loads

Applications:
- ☐ AC Switch
- ☐ Heating
- ☐ Motor Controls
- ☐ Lighting
- ☐ Solid State Relay
- ☐ Switch Mode Power Supply

Ordering Information:
Example: Select the complete eight, nine or ten digit part number you desire from the table - i.e. BCR12CM-8 is a 400 Volt, 12 Ampere Triac

Type	V_{DRM} Volts	Code	Inductive Load*
BCR12CM	400	-8	L
	60	-12	

*For inductive load, add L.

Outline Drawing (Conforms to TO-220)

Dimensions	Inches	Millimeters
A	0.63 Max.	16.0 Max.
B	0.49 Max.	12.5 Max.
C	0.41 Max.	10.5 Max.
D	0.28	7.0
E	0.18	4.5
F	0.15 Max.	3.8 Max.
G	0.142 ± 0.008 Dia.	3.6 ± 0.2 Dia.
H	0.125 ± 0.008	3.2 ± 0.2

Dimensions	Inches	Millimeters
J	0.99	2.54
K	0.10	2.6
L	0.051	1.3
M	0.051	1.3
N	0.039	1.0
P	0.031	0.8
Q	0.020	0.5

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BCR12CM
Triac
12 Amperes/400-600 Volts

Absolute Maximum Ratings, T_a = 25 °C unless otherwise specified

Ratings	Symbol	BCR12CM-8	BCR12CM-12	Units
Repetitive Peak Off-state Voltage	V_{DRM}	400	600	Volts
Non-repetitive Peak Off-state Voltage	V_{DSM}	500	720	Volts
On-state Current, T_c = 98°C	$I_{T(RMS)}$	12	12	Amperes
Non-repetitive Peak Surge, One Cycle (60 Hz)	I_{TSM}	120	120	Amperes
I^2t for Fusing, t = 8.3 msec	I^2t	60	60	A^2sec
Peak Gate Power Dissipation, 20 μsec	P_{GM}	5	5	Watts
Average Gate Power Dissipation	$P_{G(avg)}$	0.5	0.5	Watts
Peak Gate Current	I_{GM}	2	2	Amperes
Peak Gate Voltage	V_{GM}	10	10	Volts
Storage Temperature	T_{stg}	-40 to 125	-40 to 125	°C
Operating Temperature	T_j	-40 to 125	-40 to 125	°C
Weight	–	2.3	2.3	Grams

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BCR12CM
Triac
12 Amperes/400-600 Volts

Electrical and Thermal Characteristics, T_j = 25 °C unless otherwise specified

		Test Conditions (Trigger Mode)				BCR12CM			
Characteristics	**Symbol**	**V_D**	**R_L**	**R_G**	**T_j**	**Min.**	**Typ.**	**Max.**	**Units**
Gate Parameters DC Gate Trigger Current									
MT2+ Gate+	I_{GT}	6V	6Ω	330Ω	25°C	–	–	30	mA
MT2+ Gate–		6V	6Ω	330Ω	25°C	–	–	30	mA
MT2– Gate–		6V	6Ω	330Ω	25°C	–	–	30	mA
DC Gate Trigger Voltage									
MT2+ Gate+	V_{GT}	6V	6Ω	330Ω	25°C	–	–	1.5	Volts
MT2+ Gate–		6V	6Ω	330Ω	25°C	–	–	1.5	Volts
MT2– Gate–		6V	6Ω	330Ω	25°C	–	–	1.5	Volts
DC Gate Non-trigger Voltage									
All	V_{GD}	1/2 V_{DRM}	–	–	125°C	0.2	–	–	Volts

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Triac
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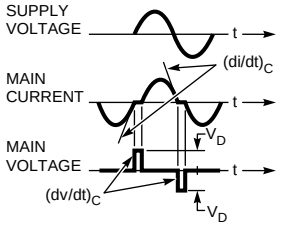
Electrical and Thermal Characteristics, T_j = 25 °C unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Junction-to-case	$R_{th(j-c)}$	–	–	–	1.8	°C/W
Voltage – Blocking State Miximums Repetitive Off-state Current	I_{DRM}	Gate Open Circuited $V_D = V_{DRM}$, T_j = 125°C	–	–	2	mA
Current – Conducting State Maximums Peak On-state Voltage	V_{TM}	T_c = 25°C, I_{TM} = 20A	–	–	1.6	Volts
Critical Rate-of-rise of Commutating Off-state Voltage (Commutating dv/dt) ▲ for inductive load (L) (Switching)	$(dv/dt)_c$	–	–	–	–	V/μs

Δ Part Number	V_{DRM} (Volts)	Commutating dv/dt, $(dv/dt)_c$ (V/μsec) Minimum	Test Condition	Commutating Voltage & Current Waveform (Inductive Load)
BCR12CM-8L	400	10	T_j = 125°C, Rate of Decay On-state Commutating Current $(di/dt)_c$ = -6A/msec: Peak Off-state Voltage V_D = 400V	
BCR12CM-12L	600	10		

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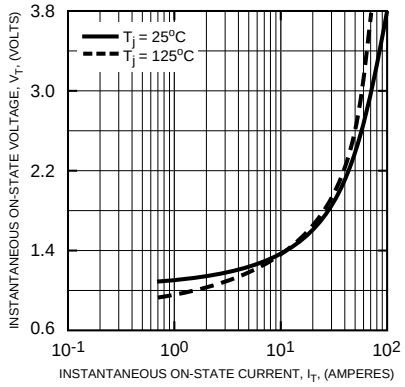
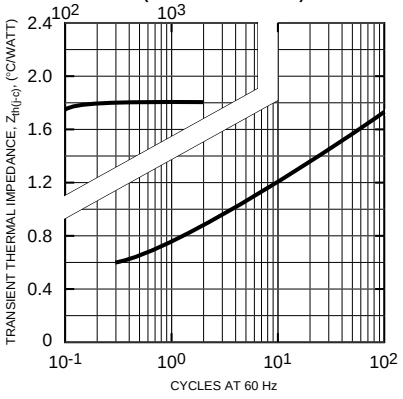
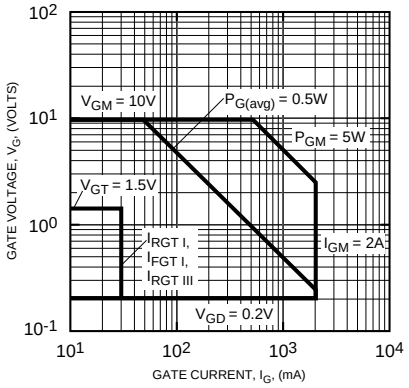
MAXIMUM ON-STATE CHARACTERISTICS



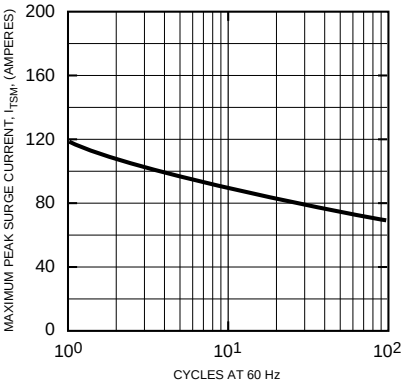
TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION-TO-CASE)



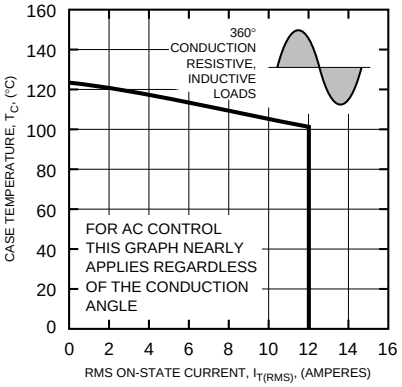
GATE CHARACTERISTICS (I, II, III)



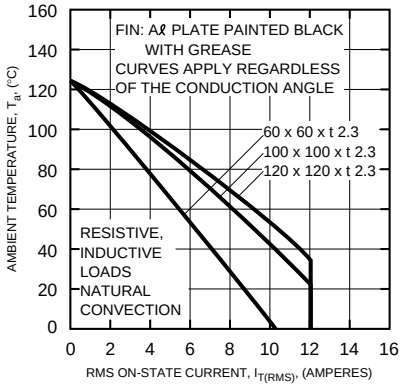
MAXIMUM SURGE CURRENT FOLLOWING RATED LOAD CONDITIONS



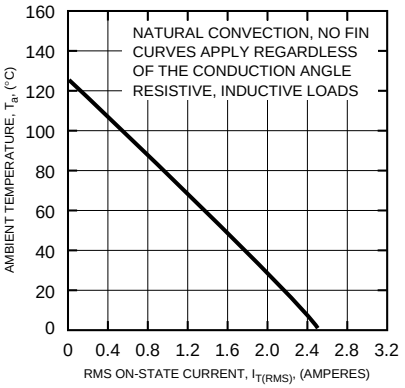
ALLOWABLE CASE TEMPERATURE VS. RMS ON-STATE CURRENT



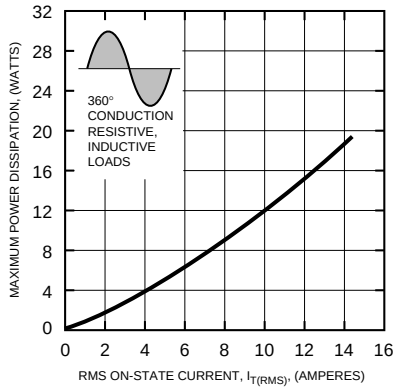
ALLOWABLE AMBIENT TEMPERATURE VS. RMS ON-STATE CURRENT



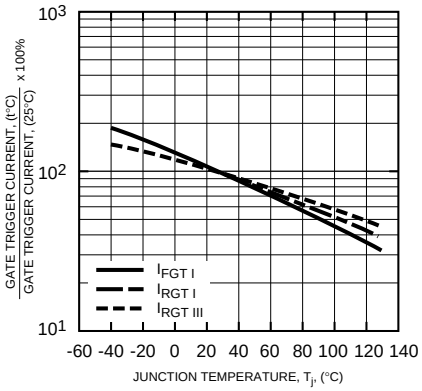
ALLOWABLE AMBIENT TEMPERATURE VS. RMS ON-STATE CURRENT



MAXIMUM ON-STATE POWER DISSIPATION



GATE TRIGGER CURRENT VS. JUNCTION TEMPERATURE (TYPICAL)



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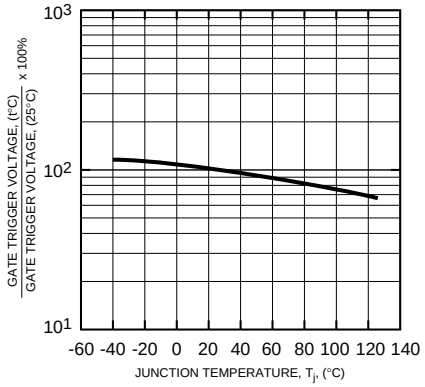
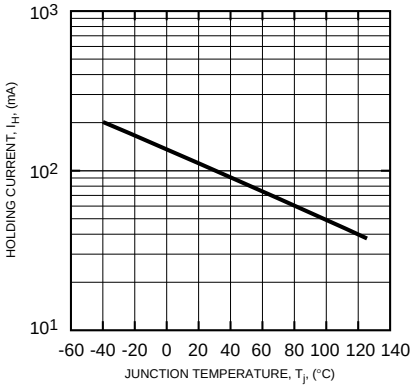
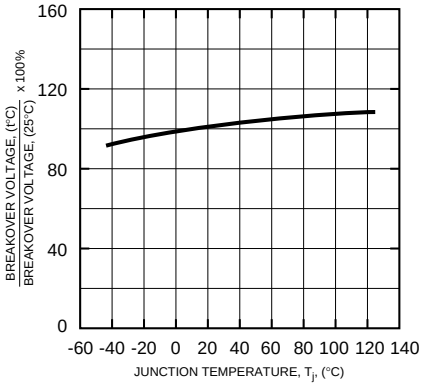
GATE TRIGGER VOLTAGE VS. JUNCTION TEMPERATURE (TYPICAL)



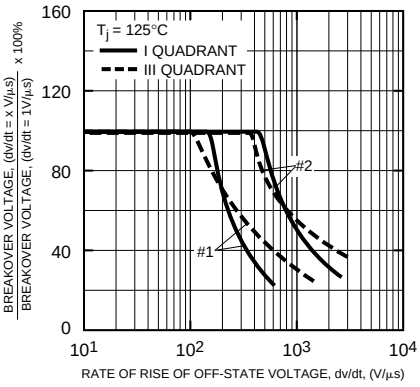
HOLDING CURRENT VS. JUNCTION TEMPERATURE (TYPICAL)



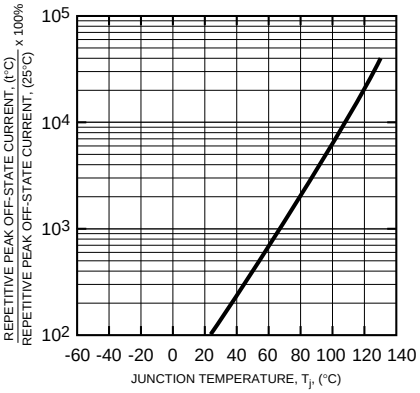
BREAKOVER VOLTAGE VS. JUNCTION TEMPERATURE (TYPICAL)



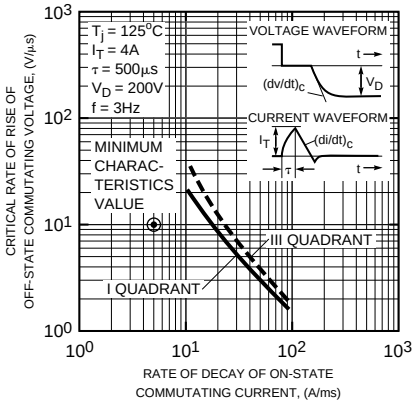
BREAKOVER VOLTAGE VS. RATE OF RISE OF OFF-STATE VOLTAGE (TYPICAL)



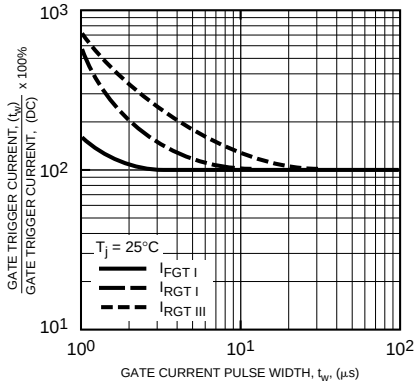
REPETITIVE PEAK OFF-STATE CURRENT VS. JUNCTION TEMPERATURE (TYPICAL)



COMMUTATION CHARACTERISTICS (TYPICAL)



GATE TRIGGER CURRENT VS. GATE CURRENT PULSE WIDTH (TYPICAL)



GATE TRIGGER CHARACTERISTICS TEST CIRCUITS