BCR16A, BCR16B, BCR16C, BCR16E

MEDIUM POWER USE

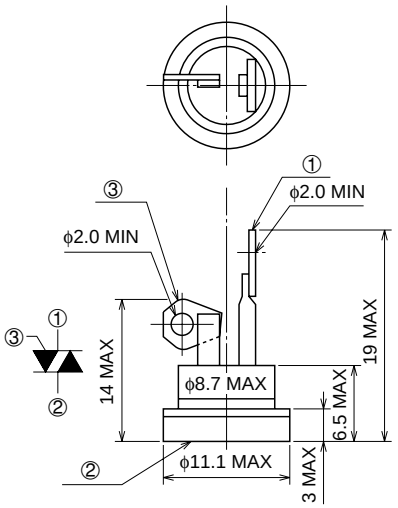
A, B, C : NON-INSULATED TYPE, E : INSULATED TYPE, GLASS PASSIVATION TYPE

BCR16A, BCR16B, BCR16C, BCR16E

- $I_{T\ (RMS)}$ 16A
- V_{DRM} 400V/500V
- $I_{FGT\ I}$, $I_{RGT\ I}$, $I_{RGT\ III}$ 30mA

OUTLINE DRAWING

Dimensions in mm



① T_1 TERMINAL
② T_2 TERMINAL
③ GATE TERMINAL

BCR16A

APPLICATION

Contactless AC switches, light dimmer, on/off and speed control of small induction motors, on/off control of traffic signals, on/off control of copier lamps, solid state relay, microwave ovens

MAXIMUM RATINGS

Symbol	Parameter	Voltage class		Unit
		8	10	
V_{DRM}	Repetitive peak off-state voltage *1	400	500	V
V_{DSM}	Non-repetitive peak off-state voltage *1	600	700	V

Symbol	Parameter	Conditions			Ratings	Unit
$I_{T\ (RMS)}$	RMS on-state current	Commercial frequency, sine full wave, 360° conduction	BCR16A, B, C	T_C=99°C	16	A
			BCR16E	T_b=71°C		
I_{TSM}	Surge on-state current	60Hz sinewave 1 full cycle, peak value, non-repetitive			170	A
I^2t	I^2t for fusing	Value corresponding to 1 cycle of half wave 60Hz, surge on-state current			121	A^2s
P_{GM}	Peak gate power dissipation				5	W
$P_{G\ (AV)}$	Average gate power dissipation				0.5	W
V_{GM}	Peak gate voltage				10	V
I_{GM}	Peak gate current				2	A
T_j	Junction temperature				–20 ~ +125	°C

*1. Gate open.

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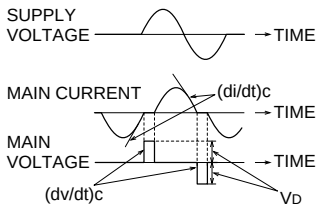
MAXIMUM RATINGS (continue)

Symbol	Parameter	Test conditions		Ratings	Unit
T_{stg}	Storage temperature			–20 ~ +125	°C
—	Weight (Typical value)	BCR16A		3.0	g
		BCR16B		8.5	
		BCR16C		8.5	
		BCR16E		9.5	
—	Soldering temperature	BCR16A only, 10 sec.		230	°C
—	Mounting torque	BCR16C only (Typical value)		30	kg·cm
				2.94	N·m
V_{iso}	Isolated voltage	BCR16E only, T_a=25°C, AC 1 minute, T_2 Terminal to base		1500	V

ELECTRICAL CHARACTERISTICS

Symbol	Parameter		Test conditions	Limits			Unit
				Min.	Typ.	Max.	
I_{DRM}	Repetitive peak off-state current		T_j=125°C, V_{DRM} applied	—	—	3.0	mA
V_{TM}	On-state voltage		T_c=25°C, T_b=25°C (BCR16E only), I_{TM}=25A , Instantaneous measurement	—	—	1.6	V
$V_{FGT\ I}$	Gate trigger voltage *2	I	T_j=25°C, V_D=6V, R_L=6Ω, R_G=330Ω	—	—	1.5	V
$V_{RGT\ I}$		II		—	—	1.5	V
$V_{RGT\ III}$		III		—	—	1.5	V
$I_{FGT\ I}$	Gate trigger current *2	I	T_j=25°C, V_D=6V, R_L=6Ω, R_G=330Ω	—	—	30	mA
$I_{RGT\ I}$		II		—	—	30	mA
$I_{RGT\ III}$		III		—	—	30	mA
V_{GD}	Gate non-trigger voltage		T_j=125°C, V_D=1/2V_{DRM}	0.2	—	—	V
$R_{th\ (j-c)}$	Thermal resistance		Junction to case (BCR16A, BCR16B, BCR16C)	—	—	1.2	°C/W
$R_{th\ (j-b)}$			Junction to base (BCR16E)	—	—	2.5	°C/W
$(dv/dt)_c$	Critical-rate of rise of off-state commutating voltage			*3	—	—	V/µs

*2. Measurement using the gate trigger characteristics measurement circuit.
*3. The critical-rate of rise of the off-state commutating voltage is shown in the table below.

Voltage class	V_{DRM} (V)	$(dv/dt)_c$			Test conditions	Commutating voltage and current waveforms (inductive load)
		Symbol	Min.	Unit		
8	400	R	—	V/µs	1. Junction temperature T_j=125°C 2. Rate of decay of on-state commutating current $(di/dt)_c$=–8A/ms 3. Peak off-state voltage V_D=400V	
		L	10			
10	500	R	—			
		L	10			

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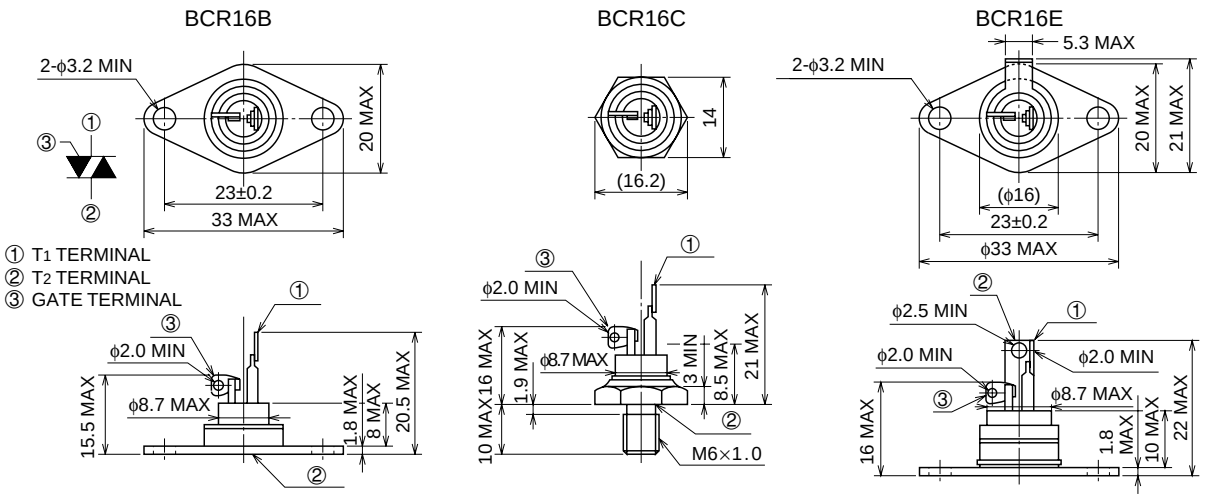
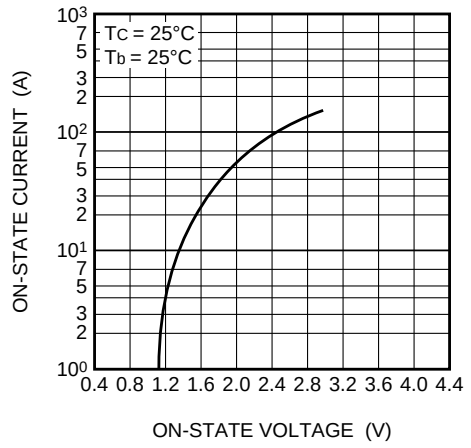
OUTLINE DRAWING

Dimensions in mm

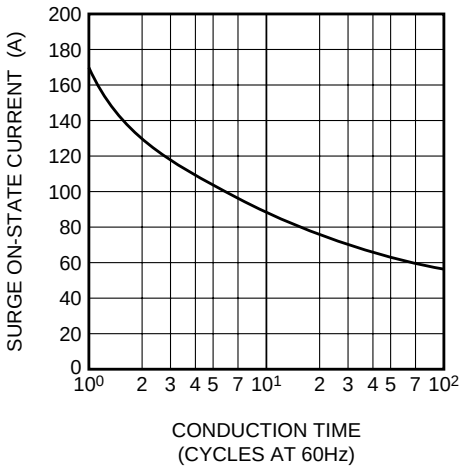


PERFORMANCE CURVES

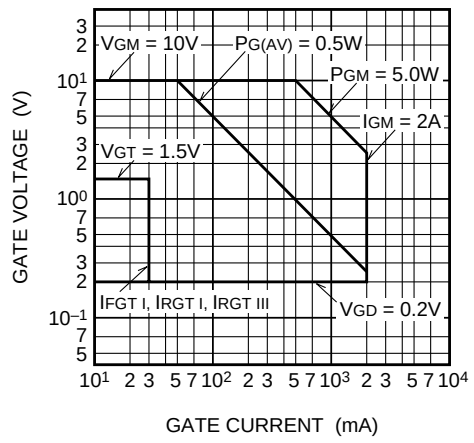
MAXIMUM ON-STATE CHARACTERISTICS



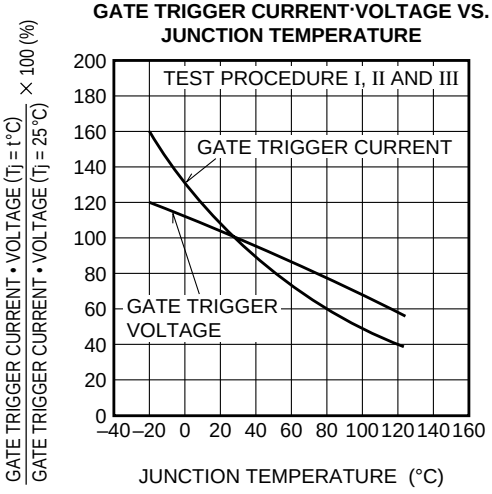
RATED SURGE ON-STATE CURRENT



GATE CHARACTERISTICS



GATE TRIGGER CURRENT·VOLTAGE VS. JUNCTION TEMPERATURE



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MEDIUM POWER USE

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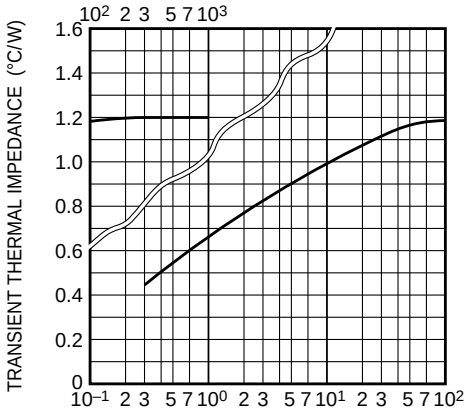
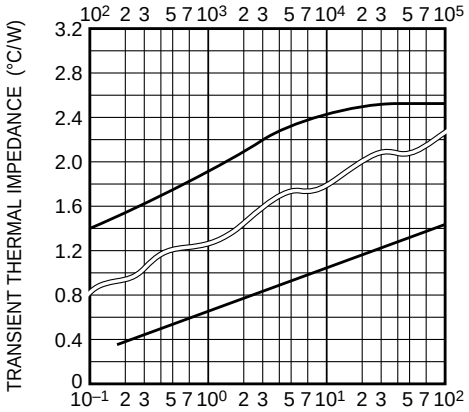
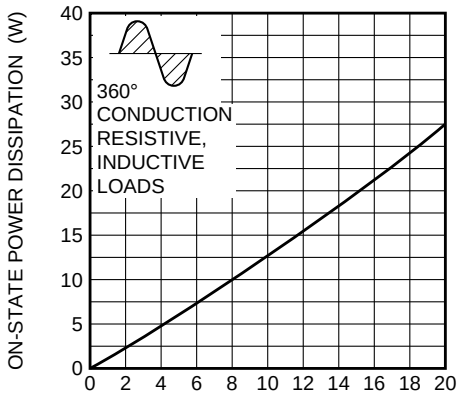
MAXIMUM TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE) (BCR16A, B, C)



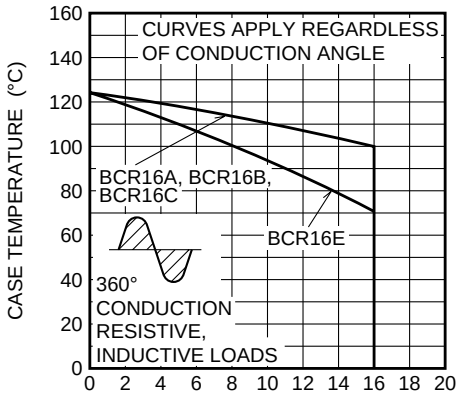
MAXIMUM TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO BASE) (BCR16E)



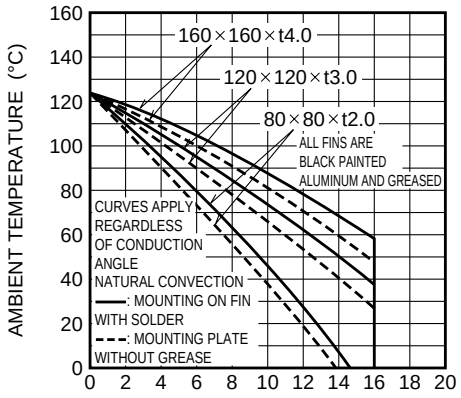
MAXIMUM ON-STATE POWER DISSIPATION



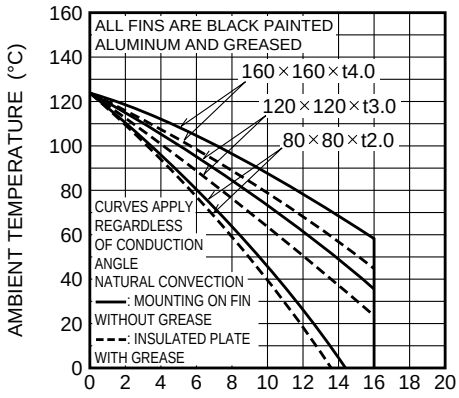
ALLOWABLE CASE TEMPERATURE VS. RMS ON-STATE CURRENT



ALLOWABLE AMBIENT TEMPERATURE VS. RMS ON-STATE CURRENT (BCR16A)



ALLOWABLE AMBIENT TEMPERATURE VS. RMS ON-STATE CURRENT (BCR16B)



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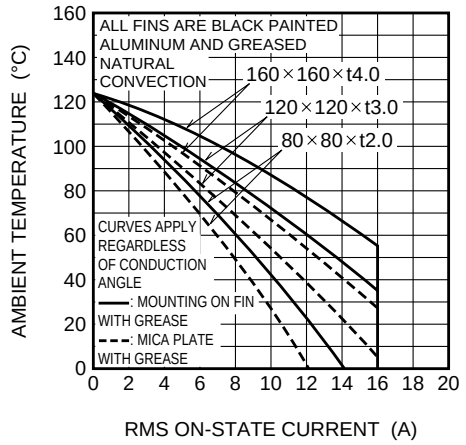
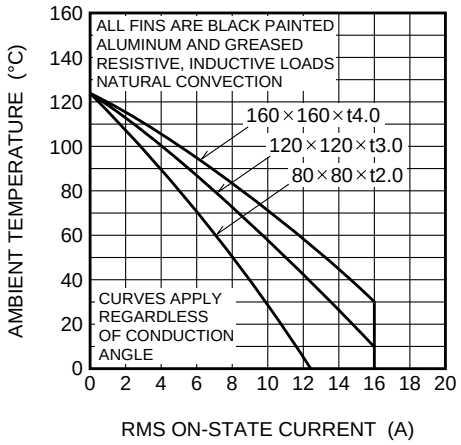
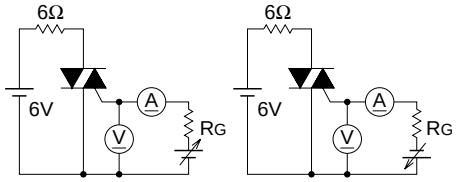
ALLOWABLE AMBIENT TEMPERATURE VS. RMS ON-STATE CURRENT (BCR16C)



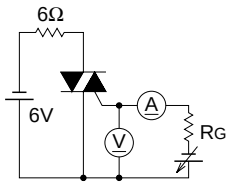
ALLOWABLE AMBIENT TEMPERATURE VS. RMS ON-STATE CURRENT (BCR16E)



GATE TRIGGER CHARACTERISTICS TEST CIRCUITS



TEST PROCEDURE Ⅰ TEST PROCEDURE Ⅱ



TEST PROCEDURE Ⅲ

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