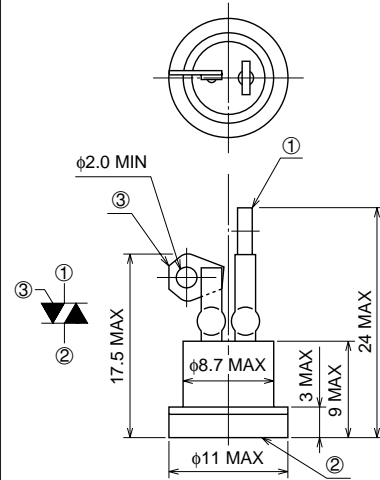


**BCR20A, BCR20B, BCR20C, BCR20E****MEDIUM POWER USE****A, B, C : NON-INSULATED TYPE, E : INSULATED TYPE, GLASS PASSIVATION TYPE****BCR20A, BCR20B, BCR20C, BCR20E**

- $I_T$  (RMS) ..... **20A**
- $V_{DRM}$  ..... **400V/500V**
- $I_{FGT}$  I,  $I_{RGT}$  I,  $I_{RGT}$  III ..... **30mA**

**OUTLINE DRAWING**Dimensions  
in mm

- ① T1 TERMINAL  
② T2 TERMINAL  
③ GATE TERMINAL

**BCR20A****APPLICATION**

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

**MAXIMUM RATINGS**

Symbol	Parameter	Voltage class		Unit
		8	12	
$V_{DRM}$	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
		Commercial frequency, sine full wave, 360° conduction	BCR20A, B, C Tc=98°C BCR20E Tb=64°C		
$I_T$ (RMS)	RMS on-state current	60Hz sinewave 1 full cycle, peak value, non-repetitive		20	A
$I_{TSM}$	Surge on-state current	Value corresponding to 1 cycle of half wave 60Hz, surge on-state current		220	A
$I^2t$	$I^2t$ for fusing			203	A <sup>2</sup> s
$P_{GM}$	Peak gate power dissipation			5.0	W
$P_G$ (AV)	Average gate power dissipation			0.5	W
$V_{GM}$	Peak gate voltage			10	V
$I_{GM}$	Peak gate current			2.0	A
$T_j$	Junction temperature			-20 ~ +125	°C
$T_{stg}$	Storage temperature			-20 ~ +125	°C

\*1. Gate open.

Feb.1999

**BCR20A, BCR20B, BCR20C, BCR20E****MEDIUM POWER USE****A, B, C : NON-INSULATED TYPE, E : INSULATED TYPE, GLASS PASSIVATION TYPE****MAXIMUM RATINGS (continue)**

Symbol	Parameter	Conditions	Ratings	Unit
—	Weight (Typical value)	BCR20A	3.5	g
		BCR20B	9.0	
		BCR20C	9.0	
		BCR20E	11	
—	Soldering temperature	BCR20A only, 10 sec.	230	°C
—	Mounting torque	BCR20C only	30	kg·cm
			2.94	N·m
V <sub>iso</sub>	Isolated voltage	BCR20E only, T <sub>a</sub> =25°C, AC 1 minute, T <sub>2</sub> terminal to base	1500	V

**ELECTRICAL CHARACTERISTICS**

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
IDRM	Repetitive peak off-state current	T <sub>J</sub> =125°C, V <sub>DRM</sub> applied	—	—	3.0	mA
V <sub>TM</sub>	On-state voltage	T <sub>C</sub> =25°C, T <sub>b</sub> =25°C (BCR20E only), I <sub>TM</sub> =30A, Instantaneous measurement	—	—	1.5	V
V <sub>FGT</sub> I	Gate trigger voltage *2	T <sub>J</sub> =25°C, V <sub>D</sub> =6V, R <sub>L</sub> =6Ω, R <sub>G</sub> =330Ω	—	—	1.5	V
V <sub>RGT</sub> I			—	—	1.5	V
V <sub>RGT</sub> III			—	—	1.5	V
I <sub>FGT</sub> I	Gate trigger current *2	T <sub>J</sub> =25°C, V <sub>D</sub> =6V, R <sub>L</sub> =6Ω, R <sub>G</sub> =330Ω	—	—	30	mA
I <sub>RGT</sub> I			—	—	30	mA
I <sub>RGT</sub> III			—	—	30	mA
V <sub>GD</sub>	Gate non-trigger voltage	T <sub>J</sub> =125°C, V <sub>D</sub> =1/2V <sub>DRM</sub>	0.2	—	—	V
R <sub>th</sub> (j-c)	Thermal resistance	Junction to case (BCR20A, BCR20B, BCR20C)	—	—	1.1	°C/W
R <sub>th</sub> (j-b)		Junction to base (BCR20E)	—	—	2.4	°C/W
(dv/dt) <sub>c</sub>	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 <sub>DRM</sub> (V)	(dv/dt) <sub>c</sub>			Test conditions	Commutating voltage and current waveforms (inductive load)
		Symbol	Min.	Unit		
8	400	R	—	V/μs	1. Junction temperature T <sub>J</sub> =125°C  2. Rate of decay of on-state commutating current (di/dt) <sub>c</sub> =10A/ms  3. Peak off-state voltage V <sub>D</sub> =400V	
		L	10			
10	600	R	—			
		L	10			

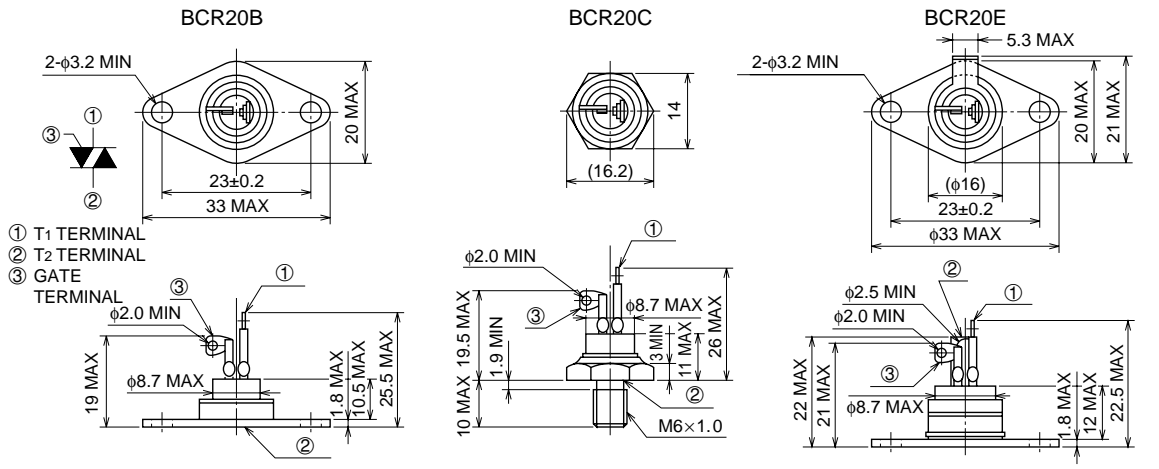
# BCR20A, BCR20B, BCR20C, BCR20E

MEDIUM POWER USE

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

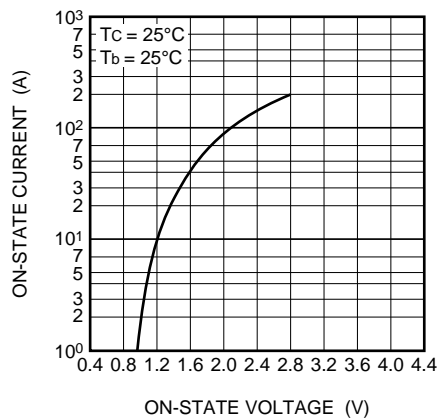
## OUTLINE DRAWING

Dimensions  
in mm

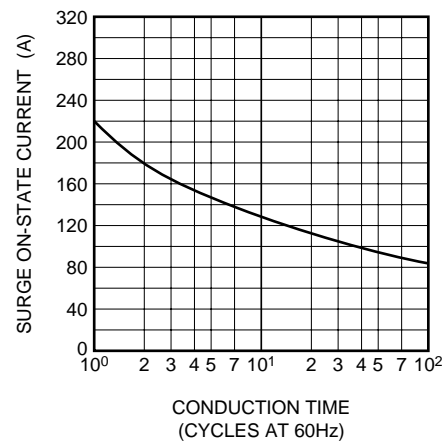


## PERFORMANCE CURVES

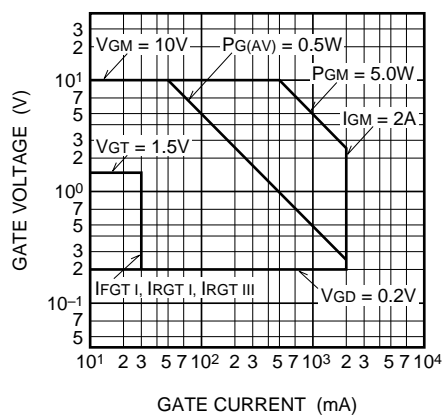
MAXIMUM ON-STATE CHARACTERISTICS



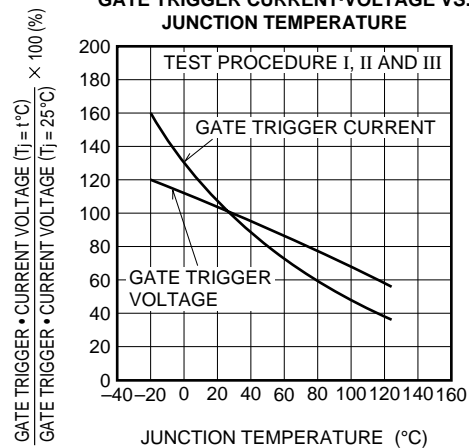
RATED SURGE ON-STATE CURRENT



GATE CHARACTERISTICS



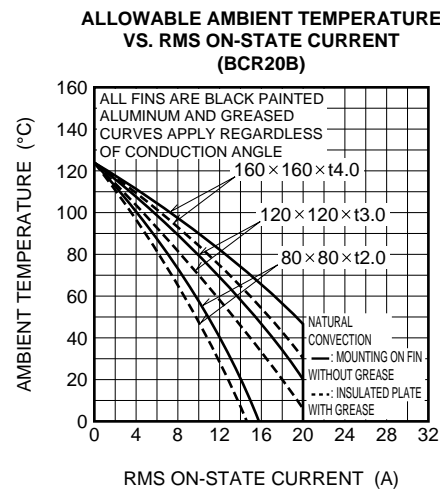
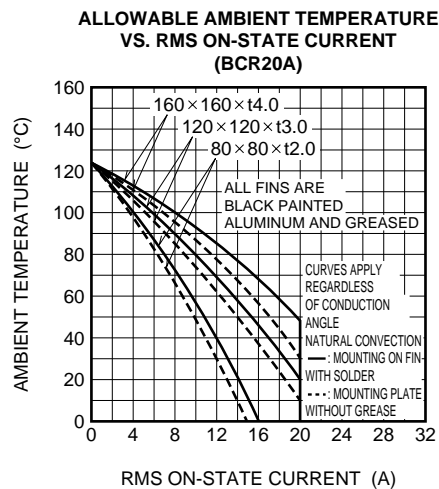
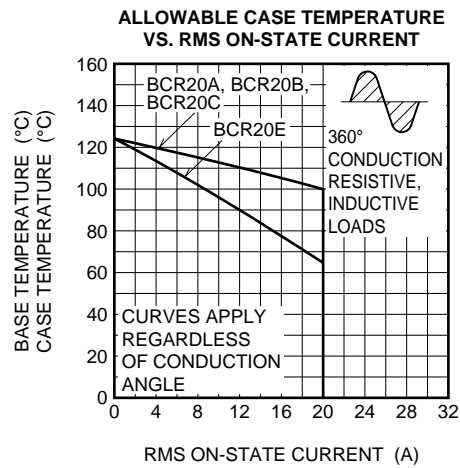
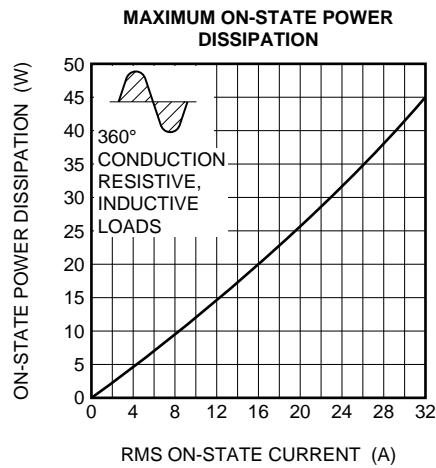
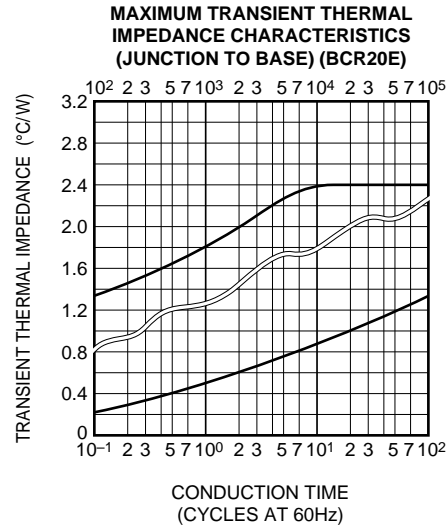
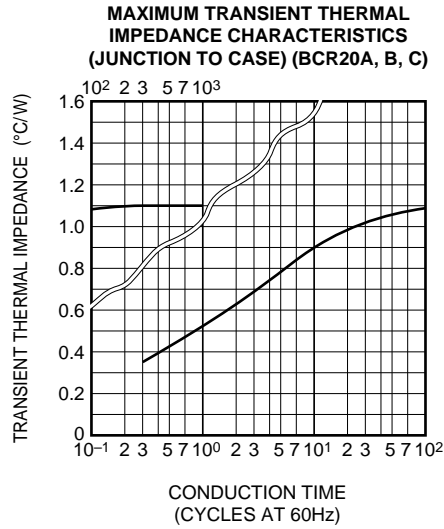
GATE TRIGGER CURRENT-VOLTAGE VS. JUNCTION TEMPERATURE



# BCR20A, BCR20B, BCR20C, BCR20E

MEDIUM POWER USE

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

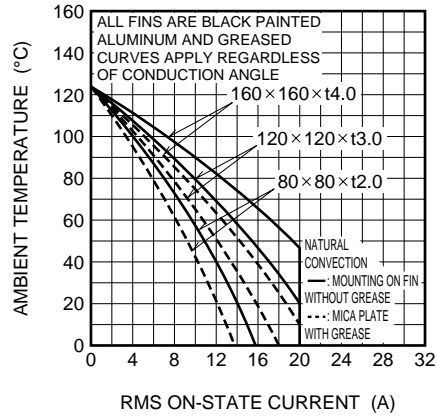


# BCR20A, BCR20B, BCR20C, BCR20E

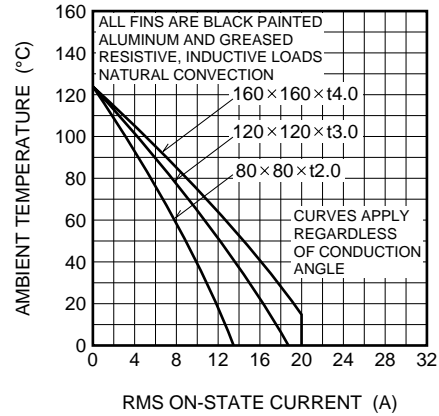
MEDIUM POWER USE

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

ALLOWABLE AMBIENT TEMPERATURE  
VS. RMS ON-STATE CURRENT  
(BCR20C)



ALLOWABLE AMBIENT TEMPERATURE  
VS. RMS ON-STATE CURRENT  
(BCR20E)



## GATE TRIGGER CHARACTERISTICS TEST CIRCUITS

