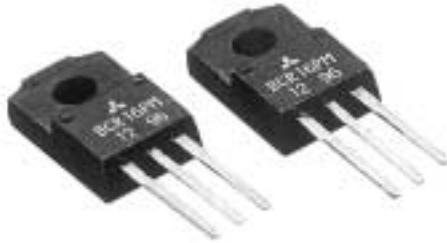


# BCR16PM

Refer to the page 6 as to the product guaranteed maximum junction temperature 150°C

MEDIUM POWER USE  
INSULATED TYPE, PLANAR PASSIVATION TYPE

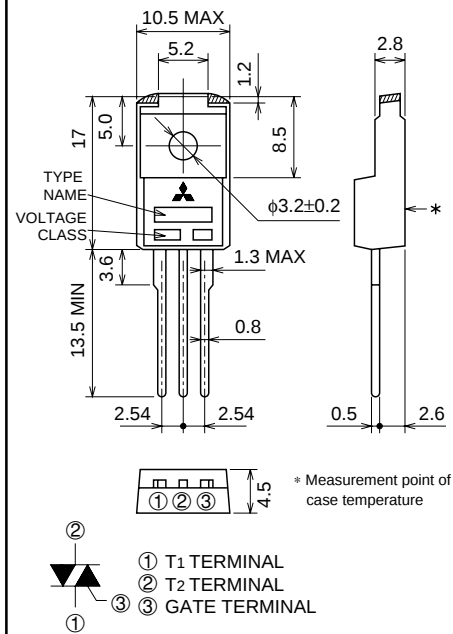
## BCR16PM



- $I_T$  (RMS) ..... 16A
- $V_{DRM}$  ..... 600V
- $I_{FGT}$  I,  $I_{RGT}$  I,  $I_{RGT}$  III ..... 20mA
- $V_{iso}$  ..... 2000V
- UL Recognized: Yellow Card No. E80276(N)  
File No. E80271

## OUTLINE DRAWING

Dimensions  
in mm



TO-220F

## APPLICATION

Contactless AC switches, light dimmer, electric flasher unit, hair drier, control of household equipment such as TV sets · refrigerator · washing machine · electric fan, other general purpose control applications

## MAXIMUM RATINGS

| Symbol    | Parameter                                | Voltage class | Unit |
|-----------|------------------------------------------|---------------|------|
|           |                                          | 12            |      |
| $V_{DRM}$ | Repetitive peak off-state voltage *1     | 600           | V    |
| $V_{DSM}$ | Non-repetitive peak off-state voltage *1 | 720           | V    |

| Symbol      | Parameter                      | Conditions                                                                         | Ratings    | Unit             |
|-------------|--------------------------------|------------------------------------------------------------------------------------|------------|------------------|
| $I_T$ (RMS) | RMS on-state current           | Commercial power frequency, sine full wave 360° conduction, $T_c=71^\circ\text{C}$ | 16         | A                |
| $I_{TSM}$   | Surge on-state current         | 60Hz sinewave 1 full cycle, peak value, non-repetitive                             | 160        | A                |
| $I^2_t$     | $I^2_t$ for fusing             | Value corresponding to 1 cycle of half wave 60Hz, surge on-state current           | 106.5      | A <sup>2</sup> s |
| PGM         | Peak gate power dissipation    |                                                                                    | 5.0        | W                |
| PG (AV)     | Average gate power dissipation |                                                                                    | 0.5        | W                |
| VGM         | Peak gate voltage              |                                                                                    | 10         | V                |
| IGM         | Peak gate current              |                                                                                    | 2          | A                |
| $T_j$       | Junction temperature           |                                                                                    | -40 ~ +125 | °C               |
| $T_{stg}$   | Storage temperature            |                                                                                    | -40 ~ +125 | °C               |
| —           | Weight                         | Typical value                                                                      | 2.0        | g                |
| $V_{iso}$   | Isolation voltage              | $T_a=25^\circ\text{C}$ , AC 1 minute, T1 · T2 · G terminal to case                 | 2000       | V                |

\*1. Gate open.

# BCR16PM

Refer to the page 6 as to the product guaranteed  
maximum junction temperature 150°C

**MEDIUM POWER USE**  
**INSULATED TYPE, PLANAR PASSIVATION TYPE**

## 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                                    | —      | —    | 2.0  | mA   |
| V <sub>TM</sub>       | On-state voltage                                          | T <sub>c</sub> =25°C, I <sub>TM</sub> =25A, 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 | —      | —    | 20   | mA   |
| I <sub>RGT</sub> I    |                                                           |                                                                                    | —      | —    | 20   | mA   |
| I <sub>RGT</sub> III  |                                                           |                                                                                    | —      | —    | 20   | 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 *3                                                                | —      | —    | 3.0  | °C/W |
| (dv/dt) <sub>c</sub>  | Critical-rate of rise of off-state commutating voltage *4 | T <sub>j</sub> =125°C                                                              | 10     | —    | —    | V/μs |

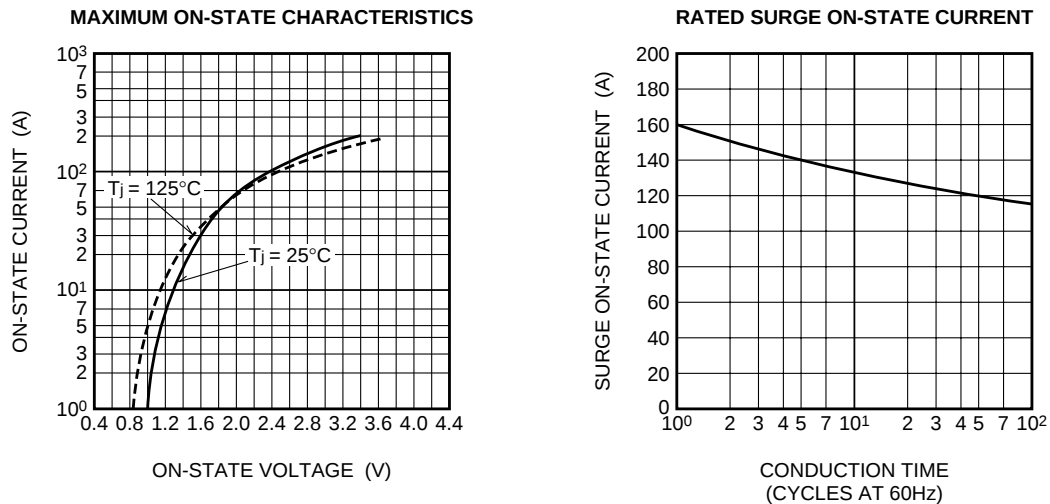
\*2. Measurement using the gate trigger characteristics measurement circuit.

\*3. The contact thermal resistance R<sub>th</sub> (c-f) in case of greasing is 0.5°C/W.

\*4. Test conditions of the critical-rate of rise of off-state commutating voltage is shown in the table below.

| Test conditions                                                                                                                                                                                     | Commutating voltage and current waveforms (inductive load) |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| 1. Junction temperature<br>T <sub>j</sub> =125°C<br><br>2. Rate of decay of on-state commutating current<br>(di/dt) <sub>c</sub> =-8.0A/ms<br><br>3. Peak off-state voltage<br>V <sub>D</sub> =400V |                                                            |

## PERFORMANCE CURVES

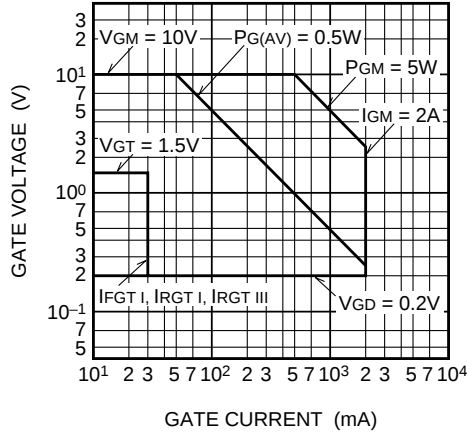


# BCR16PM

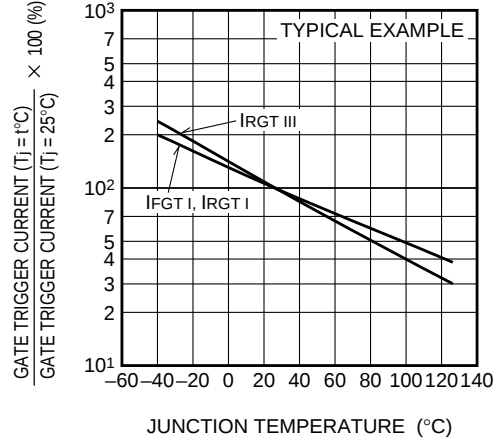
Refer to the page 6 as to the product guaranteed  
maximum junction temperature 150°C

MEDIUM POWER USE  
INSULATED TYPE, PLANAR PASSIVATION TYPE

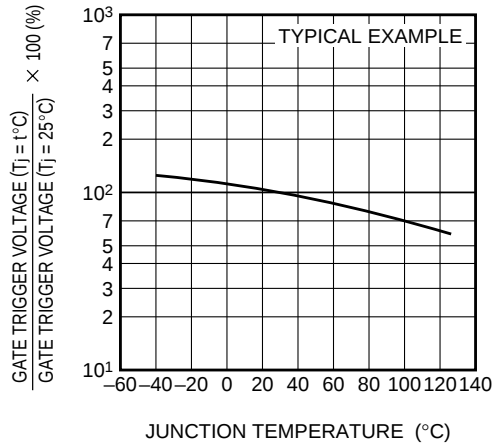
**GATE CHARACTERISTICS  
(I, II AND III)**



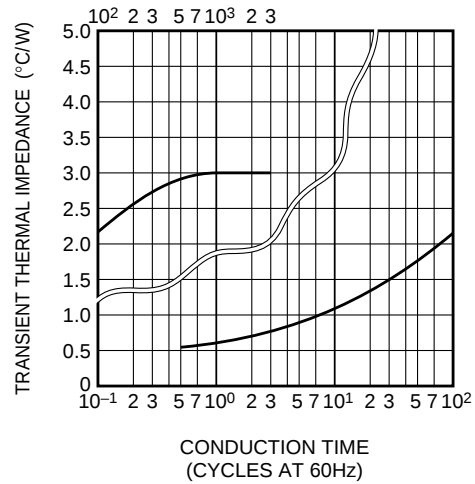
**GATE TRIGGER CURRENT VS.  
JUNCTION TEMPERATURE**



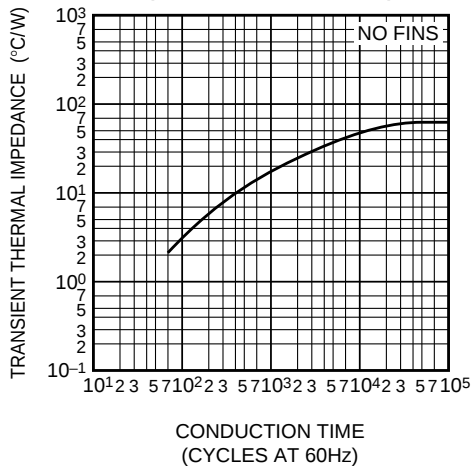
**GATE TRIGGER VOLTAGE VS.  
JUNCTION TEMPERATURE**



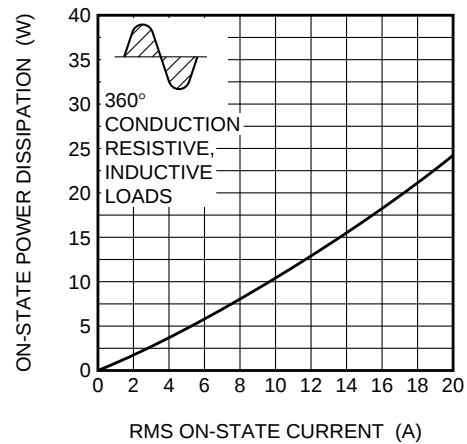
**MAXIMUM TRANSIENT THERMAL  
IMPEDANCE CHARACTERISTICS  
(JUNCTION TO CASE)**



**MAXIMUM TRANSIENT THERMAL  
IMPEDANCE CHARACTERISTICS  
(JUNCTION TO AMBIENT)**



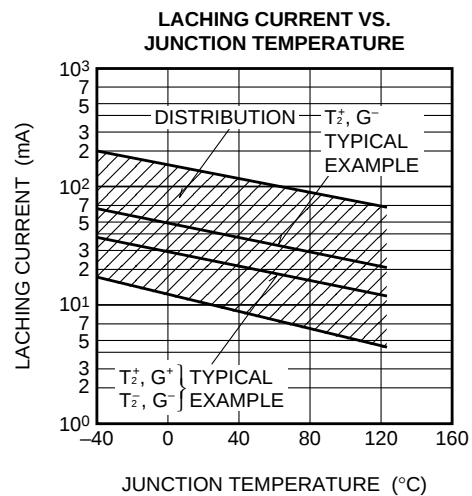
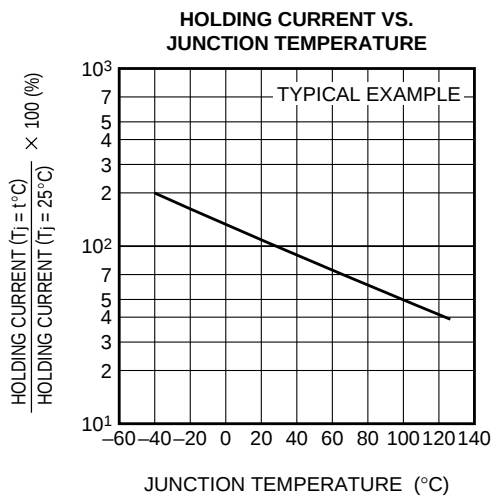
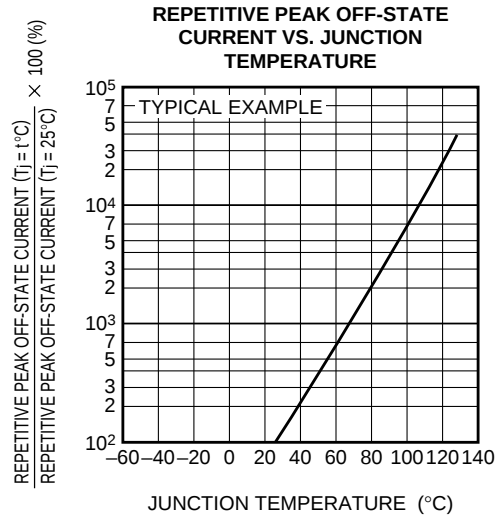
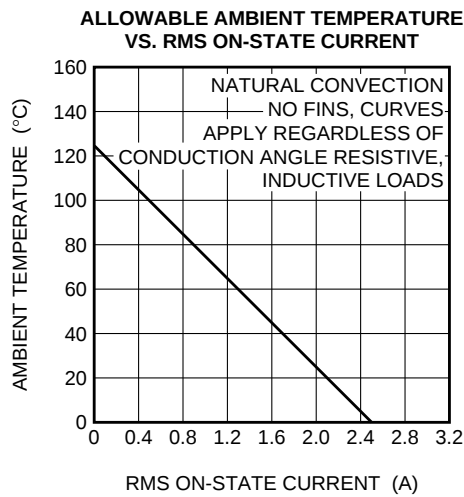
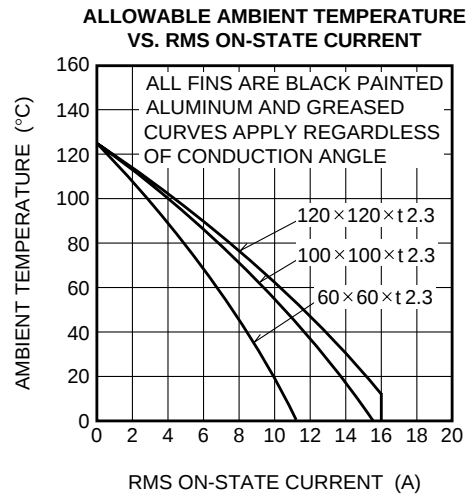
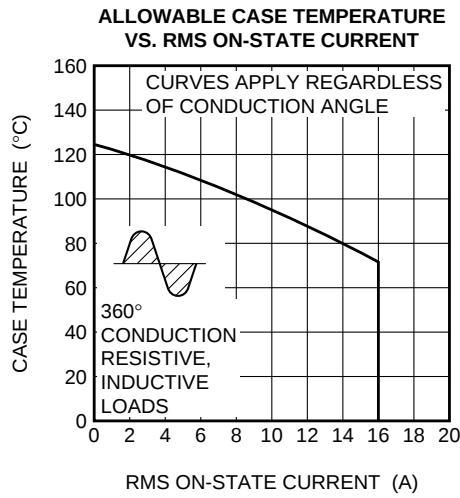
**MAXIMUM ON-STATE POWER  
DISSIPATION**



# BCR16PM

Refer to the page 6 as to the product guaranteed maximum junction temperature 150°C

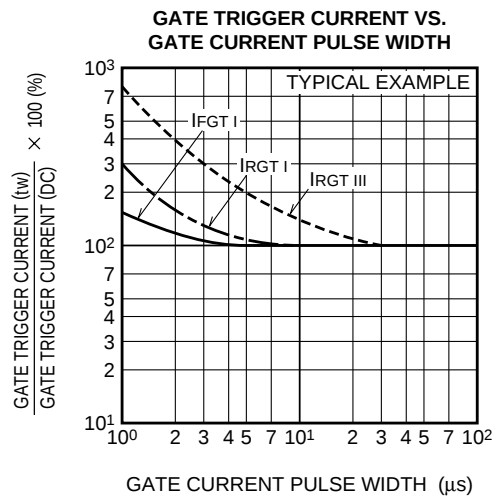
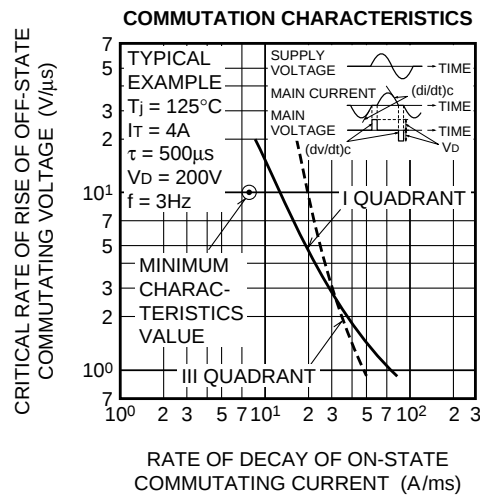
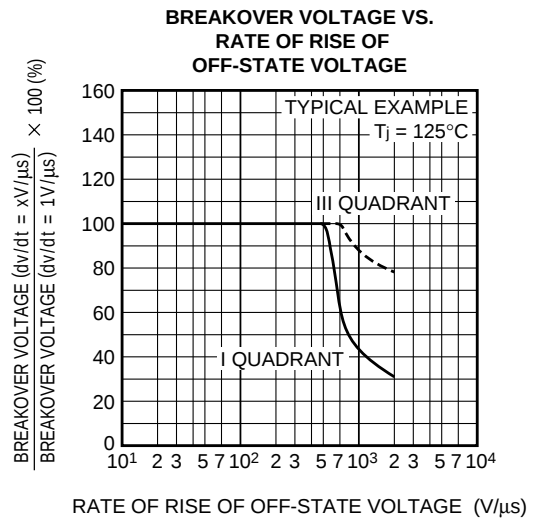
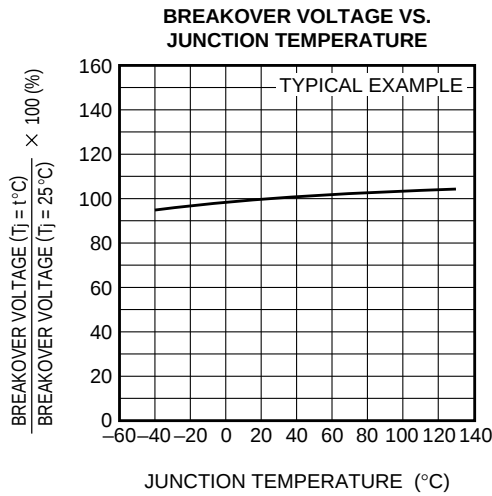
MEDIUM POWER USE  
INSULATED TYPE, PLANAR PASSIVATION TYPE



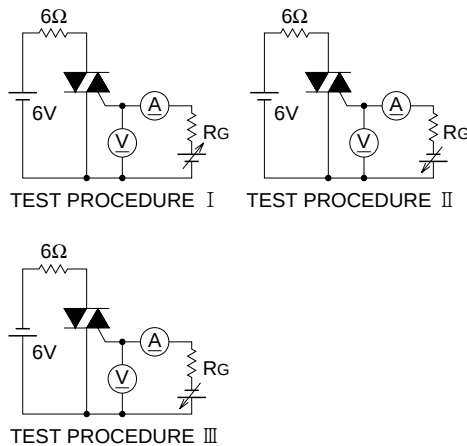
# BCR16PM

Refer to the page 6 as to the product guaranteed maximum junction temperature 150°C

MEDIUM POWER USE  
INSULATED TYPE, PLANAR PASSIVATION TYPE



## GATE TRIGGER CHARACTERISTICS TEST CIRCUITS

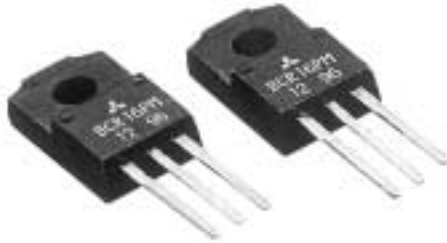


# BCR16PM

The product guaranteed maximum junction temperature 150°C (See warning.)

MEDIUM POWER USE  
INSULATED TYPE, PLANAR PASSIVATION TYPE

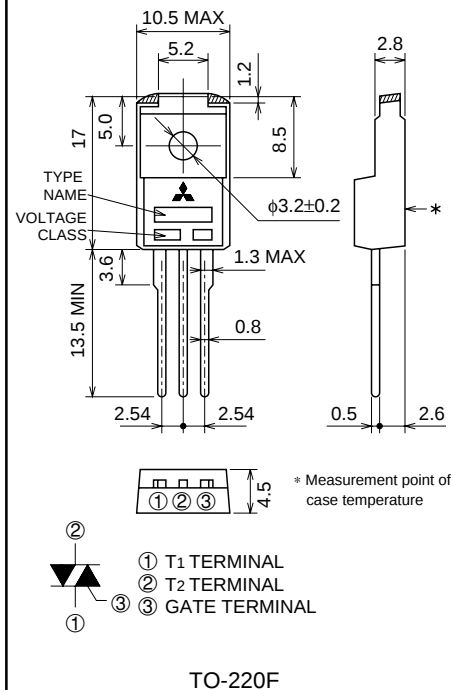
## BCR16PM



- $I_T$  (RMS) ..... 16A
- $V_{DRM}$  ..... 600V
- $I_{FGT}$  I,  $I_{RGT}$  I,  $I_{RGT}$  III ..... 20mA
- $V_{iso}$  ..... 2000V
- UL Recognized: Yellow Card No. E80276(N)  
File No. E80271

## OUTLINE DRAWING

Dimensions  
in mm



## APPLICATION

Contactless AC switches, light dimmer, electric flasher unit, hair drier, control of household equipment such as TV sets · refrigerator · washing machine · electric fan, other general purpose control applications

(Warning)

1. Refer to the recommended circuit values around the triac before using.
2. Be sure to exchange the specification before using. If not exchanged, general triacs will be supplied.

## MAXIMUM RATINGS

| Symbol    | Parameter                                | Voltage class | Unit |
|-----------|------------------------------------------|---------------|------|
|           |                                          | 12            |      |
| $V_{DRM}$ | Repetitive peak off-state voltage *1     | 600           | V    |
| $V_{DSM}$ | Non-repetitive peak off-state voltage *1 | 720           | V    |

| Symbol      | Parameter                      | Conditions                                                                         | Ratings    | Unit             |
|-------------|--------------------------------|------------------------------------------------------------------------------------|------------|------------------|
| $I_T$ (RMS) | RMS on-state current           | Commercial power frequency, sine full wave 360° conduction, $T_c=96^\circ\text{C}$ | 16         | A                |
| $I_{TSM}$   | Surge on-state current         | 60Hz sinewave 1 full cycle, peak value, non-repetitive                             | 160        | A                |
| $I^2_t$     | $I^2_t$ for fusing             | Value corresponding to 1 cycle of half wave 60Hz, surge on-state current           | 106.5      | A <sup>2</sup> s |
| PGM         | Peak gate power dissipation    |                                                                                    | 5.0        | W                |
| PG (AV)     | Average gate power dissipation |                                                                                    | 0.5        | W                |
| VGM         | Peak gate voltage              |                                                                                    | 10         | V                |
| IGM         | Peak gate current              |                                                                                    | 2          | A                |
| $T_j$       | Junction temperature           |                                                                                    | -40 ~ +150 | °C               |
| $T_{stg}$   | Storage temperature            |                                                                                    | -40 ~ +150 | °C               |
| —           | Weight                         | Typical value                                                                      | 2.0        | g                |
| $V_{iso}$   | Isolation voltage              | $T_a=25^\circ\text{C}$ , AC 1 minute, T1 · T2 · G terminal to case                 | 2000       | V                |

\*1. Gate open.

# BCR16PM

The product guaranteed maximum junction temperature 150°C (See warning.)

MEDIUM POWER USE  
INSULATED TYPE, PLANAR PASSIVATION TYPE

## ELECTRICAL CHARACTERISTICS

| Symbol                | Parameter                                                 | Test conditions                                                                    | Limits  |      |      | Unit |
|-----------------------|-----------------------------------------------------------|------------------------------------------------------------------------------------|---------|------|------|------|
|                       |                                                           |                                                                                    | Min.    | Typ. | Max. |      |
| IdRM                  | Repetitive peak off-state current                         | T <sub>j</sub> =150°C, V <sub>DRM</sub> applied                                    | —       | —    | 2.0  | mA   |
| V <sub>TM</sub>       | On-state voltage                                          | T <sub>c</sub> =25°C, I <sub>TM</sub> =25A, 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 | —       | —    | 20   | mA   |
| I <sub>RGT</sub> I    |                                                           |                                                                                    | —       | —    | 20   | mA   |
| I <sub>RGT</sub> III  |                                                           |                                                                                    | —       | —    | 20   | mA   |
| V <sub>GD</sub>       | Gate non-trigger voltage                                  | T <sub>j</sub> =125°C/150°C, V <sub>D</sub> =1/2V <sub>DRM</sub>                   | 0.2/0.1 | —    | —    | V    |
| R <sub>th</sub> (j-c) | Thermal resistance                                        | Junction to case *3                                                                | —       | —    | 3.0  | °C/W |
| (dv/dt) <sub>c</sub>  | Critical-rate of rise of off-state commutating voltage *4 | T <sub>j</sub> =125°C/150°C                                                        | 10/1    | —    | —    | V/μs |

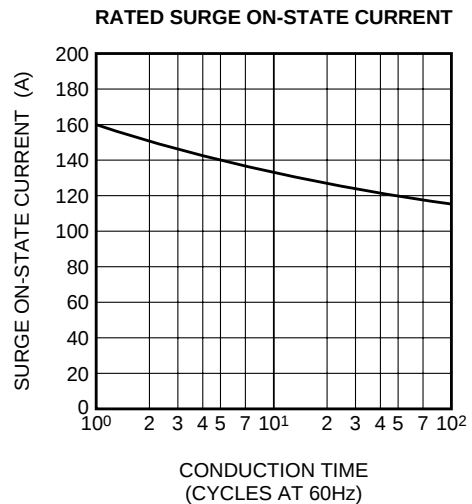
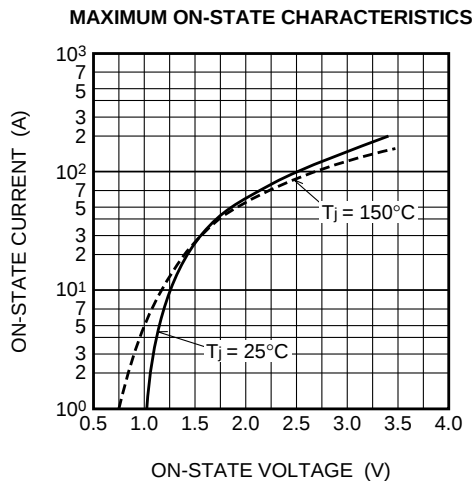
\*2. Measurement using the gate trigger characteristics measurement circuit.

\*3. The contact thermal resistance R<sub>th</sub> (c-f) in case of greasing is 0.5°C/W.

\*4. Test conditions of the critical-rate of rise of off-state commutating voltage is shown in the table below.

| Test conditions                                                                                                                                                                                           | Commutating voltage and current waveforms (inductive load) |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| 1. Junction temperature<br>T <sub>j</sub> =125°C/150°C<br><br>2. Rate of decay of on-state commutating current<br>(di/dt) <sub>c</sub> =-8.0A/ms<br><br>3. Peak off-state voltage<br>V <sub>D</sub> =400V |                                                            |

## PERFORMANCE CURVES

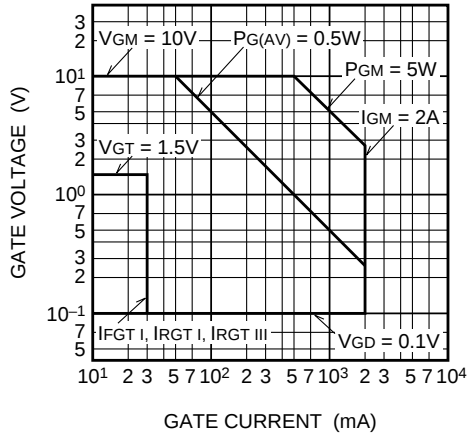


# BCR16PM

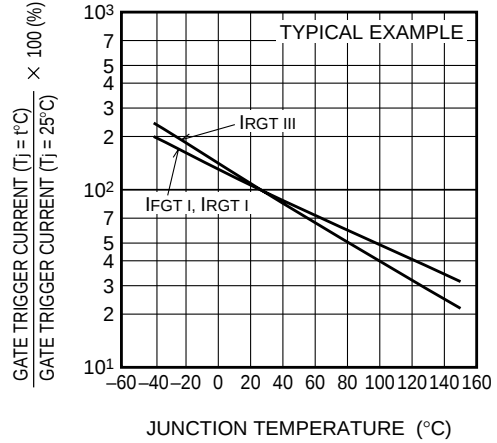
The product guaranteed maximum junction temperature 150°C (See warning.)

MEDIUM POWER USE  
INSULATED TYPE, PLANAR PASSIVATION TYPE

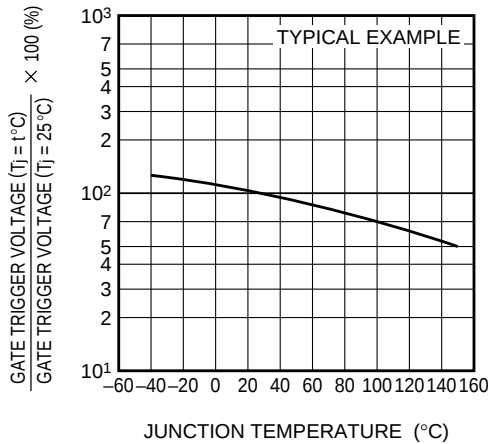
**GATE CHARACTERISTICS  
(I, II AND III)**



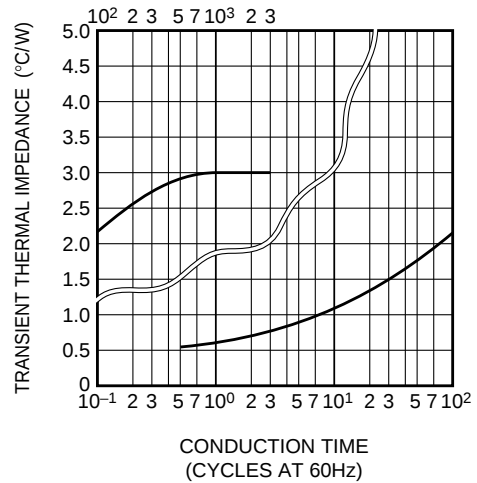
**GATE TRIGGER CURRENT VS.  
JUNCTION TEMPERATURE**



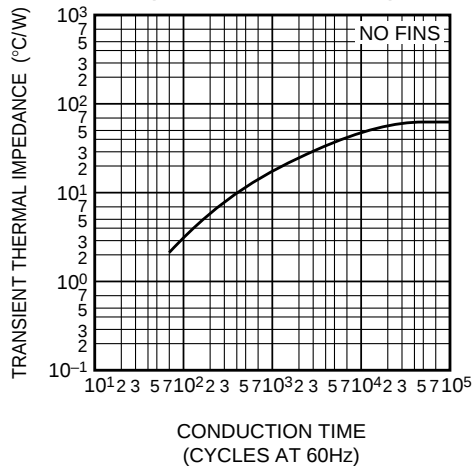
**GATE TRIGGER VOLTAGE VS.  
JUNCTION TEMPERATURE**



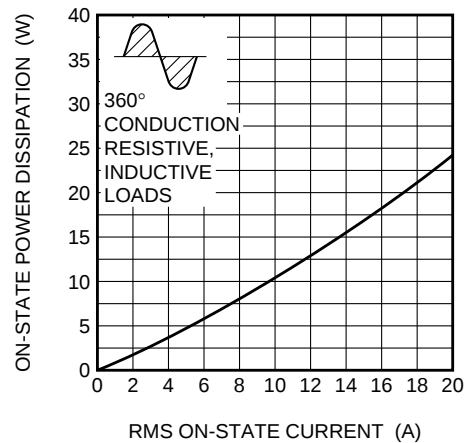
**MAXIMUM TRANSIENT THERMAL  
IMPEDANCE CHARACTERISTICS  
(JUNCTION TO CASE)**



**MAXIMUM TRANSIENT THERMAL  
IMPEDANCE CHARACTERISTICS  
(JUNCTION TO AMBIENT)**



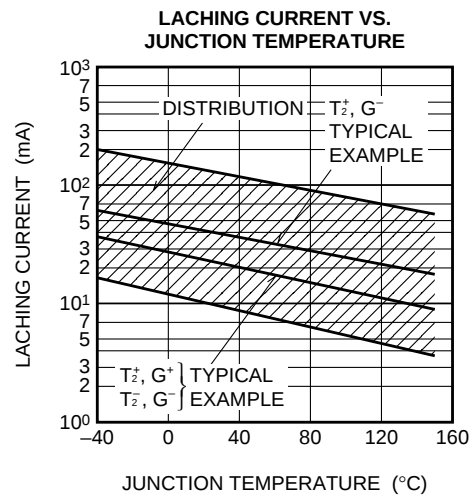
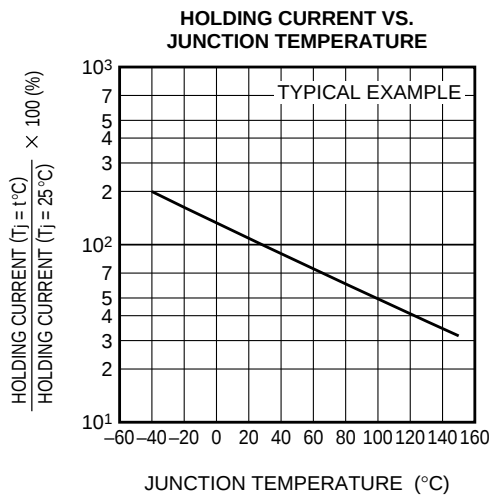
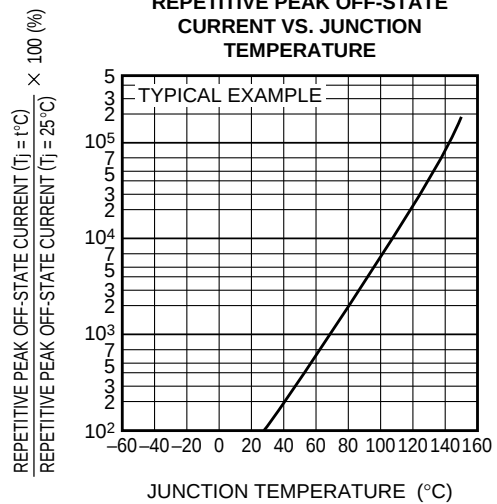
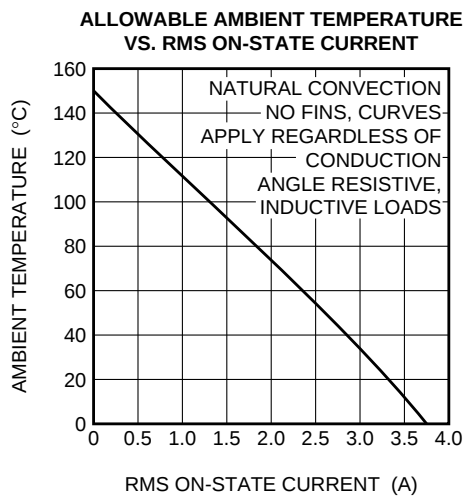
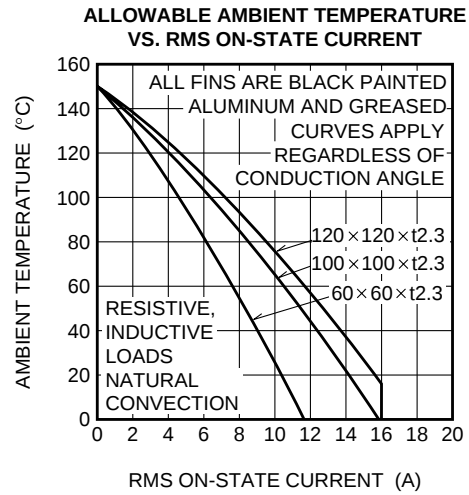
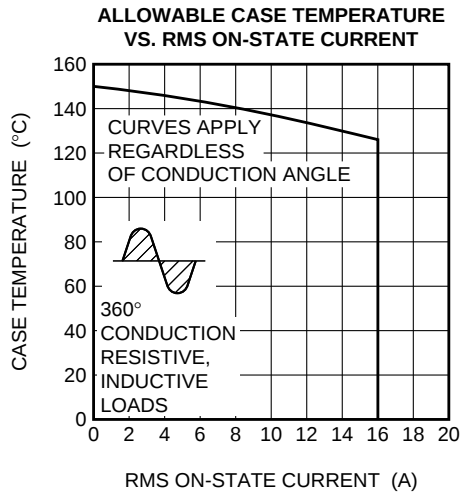
**MAXIMUM ON-STATE POWER  
DISSIPATION**



# BCR16PM

The product guaranteed maximum junction temperature 150°C (See warning.)

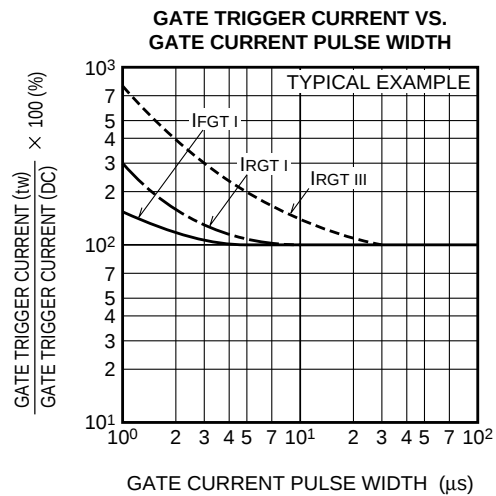
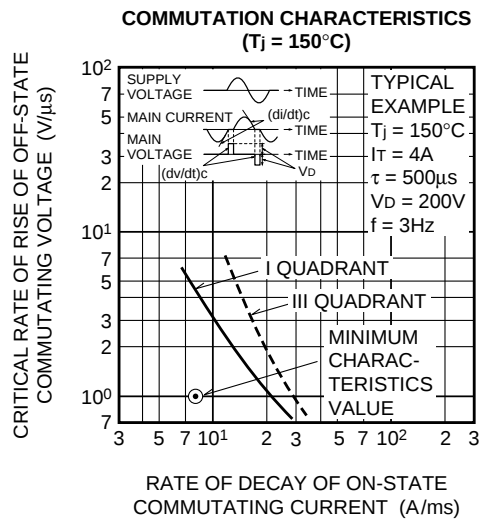
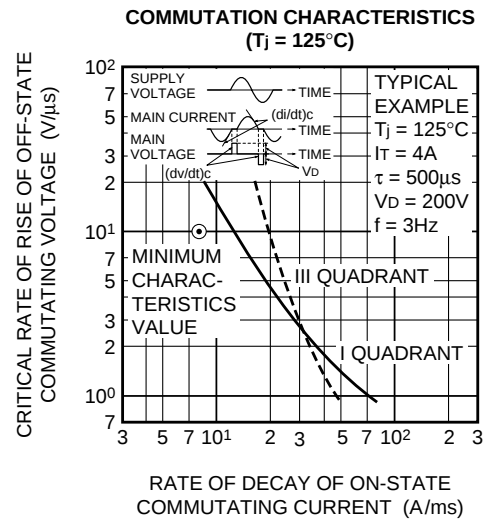
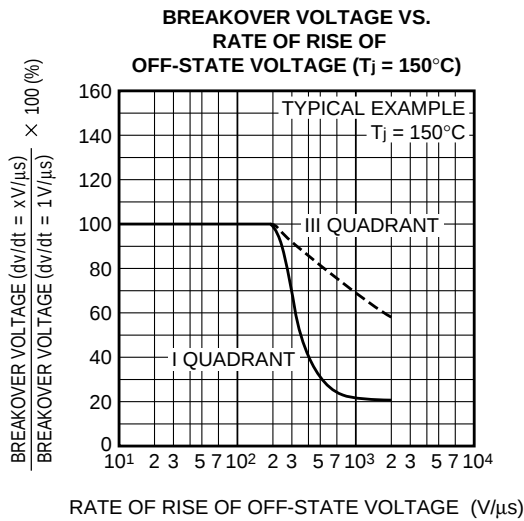
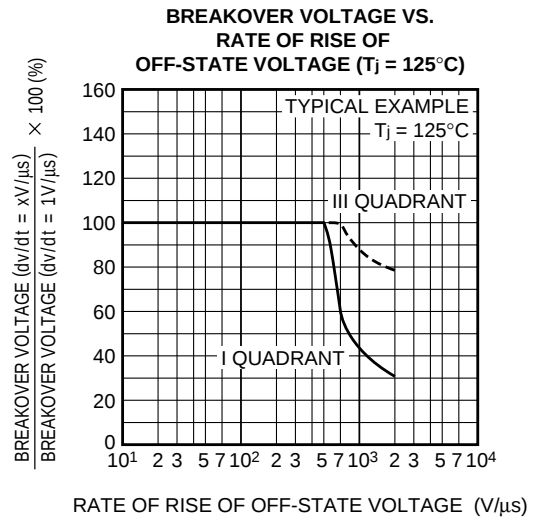
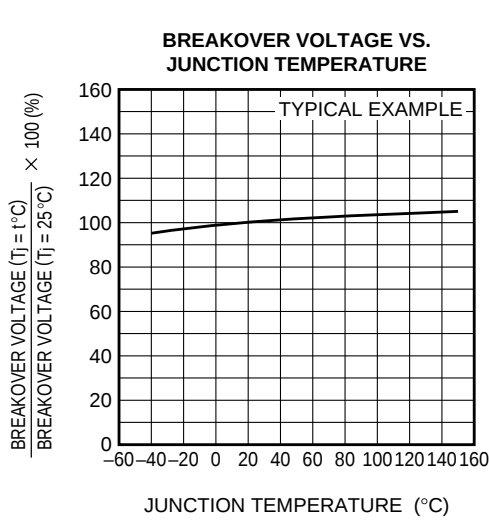
MEDIUM POWER USE  
INSULATED TYPE, PLANAR PASSIVATION TYPE



# BCR16PM

The product guaranteed maximum junction temperature 150°C (See warning.)

MEDIUM POWER USE  
INSULATED TYPE, PLANAR PASSIVATION TYPE

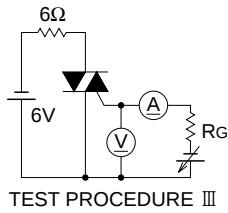
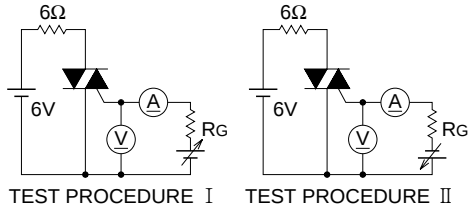


# BCR16PM

The product guaranteed maximum junction temperature 150°C (See warning.)

**MEDIUM POWER USE**  
**INSULATED TYPE, PLANAR PASSIVATION TYPE**

## GATE TRIGGER CHARACTERISTICS TEST CIRCUITS



## RECOMMENDED CIRCUIT VALUES AROUND THE TRIAC

