


# BCR3AM

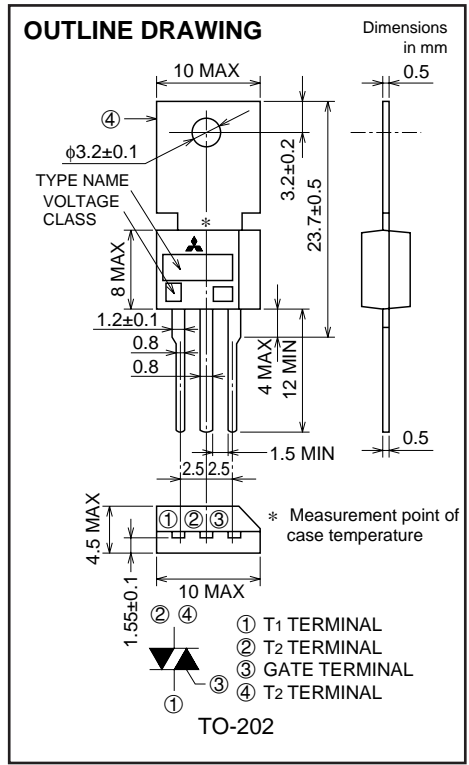
LOW POWER USE

NON-INSULATED TYPE, PLANAR PASSIVATION TYPE

**BCR3AM**



- $I_T$  (RMS) ..... **3A**
- $V_{DRM}$  ..... **400V/600V**
- IFGT I , IRGT I , IRGT III ..... **30mA (15mA) \*6**



## APPLICATION

Contactless AC switches, light dimmer, electric blankets, control of household equipment such as electric fan, solenoid drivers, small motor control, other general purpose control applications

## MAXIMUM RATINGS

| Symbol    | Parameter                                | Voltage class |     | Unit |
|-----------|--|---------------|-----|------|
|           |  | 8             | 12  |      |
| $V_{DRM}$ | Repetitive peak off-state voltage *1     | 400           | 600 | V    |
| $V_{DSM}$ | Non-repetitive peak off-state voltage *1 | 500           | 720 | V    |

| Symbol      | Parameter                      | Conditions   | Ratings    | Unit                 |
|-------------|--------------------------------|--|------------|----------------------|
| $I_T$ (RMS) | RMS on-state current           | Commercial frequency, sine full wave 360° conduction, $T_c = 86^\circ\text{C}$ | 3          | A                    |
| $I_{TSM}$   | Surge on-state current         | 60Hz sinewave 1 full cycle, peak value, non-repetitive                         | 30         | A                    |
| $I_t^2$     | $I_t^2$ for fusing             | Value corresponding to 1 cycle of half wave 60Hz, surge on-state current       | 3.7        | $\text{A}^2\text{s}$ |
| PGM         | Peak gate power dissipation    |  | 3          | W                    |
| PG (AV)     | Average gate power dissipation |  | 0.3        | W                    |
| VGM         | Peak gate voltage              |  | 6          | V                    |
| IGM         | Peak gate current              |  | 0.5        | A                    |
| $T_j$       | Junction temperature           |  | -40 ~ +125 | $^\circ\text{C}$     |
| $T_{stg}$   | Storage temperature            |  | -40 ~ +125 | $^\circ\text{C}$     |
| —           | Weight                         | Typical value  | 1.6        | g                    |

\*1. Gate open.

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## ELECTRICAL CHARACTERISTICS

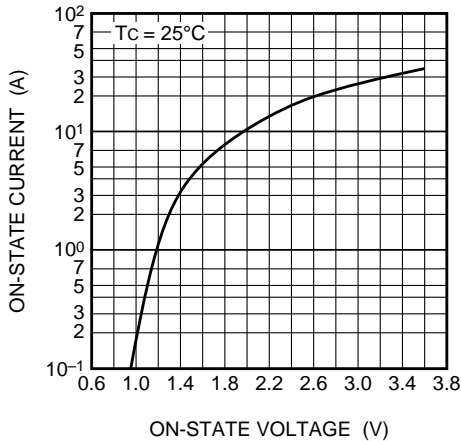
| Symbol               | Parameter  | Test conditions  | Limits |      |      | Unit |    |
|----------------------|--|--|--------|------|------|------|----|
|                      |  |  | Min.   | Typ. | Max. |      |    |
| IDRM                 | Repetitive peak off-state current                      | T <sub>j</sub> =125°C, V <sub>DRM</sub> applied                                    | —      | —    | 2.0  | mA   |    |
| VTM                  | On-state voltage                                       | T <sub>c</sub> =25°C, I <sub>TM</sub> =4.5A, Instantaneous measurement             | —      | —    | 1.5  | V    |    |
| VFGT 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 | I      | —    | —    | 1.5  | V  |
| VRGT I               |  |  | II     | —    | —    | 1.5  | V  |
| VRGT III             |  |  | III    | —    | —    | 1.5  | V  |
| IFGT 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 | I      | —    | —    | 30*6 | mA |
| IRGT I               |  |  | II     | —    | —    | 30*6 | mA |
| IRGT III             |  |  | III    | —    | —    | 30*6 | mA |
| VGD                  | Gate non-trigger voltage                               | T <sub>j</sub> =125°C, V <sub>D</sub> =1/2V <sub>DRM</sub>                         | 0.2    | —    | —    | V    |    |
| Rth (j-c)            | Thermal resistance                                     | Junction to case *4 *5   | —      | —    | 10   | °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.
- \*4. Case temperature is measured at the T<sub>2</sub> terminal 1.5mm away from the molded case.
- \*5. The contact thermal resistance R<sub>th (c-f)</sub> in case of greasing is 3°C/W.
- \*6. High sensitivity (I<sub>GT</sub>≤15mA) is also available. (IGT item ①)

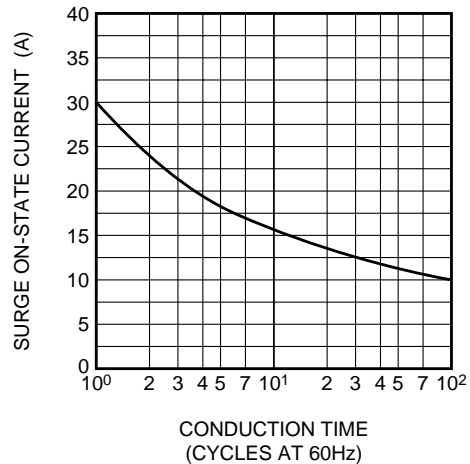
| Voltage class | V <sub>DRM</sub> (V) | (dv/dt) <sub>c</sub> |      | Test conditions  | Commutating voltage and current waveforms (inductive load) |
|---------------|----------------------|----------------------|------|--|--|
|               |                      | Min.                 | Unit |  |  |
| 8             | 400                  | 5                    | V/μs | 1. Junction temperature T <sub>j</sub> =125°C<br>2. Rate of decay of on-state commutating current (di/dt) <sub>c</sub> =-1.5A/ms<br>3. Peak off-state voltage V <sub>D</sub> =400V |  |
| 12            | 600                  |                      |      |  |  |

## PERFORMANCE CURVES

MAXIMUM ON-STATE CHARACTERISTICS

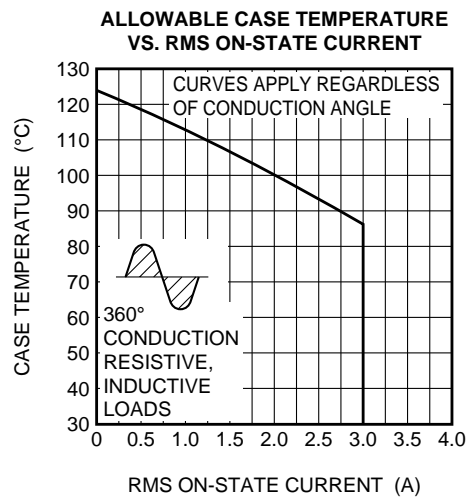
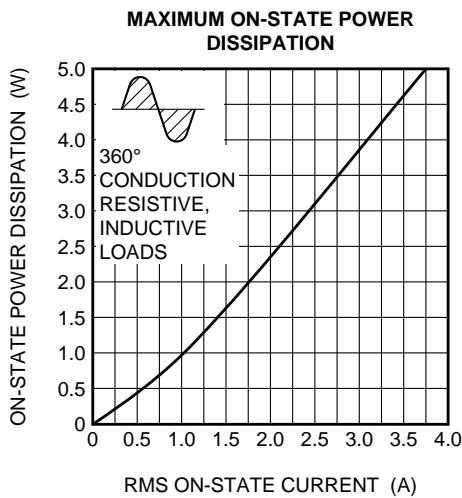
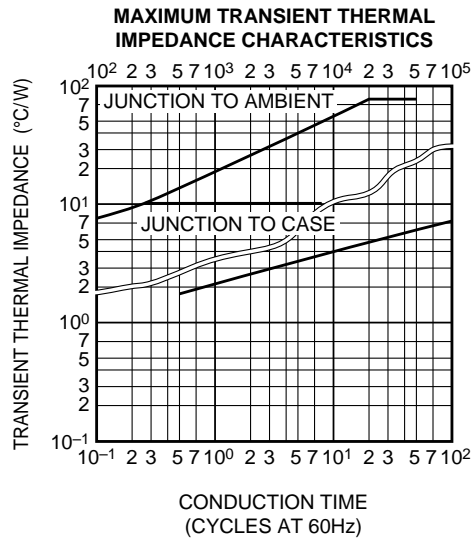
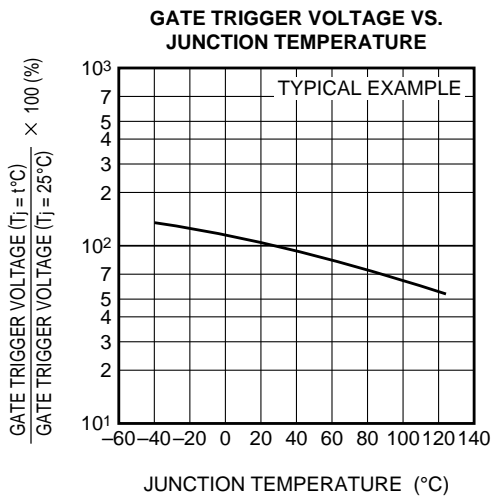
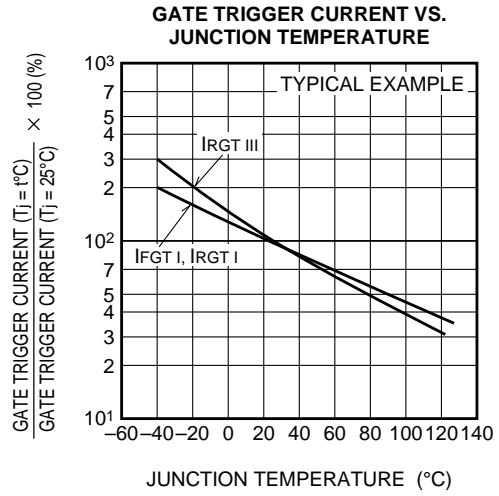
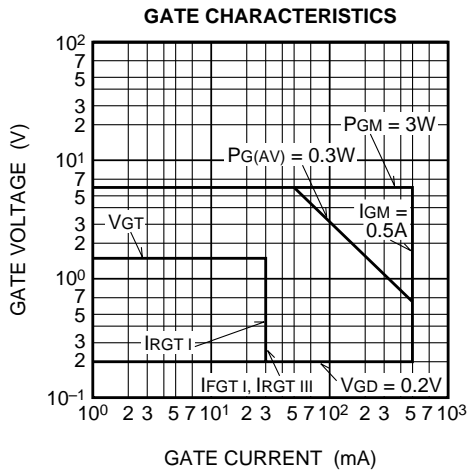


RATED SURGE ON-STATE CURRENT



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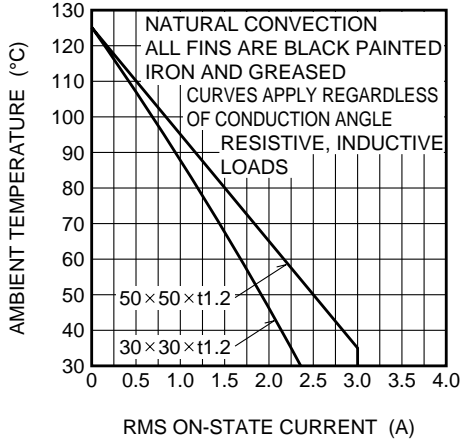
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NON-INSULATED TYPE, PLANAR PASSIVATION TYPE



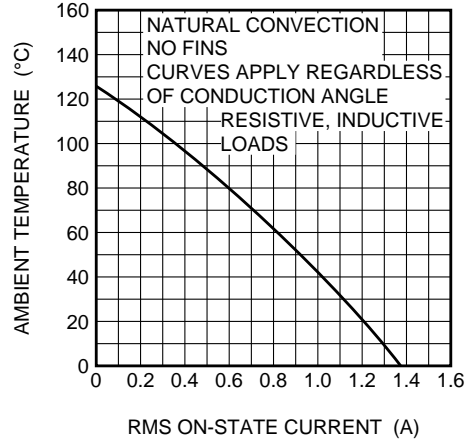
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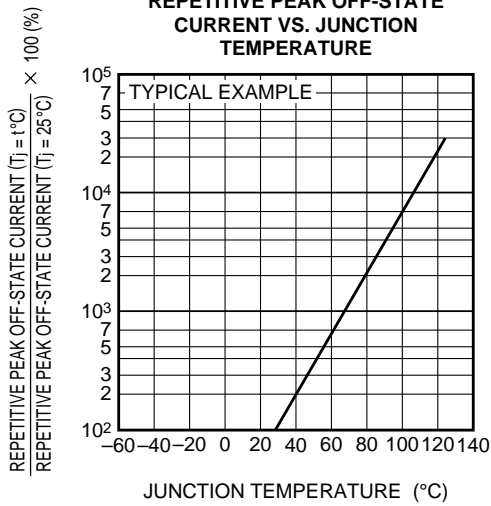
**ALLOWABLE AMBIENT TEMPERATURE VS. RMS ON-STATE CURRENT**



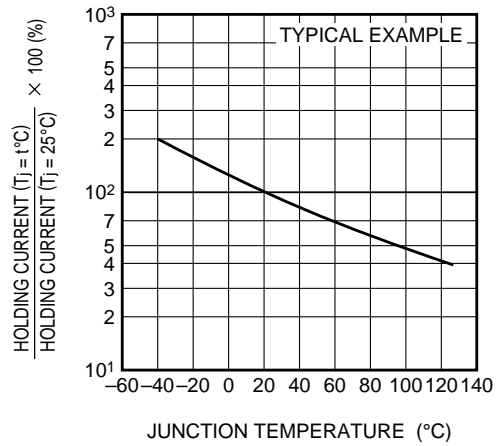
**ALLOWABLE AMBIENT TEMPERATURE VS. RMS ON-STATE CURRENT**



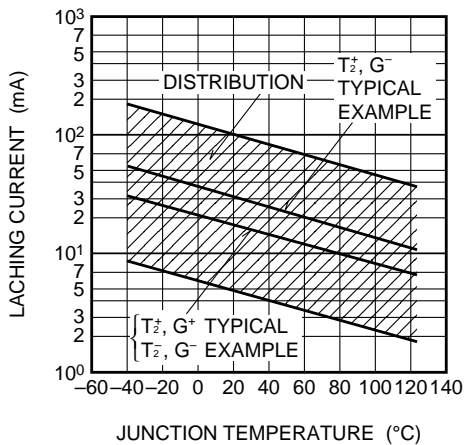
**REPETITIVE PEAK OFF-STATE CURRENT VS. JUNCTION TEMPERATURE**



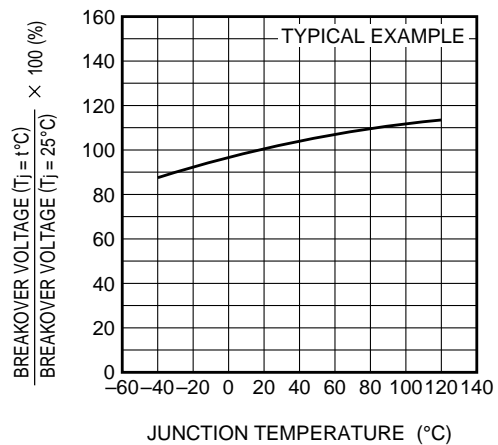
**HOLDING CURRENT VS. JUNCTION TEMPERATURE**



**LATCHING CURRENT VS. JUNCTION TEMPERATURE**



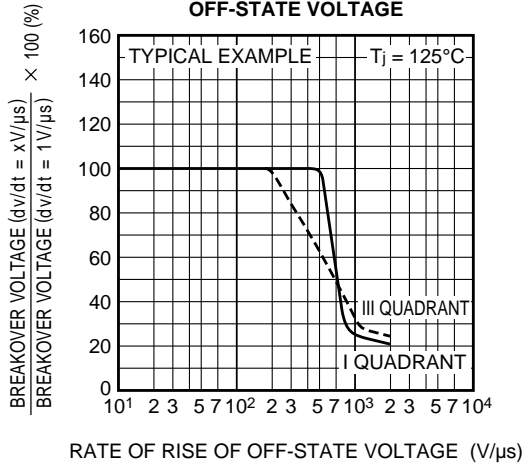
**BREAKOVER VOLTAGE VS. JUNCTION TEMPERATURE**



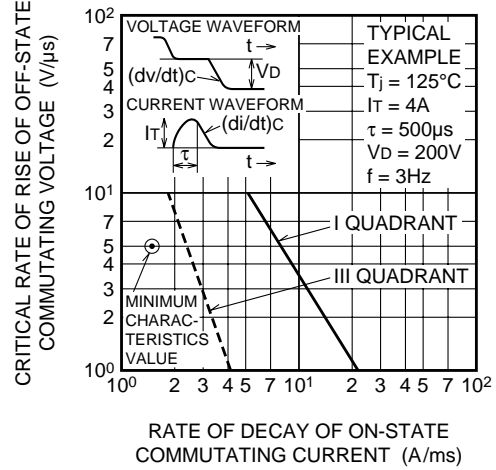
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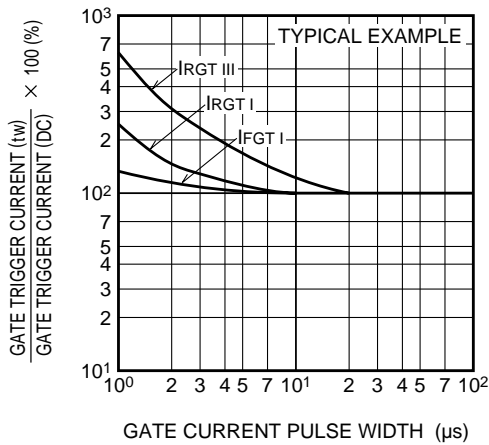
**BREAKOVER VOLTAGE VS. RATE OF RISE OF OFF-STATE VOLTAGE**



**COMMUTATION CHARACTERISTICS**



**GATE TRIGGER CURRENT VS. GATE CURRENT PULSE WIDTH**



**GATE TRIGGER CHARACTERISTICS TEST CIRCUITS**

