


BCR20AM

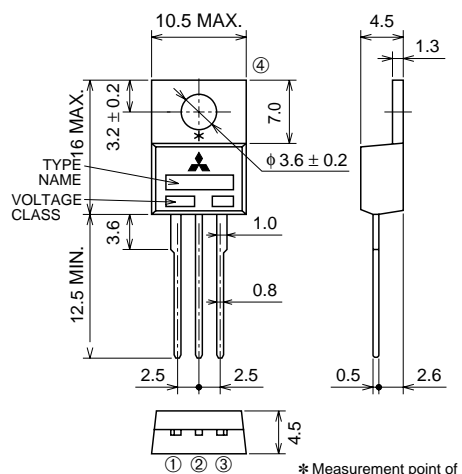
MEDIUM POWER USE
NON-INSULATED TYPE, PLANAR PASSIVATION TYPE

BCR20AM



- I_T (RMS) 20A
- V_{DRM} 400V / 600V
- IFGT I , IRGT I , IRGT III 30mA (20mA) *5

OUTLINE DRAWING Dimensions in mm



① T1 TERMINAL
② T2 TERMINAL
③ GATE TERMINAL
④ T2 TERMINAL

TO-220

APPLICATION

Vacuum cleaner, light dimmer, copying machine, other control of motor and heater

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, $T_c=105^\circ\text{C}$ | 20 | A |
| I_{TSM} | Surge on-state current | 60Hz sinewave 1 full cycle, peak value, non-repetitive | 200 | A |
| I_t^2 | I_t^2 for fusing | Value corresponding to 1 cycle of half wave 60Hz, surge on-state current | 167 | 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 | | -40 ~ +125 | $^\circ\text{C}$ |
| T_{stg} | Storage temperature | | -40 ~ +125 | $^\circ\text{C}$ |
| — | Weight | Typical value | 2.0 | g |

*1. Gate open.

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MEDIUM POWER USE

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ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Test conditions | Limits | | | Unit | |
|----------------------|--|---|--------|------|------|-------|----|
| | | | Min. | Typ. | Max. | | |
| IDRM | Repetitive peak off-state current | T _j =125°C, V _{DRM} applied | — | — | 2.0 | mA | |
| VTM | On-state voltage | T _c =25°C, I _{TM} =30A, Instantaneous measurement | — | — | 1.5 | V | |
| VFGT I | Gate trigger voltage*2 | T _j =25°C, V _D =6V, R _L =6Ω, R _G =330Ω *3 | I | — | — | 1.5 | V |
| VRGT I | | | II | — | — | 1.5 | V |
| VRGT III | | | III | — | — | 1.5 | V |
| IFGT I | Gate trigger current*2 | T _j =25°C, V _D =6V, R _L =6Ω, R _G =330Ω *3 | I | — | — | 30 *5 | mA |
| IRGT I | | | II | — | — | 30 *5 | mA |
| IRGT III | | | III | — | — | 30 *5 | mA |
| VGD | 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 *4 | — | — | 0.8 | °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.

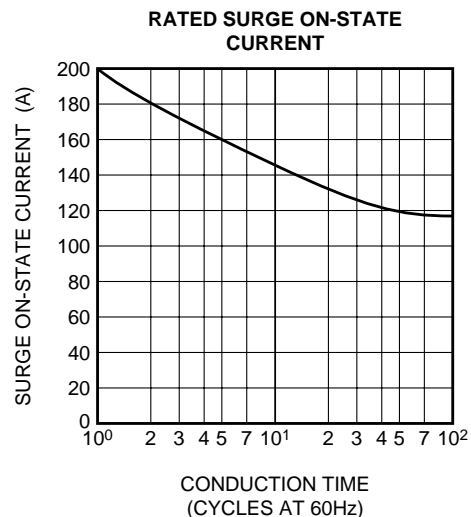
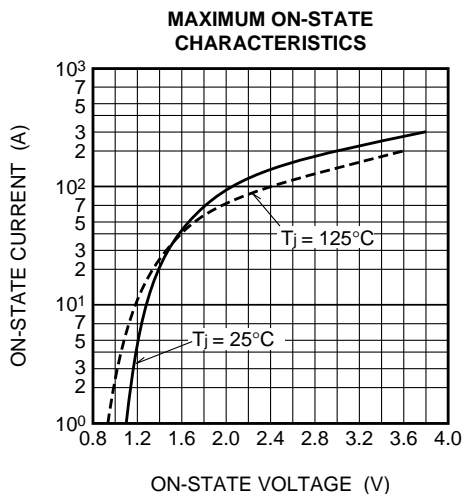
*3. The critical-rate of rise of the off-state commutating voltage is shown in the table below.

*4. The contact thermal resistance R_{th(c-f)} in case of greasing is 1°C/W.

*5. High sensitivity (I_{GT} ≤ 20mA) is also available. (I_{GT} time ①)

| 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 (dv/dt) _c =-10A/ms 3. Peak off-state voltage V _D =400V | |
| | | L | 10 | | | |
| 12 | 600 | R | — | | | |
| | | L | 10 | | | |

PERFORMANCE CURVES

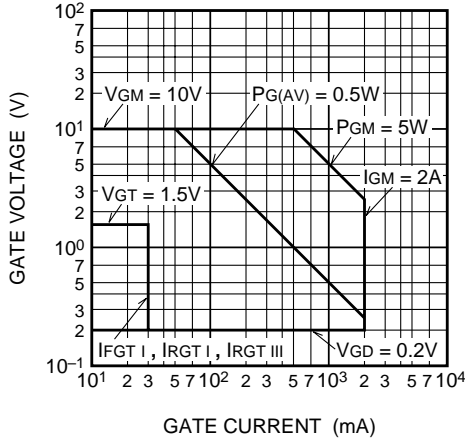


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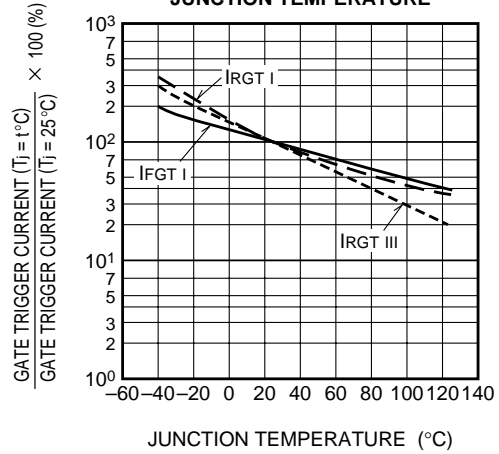
MEDIUM POWER USE

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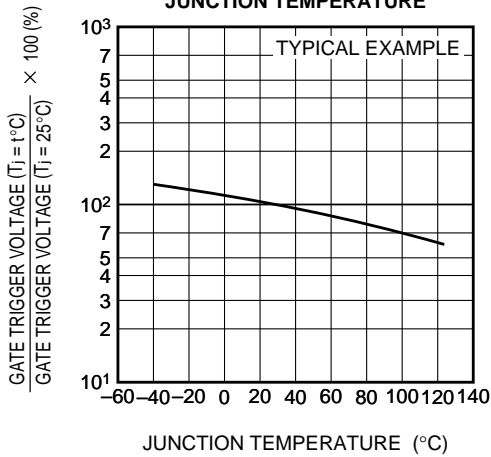
**GATE CHARACTERISTICS
(I, II AND III)**



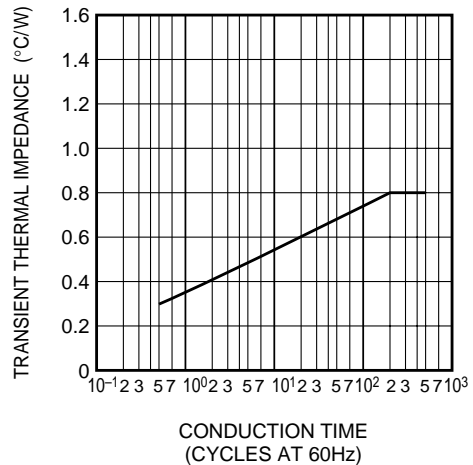
**GATE TRIGGER CURRENT VS.
JUNCTION TEMPERATURE**



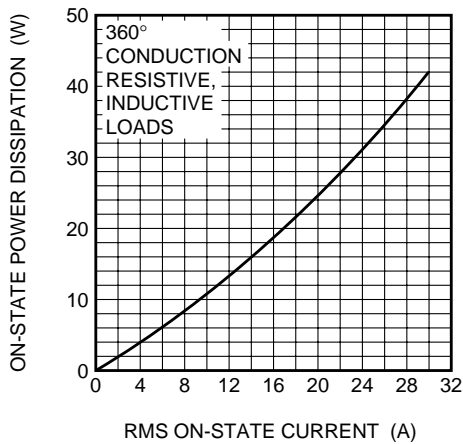
**GATE TRIGGER VOLTAGE VS.
JUNCTION TEMPERATURE**



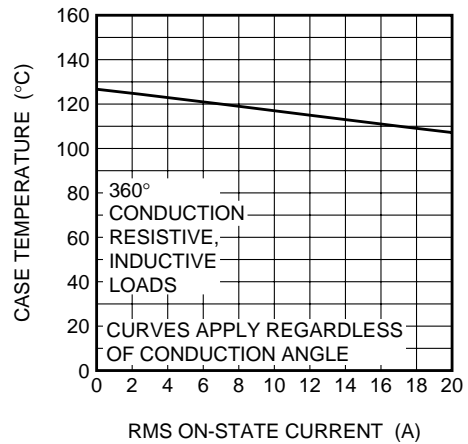
**MAXIMUM TRANSIENT THERMAL
IMPEDANCE CHARACTERISTICS**



**MAXIMUM ON-STATE POWER
DISSIPATION**



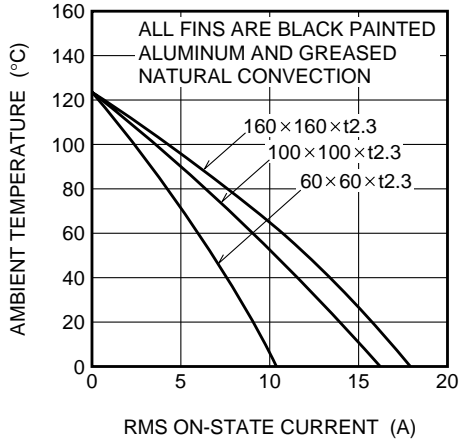
**ALLOWABLE CASE TEMPERATURE
VS. RMS ON-STATE CURRENT**



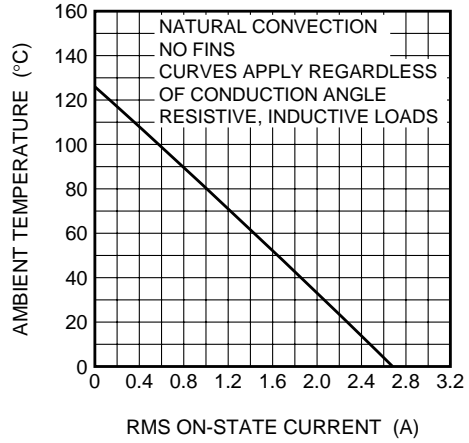
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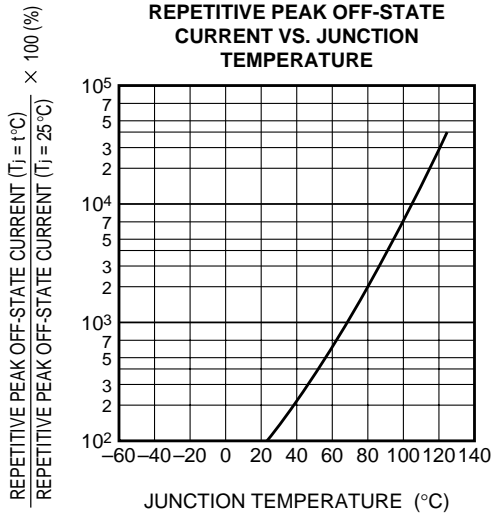
ALLOWABLE CASE TEMPERATURE VS. RMS ON-STATE CURRENT



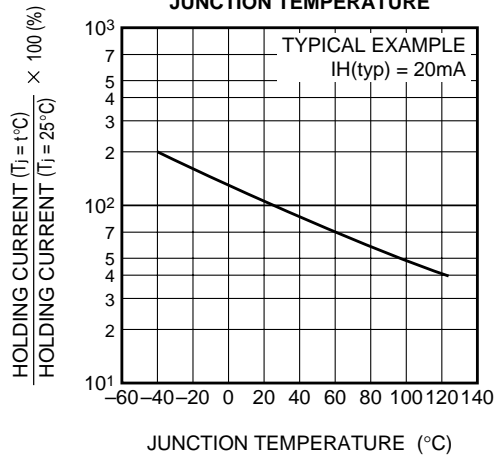
ALLOWABLE CASE TEMPERATURE VS. RMS ON-STATE CURRENT



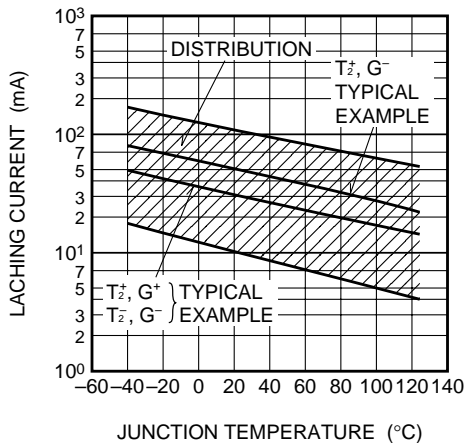
REPETITIVE PEAK OFF-STATE CURRENT VS. JUNCTION TEMPERATURE



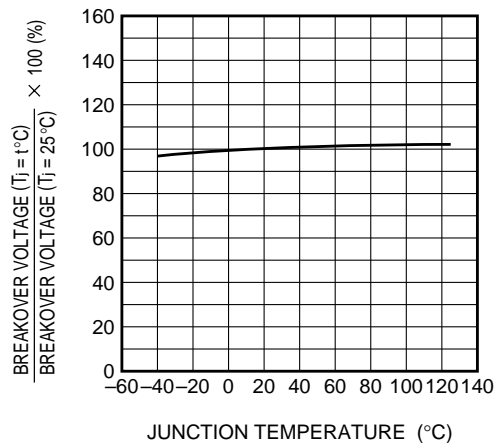
HOLDING CURRENT VS. JUNCTION TEMPERATURE



LATCHING CURRENT VS. JUNCTION TEMPERATURE



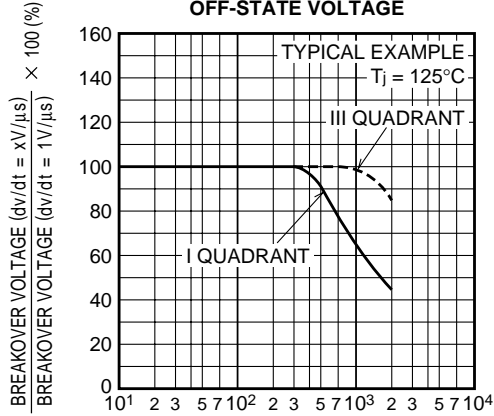
BREAKOVER VOLTAGE VS. JUNCTION TEMPERATURE



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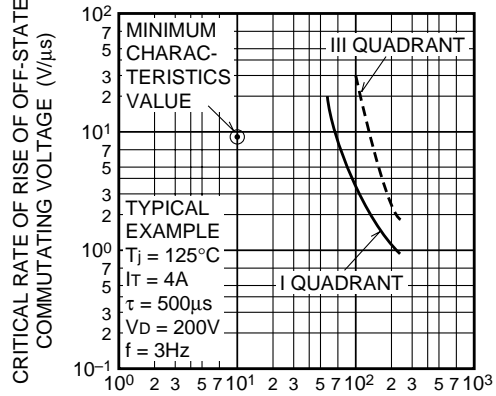
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BREAKOVER VOLTAGE VS. RATE OF RISE OF OFF-STATE VOLTAGE



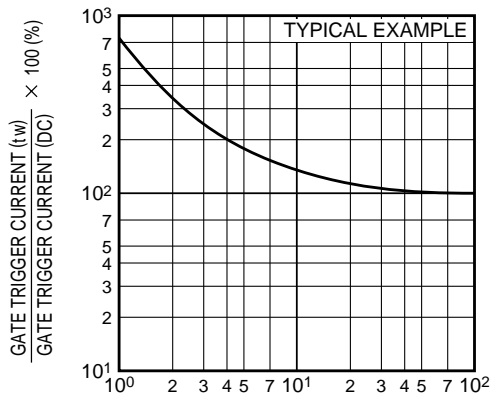
RATE OF RISE OF OFF-STATE VOLTAGE (V/μs)

COMMUTATION CHARACTERISTICS



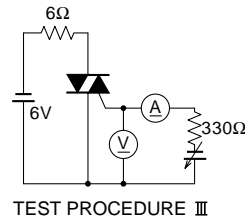
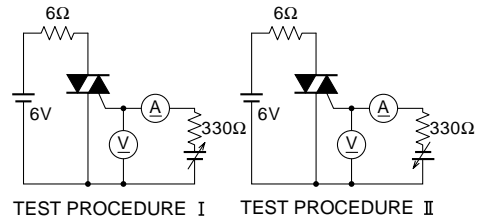
RATE OF DECAY OF ON-STATE COMMUTATING CURRENT (A/ms)

GATE TRIGGER CURRENT VS. GATE CURRENT PULSE WIDTH



GATE TRIGGER PULSE WIDTH (μs)

GATE TRIGGER CHARACTERISTICS TEST CIRCUITS



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Datasheets for electronics components.