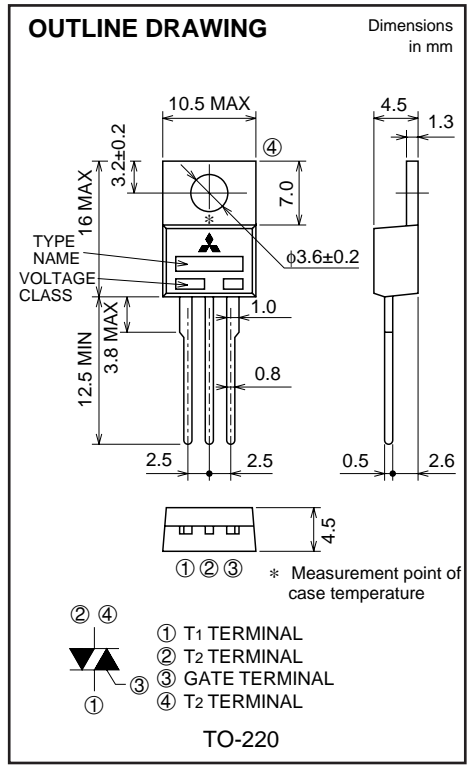


BCR12CM

MEDIUM POWER USE
NON-INSULATED TYPE, PLANAR PASSIVATION TYPE

BCR12CM

- I_T (RMS) **12A**
- V_{DRM} **400V/600V**
- $I_{FGT I}$, $I_{RG T I}$, $I_{RG T II}$ **30mA (20mA) *5**



APPLICATION

Contactless AC switches, light dimmer, electric flasher unit, control of household equipment such as TV sets · stereo · refrigerator · washing machine · infrared kotatsu · carpet · electric fan, solenoid drivers, small motor control, copying machine, electric tool, 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, $T_c=98^\circ\text{C}$ | 12 | A |
| I_{TSM} | Surge on-state current | 60Hz sinewave 1 full cycle, peak value, non-repetitive | 120 | A |
| I^2_t | I^2_t for fusing | Value corresponding to 1 cycle of half wave 60Hz, surge on-state current | 60 | A^2s |
| PGM | Peak gate power dissipation | | 5 | 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 | $^\circ\text{C}$ |
| T_{stg} | Storage temperature | | -40 ~ +125 | $^\circ\text{C}$ |
| — | Weight | Typical value | 2.0 | g |

*1. Gate open.

BCR12CM

MEDIUM POWER USE

NON-INSULATED TYPE, PLANAR PASSIVATION TYPE

ELECTRICAL CHARACTERISTICS

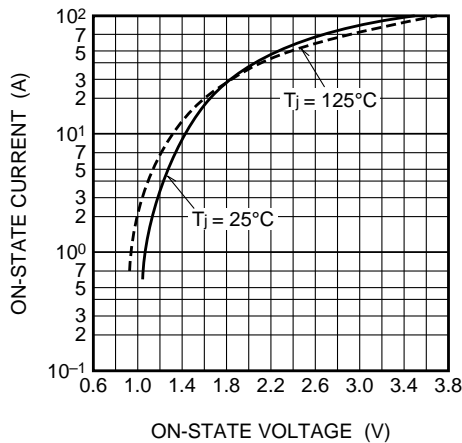
| Symbol | Parameter | Test conditions | Limits | | | Unit | |
|-----------------------|--|---|--------|------|------|------------------------|----|
| | | | Min. | Typ. | Max. | | |
| IDRM | Repetitive peak off-state current | $T_j=125^\circ\text{C}$, V_{DRM} applied | — | — | 2.0 | mA | |
| VTM | On-state voltage | $T_c=25^\circ\text{C}$, $I_{\text{TM}}=20\text{A}$, Instantaneous measurement | — | — | 1.6 | V | |
| VFGT I | Gate trigger voltage *2 | $T_j=25^\circ\text{C}$, $V_D=6\text{V}$, $R_L=6\Omega$, $R_G=330\Omega$ | I | — | — | 1.5 | V |
| VRGT I | | | II | — | — | 1.5 | V |
| VRGT III | | | III | — | — | 1.5 | V |
| IFGT I | Gate trigger current *2 | $T_j=25^\circ\text{C}$, $V_D=6\text{V}$, $R_L=6\Omega$, $R_G=330\Omega$ | I | — | — | 30*5 | mA |
| IRGT I | | | II | — | — | 30*5 | mA |
| IRGT III | | | III | — | — | 30*5 | mA |
| VGD | Gate non-trigger voltage | $T_j=125^\circ\text{C}$, $V_D=1/2V_{\text{DRM}}$ | 0.2 | — | — | V | |
| $R_{\text{th (j-c)}}$ | Thermal resistance | Junction to case *4 | — | — | 1.8 | $^\circ\text{C/W}$ | |
| $(dv/dt)_c$ | Critical-rate of rise of off-state commutating voltage | | *3 | — | — | $\text{V}/\mu\text{s}$ | |

*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 $R_{\text{th (c-f)}}$ in case of greasing is 1.0°C/W .
 *5. High sensitivity ($I_{\text{GT}}\leq 20\text{mA}$) is also available. (IGT item ①)

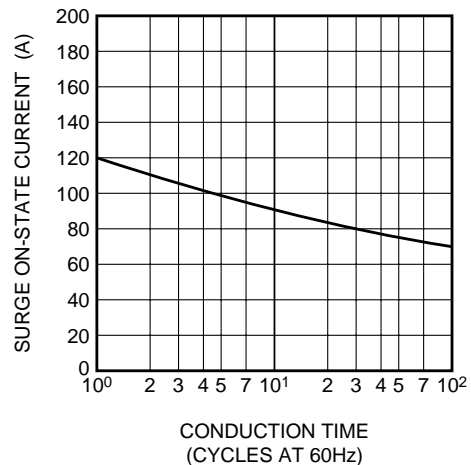
| Voltage class | V_{DRM} (V) | $(dv/dt)_c$ | | | Test conditions | Commutating voltage and current waveforms (inductive load) |
|---------------|----------------------|-------------|------|------------------------|--|--|
| | | Symbol | Min. | Unit | | |
| 8 | 400 | R | — | $\text{V}/\mu\text{s}$ | 1. Junction temperature $T_j=125^\circ\text{C}$ 2. Rate of decay of on-state commutating current $(di/dt)_c=-6\text{A/ms}$ 3. Peak off-state voltage $V_D=400\text{V}$ | |
| | | L | 10 | | | |
| 12 | 600 | R | — | | | |
| | | L | 10 | | | |

PERFORMANCE CURVES

MAXIMUM ON-STATE CHARACTERISTICS



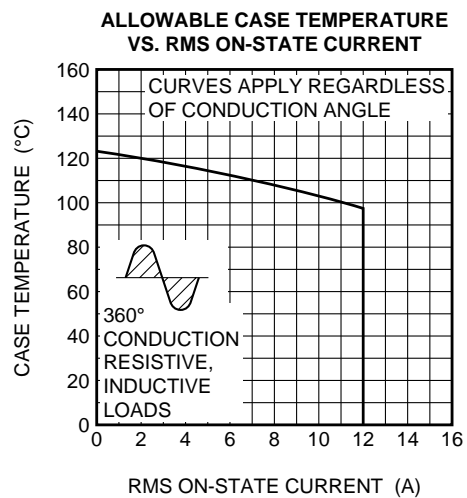
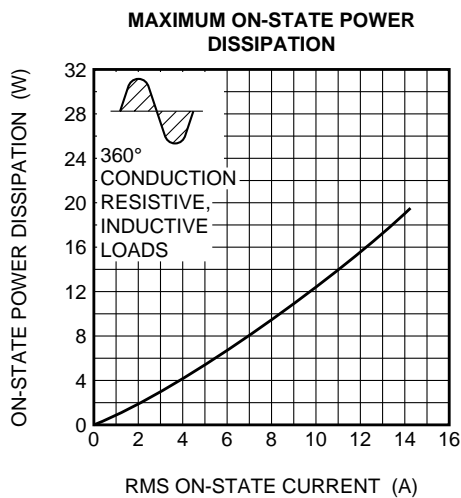
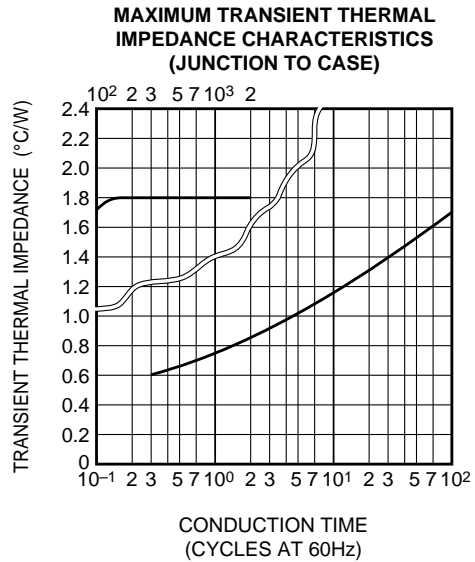
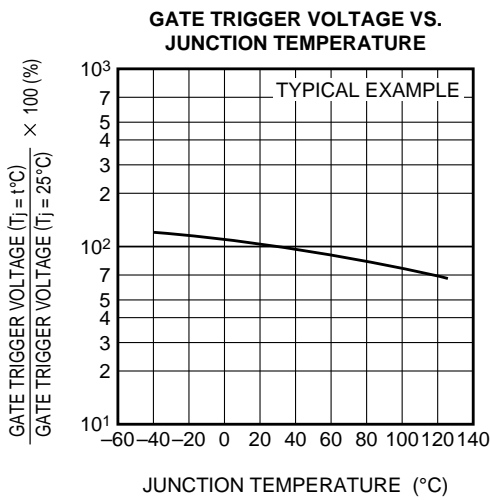
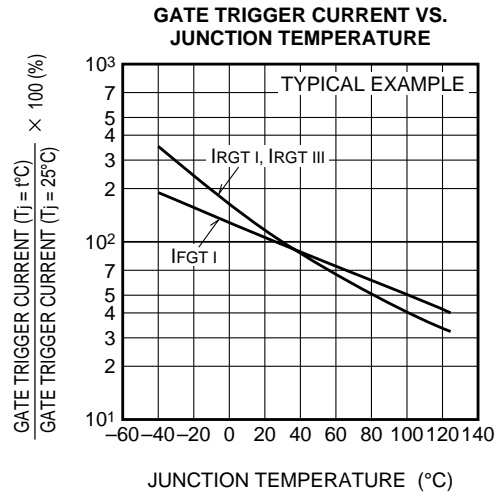
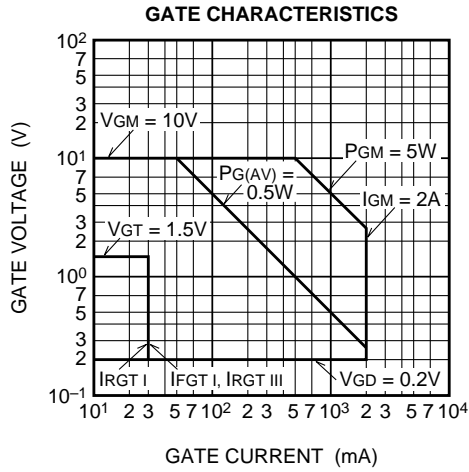
RATED SURGE ON-STATE CURRENT



BCR12CM

MEDIUM POWER USE

NON-INSULATED TYPE, PLANAR PASSIVATION TYPE

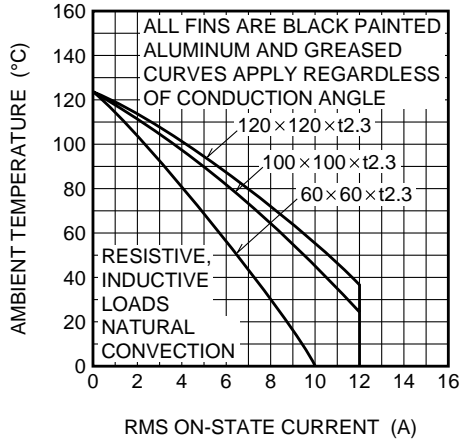


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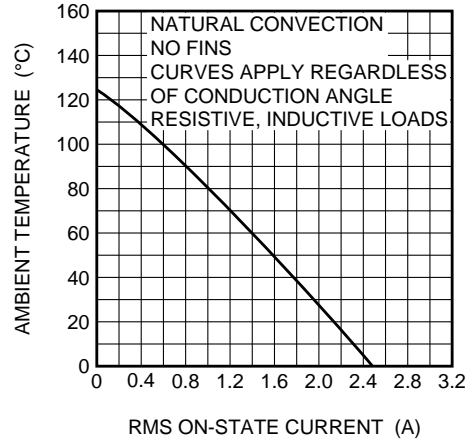
MEDIUM POWER USE

NON-INSULATED TYPE, PLANAR PASSIVATION TYPE

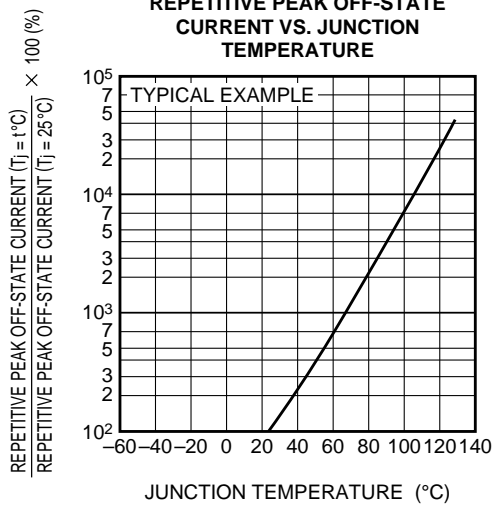
ALLOWABLE AMBIENT TEMPERATURE VS. RMS ON-STATE CURRENT



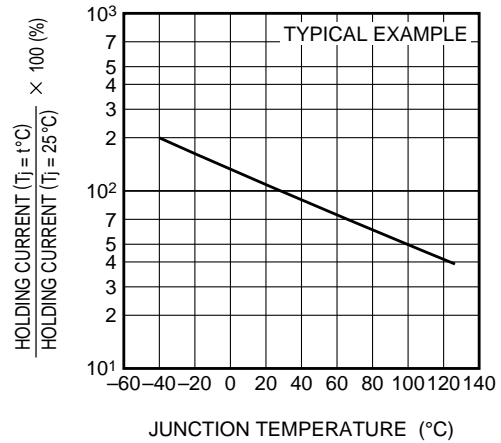
ALLOWABLE AMBIENT TEMPERATURE VS. RMS ON-STATE CURRENT



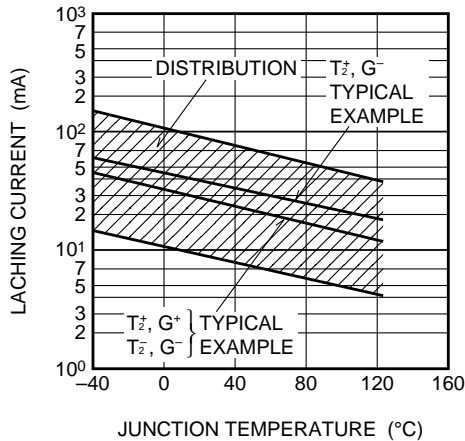
REPETITIVE PEAK OFF-STATE CURRENT VS. JUNCTION TEMPERATURE



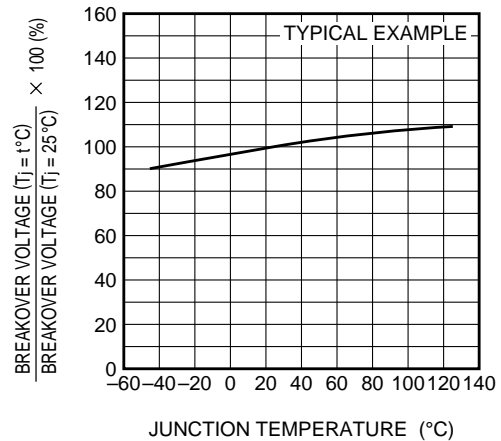
HOLDING CURRENT VS. JUNCTION TEMPERATURE



LATCHING CURRENT VS. JUNCTION TEMPERATURE



BREAKOVER VOLTAGE VS. JUNCTION TEMPERATURE

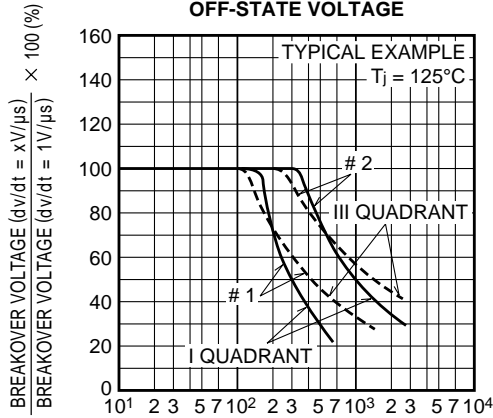


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MEDIUM POWER USE

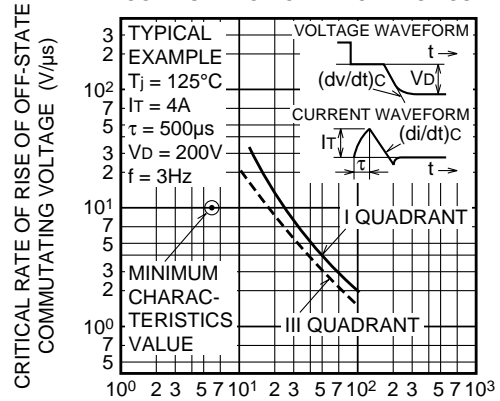
NON-INSULATED TYPE, PLANAR PASSIVATION TYPE

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



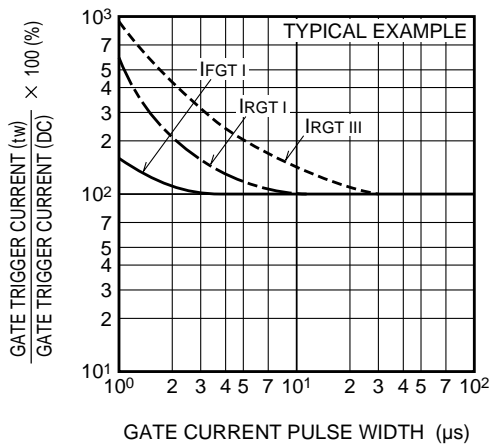
RATE OF RISE OF OFF-STATE VOLTAGE (V/μs)

COMMUTATION CHARACTERISTICS



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

GATE TRIGGER CURRENT VS. GATE CURRENT PULSE WIDTH



GATE CURRENT PULSE WIDTH (μs)

GATE TRIGGER CHARACTERISTICS TEST CIRCUITS

