

BCR16A, BCR16B, BCR16C, BCR16E

MEDIUM POWER USE

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

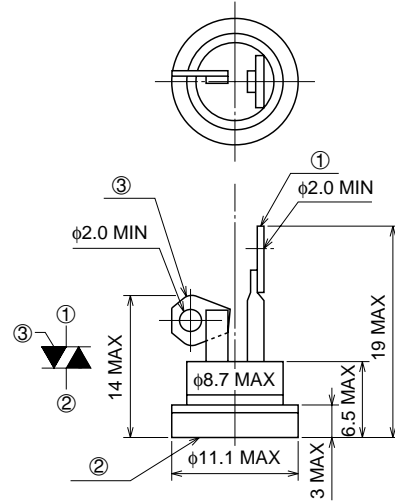
BCR16A, BCR16B, BCR16C, BCR16E



- **IT (RMS)** **16A**
- **VDRM** **400V/500V**
- **IFGT I , IRGT I , IRGT III** **30mA**

OUTLINE DRAWING

Dimensions
in mm



BCR16A

APPLICATION

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

MAXIMUM RATINGS

| Symbol | Parameter | Voltage class | | Unit |
|--------|--|---------------|-----|------|
| | | 8 | 10 | |
| VDRM | Repetitive peak off-state voltage *1 | 400 | 500 | V |
| VDSM | Non-repetitive peak off-state voltage *1 | 600 | 700 | V |

| Symbol | Parameter | Conditions | | Ratings | Unit |
|-----------------------------|--|--|---------|------------|------------------|
| | | BCR16A, B, C | BCR16E | | |
| IT (RMS) | RMS on-state current | Commercial frequency, sine full wave, 360° conduction | Tc=99°C | 16 | A |
| | | | Tb=71°C | | |
| ITSM | Surge on-state current | 60Hz sinewave 1 full cycle, peak value, non-repetitive | | 170 | A |
| i ² _t | i ² _t for fusing | Value corresponding to 1 cycle of half wave 60Hz, surge on-state current | | 121 | A ² s |
| 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 |
| Tj | Junction temperature | | | -20 ~ +125 | °C |

*1. Gate open.

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MAXIMUM RATINGS (continue)

| Symbol | Parameter | Test conditions | Ratings | Unit |
|------------------|------------------------|---|------------|-------|
| T _{stg} | Storage temperature | | -20 ~ +125 | °C |
| — | Weight (Typical value) | BCR16A | 3.0 | g |
| | | BCR16B | 8.5 | |
| | | BCR16C | 8.5 | |
| | | BCR16E | 9.5 | |
| — | Soldering temperature | BCR16A only, 10 sec. | 230 | °C |
| — | Mounting torque | BCR16C only (Typical value) | 30 | kg-cm |
| | | | 2.94 | N-m |
| V _{iso} | Isolated voltage | BCR16E only, T _a =25°C, AC 1 minute, T ₂ Terminal to base | 1500 | V |

ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Test conditions | Limits | | | Unit | |
|-----------------------|--|---|--------|------|------|------|----|
| | | | Min. | Typ. | Max. | | |
| I _{DRM} | Repetitive peak off-state current | T _j =125°C, V _{DRM} applied | — | — | 3.0 | mA | |
| V _{TM} | On-state voltage | T _c =25°C, T _b =25°C (BCR16E only), I _{TM} =25A, Instantaneous measurement | — | — | 1.6 | V | |
| V _{FGT I} | Gate trigger voltage *2 | T _j =25°C, V _D =6V, R _L =6Ω, R _G =330Ω | I | — | — | 1.5 | V |
| V _{RGT I} | | | II | — | — | 1.5 | V |
| V _{RGT III} | | | III | — | — | 1.5 | V |
| I _{FGT I} | Gate trigger current *2 | T _j =25°C, V _D =6V, R _L =6Ω, R _G =330Ω | I | — | — | 30 | mA |
| I _{RGT I} | | | II | — | — | 30 | mA |
| I _{RGT III} | | | III | — | — | 30 | mA |
| V _{GD} | 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 (BCR16A, BCR16B, BCR16C) | — | — | 1.2 | °C/W | |
| R _{th (j-b)} | | Junction to base (BCR16E) | — | — | 2.5 | °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.

| 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 (di/dt) _c =-8A/ms 3. Peak off-state voltage V _D =400V | |
| | | L | 10 | | | |
| 10 | 500 | R | — | | | |
| | | L | 10 | | | |

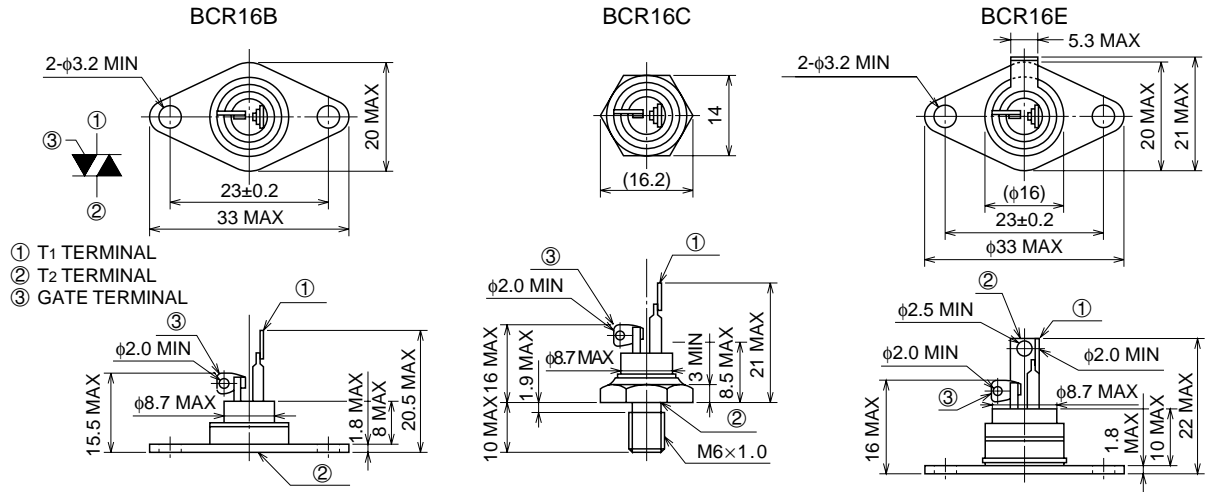
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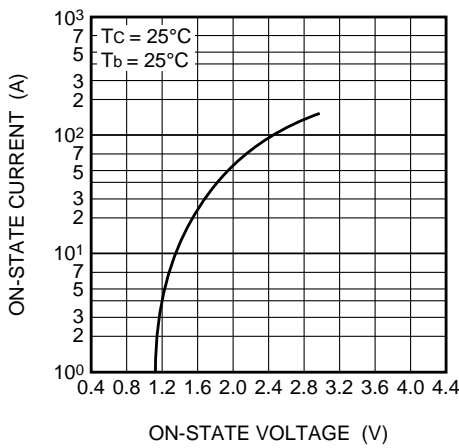
OUTLINE DRAWING

Dimensions in mm

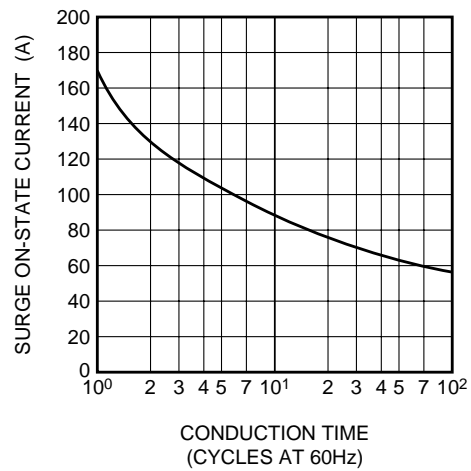


PERFORMANCE CURVES

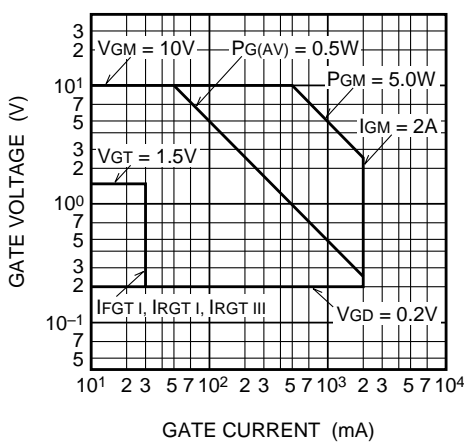
MAXIMUM ON-STATE CHARACTERISTICS



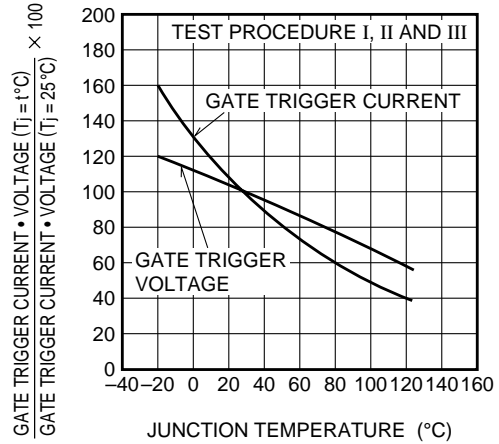
RATED SURGE ON-STATE CURRENT



GATE CHARACTERISTICS



GATE TRIGGER CURRENT-VOLTAGE VS. JUNCTION TEMPERATURE

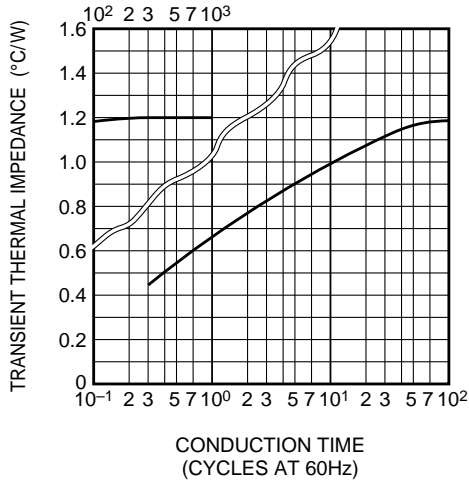


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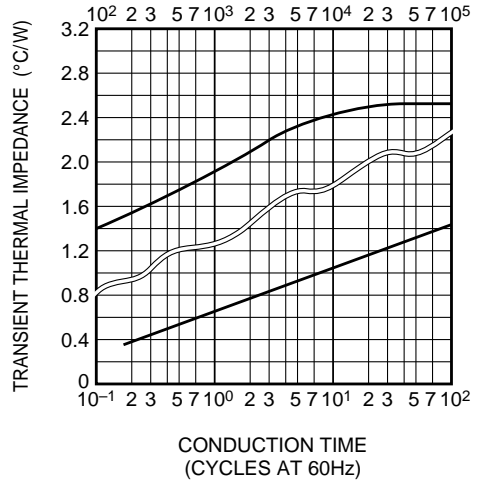
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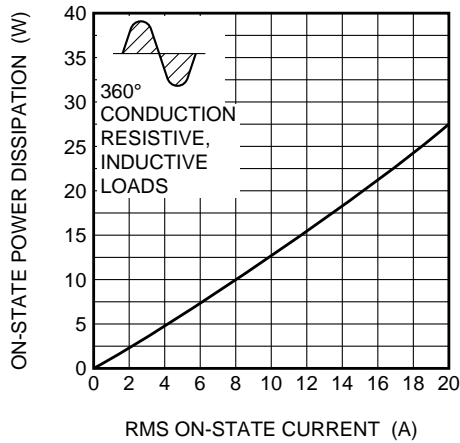
MAXIMUM TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE) (BCR16A, B, C)



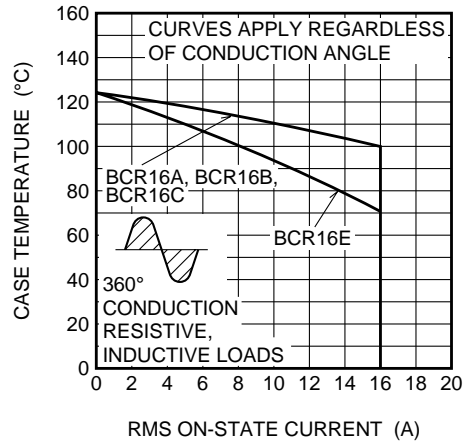
MAXIMUM TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO BASE) (BCR16E)



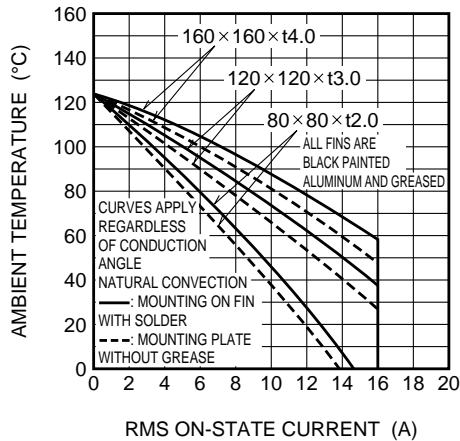
MAXIMUM ON-STATE POWER DISSIPATION



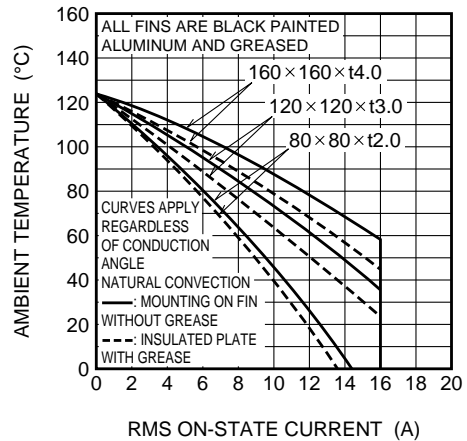
ALLOWABLE CASE TEMPERATURE VS. RMS ON-STATE CURRENT



ALLOWABLE AMBIENT TEMPERATURE VS. RMS ON-STATE CURRENT (BCR16A)



ALLOWABLE AMBIENT TEMPERATURE VS. RMS ON-STATE CURRENT (BCR16B)

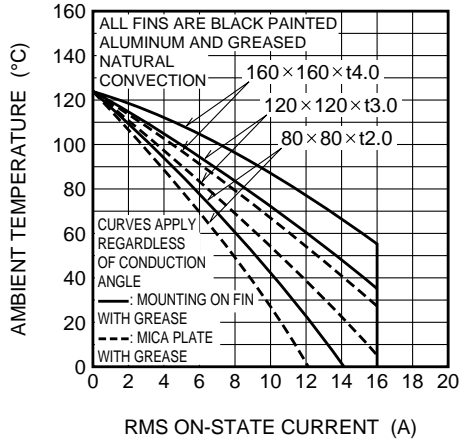


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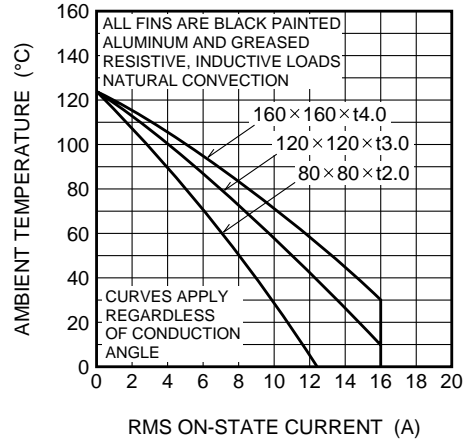
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ALLOWABLE AMBIENT TEMPERATURE VS. RMS ON-STATE CURRENT (BCR16C)



ALLOWABLE AMBIENT TEMPERATURE VS. RMS ON-STATE CURRENT (BCR16E)



GATE TRIGGER CHARACTERISTICS TEST CIRCUITS

