



# BCR8PM-20L

Triac

Medium Power Use

REJ03G0311-0100

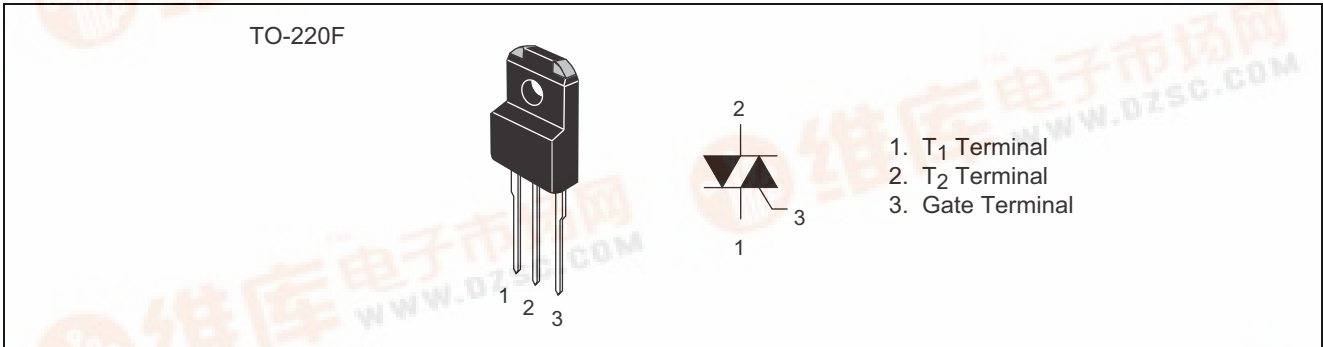
Rev.1.00

Aug.20.2004

## Features

- $I_T(RMS)$  : 8 A
- $V_{DRM}$  : 1000 V
- $I_{FGTII}$ ,  $I_{RGTII}$ ,  $I_{RGTIII}$  : 30 mA
- $V_{ISO}$  : 2000 V
- Insulated Type
- Planar Passivation Type
- UL Recognized : Yellow Card No. E223904  
File No. E80271

## Outline



## Applications

Washing machine, inversion operation of capacitor motor, and other general controlling devices

## Maximum Ratings

| Parameter  | Symbol    | Voltage class | Unit |
|--|-----------|---------------|------|
|  |           | 20            |      |
| Repetitive peak off-state voltage <sup>Note1</sup>     | $V_{DRM}$ | 1000          | V    |
| Non-repetitive peak off-state voltage <sup>Note1</sup> | $V_{DSM}$ | 1200          | V    |

## BCR8PM-20L

| Parameter                      | Symbol       | Ratings      | Unit                 | Conditions   |
|--------------------------------|--------------|--------------|----------------------|--|
| RMS on-state current           | $I_{T(RMS)}$ | 8            | A                    | Commercial frequency, sine full wave 360° conduction, $T_c = 88^\circ\text{C}$   |
| Surge on-state current         | $I_{TSM}$    | 80           | A                    | 60Hz sinewave 1 full cycle, peak value, non-repetitive                           |
| $I^2t$ for fusing              | $I^2t$       | 26           | $\text{A}^2\text{s}$ | Value corresponding to 1 cycle of half wave 60Hz, surge on-state current         |
| Peak gate power dissipation    | $P_{GM}$     | 5            | W                    |  |
| Average gate power dissipation | $P_{G(AV)}$  | 0.5          | W                    |  |
| Peak gate voltage              | $V_{GM}$     | 10           | V                    |  |
| Peak gate current              | $I_{GM}$     | 2            | A                    |  |
| Junction temperature           | $T_j$        | - 40 to +125 | $^\circ\text{C}$     |  |
| Storage temperature            | $T_{stg}$    | - 40 to +125 | $^\circ\text{C}$     |  |
| Mass                           | —            | 2.0          | g                    | Typical value  |
| Isolation voltage              | $V_{iso}$    | 2000         | V                    | $T_a = 25^\circ\text{C}$ , AC 1 minute, $T_1 \cdot T_2 \cdot G$ terminal to case |

Notes: 1. Gate open.

## Electrical Characteristics

| Parameter   | Symbol        | Min.         | Typ. | Max. | Unit                      | Test conditions   |   |
|---|---------------|--------------|------|------|---------------------------|---|---|
| Repetitive peak off-state current                                       | $I_{DRM}$     | —            | —    | 2.0  | mA                        | $T_j = 125^\circ\text{C}$ , $V_{DRM}$ applied                                 |   |
| On-state voltage  | $V_{TM}$      | —            | —    | 1.6  | V                         | $T_c = 25^\circ\text{C}$ , $I_{TM} = 12\text{ A}$ , Instantaneous measurement |   |
| Gate trigger voltage <sup>Note2</sup>                                   | I             | $V_{FGTI}$   | —    | —    | 1.5                       | V   | $T_j = 25^\circ\text{C}$ , $V_D = 6\text{ V}$ , $R_L = 6\ \Omega$ , $R_G = 330\ \Omega$ |
|   | II            | $V_{RGTI}$   | —    | —    | 1.5                       | V   |   |
|   | III           | $V_{RGTIII}$ | —    | —    | 1.5                       | V   |   |
| Gate trigger current <sup>Note2</sup>                                   | I             | $I_{FGTI}$   | —    | —    | 30                        | mA  | $T_j = 25^\circ\text{C}$ , $V_D = 6\text{ V}$ , $R_L = 6\ \Omega$ , $R_G = 330\ \Omega$ |
|   | II            | $I_{RGTI}$   | —    | —    | 30                        | mA  |   |
|   | III           | $I_{RGTIII}$ | —    | —    | 30                        | mA  |   |
| Gate non-trigger voltage  | $V_{GD}$      | 0.2          | —    | —    | V                         | $T_j = 125^\circ\text{C}$ , $V_D = 1/2 V_{DRM}$                               |   |
| Thermal resistance  | $R_{th(j-c)}$ | —            | —    | 3.7  | $^\circ\text{C}/\text{W}$ | Junction to case <sup>Note3</sup>   |   |
| Critical-rate of rise of off-state commutating voltage <sup>Note4</sup> | $(dv/dt)_c$   | 10           | —    | —    | $\text{V}/\mu\text{s}$    | $T_j = 125^\circ\text{C}$   |   |

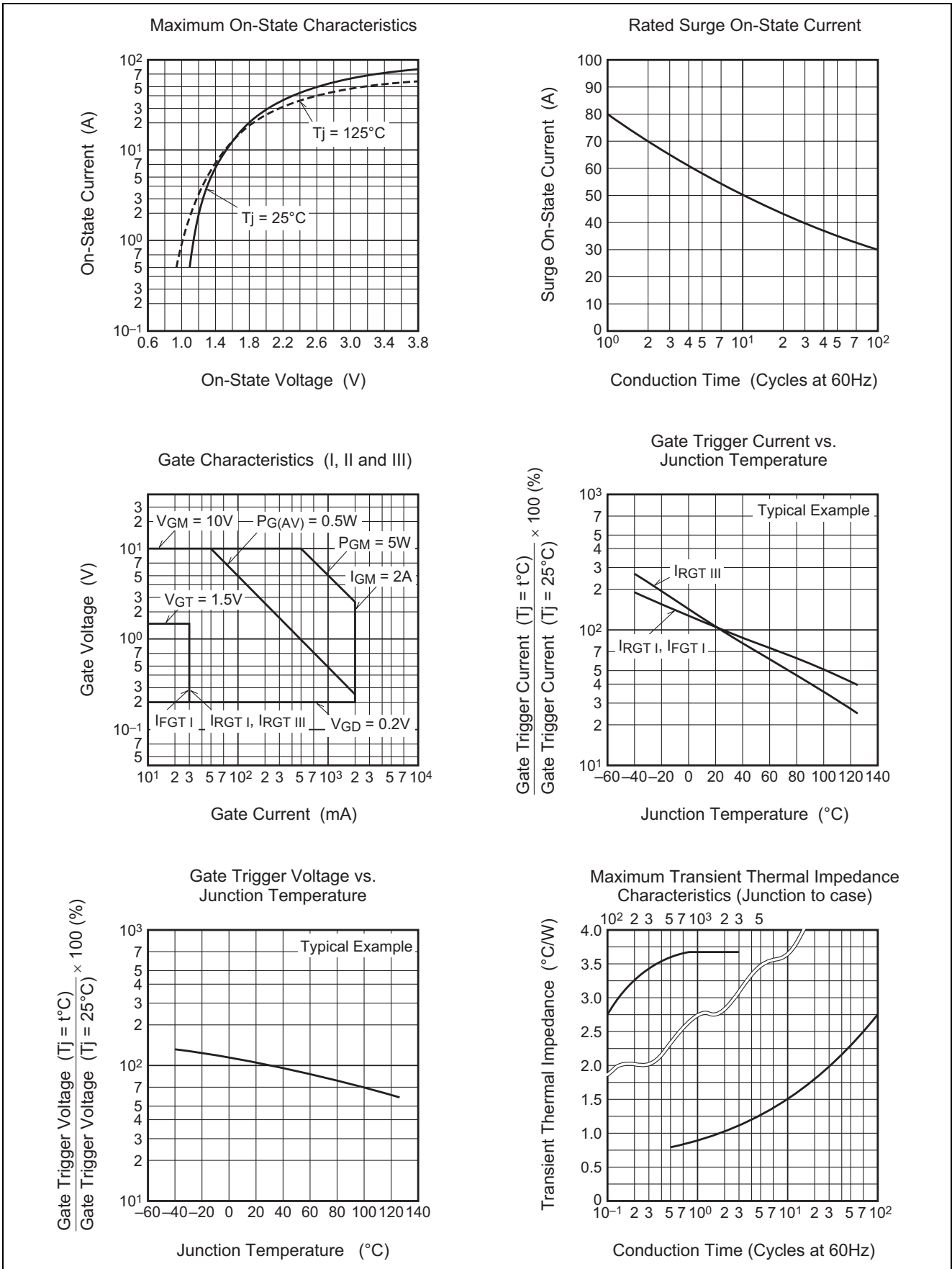
Notes: 2. Measurement using the gate trigger characteristics measurement circuit.

3. The contact thermal resistance  $R_{th(c-f)}$  in case of greasing is  $0.5^\circ\text{C}/\text{W}$ .

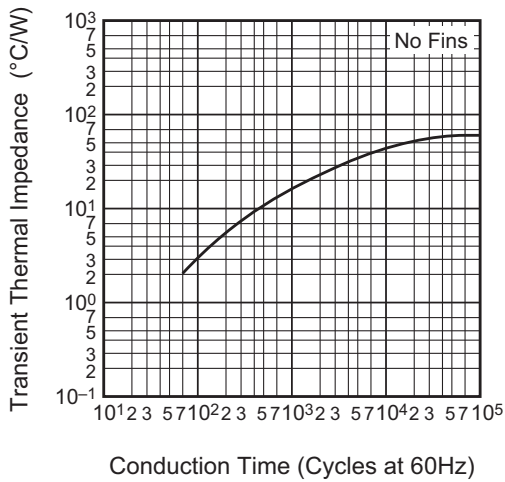
4. Test conditions of the critical-rate of rise of off-state commutating voltage is shown in the table below.

| Test conditions   | Commutating voltage and current waveforms (inductive load) |
|---|--|
| 1. Junction temperature<br>$T_j = 125^\circ\text{C}$<br>2. Rate of decay of on-state commutating current<br>$(di/dt)_c = -4.0\text{ A/ms}$<br>3. Peak off-state voltage<br>$V_D = 400\text{ V}$ |  |

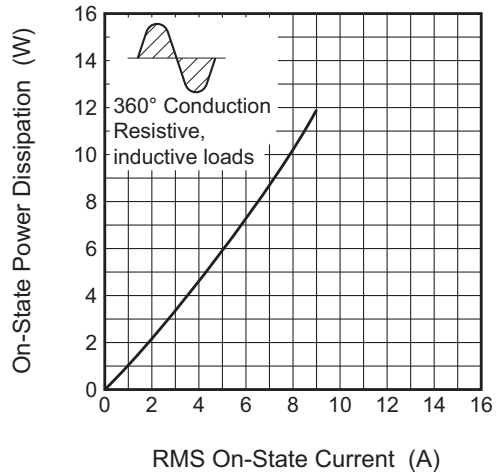
Performance Curves



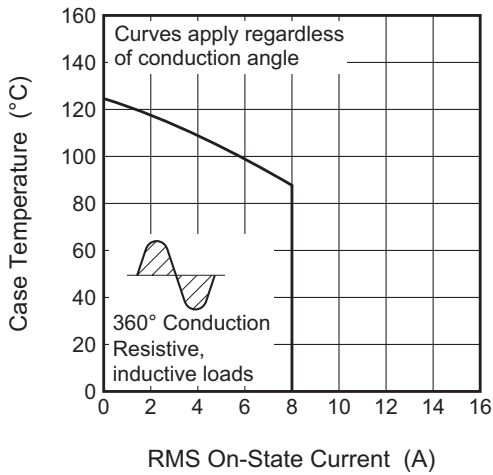
Maximum Transient Thermal Impedance Characteristics (Junction to ambient)



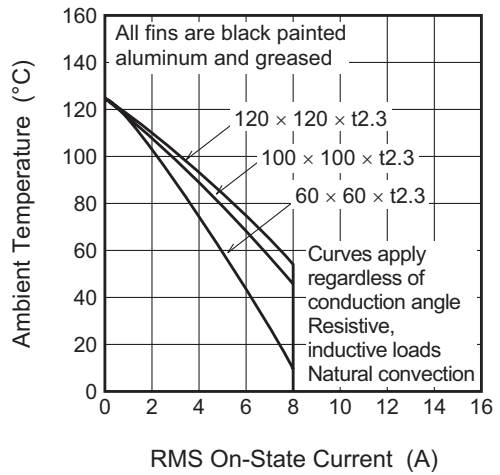
Maximum On-State Power Dissipation



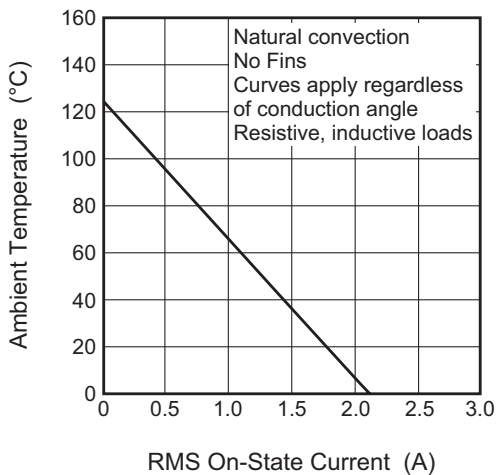
Allowable Case Temperature vs. RMS On-State Current



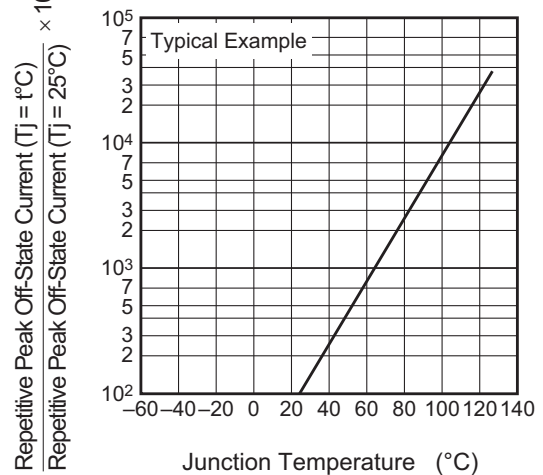
Allowable Ambient Temperature vs. RMS On-State Current



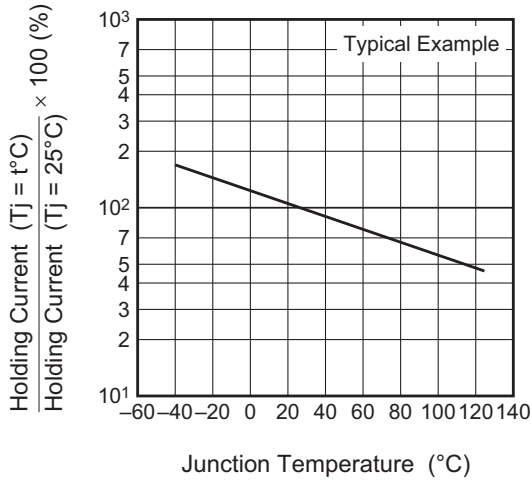
Allowable Ambient Temperature vs. RMS On-State Current



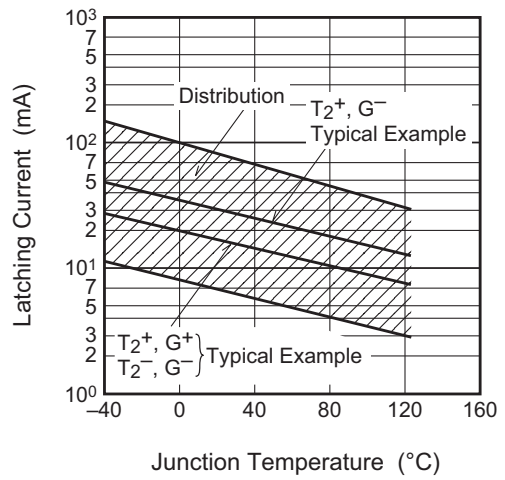
Repetitive Peak Off-State Current vs. Junction Temperature



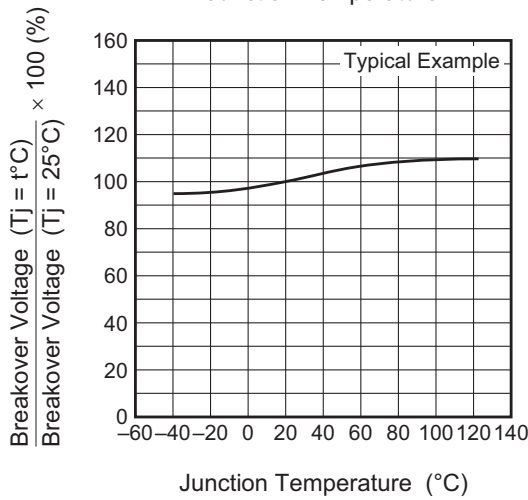
Holding Current vs. Junction Temperature



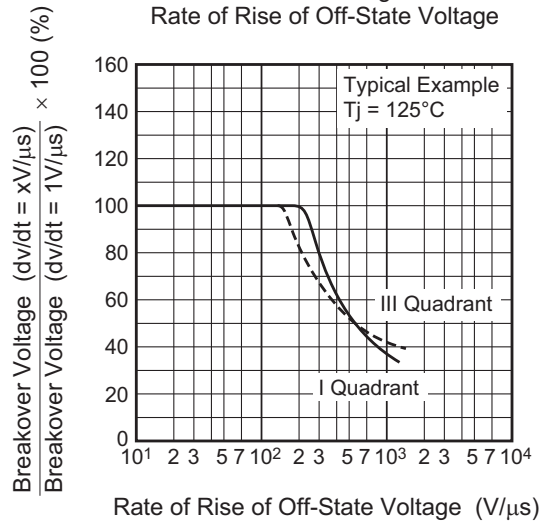
Latching Current vs. Junction Temperature



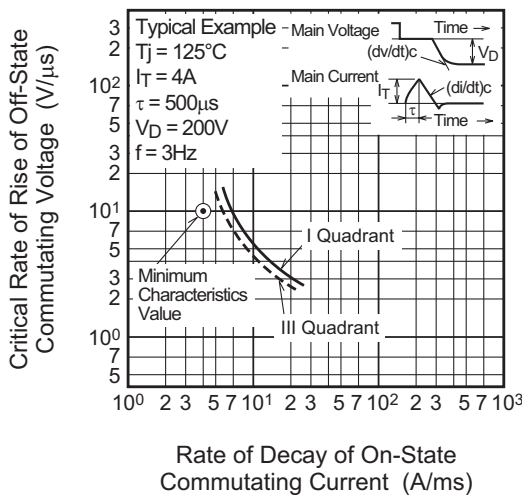
Breakover Voltage vs. Junction Temperature



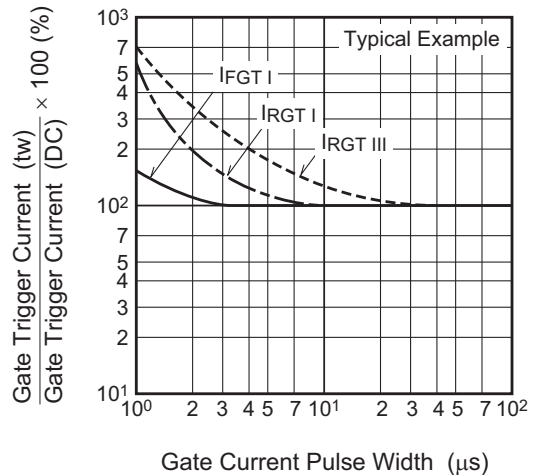
Breakover Voltage vs. Rate of Rise of Off-State Voltage



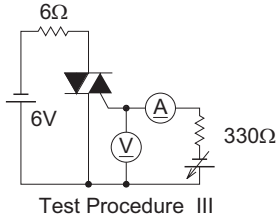
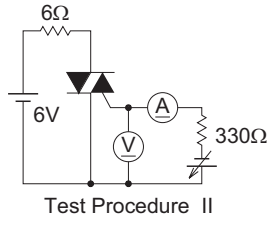
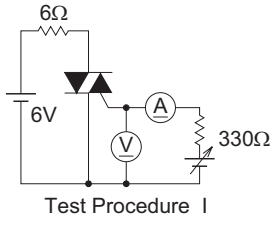
Commutation Characteristics



Gate Trigger Current vs. Gate Current Pulse Width



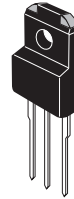
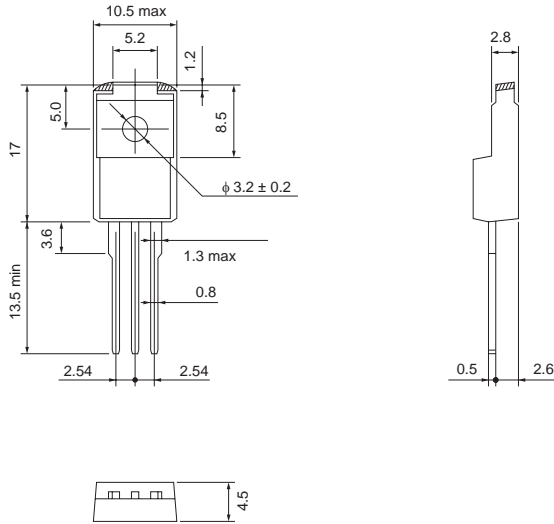
Gate Trigger Characteristics Test Circuits



Package Dimensions

TO-220F

| EIAJ Package Code | JEDEC Code | Mass (g) (reference value) | Lead Material |
|-------------------|------------|----------------------------|---------------|
| Conforms          | —          | 2.0                        | Cu alloy      |



| Symbol         | Dimension in Millimeters |     |     |
|----------------|--------------------------|-----|-----|
|                | Min                      | Typ | Max |
| A              | —                        | —   | —   |
| A <sub>1</sub> | —                        | —   | —   |
| A <sub>2</sub> | —                        | —   | —   |
| b              | —                        | —   | —   |
| D              | —                        | —   | —   |
| E              | —                        | —   | —   |
| e              | —                        | —   | —   |
| x              | —                        | —   | —   |
| y              | —                        | —   | —   |
| y <sub>1</sub> | —                        | —   | —   |
| ZD             | —                        | —   | —   |
| ZE             | —                        | —   | —   |

Note 1) The dimensional figures indicate representative values unless otherwise the tolerance is specified.

Order Code

| Lead form     | Standard packing        | Quantity | Standard order code              | Standard order code example |
|---------------|-------------------------|----------|----------------------------------|-----------------------------|
| Straight type | Vinyl sack              | 100      | Type name +A                     | BCR8PM-20LA                 |
| Lead form     | Plastic Magazine (Tube) | 50       | Type name +A – Lead forming code | BCR8PM-20LA-A8              |

Note : Please confirm the specification about the shipping in detail.

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