

# BCR20CM-16LB

800V - 20A - Triac

Medium Power Use

R07DS0673EJ0200

Rev.2.00

Feb 25, 2013

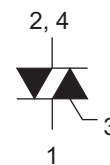
## Features

- $I_{T(RMS)}$  : 20 A
- $V_{DRM}$  : 800 V
- $I_{FGT}$ ,  $I_{RGT}$ ,  $I_{RGT III}$  : 30 mA
- The Product guaranteed maximum junction temperature 150°C
- Non-Insulated Type
- Planar Type

## Outline

RENESAS Package code: PRSS0004AG-A  
(Package name: TO-220AB)

RENESAS Package code: PRSS0004AA-A  
(Package name: TO-220)



1. T<sub>1</sub> Terminal
2. T<sub>2</sub> Terminal
3. Gate Terminal
4. T<sub>2</sub> Terminal

## Applications

Switching mode power supply, washing machine, motor control, heater control, and other general purpose control applications

## Maximum Ratings

| Parameter  | Symbol    | Voltage class |      |
|--|-----------|---------------|------|
|  |           | 16            | Unit |
| Repetitive peak off-state voltage <sup>Note1</sup>     | $V_{DRM}$ | 800           | V    |
| Non-repetitive peak off-state voltage <sup>Note1</sup> | $V_{DSM}$ | 960           | V    |

| Parameter                      | Symbol       | Ratings     | Unit             | Conditions   |
|--------------------------------|--------------|-------------|------------------|--|
| RMS on-state current           | $I_{T(RMS)}$ | 20          | A                | Commercial frequency, sine full wave 360° conduction, $T_c = 116^{\circ}\text{C}$ <sup>Note3</sup> |
| Surge on-state current         | $I_{TSM}$    | 200         | A                | 60 Hz sinewave 1 full cycle, peak value, non-repetitive  |
| $I^2t$ for fusion              | $I^2t$       | 167         | A <sup>2</sup> s | Value corresponding to 1 cycle of half wave 60 Hz, 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 +150 | °C               |  |
| Storage temperature            | $T_{stg}$    | -40 to +150 | °C               |  |
| Mass                           | —            | 2.1         | g                | Typical value  |

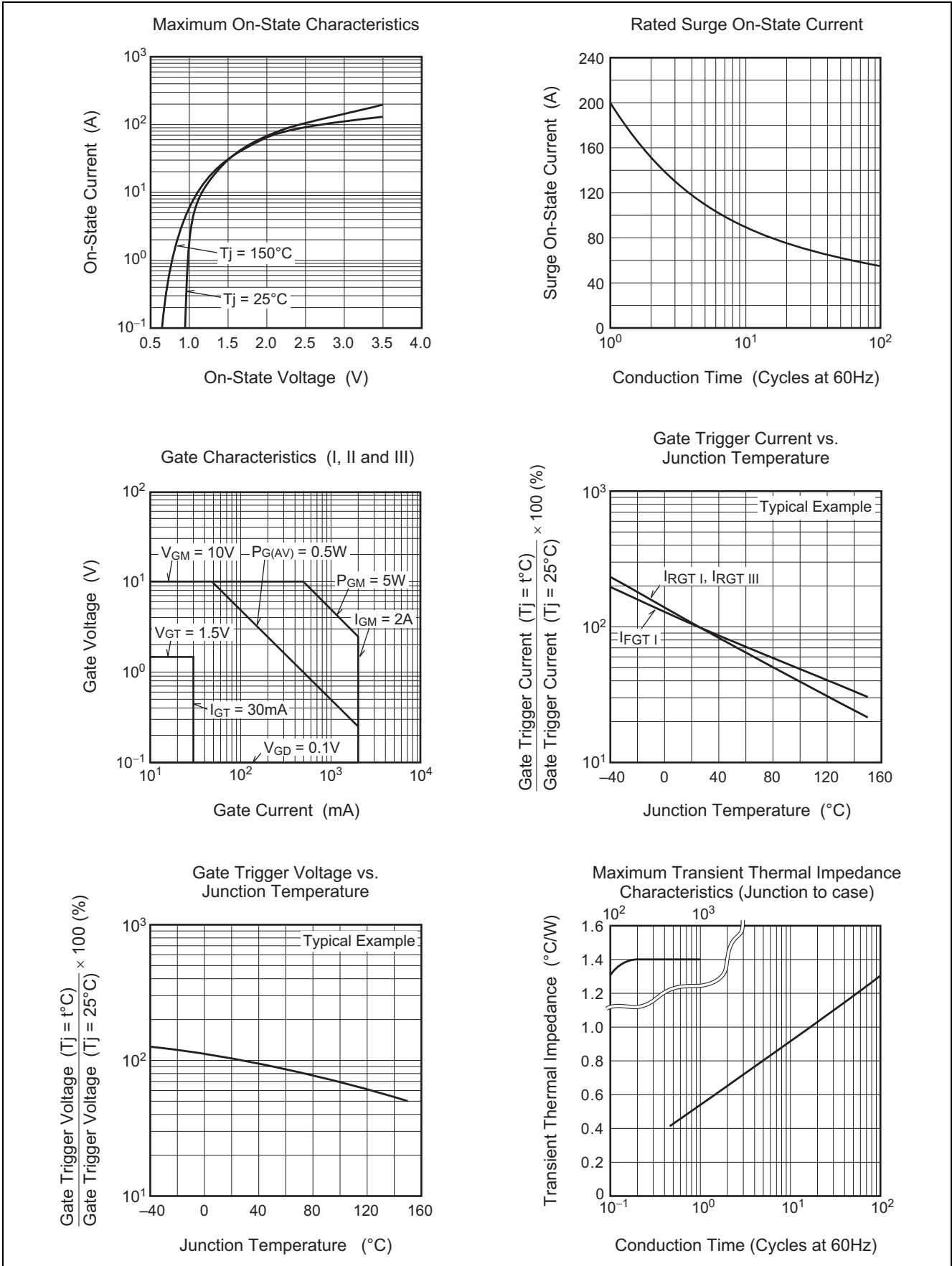
## Electrical Characteristics

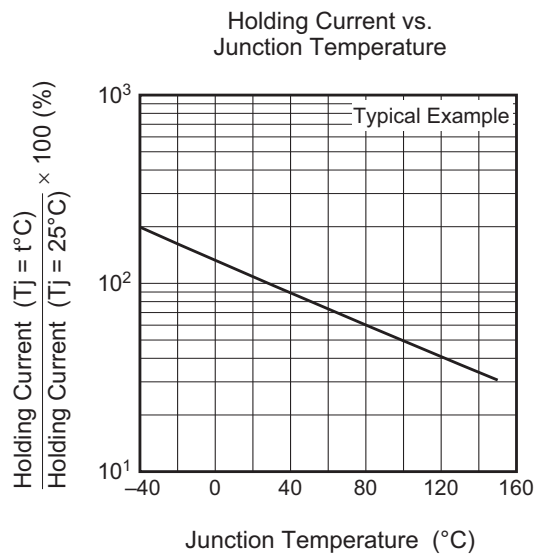
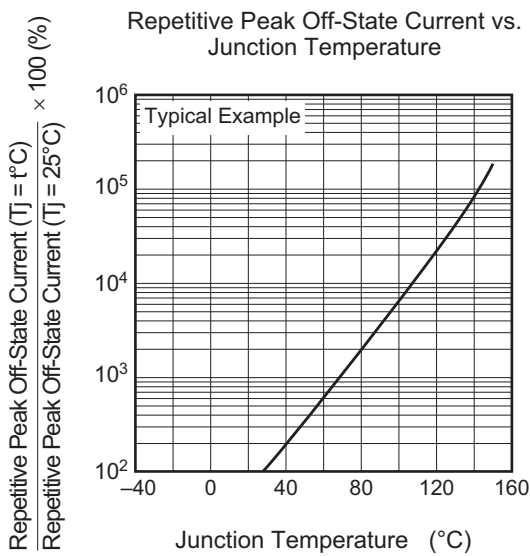
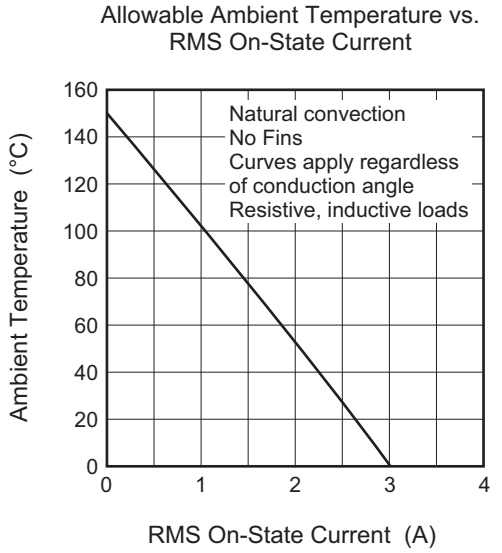
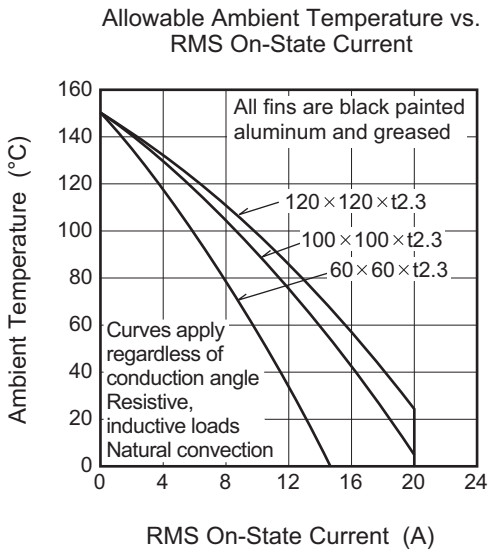
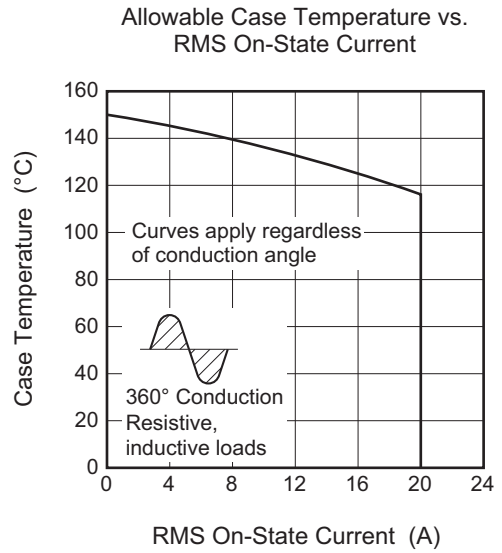
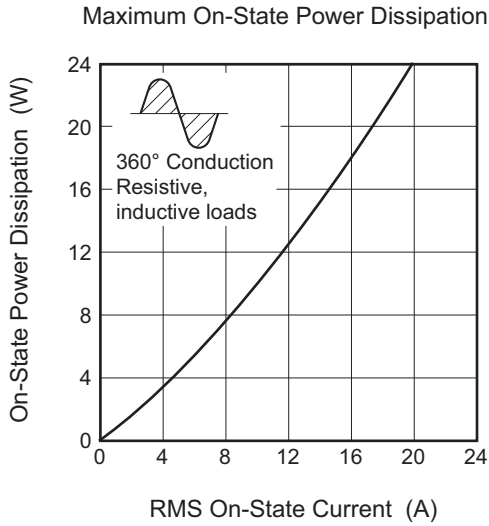
| Parameter   | Symbol        | Min.         | Typ. | Max. | Unit               | Test conditions   |    |
|---|---------------|--------------|------|------|--------------------|---|----|
| Repetitive peak off-state current                                       | $I_{DRM}$     | —            | —    | 2.0  | mA                 | $T_j = 125^\circ\text{C}$ , $V_{DRM}$ applied   |    |
|   |               | —            | —    | 5.0  | mA                 | $T_j = 150^\circ\text{C}$ , $V_{DRM}$ applied   |    |
| On-state voltage  | $V_{TM}$      | —            | —    | 1.5  | V                  | $T_c = 25^\circ\text{C}$ , $I_{TM} = 30\text{ A}$ , instantaneous measurement           |    |
| Gate trigger voltage <sup>Note2</sup>                                   | I             | $V_{FGTI}$   | —    | —    | 1.5                | $T_j = 25^\circ\text{C}$ , $V_D = 6\text{ V}$ , $R_L = 6\ \Omega$ , $R_G = 330\ \Omega$ |    |
|   | II            | $V_{RGTI}$   | —    | —    | 1.5                |   | V  |
|   | III           | $V_{RGTIII}$ | —    | —    | 1.5                |   | V  |
| Gate trigger current <sup>Note2</sup>                                   | I             | $I_{FGTI}$   | —    | —    | 30                 | $T_j = 25^\circ\text{C}$ , $V_D = 6\text{ V}$ , $R_L = 6\ \Omega$ , $R_G = 330\ \Omega$ |    |
|   | II            | $I_{RGTI}$   | —    | —    | 30                 |   | mA |
|   | III           | $I_{RGTIII}$ | —    | —    | 30                 |   | mA |
| Gate non-trigger voltage  | $V_{GD}$      | 0.2          | —    | —    | V                  | $T_j = 125^\circ\text{C}$ , $V_D = 1/2 V_{DRM}$   |    |
|   |               | 0.1          | —    | —    | V                  | $T_j = 150^\circ\text{C}$ , $V_D = 1/2 V_{DRM}$   |    |
| Thermal resistance  | $R_{th(j-c)}$ | —            | —    | 1.4  | $^\circ\text{C/W}$ | Junction to case <sup>Note3,4</sup>   |    |
| Critical-rate of rise of off-state commutation voltage <sup>Note5</sup> | $(dv/dt)_c$   | 10           | —    | —    | V/ $\mu\text{s}$   | $T_j = 125^\circ\text{C}$   |    |
|   |               | 1            | —    | —    | V/ $\mu\text{s}$   | $T_j = 150^\circ\text{C}$   |    |

- Notes: 1. Gate open.  
 2. Measurement using the gate trigger characteristics measurement circuit.  
 3. Case temperature is measured at the  $T_2$  tab 1.5 mm apart from the molded case.  
 4. The contact thermal resistance  $R_{th(c-f)}$  in case of greasing is  $1.0^\circ\text{C/W}$ .  
 5. Test conditions of the critical-rate of rise of off-state commutation voltage is shown in the table below.

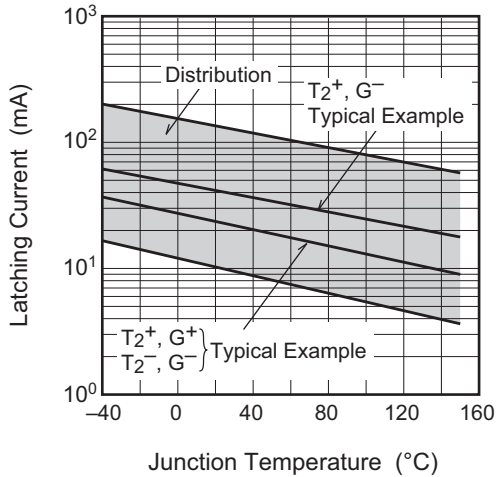
| Test conditions  | Commutating voltage and current waveforms (inductive load) |
|--|--|
| 1. Junction temperature<br>$T_j = 125^\circ\text{C}/150^\circ\text{C}$<br>2. Rate of decay of on-state commutating current<br>$(di/dt)_c = -10\text{ A/ms}$<br>3. Peak off-state voltage<br>$V_D = 400\text{ V}$ |  |

Performance Curves

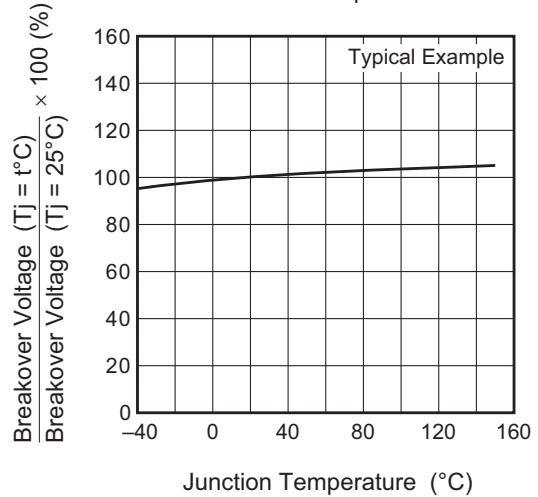




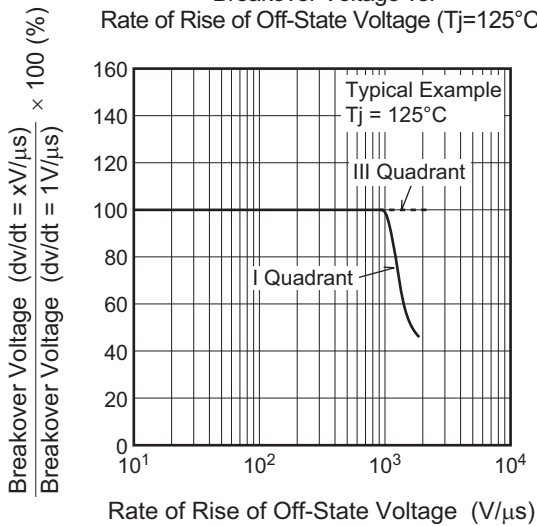
Latching Current vs. Junction Temperature



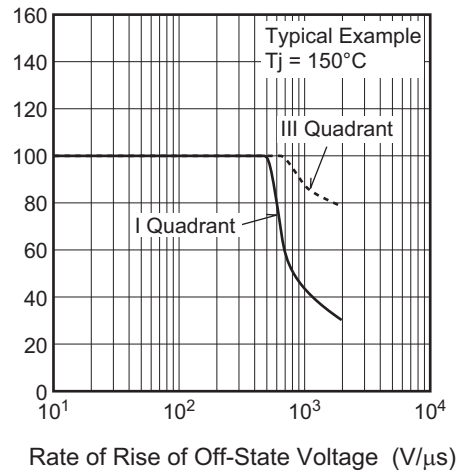
Breakover Voltage vs. Junction Temperature



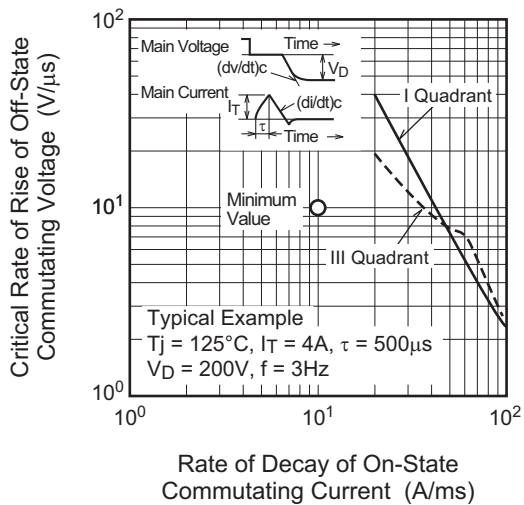
Breakover Voltage vs. Rate of Rise of Off-State Voltage (Tj=125°C)



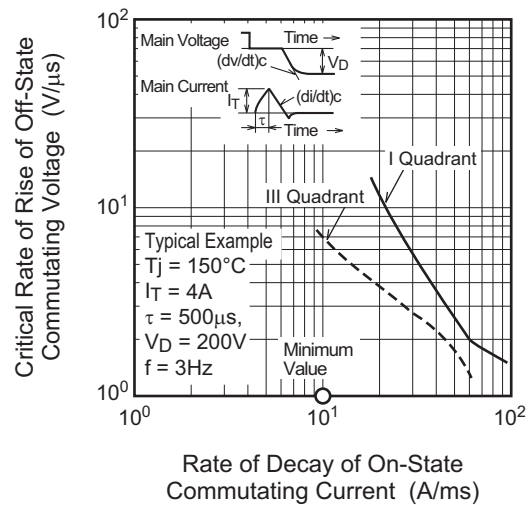
Breakover Voltage vs. Rate of Rise of Off-State Voltage (Tj=150°C)



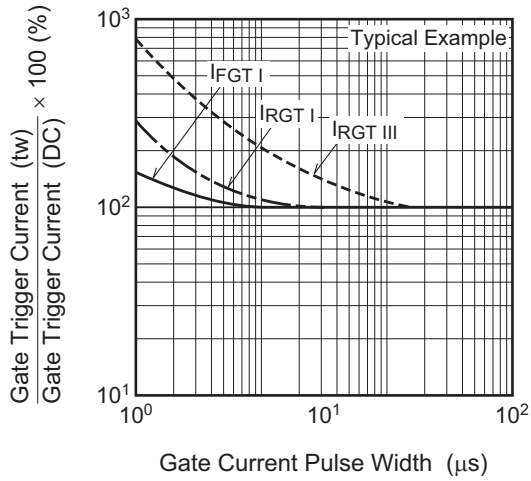
Commutation Characteristics (Tj=125°C)



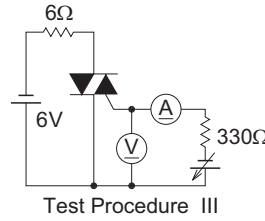
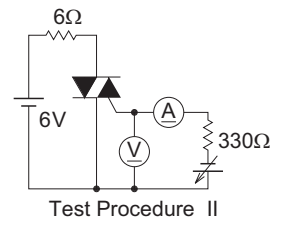
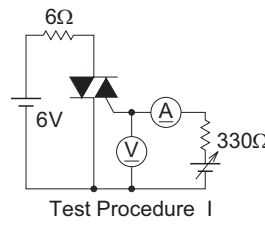
Commutation Characteristics (Tj=150°C)



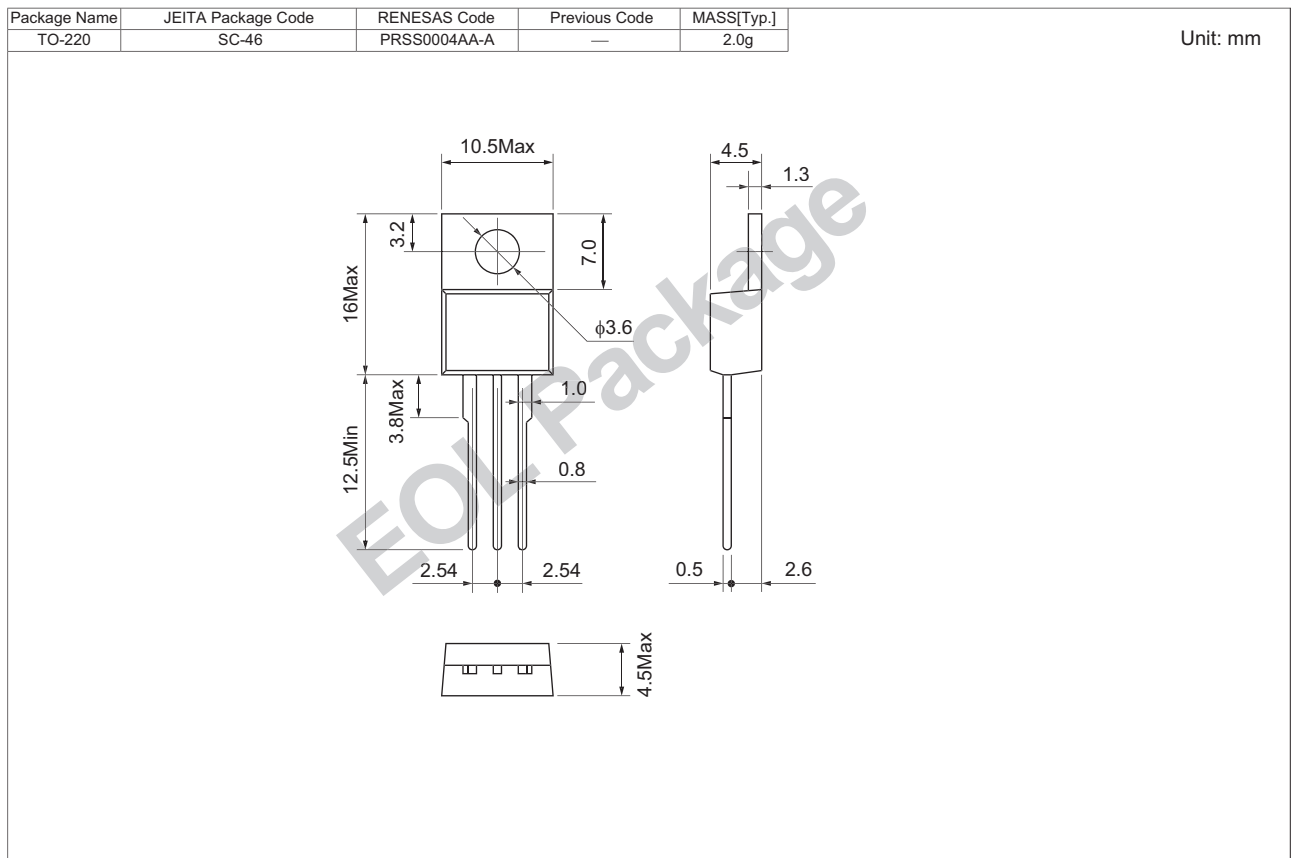
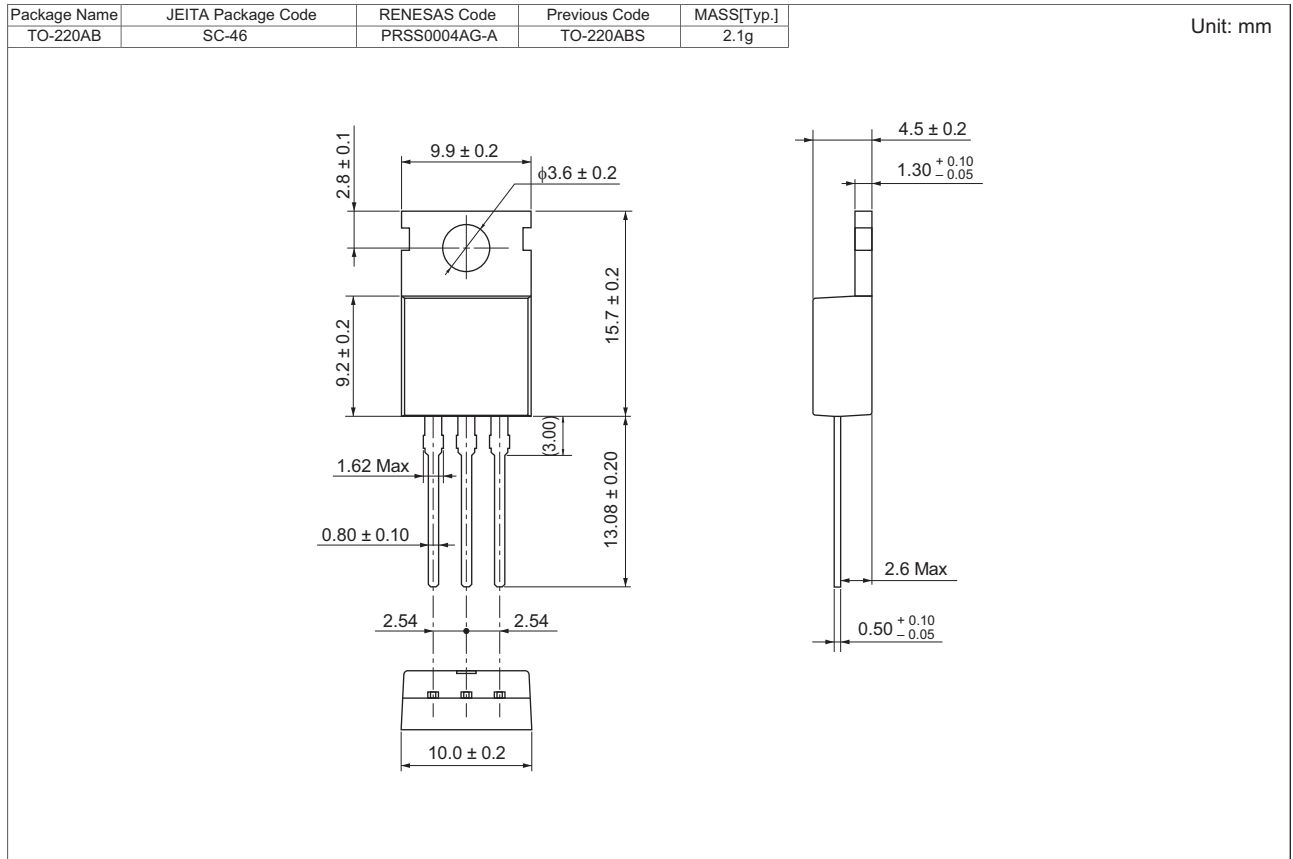
Gate Trigger Current vs. Gate Current Pulse Width



Gate Trigger Characteristics Test Circuits



Package Dimensions



### Ordering Information

| Orderable Part Number | Packing | Quantity | Remark        |
|-----------------------|---------|----------|---------------|
| BCR20CM-16LB#BB0      | Tube    | 50 pcs.  | Straight type |
| BCR20CM-16LBA8#BB0    | Tube    | 50 pcs.  | A8 Lead form  |

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



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