

# BCR08DS-14A

700V-0.8A-Triac

Low Power Use

R07DS0258EJ0200

Rev.2.00

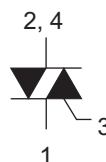
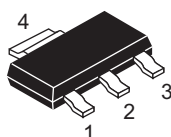
Aug 07, 2013

## Features

- $I_{T(RMS)}$  : 0.8 A
- $V_{DRM}$  : 700 V
- $I_{FGTL}$ ,  $I_{RGTL}$ ,  $I_{RGTH}$  : 5 mA or 10mA
- IVmode trigger is available (#B12)
- Planar Passivation Type
- Surface Mounted Type
- Completed Pb Free

## Outline

RENESAS Package code: PRSP0004ZA-A  
(Package name: SOT-223)



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

## Applications

Washing machine, electric fan, air cleaner, other general purpose control applications

## Maximum Ratings

| Parameter                                               | Symbol    | Voltage class | Unit |
|---------------------------------------------------------|-----------|---------------|------|
|                                                         |           | 14            |      |
| Repetitive peak off-state voltage <sup>Note1</sup>      | $V_{DRM}$ | 700           | V    |
| Non- repetitive peak off-state voltage <sup>Note1</sup> | $V_{DSM}$ | 840           | V    |

Notes: 1. Gate open.

| Parameter                      | Symbol             | Ratings      | Unit             | Conditions                                                                                   |
|--------------------------------|--------------------|--------------|------------------|----------------------------------------------------------------------------------------------|
| RMS on-state current           | $I_{T(RMS)}$       | 0.8          | A                | Commercial frequency, sine full wave 360° conduction, T <sub>c</sub> = 96°C <sup>Note3</sup> |
| Surge on-state current         | $I_{TSM}$          | 8            | A                | 60Hz sinewave 1 full cycle, peak value, non-repetitive                                       |
| I <sup>2</sup> t for fusing    | I <sup>2</sup> t   | 0.26         | A <sup>2</sup> s | Value corresponding to 1 cycle of half wave 60Hz, surge on-state current                     |
| Peak gate power dissipation    | P <sub>GM</sub>    | 1            | W                |                                                                                              |
| Average gate power dissipation | P <sub>G(AV)</sub> | 0.1          | W                |                                                                                              |
| Peak gate voltage              | V <sub>GM</sub>    | 6            | V                |                                                                                              |
| Peak gate current              | I <sub>GM</sub>    | 0.5          | A                |                                                                                              |
| Junction temperature           | T <sub>j</sub>     | – 40 to +125 | °C               |                                                                                              |
| Storage temperature            | T <sub>stg</sub>   | – 40 to +125 | °C               |                                                                                              |
| Mass                           | —                  | 0.12         | g                | Typical value                                                                                |

## Electrical Characteristics

| Parameter                                                               | Symbol                  | BCR08DS-14A#B10 |      |      | BCR08DS-14A#B12 |      |      | Unit               | Test conditions                                                                          |
|-------------------------------------------------------------------------|-------------------------|-----------------|------|------|-----------------|------|------|--------------------|------------------------------------------------------------------------------------------|
|                                                                         |                         | Min.            | Typ. | Max. | Min.            | Typ. | Max. |                    |                                                                                          |
| Repetitive peak off-state current                                       | $I_{\text{DRM}}$        | —               | —    | 1.0  | —               | —    | 1.0  | mA                 | $T_j = 125^\circ\text{C}$<br>$V_{\text{DRM}}$ applied                                    |
| On-state voltage                                                        | $V_{\text{TM}}$         | —               | —    | 2.0  | —               | —    | 2.0  | V                  | $T_c = 25^\circ\text{C}$ , $I_{\text{TM}} = 1.2\text{ A}$<br>instantaneous measurement   |
| Gate trigger voltage <sup>Note2</sup>                                   | I $V_{\text{FGTI}}$     | —               | —    | 2.0  | —               | —    | 2.0  | V                  | $T_j = 25^\circ\text{C}$ , $V_D = 6\text{ V}$<br>$R_L = 6\ \Omega$ , $R_G = 330\ \Omega$ |
|                                                                         | II $V_{\text{RGTI}}$    | —               | —    | 2.0  | —               | —    | 2.0  | V                  |                                                                                          |
|                                                                         | III $V_{\text{RGTIII}}$ | —               | —    | 2.0  | —               | —    | 2.0  | V                  |                                                                                          |
|                                                                         | IV $V_{\text{FGTIII}}$  | —               | —    | —    | —               | —    | 2.0  | V                  |                                                                                          |
| Gate trigger current <sup>Note2</sup>                                   | I $I_{\text{FGTI}}$     | —               | —    | 5    | —               | —    | 10   | mA                 | $T_j = 25^\circ\text{C}$ , $V_D = 6\text{ V}$<br>$R_L = 6\ \Omega$ , $R_G = 330\ \Omega$ |
|                                                                         | II $I_{\text{RGTI}}$    | —               | —    | 5    | —               | —    | 10   | mA                 |                                                                                          |
|                                                                         | III $I_{\text{RGTIII}}$ | —               | —    | 5    | —               | —    | 10   | mA                 |                                                                                          |
|                                                                         | IV $I_{\text{FGTIII}}$  | —               | —    | —    | —               | —    | 10   | mA                 |                                                                                          |
| Gate non-trigger voltage                                                | $V_{\text{GD}}$         | 0.2             | —    | —    | 0.2             | —    | —    | V                  | $T_j = 125^\circ\text{C}$<br>$V_D = 1/2 V_{\text{DRM}}$                                  |
| Thermal resistance                                                      | $R_{\text{th (j-c)}}$   | —               | —    | 25   | —               | —    | 25   | $^\circ\text{C/W}$ | Junction to case <sup>Note3</sup>                                                        |
| Critical-rate of rise of off-state commutating voltage <sup>Note4</sup> | $(dv/dt)_c$             | 0.5             | —    | —    | 0.5             | —    | —    | V/ $\mu\text{s}$   | $T_j = 125^\circ\text{C}$                                                                |
| Critical-rate of rise of off-state voltage <sup>Note5</sup>             | $dv/dt$                 | 200             | —    | —    | 200             | —    | —    | V/ $\mu\text{s}$   | $T_j = 125^\circ\text{C}$                                                                |

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

3. Case temperature is measured on the  $T_2$  tab.

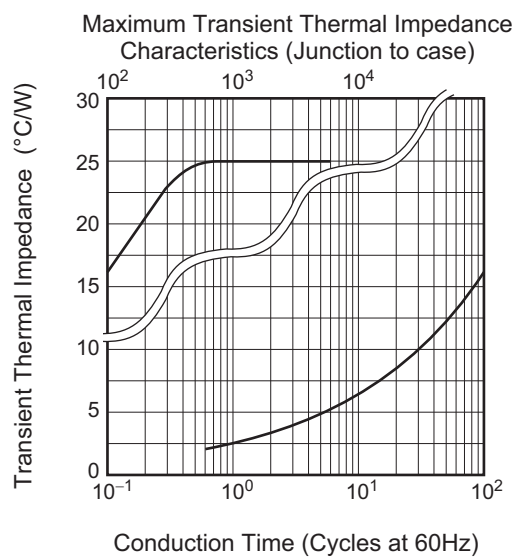
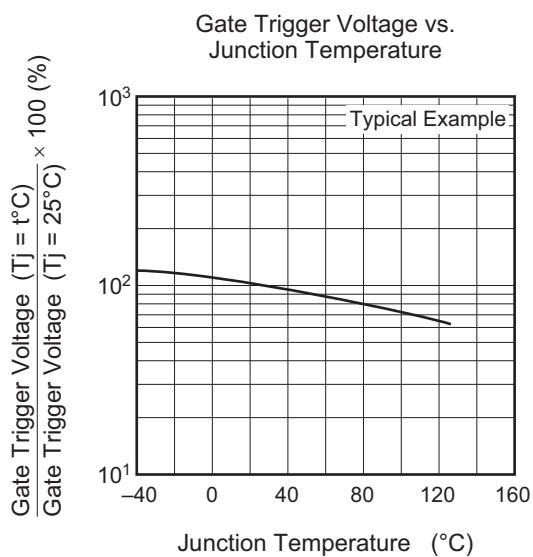
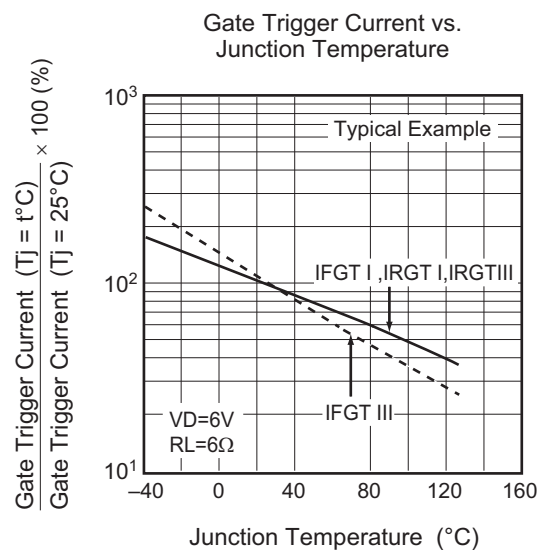
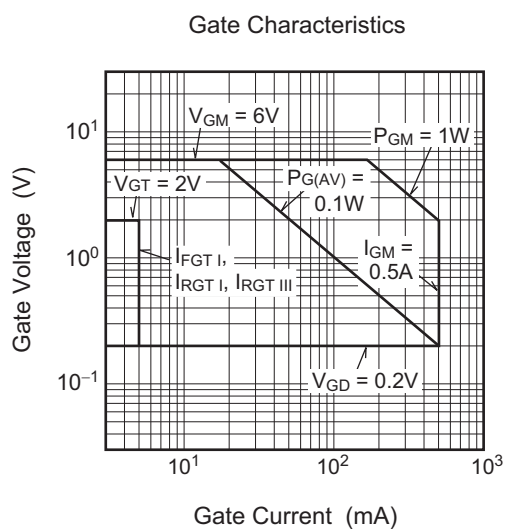
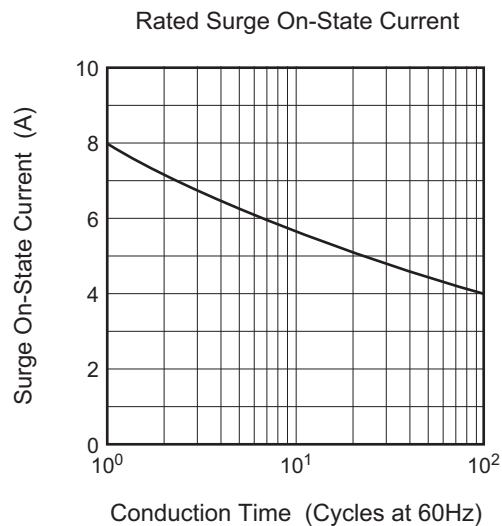
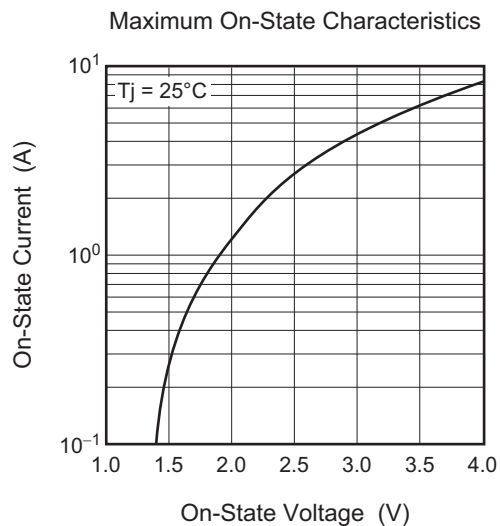
4. Test conditions of the critical-rate of rise of off-state commutating voltage are shown in the table below.

| 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>$(di/dt)_c = -0.4\text{ A/ms}$<br>3. Peak off-state voltage<br>$V_D = 400\text{ V}$ |                                                            |

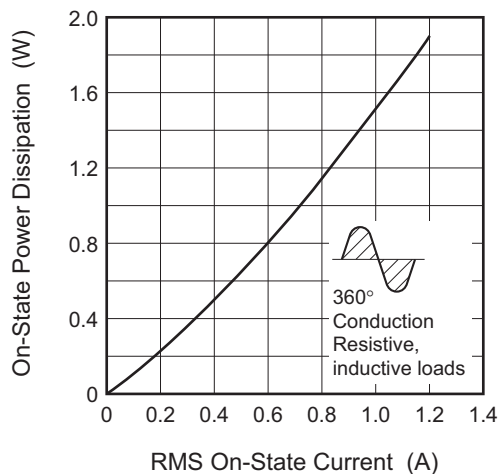
5. Test conditions of the critical-rate of rise of off-state voltage are shown in the table below.

| Test conditions                                                                                                                                                               | Off-state voltage waveforms |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| 1. Junction temperature<br>$T_j = 125^\circ\text{C}$<br>2. Off-state voltage waveform<br>Linear waveform<br>3. Peak off-state voltage<br>$V_D = 200\text{ V}$<br>4. Gate open |                             |

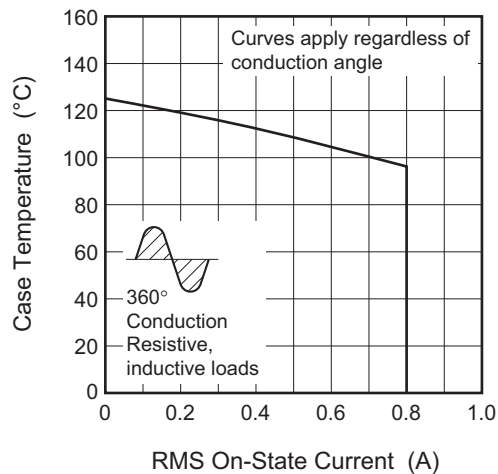
## Performance Curves



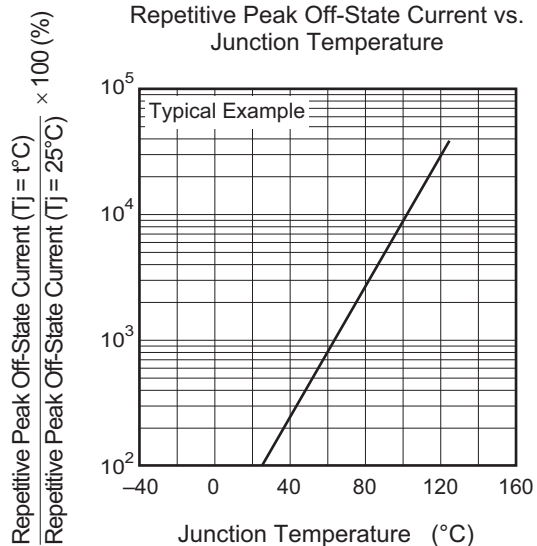
Maximum On-State Power Dissipation



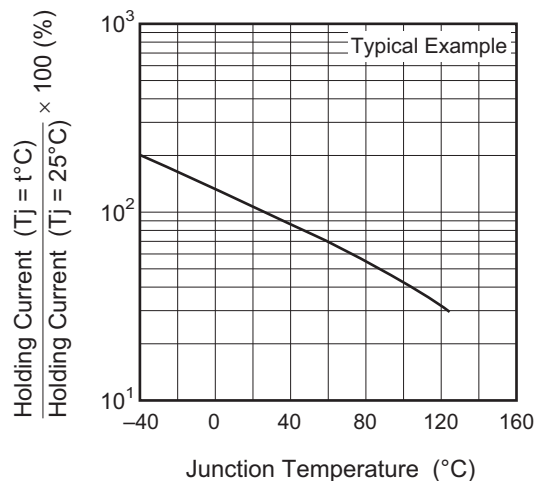
Allowable Case Temperature vs. RMS On-State Current



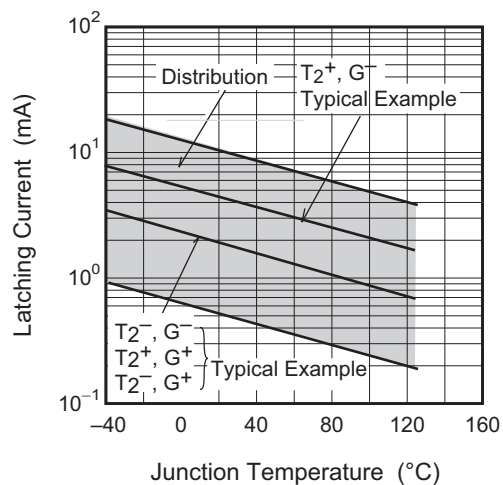
Repetitive Peak Off-State Current vs. Junction Temperature



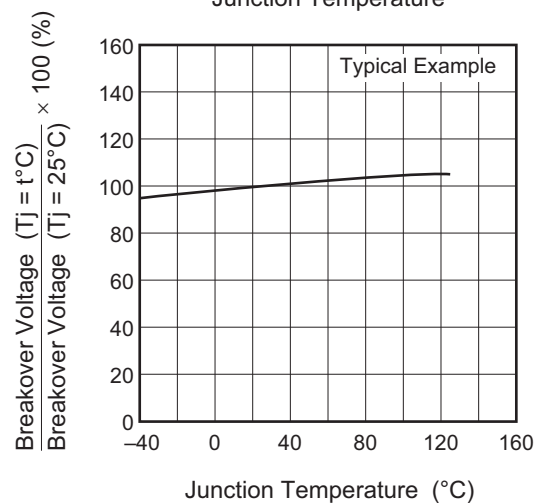
Holding Current vs. Junction Temperature

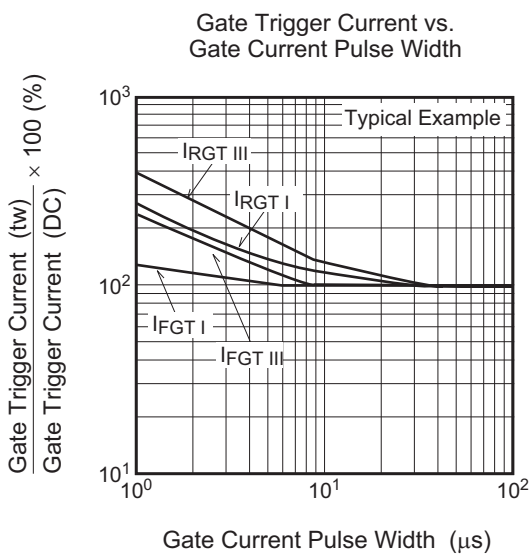
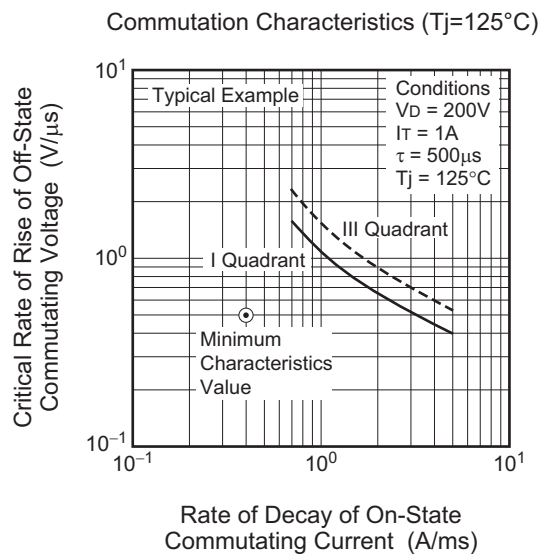
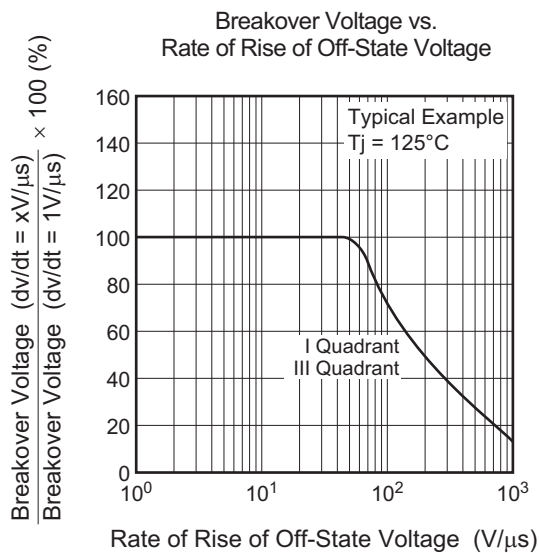


Latching Current vs. Junction Temperature

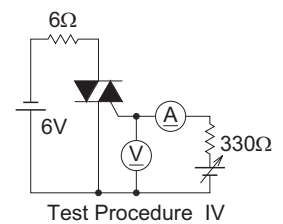
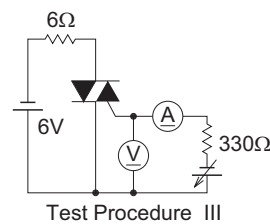
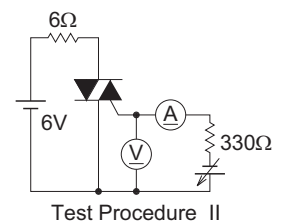
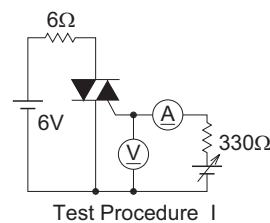


Breakover Voltage vs. Junction Temperature





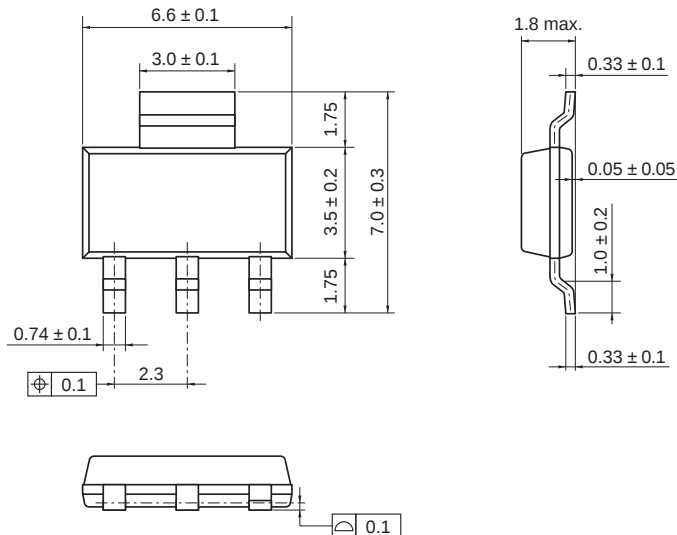
Gate Trigger Characteristics Test Circuits



## Package Dimensions

| Package Name | JEITA Package Code | RENESAS Code | Previous Code | MASS[Typ.] |
|--------------|--------------------|--------------|---------------|------------|
| SOT-223      | —                  | PRSP0004ZA-A | —             | 0.12g      |

Unit: mm



## Ordering Information

| Orderable Part Number | Packing       | Quantity  | Remark                |
|-----------------------|---------------|-----------|-----------------------|
| BCR08DS-14AT13#B10    | Embossed Tape | 3000 pcs. | Taping direction "T1" |
| BCR08DS-14AT13#B12    | Embossed Tape | 3000 pcs. | Taping direction "T1" |

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

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