To our customers,

# Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: http://www.renesas.com

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (http://www.renesas.com)

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# BCR3AS-14B

## Triac

Low Power Use

REJ03G1807-0100
Rev.1.00
Jul 22, 2009

### Features

- $I_{T\,(RMS)}$ : 3 A
- $V_{DRM}$ : 800 V (Tj = 125°C)
- $I_{FGT\,I}$, $I_{RGT\,I}$, $I_{RGT\,III}$ : 30 mA
- The Product guaranteed maximum junction temperature 150°C
- Non-Insulated Type
- Planar Passivation Type

### Outline

RENESAS Package code: PRSS0004ZG-A
(Package name: MP-3A)


1. $T_1$ Terminal
2. $T_2$ Terminal
3. Gate Terminal
4. $T_2$ Terminal

### Applications

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

### Maximum Ratings

| Parameter | Symbol | Voltage class | Unit | Conditions |
|---|---|---|---|---|
| | | 14 | | |
| Repetitive peak off-state voltage[Note1] | $V_{DRM}$ | 800 | V | Tj = 125°C |
| | | 700 | V | Tj = 150°C |
| Non-repetitive peak off-state voltage[Note1] | $V_{DSM}$ | 840 | V | |

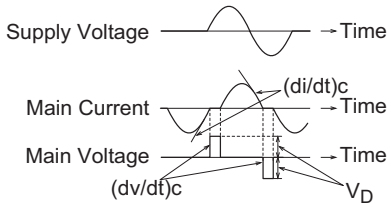
Notes: 1. Gate open.

| Parameter | Symbol | Ratings | Unit | Conditions |
|---|---|---|---|---|
| RMS on-state current | $I_{T\,(RMS)}$ | 3.0 | A | Commercial frequency, sine full wave 360°conduction, Tc = 133°C [Note3] |
| Surge on-state current | $I_{TSM}$ | 30 | A | 60Hz sinewave 1 full cycle, peak value, non-repetitive |
| $I^2t$ for fusion | $I^2t$ | 3.7 | $A^2s$ | Value corresponding to 1 cycle of half wave 60Hz, surge on-state current |
| Peak gate power dissipation | $P_{GM}$ | 3 | W | |
| Average gate power dissipation | $P_{G\,(AV)}$ | 0.3 | W | |
| Peak gate voltage | $V_{GM}$ | 6 | V | |
| Peak gate current | $I_{GM}$ | 0.5 | A | |
| Junction Temperature | Tj | –40 to +150 | °C | |
| Storage temperature | Tstg | –40 to +150 | °C | |
| Mass | — | 0.32 | g | Typical value |

## Electrical Characteristics

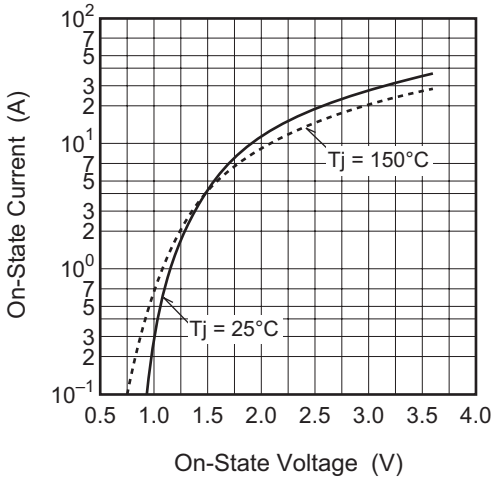
| Parameter | | Symbol | Min. | Typ. | Max. | Unit | Test conditions |
|---|---|---|---|---|---|---|---|
| Repetitive peak off-state current | | $I_{DRM}$ | — | — | 2.0 | mA | Tj = 150°C, $V_{DRM}$ applied |
| On-state voltage | | $V_{TM}$ | — | — | 1.6 | V | Tc = 25°C, $I_{TM}$ = 4.5 A, instantaneous measurement |
| Gate trigger voltage[Note2] | I | $V_{FGT_I}$ | — | — | 1.5 | V | Tj = 25°C, $V_D$ = 6 V, $R_L$ = 6 Ω, $R_G$ = 330 Ω |
| | II | $V_{RGT_I}$ | — | — | 1.5 | V | |
| | III | $V_{RGT_{III}}$ | — | — | 1.5 | V | |
| Gate trigger curent[Note2] | I | $I_{FGT_I}$ | — | — | 30 | mA | Tj = 25°C, $V_D$ = 6 V, $R_L$ = 6 Ω, $R_G$ = 330 Ω |
| | II | $I_{RGT_I}$ | — | — | 30 | mA | |
| | III | $I_{RGT_{III}}$ | — | — | 30 | mA | |
| Gate non-trigger voltage | | $V_{GD}$ | 0.2/0.1 | — | — | V | Tj = 125°C /150°C, $V_D$ = 1/2 $V_{DRM}$ |
| Thermal resistance | | $R_{th\ (j-c)}$ | — | — | 3.8 | °C/W | Junction to case[Note3] |
| Critical-rate of rise of off-state commutation voltage[Note4] | | (dv/dt)c | 5/1 | — | — | V/µs | Tj = 125°C/150°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 commutation voltage is shown in the table below.

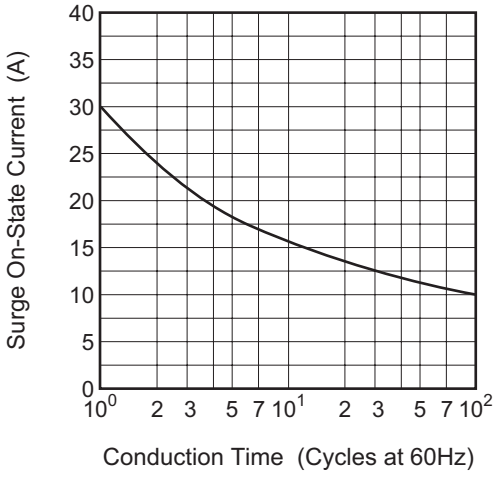
| Test conditions | Commutating voltage and current waveforms (inductive load) |
|---|---|
| 1. Junction temperature<br>Tj = 125°C/150°C<br>2. Rate of decay of on-state commutating current<br>(di/dt)c = –1.5 A/ms<br>3. Peak off-state voltage<br>$V_D$ = 400 V |  |

## Performance Curves

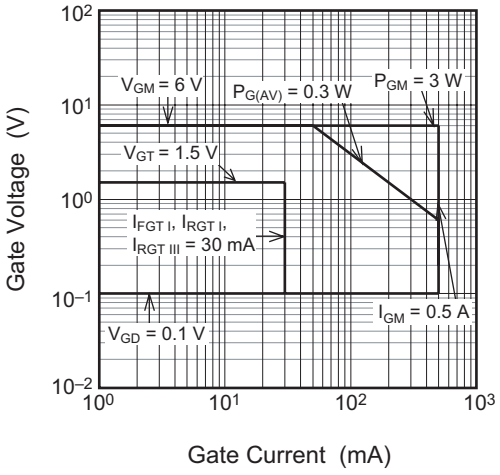
Maximum On-State Characteristics



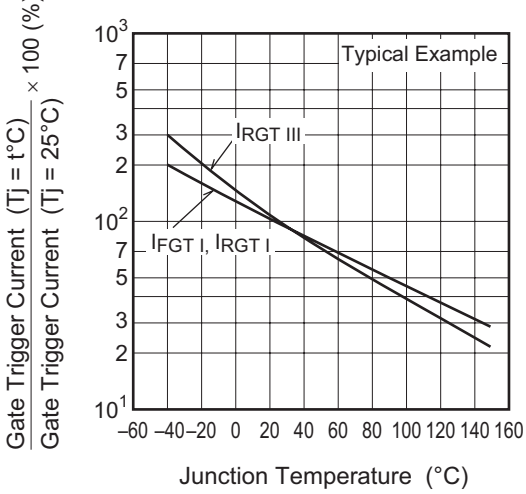

Rated Surge On-State Current



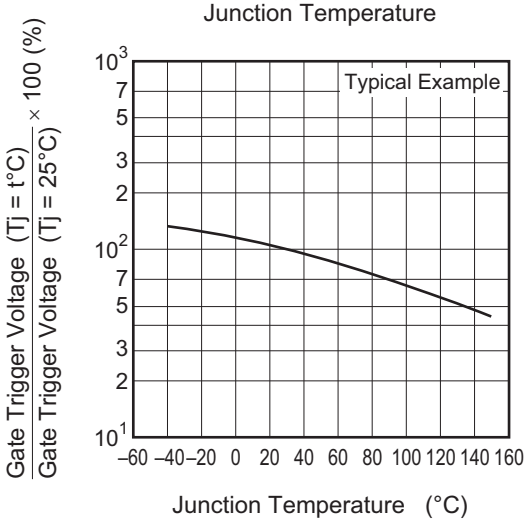

Gate Characteristics (I, II and III)



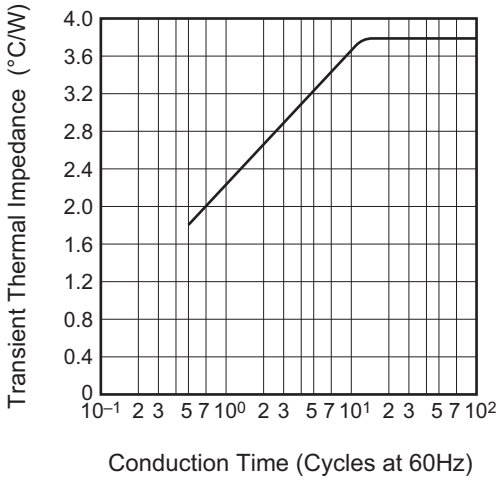

Gate Trigger Current vs. Junction Temperature



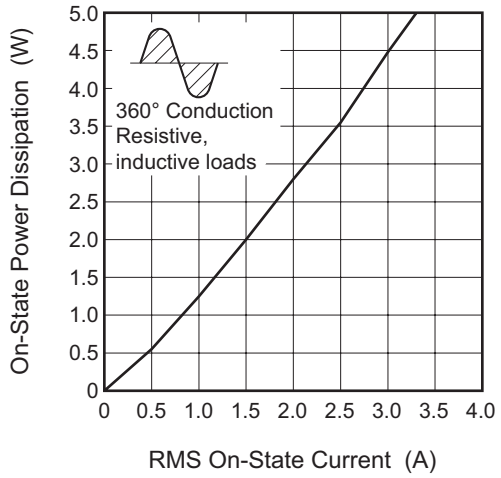

Gate Trigger Voltage vs. Junction Temperature



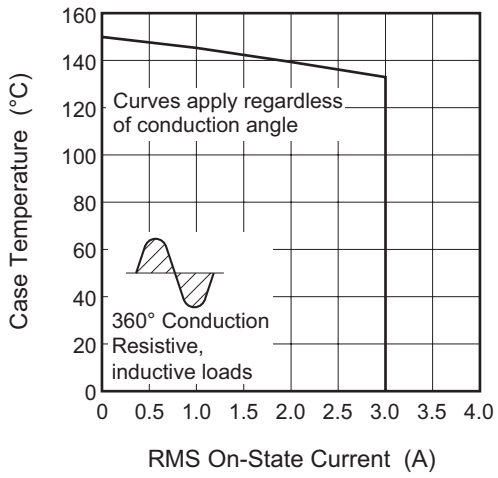

Maximum Transient Thermal Impedance Characteristics (Junction to case)



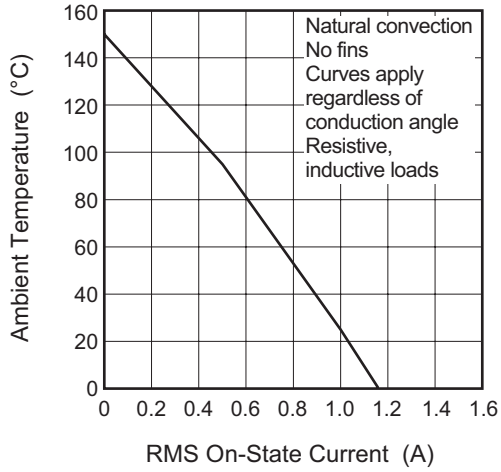
Maximum On-State Power Dissipation



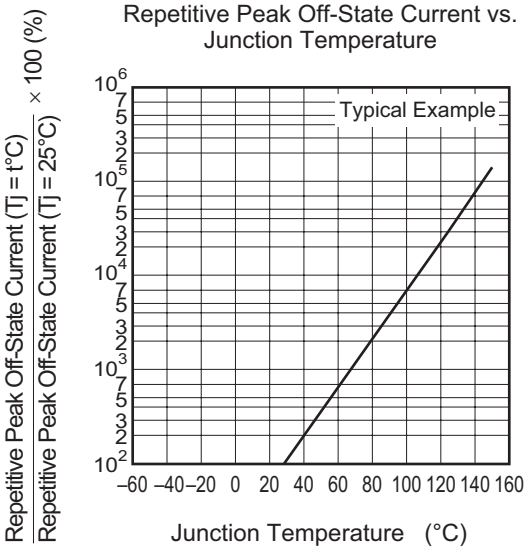

Allowable Case Temperature vs.
RMS On-State Current



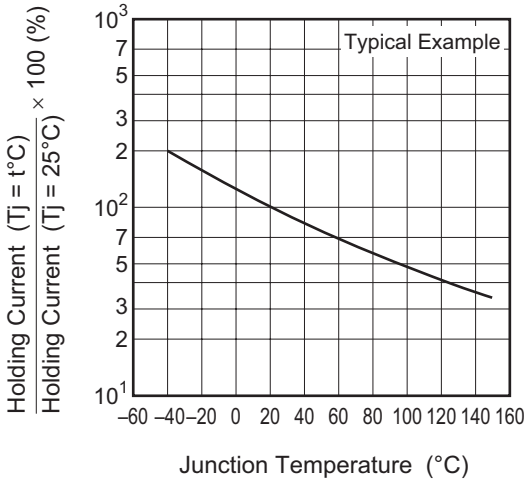

Allowable Ambient Temperature vs.
RMS On-State Current



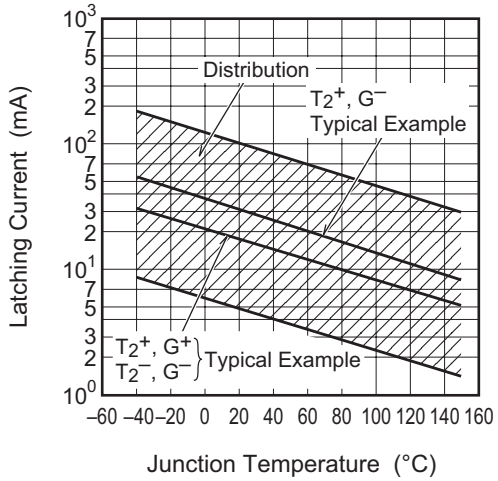

Repetitive Peak Off-State Current vs.
Junction Temperature



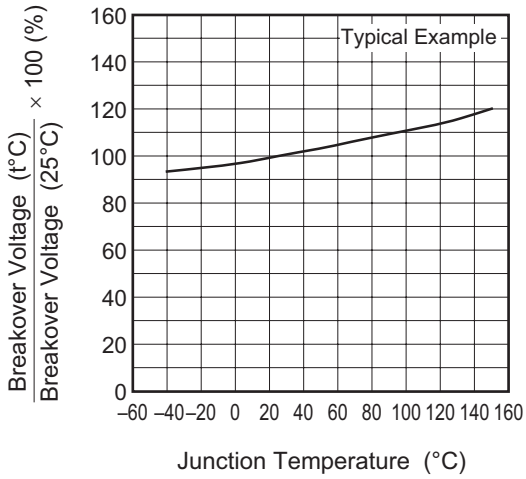

Holding Current vs.
Junction Temperature



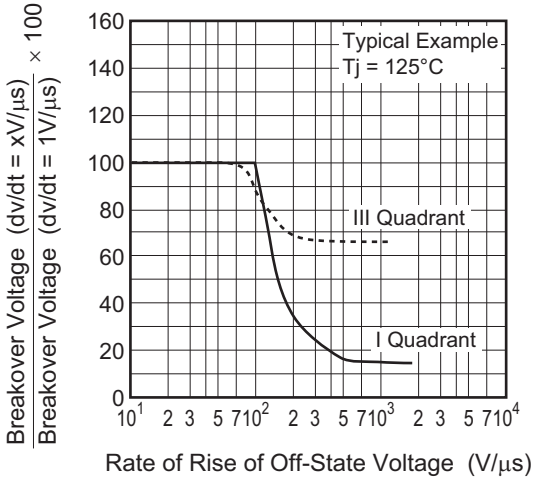

Latching Current vs.
Junction Temperature



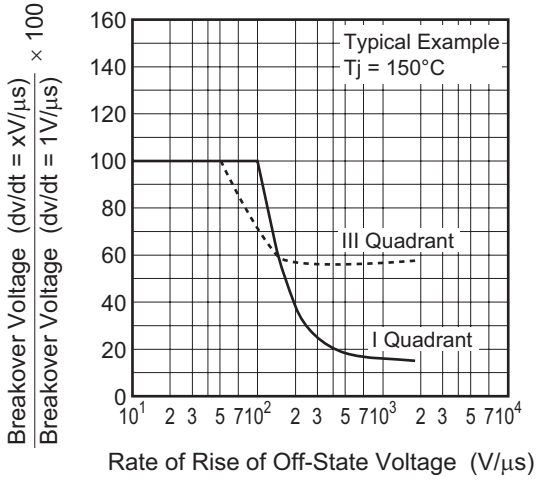
Breakover Voltage vs.
Junction Temperature



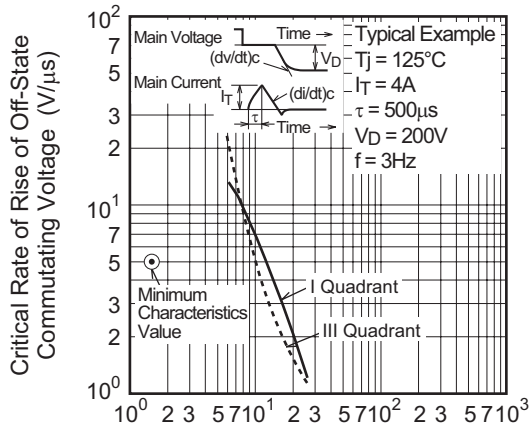

Breakover Voltage vs.
Rate of Rise of Off-State Voltage (Tj=125°C)



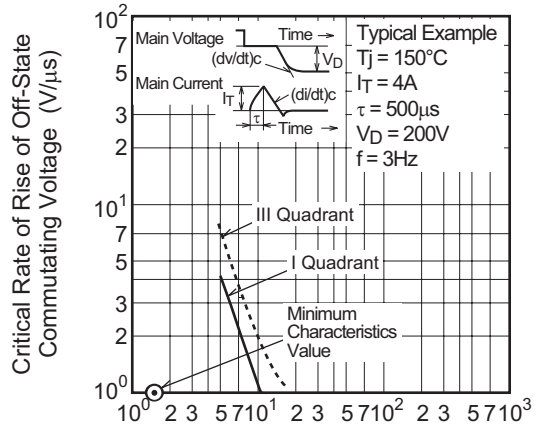

Breakover Voltage vs.
Rate of Rise of Off-State Voltage (Tj=150°C)



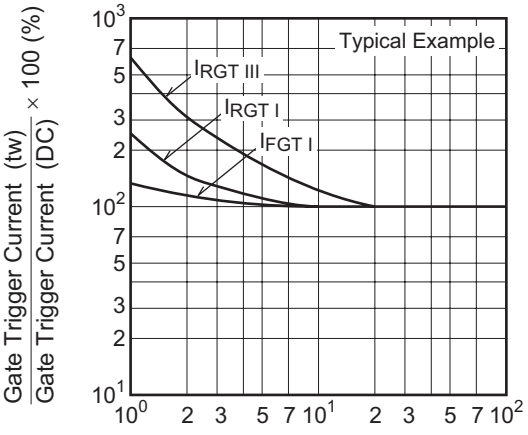

Commutation Characteristics (Tj=125°C)



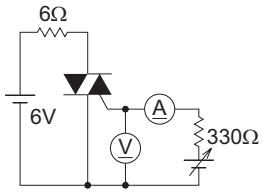

Commutation Characteristics (Tj=150°C)



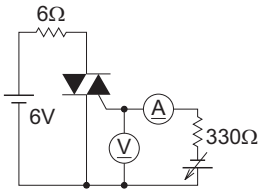

Gate Trigger Current vs.
Gate Current Pulse Width



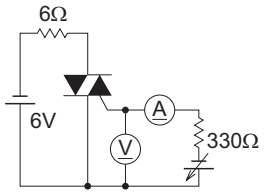
Gate Trigger Characteristics Test Circuits




Test Procedure I

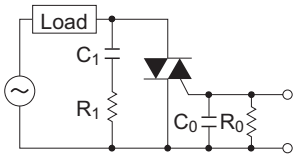



Test Procedure II




Test Procedure III

Recommended Circuit Values Around The Triac

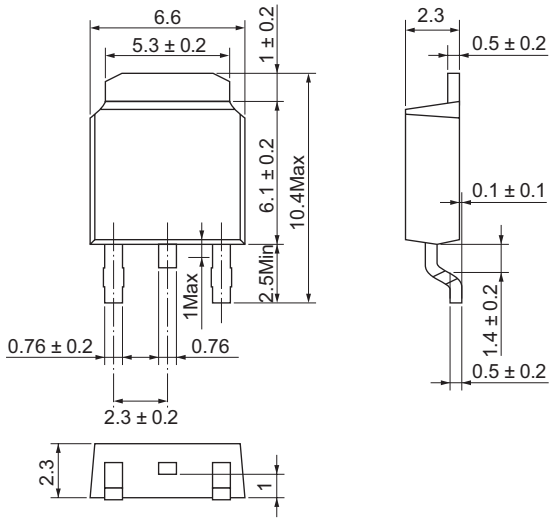



$C_1$ = 0.1 to 0.47μF $C_0$ = 0.1μF
$R_1$ = 47 to 100Ω $R_0$ = 100Ω

## Package Dimensions

| Package Name | JEITA Package Code | RENESAS Code | Previous Code | MASS[Typ.] |
|---|---|---|---|---|
| MP-3A | SC-63 | PRSS0004ZG-A | — | 0.32g |

Unit: mm




## Order Code

| Lead form | Standard packing | Quantity | Standard order code | Standard order code example |
|---|---|---|---|---|
| Surface-mounted type | Taping | 3000 | Type name – T+Direction(1 or 2)+3 | BCR3AS-14B-T13 |
| Surface-mounted type | Plastic Magazine(Tube) | 75 | Type name | BCR3AS-14B |

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

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