# BCR10PM-14LJ

## 700V - 10A - Triac
## Medium Power Use

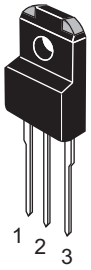
R07DS0980EJ0100
Rev.1.00
Dec 03, 2012

### Features

- $I_{T\ (RMS)}$ : 10 A
- $V_{DRM}$ : 800 V (Tj = 125 °C)
- Tj: 150 °C
- $I_{FGTI}$, $I_{RGTI}$, $I_{RGTIII}$: 30 mA
- Viso: 2000V
- Insulated Type
- Planar Passivation Type
- UL Recognized: File No. E223904

### Outline

RENESAS Package code: PRSS0003AA-A
(Package name: TO-220F )





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

### Applications

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

### Maximum Ratings

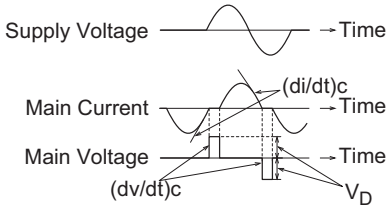
| Parameter | Symbol | Voltage class | Unit | Conditions |
|---|---|---|---|---|
| | | 14 | | |
| Repetitive peak off-state voltage[Note1] | $V_{DRM}$ | 800 | V | Tj = 125°C |
| | | 700 | | Tj = 150°C |
| Non-repetitive peak off-state voltage[Note1] | $V_{DSM}$ | 840 | V | |

| Parameter | Symbol | Ratings | Unit | Conditions |
|---|---|---|---|---|
| RMS on-state current | $I_{T\ (RMS)}$ | 10 | A | Commercial frequency, sine full wave 360° conduction, Tc = 103°C |
| Surge on-state current | $I_{TSM}$ | 100 | A | 60 Hz sinewave 1 full cycle, peak value, non-repetitive |
| $I^2t$ for fusion | $I^2t$ | 41.6 | $A^2s$ | 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 | Tj | –40 to +150 | °C | |
| Storage temperature | Tstg | –40 to +150 | °C | |
| Mass | — | 2.0 | g | Typical value |
| Isolation voltage [Note5] | Viso | 2000 | V | Ta = 25°C, AC 1 minute $T_1$ • $T_2$ • G terminal to case |

## Electrical Characteristics

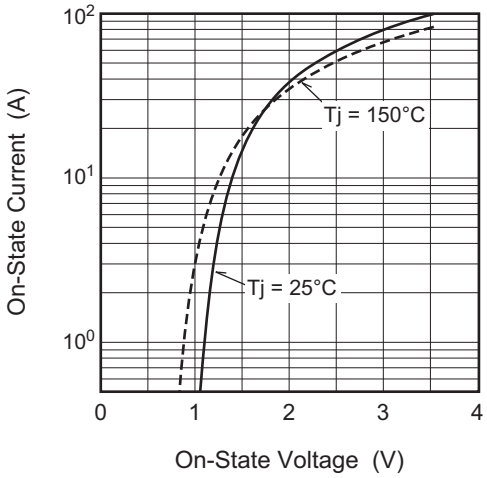
| Parameter | | Symbol | Rated value | | | Unit | Test conditions |
|---|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | | |
| Repetitive peak off-state current | | $I_{DRM}$ | — | — | 2.0 | mA | Tj = 150°C, $V_{DRM}$ applied |
| On-state voltage | | $V_{TM}$ | — | — | 1.5 | V | Tc = 25°C, $I_{TM}$ = 15A, instantaneous measurement |
| Gate trigger voltage[Note2] | I | $V_{FGTI}$ | — | — | 1.5 | V | Tj = 25°C, $V_D$ = 6 V, $R_L$ = 6 Ω, $R_G$ = 330 Ω |
| | II | $V_{RGTI}$ | — | — | 1.5 | V | |
| | III | $V_{RGTIII}$ | — | — | 1.5 | V | |
| Gate trigger curent[Note2] | I | $I_{FGTI}$ | — | — | 30 | mA | Tj = 25°C, $V_D$ = 6 V, $R_L$ = 6 Ω, $R_G$ = 330 Ω |
| | II | $I_{RGTI}$ | — | — | 30 | mA | |
| | III | $I_{RGTIII}$ | — | — | 30 | mA | |
| Gate non-trigger voltage | | $V_{GD}$ | 0.2 | — | — | V | Tj = 125°C, $V_D$ = 1/2 $V_{DRM}$ |
| | | | 0.1 | — | — | V | Tj = 150°C, $V_D$ = 1/2 $V_{DRM}$ |
| Thermal resistance | | $R_{th\ (j-c)}$ | — | — | 4.1 | °C/W | Junction to case[Note3] |
| Critical-rate of rise of off-state commutation voltage[Note4] | | (dv/dt)c | 10 | — | — | V/μs | Tj = 125°C |
| | | | 1 | — | — | V/μs | Tj = 150°C |

Notes: 1. Gate open.
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°C/W.
4. Test conditions of the critical-rate of rise of off-state commutation voltage is shown in the table below.
5. Make sure that your finished product containing this device meets your safe isolation requirements. For safety, it's advisable that heatsink is electrically floating.

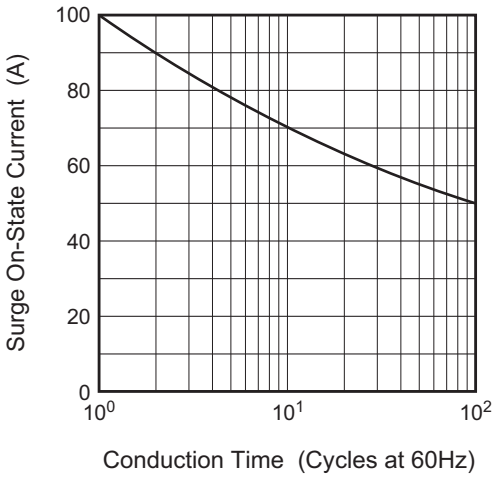
| Test conditions | Commutating voltage and current waveforms (inductive load) |
|---|---|
| 1. Junction temperature<br>Tj = 125/150°C<br>2. Rate of decay of on-state commutating current<br>(di/dt)c = –5 A/ms<br>3. Peak off-state voltage<br>$V_D$ = 400 V |  |

## Performance Curves

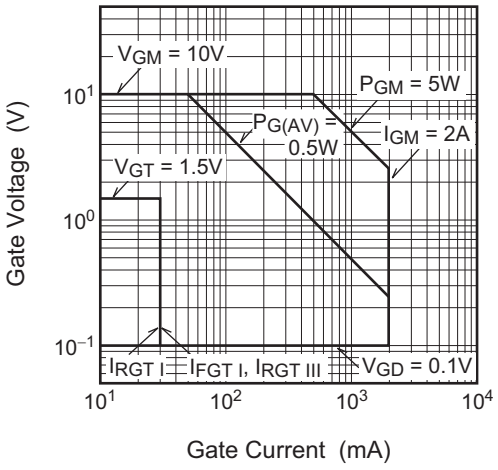
Maximum On-State Characteristics



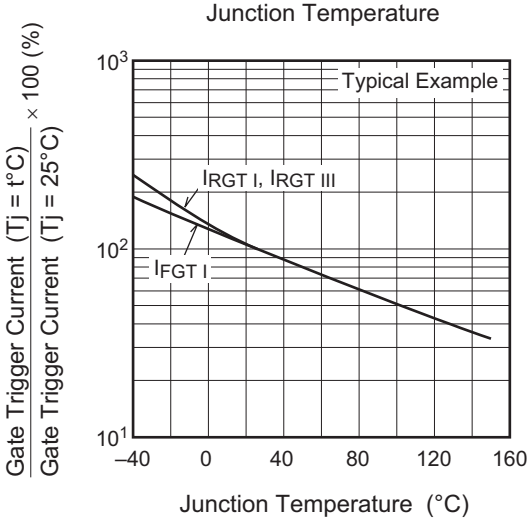

Rated Surge On-State Current



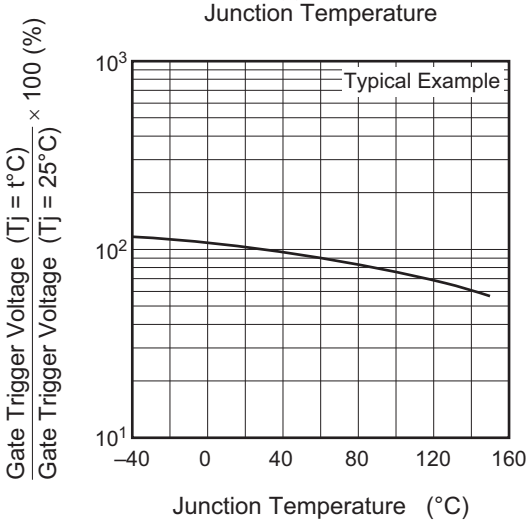

Gate Characteristics (I, II and III)



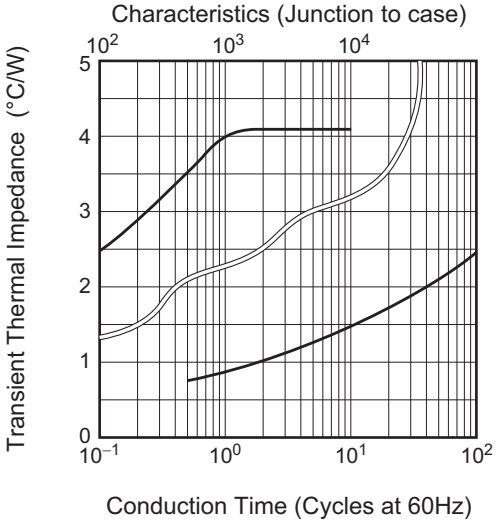

Gate Trigger Current vs. Junction Temperature



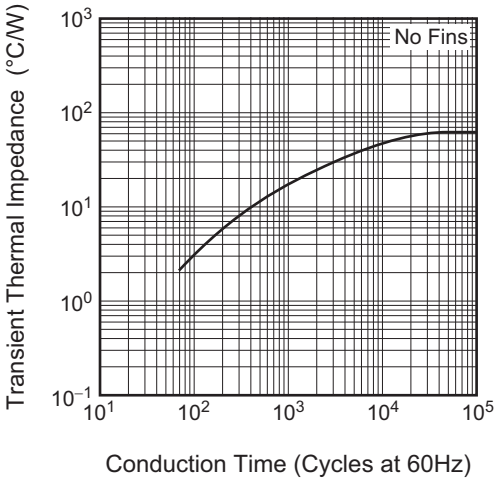

Gate Trigger Voltage vs. Junction Temperature



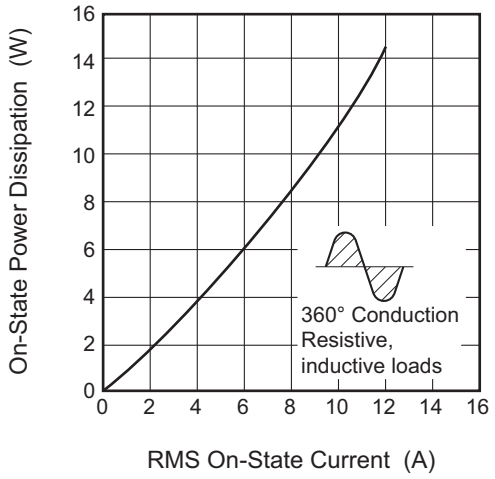

Maximum Transient Thermal Impedance Characteristics (Junction to case)



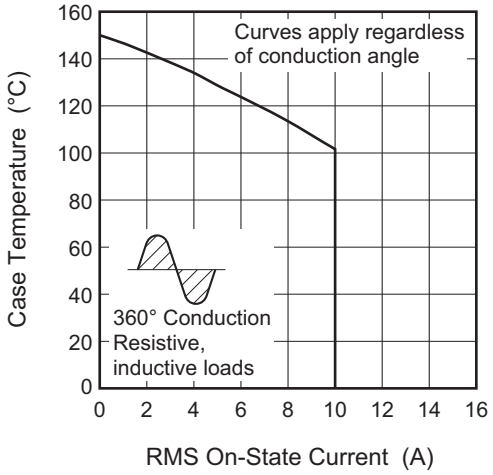
Maximum Transient Thermal Impedance Characteristics (Junction to ambient)



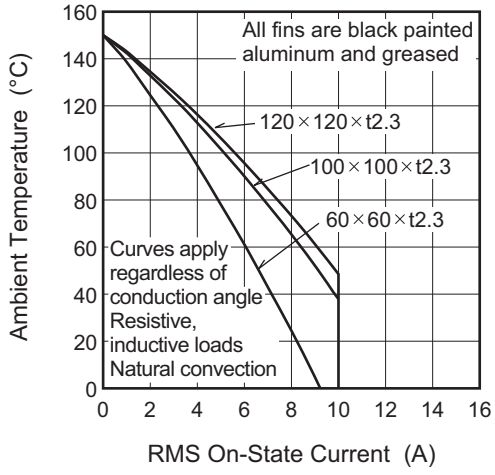

Maximum On-State Power Dissipation



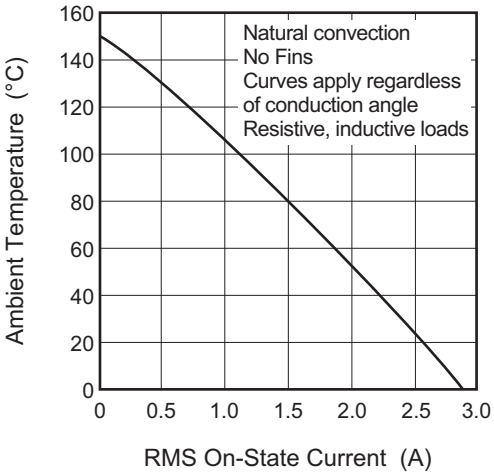

Allowable Case Temperature vs. RMS On-State Current



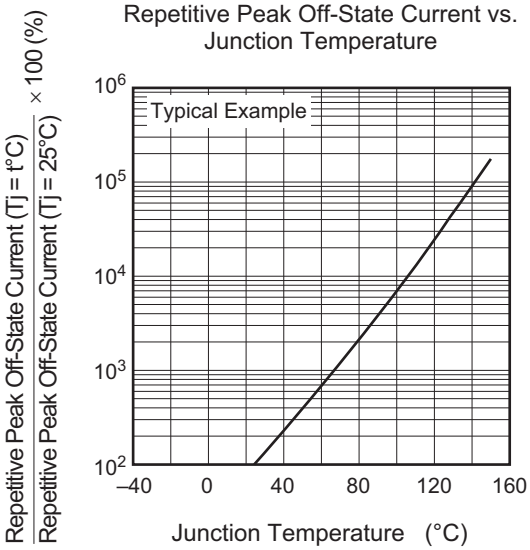

Allowable Ambient Temperature vs. RMS On-State Current



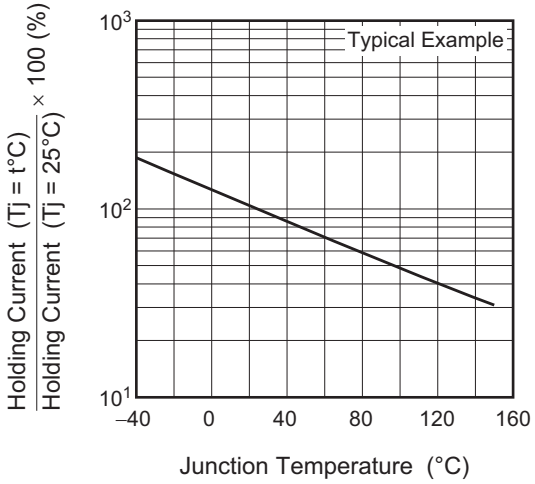

Allowable Ambient Temperature vs. RMS On-State Current



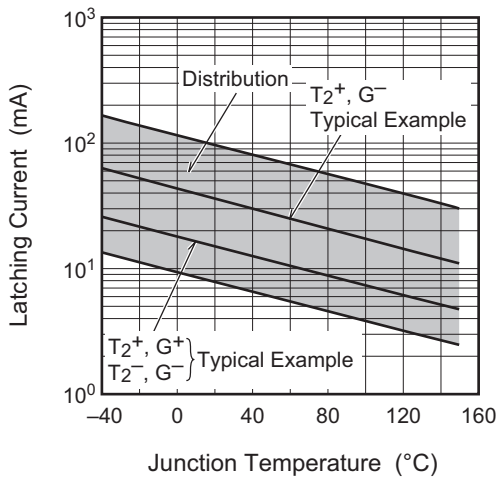

Repetitive Peak Off-State Current vs. Junction Temperature



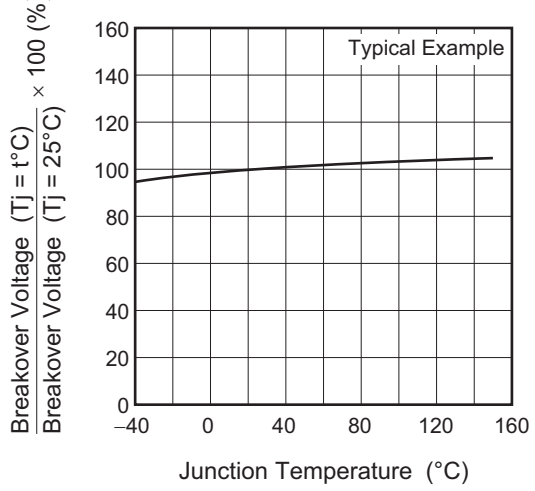
Holding Current vs.
Junction Temperature



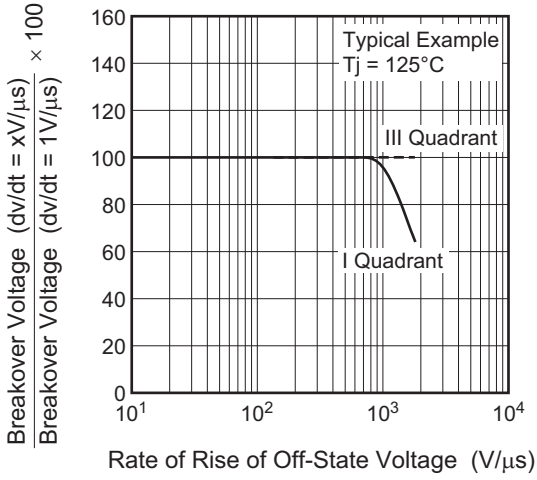

Latching Current vs.
Junction Temperature



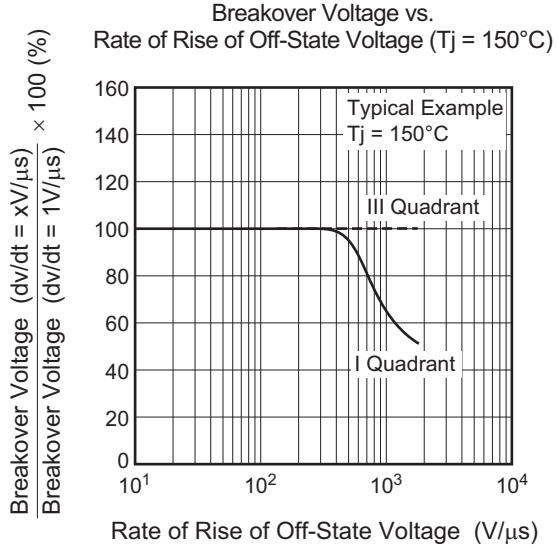

Breakover Voltage vs.
Junction Temperature



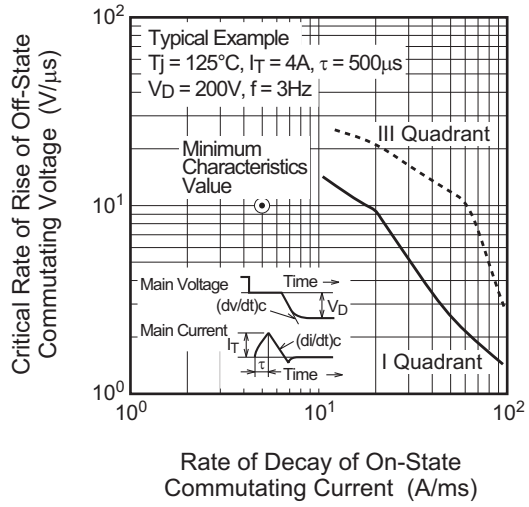

Breakover Voltage vs.
Rate of Rise of Off-State Voltage (Tj = 125°C)



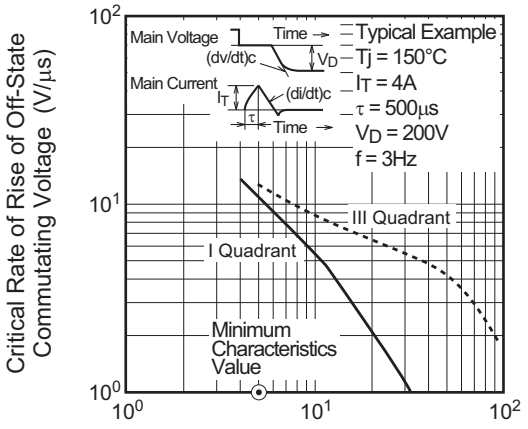

Breakover Voltage vs.
Rate of Rise of Off-State Voltage (Tj = 150°C)



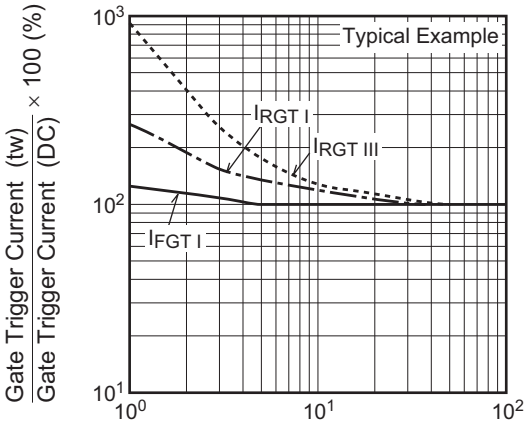

Commutation Characteristics (Tj = 125°C)



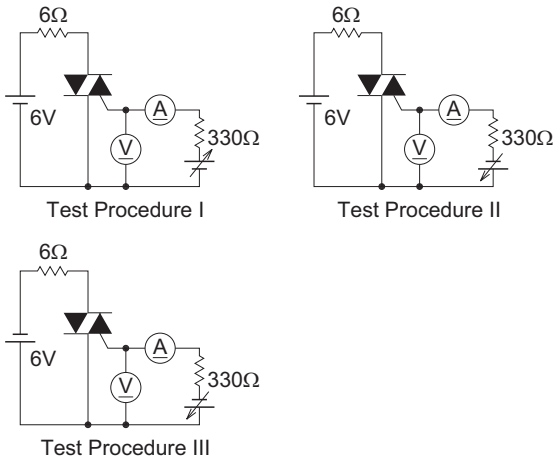
Commutation Characteristics (Tj = 150°C)



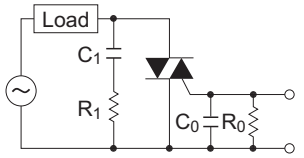

Gate Trigger Current vs. Gate Current Pulse Width




Gate Trigger Characteristics Test Circuits




Recommended Circuit Values Around The Triac

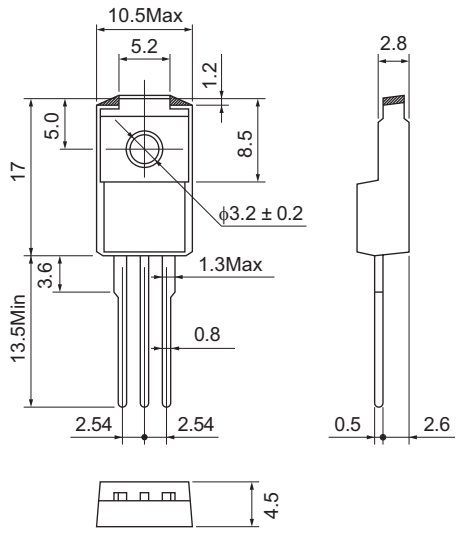



$C_1$ = 0.1 to 0.47μF $C_0$ = 0.1μF
$R_1$ = 47 to 100Ω $R_0$ = 100Ω

## Package Dimensions

| Package Name | JEITA Package Code | RENESAS Code | Previous Code | MASS[Typ.] |
|---|---|---|---|---|
| TO-220F | SC-67 | PRSS0003AA-A | T220F | 2.0g |

Unit: mm




## Ordering Information

| Orderable Part Number | Packing | Quantity | Remark |
|---|---|---|---|
| BCR10PM-14LJ#B00 | Bag | 100 pcs. | Straight type |
| BCR10PM-14LJA8#B00 | Tube | 50 pcs. | A8 Lead form |

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