# BCR6AM-12LB

## Triac

Medium Power Use

(The product guaranteed maximum junction temperature of 150°C)

REJ03G0453-0300
Rev.3.00
Nov 30, 2007

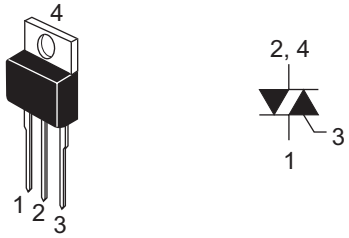


### Features

- $I_{T\,(RMS)}$ : 6 A
- $V_{DRM}$ : 600 V
- $I_{FGTI}$, $I_{RGTI}$, $I_{RGT\,III}$ : 30 mA (20 mA)[Note6]
- Non-Insulated Type
- Planar Passivation Type

### Outline

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




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

### Applications

Contactless AC switch, light dimmer, electronic flasher unit, control of household equipment such as TV sets, stereo systems, washing machine, infrared kotatsu, carpet, electric fan, solenoid driver, small motor control, solid state relay, copying machine, electric heater control, and other general purpose control applications

### Warning

1. Refer to the recommended circuit values around the triac before using.
2. Be sure to exchange the specification before using. Otherwise, general triacs with the maximum junction temperature of 125°C will be supplied.

### Maximum Ratings

| Parameter | Symbol | Voltage class | Unit |
|---|---|---|---|
| | | 12 | |
| Repetitive peak off-state voltage[Note1] | $V_{DRM}$ | 600 | V |
| Non-repetitive peak off-state voltage[Note1] | $V_{DSM}$ | 720 | V |

| Parameter | Symbol | Ratings | Unit | Conditions |
|---|---|---|---|---|
| RMS on-state current | $I_{T\ (RMS)}$ | 6 | A | Commercial frequency, sine full wave 360° conduction, Tc = 128°C[Note3] |
| Surge on-state current | $I_{TSM}$ | 60 | A | 60Hz sinewave 1 full cycle, peak value, non-repetitive |
| $I^2t$ for fusing | $I^2t$ | 15 | $A^2s$ | 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 | Tj | – 40 to +150 | °C | |
| Storage temperature | Tstg | – 40 to +150 | °C | |
| Mass | — | 2.0 | g | Typical value |

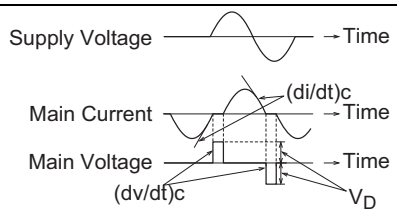


Notes: 1. Gate open.

## Electrical Characteristics

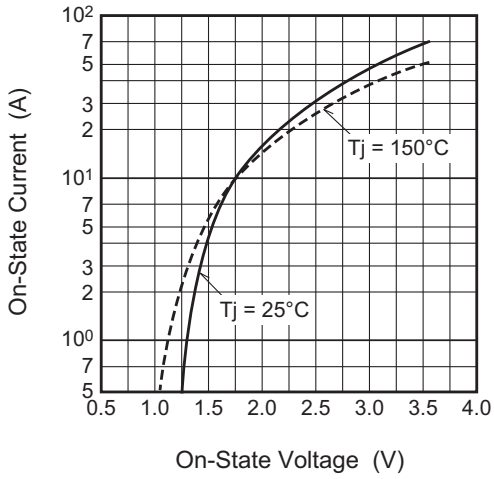
| Parameter | | Symbol | Min. | Typ. | Max. | Unit | Test conditions |
|---|---|---|---|---|---|---|---|
| Repetitive peak off-state current | | $I_{DRM}$ | — | — | 2.0 | mA | Tj = 150°C, $V_{DRM}$ applied |
| On-state voltage | | $V_{TM}$ | — | — | 1.7 | V | Tc = 25°C, $I_{TM}$ = 9 A, Instantaneous 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 current[Note2] | I | $I_{FGTI}$ | — | — | 30[Note6] | mA | Tj = 25°C, $V_D$ = 6 V, $R_L$ = 6 Ω, $R_G$ = 330 Ω |
| | II | $I_{RGTI}$ | — | — | 30[Note6] | mA | |
| | III | $I_{RGTIII}$ | — | — | 30[Note6] | 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 | | $R_{th\ (j-c)}$ | — | — | 2.5 | °C/W | Junction to case[Note3 Note4] |
| Critical-rate of rise of off-state commutating voltage[Note5] | | (dv/dt)c | 10/1 | — | — | V/µs | Tj = 125°C/150°C |

Notes: 2. Measurement using the gate trigger characteristics measurement circuit.
3. Case temperature is measured at the $T_2$ tab 1.5 mm away from the molded case.
4. The contact thermal resistance $R_{th\ (c-f)}$ in case of greasing is 1.0°C/W.
5. Test conditions of the critical-rate of rise of off-state commutating voltage is shown in the table below.
6. High sensitivity ($I_{GT} \leq 20$ mA) is also available. ($I_{GT}$ item: 1)

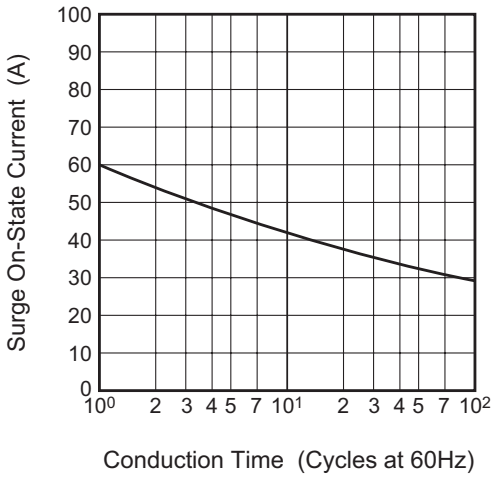
| Test conditions | Commutating voltage and current waveforms (inductive load) |
|---|---|
| 1. Junction temperature<br>Tj = 125°C/150°C<br>2. Rate of decay of on-state commutating current<br>(di/dt)c = – 3.0 A/ms<br>3. Peak off-state voltage<br>$V_D$ = 400 V |  |

## Performance Curves

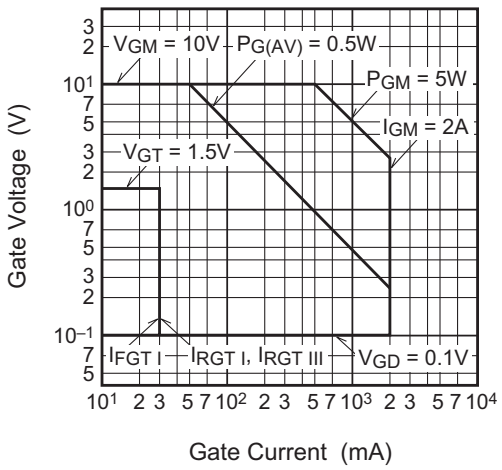
Maximum On-State Characteristics



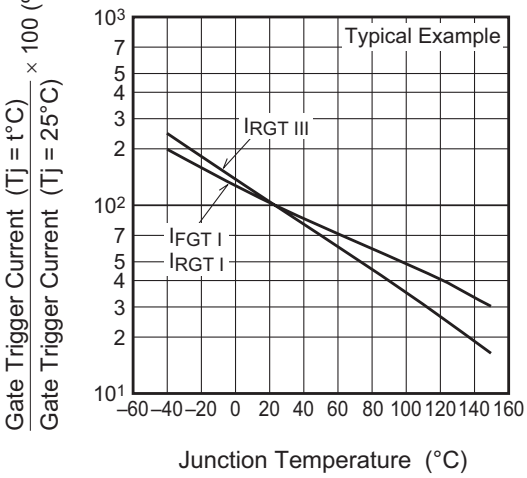

Rated Surge On-State Current



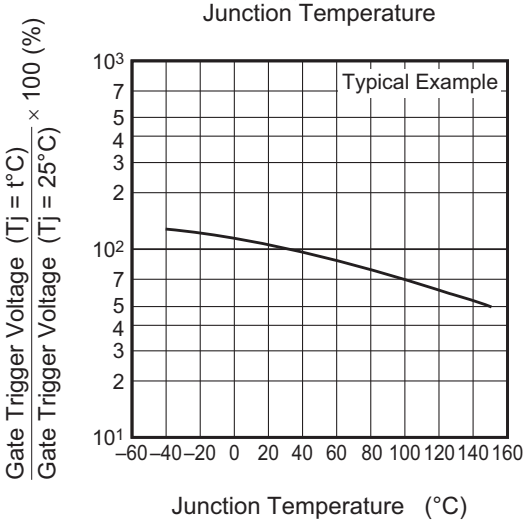

Gate Characteristics (I, II and III)



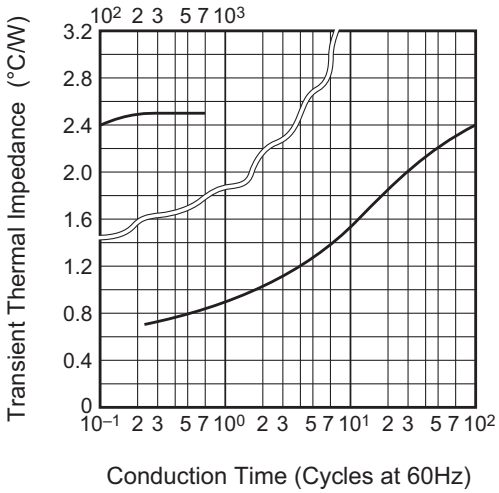

Gate Trigger Current vs. Junction Temperature



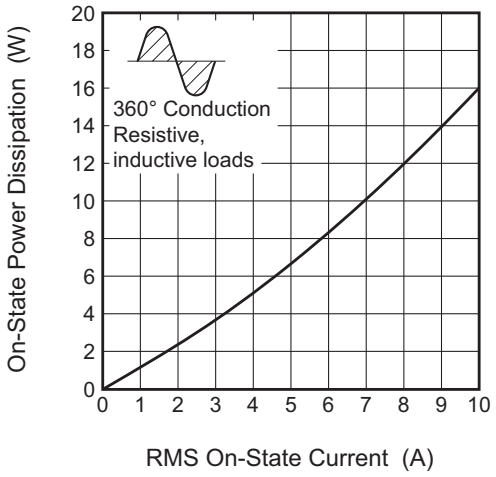

Gate Trigger Voltage vs. Junction Temperature



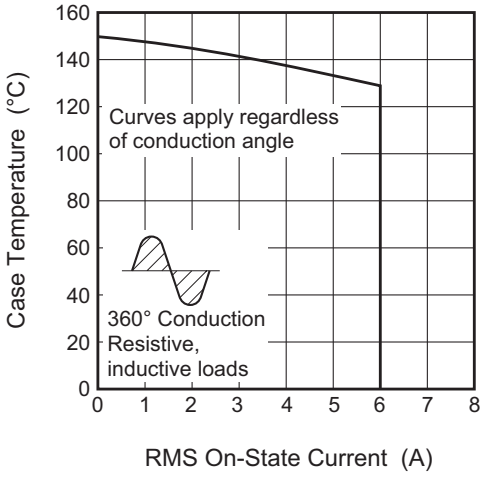

Maximum Transient Thermal Impedance Characteristics (Junction to case)



Maximum On-State Power Dissipation

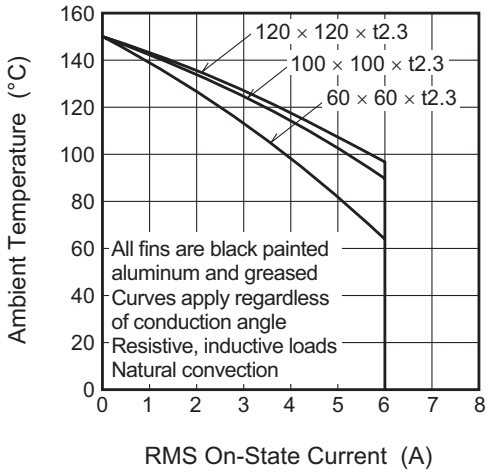



Allowable Case Temperature vs. RMS On-State Current

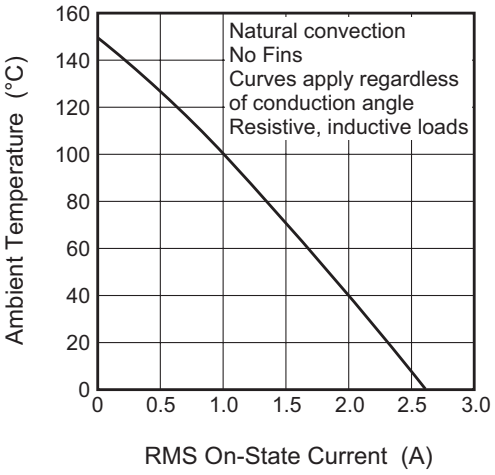




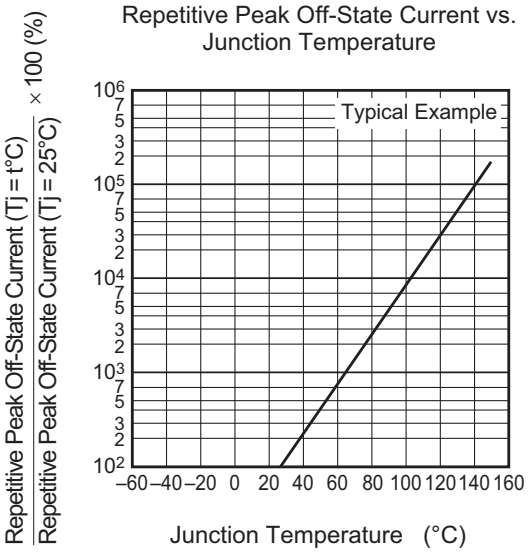

Allowable Ambient Temperature vs. RMS On-State Current



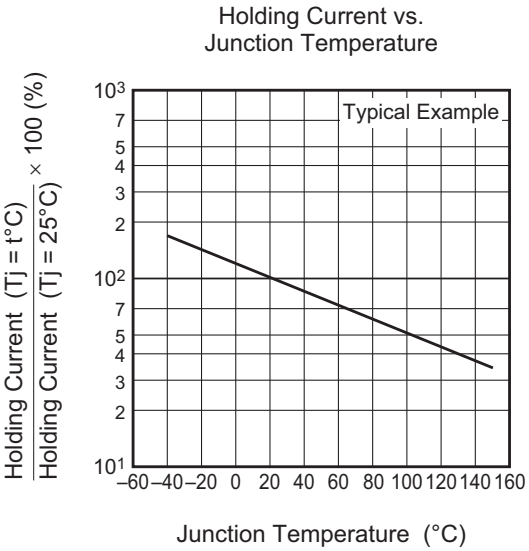

Allowable Ambient Temperature vs. RMS On-State Current



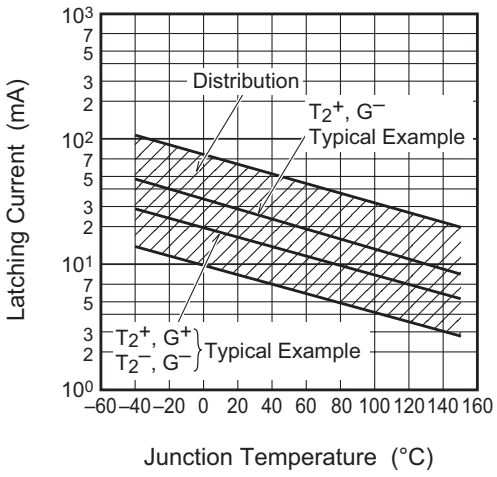

Repetitive Peak Off-State Current vs. Junction Temperature



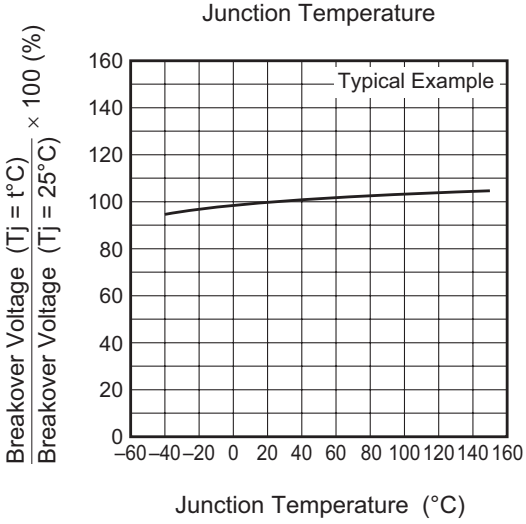

Holding Current vs. Junction Temperature



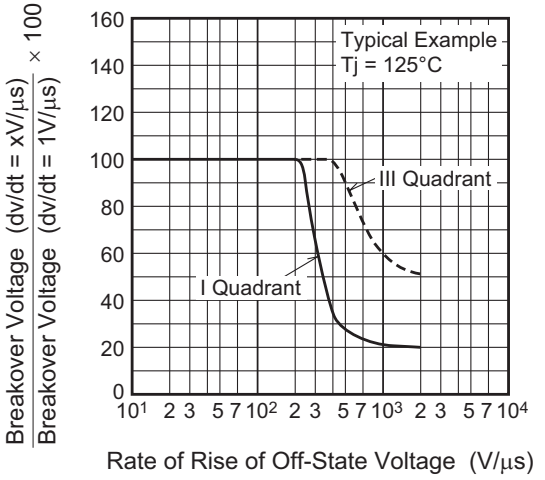
Latching Current vs. Junction Temperature



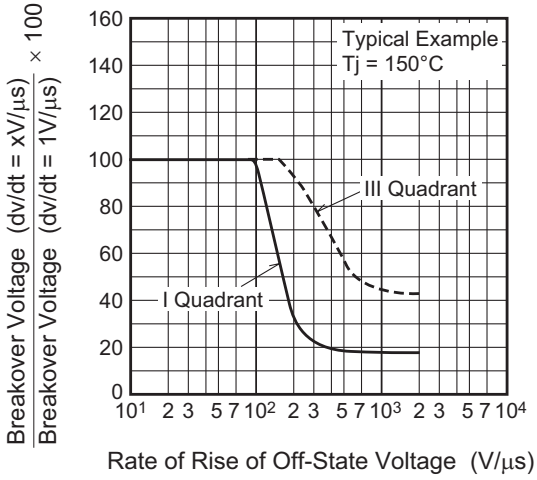

Breakover Voltage vs. Junction Temperature



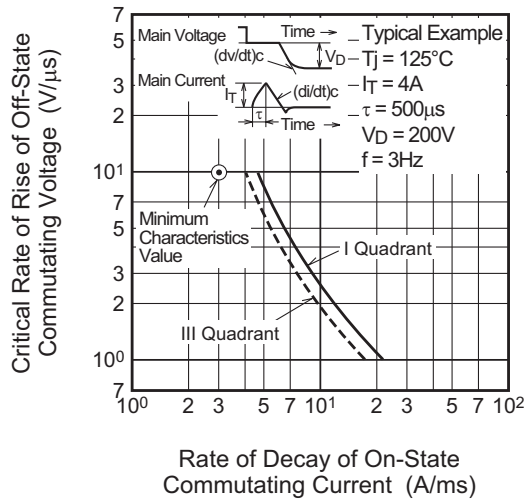

Breakover Voltage vs. Rate of Rise of Off-State Voltage (Tj=125°C)



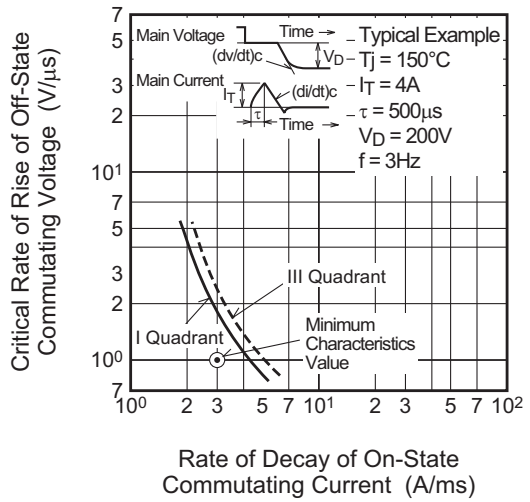

Breakover Voltage vs. Rate of Rise of Off-State Voltage (Tj=150°C)



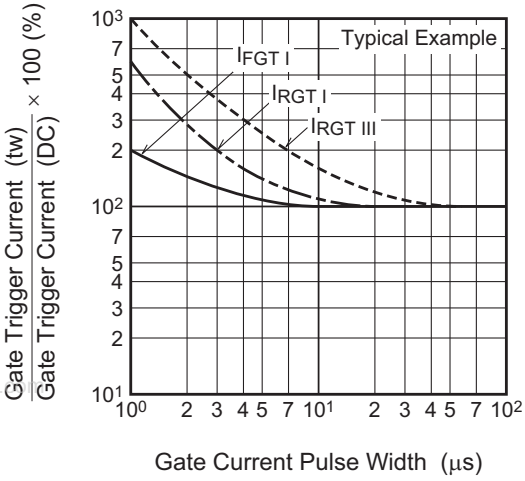

Commutation Characteristics (Tj=125°C)




Commutation Characteristics (Tj=150°C)

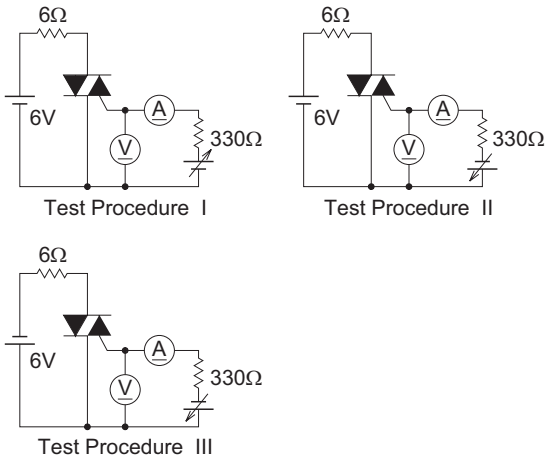


Gate Trigger Current vs.
Gate Current Pulse Width

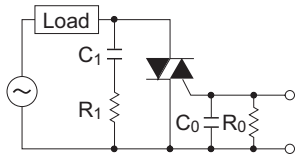





Gate Trigger Characteristics Test Circuits




Recommended Circuit Values Around The Triac

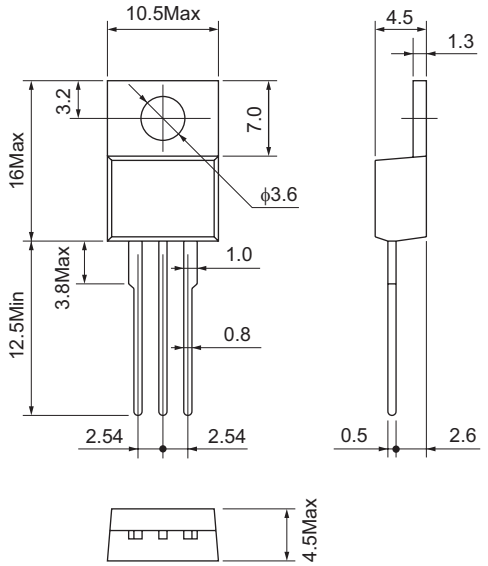



$C_1$ = 0.1 to 0.47µF $C_0$ = 0.1µF
$R_1$ = 47 to 100Ω $R_0$ = 100Ω

## Package Dimensions

| Package Name | JEITA Package Code | RENESAS Code | Previous Code | MASS[Typ.] |
|---|---|---|---|---|
| TO-220 | SC-46 | PRSS0004AA-A | — | 2.0g |

Unit: mm






## Order Code

| Lead form | Standard packing | Quantity | Standard order code | Standard order code example |
|---|---|---|---|---|
| Straight type | Vinyl sack | 100 | Type name | BCR6AM-12LB |
| Lead form | Plastic Magazine (Tube) | 50 | Type name – Lead forming code | BCR6AM-12LB-A8 |

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

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