

BCR25RM-12LB

Triac

Medium Power Use

REJ03G1715-0100

Rev.1.00

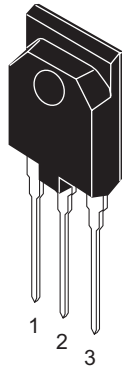
Jul 10, 2008

Features

- $I_{T(RMS)}$: 25 A
- V_{DRM} : 600 V
- I_{FGTI} , I_{RGTI} , I_{RGTHI} : 50 mA
- V_{iso} : 2000 V
- The product guaranteed maximum junction temperature of 150°C
- Insulated Type
- Planar Type

Outline

RENESAS Package code: PRSS0003ZA-A
(Package name: TO-3PFM)



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

Applications

Contactless AC switch, electric heater control, light dimmer, on/off and speed control of small induction motor, on/off control of copier lamp

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 |

Notes: 1. Gate open.

| Parameter | Symbol | Ratings | Unit | Conditions |
|--------------------------------|-------------|-------------|----------------------|--|
| RMS on-state current | I_T (RMS) | 25 | A | Commercial frequency, sine full wave 360° conduction, $T_c = 96^\circ\text{C}$ |
| Surge on-state current | I_{TSM} | 250 | A | 50 Hz sinewave 1 full cycle, peak value, non-repetitive |
| I^2t for fusion | I^2t | 313 | A^2s | Value corresponding to 1 cycle of half wave 50 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 | $^\circ\text{C}$ | |
| Storage temperature | T_{stg} | -40 to +150 | $^\circ\text{C}$ | |
| Mass | — | 5.2 | g | Typical value |
| Isolation voltage | V_{iso} | 2000 | V | $T_a = 25^\circ\text{C}$, AC 1 minute, T_1, T_2, G terminal to case |

Electrical Characteristics

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test conditions |
|---|---------------|--------------|------|---------|------------------------|---|
| Repetitive peak off-state current | I_{DRM} | — | — | 3.0/5.0 | mA | $T_j = 125^\circ\text{C} / 150^\circ\text{C}$, V_{DRM} applied |
| On-state voltage | V_{TM} | — | — | 1.5 | V | $T_c = 25^\circ\text{C}$, $I_{TM} = 40\text{ A}$, instantaneous measurement |
| Gate trigger voltage ^{Note2} | I | V_{FGTI} | — | — | 2.0 | $T_j = 25^\circ\text{C}$, $V_D = 6\text{ V}$, $R_L = 6\ \Omega$, $R_G = 330\ \Omega$ |
| | II | V_{RGTI} | — | — | 2.0 | |
| | III | V_{RGTIII} | — | — | 2.0 | |
| Gate trigger current ^{Note2} | I | I_{FGTI} | — | — | 50 | $T_j = 25^\circ\text{C}$, $V_D = 6\text{ V}$, $R_L = 6\ \Omega$, $R_G = 330\ \Omega$ |
| | II | I_{RGTI} | — | — | 50 | |
| | III | I_{RGTIII} | — | — | 50 | |
| Gate non-trigger voltage | V_{GD} | 0.2/0.1 | — | — | V | $T_j = 125^\circ\text{C} / 150^\circ\text{C}$, $V_D = 1/2 V_{DRM}$ |
| Thermal resistance | $R_{th(j-c)}$ | — | — | 1.7 | $^\circ\text{C/W}$ | Junction to case ^{Note3} |
| Critical-rate of rise of off-state commutation voltage ^{Note4} | $(dv/dt)_c$ | 10/1 | — | — | $\text{V}/\mu\text{s}$ | $T_j = 125^\circ\text{C} / 150^\circ\text{C}$ |

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

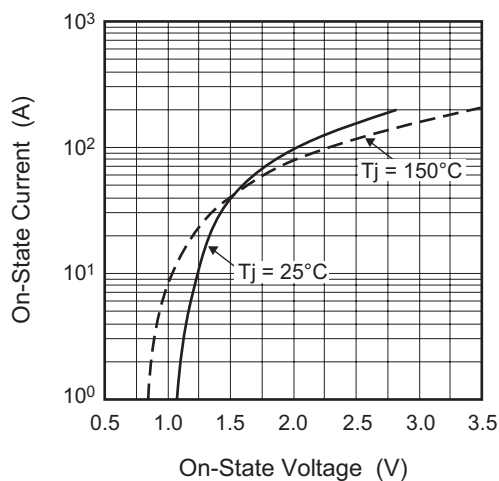
3. The contact thermal resistance $R_{th(c-f)}$ in case of greasing is 0.5°C/W .

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

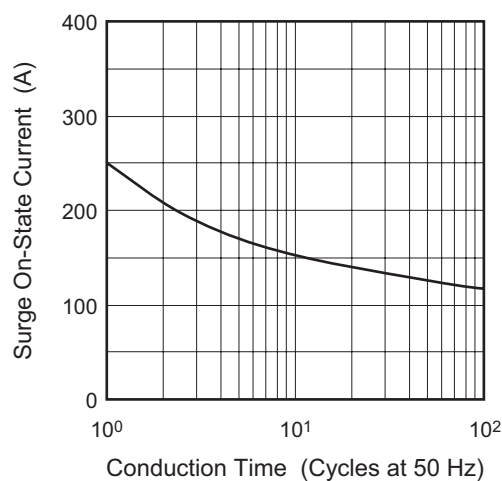
| Test conditions | Commutating voltage and current waveforms (inductive load) |
|--|--|
| 1. Junction temperature $T_j = 125/150^\circ\text{C}$ 2. Rate of decay of on-state commutating current $(di/dt)_c = -13\text{ A/ms}$ 3. Peak off-state voltage $V_D = 400\text{ V}$ | |

Performance Curves

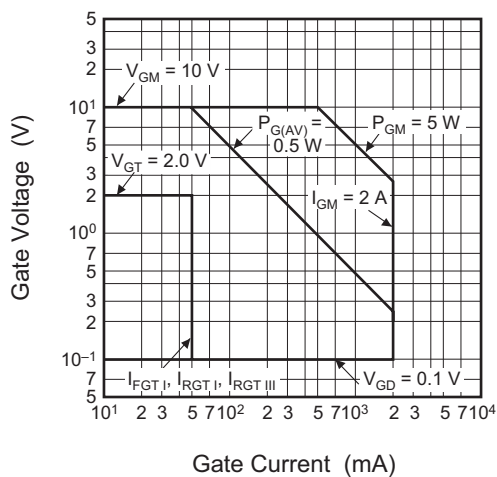
Maximum On-State Characteristics



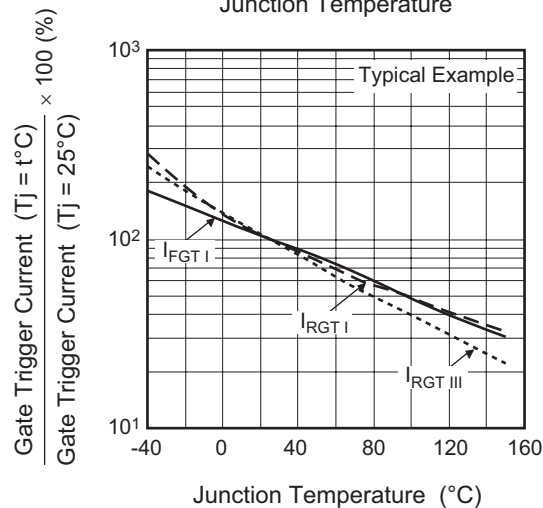
Rated Surge On-State Current



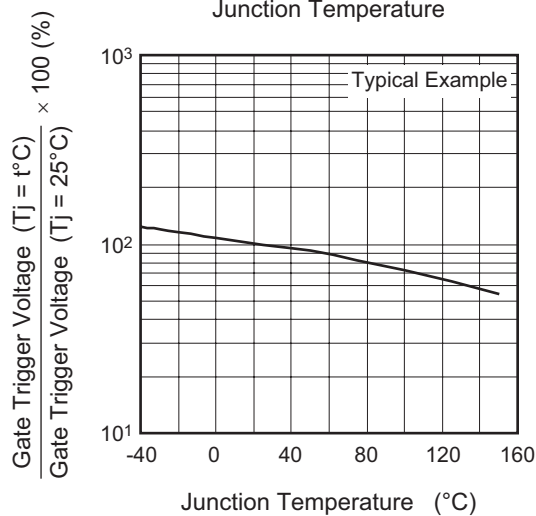
Gate Characteristics (I, II and III)



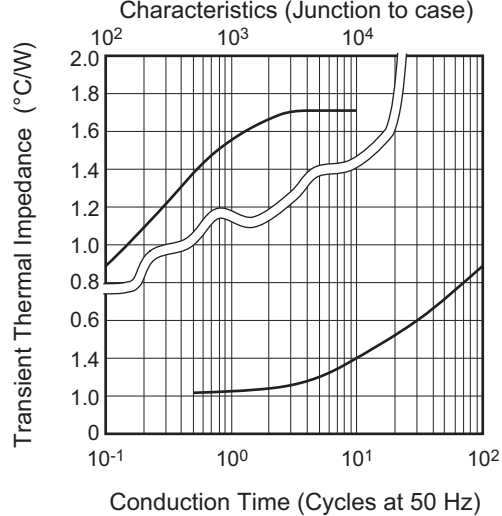
Gate Trigger Current vs. Junction Temperature



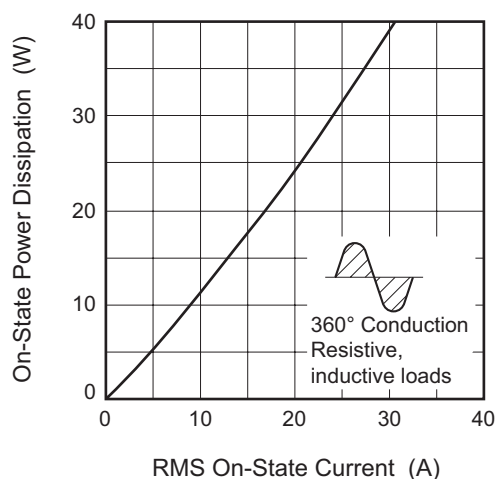
Gate Trigger Voltage vs. Junction Temperature



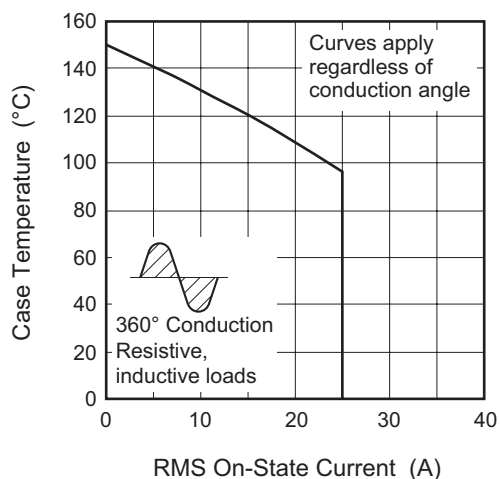
Maximum Transient Thermal Impedance Characteristics (Junction to case)



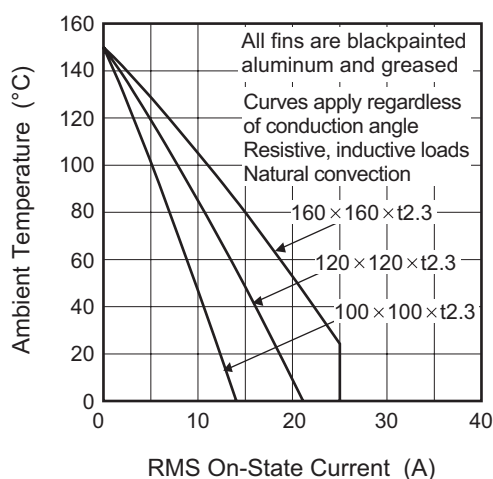
Maximum On-State Power Dissipation



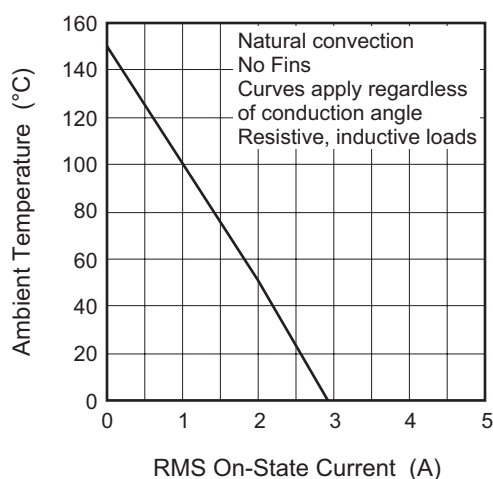
Allowable Case Temperature vs. RMS On-State Current



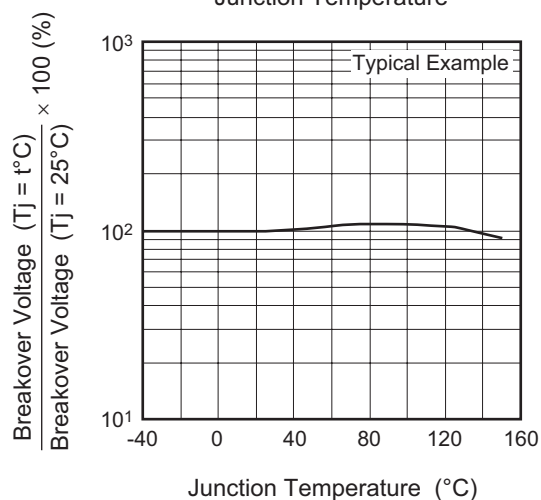
Allowable Ambient Temperature vs. RMS On-State Current



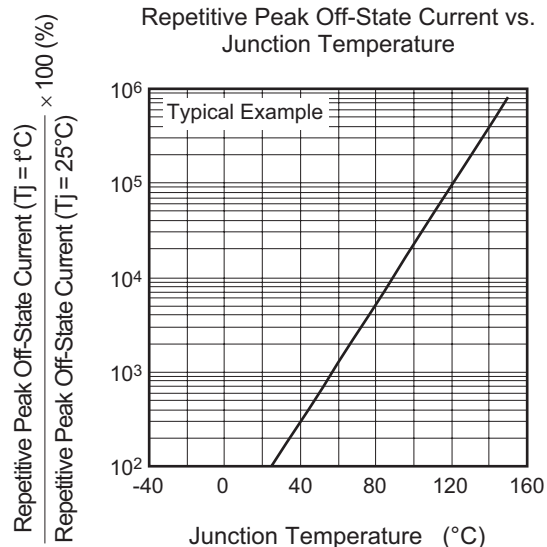
Allowable Ambient Temperature vs. RMS On-State Current

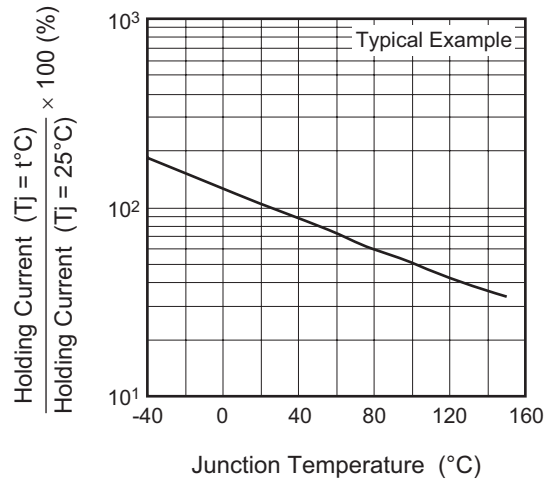
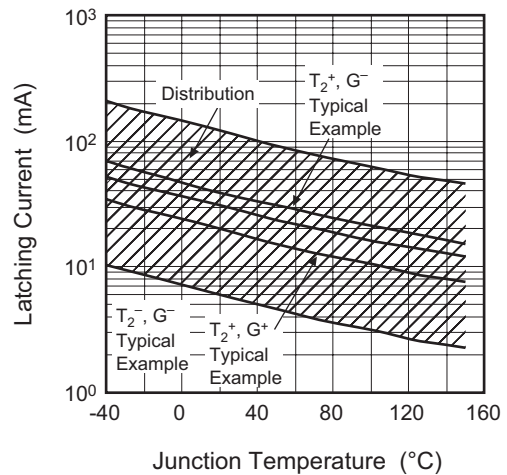
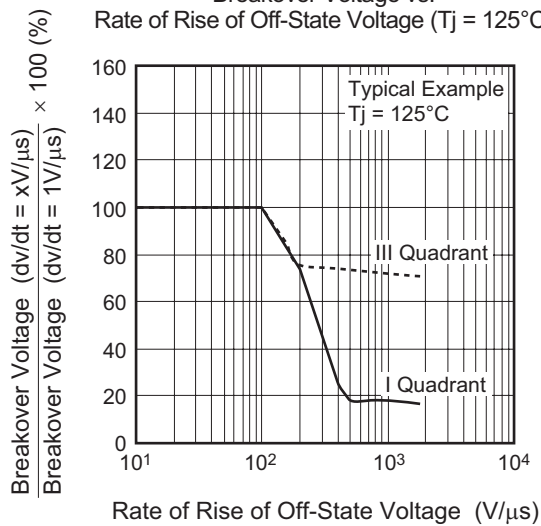
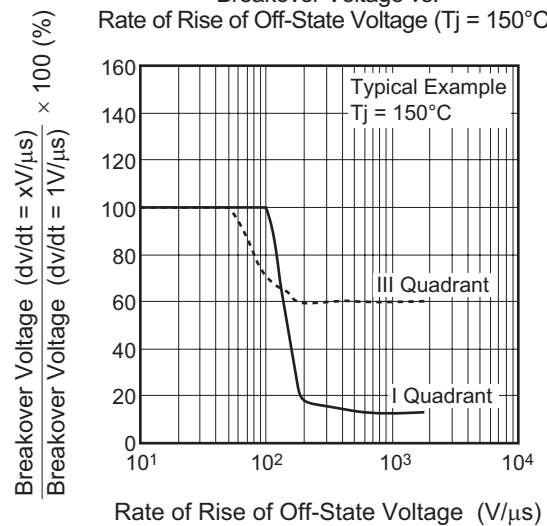
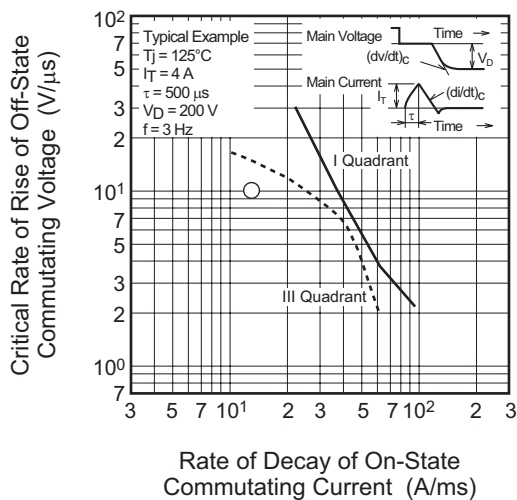
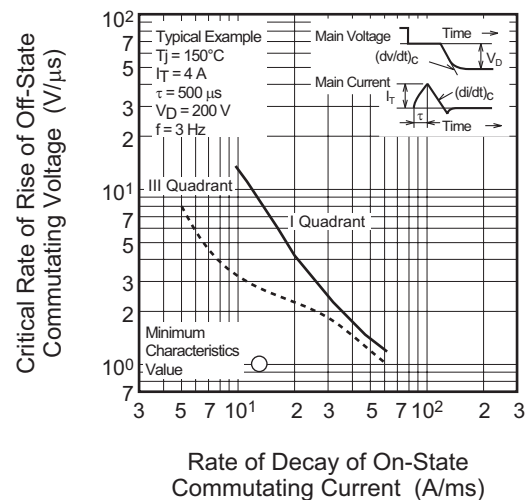


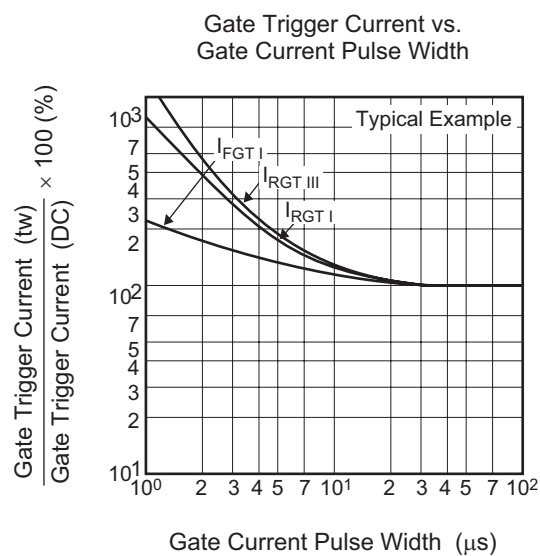
Breakover Voltage vs. Junction Temperature



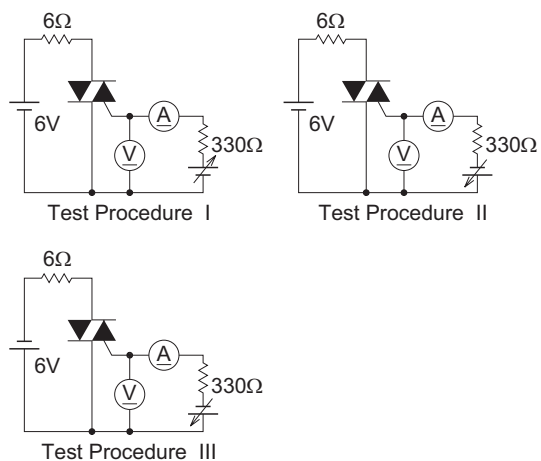
Repetitive Peak Off-State Current vs. Junction Temperature



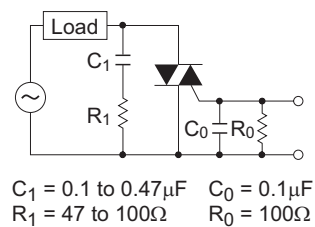
Holding Current vs.
Junction TemperatureLatching Current vs.
Junction TemperatureBreakover Voltage vs.
Rate of Rise of Off-State Voltage ($T_J = 125^\circ\text{C}$)Breakover Voltage vs.
Rate of Rise of Off-State Voltage ($T_J = 150^\circ\text{C}$)Commutation Characteristics ($T_J = 125^\circ\text{C}$)Commutation Characteristics ($T_J = 150^\circ\text{C}$)



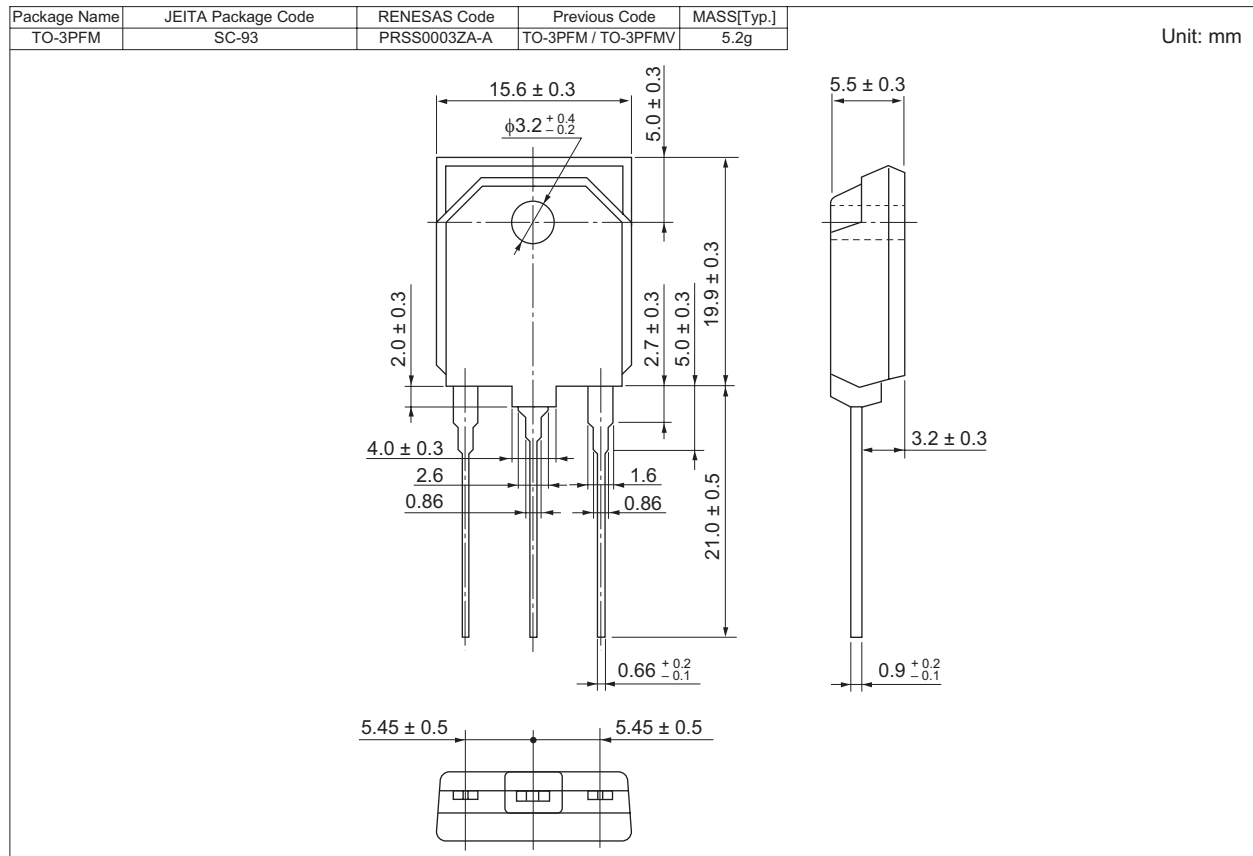
Gate Trigger Characteristics Test Circuits



Recommended Circuit Values Around The Triac



Package Dimensions



Order Code

| Lead form | Standard packing | Quantity | Standard order code | Standard order code example |
|---------------|------------------|----------|---------------------|-----------------------------|
| Straight type | Magazine (Tube) | 30 | Type name | BCR25RM-12LB |

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

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