

BCR8FM-12LB

600V - 8A - Triac

Medium Power Use

R07DS1186EJ0100

Rev.1.00

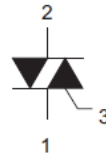
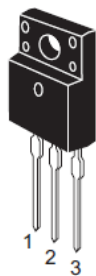
Mar 03, 2014

Features

- $I_{T(RMS)}$: 8 A
- V_{DRM} : 600 V
- T_j : 150 °C
- I_{FGT} , I_{RGT} , $I_{RGT III}$:30 mA(20mA) ^{Note5}
- Insulated Type
- Planar Passivation Type
- Viso: 2000V

Outline

RENESAS Package code: PRSS0003AG-A
(Package name: TO-220FP)



1. T₁ Terminal
2. T₂ 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 | |
|--|-----------|---------------|------|
| | | 12 | Unit |
| 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 | $I_{T(RMS)}$ | 8 | A | Commercial frequency, sine full wave 360°conduction, $T_c = 114^\circ\text{C}$ |
| Surge on-state current | I_{TSM} | 80 | A | 60 Hz sinewave 1 full cycle, peak value, non-repetitive |
| I^2t for fusion | I^2t | 26 | 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 | T_j | -40 to +150 | °C | |
| Storage temperature | T_{stg} | -40 to +150 | °C | |
| Mass | — | 1.9 | g | Typical value |
| Isolation voltage ^{Note6} | V_{iso} | 2000 | V | $T_a=25^\circ\text{C}$, AC 1 minute, $T_1 \cdot T_2 \cdot G$ terminal to case |

Electrical Characteristics

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test conditions | |
|---|---------------|--------------|------|------|---------------------------|--|--|
| Repetitive peak off-state current | I_{DRM} | — | — | 2.0 | mA | $T_j = 150^\circ\text{C}$, V_{DRM} applied | |
| On-state voltage | V_{TM} | — | — | 1.6 | V | $T_c = 25^\circ\text{C}$, $I_{TM} = 12\text{A}$, instantaneous measurement | |
| Gate trigger voltage ^{Note2} | I | V_{FGTI} | — | — | 1.5 | V | $T_j = 25^\circ\text{C}$, $V_D = 6\text{V}$, $R_L = 6\ \Omega$, $R_G = 330\ \Omega$ |
| | II | V_{RGTI} | — | — | 1.5 | V | |
| | III | V_{RGTIII} | — | — | 1.5 | V | |
| Gate trigger current ^{Note2} | I | I_{FGTI} | — | — | 30 ^{Note5} | mA | $T_j = 25^\circ\text{C}$, $V_D = 6\text{V}$, $R_L = 6\ \Omega$, $R_G = 330\ \Omega$ |
| | II | I_{RGTI} | — | — | 30 ^{Note5} | mA | |
| | III | I_{RGTIII} | — | — | 30 ^{Note5} | mA | |
| Gate non-trigger voltage | V_{GD} | 0.2 | — | — | V | $T_j = 125^\circ\text{C}$, $V_D = 1/2 V_{DRM}$ | |
| | | 0.1 | — | — | | $T_j = 150^\circ\text{C}$, $V_D = 1/2 V_{DRM}$ | |
| Thermal resistance | $R_{th(j-c)}$ | — | — | 3.6 | $^\circ\text{C}/\text{W}$ | Junction to case ^{Note3} | |
| Critical-rate of rise of off-state commutation voltage ^{Note4} | $(dv/dt)_c$ | 10 | — | — | $\text{V}/\mu\text{s}$ | $T_j = 125^\circ\text{C}$ | |
| | | 1 | — | — | | $T_j = 150^\circ\text{C}$ | |

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 $0.5^\circ\text{C}/\text{W}$.

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

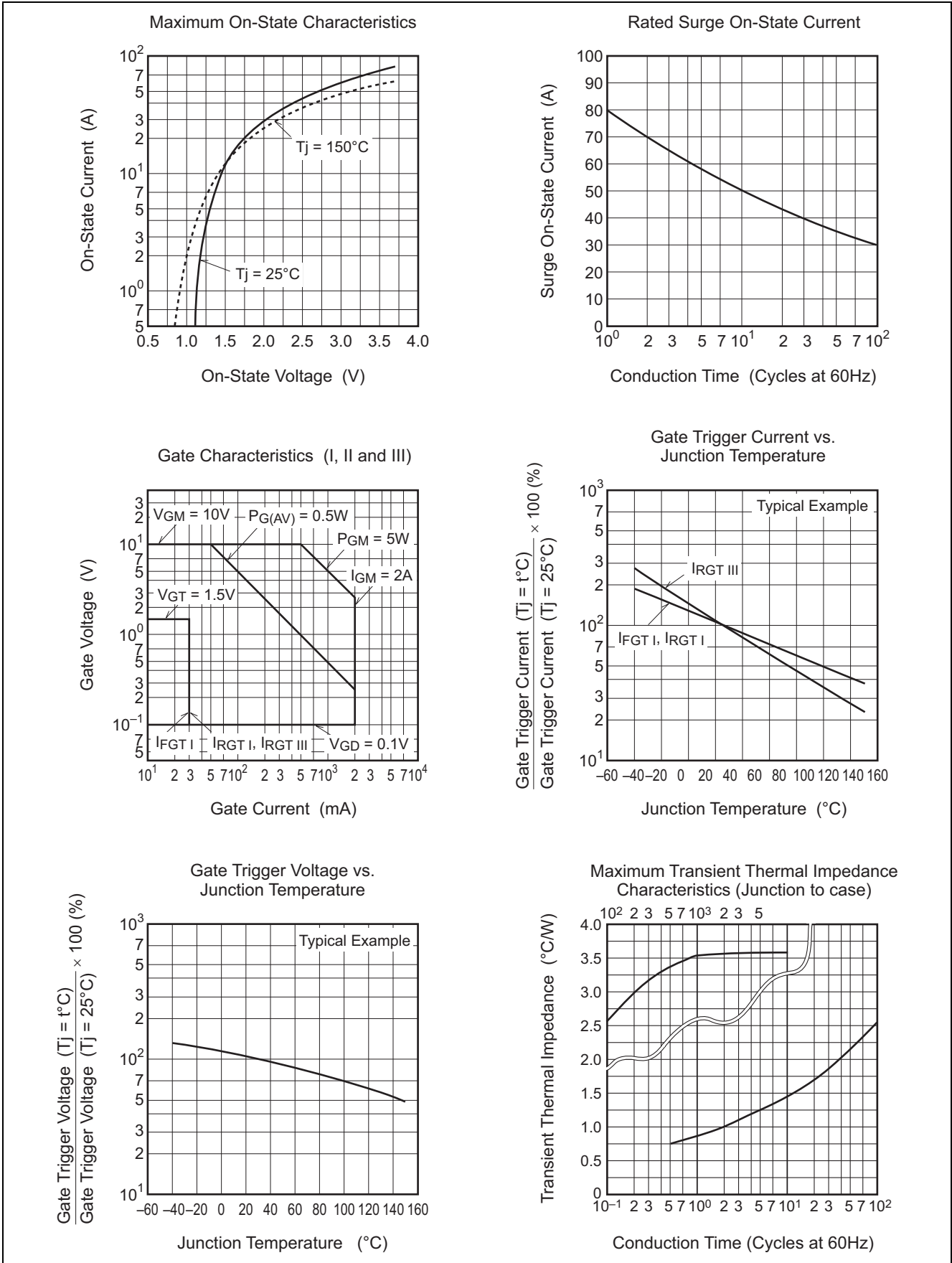
5. High sensitivity ($I_{GT} \leq 20\text{mA}$) is also available. (I_{GT} item:1)

6. Make sure that your finished product containing this device meets your safe isolation requirements.

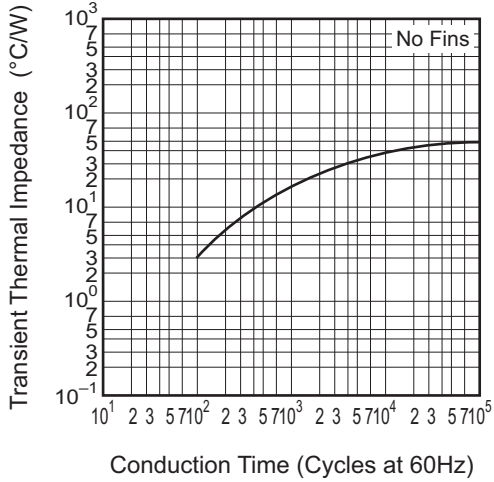
For safety, it's advisable that heatsink is electrically floating.

| Test conditions | Commutating voltage and current waveforms (inductive load) |
|---|--|
| 1. Junction temperature $T_j = 125^\circ\text{C}/150^\circ\text{C}$ 2. Rate of rise of off-state commutating voltage $(dv/dt)_c = 4\ \text{A}/\text{ms}$ 3. Peak off-state voltage $V_D = 400\ \text{V}$ | |

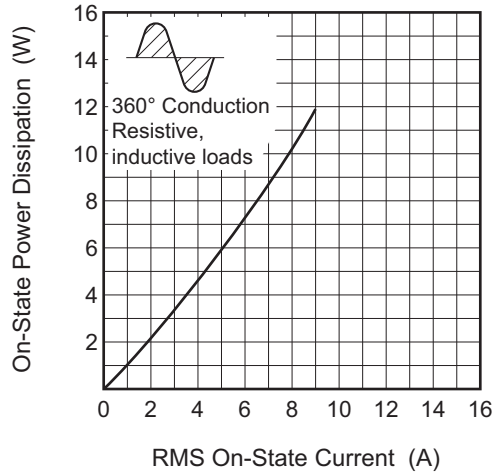
Performance Curves



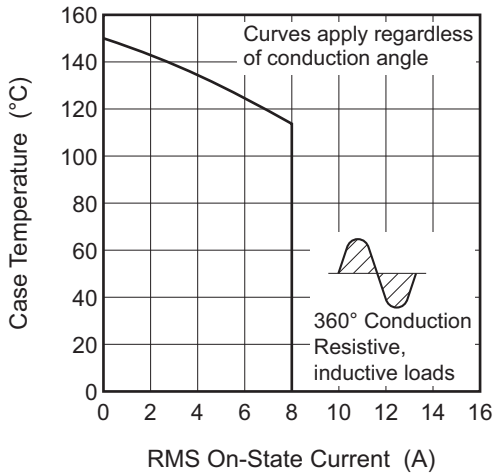
Maximum Transient Thermal Impedance Characteristics (Junction to ambient)



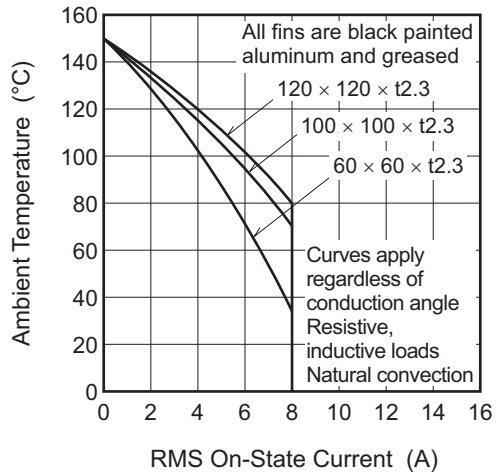
Maximum On-State Power Dissipation



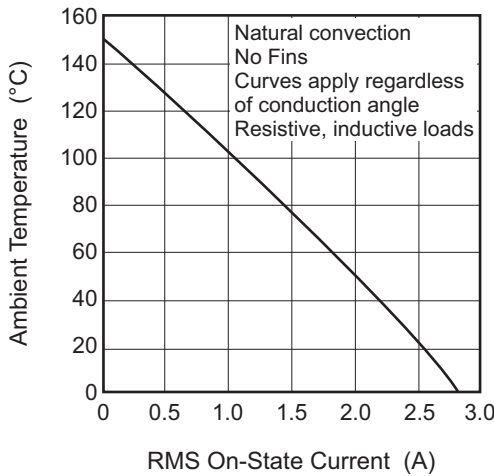
Allowable Case Temperature vs. RMS On-State Current



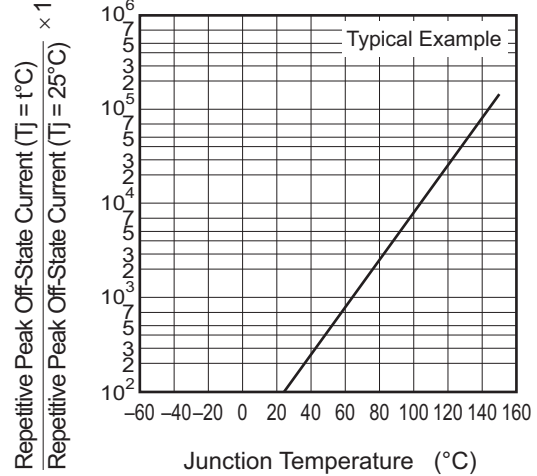
Allowable Ambient Temperature vs. RMS On-State Current



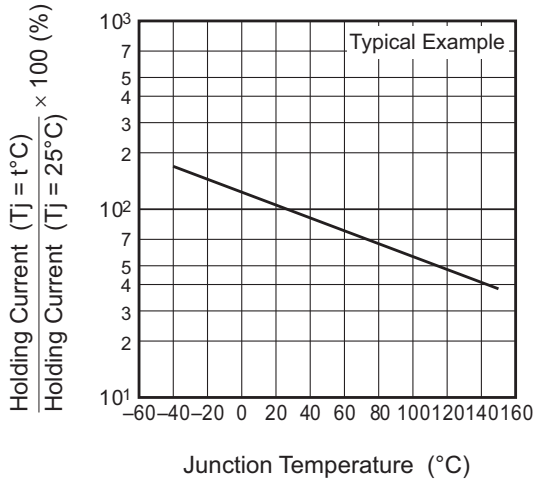
Allowable Ambient Temperature vs. RMS On-State Current



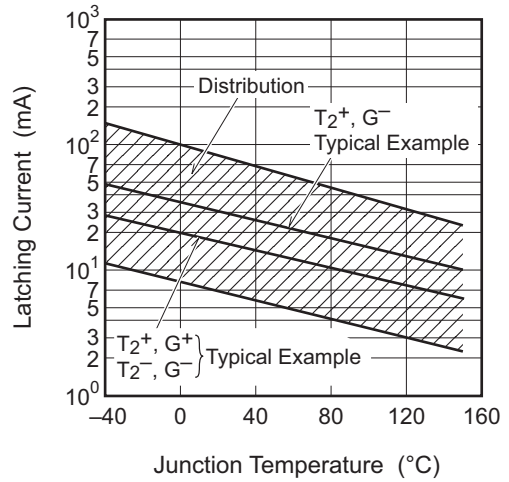
Repetitive Peak Off-State Current vs. Junction Temperature



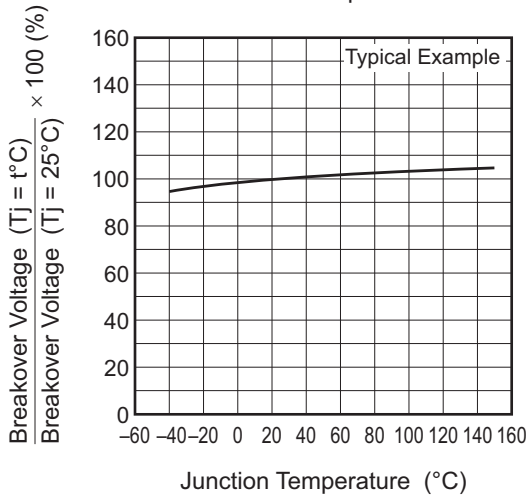
Holding Current vs. Junction Temperature



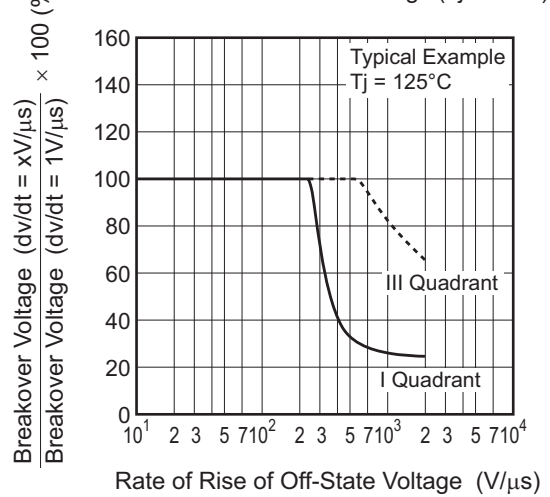
Latching Current vs. Junction Temperature



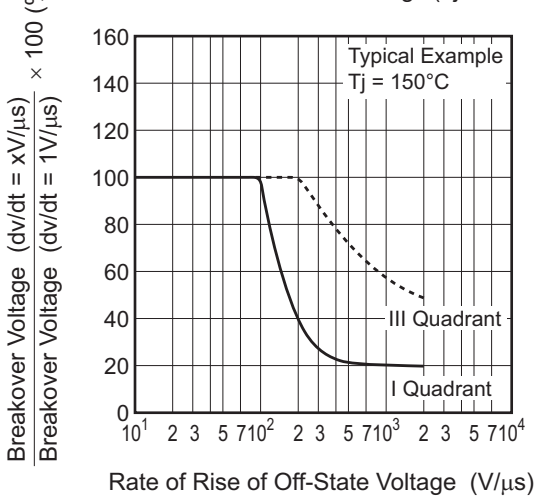
Breakover Voltage vs. Junction Temperature



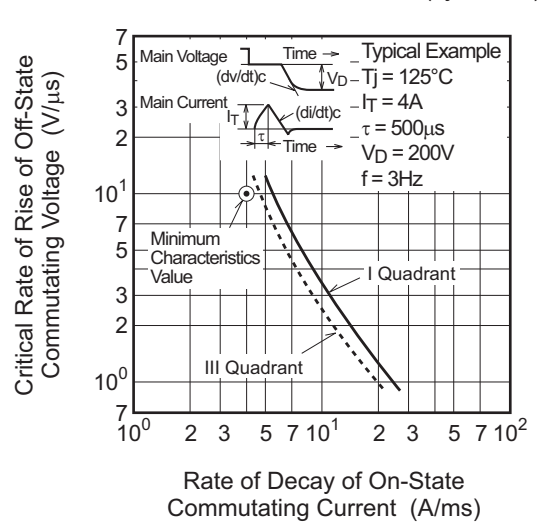
Breakover Voltage vs. Rate of Rise of Off-State Voltage (Tj=125°C)



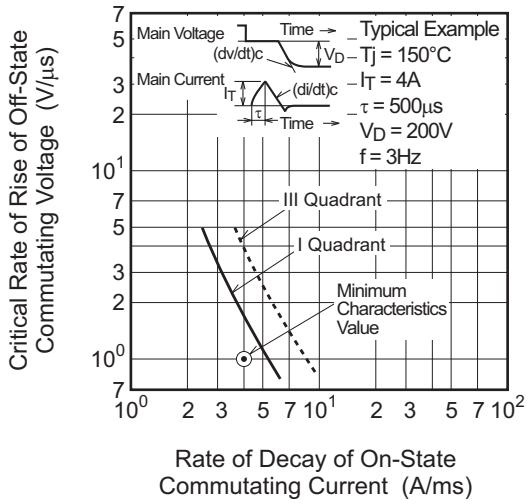
Breakover Voltage vs. Rate of Rise of Off-State Voltage (Tj=150°C)



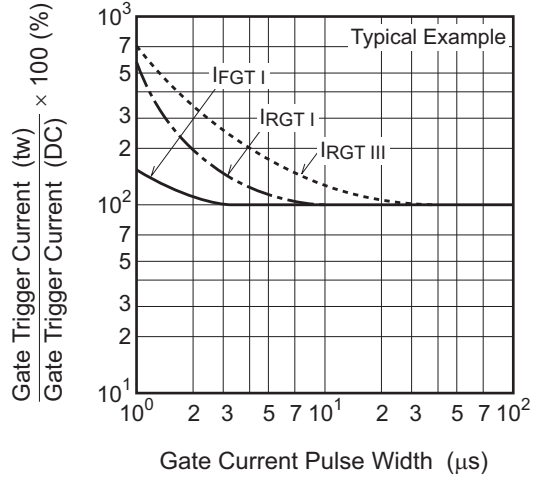
Commutation Characteristics (Tj=125°C)



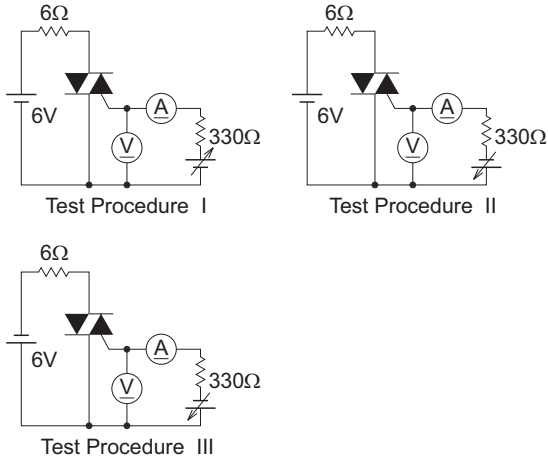
Commutation Characteristics (Tj=150°C)



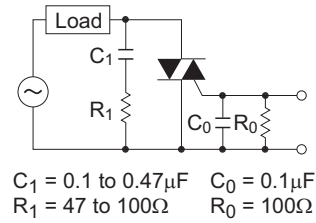
Gate Trigger Current vs. Gate Current Pulse Width



Gate Trigger Characteristics Test Circuits



Recommended Circuit Values Around The Triac



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Renesas Electronics America Inc.
2801 Scott Boulevard Santa Clara, CA 95050-2549, U.S.A.
Tel: +1-408-586-6000, Fax: +1-408-588-6130

Renesas Electronics Canada Limited
1101 Nicholson Road, Newmarket, Ontario L3Y 9C3, Canada
Tel: +1-905-898-5441, Fax: +1-905-898-3220

Renesas Electronics Europe Limited
Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K
Tel: +44-1628-585-100, Fax: +44-1628-585-900

Renesas Electronics Europe GmbH
Arcadiastrasse 10, 40472 Düsseldorf, Germany
Tel: +49-211-6503-0, Fax: +49-211-6503-1327

Renesas Electronics (China) Co., Ltd.
Room 1709, Quantum Plaza, No.27 ZhiChunLu Haidian District, Beijing 100191, P.R.China
Tel: +86-10-8235-1155, Fax: +86-10-8235-7679

Renesas Electronics (Shanghai) Co., Ltd.
Unit 301, Tower A, Central Towers, 555 Langao Road, Putuo District, Shanghai, P. R. China 200333
Tel: +86-21-2226-0888, Fax: +86-21-2226-0999

Renesas Electronics Hong Kong Limited
Unit 1601-1613, 16/F., Tower 2, Grand Century Place, 193 Prince Edward Road West, Mongkok, Kowloon, Hong Kong
Tel: +852-2265-6688, Fax: +852 2886-9022/9044

Renesas Electronics Taiwan Co., Ltd.
13F, No. 363, Fu Shing North Road, Taipei 10543, Taiwan
Tel: +886-2-8175-9600, Fax: +886 2-8175-9670

Renesas Electronics Singapore Pte. Ltd.
80 Bendemeer Road, Unit #06-02 Hyflux Innovation Centre, Singapore 339949
Tel: +65-6213-0200, Fax: +65-6213-0300

Renesas Electronics Malaysia Sdn.Bhd.
Unit 906, Block B, Menara Amcorp, Amcorp Trade Centre, No. 18, Jln Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia
Tel: +60-3-7955-9390, Fax: +60-3-7955-9510

Renesas Electronics Korea Co., Ltd.
12F., 234 Teheran-ro, Gangnam-Ku, Seoul, 135-920, Korea
Tel: +82-2-558-3737, Fax: +82-2-558-5141