

# CR8PM-12B

Thyristor

Medium Power Use

R07DS0117EJ0100

Rev.1.00

Sep 03, 2010

## Features

- $I_{T(AV)}$  : 8 A
- $V_{DRM}$  : 600 V
- $I_{GT}$  : 15 mA
- $V_{ISO}$  : 2000 V
- Insulated Type
- Planar Passivation Type
- UL Recognized : Yellow Card No. E223904

## Outline

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



1. Cathode
2. Anode
3. Gate

## Applications

Switching mode power supply, regulator for autcycle, motor control, heater control, and other general purpose control applications

## Maximum Ratings

| Parameter                           | Symbol      | Voltage class | Unit |
|-------------------------------------|-------------|---------------|------|
|                                     |             | 12            |      |
| Repetitive peak reverse voltage     | $V_{RRM}$   | 600           | V    |
| Non-repetitive peak reverse voltage | $V_{RSM}$   | 720           | V    |
| DC reverse voltage                  | $V_{R(DC)}$ | 480           | V    |
| Repetitive peak off-state voltage   | $V_{DRM}$   | 600           | V    |
| DC off-state voltage                | $V_{D(DC)}$ | 480           | V    |

| Parameter                      | Symbol       | Ratings      | Unit                 | Conditions                                                                         |
|--------------------------------|--------------|--------------|----------------------|------------------------------------------------------------------------------------|
| RMS on-state current           | $I_T (RMS)$  | 12.6         | A                    |                                                                                    |
| Average on-state current       | $I_T (AV)$   | 8            | A                    | Commercial frequency, sine half wave<br>180° conduction, $T_c = 106^\circ\text{C}$ |
| Surge on-state current         | $I_{TSM}$    | 120          | A                    | 60Hz sine half wave 1 full cycle,<br>peak value, non-repetitive                    |
| $I^2t$ for fusing              | $I^2t$       | 60           | $\text{A}^2\text{s}$ | Value corresponding to 1 cycle of half<br>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 forward voltage      | $V_{FGM}$    | 6            | V                    |                                                                                    |
| Peak gate reverse voltage      | $V_{RGM}$    | 10           | V                    |                                                                                    |
| Peak gate forward current      | $I_{FGM}$    | 2            | A                    |                                                                                    |
| Junction temperature           | $T_j$        | – 40 to +150 | $^\circ\text{C}$     |                                                                                    |
| Storage temperature            | $T_{stg}$    | – 40 to +150 | $^\circ\text{C}$     |                                                                                    |
| Mass                           | —            | 2.0          | g                    | Typical value                                                                      |
| Isolation voltage              | $V_{iso}$    | 2000         | V                    | $T_a = 25^\circ\text{C}$ , AC 1 minute,<br>each terminal to case                   |

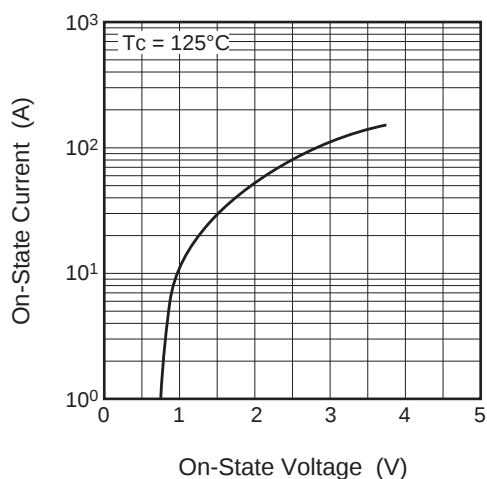
## Electrical Characteristics

| Parameter                         | Symbol         | Rated value |      |         | Unit               | Test conditions                                                            |
|-----------------------------------|----------------|-------------|------|---------|--------------------|----------------------------------------------------------------------------|
|                                   |                | Min.        | Typ. | Max.    |                    |                                                                            |
| Repetitive peak reverse current   | $I_{RRM}$      | —           | —    | 2.0/5.0 | mA                 | $T_j = 125^\circ\text{C}/150^\circ\text{C}$ , $V_{RRM}$ applied            |
| Repetitive peak off-state current | $I_{DRM}$      | —           | —    | 2.0/5.0 | mA                 | $T_j = 125^\circ\text{C}/150^\circ\text{C}$ , $V_{DRM}$ applied            |
| On-state voltage                  | $V_{TM}$       | —           | —    | 1.4     | V                  | $T_c = 25^\circ\text{C}$ , $I_{TM} = 25\text{ A}$ ,<br>instantaneous value |
| Gate trigger voltage              | $V_{GT}$       | —           | —    | 1.0     | V                  | $T_j = 25^\circ\text{C}$ , $V_D = 6\text{ V}$ , $I_T = 1\text{ A}$         |
| Gate non-trigger voltage          | $V_{GD}$       | 0.2/0.1     | —    | —       | V                  | $T_j = 125^\circ\text{C}/150^\circ\text{C}$ , $V_D = 1/2 V_{DRM}$          |
| Gate trigger current              | $I_{GT}$       | —           | —    | 15      | mA                 | $T_j = 25^\circ\text{C}$ , $V_D = 6\text{ V}$ , $I_T = 1\text{ A}$         |
| Holding current                   | $I_H$          | —           | 15   | —       | mA                 | $T_j = 25^\circ\text{C}$ , $V_D = 12\text{ V}$                             |
| Thermal resistance                | $R_{th (j-c)}$ | —           | —    | 3.7     | $^\circ\text{C/W}$ | Junction to case <sup>Note1</sup>                                          |

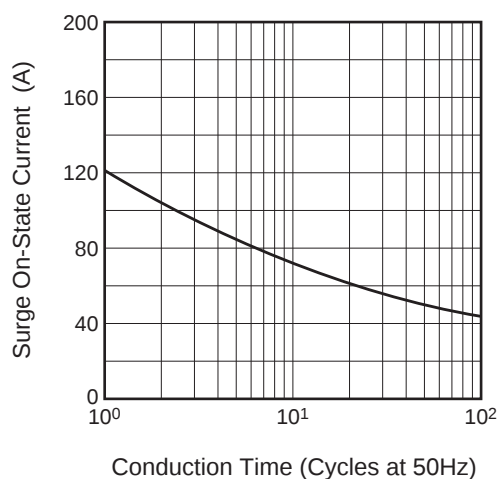
Notes: 1. The contact thermal resistance  $R_{th (c-f)}$  in case of greasing is  $0.5^\circ\text{C/W}$ .

## Performance Curves

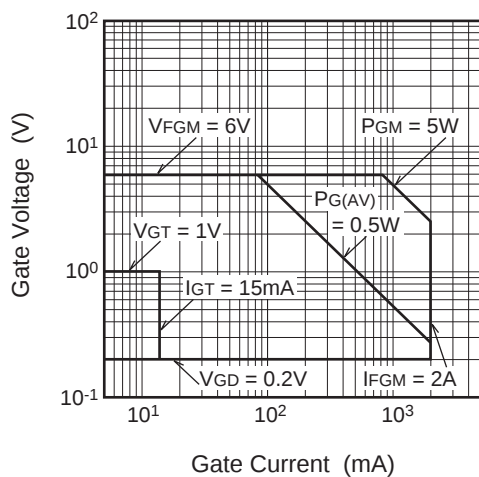
Maximum On-State Characteristics



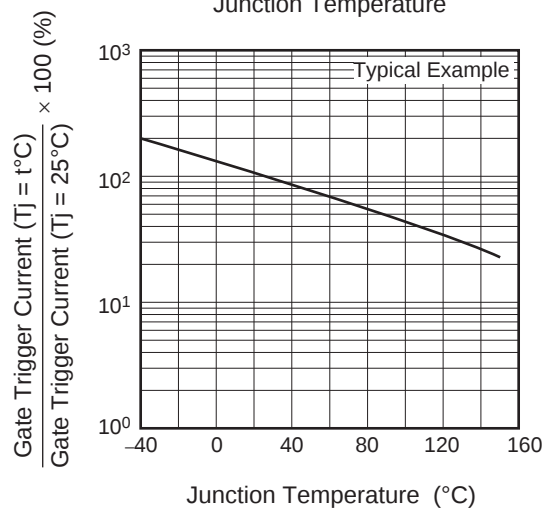
Rated Surge On-State Current



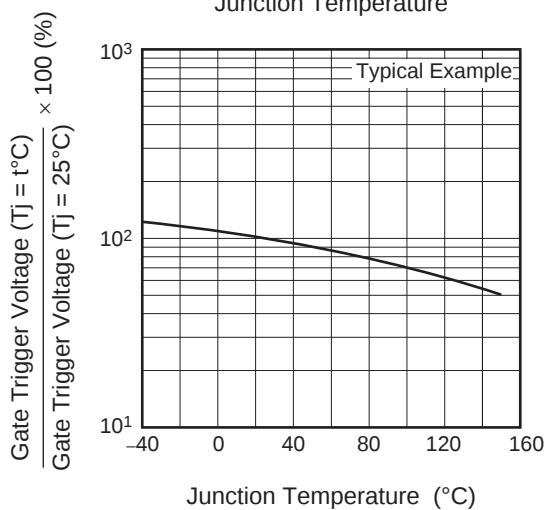
Gate Characteristics



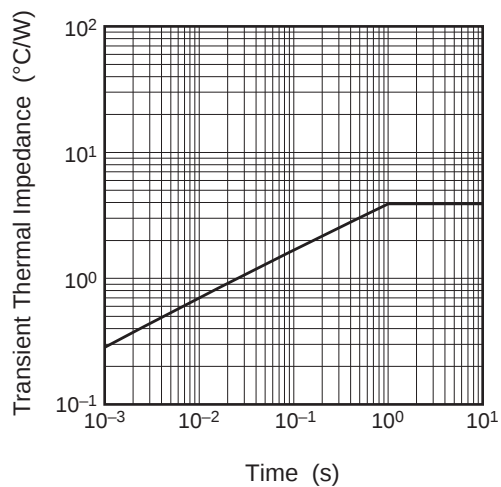
Gate Trigger Current vs. Junction Temperature

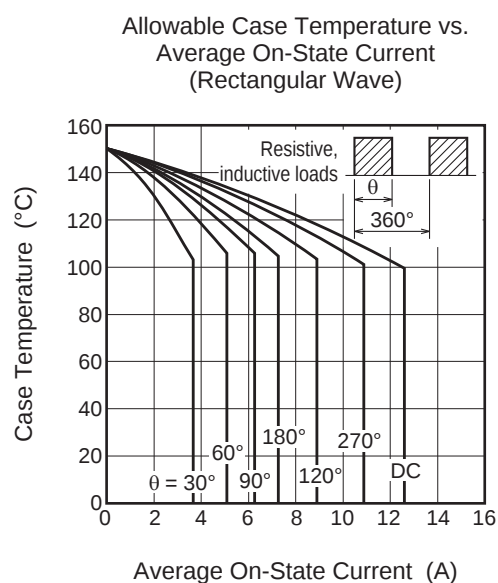
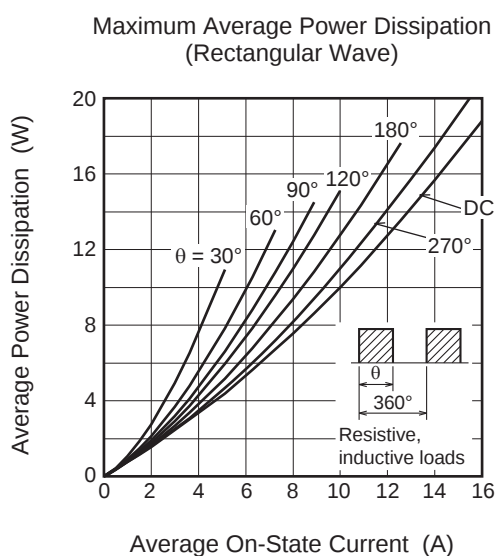
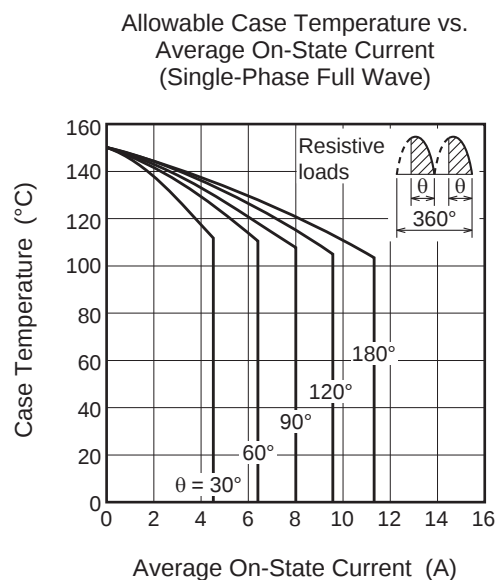
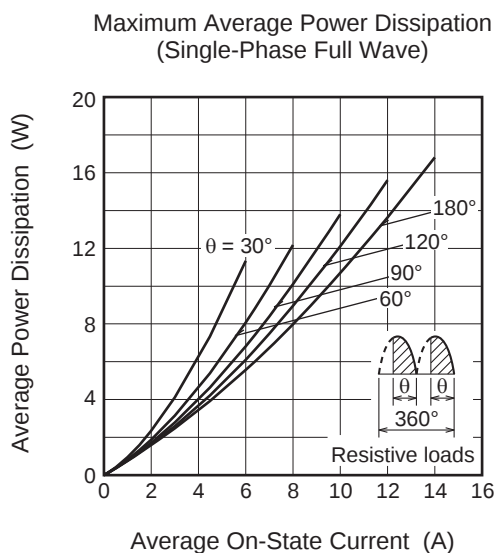
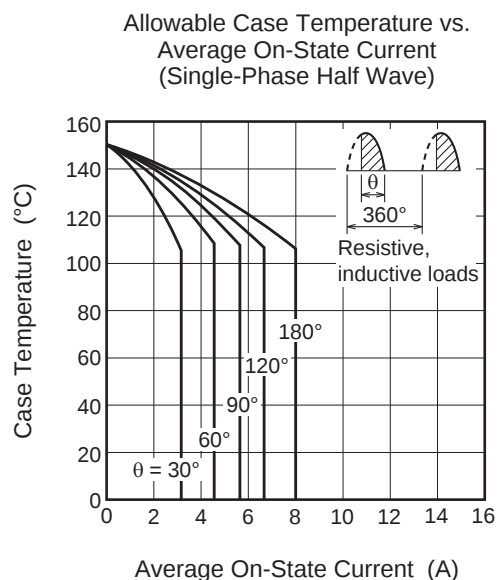
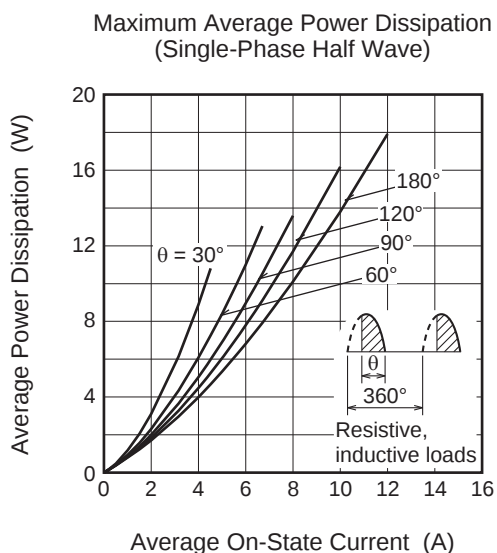


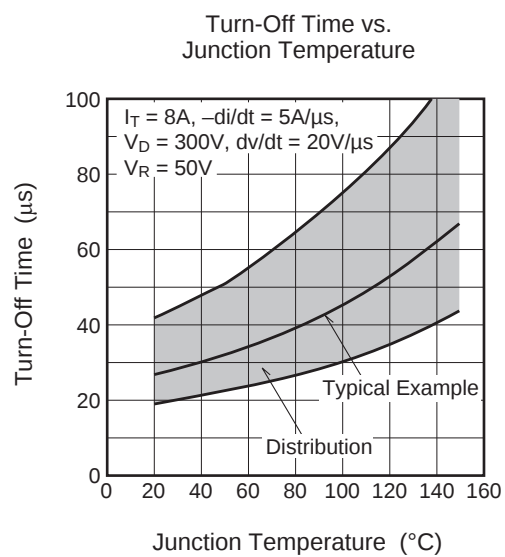
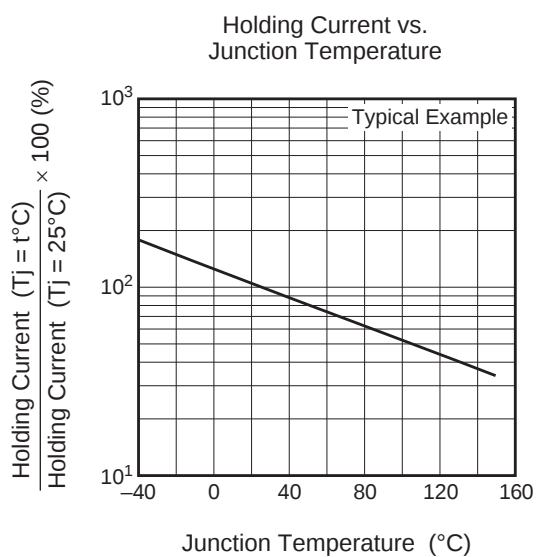
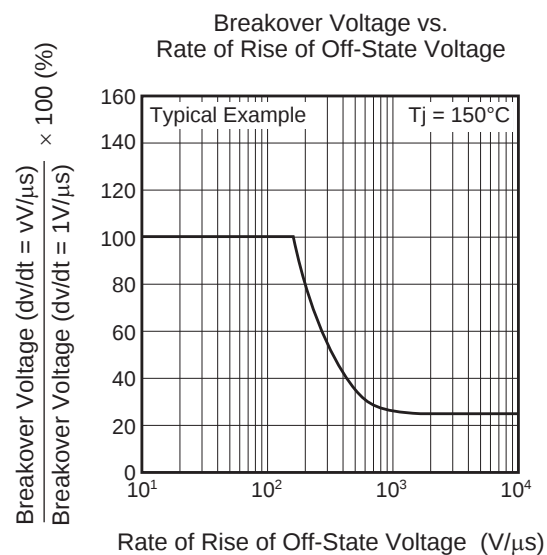
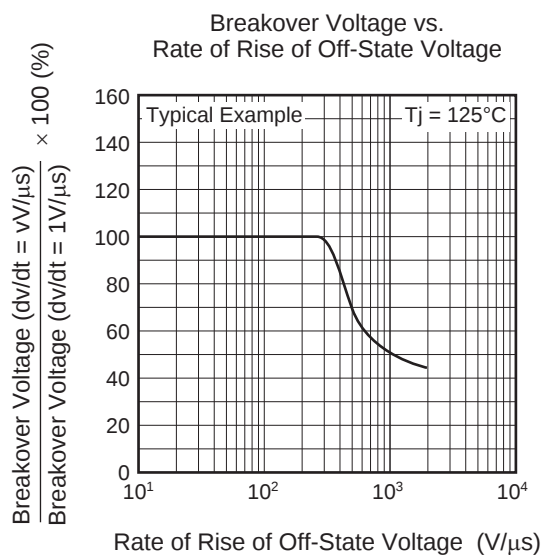
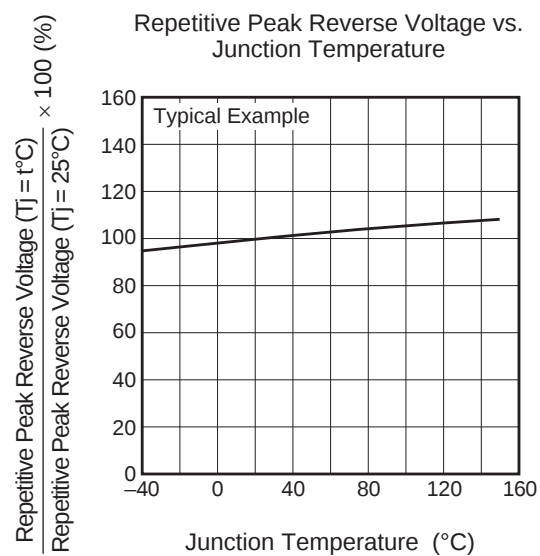
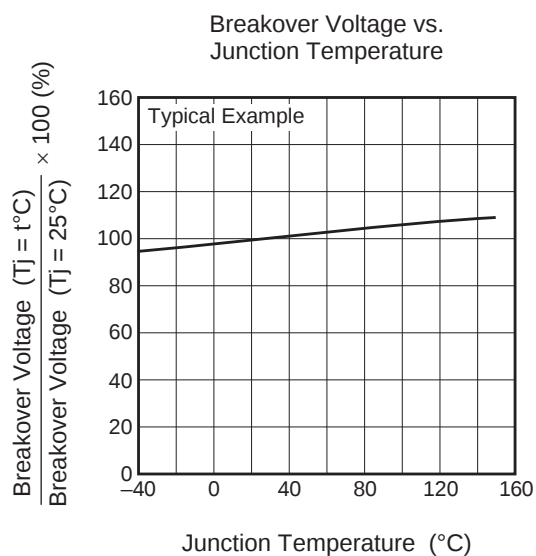
Gate Trigger Voltage vs. Junction Temperature

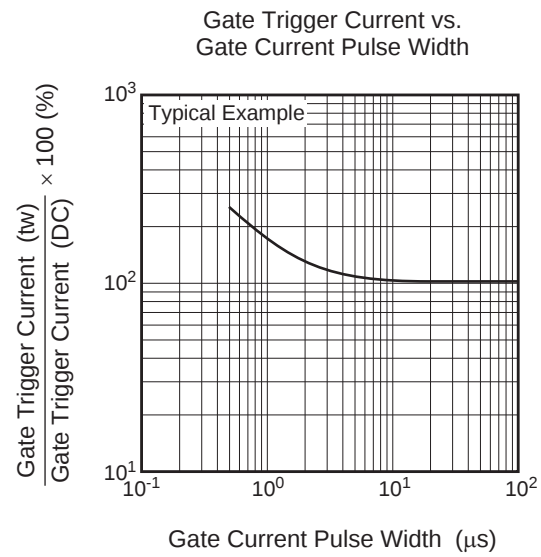


Maximum Transient Thermal Impedance Characteristics (Junction to case)





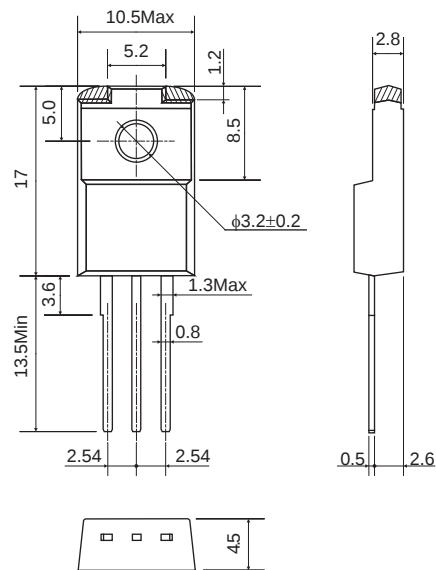




## Package Dimensions

| Package Name | JEITA Package Code | RENESAS Code | Previous Code | MASS[Typ.] |
|--------------|--------------------|--------------|---------------|------------|
| TO-220F      | SC-67              | PRSS0003AA-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                     | CR8PM-12B                   |
| Lead form     | Plastic Magazine (Tube) | 50       | Type name – Lead forming code | CR8PM-12B-A8                |

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

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