

CR3PM-12

Thyristor

Low Power Use

REJ03G0357-0200

Rev.2.00

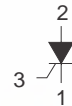
Mar.01.2005

Features

- $I_{T(AV)}$: 3 A
- V_{DRM} : 600 V
- I_{GT} : 100 μ A
- V_{iso} : 1500 V
- Insulated Type
- Glass Passivation Type
- UL Recognized : Yellow Card No. E223904
File No. E80271

Outline

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



1. Cathode
2. Anode
3. Gate

Applications

TV sets, control of household equipment such as electric blanket, 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 ^{Note1} | V_{DRM} | 600 | V |
| DC off-state voltage ^{Note1} | V_D (DC) | 480 | V |

| Parameter | Symbol | Ratings | Unit | Conditions |
|--------------------------------|-------------|--------------|----------------------|---|
| RMS on-state current | I_T (RMS) | 4.7 | A | |
| Average on-state current | I_T (AV) | 3.0 | A | Commercial frequency, sine half wave 180° conduction, $T_c = 103^\circ\text{C}$ |
| Surge on-state current | I_{TSM} | 70 | A | 60Hz sine half wave 1 full cycle, peak value, non-repetitive |
| I^2t for fusing | I^2t | 24.5 | A^2s | Value corresponding to 1 cycle of half wave 60Hz, surge on-state current |
| Peak gate power dissipation | P_{GM} | 0.5 | W | |
| Average gate power dissipation | $P_{G(AV)}$ | 0.1 | W | |
| Peak gate forward voltage | V_{FGM} | 6 | V | |
| Peak gate reverse voltage | V_{RGM} | 6 | V | |
| Peak gate forward current | I_{FGM} | 0.3 | A | |
| Junction temperature | T_j | - 40 to +125 | $^\circ\text{C}$ | |
| Storage temperature | T_{stg} | - 40 to +125 | $^\circ\text{C}$ | |
| Mass | — | 2.0 | g | Typical value |
| Isolation voltage | Viso | 1500 | V | $T_a = 25^\circ\text{C}$, AC 1 minute, each terminal to case |

Notes: 1. With gate to cathode resistance $R_{GK} = 220\ \Omega$.

Electrical Characteristics

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test conditions |
|-----------------------------------|---------------|------|------|----------------------|--------------------|---|
| Repetitive peak reverse current | I_{RRM} | — | — | 2.0 | mA | $T_j = 125^\circ\text{C}$, V_{RRM} applied, $R_{GK} = 220\ \Omega$ |
| Repetitive peak off-state current | I_{DRM} | — | — | 2.0 | mA | $T_j = 125^\circ\text{C}$, V_{DRM} applied, $R_{GK} = 220\ \Omega$ |
| On-state voltage | V_{TM} | — | — | 1.6 | V | $T_c = 25^\circ\text{C}$, $I_{TM} = 10\ \text{A}$, instantaneous value |
| Gate trigger voltage | V_{GT} | — | — | 0.8 | V | $T_j = 25^\circ\text{C}$, $V_D = 6\ \text{V}$, $I_T = 0.1\ \text{A}$ |
| Gate non-trigger voltage | V_{GD} | 0.1 | — | — | V | $T_j = 125^\circ\text{C}$, $V_D = 1/2\ V_{DRM}$, $R_{GK} = 220\ \Omega$ |
| Gate trigger current | I_{GT} | 1 | — | 100 ^{Note3} | μA | $T_j = 25^\circ\text{C}$, $V_D = 6\ \text{V}$, $I_T = 0.1\ \text{A}$ |
| Thermal resistance | $R_{th(j-c)}$ | — | — | 4.1 | $^\circ\text{C/W}$ | Junction to case ^{Note2} |

Notes: 2. The contact thermal resistance $R_{th(c-f)}$ in case of greasing is 0.5°C/W .

3. If special values of I_{GT} are required, choose item D or E from those listed in the table below if possible.

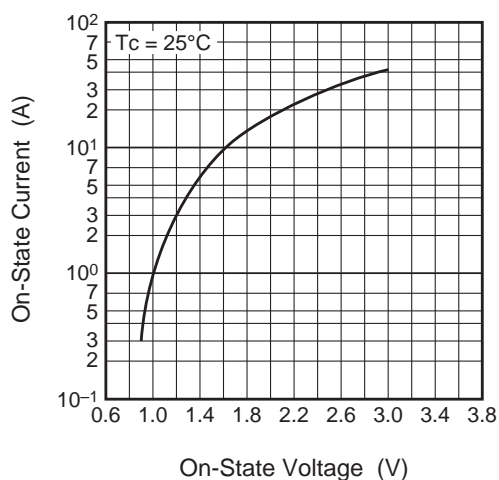
| Item | A | B | C | D | E |
|----------------------------|---------|----------|-----------|---------|-----------|
| I_{GT} (μA) | 1 to 30 | 20 to 50 | 40 to 100 | 1 to 50 | 20 to 100 |

The above values do not include the current flowing through the $220\ \Omega$ resistance between the gate and cathode.

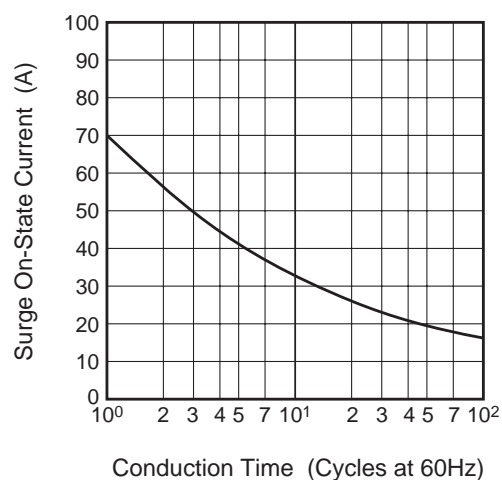
Performance Curves

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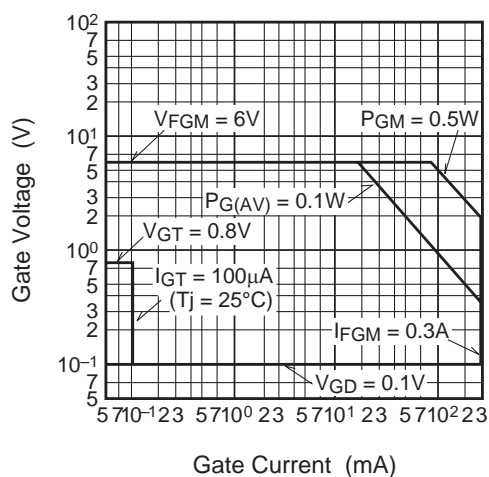
Maximum On-State Characteristics



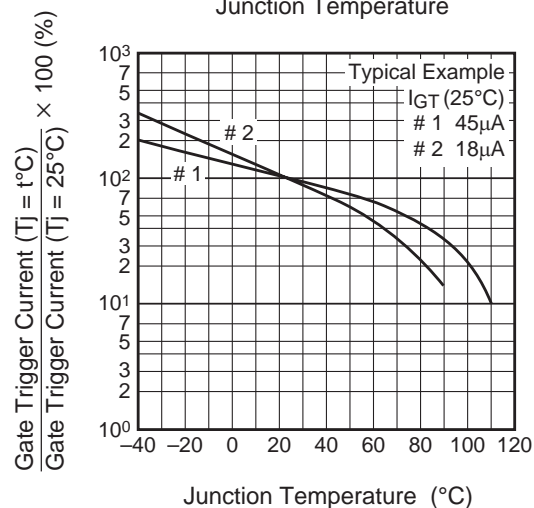
Rated Surge On-State Current



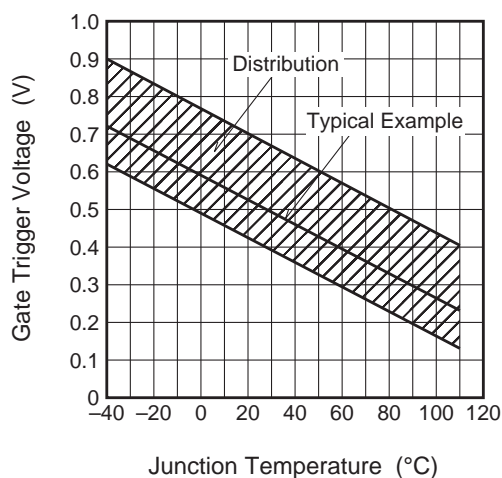
Gate Characteristics



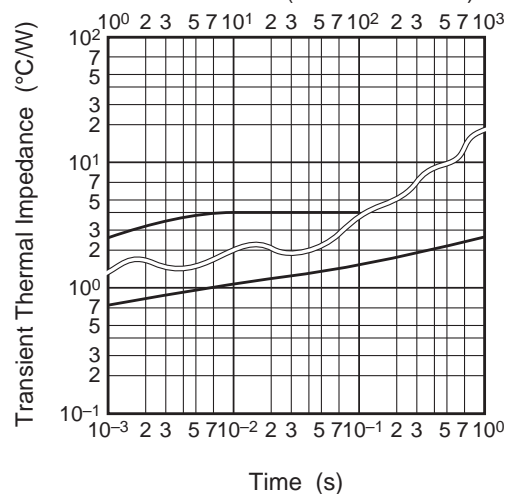
Gate Trigger Current vs. Junction Temperature



Gate Trigger Voltage vs. Junction Temperature

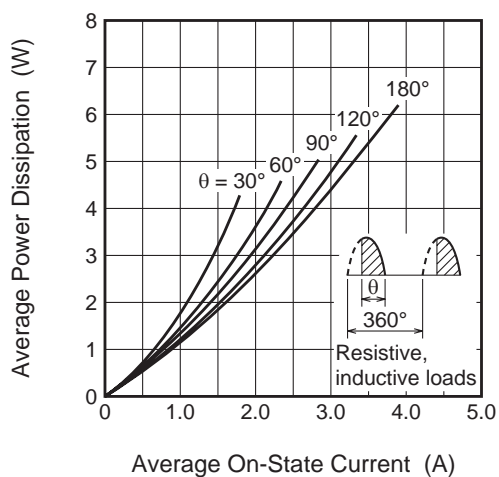


Maximum Transient Thermal Impedance Characteristics (Junction to case)

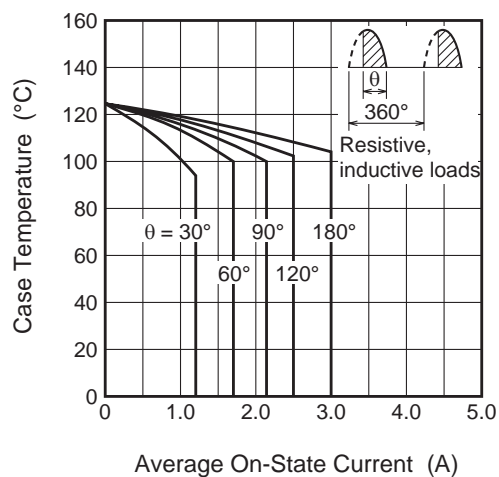


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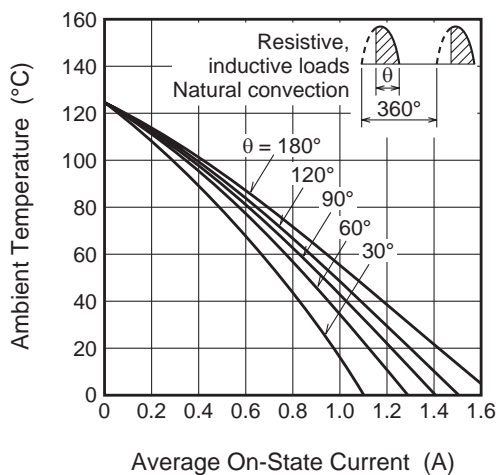
Maximum Average Power Dissipation
(Single-Phase Half Wave)



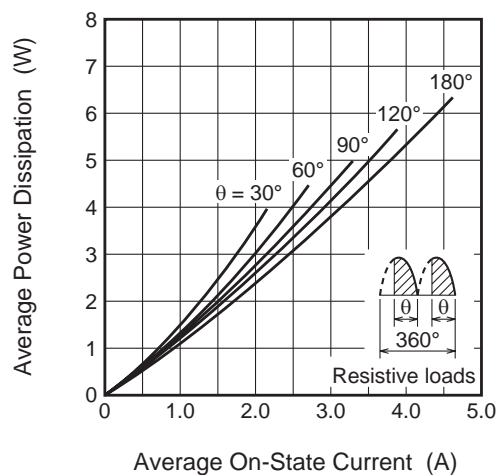
Allowable Case Temperature vs.
Average On-State Current
(Single-Phase Half Wave)



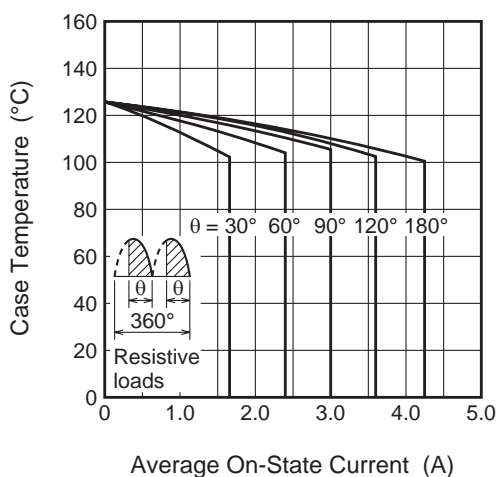
Allowable Ambient Temperature vs.
Average On-State Current
(Single-Phase Half Wave)



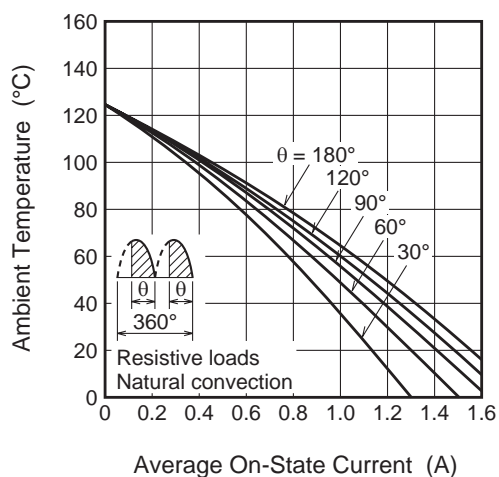
Maximum Average Power Dissipation
(Single-Phase Full Wave)

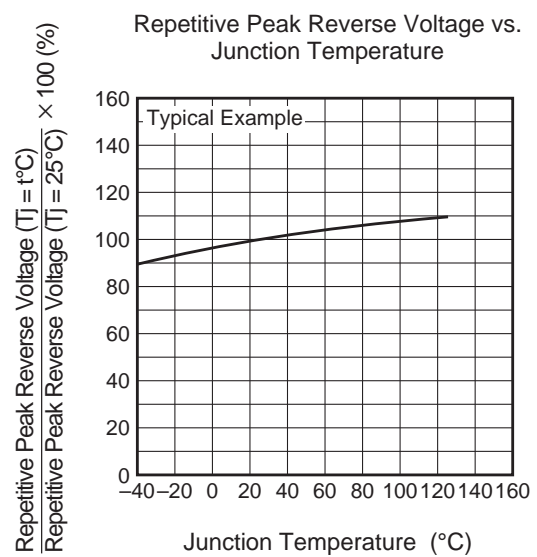
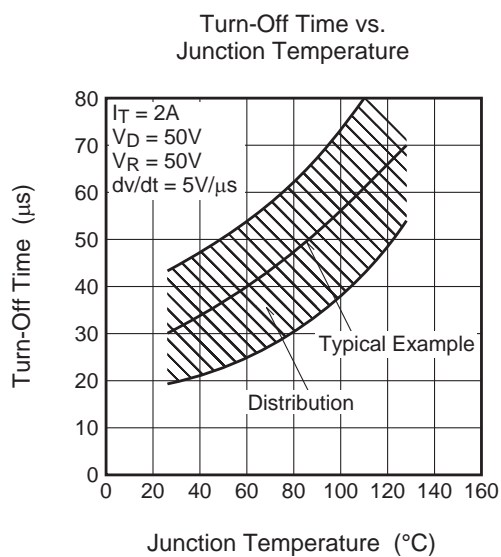
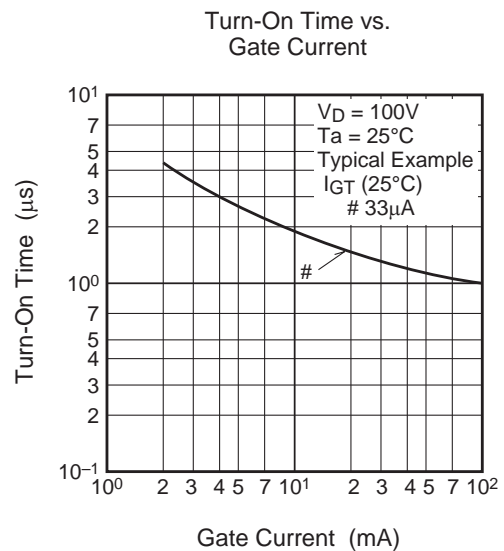
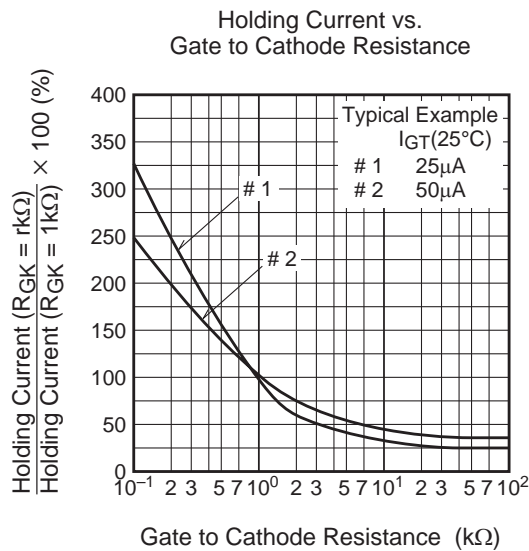
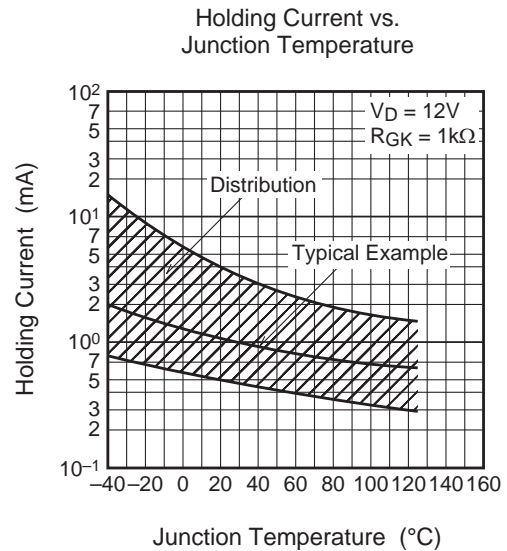
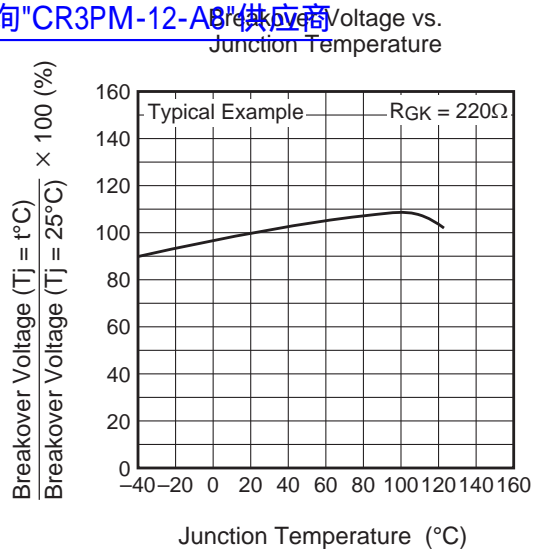


Allowable Case Temperature vs.
Average On-State Current
(Single-Phase Full Wave)



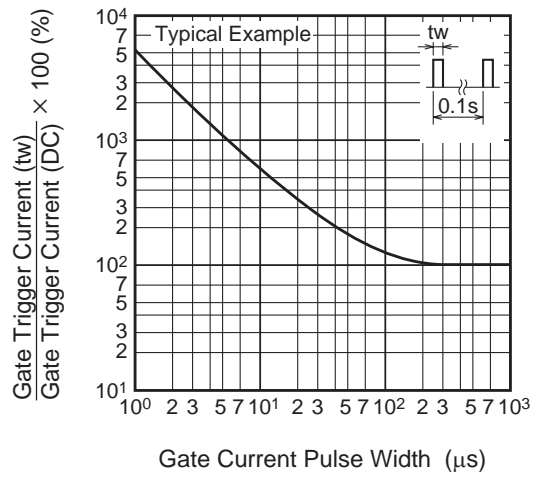
Allowable Ambient Temperature vs.
Average On-State Current
(Single-Phase Full Wave)



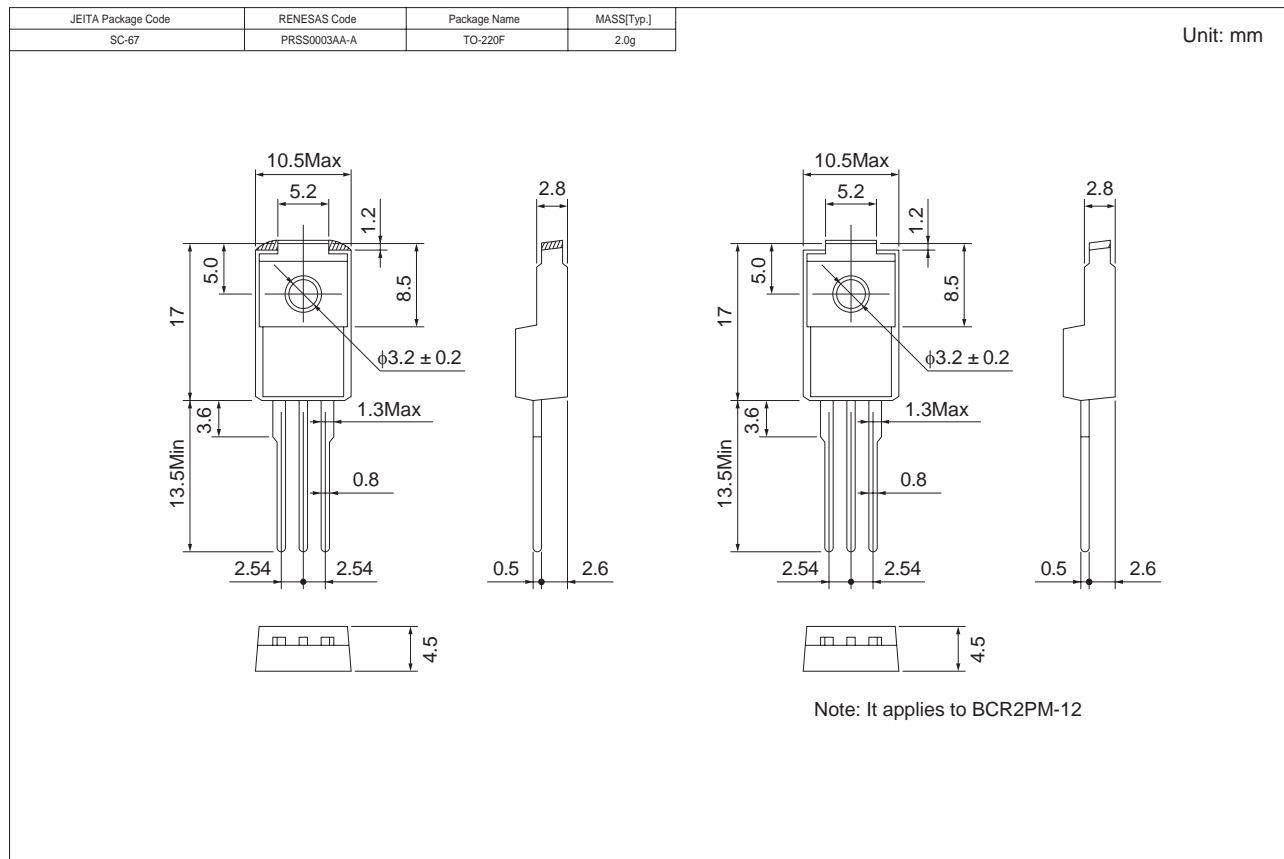
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Gate Trigger Current vs.
Gate Current Pulse Width



Package Dimensions



Order Code

| Lead form | Standard packing | Quantity | Standard order code | Standard order code example |
|---------------|------------------|----------|-------------------------------|-----------------------------|
| Straight type | Vinyl sack | 100 | Type name | CR3PM-12 |
| Lead form | Tube | 50 | Type name – Lead forming code | CR3PM-12-A8 |

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

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