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April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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CR5AS-12

Thyristor

Medium Power Use

REJ03G0345-0300

Rev.3.00

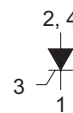
Dec 19, 2008

Features

- $I_{T(AV)}$: 5 A
- V_{DRM} : 600 V
- I_{GT} : 100 μ A
- Non-Insulated Type
- Glass Passivation Type

Outline

RENESAS Package code: PRSS0004ZG-A
(Package name: MP-3A)



1. Cathode
2. Anode
3. Gate
4. Anode

Applications

Switching mode power supply, regulator for autcycle, protective circuit for TV sets, VCRs, and printers, igniter for autcycle, electric tool, strobe flasher, 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 | $I_{T(RMS)}$ | 7.8 | A | |
| Average on-state current | $I_{T(AV)}$ | 5 | A | Commercial frequency, sine half wave 180° conduction, $T_C = 88^\circ\text{C}$ |
| Surge on-state current | I_{TSM} | 90 | A | 60Hz sine half wave 1 full cycle, peak value, non-repetitive |
| I^2t for fusing | I^2t | 33 | 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 | — | 0.26 | g | Typical value |

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

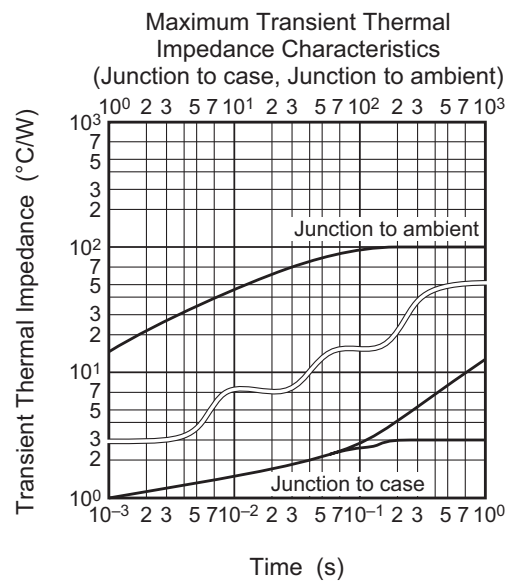
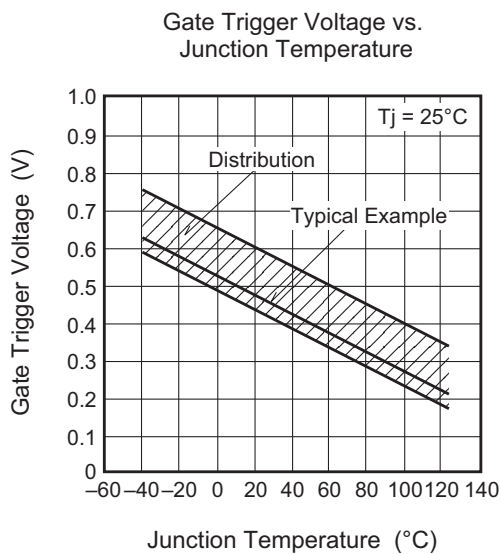
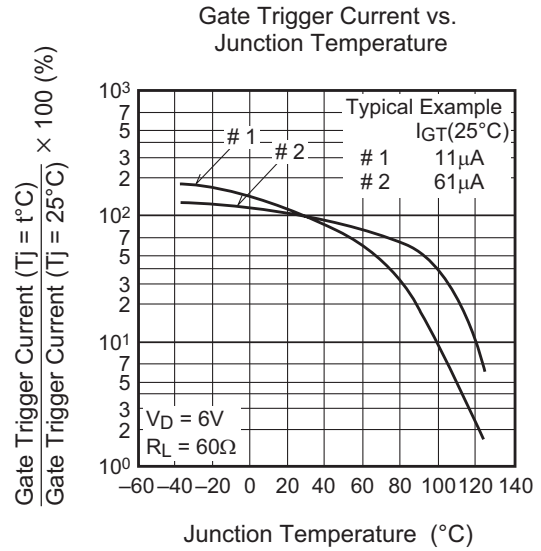
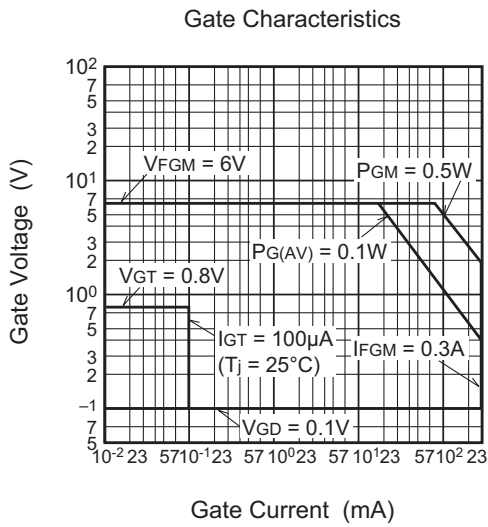
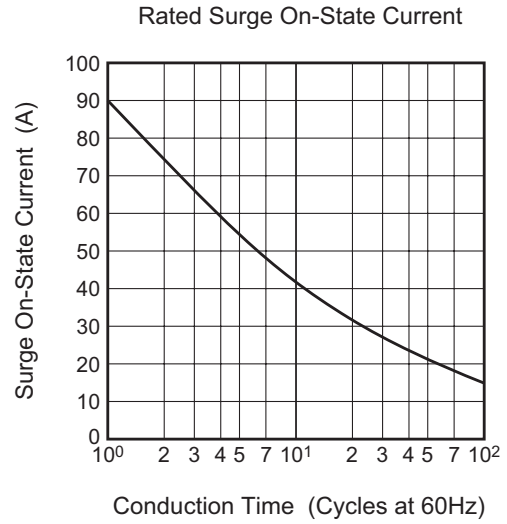
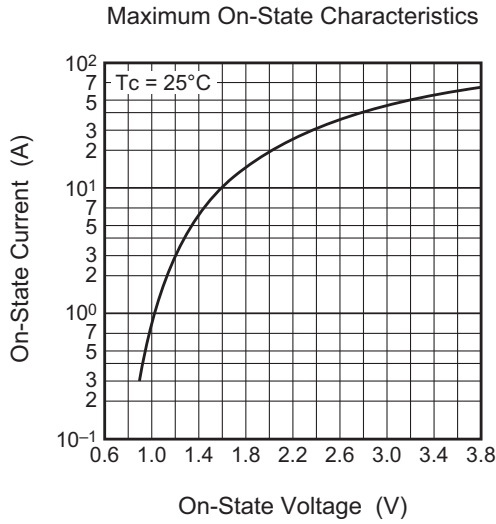
Electrical Characteristics

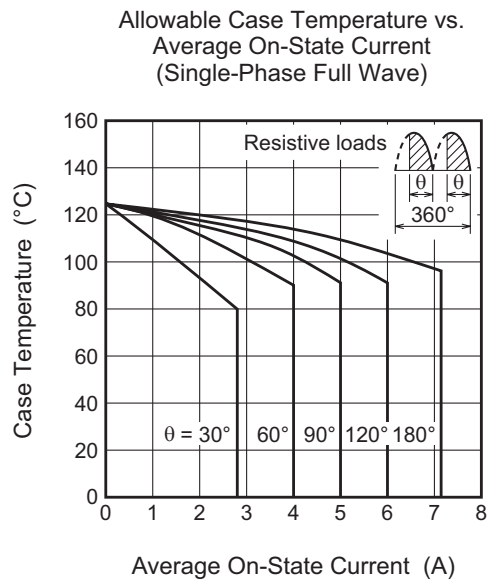
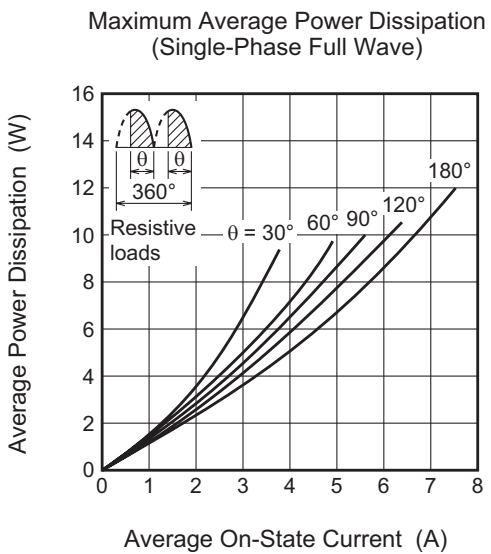
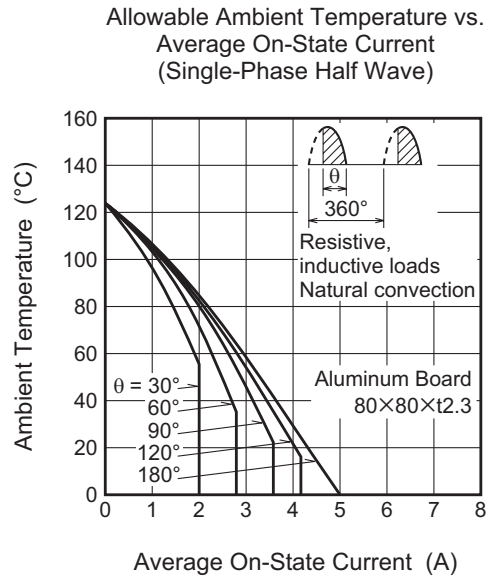
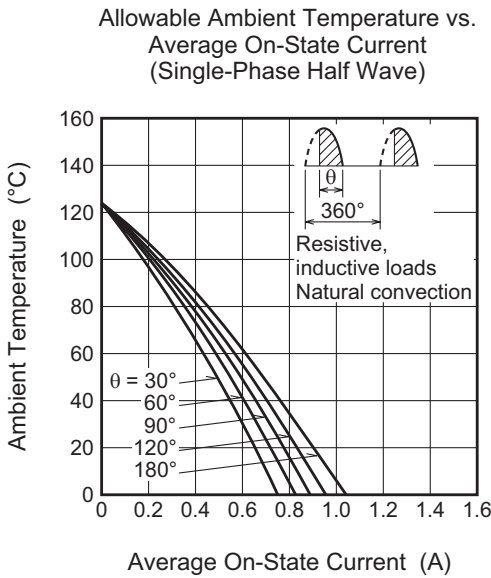
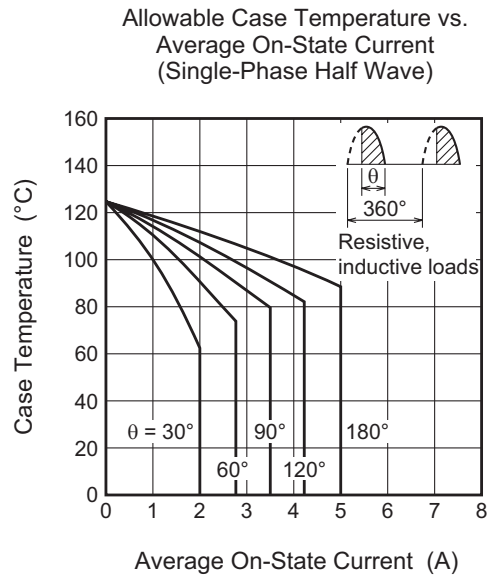
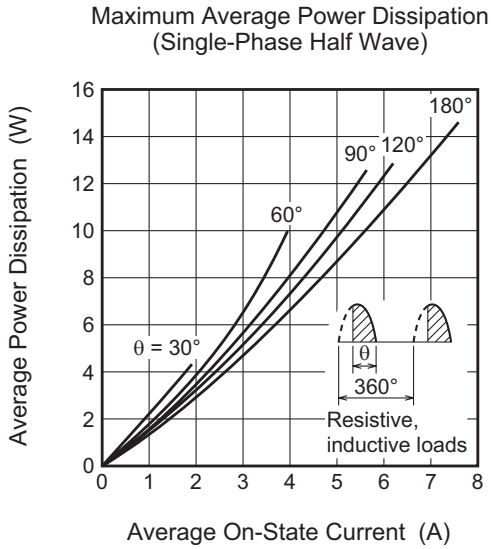
| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test conditions |
|-----------------------------------|---------------|------|------|----------------------|--------------------|--|
| Repetitive peak reverse current | I_{RRM} | — | — | 2.0 | mA | $T_J = 125^\circ\text{C}$, V_{RRM} applied, $R_{GK} = 220 \Omega$ |
| 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} | — | — | 1.8 | V | $T_C = 25^\circ\text{C}$, $I_{TM} = 15 \text{ A}$, 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 | $T_J = 25^\circ\text{C}$, $V_D = 6 \text{ V}$, $I_T = 0.1 \text{ A}$ |
| Holding current | I_H | — | 3.5 | — | mA | $T_J = 25^\circ\text{C}$, $V_D = 12 \text{ V}$, $R_{GK} = 220 \Omega$ |
| Thermal resistance | $R_{th(j-c)}$ | — | — | 3.0 | $^\circ\text{C/W}$ | Junction to case ^{Note2} |

Notes: 2. The measurement point for case temperature is at anode tab.

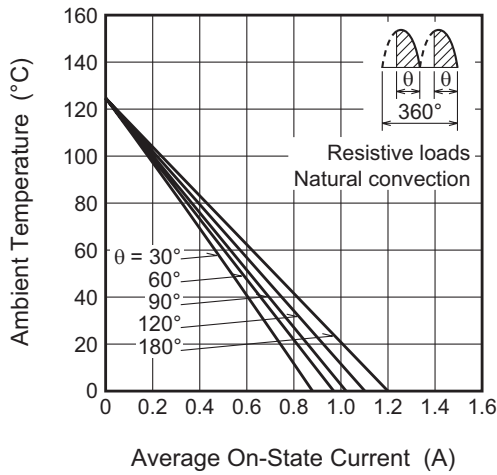
3. If special value of I_{GT} is required, I_{GT} from 20 to 100 μA is possible. (I_{GT} item: E)

Performance Curves

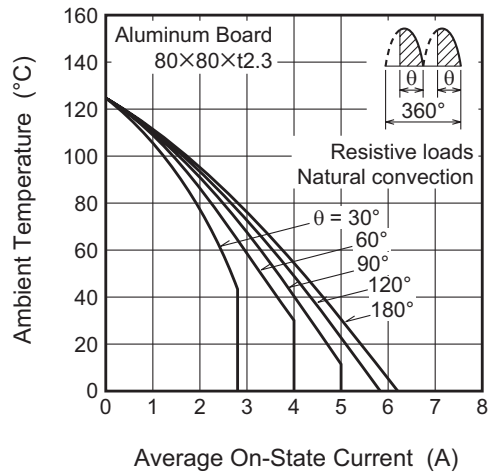




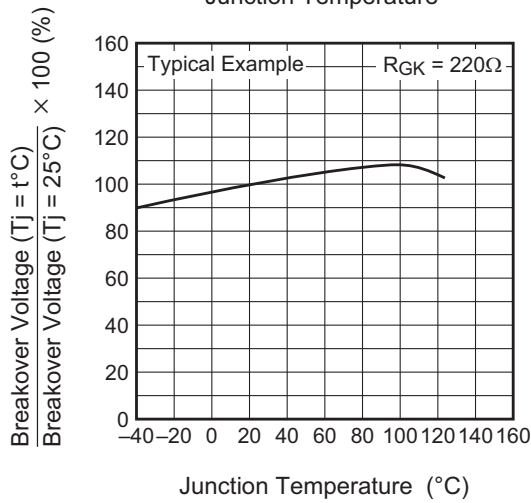
Allowable Ambient Temperature vs. Average On-State Current (Single-Phase Full Wave)



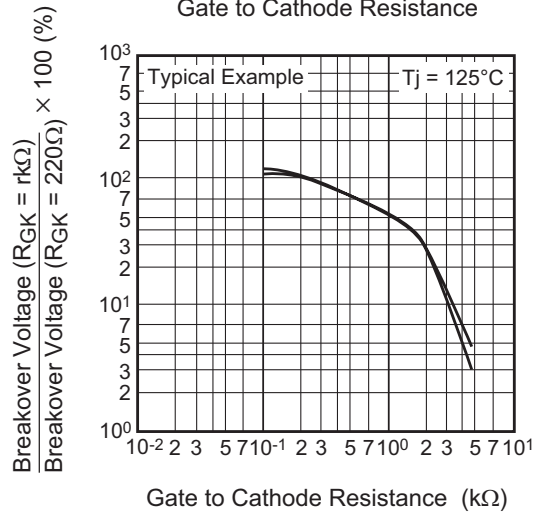
Allowable Ambient Temperature vs. Average On-State Current (Single-Phase Full Wave)



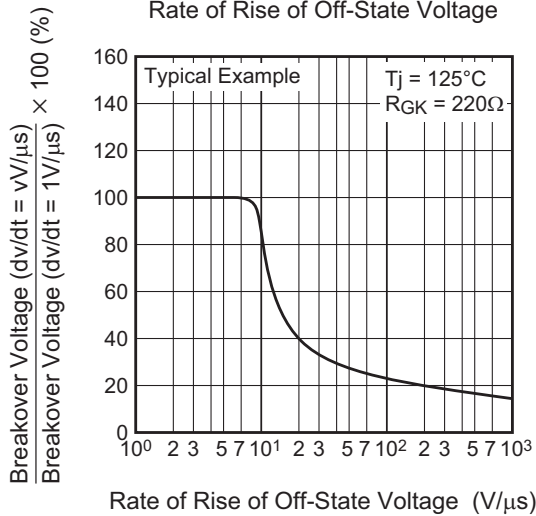
Breakover Voltage vs. Junction Temperature



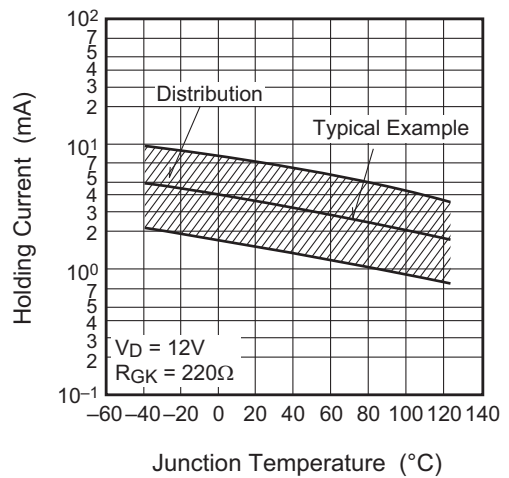
Breakover Voltage vs. Gate to Cathode Resistance

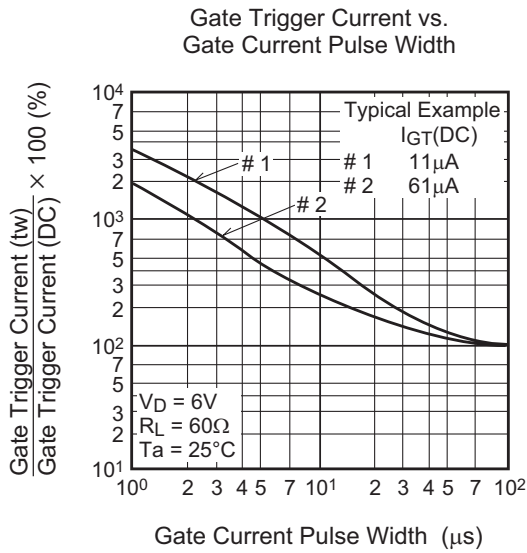
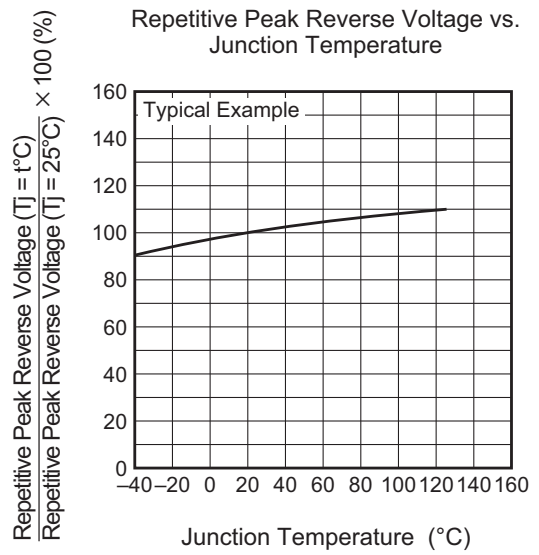
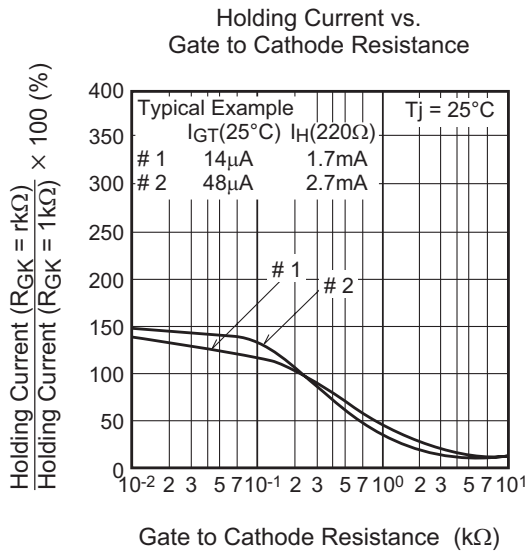


Breakover Voltage vs. Rate of Rise of Off-State Voltage

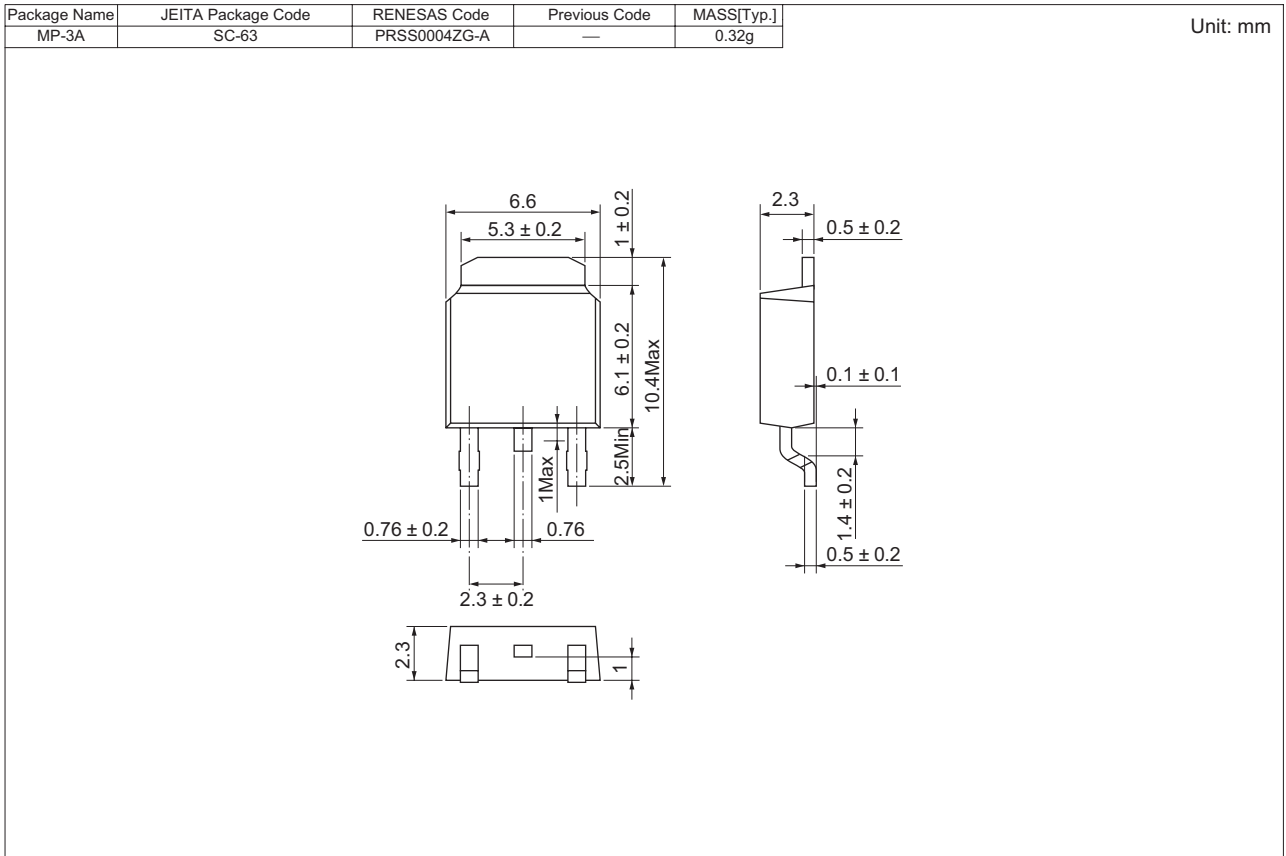


Holding Current vs. Junction Temperature





Package Dimensions



Order Code

| Lead form | Standard packing | Quantity | Standard order code | Standard order code example |
|----------------------|------------------|----------|--------------------------------------|-----------------------------|
| Surface-mounted type | Taping | 3000 | Type name – T +Direction (1 or 2) +3 | CR5AS-12-T13 |
| Surface-mounted type | Tube | 75 | Type name | CR5AS-12 |

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

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