# CR05AS-8

## Thyristor

Low Power Use

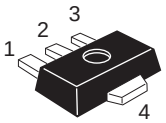
R07DS0135EJ0500
(Previous: REJ03G0348-0400)
Rev.5.00
Sep 15, 2010

## Features

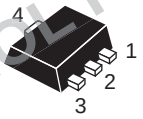
- $I_{T (AV)}$ : 0.5 A
- $V_{DRM}$ : 400 V
- $I_{GT}$ : 100 µA
- Non-Insulated Type
- Planar Passivation Type
- Surface Mounted type

## Outline

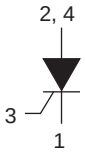
RENESAS Package code: PLZZ0004CA-A
(Package name: UPAK)




RENESAS Package code: PLZZ0004CB-A
(Package name: SOT-89)






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

## Applications

Solid state relay, strobe flasher, igniter, and hybrid IC

## Maximum Ratings

| Parameter | Symbol | Voltage class | Unit |
|---|---|---|---|
| | | 8 (Mark CD) | |
| Repetitive peak reverse voltage | $V_{RRM}$ | 400 | V |
| Non-repetitive peak reverse voltage | $V_{RSM}$ | 500 | V |
| DC reverse voltage | $V_{R (DC)}$ | 320 | V |
| Repetitive peak off-state voltage[Note1] | $V_{DRM}$ | 400 | V |
| DC off-state voltage[Note1] | $V_{D (DC)}$ | 320 | V |

| Parameter | Symbol | Ratings | Unit | Conditions |
|---|---|---|---|---|
| RMS on-state current | $I_{T (RMS)}$ | 0.79 | A | |
| Average on-state current | $I_{T (AV)}$ | 0.5 | A | Commercial frequency, sine half wave 180° conduction, Ta = 57°C[Note2] |
| Surge on-state current | $I_{TSM}$ | 10 | A | 60Hz sine half wave 1 full cycle, peak value, non-repetitive |
| $I^2t$ for fusing | $I^2t$ | 0.4 | $A^2s$ | Value corresponding to 1 cycle of half wave 60Hz, surge on-state current |
| Peak gate power dissipation | $P_{GM}$ | 0.1 | W | |
| Average gate power dissipation | $P_{G (AV)}$ | 0.01 | W | |
| Peak gate forward voltage | $V_{FGM}$ | 6 | V | |
| Peak gate reverse voltage | $V_{RGM}$ | 6 | V | |
| Peak gate forward current | $I_{FGM}$ | 0.1 | A | |
| Junction temperature | Tj | – 40 to +125 | °C | |
| Storage temperature | Tstg | – 40 to +125 | °C | |
| Mass | — | 50 | mg | Typical value |

Notes: 1. With gate to cathode resistance $R_{GK}$ = 1 kΩ.

## Electrical Characteristics

| Parameter | Symbol | Rated value | | | Unit | Test conditions |
|---|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | | |
| Repetitive peak reverse current | $I_{RRM}$ | — | — | 0.1 | mA | Tj = 125°C, $V_{RRM}$ applied |
| Repetitive peak off-state current | $I_{DRM}$ | — | — | 0.1 | mA | Tj = 125°C, $V_{DRM}$ applied, $R_{GK}$ = 1 kΩ |
| On-state voltage | $V_{TM}$ | — | — | 1.9 | V | Ta = 25°C, $I_{TM}$ = 1.5 A, instantaneous value |
| Gate trigger voltage | $V_{GT}$ | — | — | 0.8 | V | Tj = 25°C, $V_D$ = 6 V, $I_T$ = 0.1 A[Note4] |
| Gate non-trigger voltage | $V_{GD}$ | 0.2 | — | — | V | Tj = 125°C, $V_D$ = 1/2 $V_{DRM}$, $R_{GK}$ = 1 kΩ |
| Gate trigger current | $I_{GT}$ | 20 | — | 100[Note3] | μA | Tj = 25°C, $V_D$ = 6 V, $I_T$ = 0.1 A[Note4] |
| Holding current | $I_H$ | — | — | 3 | mA | Tj = 25°C, $V_D$ = 12 V, $R_{GK}$ = 1 kΩ |
| Thermal resistance | $R_{th\ (j-a)}$ | — | — | 70 | °C/W | Junction to ambient[Note2] |

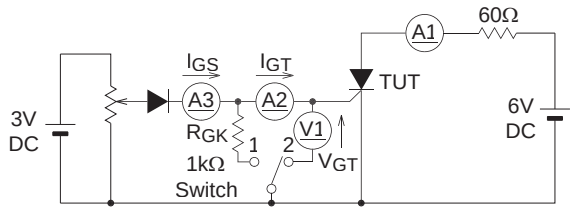
Notes: 2. Soldering with ceramic plate (25 mm × 25 mm × t0.7 mm).

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

| Item | B | E |
|---|---|---|
| $I_{GT}$ (μA) | 20 to 50 | 20 to 100 |

The above values do not include the current flowing through the 1 kΩ resistance between the gate and cathode.

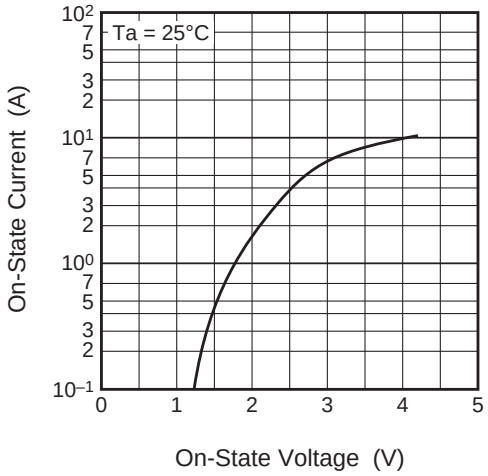
4. $I_{GT}$, $V_{GT}$ measurement circuit.



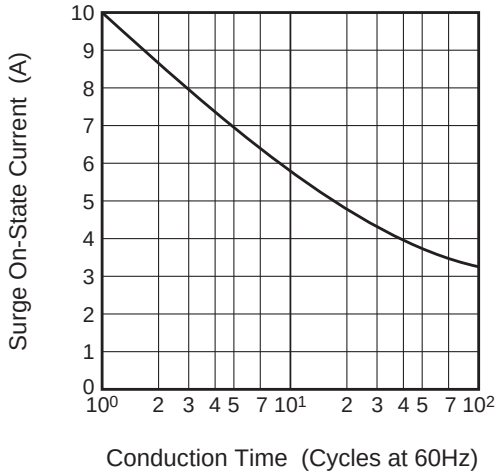

Switch 1 : $I_{GT}$ measurement
Switch 2 : $V_{GT}$ measurement
(Inner resistance of voltage meter is about 1kΩ)

## Performance Curves

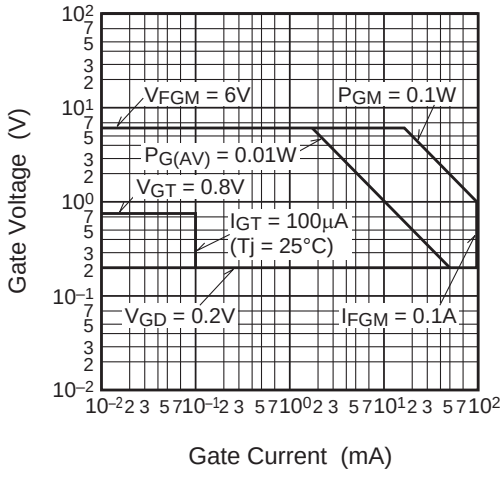
Maximum On-State Characteristics



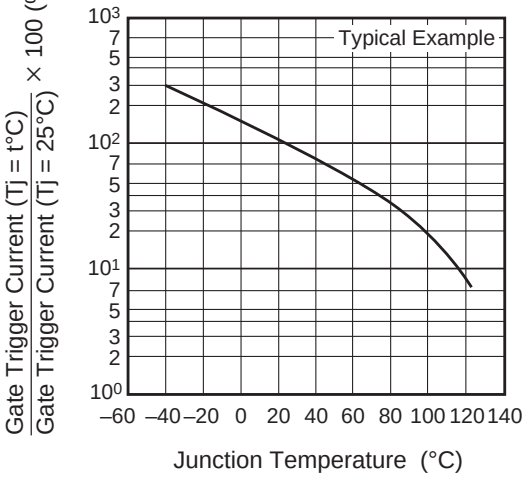

Rated Surge On-State Current



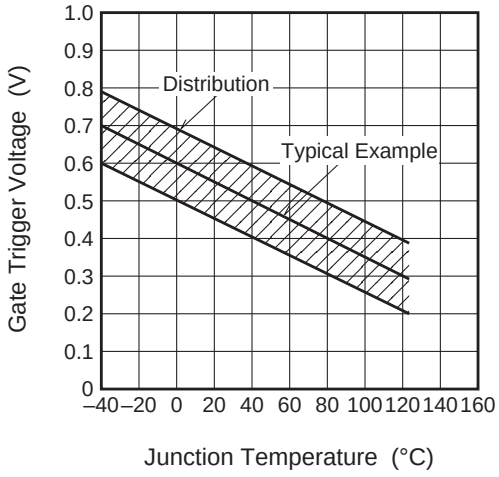

Gate Characteristics



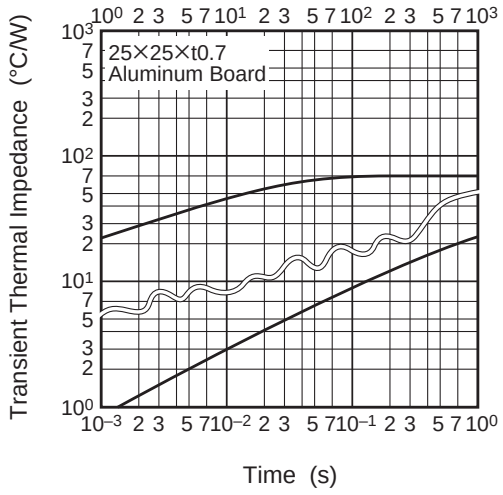

Gate Trigger Current vs. Junction Temperature



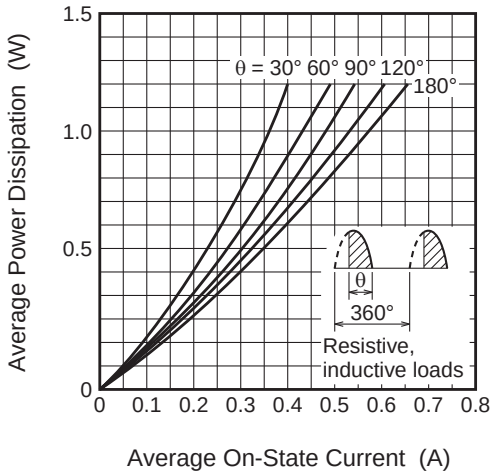

Gate Trigger Voltage vs. Junction Temperature



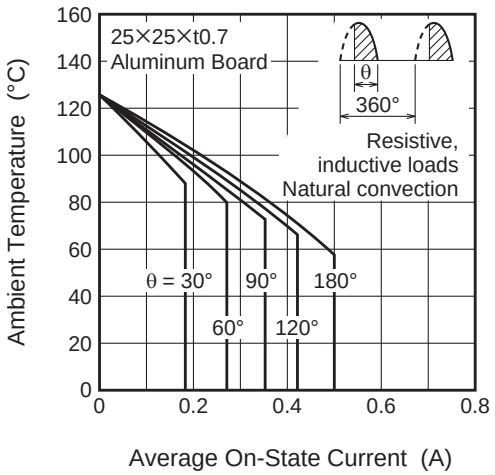

Maximum Transient Thermal Impedance Characteristics (Junction to ambient)



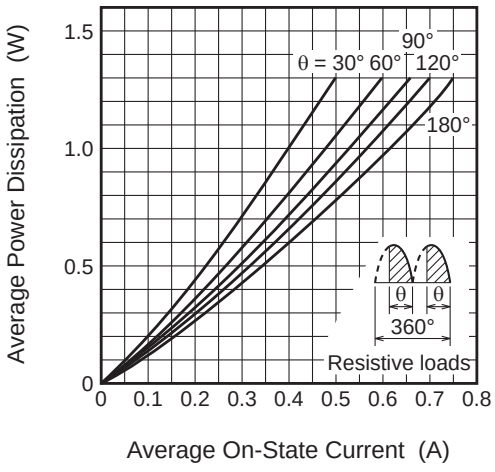
Maximum Average Power Dissipation
(Single-Phase Half Wave)



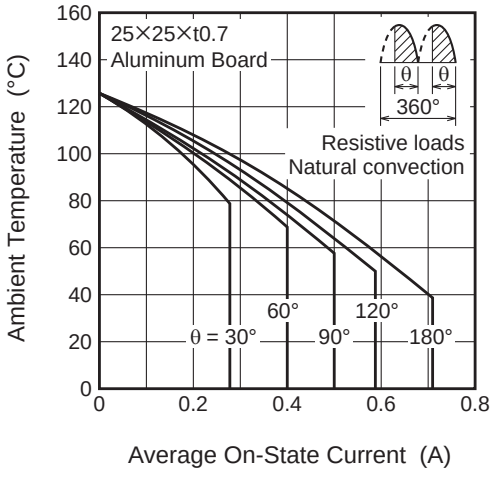

Allowable Ambient Temperature vs.
Average On-State Current
(Single-Phase Half Wave)



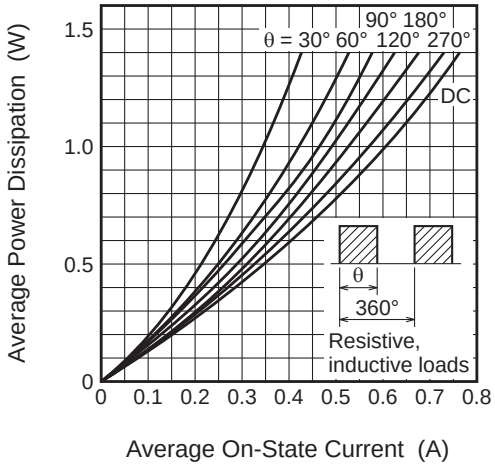

Maximum Average Power Dissipation
(Single-Phase Full Wave)



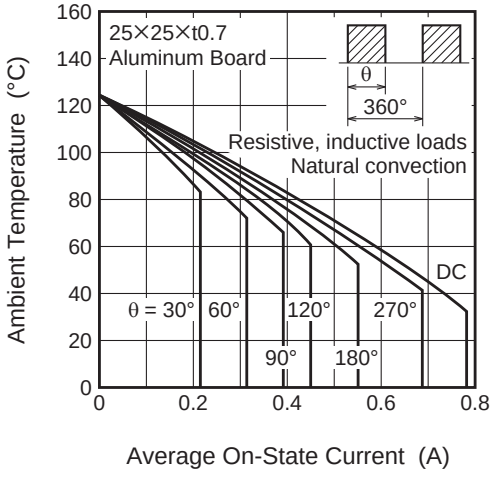

Allowable Ambient Temperature vs.
Average On-State Current
(Single-Phase Full Wave)



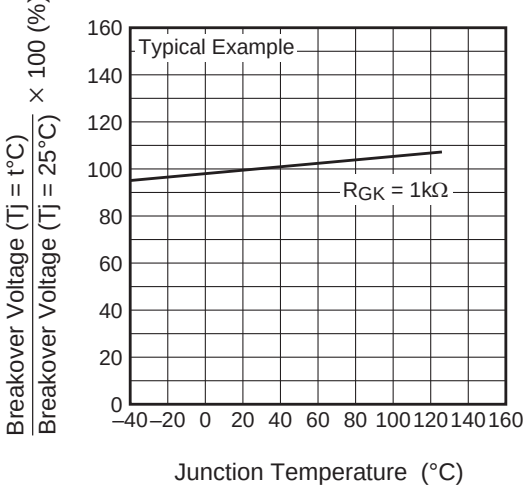

Maximum Average Power Dissipation
(Rectangular Wave)



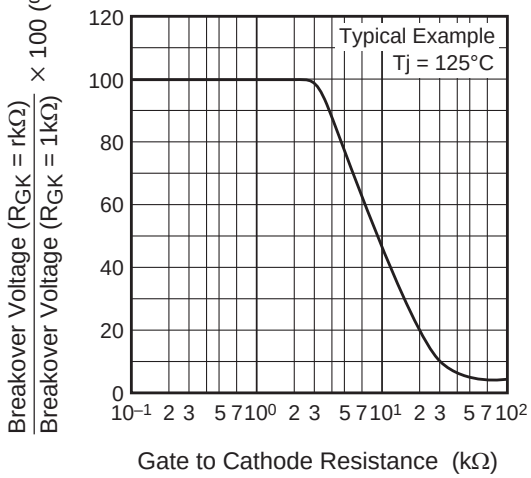

Allowable Ambient Temperature vs.
Average On-State Current
(Rectangular Wave)



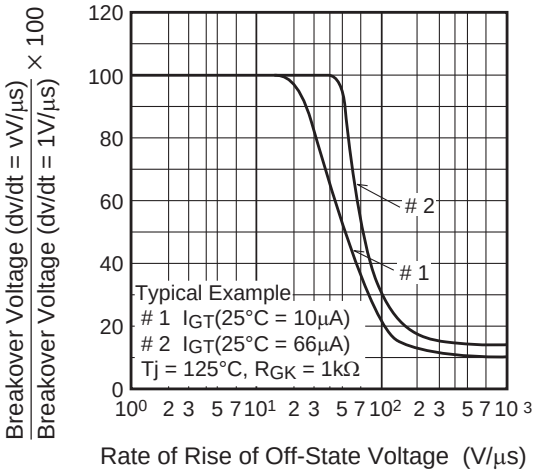
Breakover Voltage vs.
Junction Temperature



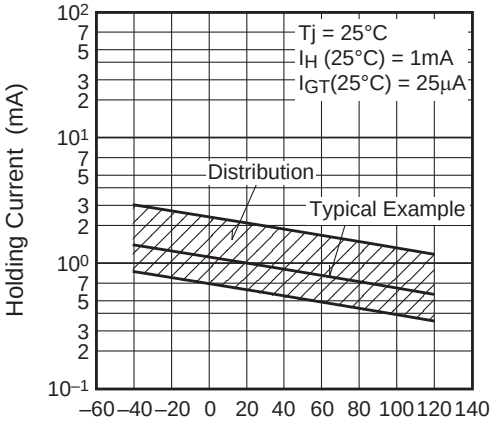

Breakover Voltage vs.
Gate to Cathode Resistance



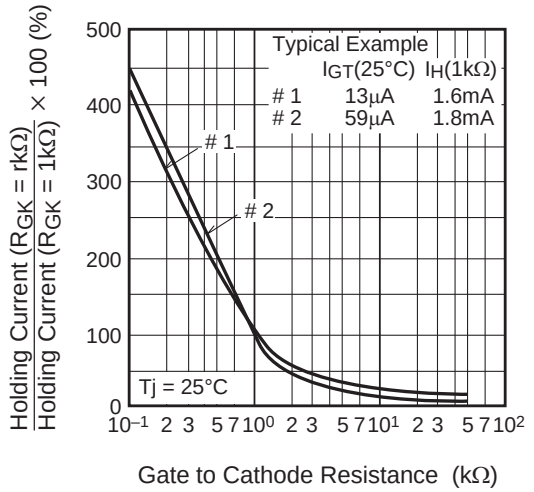

Breakover Voltage vs.
Rate of Rise of Off-State Voltage



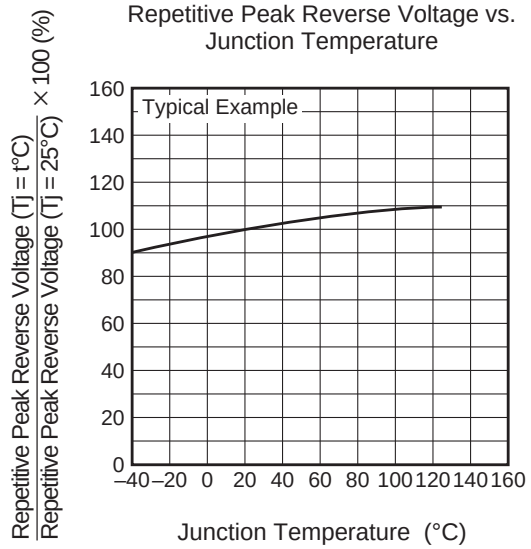

Holding Current vs.
Junction Temperature



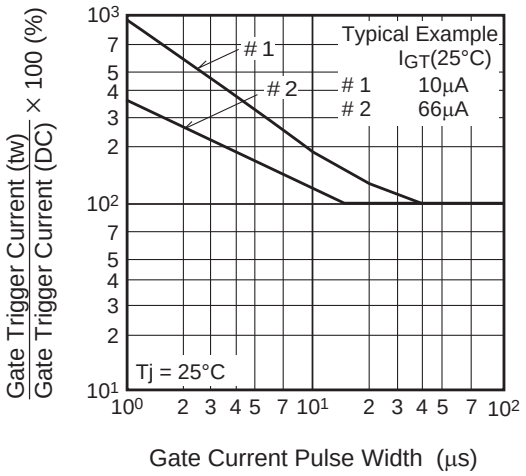

Holding Current vs.
Gate to Cathode Resistance




Repetitive Peak Reverse Voltage vs.
Junction Temperature



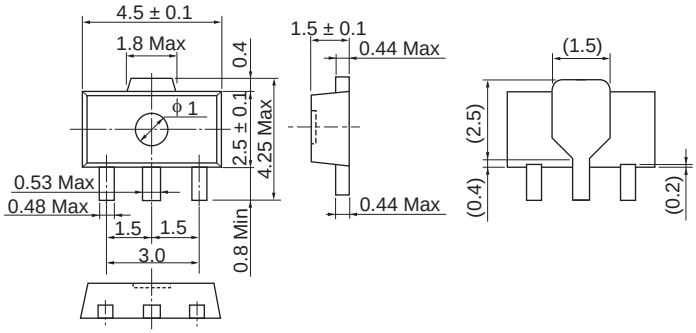
Gate Trigger Current vs.
Gate Current Pulse Width



## Package Dimensions

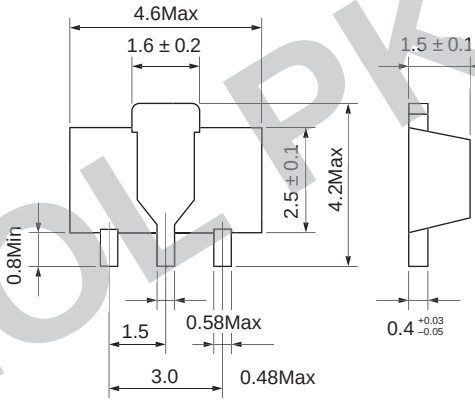
| Package Name | JEITA Package Code | RENESAS Code | Previous Code | MASS[Typ.] |
|---|---|---|---|---|
| UPAK | SC-62 | PLZZ0004CA-A | UPAK / UPAKV | 0.050g |

Unit: mm




| Package Name | JEITA Package Code | RENESAS Code | Previous Code | MASS[Typ.] |
|---|---|---|---|---|
| SOT-89 | SC-62 | PLZZ0004CB-A | — | 0.48g |

Unit: mm



## Order Code

| Lead form | Standard packing | Quantity | Standard order code | Standard order code example |
|---|---|---|---|---|
| Surface-mounted type | Taping | 4000 | Type name – ET +Direction (1 or 2) + 4 | CR05AS-8-ET14 |

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

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