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April 1st, 2010
Renesas Electronics Corporation

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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 auticycle, protective circuit for TV sets, VCRs, and printers, igniter for auticycle, 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 $R_{GK} = 220 \Omega$.

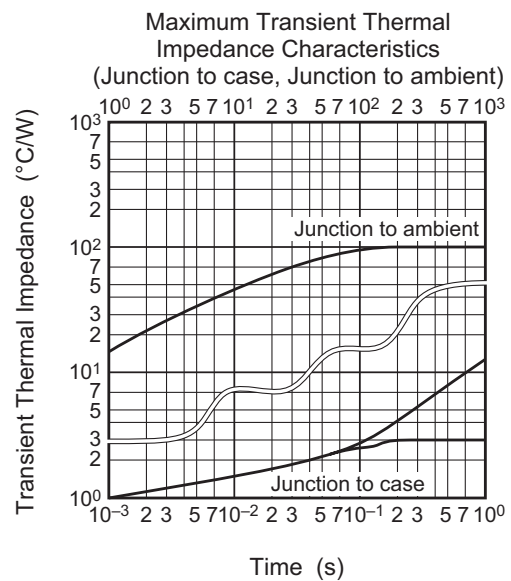
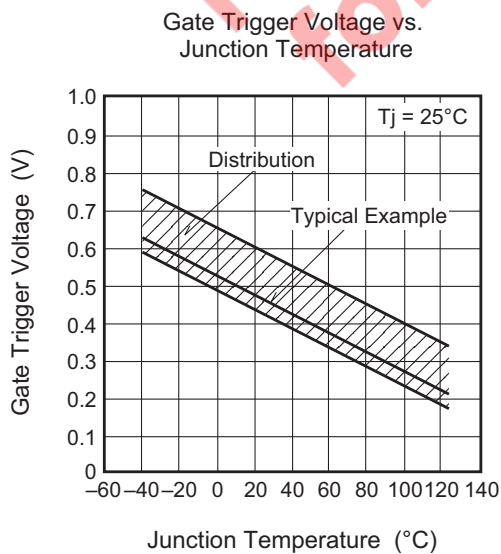
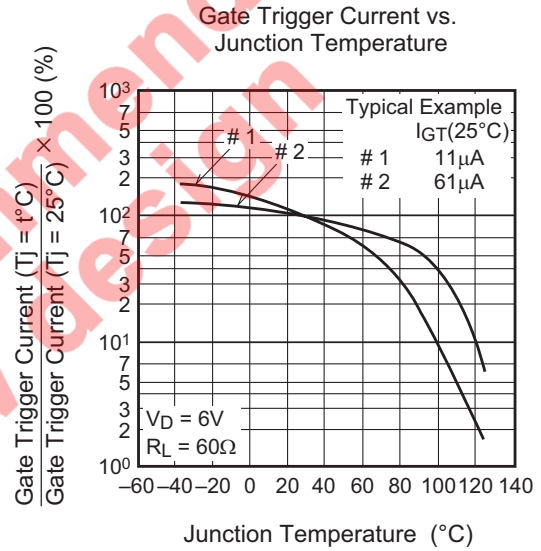
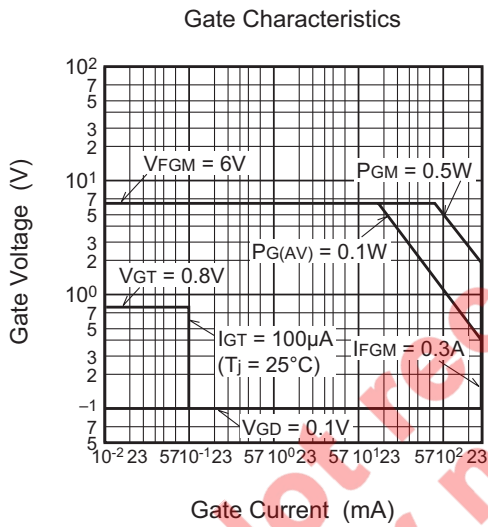
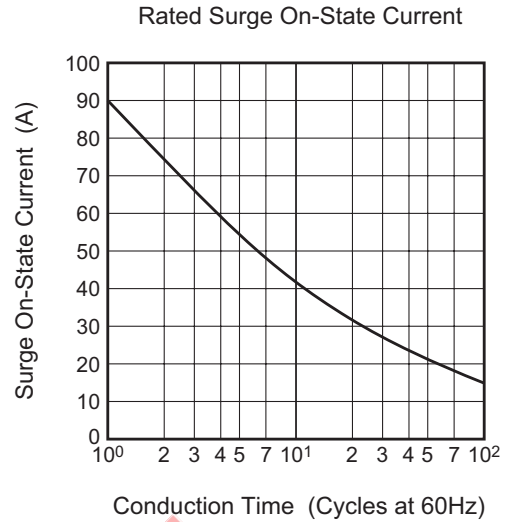
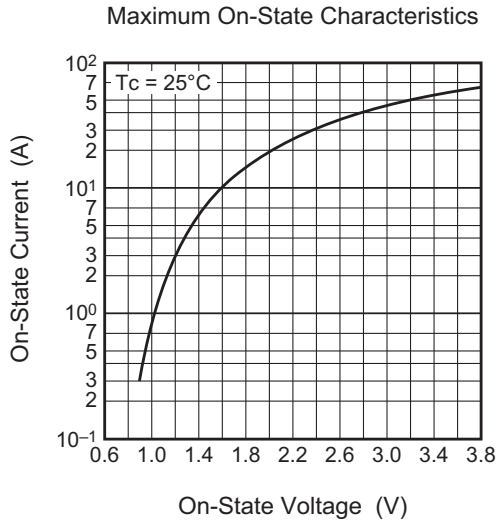
Electrical Characteristics

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}

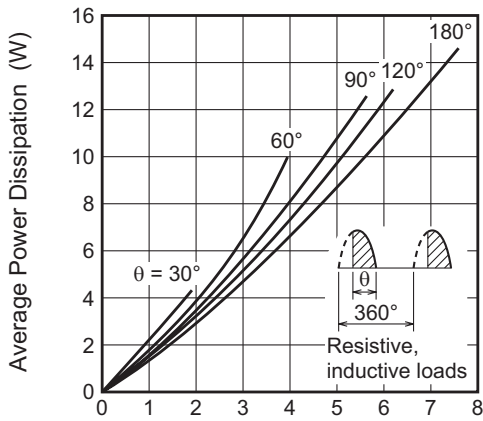
Notes: 2. The measurement point for case temperature is at anode tab.

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

Performance Curves

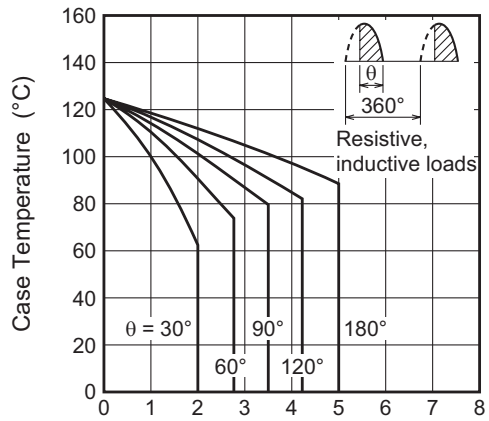


Maximum Average Power Dissipation (Single-Phase Half Wave)



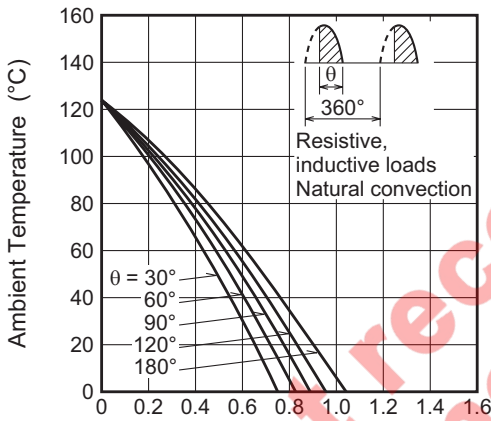
Average On-State Current (A)

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



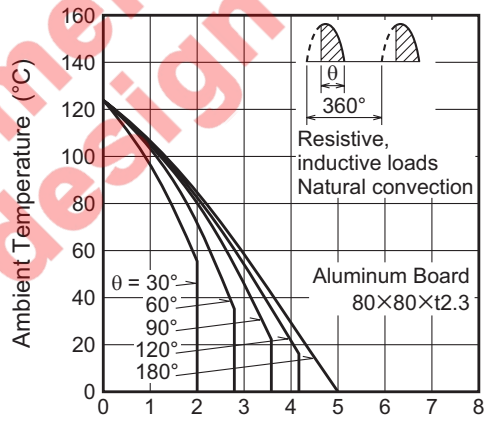
Average On-State Current (A)

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



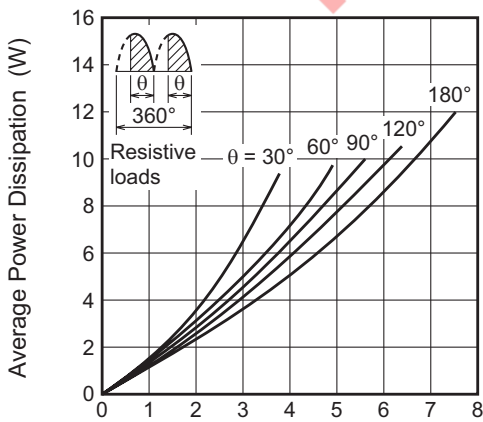
Average On-State Current (A)

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



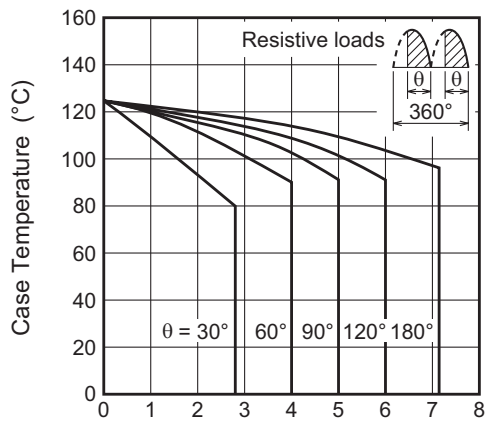
Average On-State Current (A)

Maximum Average Power Dissipation (Single-Phase Full Wave)



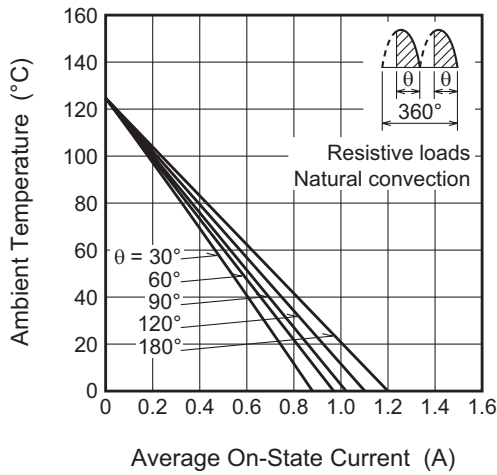
Average On-State Current (A)

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

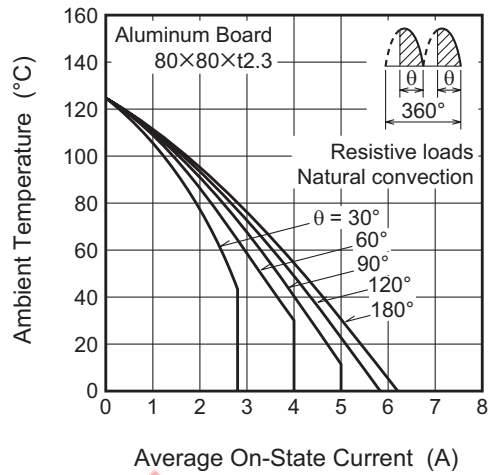


Average On-State Current (A)

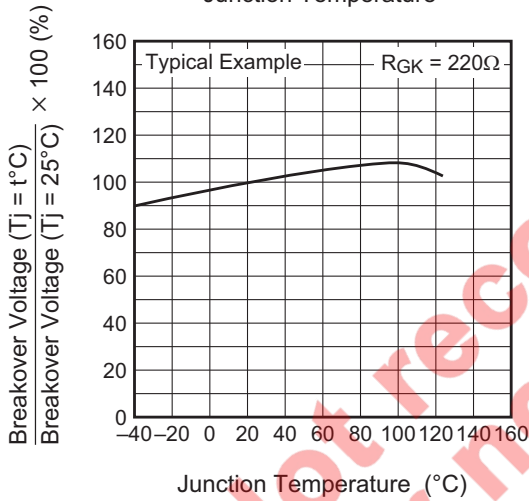
Allowable Ambient Temperature vs. Average On-State Current (Single-Phase Full Wave)



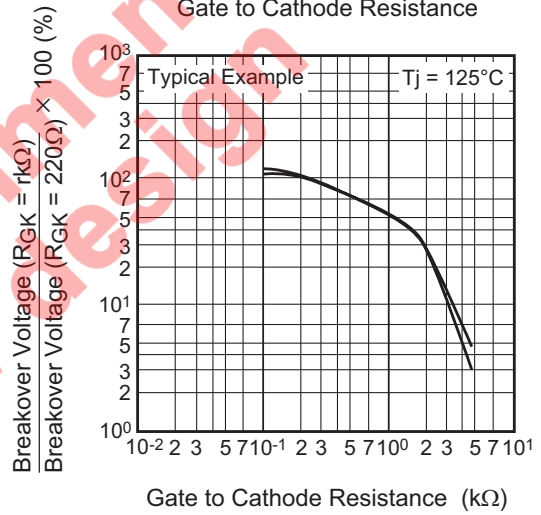
Allowable Ambient Temperature vs. Average On-State Current (Single-Phase Full Wave) (Aluminum Board)



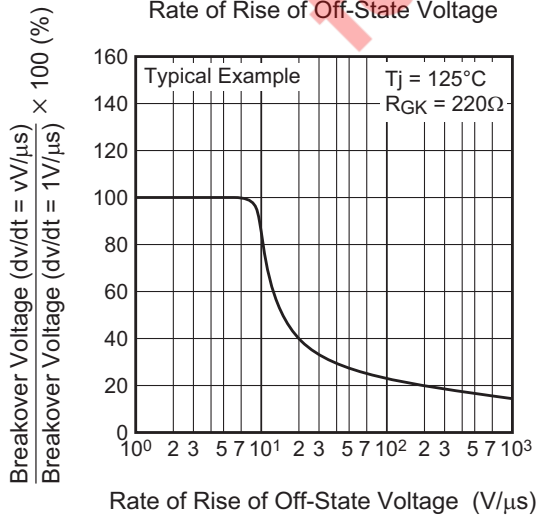
Breakover Voltage vs. Junction Temperature



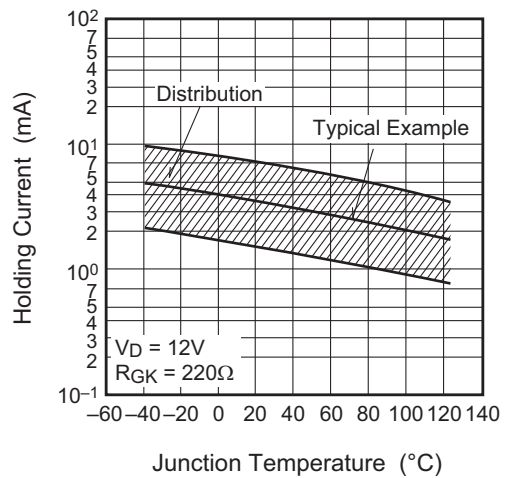
Breakover Voltage vs. Gate to Cathode Resistance

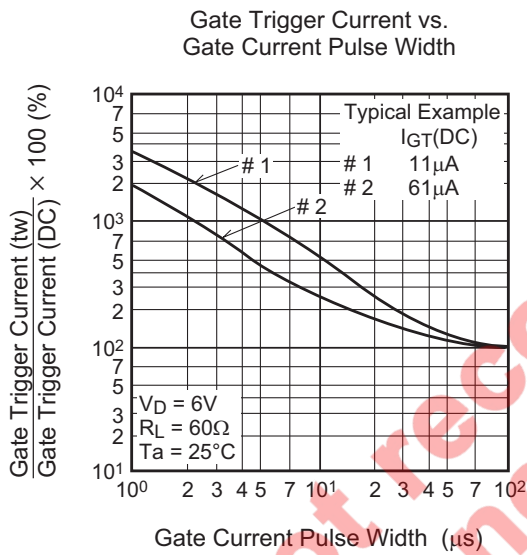
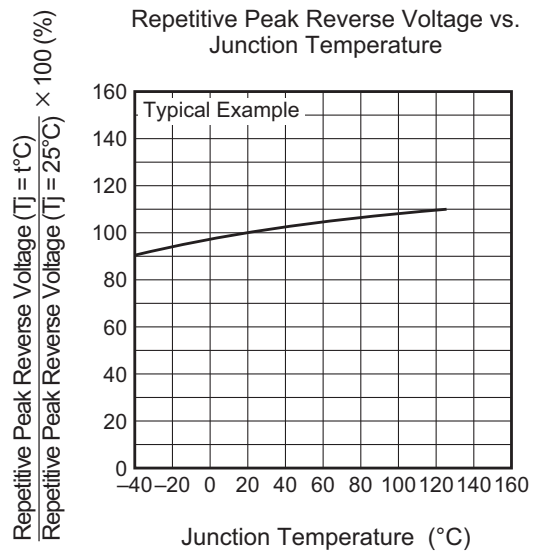
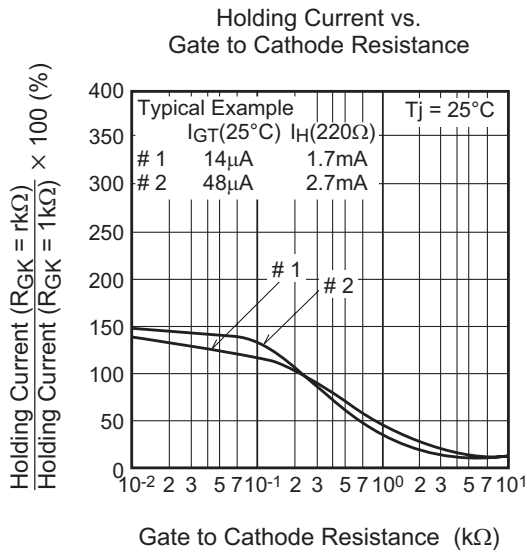


Breakover Voltage vs. Rate of Rise of Off-State Voltage



Holding Current vs. Junction Temperature





Not recommended for new design

Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]	Unit: mm
MP-3A	SC-63	PRSS0004ZG-A	—	0.32g	

Technical drawing showing the package dimensions for the CR5AS-12 package. The drawing includes three views: a top view, a side view, and a bottom view. Dimensions are provided in millimeters (mm).

Top View Dimensions:

- Overall width: 6.6
- Lead pitch: 2.3
- Lead width: 0.76
- Lead thickness: 0.1
- Lead height: 1.4
- Lead thickness (bottom): 0.5

Side View Dimensions:

- Overall height: 10.4 (Max)
- Lead height: 1.4
- Lead thickness: 0.1
- Lead thickness (bottom): 0.5

Bottom View Dimensions:

- Lead width: 0.76
- Lead thickness: 0.1
- Lead thickness (bottom): 0.5

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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