To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

Renesas Electronics website: http://www.renesas.com

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

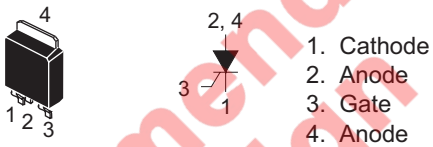
REJ03G0345-0300
Rev.3.00
Dec 19, 2008

Features

- $I_{T\,(AV)}$: 5 A
- V_{DRM} : 600 V
- I_{GT} : 100 µA
- 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 autocycle, protective circuit for TV sets, VCRs, and printers, igniter for autocycle, 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, Tc = 88°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	Tj	– 40 to +125	°C	
Storage temperature	Tstg	– 40 to +125	°C	
Mass	—	0.26	g	Typical value

Notes: 1. With gate to cathode resistance R_{GK} = 220 Ω.

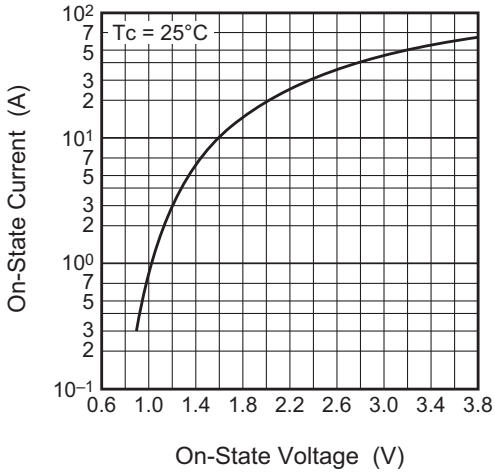
Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Repetitive peak reverse current	I_{RRM}	—	—	2.0	mA	Tj = 125°C, V_{RRM} applied, R_{GK} = 220 Ω
Repetitive peak off-state current	I_{DRM}	—	—	2.0	mA	Tj = 125°C, V_{DRM} applied, R_{GK} = 220 Ω
On-state voltage	V_{TM}	—	—	1.8	V	Tc = 25°C, I_{TM} = 15 A, instantaneous value
Gate trigger voltage	V_{GT}	—	—	0.8	V	Tj = 25°C, V_D = 6 V, I_T = 0.1 A
Gate non-trigger voltage	V_{GD}	0.1	—	—	V	Tj = 125°C, V_D = 1/2 V_{DRM}, R_{GK} = 220 Ω
Gate trigger current	I_{GT}	1	—	100 Note3	μA	Tj = 25°C, V_D = 6 V, I_T = 0.1 A
Holding current	I_H	—	3.5	—	mA	Tj = 25°C, V_D = 12 V, R_{GK} = 220 Ω
Thermal resistance	$R_{th\ (j-c)}$	—	—	3.0	°C/W	Junction to case Note2

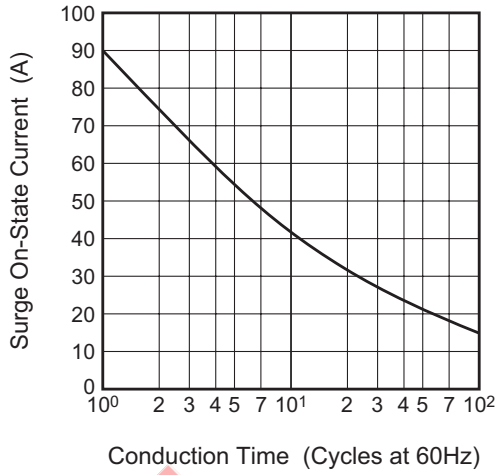
Notes: 2. The measurement point for case temperature is at anode tab.
3. If special value of I_{GT} is required, I_{GT} from 20 to 100 μA is possible. (I_{GT} item: E)

Performance Curves

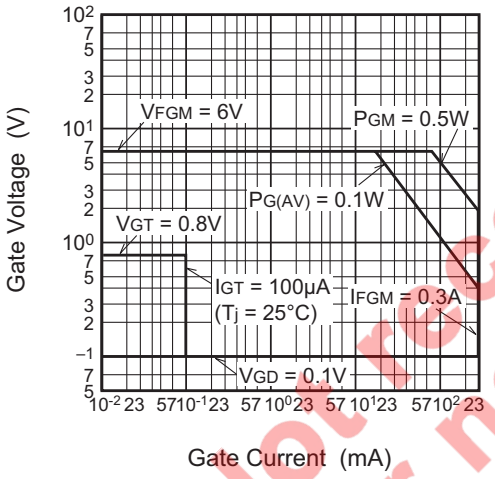
Maximum On-State Characteristics



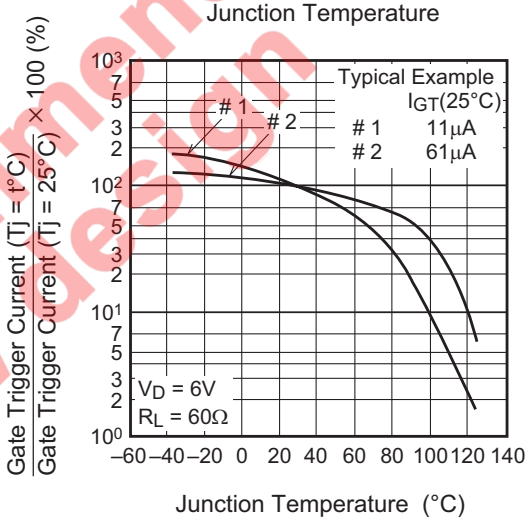
Rated Surge On-State Current



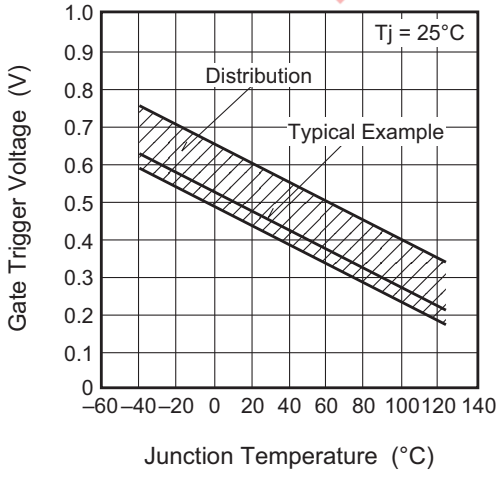
Gate Characteristics



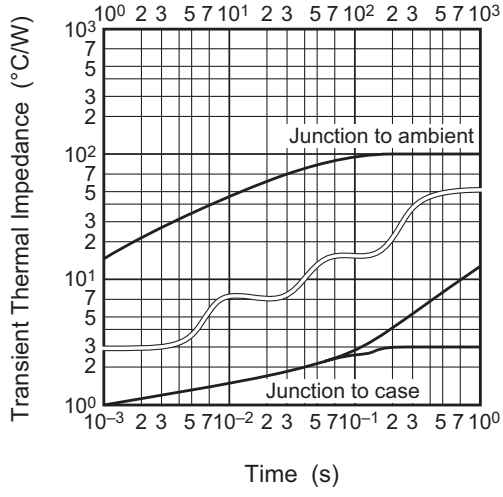
Gate Trigger Current vs. Junction Temperature



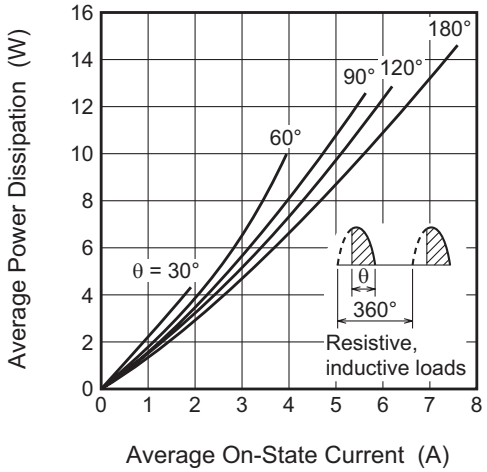
Gate Trigger Voltage vs. Junction Temperature



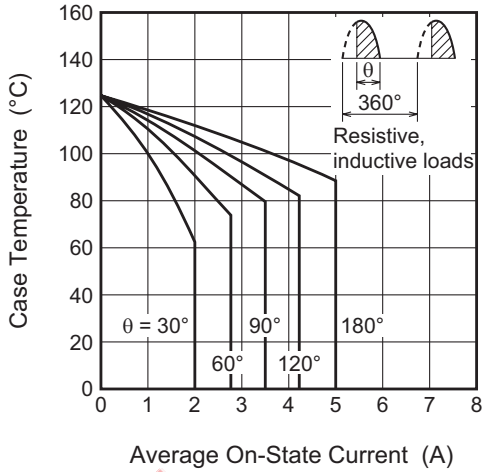
Maximum Transient Thermal Impedance Characteristics (Junction to case, Junction to ambient)



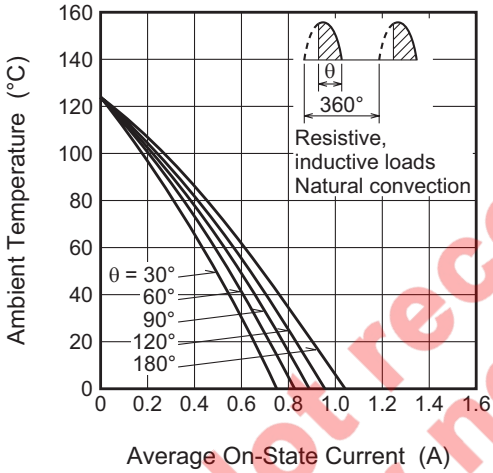
Maximum Average Power Dissipation
(Single-Phase Half Wave)



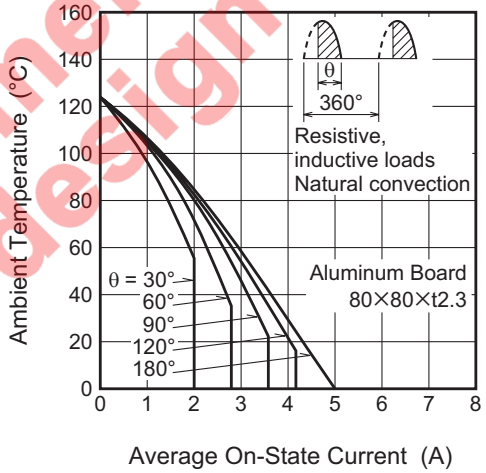
Allowable Case Temperature vs.
Average On-State Current
(Single-Phase Half Wave)



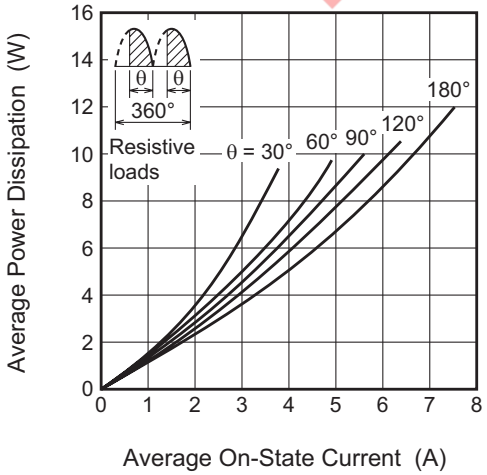
Allowable Ambient Temperature vs.
Average On-State Current
(Single-Phase Half Wave)



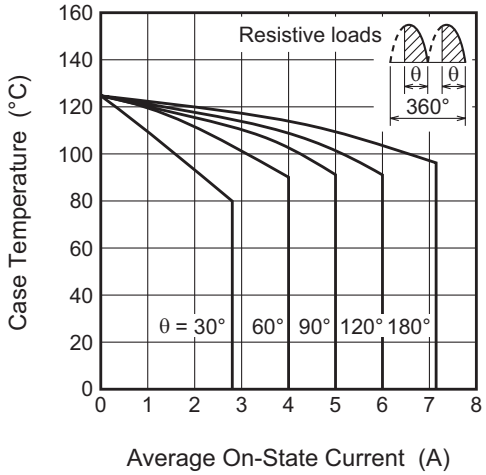
Allowable Ambient Temperature vs.
Average On-State Current
(Single-Phase Half Wave)



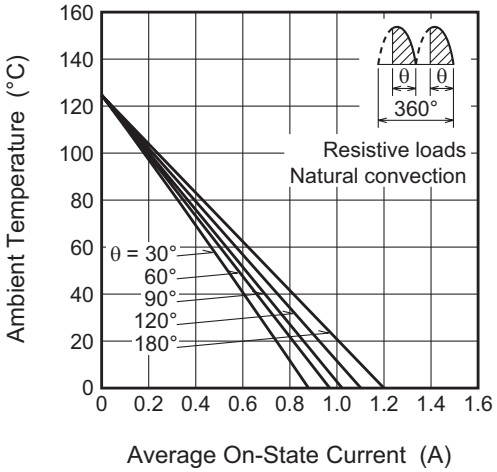
Maximum Average Power Dissipation
(Single-Phase Full Wave)



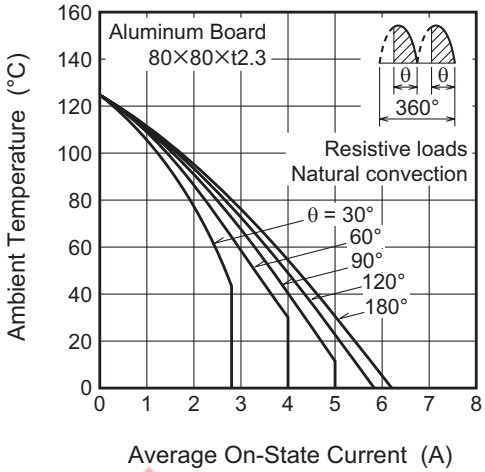
Allowable Case Temperature vs.
Average On-State Current
(Single-Phase Full Wave)



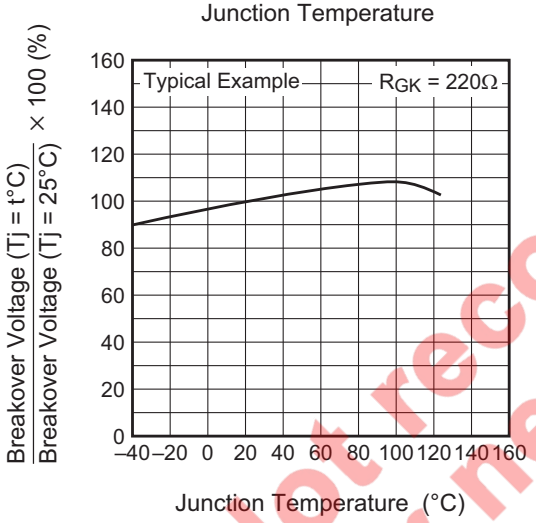
Allowable Ambient Temperature vs.
Average On-State Current
(Single-Phase Full Wave)



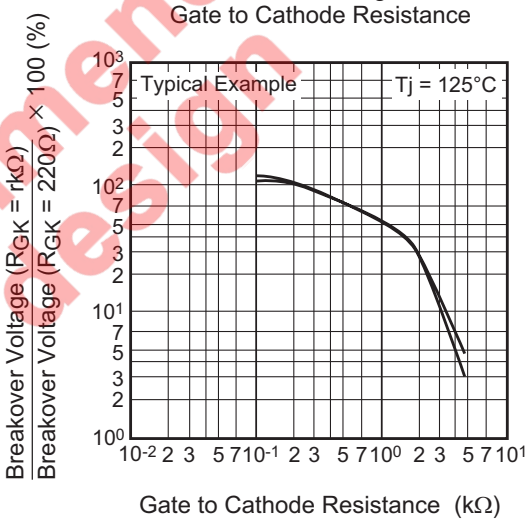
Allowable Ambient Temperature vs.
Average On-State Current
(Single-Phase Full Wave)



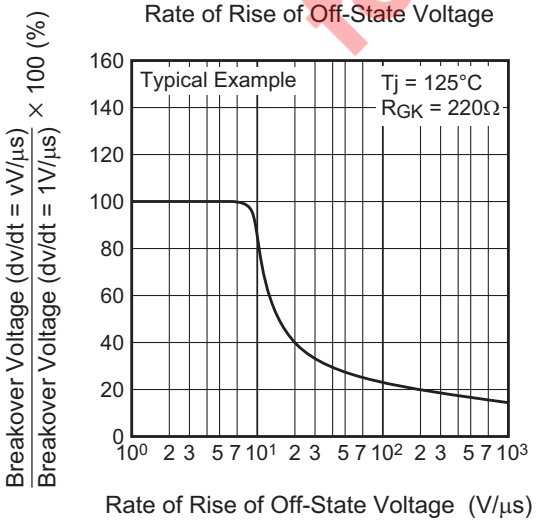
Breakover Voltage vs.
Junction Temperature



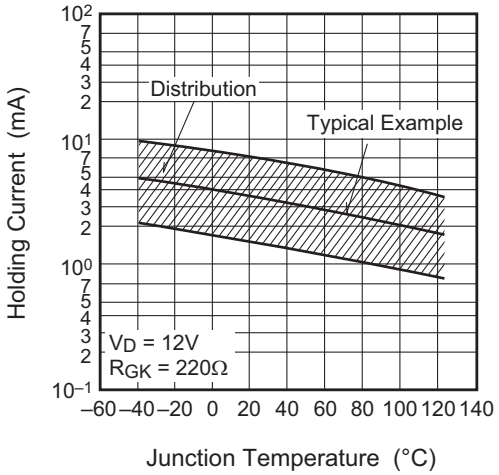
Breakover Voltage vs.
Gate to Cathode Resistance



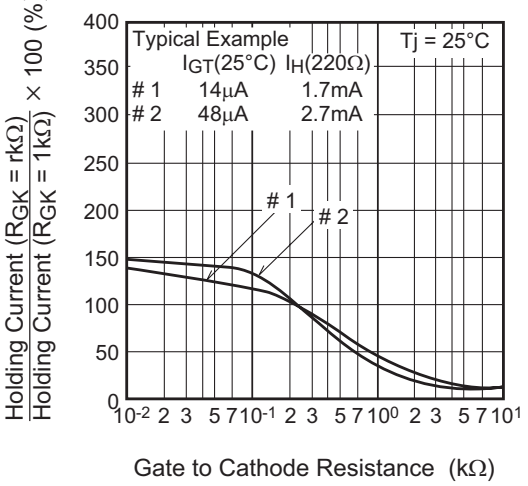
Breakover Voltage vs.
Rate of Rise of Off-State Voltage



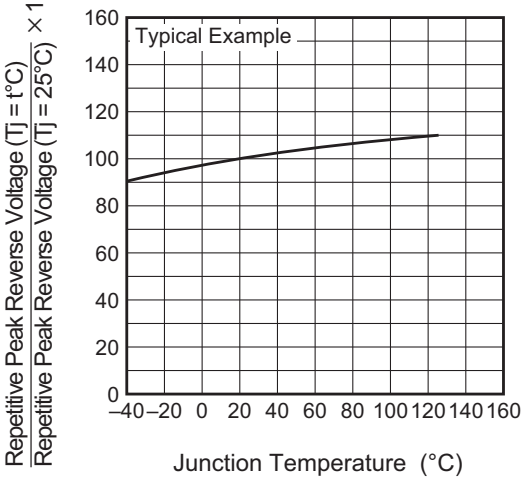
Holding Current vs.
Junction Temperature



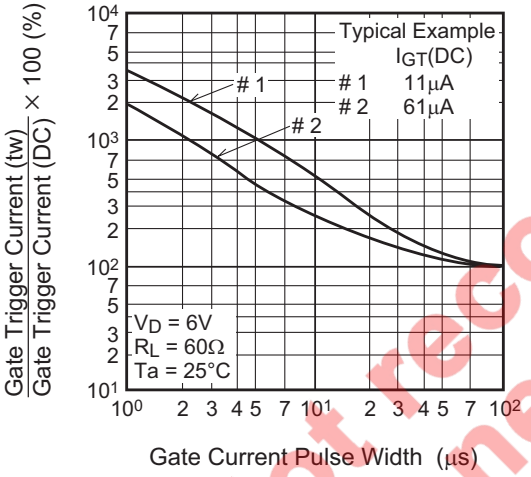
Holding Current vs.
Gate to Cathode Resistance



Repetitive Peak Reverse Voltage vs.
Junction Temperature



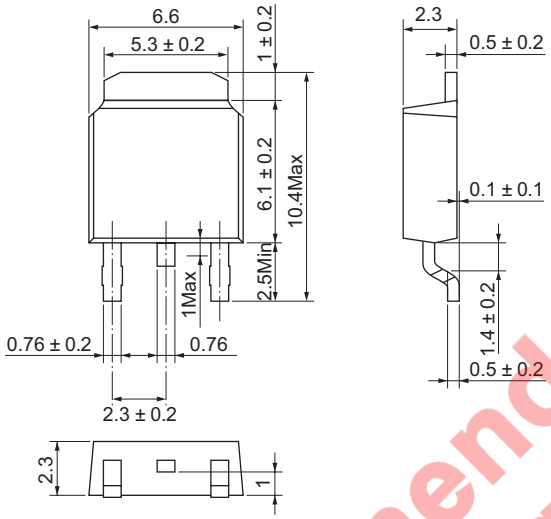
Gate Trigger Current vs.
Gate Current Pulse Width



Package Dimensions

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

Unit: mm



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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Colophon .7.2