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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CR3KM-12

Thyristor

Low Power Use

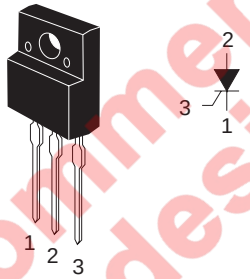
REJ03G0386-0200
Rev.2.00
Mar.28.2005

Features

- $I_{T\,(AV)}$: 3 A
- V_{DRM} : 600 V
- I_{GT} : 100 µA
- Viso : 2000 V
- Insulated Type
- Glass Passivation Type
- UL Recognized : Yellow Card No. E223904
  File No. E80271

Outline

RENESAS Package code: PRSS0003AB-A
(Package name: TO-220FN)



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, Tc = 103°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	Tj	– 40 to +125	°C	
Storage temperature	Tstg	– 40 to +125	°C	
Mass	—	2.0	g	Typical value
Isolation voltage	Viso	2000	V	Ta = 25°C, AC 1 minute, each terminal to case

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}	—	—	1.6	V	Tc = 25°C, I_{TM} = 10 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
Thermal resistance	$R_{th\ (j\text{-}c)}$	—	—	4.1	°C/W	Junction to case Note2

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

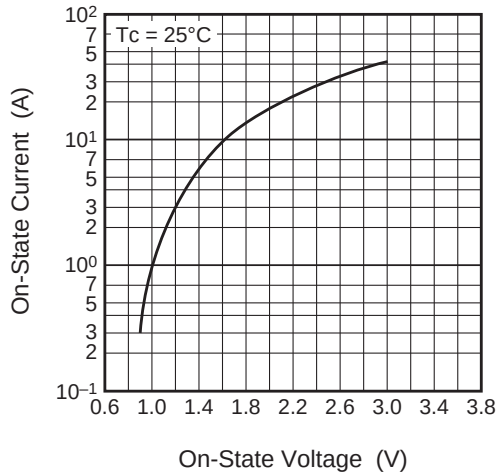
3. If special values of I_{GT} are required, choose item D or E from those listed in the table below if possible.

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

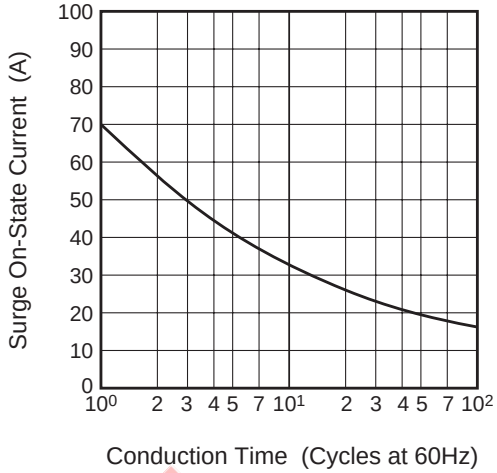
The above values do not include the current flowing through the 220 Ω resistance between the gate and cathode.

Performance Curves

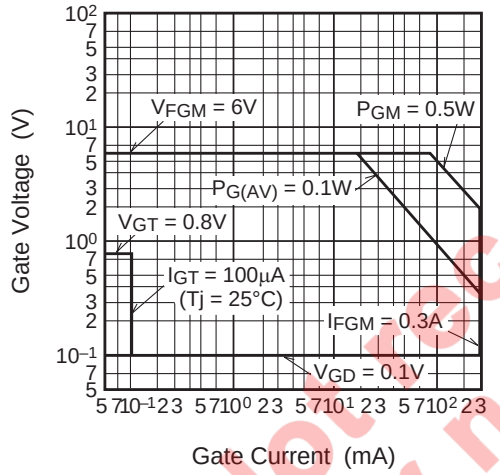
Maximum On-State Characteristics



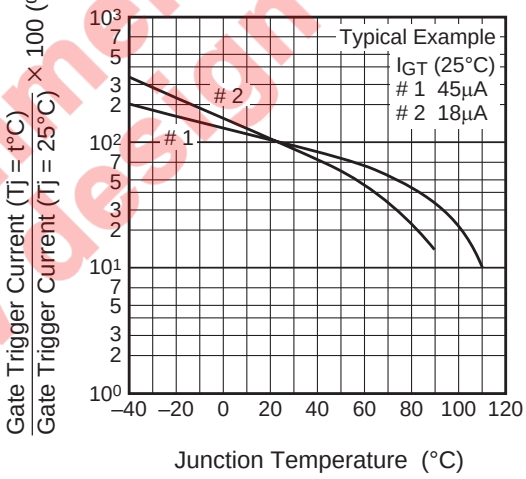
Rated Surge On-State Current



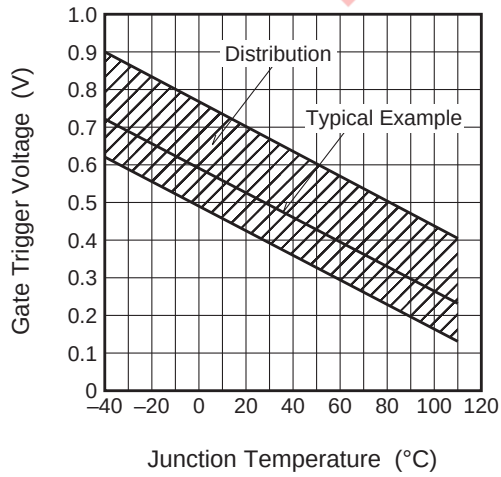
Gate Characteristics



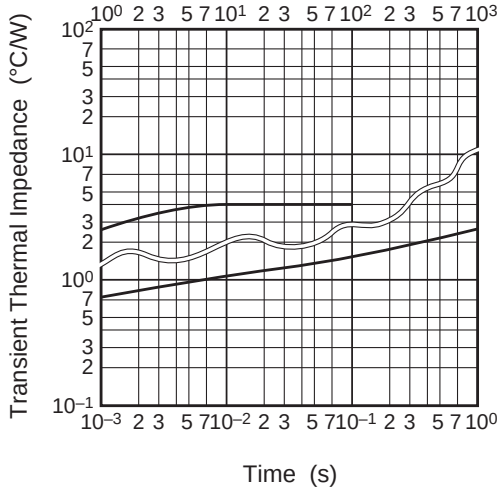
Gate Trigger Current vs.
Junction Temperature



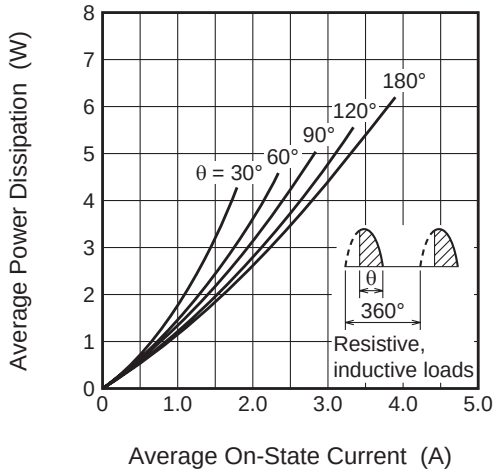
Gate Trigger Voltage vs.
Junction Temperature



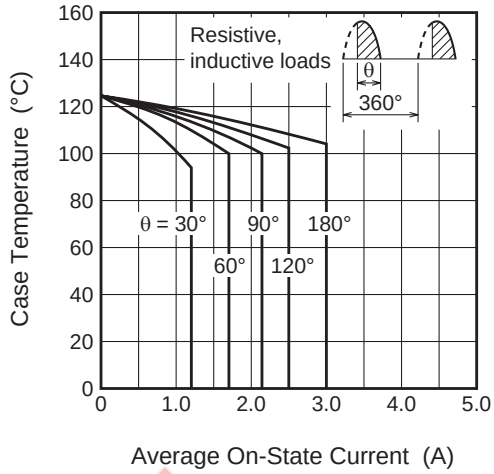
Maximum Transient Thermal Impedance
Characteristics (Junction to case)



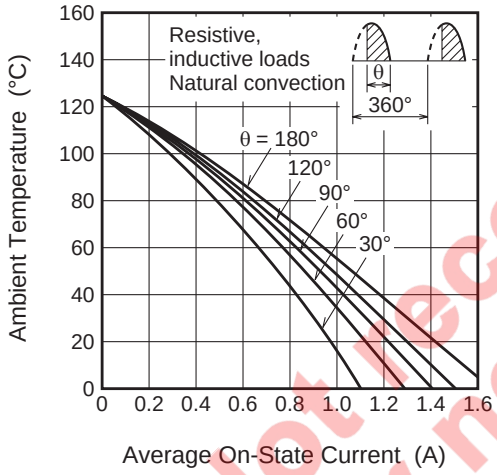
Maximum Average Power Dissipation
(Single-Phase Half Wave)



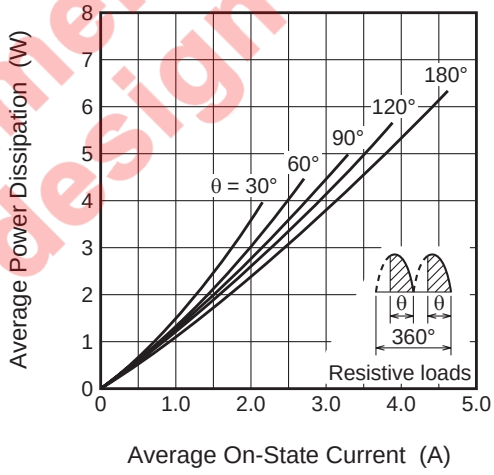
Allowable Case Temperature vs.
Average On-State Current
(Single-Phase Half Wave)



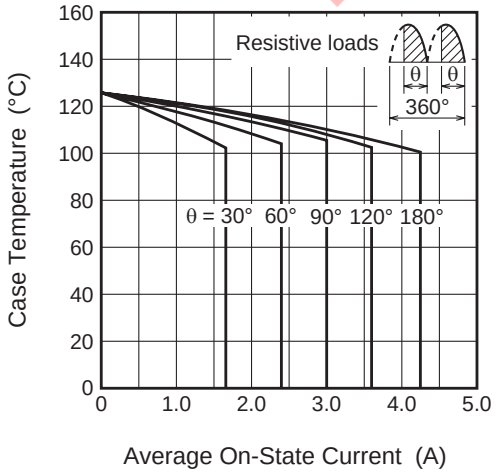
Allowable Ambient Temperature vs.
Average On-State Current
(Single-Phase Half Wave)



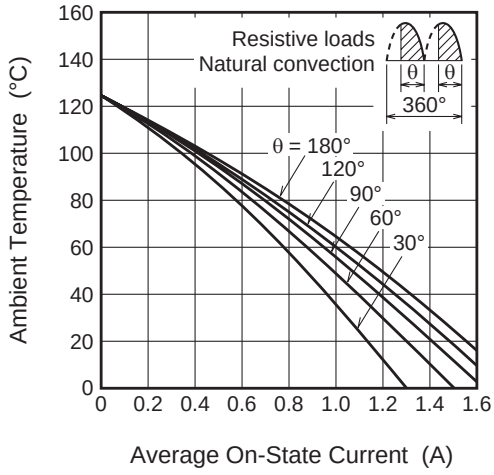
Maximum Average Power Dissipation
(Single-Phase Full Wave)



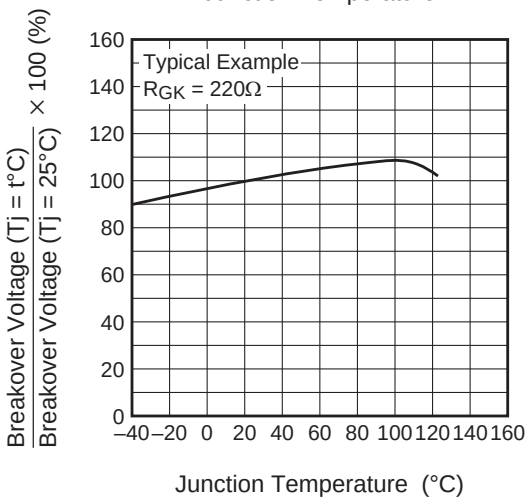
Allowable Case Temperature vs.
Average On-State Current
(Single-Phase Full Wave)



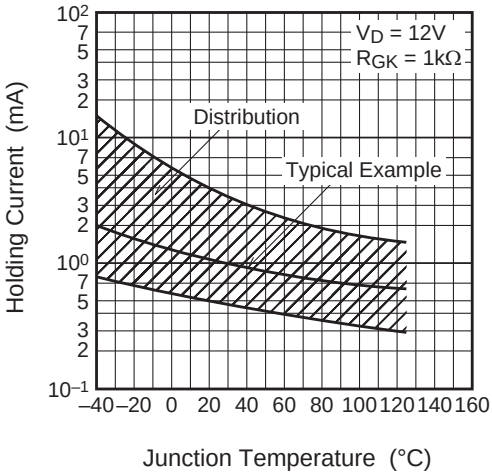
Allowable Ambient Temperature vs.
Average On-State Current
(Single-Phase Full Wave)



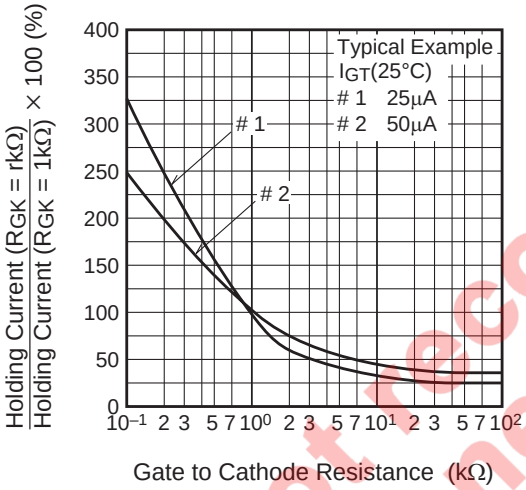
Breakover Voltage vs. Junction Temperature



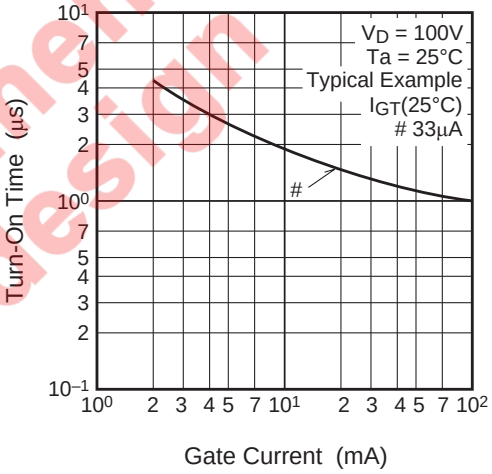
Holding Current vs. Junction Temperature



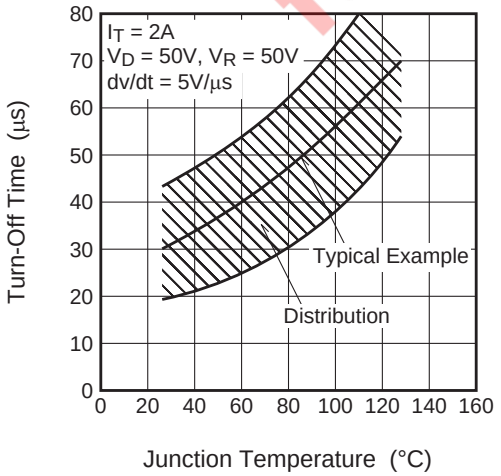
Holding Current vs. Gate to Cathode Resistance



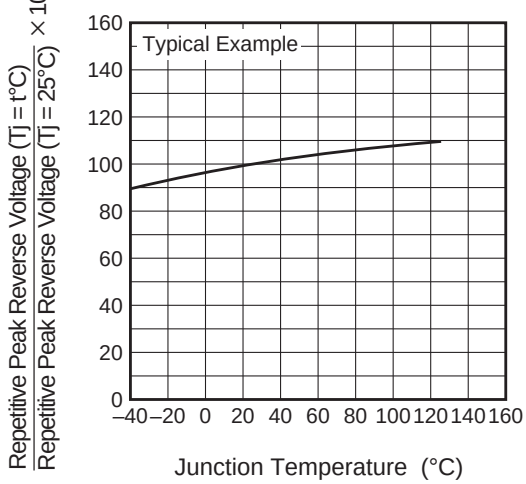
Turn-On Time vs. Gate Current



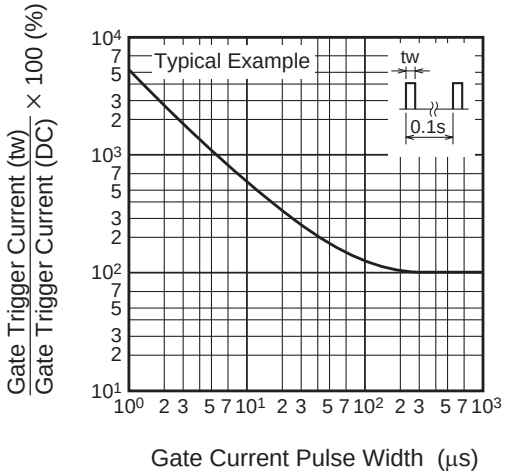
Turn-Off Time vs. Junction Temperature



Repetitive Peak Reverse Voltage vs. Junction Temperature



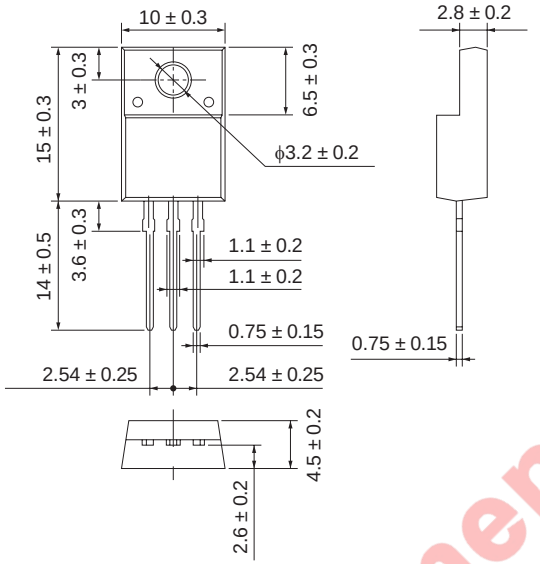
Gate Trigger Current vs.
Gate Current Pulse Width



Package Dimensions

JEITA Package Code	RENESAS Code	Package Name	MASS[Typ.]
–	PRSS0003AB-A	TO-220FN	2.0g

Unit: mm



Order Code

Lead form	Standard packing	Quantity	Standard order code	Standard order code example
Straight type	Tube	50	Type name	CR3KM-12
Lead form	Tube	50	Type name – Lead forming code	CR3KM-12-A8

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

Renesas Technology Corp. Sales Strategic Planning Div. Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan

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Renesas Technology America, Inc.
450 Holger Way, San Jose, CA 95134-1368, U.S.A
Tel: <1> (408) 382-7500, Fax: <1> (408) 382-7501

Renesas Technology Europe Limited
Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K.
Tel: <44> (1628) 585-100, Fax: <44> (1628) 585-900

Renesas Technology Hong Kong Ltd.
7th Floor, North Tower, World Finance Centre, Harbour City, 1 Canton Road, Tsimshatsui, Kowloon, Hong Kong
Tel: <852> 2265-6688, Fax: <852> 2730-6071

Renesas Technology Taiwan Co., Ltd.
10th Floor, No.99, Fushing North Road, Taipei, Taiwan
Tel: <886> (2) 2715-2888, Fax: <886> (2) 2713-2999

Renesas Technology (Shanghai) Co., Ltd.
Unit2607 Ruijing Building, No.205 Maoming Road (S), Shanghai 200020, China
Tel: <86> (21) 6472-1001, Fax: <86> (21) 6415-2952

Renesas Technology Singapore Pte. Ltd.
1 Harbour Front Avenue, #06-10, Keppel Bay Tower, Singapore 098632
Tel: <65> 6213-0200, Fax: <65> 6278-8001

Colophon .2.0