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April 1st, 2010
Renesas Electronics Corporation

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

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BCR3AM-14B

Triac

Low Power Use

REJ03G1806-0100

Rev.1.00

Jul 22, 2009

Features

- $I_{T(RMS)}$: 3 A
- V_{DRM} : 800 V ($T_j = 125^\circ\text{C}$)
- $I_{FGT I}$, $I_{RGT I}$, $I_{RGT III}$: 30 mA
- The Product guaranteed maximum junction temperature 150°C
- Planar Passivation Type

Outline

RENESAS Package code: PRSS0003EA-A
(Package name: TO-92)



1. T_1 Terminal
2. T_2 Terminal
3. Gate Terminal

Applications

Heater control, other general controlling devices

Maximum Ratings

Parameter	Symbol	Voltage class	Unit	Conditions
		14		
Repetitive peak off-state voltage ^{Note1}	V_{DRM}	800	V	$T_j = 125^\circ\text{C}$
		700	V	$T_j = 150^\circ\text{C}$
Non-repetitive peak off-state voltage ^{Note1}	V_{DSM}	840	V	

Parameter	Symbol	Ratings	Unit	Conditions
RMS on-state current	$I_{T(RMS)}$	3	A	Commercial frequency, sine full wave 360° conduction, non-continuous
Surge on-state current	I_{TSM}	30	A	60Hz sinewave 1 full cycle, peak value, non-repetitive
I^2t for fusing	I^2t	3.7	A^2s	Value corresponding to 1 cycle of half wave 60Hz, surge on-state current
Peak gate power dissipation	P_{GM}	3	W	
Average gate power dissipation	$P_{G(AV)}$	0.3	W	
Peak gate voltage	V_{GM}	6	V	
Peak gate current	I_{GM}	0.5	A	
Junction temperature	T_j	- 40 to +150	$^\circ\text{C}$	
Storage temperature	T_{stg}	- 40 to +150	$^\circ\text{C}$	
Mass	—	0.32	g	Typical value

Notes: 1. Gate open.

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Repetitive peak off-state current	I_{DRM}	—	—	2.0	mA	$T_j = 150^\circ\text{C}$, V_{DRM} applied
On-state voltage	V_{TM}	—	—	1.6	V	$T_c = 25^\circ\text{C}$, $I_{TM} = 4.5\text{ A}$, Instantaneous measurement
Gate trigger voltage ^{Note2}	I	V_{FGTI}	—	—	1.5	$T_j = 25^\circ\text{C}$, $V_D = 6\text{ V}$, $R_L = 6\ \Omega$, $R_G = 330\ \Omega$
	II	V_{RGTI}	—	—	1.5	
	III	V_{RGTIII}	—	—	1.5	
Gate trigger current ^{Note2}	I	I_{FGTI}	—	—	30	$T_j = 25^\circ\text{C}$, $V_D = 6\text{ V}$, $R_L = 6\ \Omega$, $R_G = 330\ \Omega$
	II	I_{RGTI}	—	—	30	
	III	I_{RGTIII}	—	—	30	
Gate non-trigger voltage	V_{GD}	0.2/0.1	—	—	V	$T_j = 125^\circ\text{C}/150^\circ\text{C}$, $V_D = 1/2 V_{DRM}$
Thermal resistance	$R_{th(j-c)}$	—	—	50	$^\circ\text{C}/\text{W}$	Junction to case ^{Note3}
Critical-rate of rise of off-state commutating voltage ^{Note4}	$(dv/dt)_c$	5/1	—	—	$\text{V}/\mu\text{s}$	$T_j = 125^\circ\text{C}/150^\circ\text{C}$

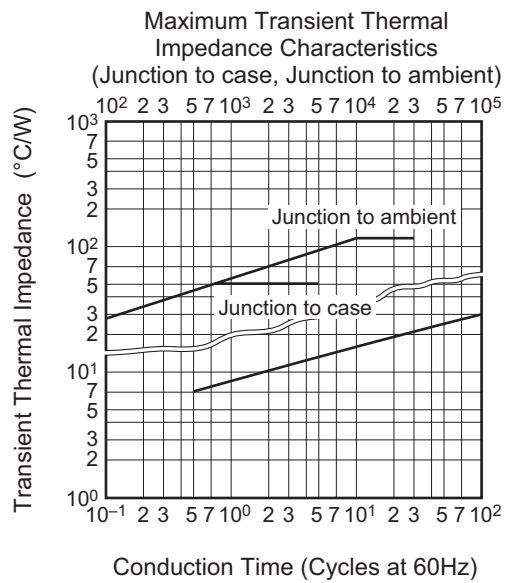
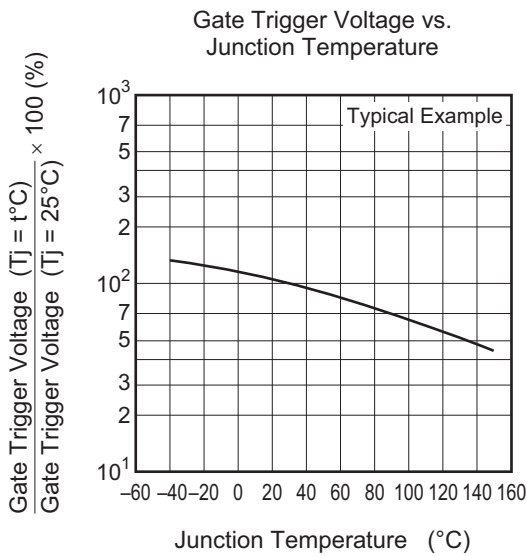
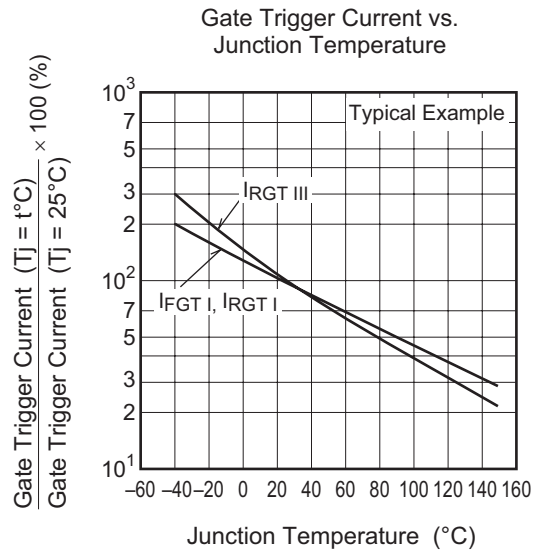
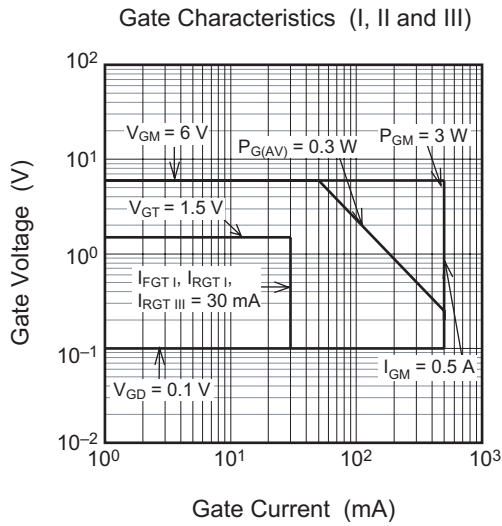
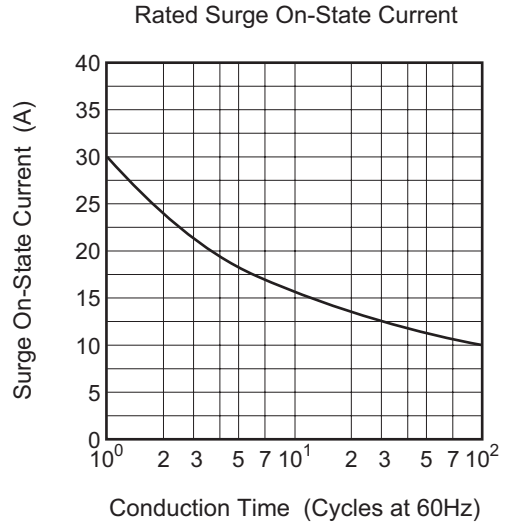
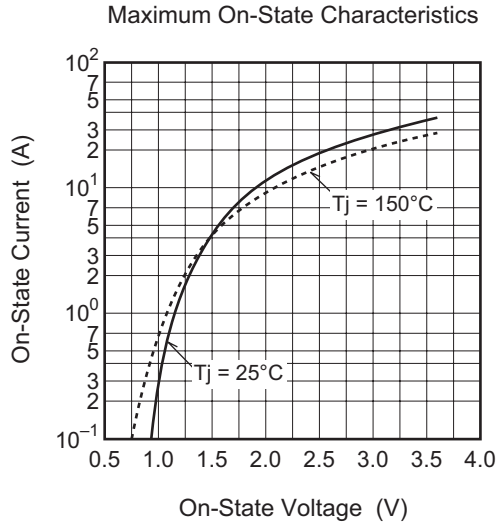
Notes: 2. Measurement using the gate trigger characteristics measurement circuit.

3. Case temperature is measured at the T_2 terminal 1.5 mm away from the molded case.

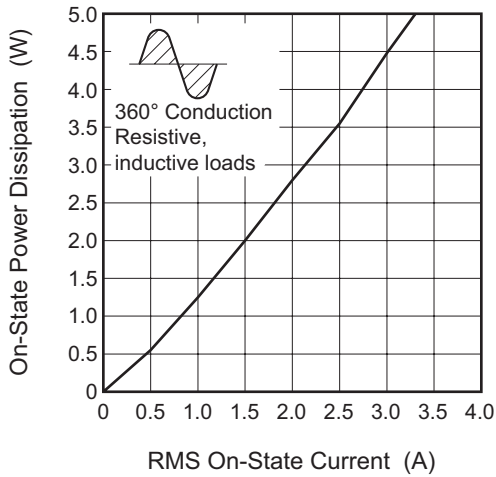
4. Test conditions of the critical-rate of rise of off-state commutating voltage is shown in the table below.

Test conditions	Commutating voltage and current waveforms (inductive load)
1. Junction temperature $T_j = 125^\circ\text{C}/150^\circ\text{C}$ 2. Rate of decay of on-state commutating current $(di/dt)_c = -4.0\text{ A/ms}$ 3. Peak off-state voltage $V_D = 400\text{ V}$	

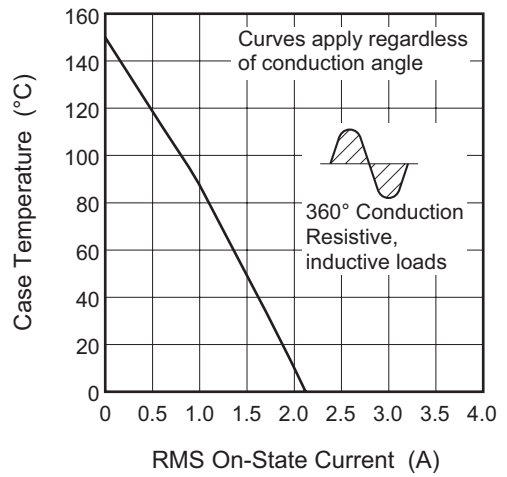
Performance Curves



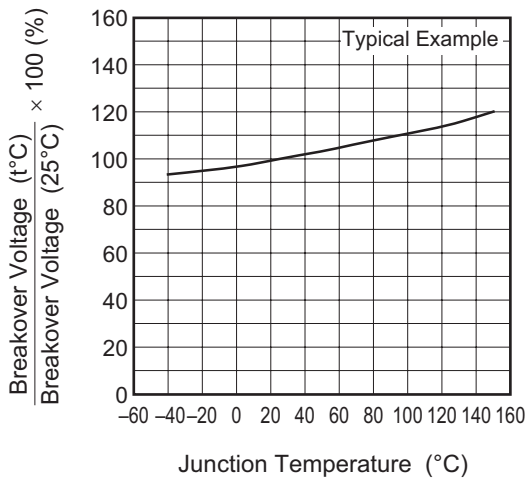
Maximum On-State Power Dissipation



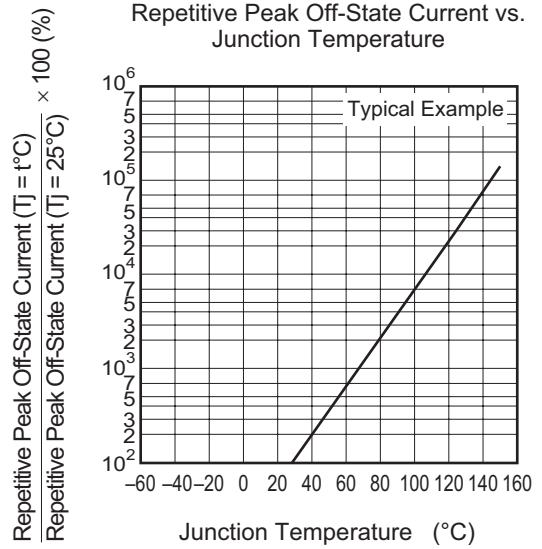
Allowable Case Temperature vs. RMS On-State Current



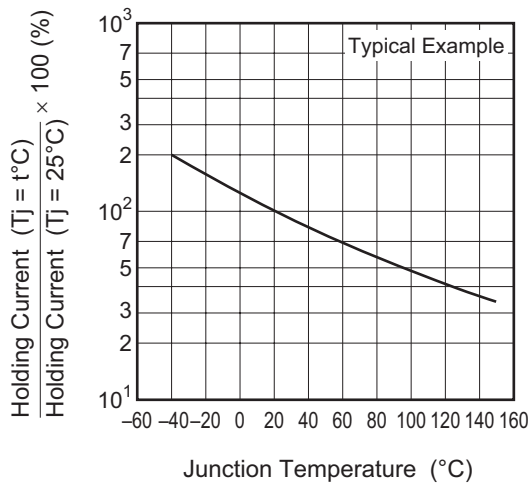
Breakover Voltage vs. Junction Temperature



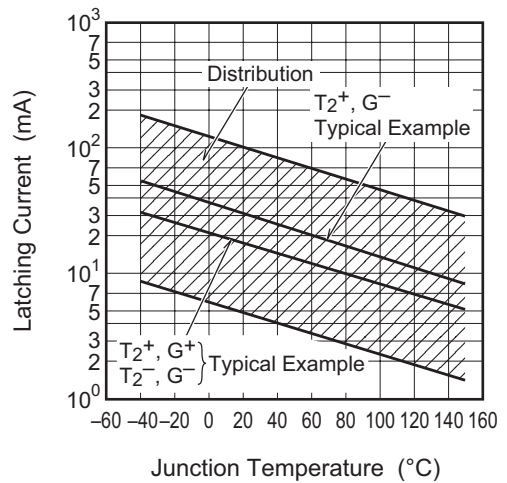
Repetitive Peak Off-State Current vs. Junction Temperature

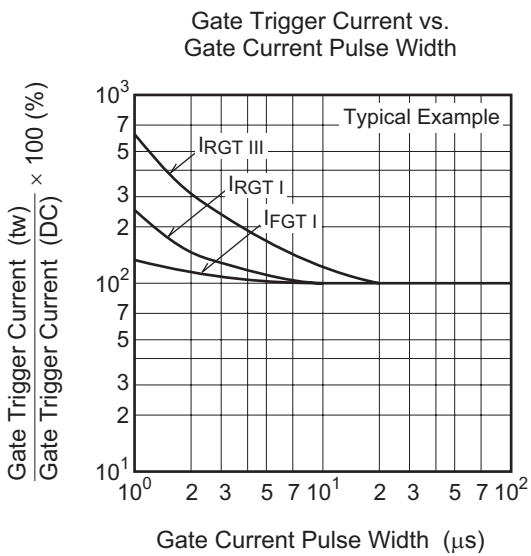
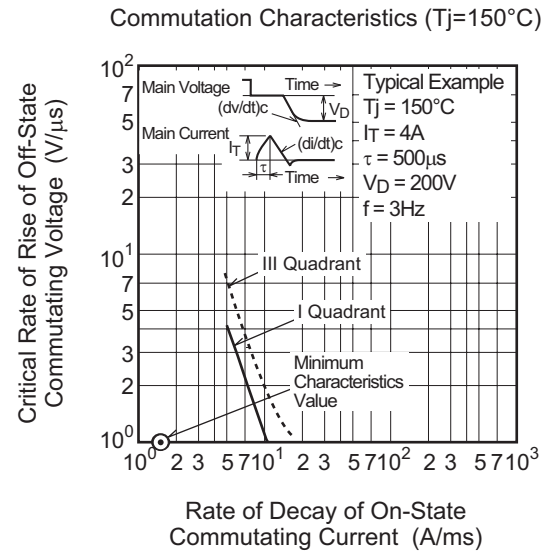
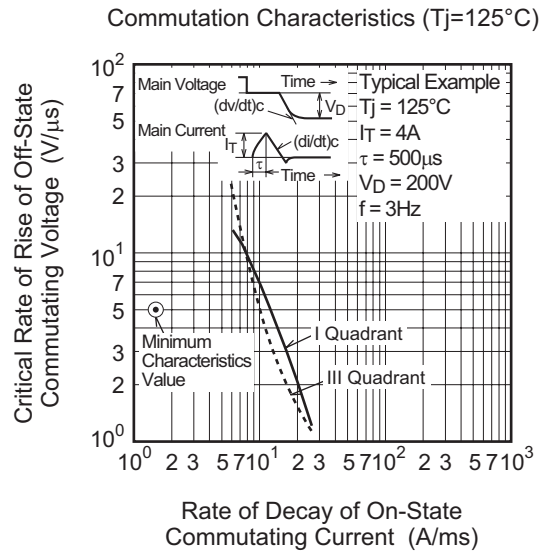
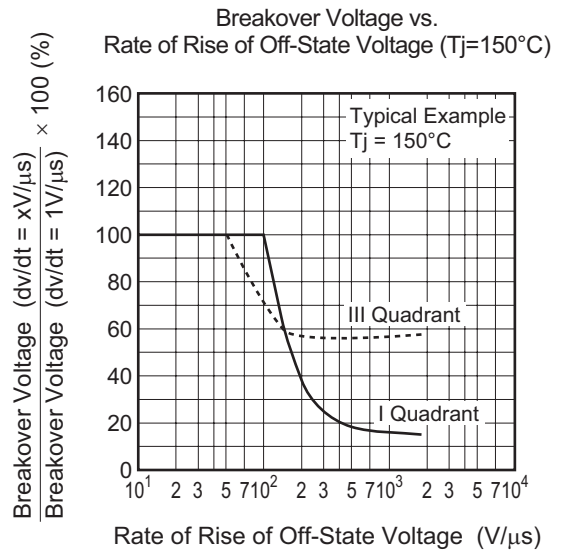
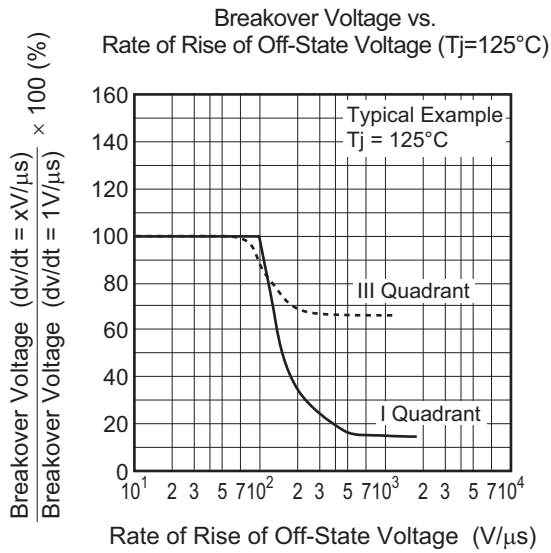


Holding Current vs. Junction Temperature

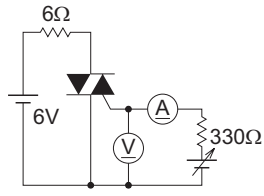


Latching Current vs. Junction Temperature

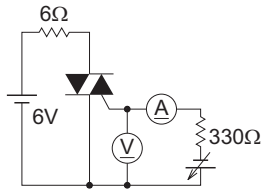




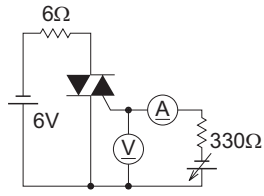
Gate Trigger Characteristics Test Circuits



Test Procedure I

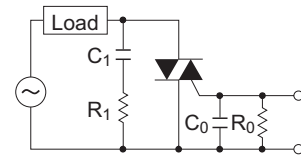


Test Procedure II



Test Procedure III

Recommended Circuit Values Around The Triac

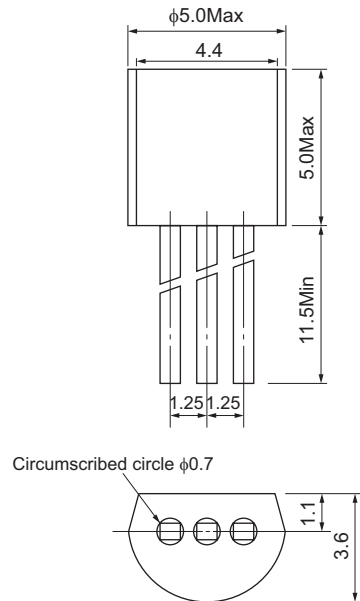


$C_1 = 0.1 \text{ to } 0.47 \mu\text{F}$ $C_0 = 0.1 \mu\text{F}$
 $R_1 = 47 \text{ to } 100 \Omega$ $R_0 = 100 \Omega$

Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
TO-92*	SC-43A	PRSS0003EA-A	—	0.23g

Unit: mm



Order Code

Lead form	Standard packing	Quantity	Standard order code	Standard order code example
Straight type	Vinyl sack	500	Type name	BCR3AM-14B
Lead form	Vinyl sack	500	Type name – Lead forming code	BCR3AM-14B-A6
Form A8	Taping	2000	Type name – TB	BCR3AM-14B-TB

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

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