



# BCR12PM-12LC

## Triac

### Medium Power Use

REJ03G1261-0300

Rev.3.00

Dec 20, 2006

### Features

- $I_T(RMS)$  : 12 A
- $V_{DRM}$  : 600 V
- $I_{FGT}$ ,  $I_{RGT}$ ,  $I_{RGTII}$  : 50 mA
- $V_{iso}$  : 1500 V
- The product guaranteed maximum junction temperature 150°C.
- Insulated Type
- Planar Passivation Type

### Outline

RENESAS Package code: PRSS0003AA-B  
(Package name: TO-220F(2) )



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

### Applications

Heater control, motor control

### Maximum Ratings

Parameter	Symbol	Voltage class	Unit
		12	
Repetitive peak off-state voltage <sup>Note1</sup>	$V_{DRM}$	600	V
Non-repetitive peak off-state voltage <sup>Note1</sup>	$V_{DSM}$	700	V



## BCR12PM-12LC

Parameter	Symbol	Ratings	Unit	Conditions
RMS on-state current	$I_T (RMS)$	12	A	Commercial frequency, sine full wave 360° conduction, $T_c = 77^\circ\text{C}$
Surge on-state current	$I_{TSM}$	72	A	60Hz sinewave 1 full cycle, peak value, non-repetitive
$I^2t$ for fusing	$I^2t$	21.6	$\text{A}^2\text{s}$	Value corresponding to 1 cycle of half wave 60Hz, surge on-state current
Peak gate power dissipation	$P_{GM}$	5	W	
Average gate power dissipation	$P_{G(AV)}$	0.5	W	
Peak gate voltage	$V_{GM}$	10	V	
Peak gate current	$I_{GM}$	2	A	
Junction temperature	$T_j$	- 40 to +150	$^\circ\text{C}$	
Storage temperature	$T_{stg}$	- 40 to +150	$^\circ\text{C}$	
Mass	—	2.0	g	Typical value
Isolation voltage	Viso	1500	V	$T_a = 25^\circ\text{C}$ , AC 1 minute, $T_1 \cdot T_2 \cdot G$ terminal to case

Notes: 1. Gate open.

## Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Repetitive peak off-state current	$I_{DRM}$	—	—	2.0	mA	$T_j = 125^\circ\text{C}$ , $V_{DRM}$ applied
On-state voltage	$V_{TM}$	—	—	1.8	V	$T_c = 25^\circ\text{C}$ , $I_{TM} = 20\text{ A}$ , Instantaneous measurement
Gate trigger voltage <sup>Note2</sup>	I $V_{FGTI}$	—	—	1.5	V	$T_j = 25^\circ\text{C}$ , $V_D = 6\text{ V}$ , $R_L = 6\ \Omega$ , $R_G = 330\ \Omega$
	II $V_{RGTI}$	—	—	1.5	V	
	III $V_{RGTIII}$	—	—	1.5	V	
Gate trigger current <sup>Note2</sup>	I $I_{FGTI}$	—	—	50	mA	$T_j = 25^\circ\text{C}$ , $V_D = 6\text{ V}$ , $R_L = 6\ \Omega$ , $R_G = 330\ \Omega$
	II $I_{RGTI}$	—	—	50	mA	
	III $I_{RGTIII}$	—	—	50	mA	
Gate non-trigger voltage	$V_{GD}$	0.2	—	—	V	$T_j = 125^\circ\text{C}$ , $V_D = 1/2 V_{DRM}$
Thermal resistance	$R_{th(j-c)}$	—	—	4.3	$^\circ\text{C/W}$	Junction to case <sup>Note3</sup>
Critical-rate of rise of off-state commutating voltage <sup>Note4</sup>	$(dv/dt)_c$	10	—	—	$\text{V}/\mu\text{s}$	$T_j = 125^\circ\text{C}$

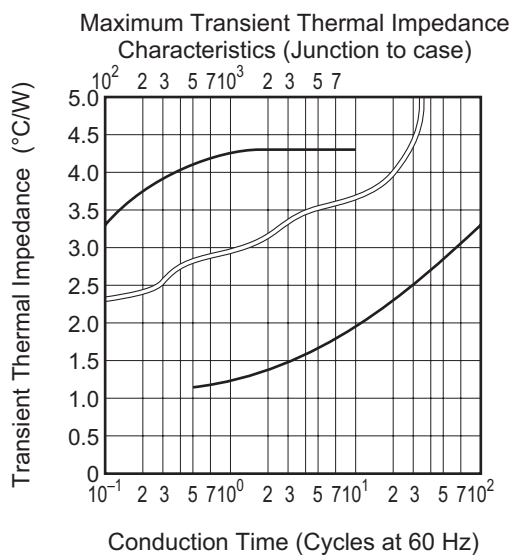
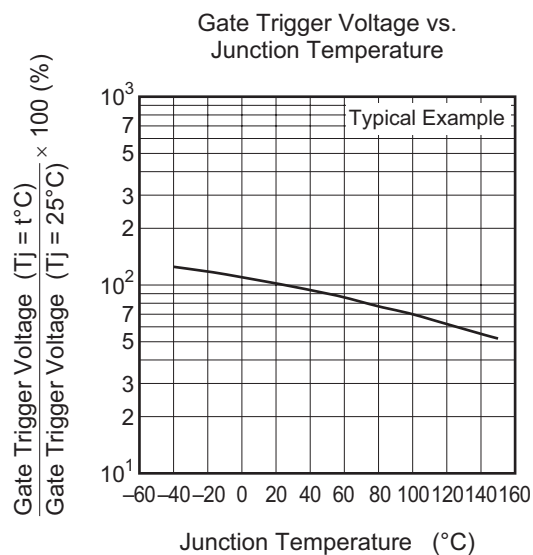
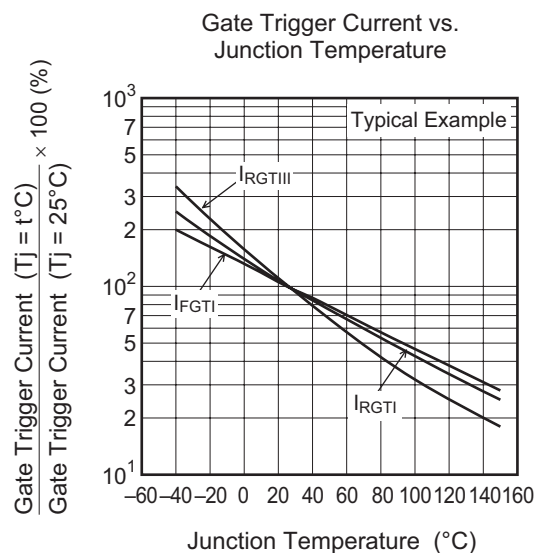
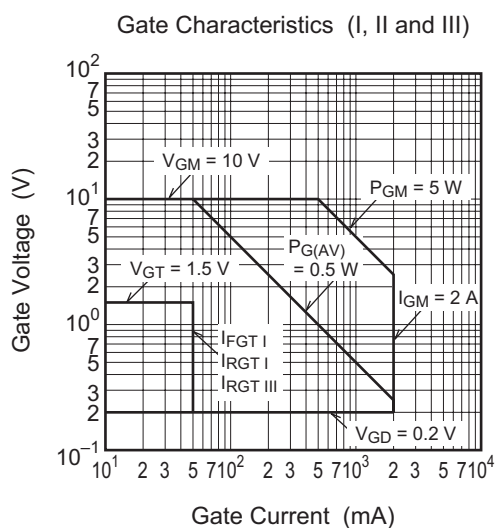
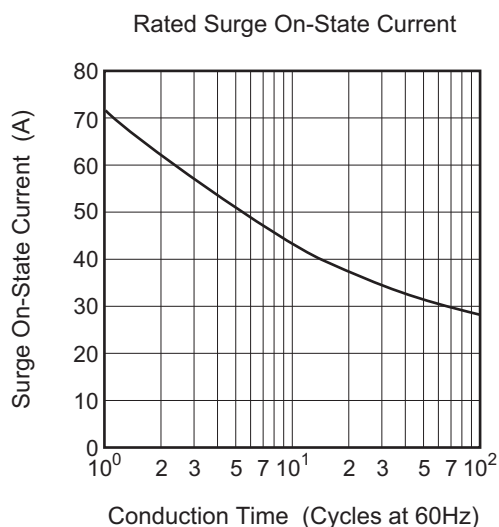
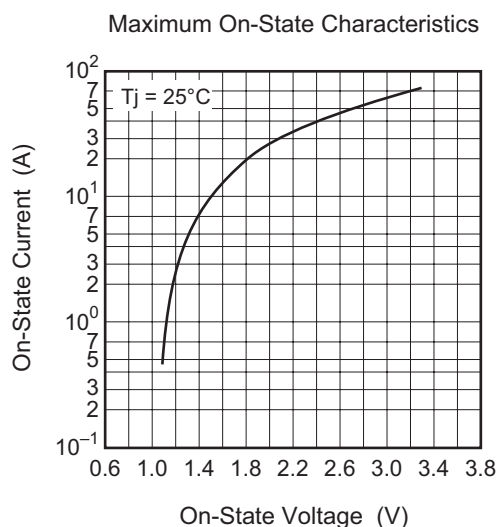
Notes: 2. Measurement using the gate trigger characteristics measurement circuit.

3. The contact thermal resistance  $R_{th(c-f)}$  in case of greasing is  $0.5^\circ\text{C/W}$ .

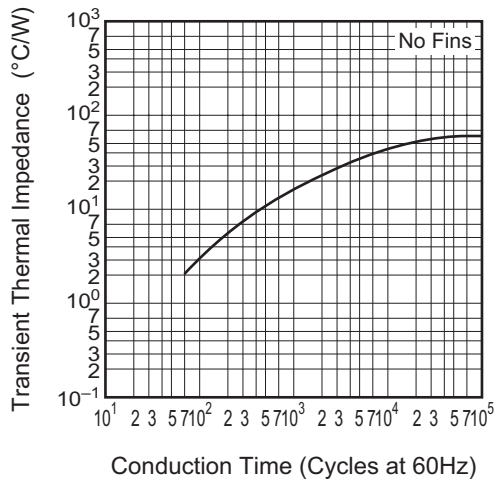
4. Test conditions of the critical-rate of rise of off-state commutating voltage is shown in the table below.

Test conditions	Commutating voltage and current waveforms (inductive load)
1. Junction temperature $T_j = 125^\circ\text{C}$ 2. Rate of decay of on-state commutating current $(di/dt)_c = -6\text{ A/ms}$ 3. Peak off-state voltage $V_D = 400\text{ V}$	

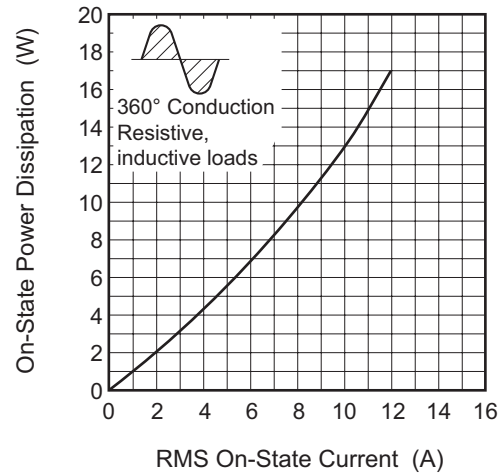
## Performance Curves



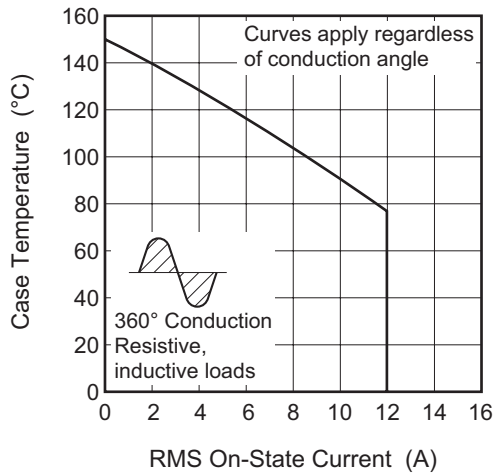
Maximum Transient Thermal Impedance Characteristics (Junction to ambient)



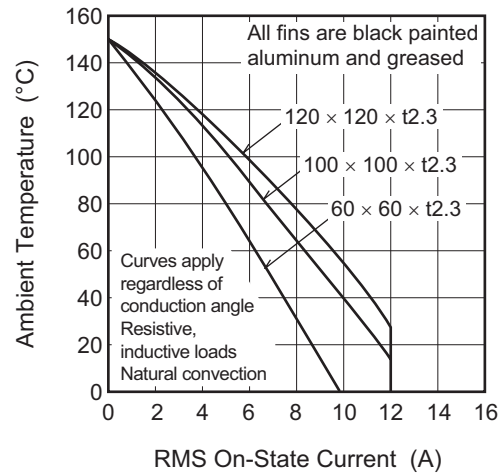
Maximum On-State Power Dissipation



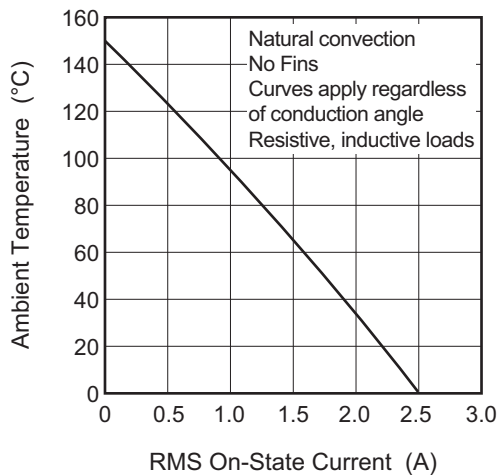
Allowable Case Temperature vs. RMS On-State Current



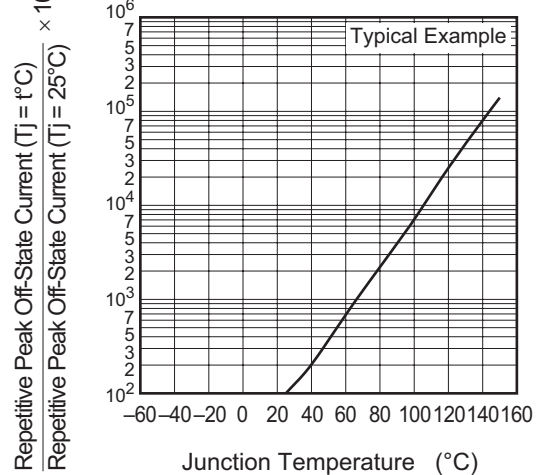
Allowable Ambient Temperature vs. RMS On-State Current

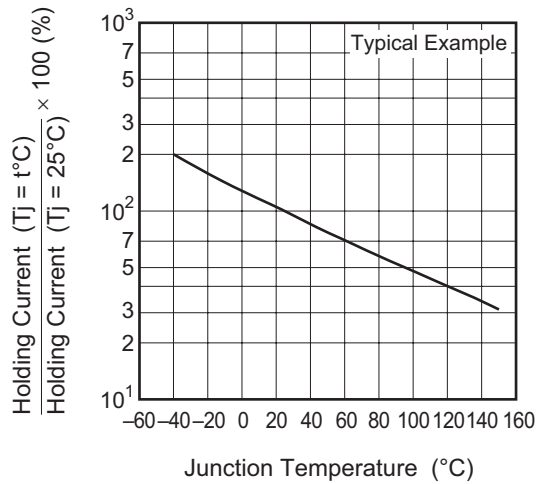
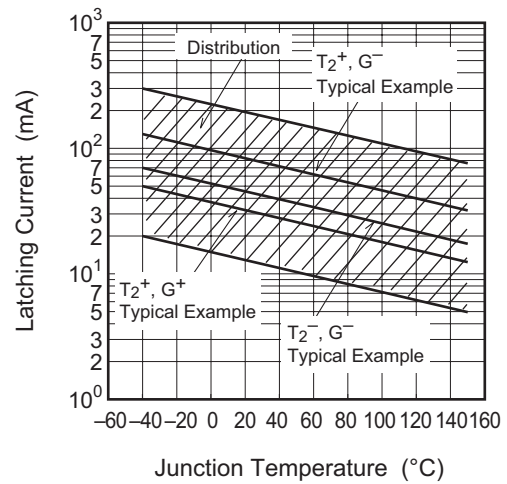
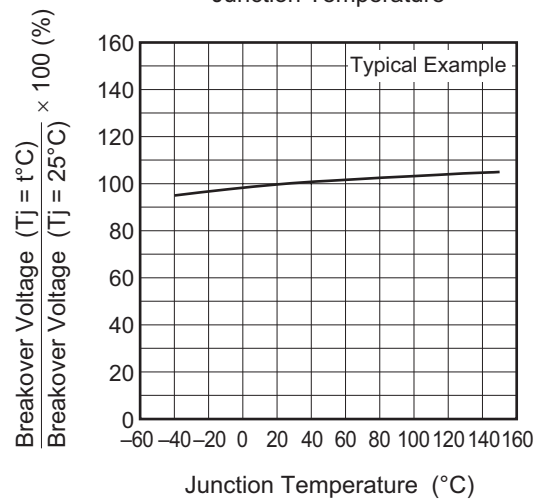
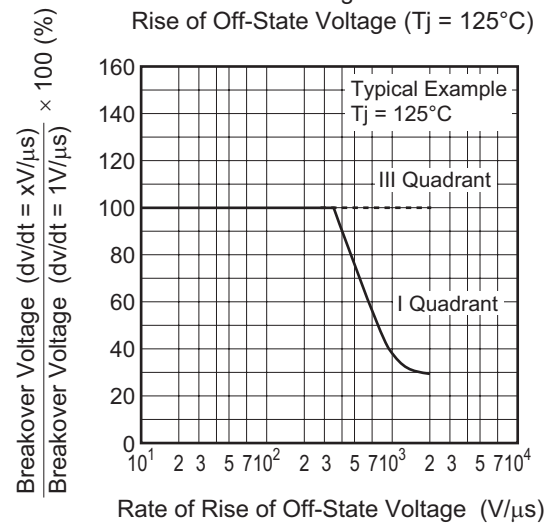
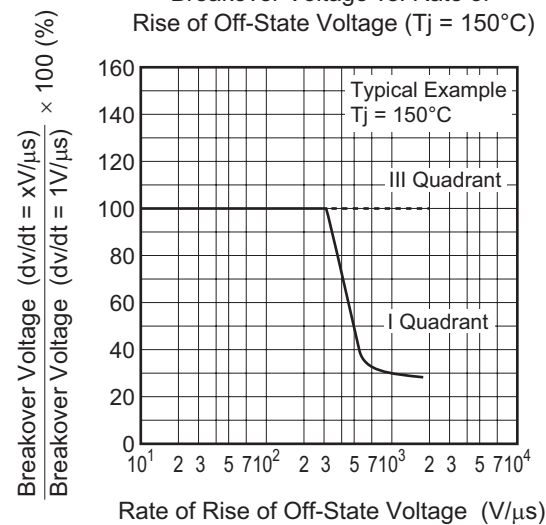
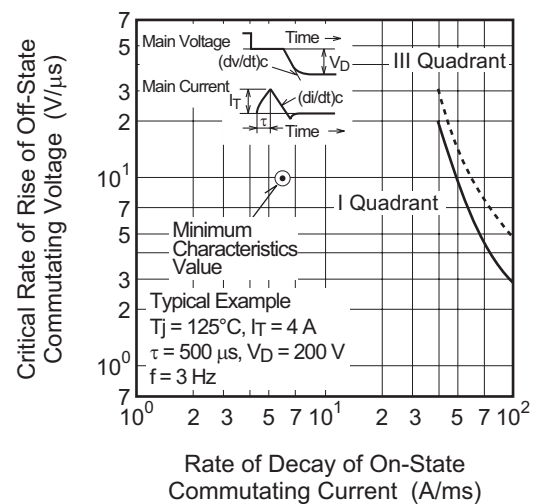


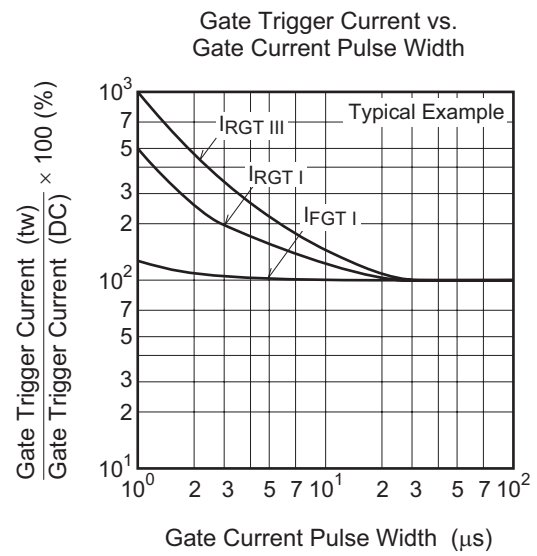
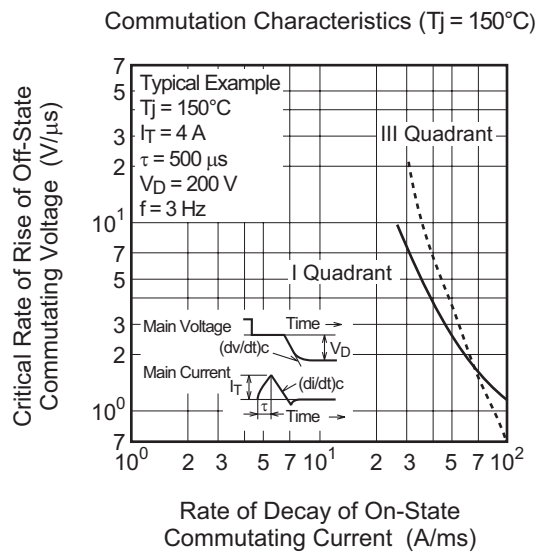
Allowable Ambient Temperature vs. RMS On-State Current



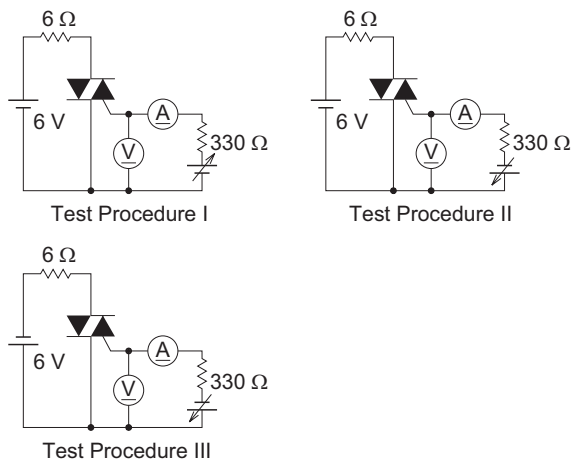
Repetitive Peak Off-State Current vs. Junction Temperature



Holding Current vs.  
Junction TemperatureLatching Current vs.  
Junction TemperatureBreakover Voltage vs.  
Junction TemperatureBreakover Voltage vs. Rate of  
Rise of Off-State Voltage ( $T_j = 125^\circ\text{C}$ )Breakover Voltage vs. Rate of  
Rise of Off-State Voltage ( $T_j = 150^\circ\text{C}$ )Commutation Characteristics ( $T_j = 125^\circ\text{C}$ )



Gate Trigger Characteristics Test Circuits



## Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]	Unit: mm
TO-220F(2)	SC-67	PRSS0003AA-B	—	2.0g	

Technical drawing of the BCR12PM-12LC package showing dimensions in mm:

- Top View:** Overall width 10.5Max, mounting hole diameter  $\phi 3.2 \pm 0.2$ , hole offset 5.2, hole diameter 1.2, body width 5.0, body height 8.5, lead thickness 1.3Max, lead width 0.8, lead pitch 2.54, lead length 13.5Min, total height 17.
- Side View:** Lead height 2.8, lead thickness 0.5, body width 2.6.
- Bottom View:** Mounting tab width 4.5.

## Order Code

Lead form	Standard packing	Quantity	Standard order code	Standard order code example
Straight type	Vinyl sack	100	Type name	BCR12PM-12LC
Lead form	Plastic Magazine (Tube)	50	Type name – Lead forming code	BCR12PM-12LC-A8

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

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