

# BCR20PM-14LJ

700V - 20A - Triac  
Medium Power Use

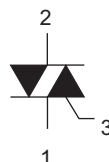
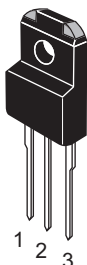
R07DS0982EJ0100  
Rev.1.00  
Dec 03, 2012

## Features

- $I_{T(RMS)}$  : 20 A
- $V_{DRM}$  : 800 V ( $T_j = 125^\circ\text{C}$ )
- $T_j$ : 150 °C
- $I_{FGTB}$ ,  $I_{RGTB}$ ,  $I_{RGTH}$ : 30 mA
- Viso: 2000 V
- Insulated Type
- Planar Passivation Type
- UL Recognized: File No. E223904

## Outline

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



1. T<sub>1</sub> Terminal
2. T<sub>2</sub> Terminal
3. Gate Terminal

## Applications

Vacuum cleaner, electric heater, light dimmer, copying machine, and other general controlling devices

## Maximum Ratings

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

Parameter	Symbol	Ratings	Unit	Conditions
RMS on-state current	$I_{T(RMS)}$	20	A	Commercial frequency, sine full wave 360° conduction, $T_c = 86^\circ\text{C}$
Surge on-state current	$I_{TSM}$	200	A	60 Hz sinewave 1 full cycle, peak value, non-repetitive
$I^2t$ for fusion	$I^2t$	167	A <sup>2</sup> s	Value corresponding to 1 cycle of half wave 60 Hz, 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	°C	
Storage temperature	$T_{stg}$	-40 to +150	°C	
Mass	—	2.0	g	Typical value
Isolation voltage <sup>Note5</sup>	Viso	2000	V	$T_a = 25^\circ\text{C}$ , AC 1 minute T <sub>1</sub> • T <sub>2</sub> • G terminal to case

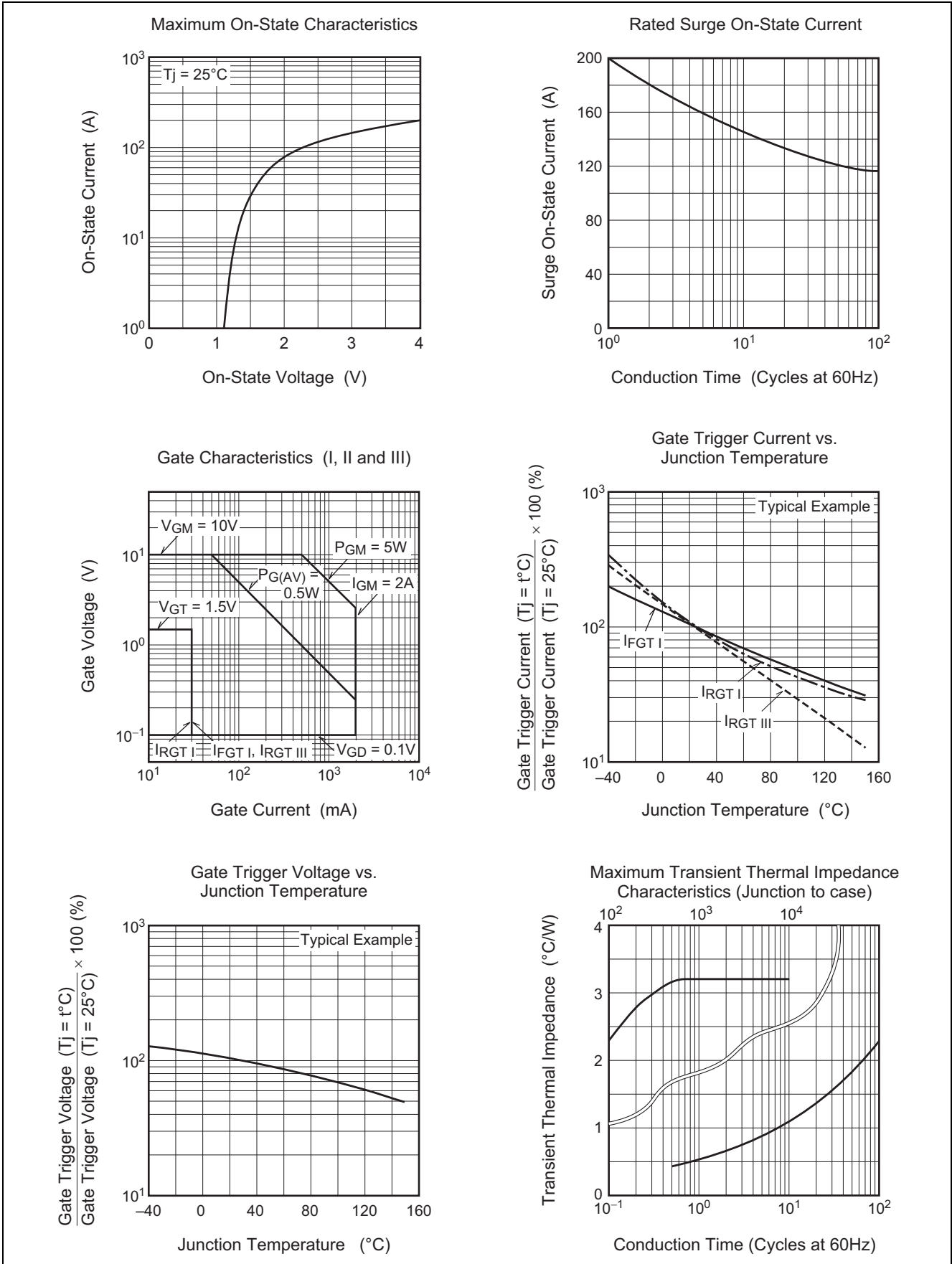
## Electrical Characteristics

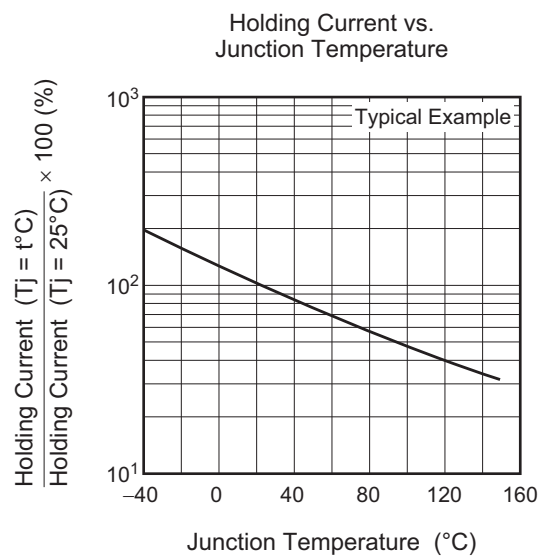
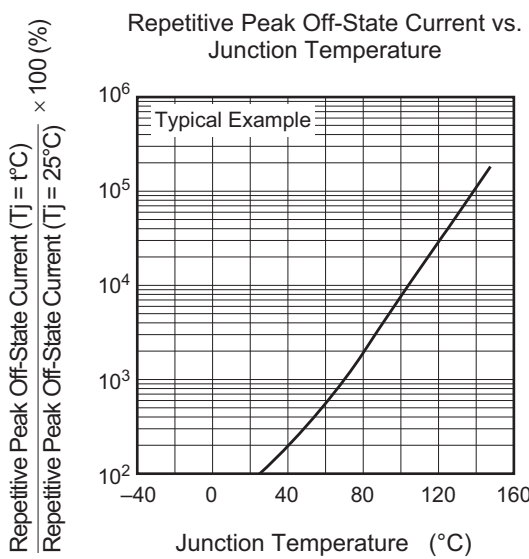
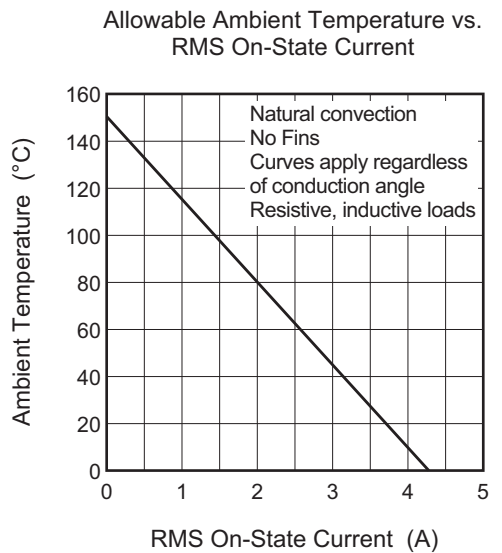
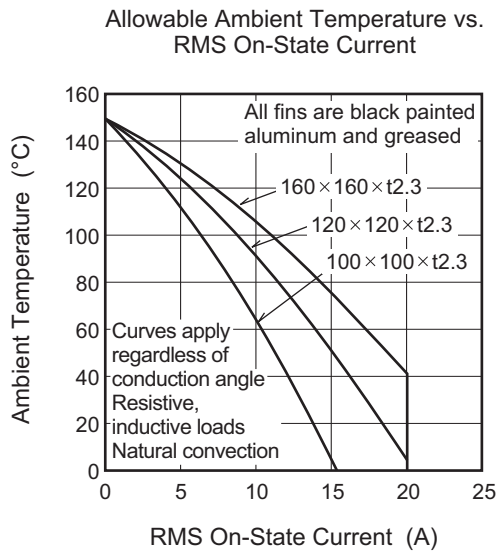
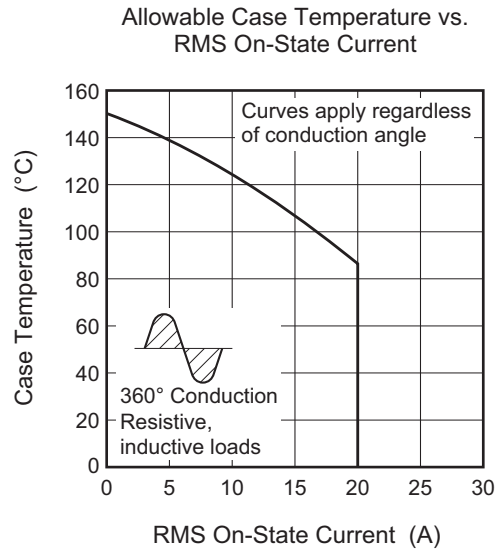
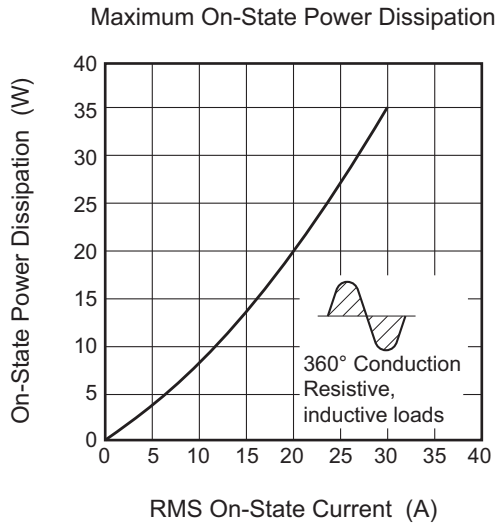
Parameter	Symbol	Rated value			Unit	Test conditions
		Min.	Typ.	Max.		
Repetitive peak off-state current	$I_{DRM}$	—	—	3.0	mA	$T_j = 150^\circ\text{C}$ , $V_{DRM}$ applied
On-state voltage	$V_{TM}$	—	—	1.5	V	$T_c = 25^\circ\text{C}$ , $I_{TM} = 30\text{A}$ , instantaneous measurement
Gate trigger voltage <sup>Note2</sup>	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 <sup>Note2</sup>	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	—	—	V	$T_j = 125^\circ\text{C}$ , $V_D = 1/2 V_{DRM}$
		0.1	—	—		$T_j = 150^\circ\text{C}$ , $V_D = 1/2 V_{DRM}$
Thermal resistance	$R_{th(j-c)}$	—	—	3.2	$^\circ\text{C/W}$	Junction to case <sup>Note3</sup>
Critical-rate of rise of off-state commutation voltage <sup>Note4</sup>	$(dv/dt)_c$	10	—	—	$\text{V}/\mu\text{s}$	$T_j = 125^\circ\text{C}$
		1	—	—		$T_j = 150^\circ\text{C}$

- Notes: 1. Gate open.  
 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 commutation voltage is shown in the table below.  
 5. Make sure that your finished product containing this device meets your safe isolation requirements.  
 For safety, it's advisable that heatsink is electrically floating.

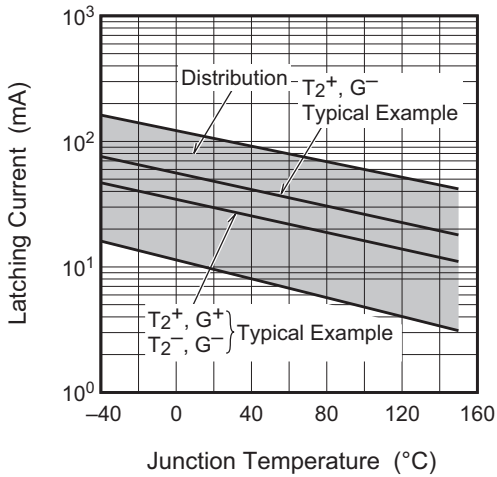
Test conditions	Commutating voltage and current waveforms (inductive load)
1. Junction temperature $T_j = 125/150^\circ\text{C}$ 2. Rate of decay of on-state commutating current $(di/dt)_c = -10\text{A/ms}$ 3. Peak off-state voltage $V_D = 400\text{V}$	

Performance Curves

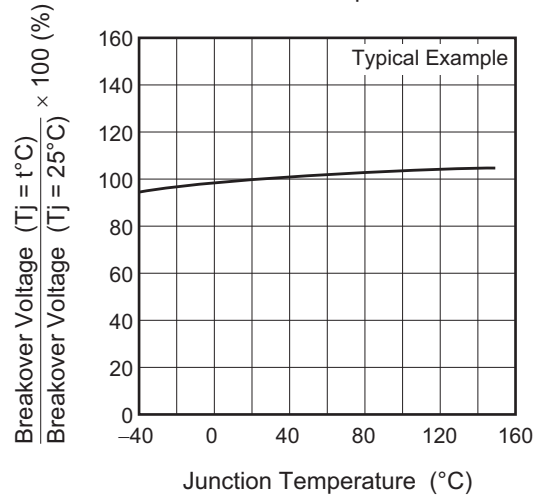




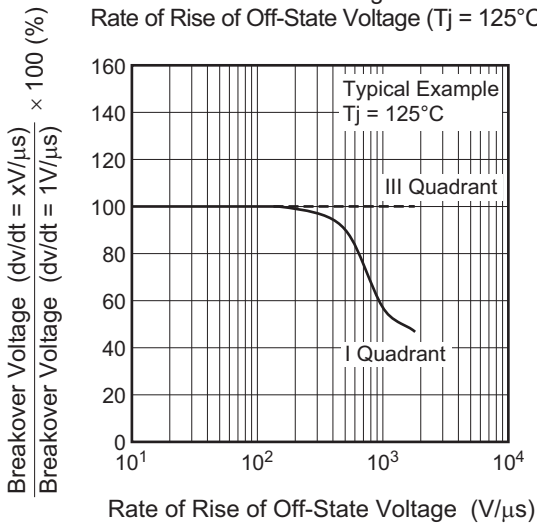
Latching Current vs. Junction Temperature



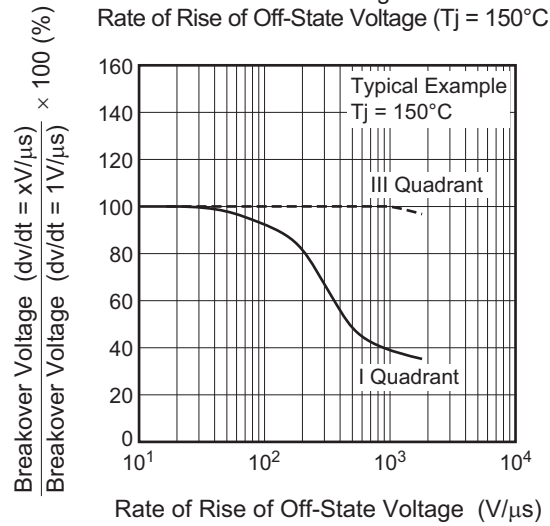
Breakover Voltage vs. Junction Temperature



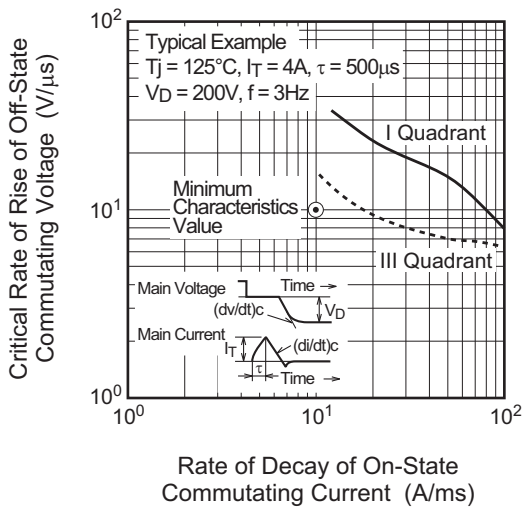
Breakover Voltage vs. Rate of Rise of Off-State Voltage (Tj = 125°C)



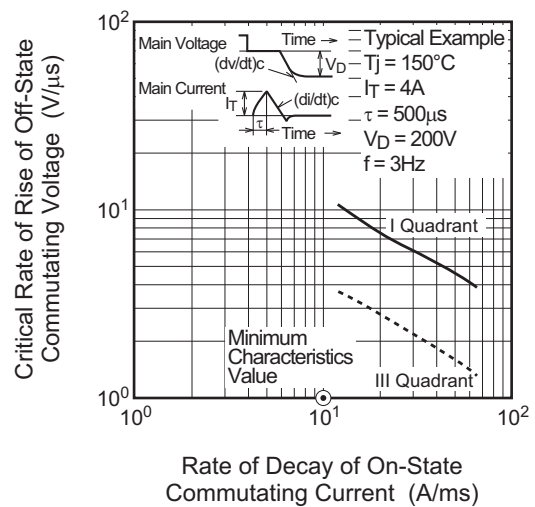
Breakover Voltage vs. Rate of Rise of Off-State Voltage (Tj = 150°C)



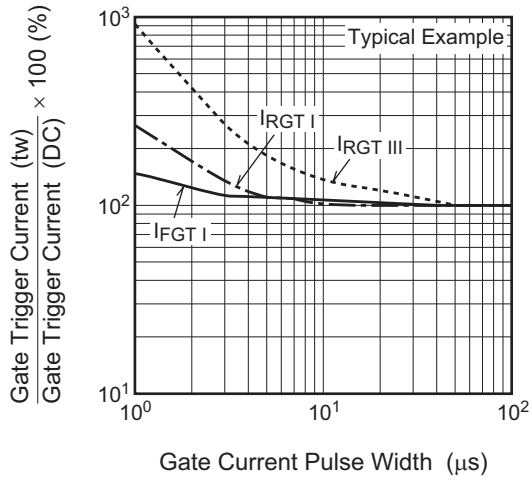
Commutation Characteristics (Tj = 125°C)



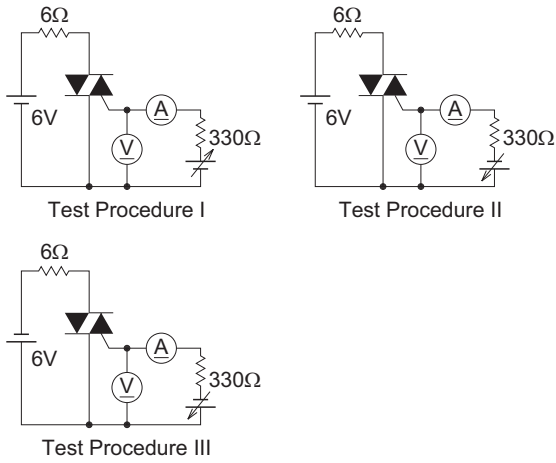
Commutation Characteristics (Tj = 150°C)



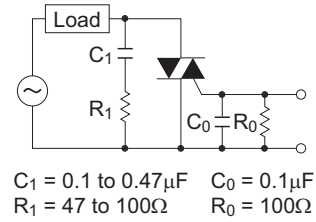
Gate Trigger Current vs. Gate Current Pulse Width



Gate Trigger Characteristics Test Circuits



Recommended Circuit Values Around The Triac



## Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]	Unit: mm
TO-220F	SC-67	PRSS0003AA-A	T220F	2.0g	

The technical drawing illustrates the BCR20PM-14LJ package dimensions. The top view shows a rectangular body with a diameter of 10.5 mm (maximum) and a width of 5.2 mm. The height of the body is 17 mm. The distance from the top edge to the center of the mounting hole is 5.0 mm. The mounting hole has a diameter of  $\phi 3.2 \pm 0.2$  mm. The distance from the center of the mounting hole to the edge of the body is 1.2 mm. The distance from the top edge to the start of the leads is 8.5 mm. The leads are spaced 2.54 mm apart and have a length of 13.5 mm (minimum). The lead thickness is 0.8 mm, and the lead height is 1.3 mm (maximum). The distance from the top edge to the start of the leads is 3.6 mm. The distance from the top edge to the start of the leads is 1.3 mm (maximum). The distance from the top edge to the start of the leads is 0.5 mm. The distance from the top edge to the start of the leads is 2.6 mm. The distance from the top edge to the start of the leads is 4.5 mm.

## Ordering Information

Orderable Part Number	Packing	Quantity	Remark
BCR20PM-14LJ#B00	Bag	100 pcs.	Straight type
BCR20PM-14LJA8#B00	Tube	50 pcs.	A8 Lead form

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