

# BCR16FM-14LB

700V - 16A - Triac

Medium Power Use

R07DS1189EJ0301


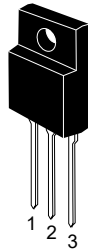
Rev.3.01

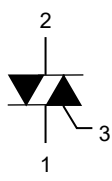
Oct. 10, 2017

## Features

- $I_{T(RMS)}$  : 16 A
- $V_{DRM}$  : 800 V ( $T_j=125^{\circ}C$ )
- $T_j$ : 150 °C
- $I_{FGTI}, I_{RGTI}, I_{RGTIII}$ :30 mA(20mA) <sup>Note6</sup>
- Insulated Type
- Planar Passivation Type
- Viso: 2000V

## Outline

<p>RENESAS Package code: PRSS0003AG-A (Package name: TO-220FP)</p>  <p><b>Not Recommended for New Design</b></p>	<p>RENESAS Package code: PRSS0003AP-A (Package name: TO-220FPA)</p> 
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1. T<sub>1</sub> Terminal  
2. T<sub>2</sub> Terminal  
3. Gate Terminal

## Application

Power supply, motor control, heater control, solid state relay, and other general purpose AC control applications.

## Maximum Ratings

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

Parameter	Symbol	Ratings	Unit	Conditions
RMS on-state current	$I_{T(RMS)}$	16	A	Commercial frequency, sine full wave 360°conduction, $T_c = 98^{\circ}C$ (#BB0) <sup>Note2</sup> $T_c = 87^{\circ}C$ (#BG0, #FG0, #FA0) <sup>Note2</sup>
Surge on-state current	$I_{TSM}$	160	A	50 Hz sinewave 1 full cycle, peak value, non-repetitive
$I^2t$ for fusion	$I^2t$	106.5	A <sup>2</sup> s	Value corresponding to 1 cycle of half wave 50 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	
Isolation voltage <sup>Note7</sup>	$V_{iso}$	2000	V	$T_a=25^{\circ}C$ , AC 1 minute, $T_1 \cdot T_2 \cdot G$ terminal to case

- Notes: 1. Gate open.  
2. Please refer to the Ordering Information.

## 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	$V_{TM}$	—	—	1.5	V	$T_c = 25^\circ\text{C}$ , $I_{TM} = 25\text{A}$ , instantaneous measurement	
Gate trigger voltage <sup>Note3</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>Note3</sup>	I	$I_{FGTI}$	—	—	30 <sup>Note6</sup>	mA	$T_j = 25^\circ\text{C}$ , $V_D = 6\text{V}$ , $R_L = 6\ \Omega$ , $R_G = 330\ \Omega$
	II	$I_{RGTI}$	—	—	30 <sup>Note6</sup>	mA	
	III	$I_{RGTIII}$	—	—	30 <sup>Note6</sup>	mA	
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	$R_{th(j-c)}$	—	—	2.9	$^\circ\text{C/W}$	Junction to case <sup>Note4</sup> (#BB0) <sup>Note2</sup>	
		—	—	3.5	$^\circ\text{C/W}$	Junction to case <sup>Note4</sup> (#BG0, #FG0, #FA0) <sup>Note2</sup>	
Critical-rate of rise of off-state commutation voltage <sup>Note5</sup>	$(dv/dt)_c$	10	—	—	V/ $\mu\text{s}$	$T_j = 125^\circ\text{C}$	
		1	—	—		$T_j = 150^\circ\text{C}$	

Notes: 3. Measurement using the gate trigger characteristics measurement circuit.

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

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

6. High sensitivity ( $I_{GT} \leq 20\text{ mA}$ ) is also available. ( $I_{GT}$  item:1)

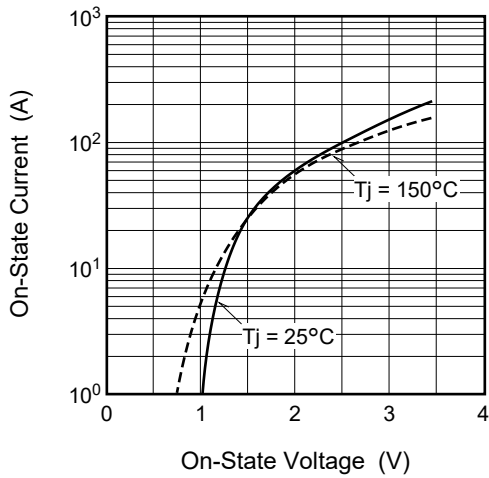
7. Make sure that your finished product containing this device meets your safe isolation requirements.

For safety, it's advisable that heatsink is electrically floating.

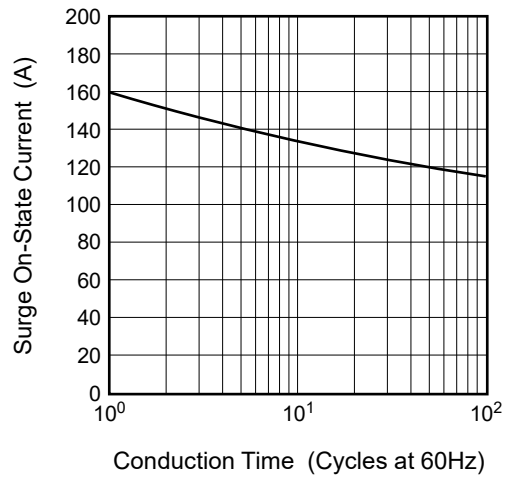
Test conditions	Commutating voltage and current waveforms (inductive load)
1. Junction temperature $T_j = 125^\circ\text{C}/150^\circ\text{C}$ 2. Rate of decay of on-state commutating current $(di/dt)_c = -8.0\text{ A/ms}$ 3. Peak off-state voltage $V_D = 400\text{ V}$	

Performance Curves

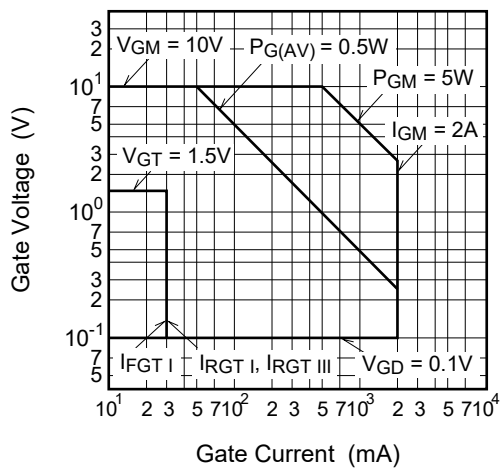
Maximum On-State Characteristics



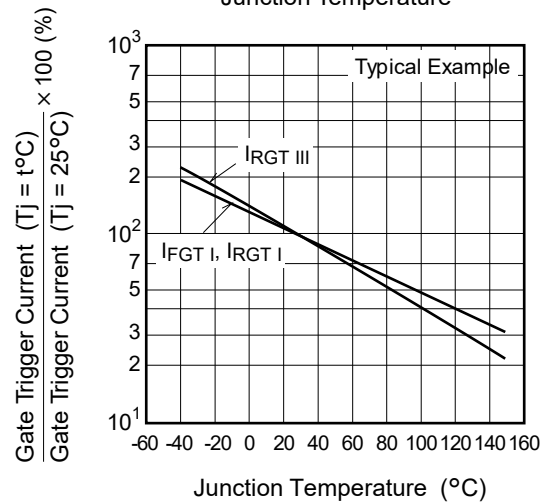
Rated Surge On-State Current



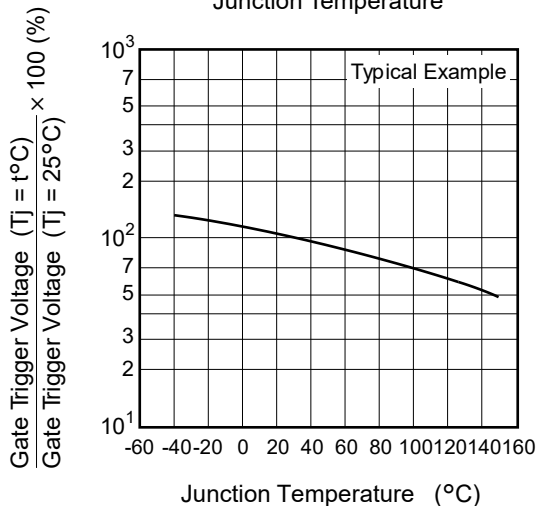
Gate Characteristics (I, II and III)



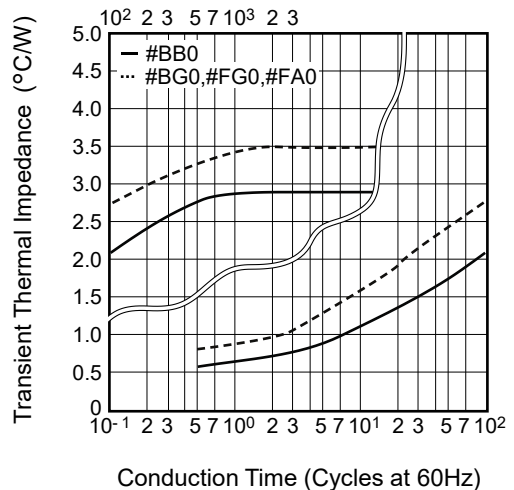
Gate Trigger Current vs. Junction Temperature

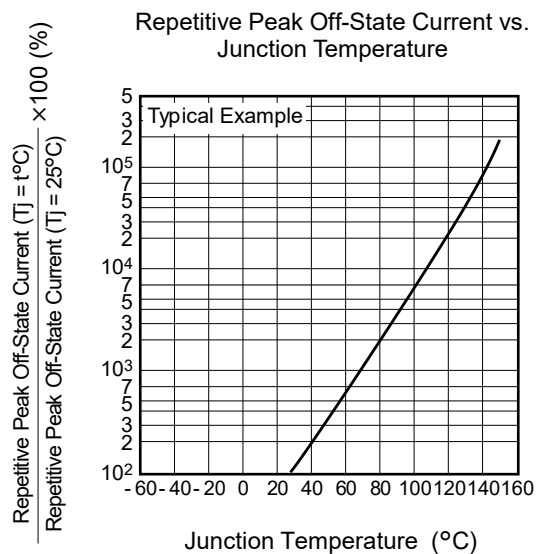
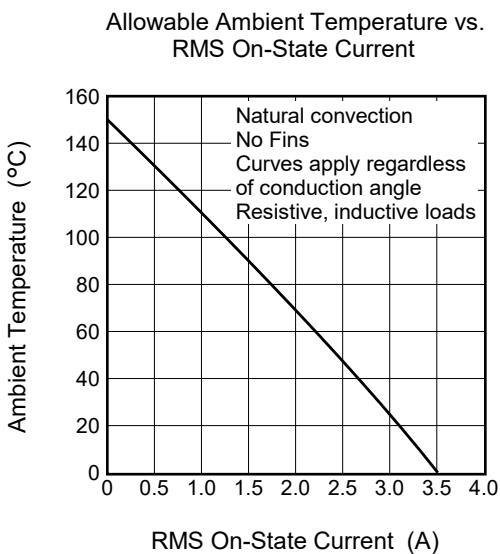
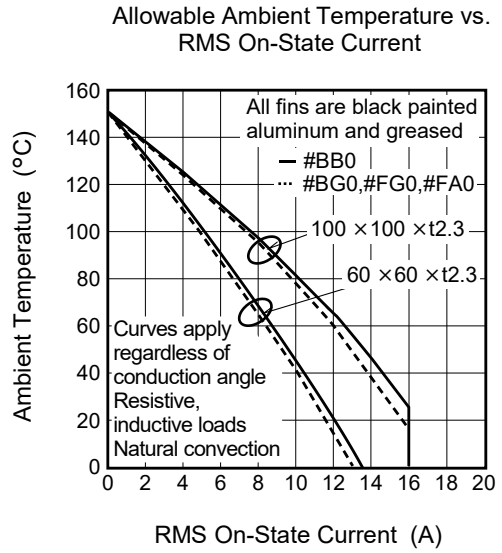
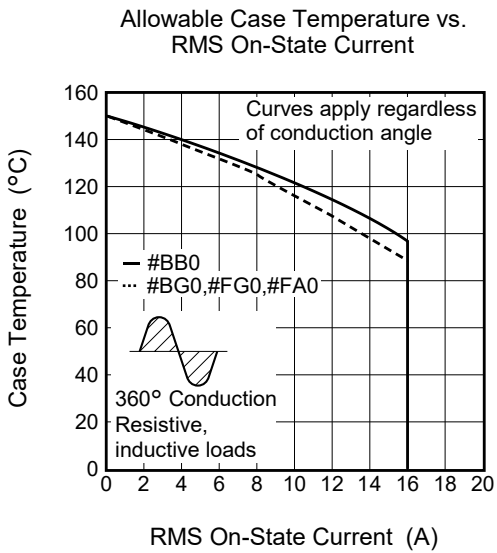
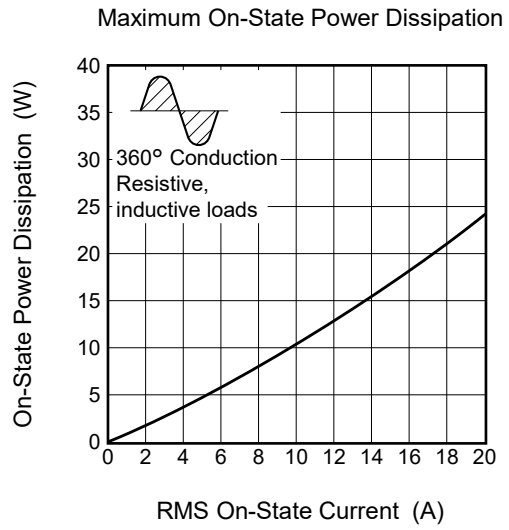
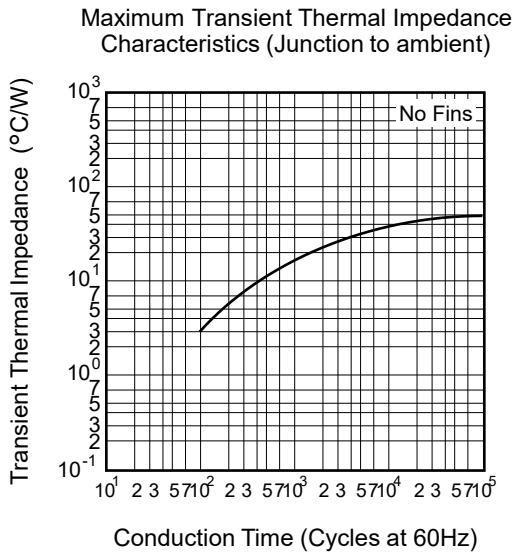


Gate Trigger Voltage vs. Junction Temperature

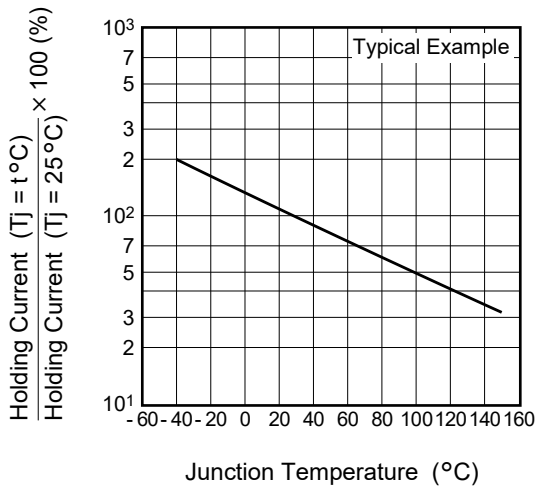


Maximum Transient Thermal Impedance Characteristics (Junction to case)

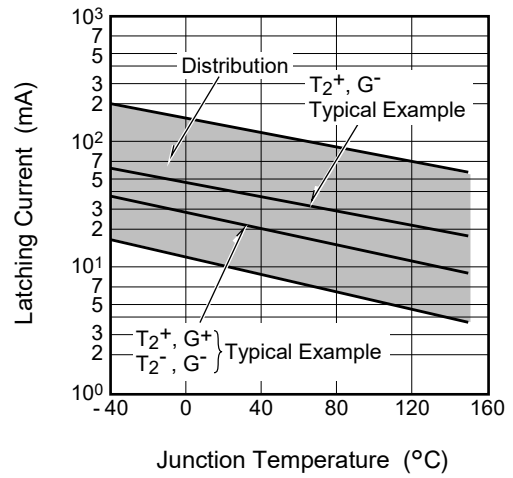




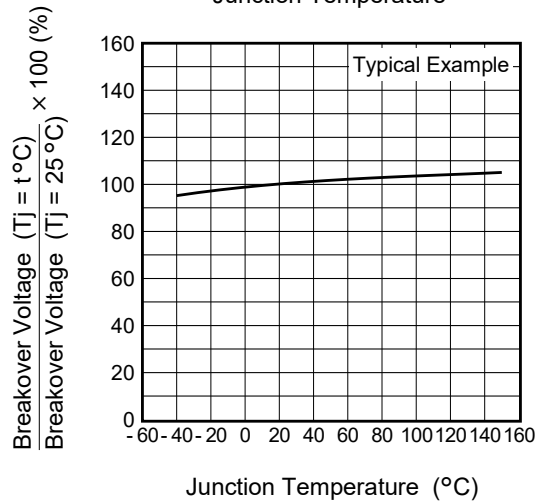
Holding Current vs. Junction Temperature



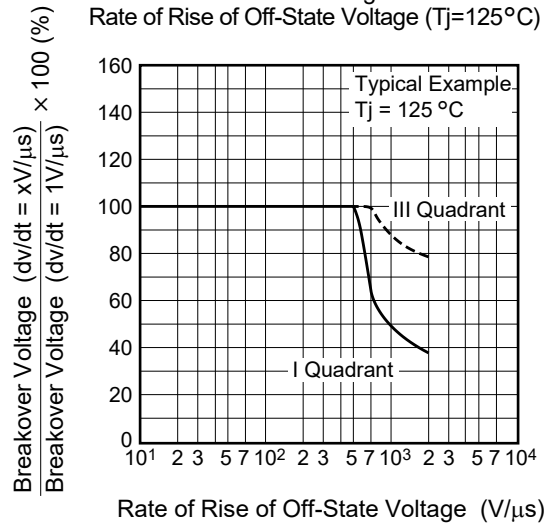
Latching Current vs. Junction Temperature



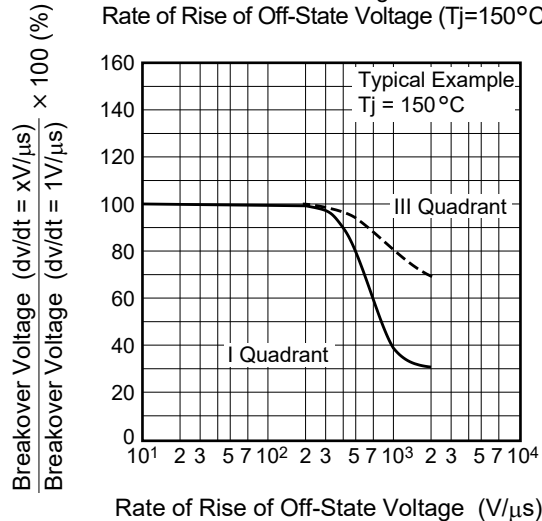
Breakover Voltage vs. Junction Temperature



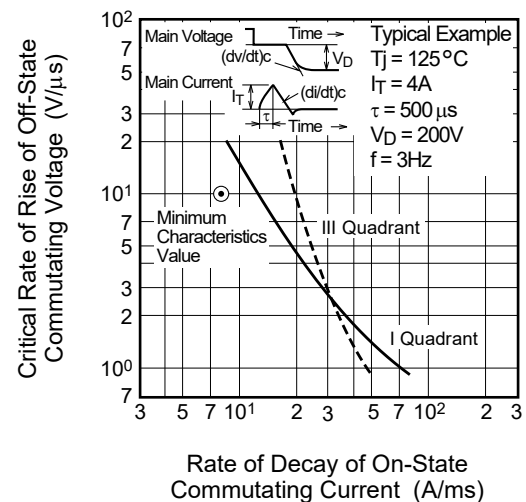
Breakover Voltage vs. Rate of Rise of Off-State Voltage (Tj=125°C)

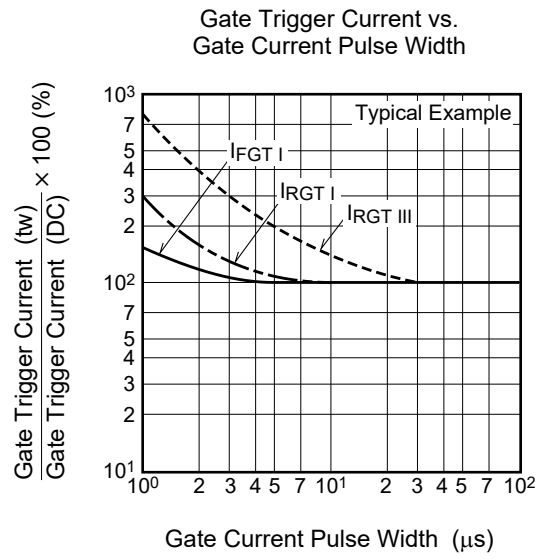
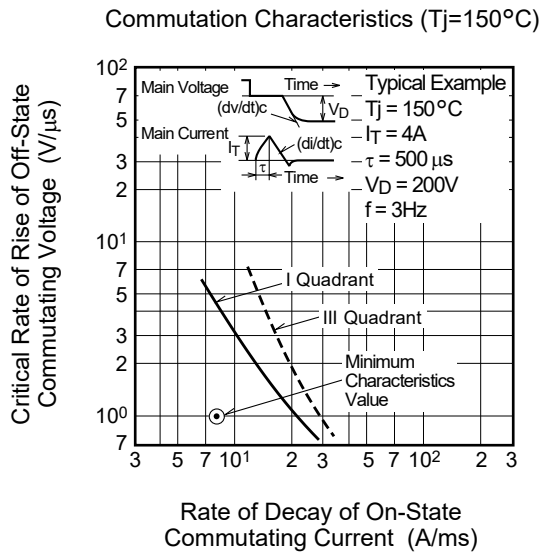


Breakover Voltage vs. Rate of Rise of Off-State Voltage (Tj=150°C)



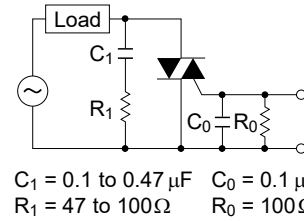
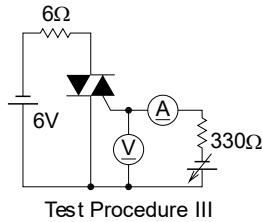
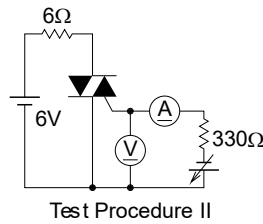
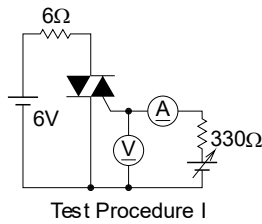
Commutation Characteristics (Tj=125°C)





Gate Trigger Characteristics Test Circuits

Recommended peripheral components for Triac

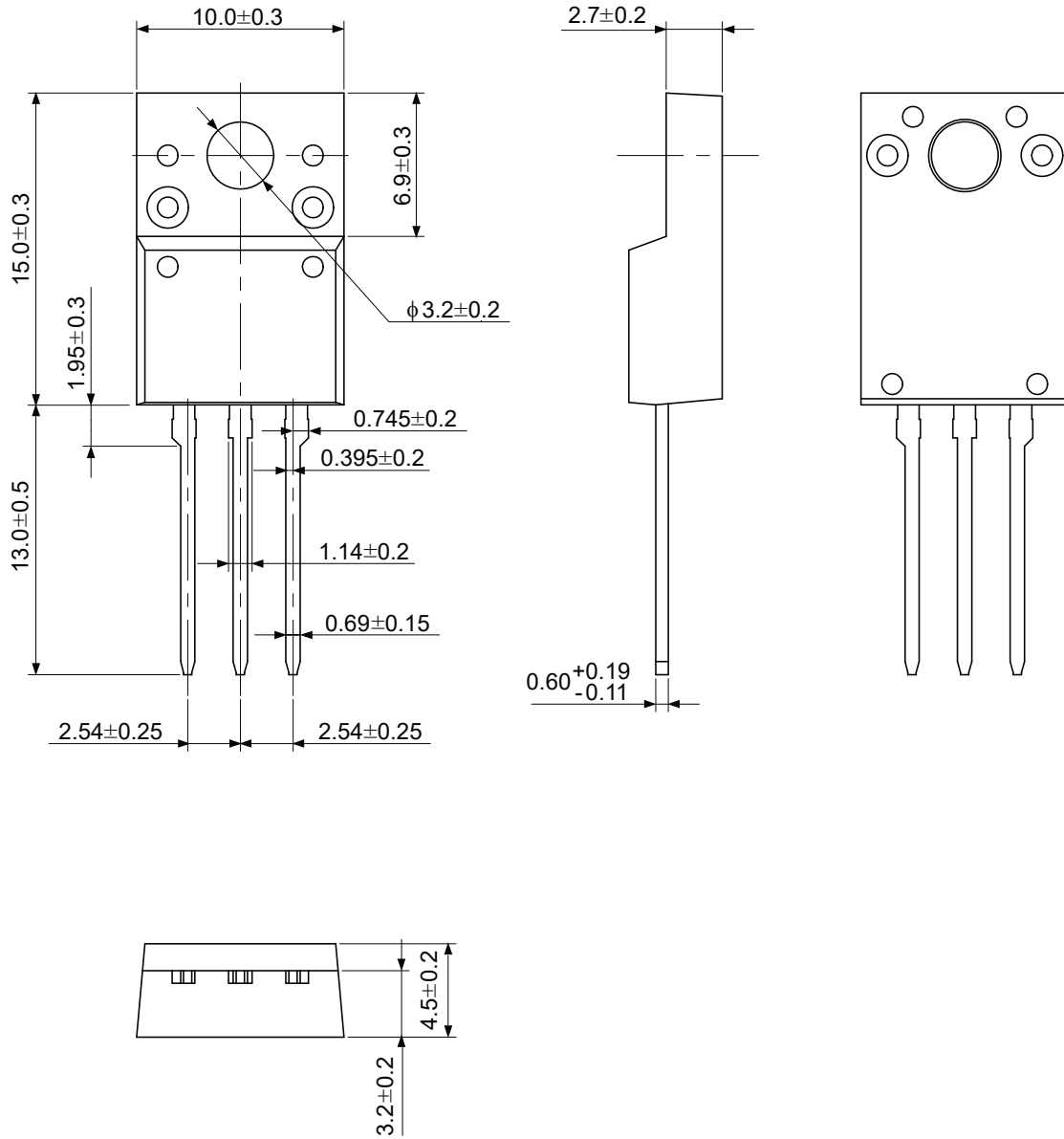


Package Dimensions

TO-220FPA (PRSS0003AP-A)

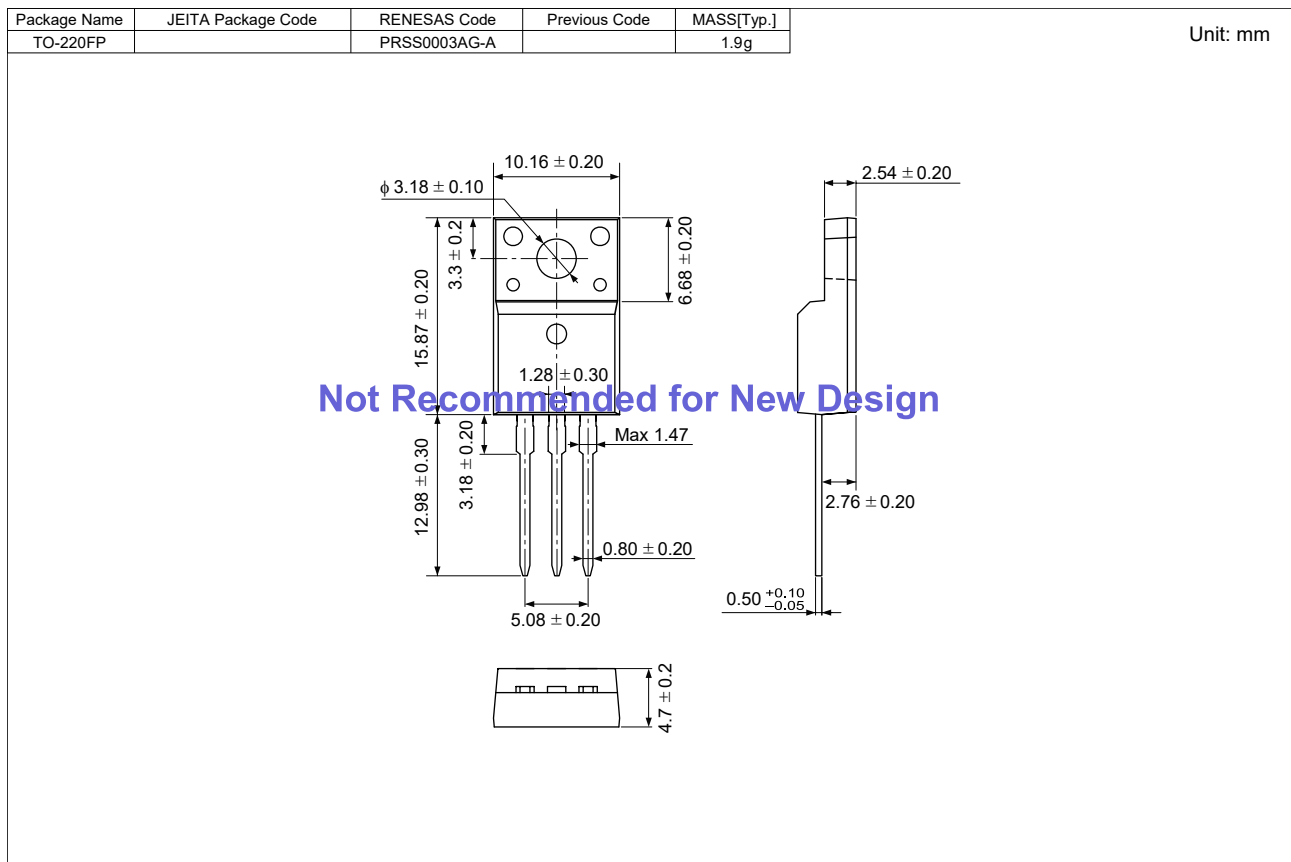
JEITA Package Code	RENESAS Code	Previous Code	MASS (Typ) [g]
-	PRSS0003AP-A	TO-220FPA	1.65

Unit: mm



## Package Dimensions

### TO-220FP (PRSS0003AG-A) <Not Recommended for New Design>



## Ordering Information

Orderable Part Number	Package	Quantity <sup>Note8</sup>	Remark	Quality Grade <sup>Note10</sup>
BCR16FM-14LB#BG0	TO-220FPA	50 pcs./ tube	Straight type	General Industrial & General Consumer Use
BCR16FM-14LB-1#BG0	TO-220FPA	50 pcs./ tube	Straight type, IGT item:1	
BCR16FM-14LB□□#BG0	TO-220FPA	50 pcs./ tube	□□:Lead form type	Special Consumer Use <sup>Note9</sup>
BCR16FM14LB1□□#BG0	TO-220FPA	50 pcs./ tube	□□:Lead form type, IGT item:1	
BCR16FM-14LB#BB0	TO-220FP	50 pcs./ tube	Straight type, NRND	Special Consumer Use <sup>Note9</sup>
BCR16FM-14LB#FG0	TO-220FPA	50 pcs./ tube	Straight type	
BCR16FM-14LB□□#FG0	TO-220FPA	50 pcs./ tube	□□:Lead form type	
BCR16FM-14LB#FA0	TO-220FP	50 pcs./ tube	Straight type, NRND	

Notes: 8. Please confirm the specification about the shipping in detail.

9. "Special Consumer Use" grade product is not tested for the "Temperature Humidity Bias" reliability in the condition of rated  $V_{DRM}$ . Please be sure to implement qualification tests and judge whether the product meets your criteria. If necessary, please apply moisture-proof measures according to user's conditions.

10. For further details about the classification in the Standard quality grade, please refer to the application note.



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