

# BCR16FM-12LB

600V - 16A - Triac

Medium Power Use

R07DS1188EJ0100

Rev.1.00

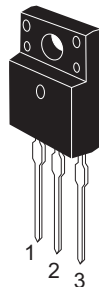
Mar 26, 2014

## Features

- $I_{T(RMS)}$  : 16A
- $V_{DRM}$  : 600 V
- $T_j$ : 150 °C
- $I_{FGT}$ ,  $I_{RGT}$ ,  $I_{RGT III}$ : 30 mA(20mA) <sup>Note5</sup>
- Insulated Type
- Planar Passivation Type
- Viso:2000V

## Outline

RENESAS Package code: PRSS0003AG-A  
(Package name: TO-220FP)



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

## Applications

Switching mode power supply, washing machine, motor control, heater control, and other general purpose control applications.

## Maximum Ratings

Parameter	Symbol	Voltage class	
		12	Unit
Repetitive peak off-state voltage <sup>Note1</sup>	$V_{DRM}$	600	V
Non-repetitive peak off-state voltage <sup>Note1</sup>	$V_{DSM}$	720	V

Parameter	Symbol	Ratings	Unit	Conditions
RMS on-state current	$I_{T(RMS)}$	16	A	Commercial frequency, sine full wave 360°conduction, $T_c = 98^{\circ}C$
Surge on-state current	$I_{TSM}$	160	A	60Hz 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 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	°C	
Storage temperature	$T_{stg}$	-40 to +150	°C	
Mass	—	1.9	g	Typical value
Isolation voltage <sup>Note6</sup>	Viso	2000	V	$T_a=25^{\circ}C$ , AC 1 minute $T_1 \cdot T_2 \cdot G$ terminal to case

## Electrical Characteristics

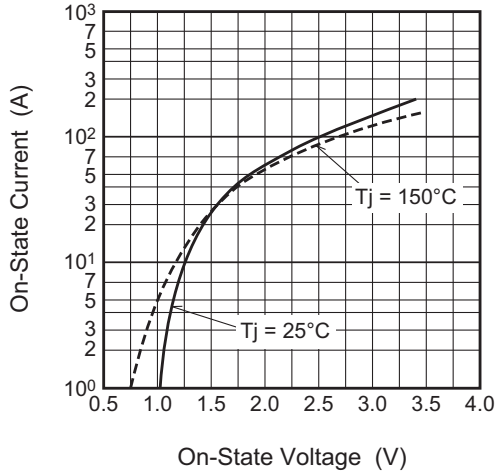
Parameter	Symbol	Rated value			Unit	Test conditions	
		Min.	Typ.	Max.			
Repetitive peak off-state current	$I_{DRM}$	—	—	2.0	mA	$T_j = 150^\circ\text{C}$ , $V_{DRM}$ applied	
On-state voltage	$V_{TM}$	—	—	1.5	V	$T_c = 25^\circ\text{C}$ , $I_{TM} = 25\text{A}$ , instantaneous measurement	
Gate trigger voltage <sup>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		
	III	$V_{RGTIII}$	—	—	1.5		
Gate trigger current <sup>Note2</sup>	I	$I_{FGTI}$	—	—	30 <sup>Note5</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>Note5</sup>	mA	
	III	$I_{RGTIII}$	—	—	30 <sup>Note5</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>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. High sensitivity ( $I_{GT} \leq 20\text{mA}$ ) is also available. ( $I_{GT}$  item:1)  
 6. Make sure that your finished product containing this device meets your safe isolation requirements.  
 For safety, it's advisable that heatsink is electrically floating.

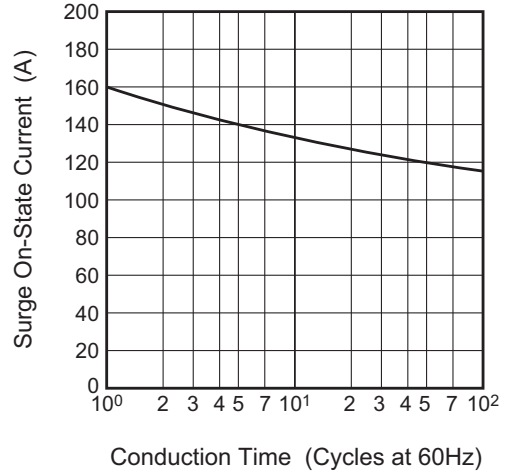
Test conditions	Commutating voltage and current waveforms (inductive load)
1. Junction temperature $T_j = 125/150^\circ\text{C}$ 2. Rate of decay of on-state commutating current $(di/dt)_c = -8.0\text{A/ms}$ 3. Peak off-state voltage $V_D = 400\text{V}$	

Performance Curves

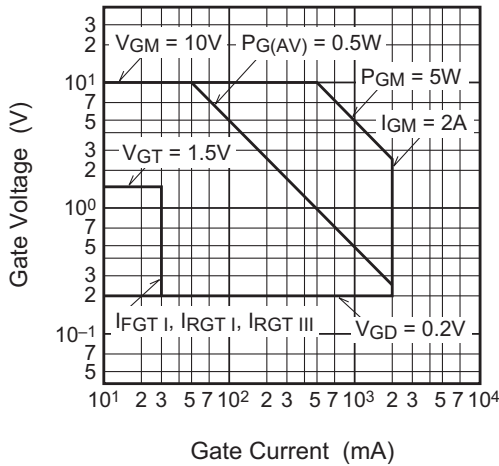
Maximum On-State Characteristics



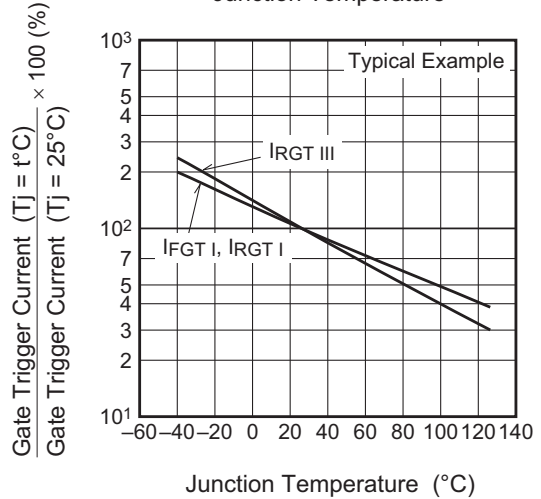
Rated Surge On-State Current



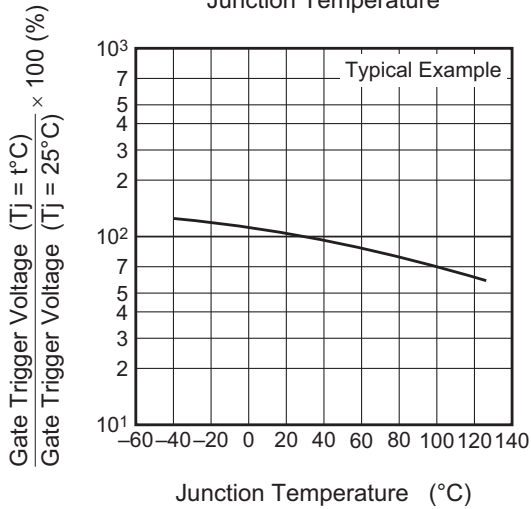
Gate Characteristics (I, II and III)



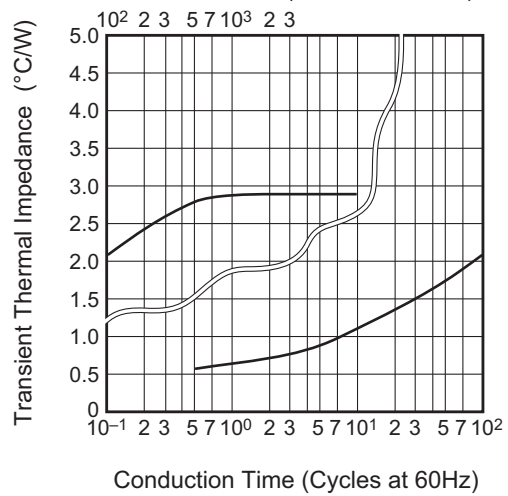
Gate Trigger Current vs. Junction Temperature

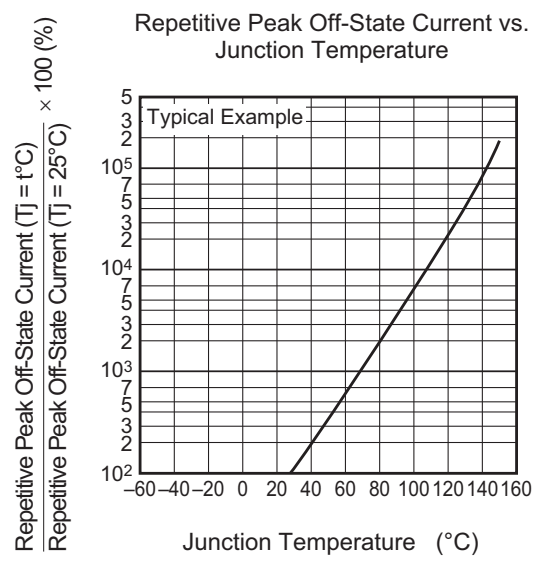
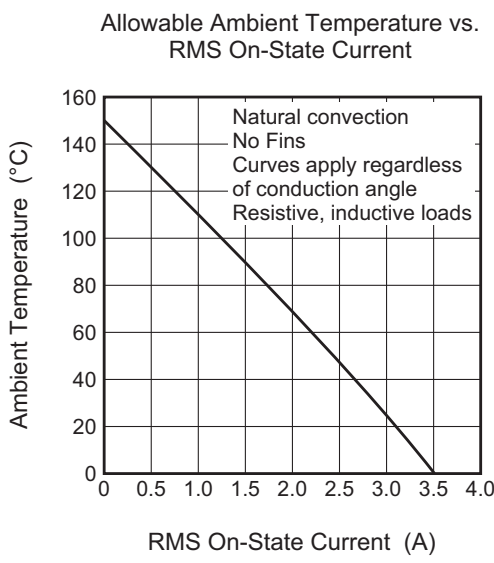
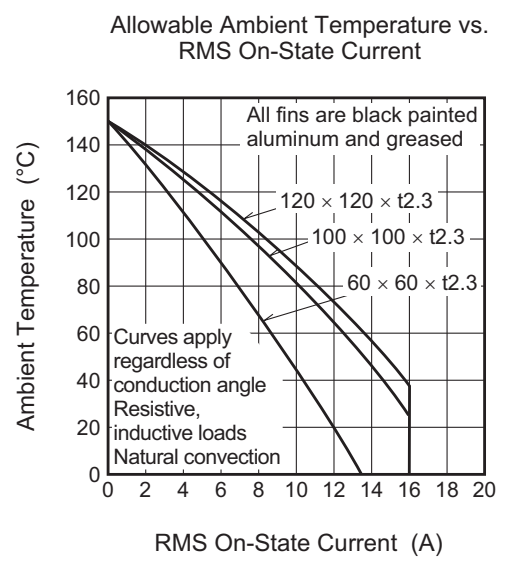
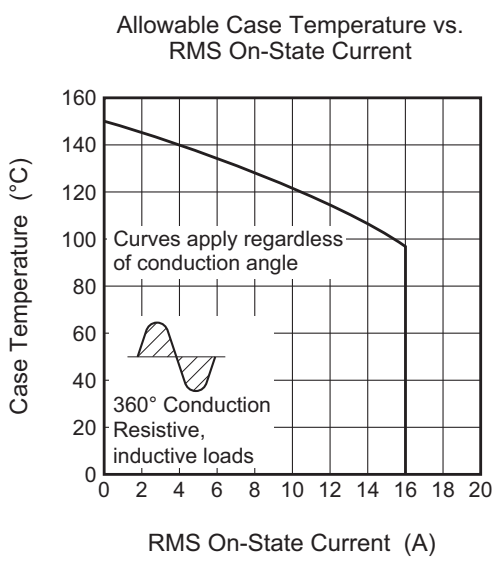
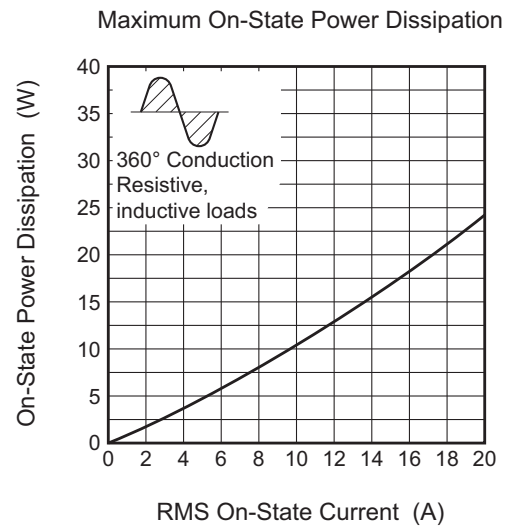
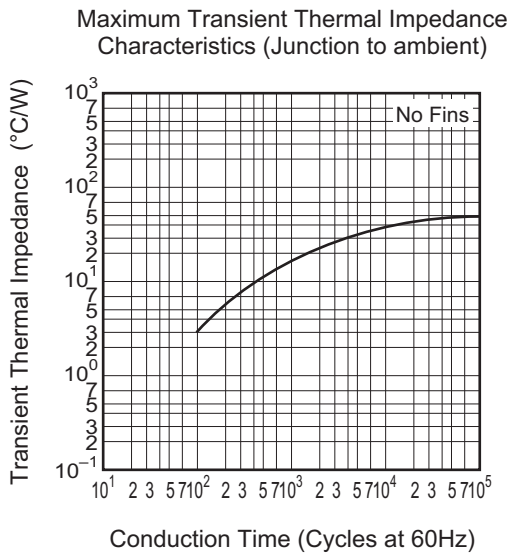


Gate Trigger Voltage vs. Junction Temperature

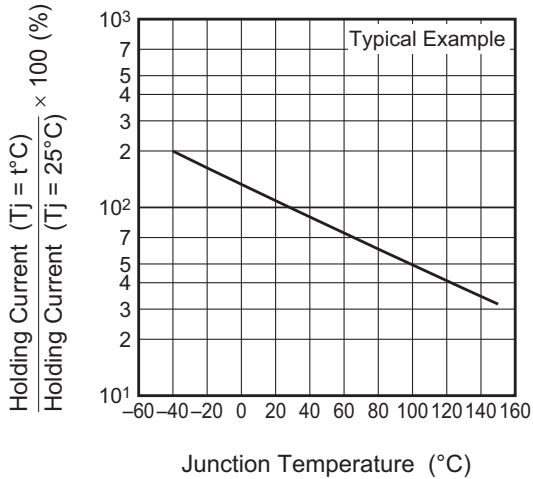


Maximum Transient Thermal Impedance Characteristics (Junction to case)

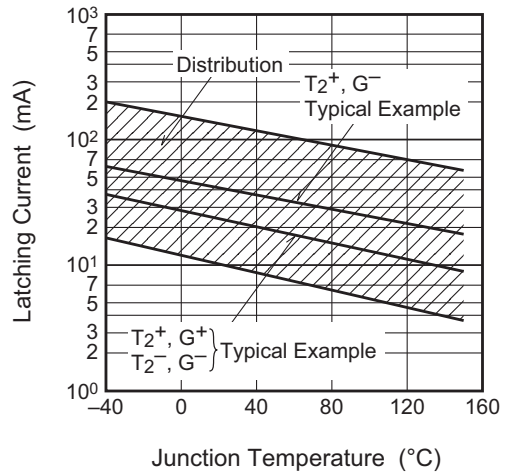




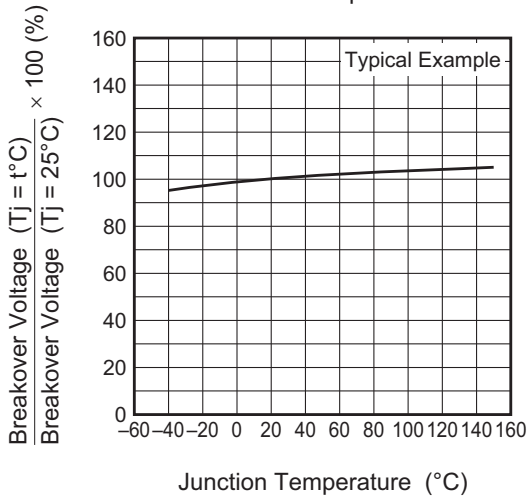
Holding Current vs. Junction Temperature



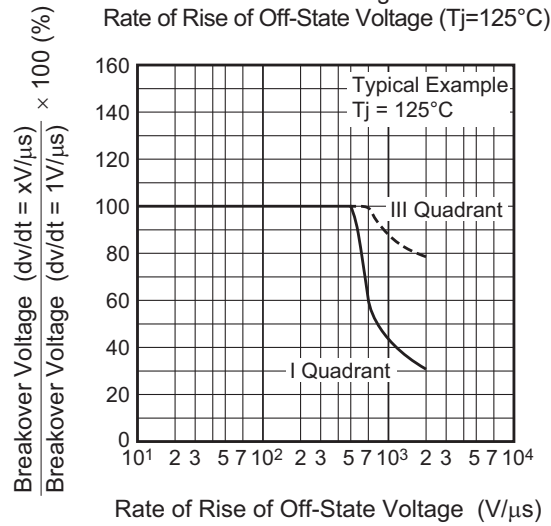
Latching Current vs. Junction Temperature



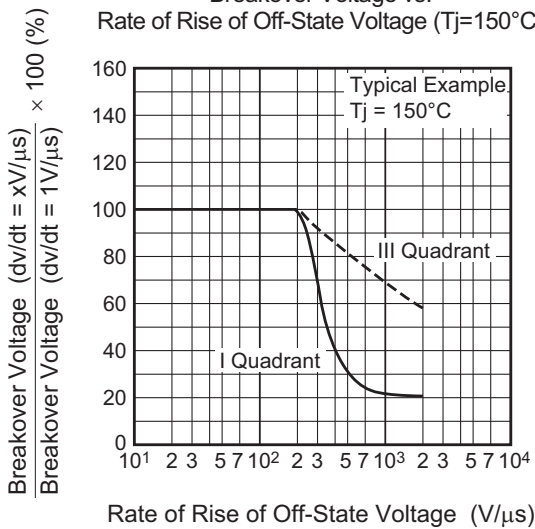
Breakover Voltage vs. Junction Temperature



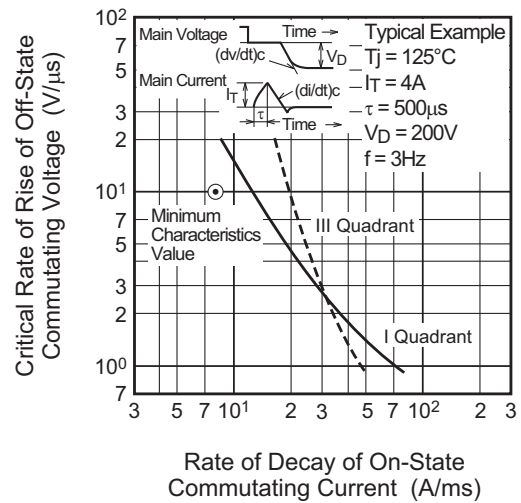
Breakover Voltage vs. Rate of Rise of Off-State Voltage (Tj=125°C)



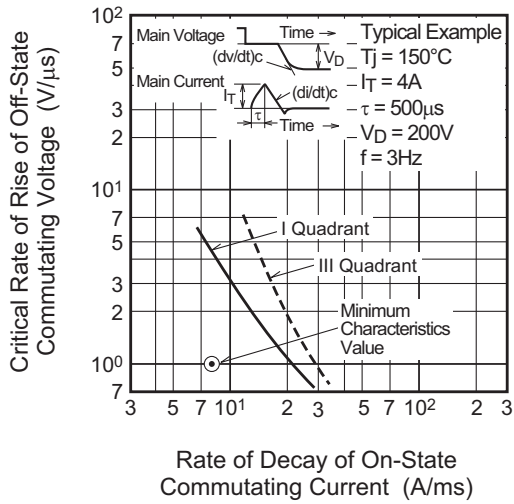
Breakover Voltage vs. Rate of Rise of Off-State Voltage (Tj=150°C)



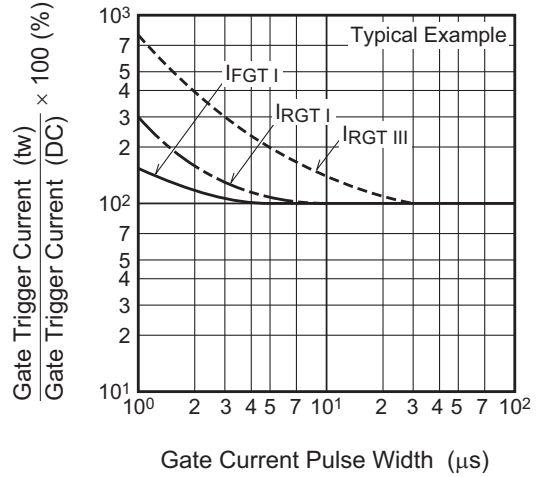
Commutation Characteristics (Tj=125°C)



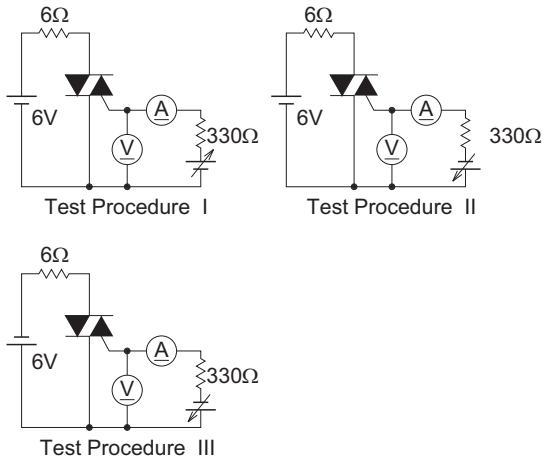
Commutation Characteristics (Tj=150°C)



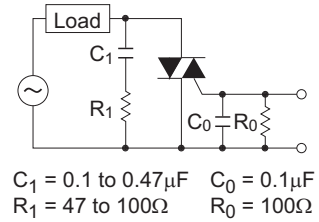
Gate Trigger Current vs. Gate Current Pulse Width



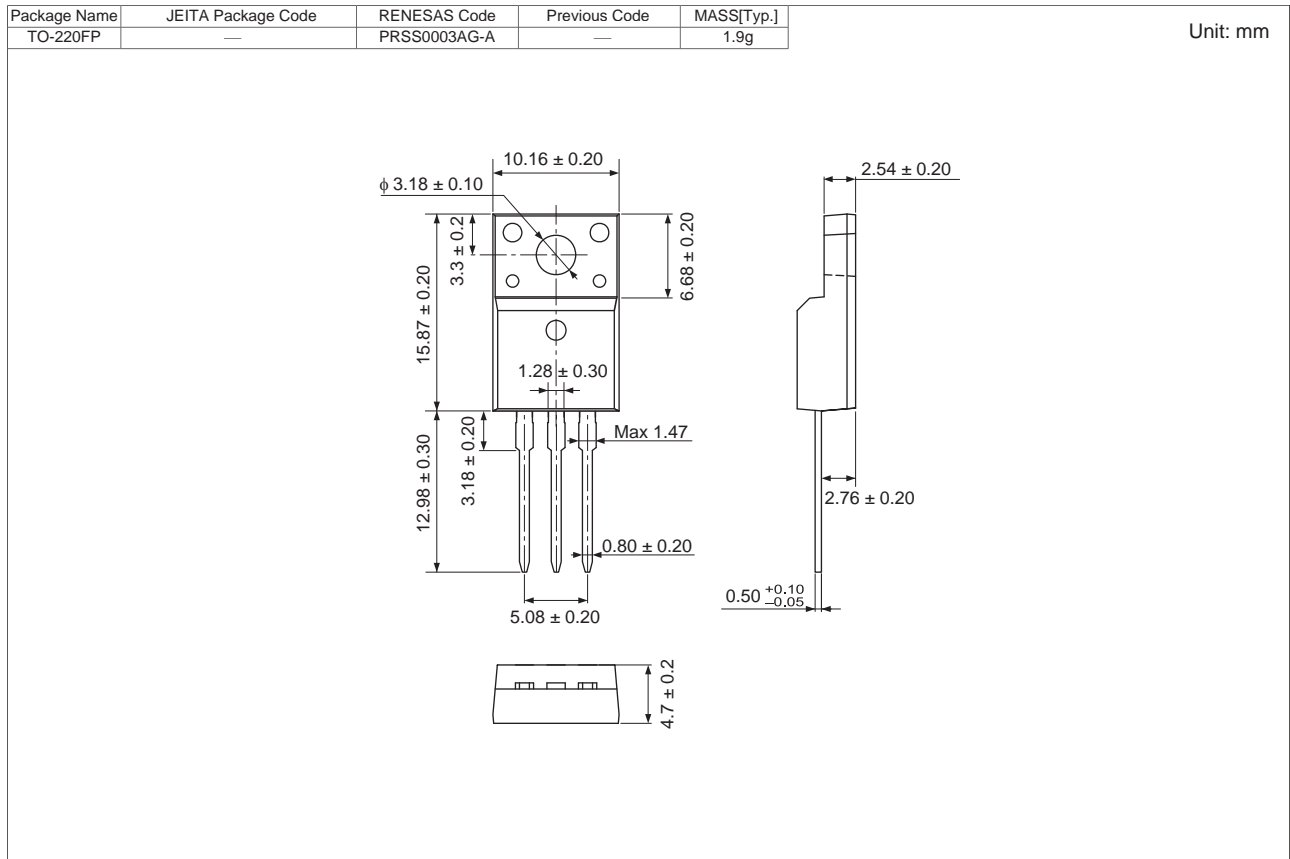
Gate Trigger Characteristics Test Circuits



Recommended Circuit Values Around The Triac



## Package Dimensions



## Ordering Information

Orderable Part Number	Packing	Quantity	Remark
BCR16FM-12LB#BB0	Tube	50 pcs.	Straight type
BCR16FM-12LB-1#BB0	Tube	50 pcs.	Straight type, l <sub>GT</sub> item:1
BCR16FM-12LB□□#BB0	Tube	50 pcs.	□□ :Lead forming type
BCR16FM12LB1□□#BB0	Tube	50 pcs.	□□: Lead forming type, l <sub>GT</sub> item:1

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

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