

# BCR12FM-14LJ

700V - 12A - Triac  
Medium Power Use

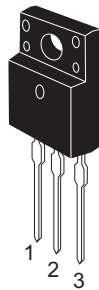
R07DS0908EJ0100  
Rev.1.00  
Nov 14, 2012

## Features

- $I_{T(RMS)}$ : 12 A
- $V_{DRM}$ : 800 V ( $T_j = 125^\circ\text{C}$ )
- $T_j$ :  $150^\circ\text{C}$
- $I_{FGT}$ ,  $I_{RGT}$ ,  $I_{RGT III}$ : 30 mA
- Viso: 2000 V
- Insulated Type
- Planar Passivation Type

## Outline

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



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

## Applications

Washing machine, inversion operation of capacitor motor, 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	$I_{T(RMS)}$	12	A	Commercial frequency, sine full wave 360° conduction, $T_c = 93^\circ\text{C}$
Surge on-state current	$I_{TSM}$	120	A	60Hz sinewave 1 full cycle, peak value, non-repetitive
$I^2t$ for fusion	$I^2t$	60	$\text{A}^2\text{s}$	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	$^\circ\text{C}$	
Storage temperature	$T_{stg}$	-40 to +150	$^\circ\text{C}$	
Mass	—	1.9	g	Typical value
Isolation voltage <sup>Note5</sup>	Viso	2000	V	$T_a = 25^\circ\text{C}$ , AC 1 minute $T_1 \bullet T_2 \bullet G$ terminal to case

## Electrical Characteristics

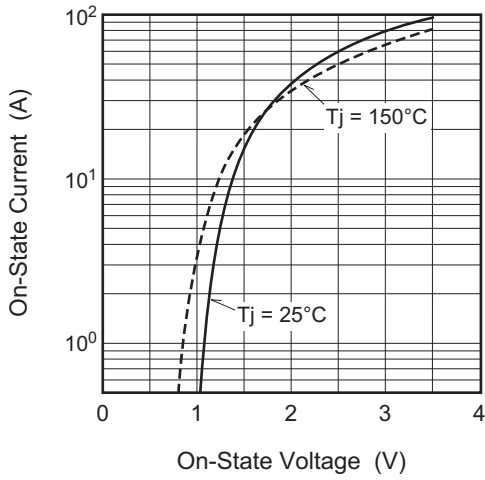
Parameter	Symbol	Rated value			Unit	Test conditions
		Min.	Typ.	Max.		
Repetitive peak off-state current	$I_{DRM}$	—	—	2.0	mA	$T_j = 150^\circ\text{C}$ , $V_{DRM}$ applied
On-state voltage	$V_{TM}$	—	—	1.6	V	$T_c = 25^\circ\text{C}$ , $I_{TM} = 20\text{A}$ , instantaneous measurement
Gate trigger voltage <sup>Note2</sup>	I	$V_{FGTI}$	—	—	1.5	$T_j = 25^\circ\text{C}$ , $V_D = 6\text{V}$ , $R_L = 6\ \Omega$ , $R_G = 330\ \Omega$
	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	—	—	V	$T_j = 150^\circ\text{C}$ , $V_D = 1/2 V_{DRM}$
Thermal resistance	$R_{th(j-c)}$	—	—	4.0	$^\circ\text{C/W}$	Junction to case <sup>Note3</sup>
Critical-rate of rise of off-state commutation voltage <sup>Note4</sup>	$(dv/dt)_c$	10	—	—	V/ $\mu\text{s}$	$T_j = 125^\circ\text{C}$
		1	—	—	V/ $\mu\text{s}$	$T_j = 150^\circ\text{C}$

- 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.

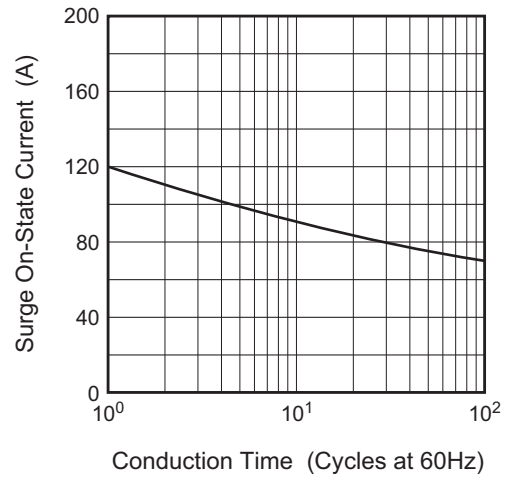
Test conditions	Commutating voltage and current waveforms (inductive load)
1. Junction temperature $T_j = 125/150^\circ\text{C}$ 2. Rate of decay of on-state commutating current $(di/dt)_c = -6.0\text{A/ms}$ 3. Peak off-state voltage $V_D = 400\text{V}$	

Performance Curves

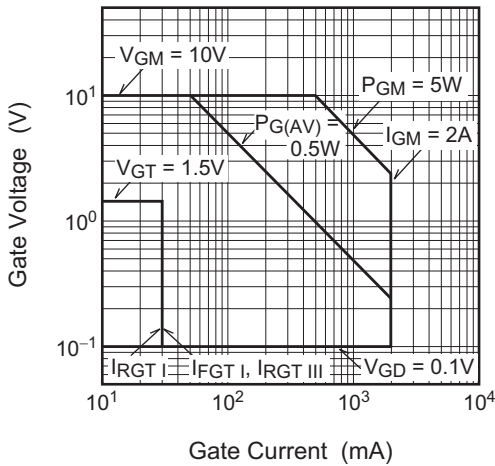
Maximum On-State Characteristics



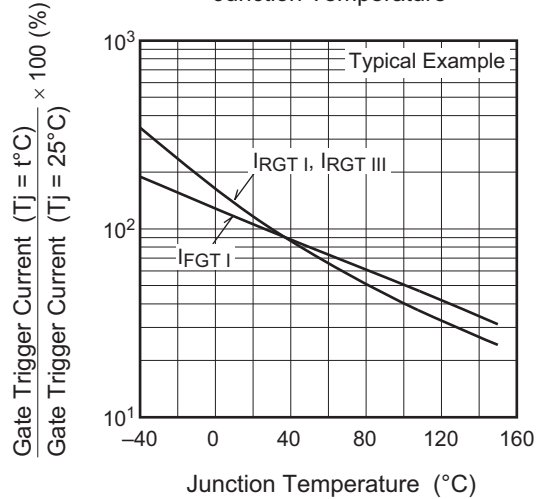
Rated Surge On-State Current



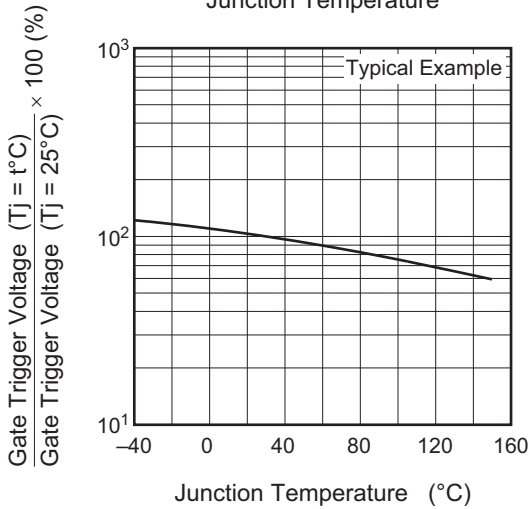
Gate Characteristics (I, II and III)



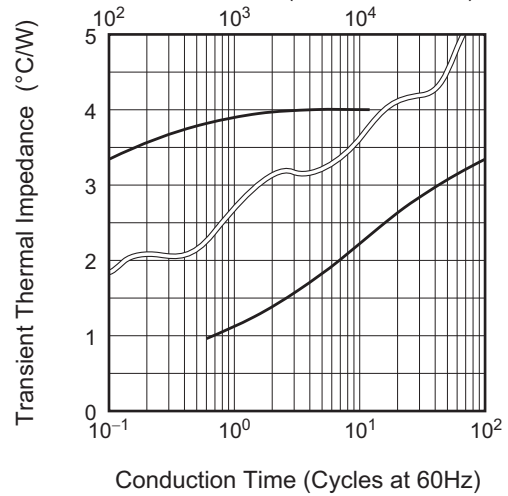
Gate Trigger Current vs. Junction Temperature

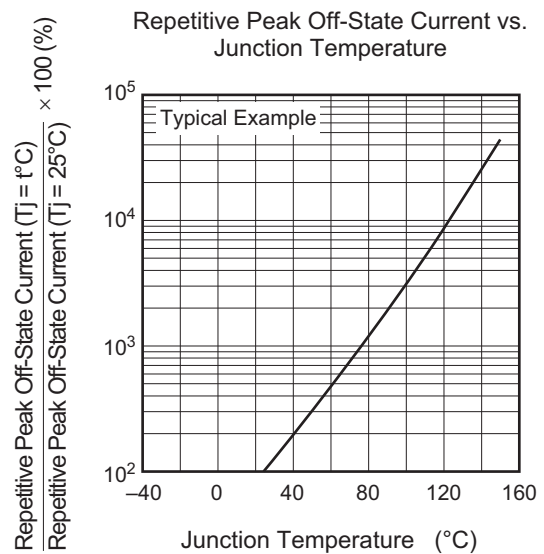
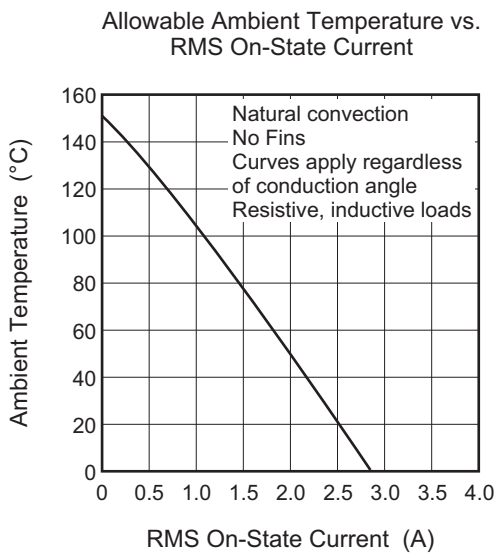
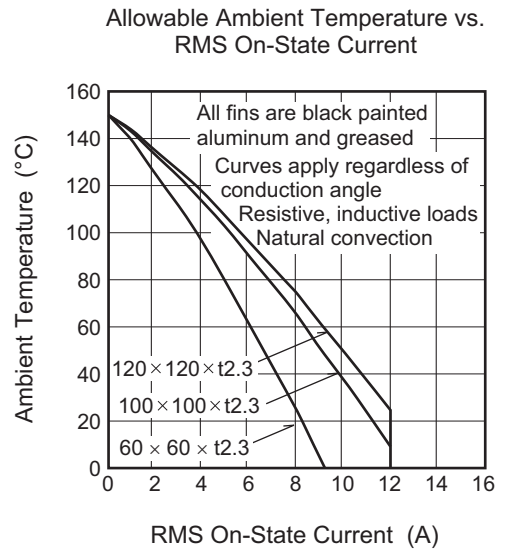
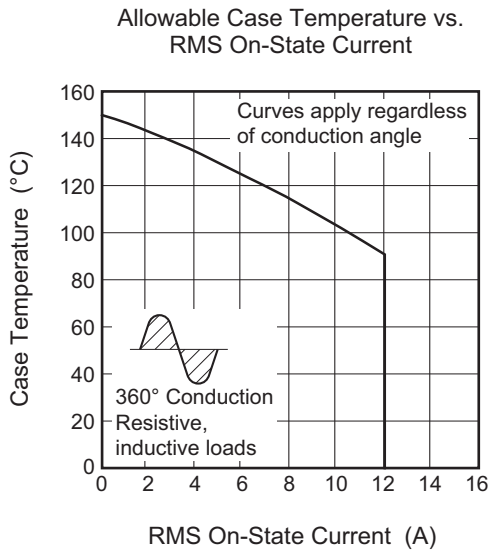
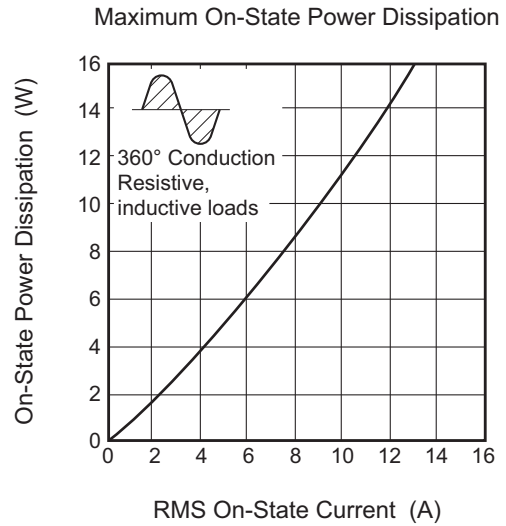
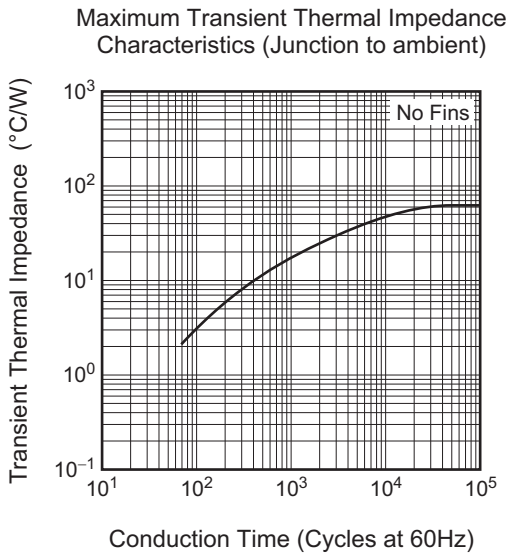


Gate Trigger Voltage vs. Junction Temperature

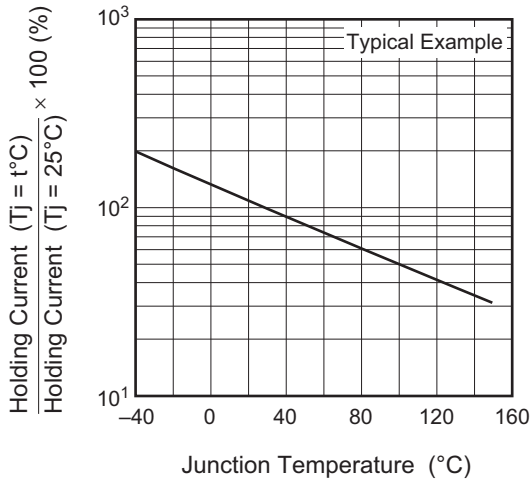


Maximum Transient Thermal Impedance Characteristics (Junction to case)

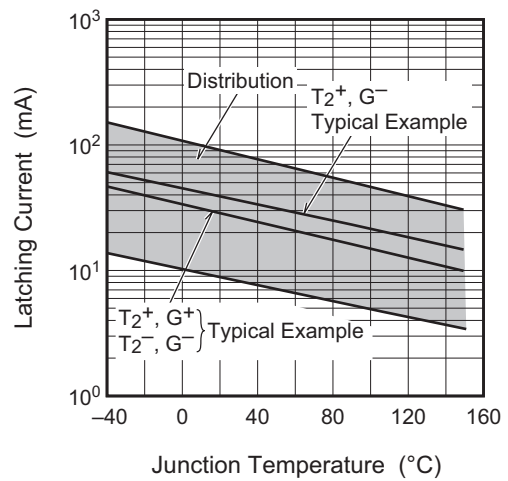




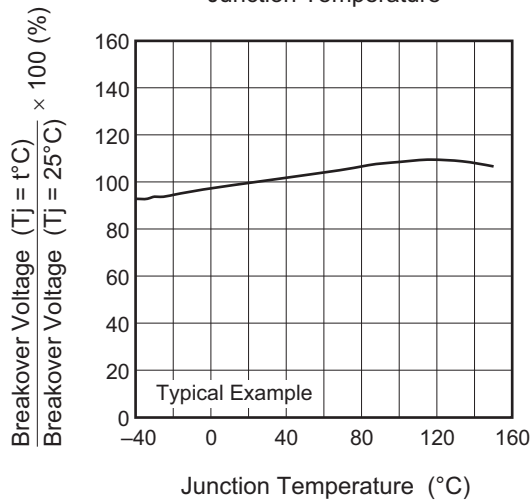
Holding Current vs. Junction Temperature



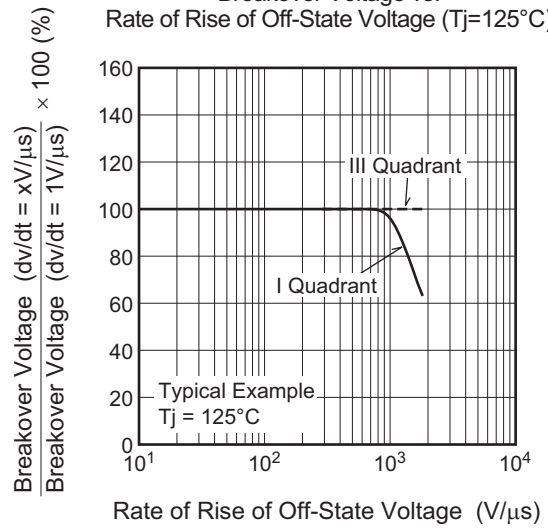
Latching Current vs. Junction Temperature



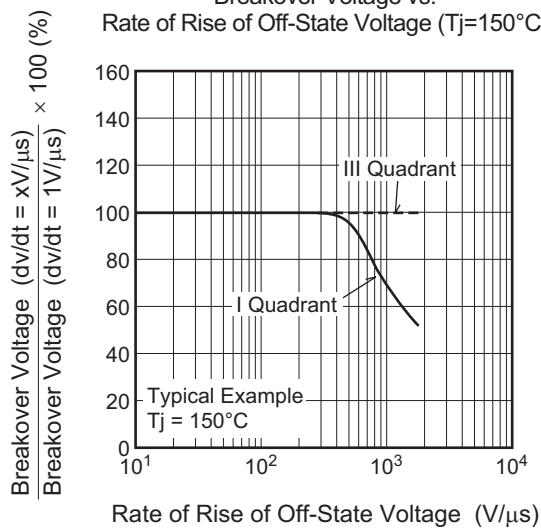
Breakover Voltage vs. Junction Temperature



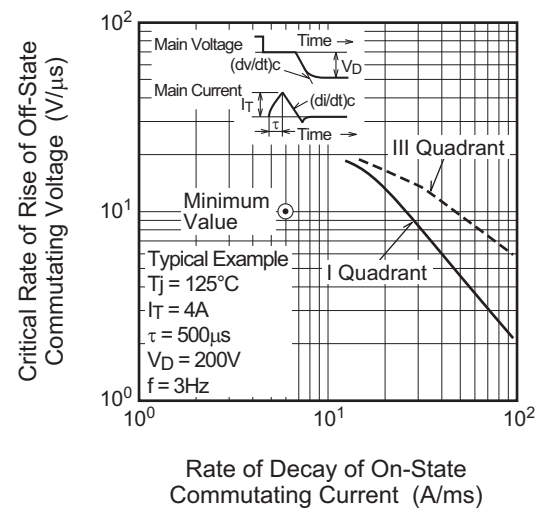
Breakover Voltage vs. Rate of Rise of Off-State Voltage (Tj=125°C)

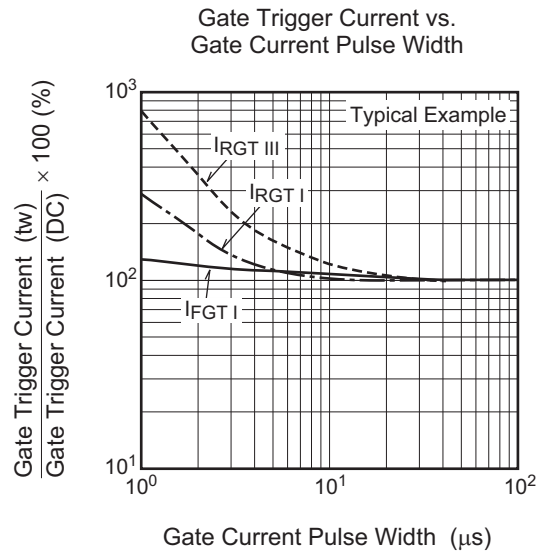
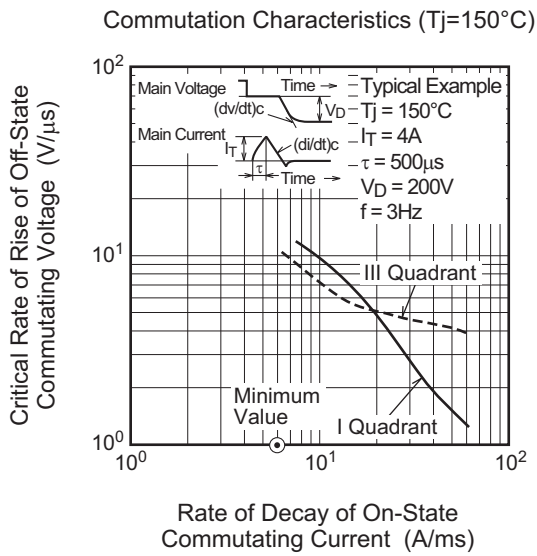


Breakover Voltage vs. Rate of Rise of Off-State Voltage (Tj=150°C)

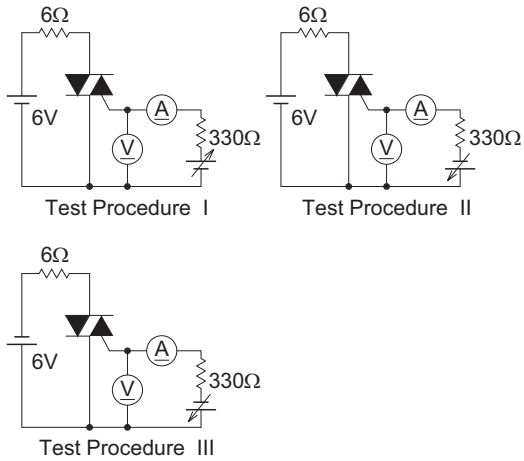


Commutation Characteristics (Tj=125°C)

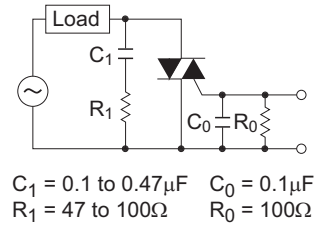




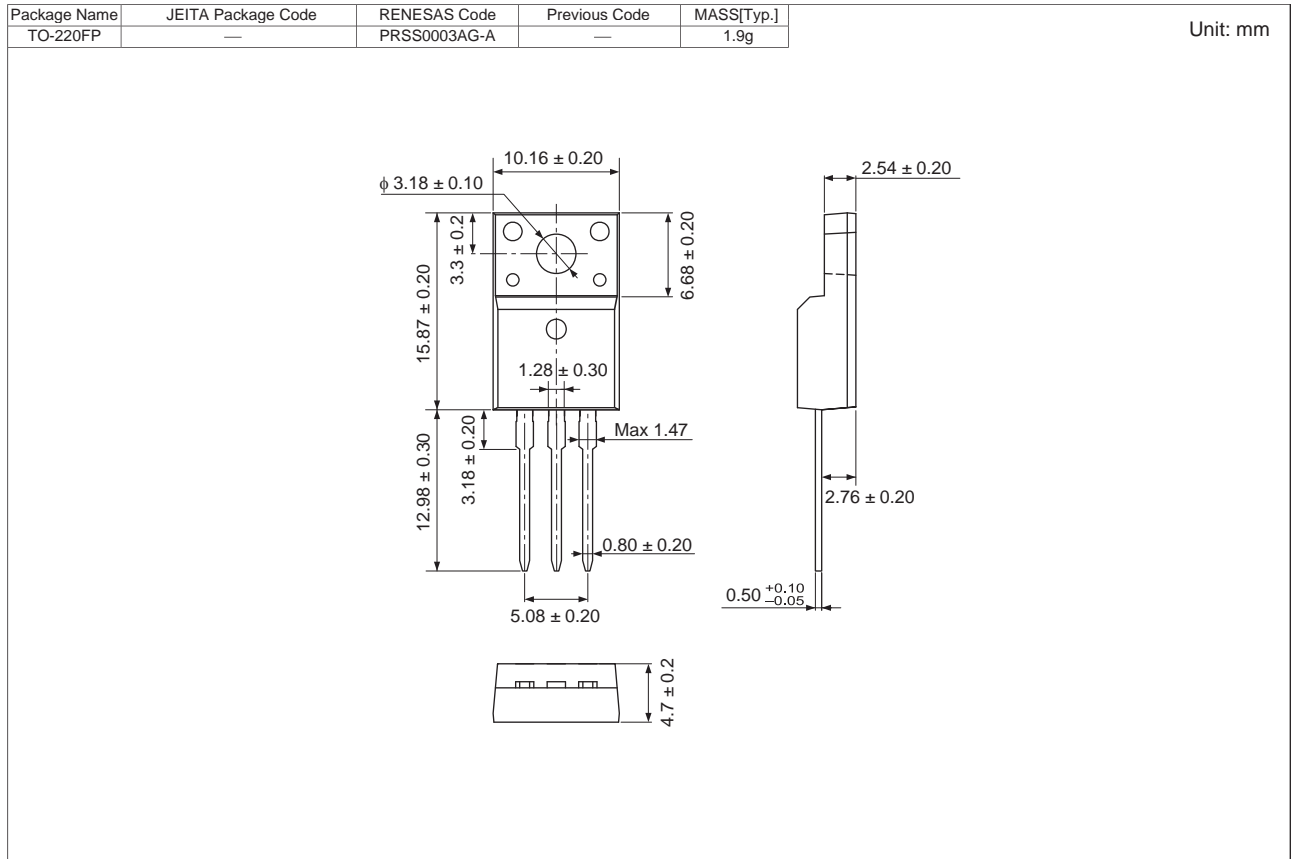
Gate Trigger Characteristics Test Circuits



Recommended Circuit Values Around The Triac



## Package Dimensions



Orderable Part Number	Packing	Quantity	Remark
BCR12FM-14LJ#BB0	Tube	50 pcs.	Straight type
BCR12FM-14LJA8#BB0	Tube	50 pcs.	A8 Lead form

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

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