

# BCR5CM-12LB

600V - 5A - Triac

Medium Power Use

R07DS1026EJ0200


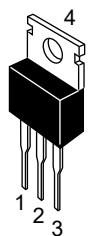
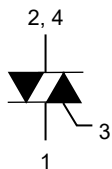
Rev.2.00

Jun. 28, 2018

## Features

- $I_T (RMS)$  : 5 A
- $V_{DRM}$  : 600 V
- $I_{FGT}$ ,  $I_{RGT}$ ,  $I_{RGT III}$ : 20 mA (10 mA)<sup>Note6</sup>
- $T_j$ : 150°C
- Non-insulated Type
- Planar Passivation Type

## Outline

RENESAS Package code: PRSS0004AG-A (Package name: TO-220AB)	RENESAS Package code: PRSS0004AT-A (Package name: TO-220ABA)
 <p style="color: blue; font-weight: bold; font-size: 1.2em;">To be EOLed PKG</p>	
 <ul style="list-style-type: none"> <li>1. T<sub>1</sub> Terminal</li> <li>2. T<sub>2</sub> Terminal</li> <li>3. Gate Terminal</li> <li>4. T<sub>2</sub> Terminal</li> </ul>	

## Application

Power supply, motor control, heater control, solenoid control, and other general purpose AC 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	$I_T (RMS)$	5	A	Commercial frequency, sine full wave 360°conduction, $T_c = 128^\circ\text{C}$ <sup>Note3</sup>
Surge on-state current	$I_{TSM}$	50	A	60 Hz sinewave 1 full cycle, peak value, non-repetitive
$I^2t$ for fusion	$I^2t$	10.4	A <sup>2</sup> s	Value corresponding to 1 cycle of half wave 60 Hz, surge on-state current
Peak gate power dissipation	$P_{GM}$	3	W	
Average gate power dissipation	$P_{G(AV)}$	0.3	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	

## Electrical Characteristics

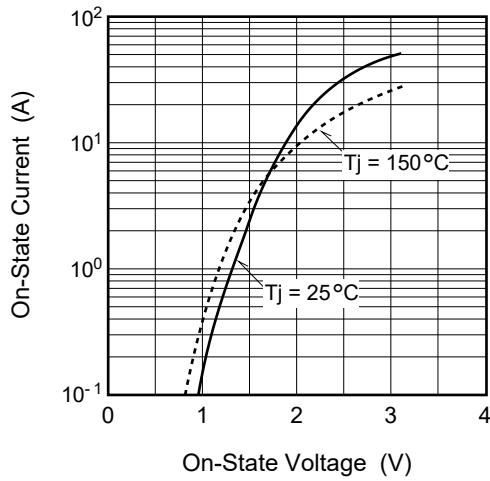
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions	
Repetitive peak off-state current	$I_{DRM}$	—	—	2.0	mA	$T_j = 150^\circ\text{C}$ , $V_{DRM}$ applied	
On-state voltage	$V_{TM}$	—	—	1.8	V	$T_c = 25^\circ\text{C}$ , $I_{TM} = 7\text{ A}$ , instantaneous measurement	
Gate trigger voltage <sup>Note2</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	$I_{FGTI}$	—	—	20 <sup>Note6</sup>	mA	$T_j = 25^\circ\text{C}$ , $V_D = 6\text{ V}$ , $R_L = 6\ \Omega$ , $R_G = 330\ \Omega$
	II	$I_{RGTI}$	—	—	20 <sup>Note6</sup>	mA	
	III	$I_{RGTIII}$	—	—	20 <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	—	—	V	$T_j = 150^\circ\text{C}$ , $V_D = 1/2 V_{DRM}$	
Thermal resistance	$R_{th(j-c)}$	—	—	3.0	$^\circ\text{C/W}$	Junction to case <sup>Note3 Note4</sup>	
Critical-rate of rise of off-state commutation voltage <sup>Note5</sup>	$(dv/dt)_c$	5	—	—	$\text{V}/\mu\text{s}$	$T_j = 125^\circ\text{C}$	
		1	—	—	$\text{V}/\mu\text{s}$	$T_j = 150^\circ\text{C}$	

- Notes: 1. Gate open.  
 2. Measurement using the gate trigger characteristics measurement circuit.  
 3. Case temperature is measured at the  $T_2$  tab 1.5 mm away from the molded case.  
 4. The contact thermal resistance  $R_{th(c-f)}$  in case of greasing is  $1.0^\circ\text{C/W}$ .  
 5. Test conditions of the critical-rate of rise of off-state commutation voltage is shown in the table below.  
 6. High sensitivity ( $I_{GT} \leq 10\text{ mA}$ ) is also available. ( $I_{GT}$  item:1)

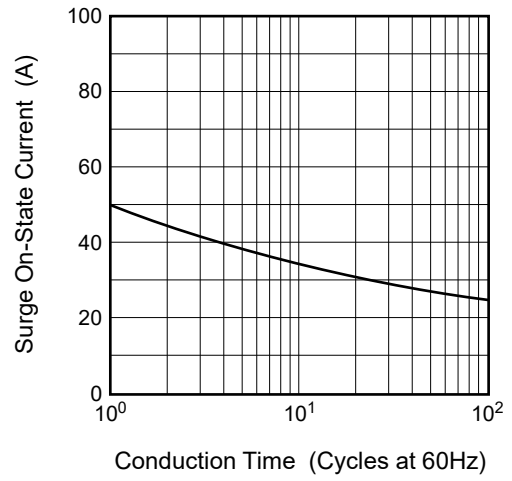
Test conditions	Commutating voltage and current waveforms (inductive load)
1. Junction temperature $T_j = 125^\circ\text{C}/150^\circ\text{C}$ 2. Rate of decay of on-state commutating current $(di/dt)_c = -2.5\text{ A/ms}$ 3. Peak off-state voltage $V_D = 400\text{ V}$	

Performance Curves

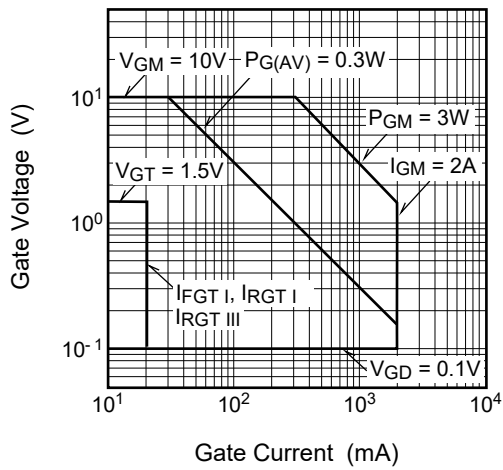
Maximum On-State Characteristics



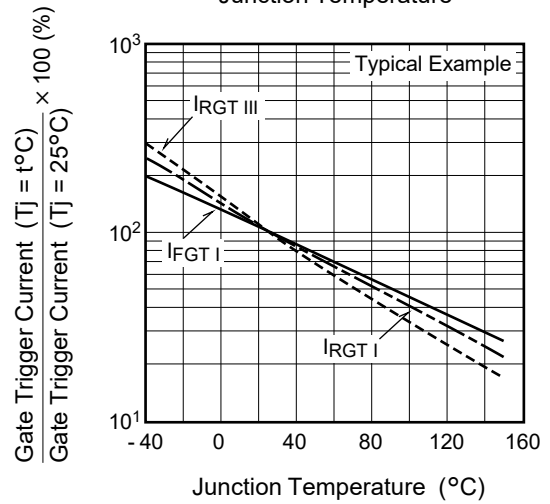
Rated Surge On-State Current



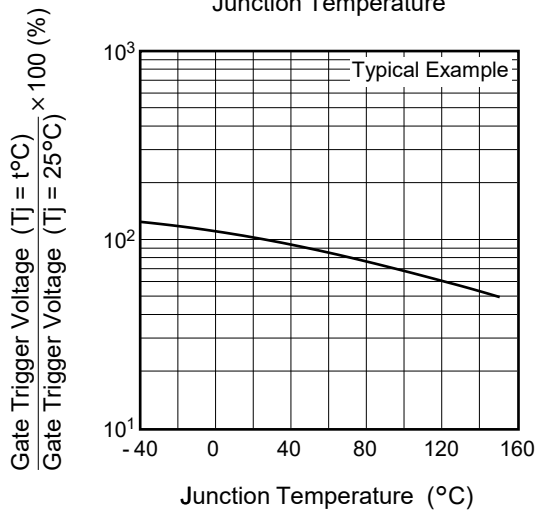
Gate Characteristics (I, II and III)



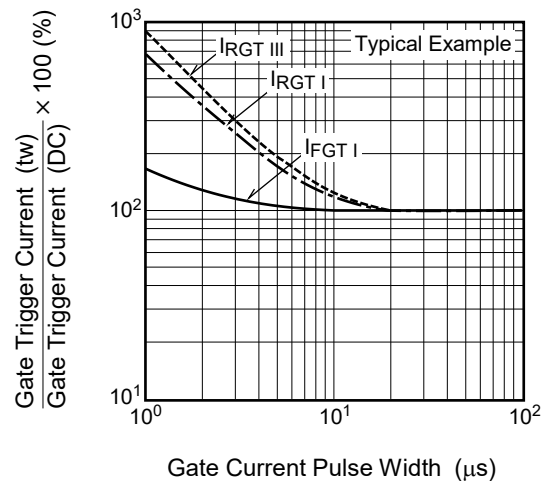
Gate Trigger Current vs. Junction Temperature

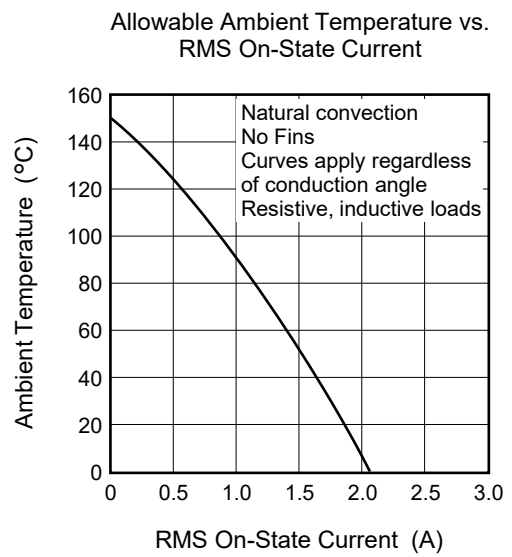
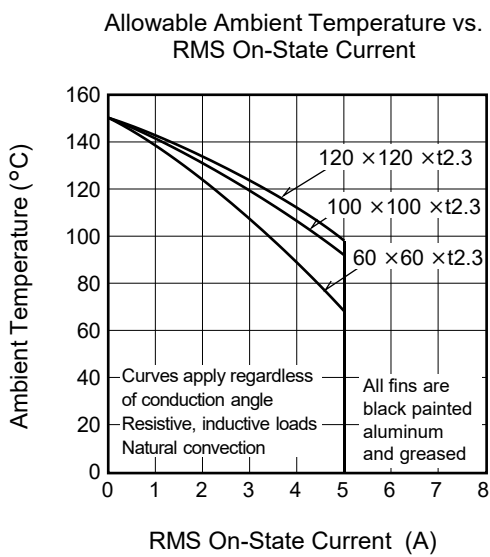
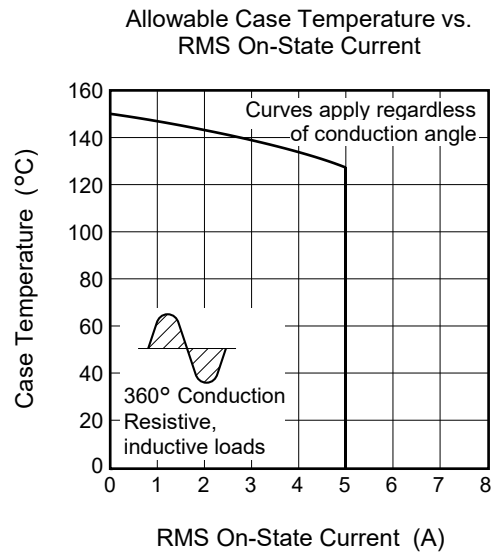
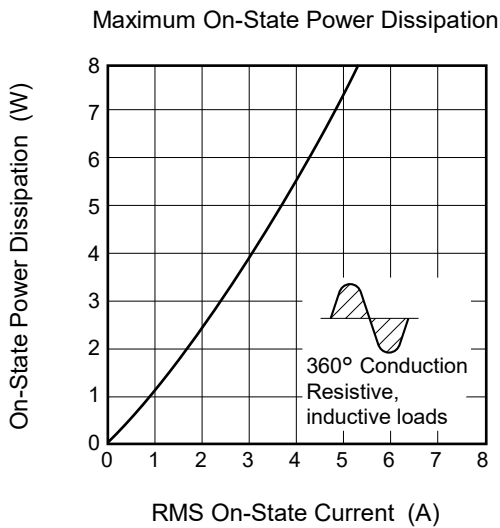
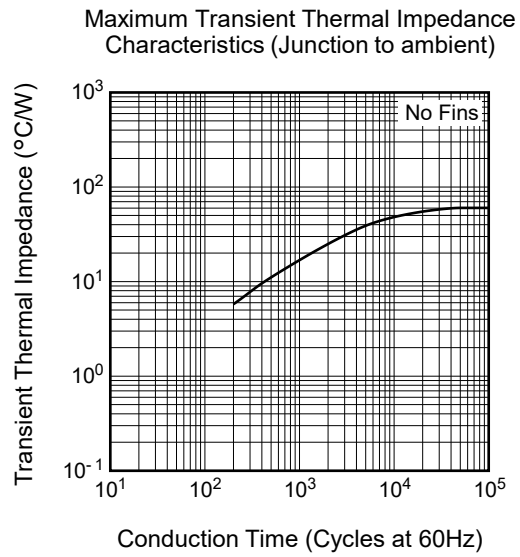
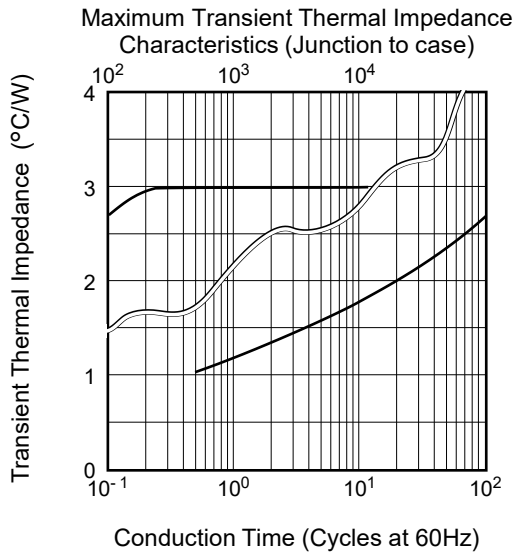


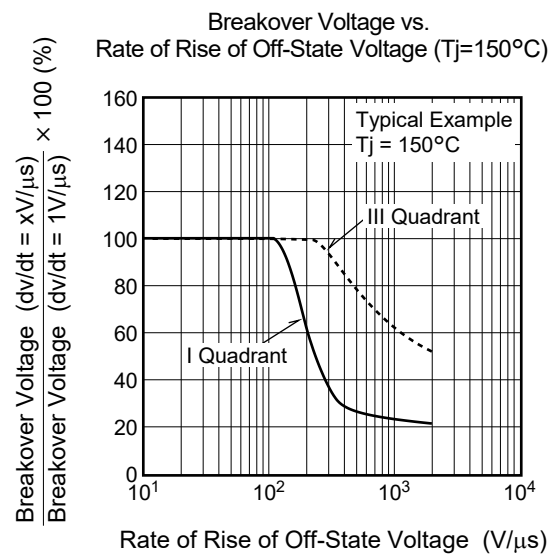
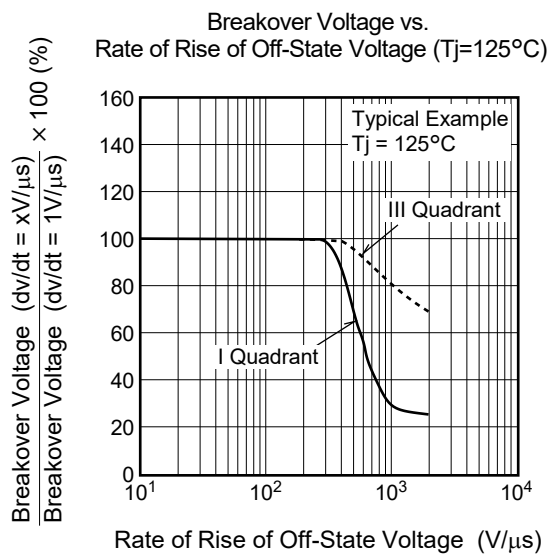
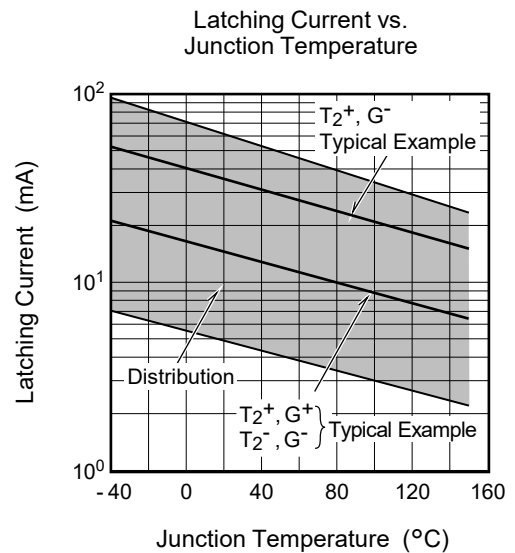
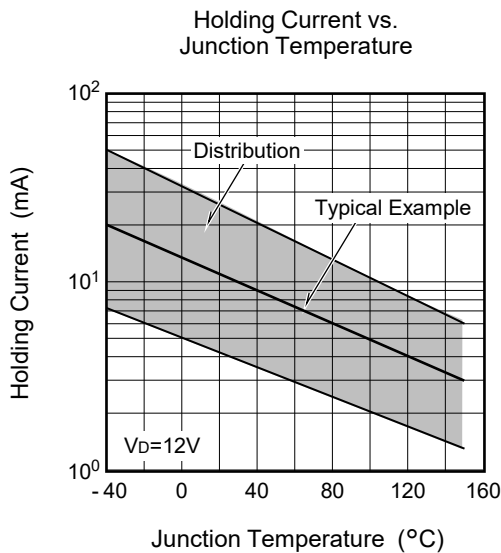
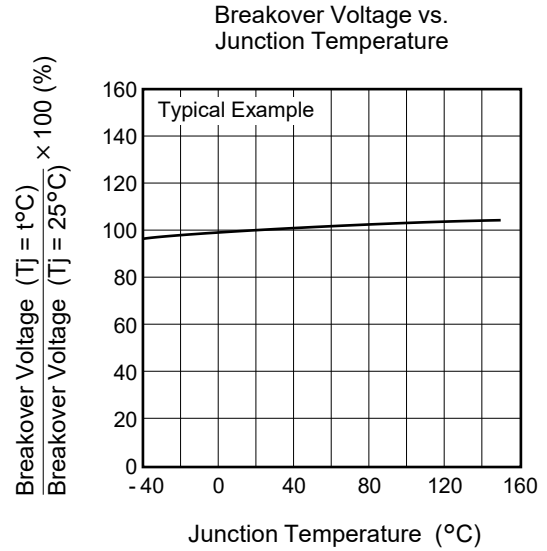
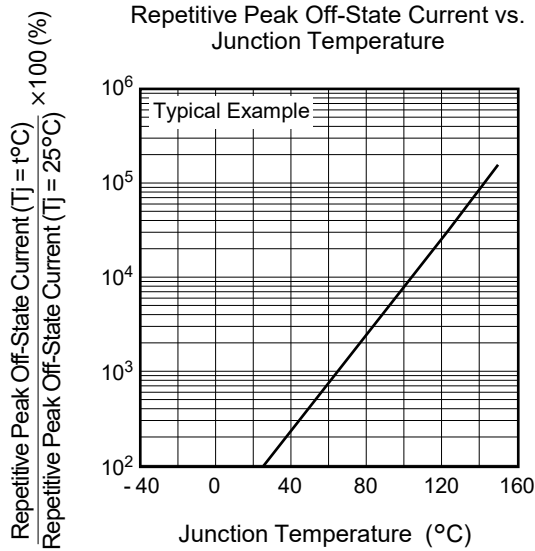
Gate Trigger Voltage vs. Junction Temperature



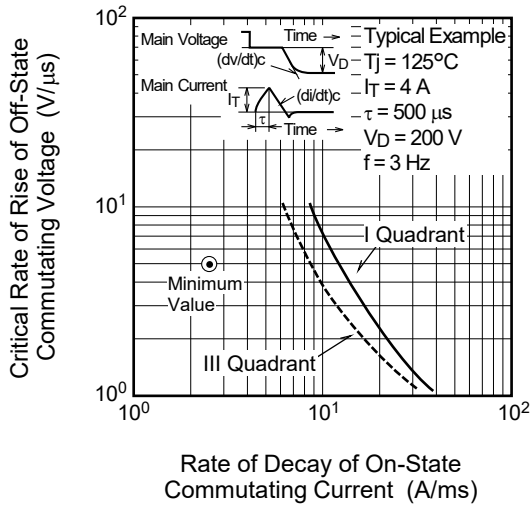
Gate Trigger Current vs. Gate Current Pulse Width



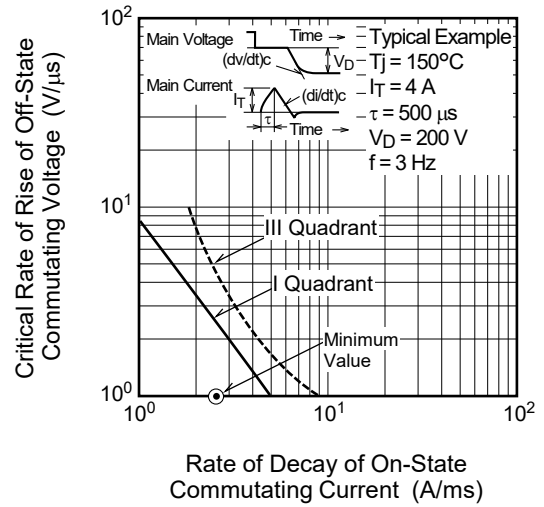




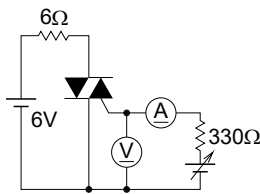
Commutation Characteristics (Tj=125°C)



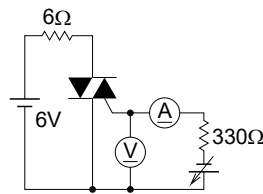
Commutation Characteristics (Tj=150°C)



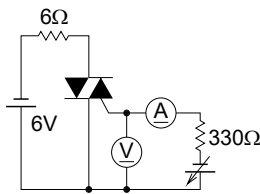
Gate Trigger Characteristics Test Circuits



Test Procedure I

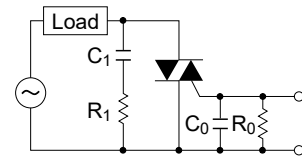


Test Procedure II



Test Procedure III

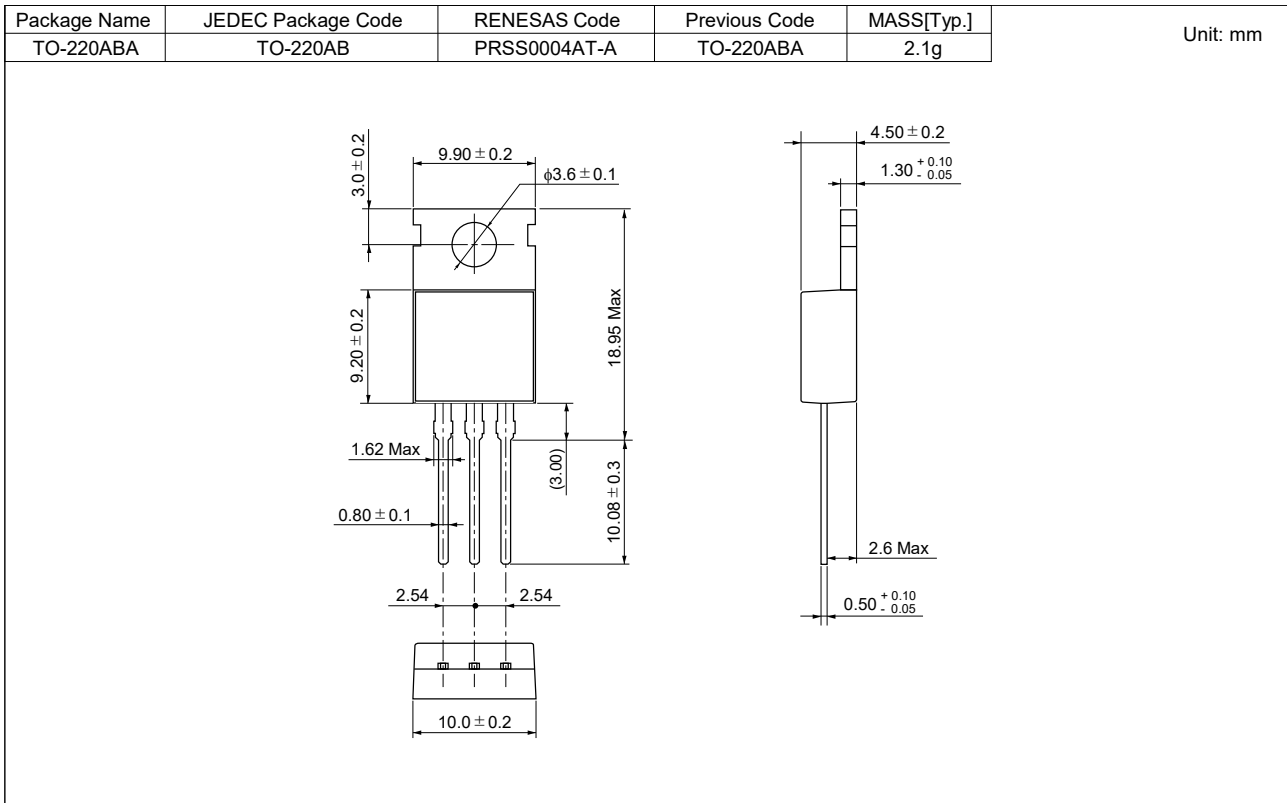
Recommended peripheral components for Triac



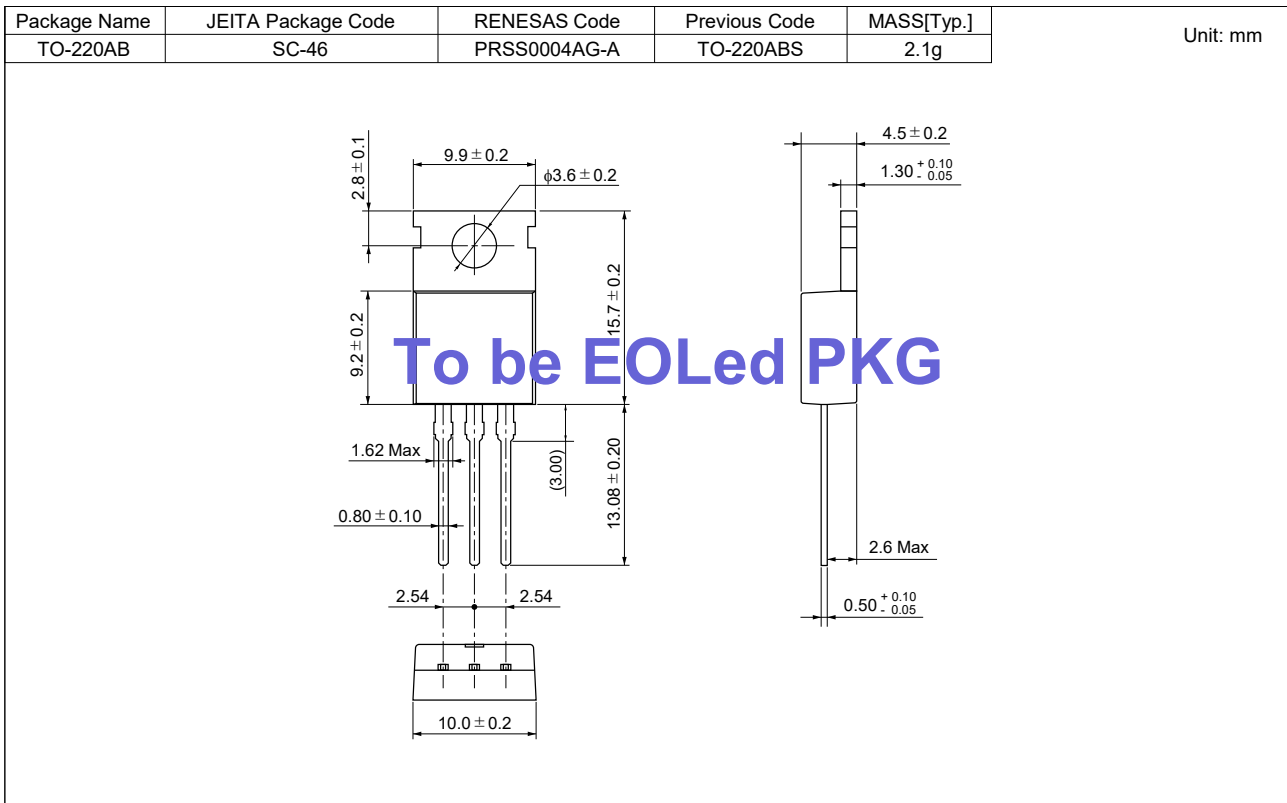
C<sub>1</sub> = 0.1 to 0.47 μF    C<sub>0</sub> = 0.1 μF  
 R<sub>1</sub> = 47 to 100 Ω    R<sub>0</sub> = 100 Ω

### Package Dimensions

Ordering code: #BH0



Ordering code: #BB0



## Ordering Information

Orderable Part Number	Package	Quantity <sup>Note7</sup>	Remark	Status
BCR5CM-12LB#BH0	TO-220ABA	50 pcs./ tube	Straight type	Mass Production
BCR5CM-12LB-1#BH0	TO-220ABA	50 pcs./ tube	Straight type, I <sub>GT</sub> item:1	
BCR5CM-12LB#BB0	TO-220ABS	50 pcs./ tube	Straight type	EOL Candidate
BCR5CM-12LB-1#BB0	TO-220ABS	50 pcs./ tube	Straight type, I <sub>GT</sub> item:1	
BCR5CM-12LB-□□#BB0	TO-220ABS	50 pcs./ tube	□□:Lead form type	
BCR5CM-12LB1□□#BB0	TO-220ABS	50 pcs./ tube	□□:Lead form type, I <sub>GT</sub> item:1	

Notes: 7. Please confirm the specification about the shipping in detail.

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