

BCR12FM-14LB

700V - 12A - Triac

Medium Power Use

R07DS1064EJ0300

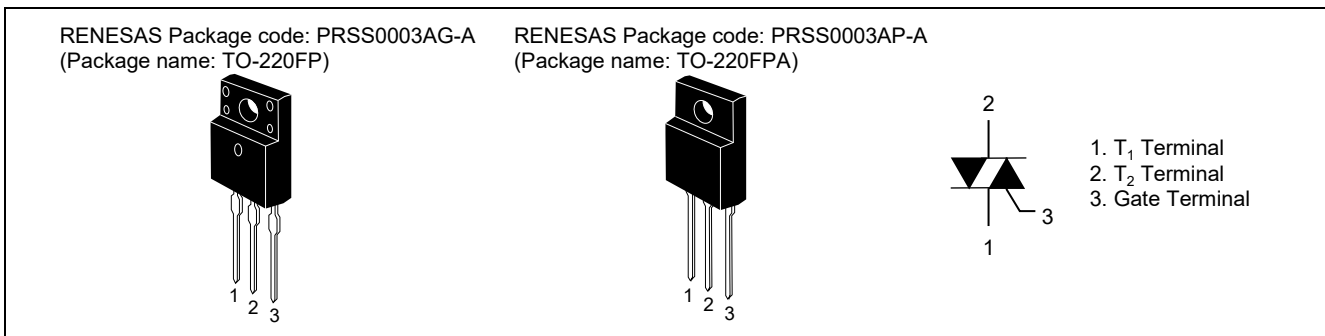
Rev.3.00

Apr 14, 2017

Features

- $I_{T(RMS)}$: 12 A
- V_{DRM} : 800 V ($T_j=125^{\circ}C$)
- T_j : 150 °C
- I_{FGT1} , I_{RGT1} , $I_{RGT III}$:30 mA(20mA) ^{Note5}
- Insulated Type
- Planar Passivation Type
- Viso: 2000V

Outline



Application

Washing machine, Power supply, Solid state relay, and other general purpose AC control applications.

Maximum Ratings

Parameter	Symbol	Voltage class	Unit	Conditions
		14		
Repetitive peak off-state voltage ^{Note1}	V_{DRM}	800	V	$T_j=125^{\circ}C$
		700	V	$T_j=150^{\circ}C$
Non-repetitive peak off-state voltage ^{Note1}	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, $T_c = 102^{\circ}C$ (#BB0, See Ordering Info.) $T_c = 93^{\circ}C$ (#BG0, #FG0, #FA0)
Surge on-state current	I_{TSM}	120	A	50 Hz sinewave 1 full cycle, peak value, non-repetitive
I^2t for fusion	I^2t	60	A ² 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 ^{Note6}	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.

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}	—	—	1.6	V	$T_c = 25^\circ\text{C}$, $I_{TM} = 20\text{A}$, instantaneous measurement	
Gate trigger voltage ^{Note2}	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 ^{Note2}	I	I_{FGTI}	—	—	30 ^{Note5}	mA	$T_j = 25^\circ\text{C}$, $V_D = 6\text{V}$, $R_L = 6\ \Omega$, $R_G = 330\ \Omega$
	II	I_{RGTI}	—	—	30 ^{Note5}	mA	
	III	I_{RGTIII}	—	—	30 ^{Note5}	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	$R_{th(j-c)}$	—	—	3.3	$^\circ\text{C/W}$	Junction to case ^{Note3} #BB0 (See Ordering Info.)	
		—	—	4.0	$^\circ\text{C/W}$	Junction to case ^{Note3} #BG0, #FG0, #FA0	
Critical-rate of rise of off-state commutation voltage ^{Note4}	$(dv/dt)_c$	10	—	—	V/ μs	$T_j = 125^\circ\text{C}$	
		1	—	—		$T_j = 150^\circ\text{C}$	

Notes: 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°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)

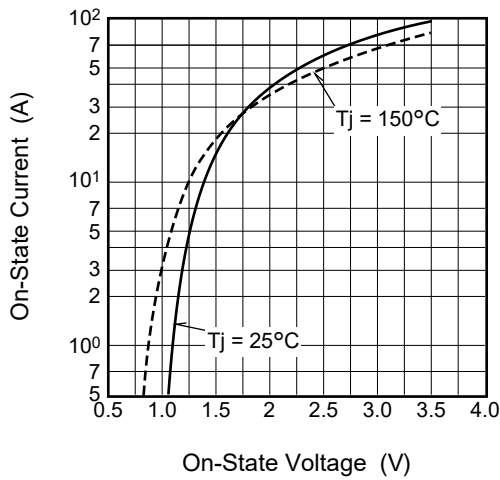
6. Make sure that your finished product containing this device meets your safe isolation requirements.

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

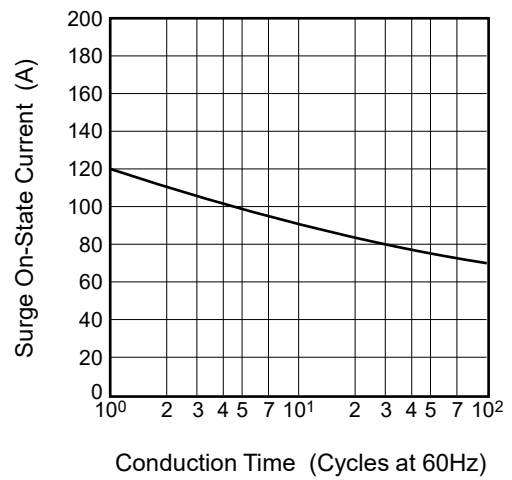
Test conditions	Commutating voltage and current waveforms (inductive load)
1. Junction temperature $T_j = 125^\circ\text{C}/150^\circ\text{C}$ 2. Rate of decay of on-state commutating current $(di/dt)_c = -6.0\text{A/ms}$ 3. Peak off-state voltage $V_D = 400\text{V}$	

Performance Curves

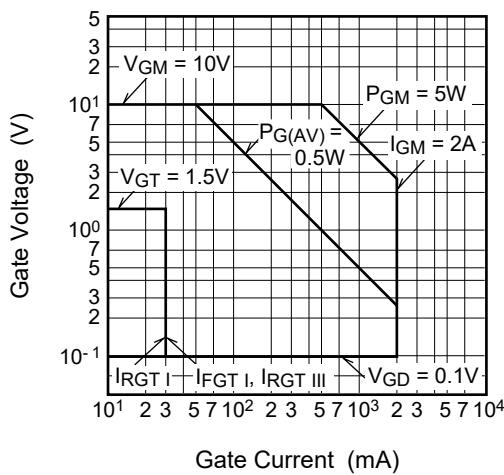
Maximum On-State Characteristics



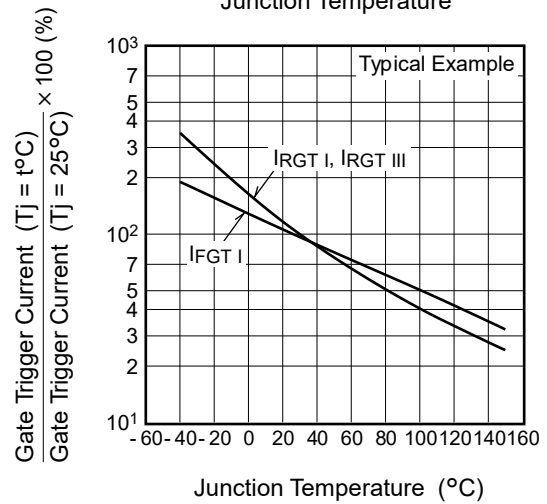
Rated Surge On-State Current



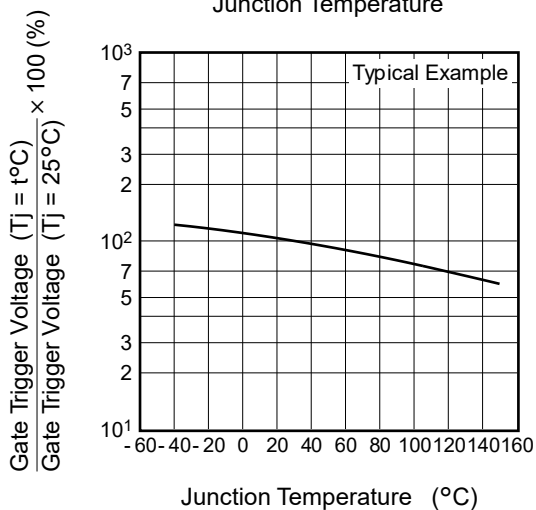
Gate Characteristics (I, II and III)



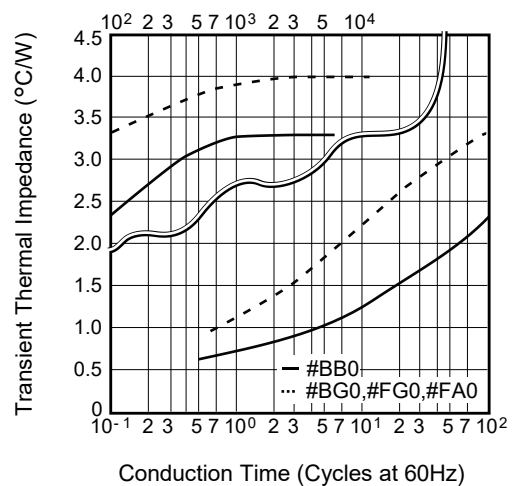
Gate Trigger Current vs. Junction Temperature

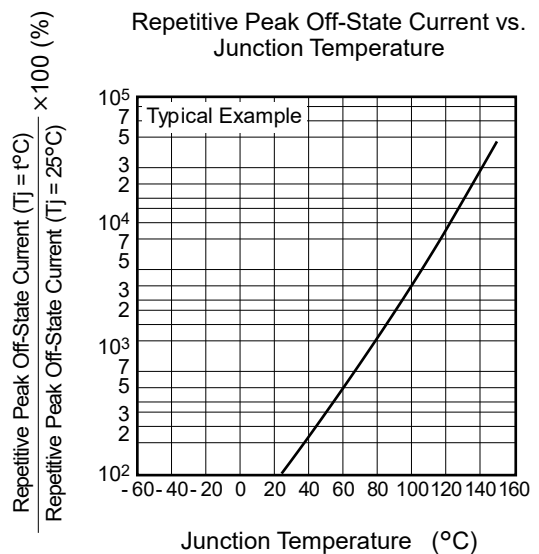
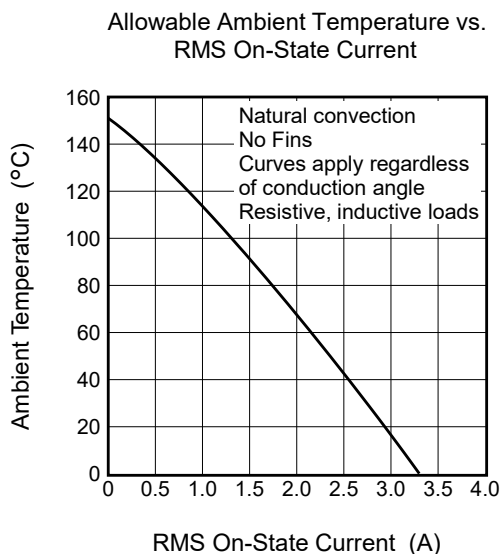
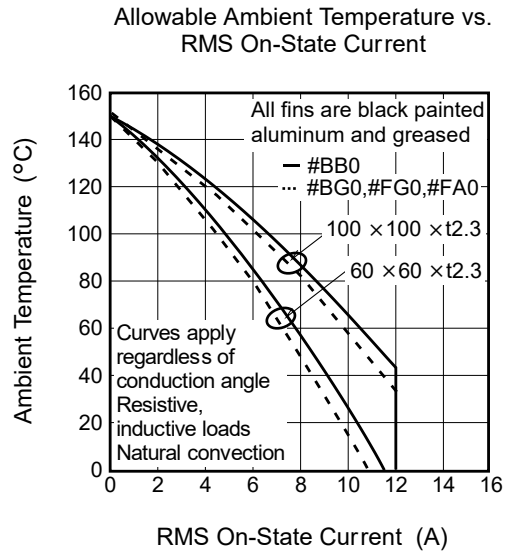
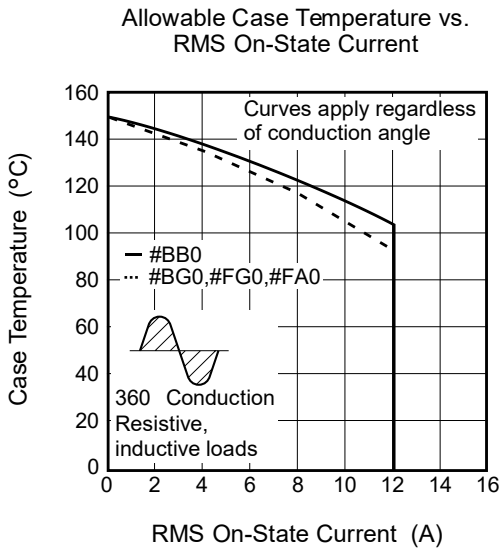
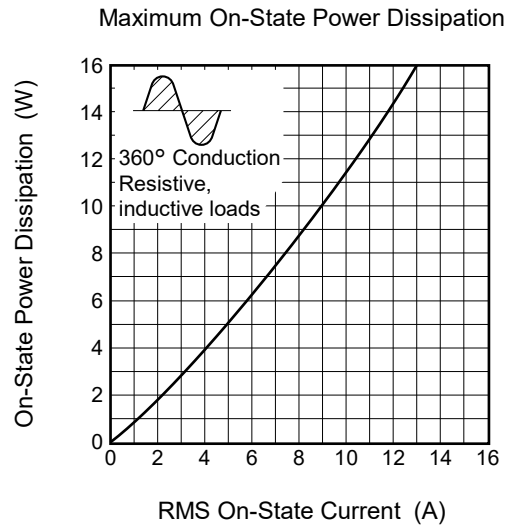
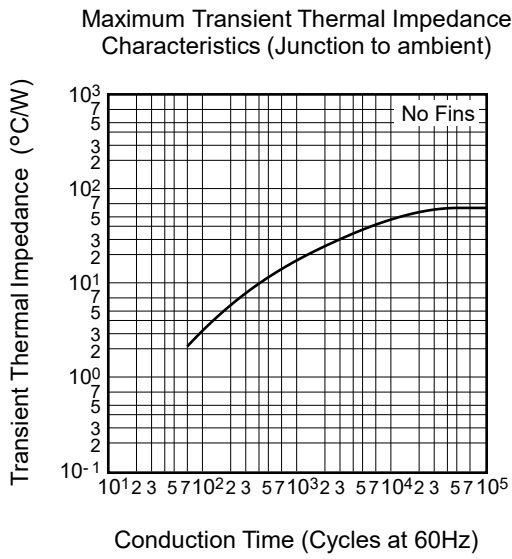


Gate Trigger Voltage vs. Junction Temperature

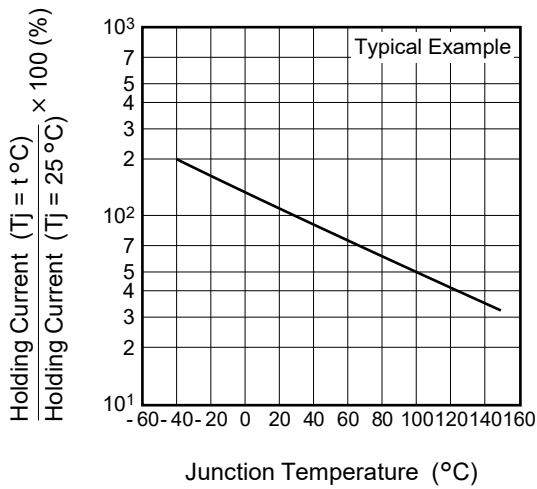


Maximum Transient Thermal Impedance Characteristics (Junction to case)

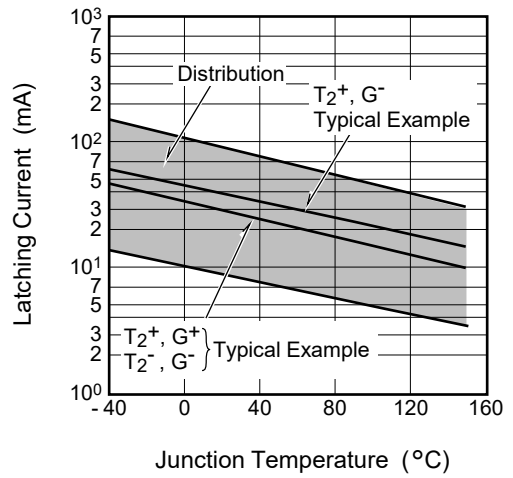




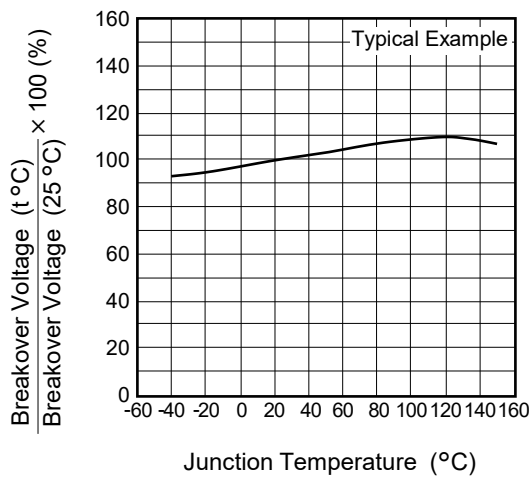
Holding Current vs. Junction Temperature



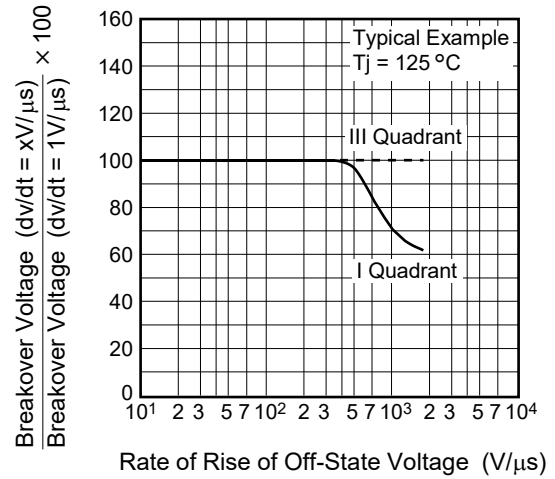
Latching Current vs. Junction Temperature



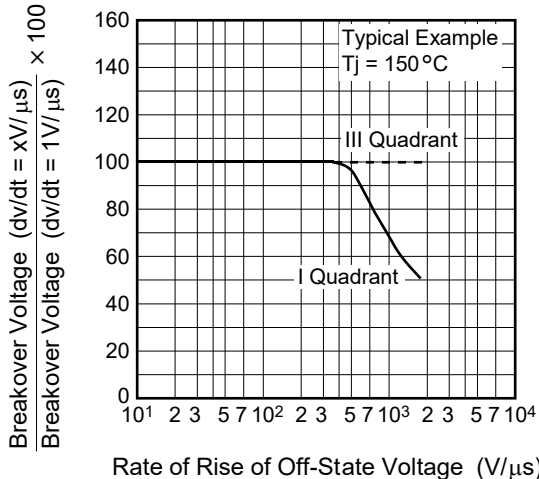
Breakover Voltage vs. Junction Temperature



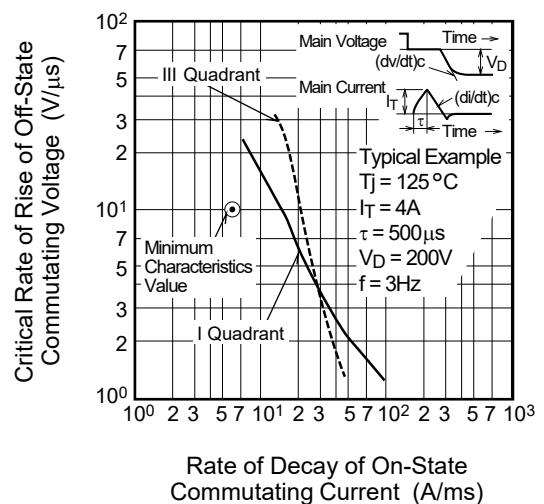
Breakover Voltage vs. Rate of Rise of Off-State Voltage (Tj=125°C)

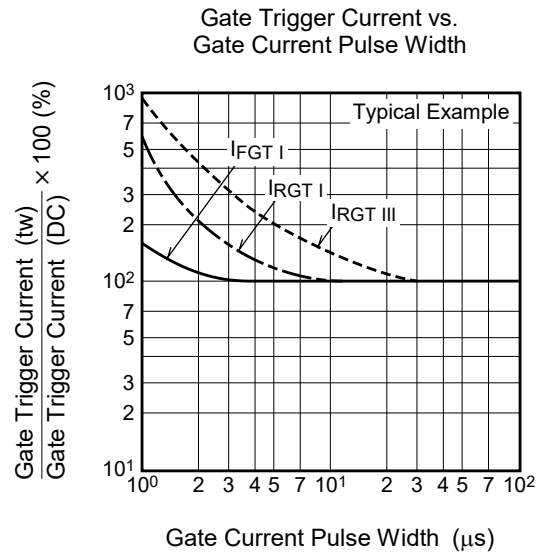
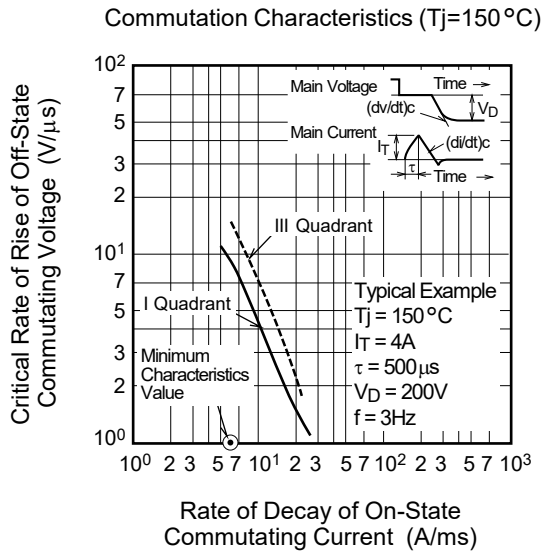


Breakover Voltage vs. Rate of Rise of Off-State Voltage (Tj=150°C)

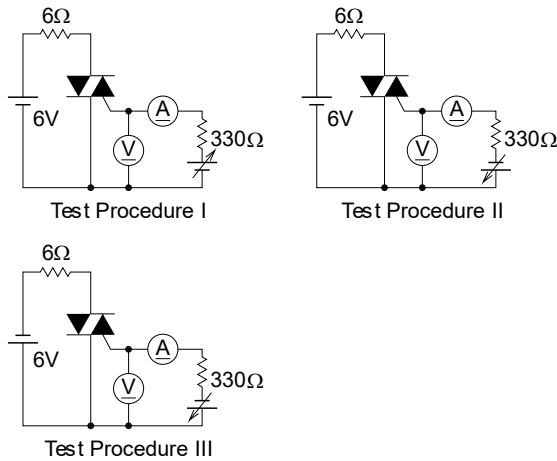


Commutation Characteristics (Tj=125°C)

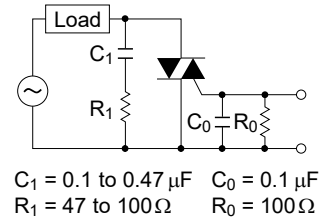




Gate Trigger Characteristics Test Circuits



Recommended peripheral components for Triac

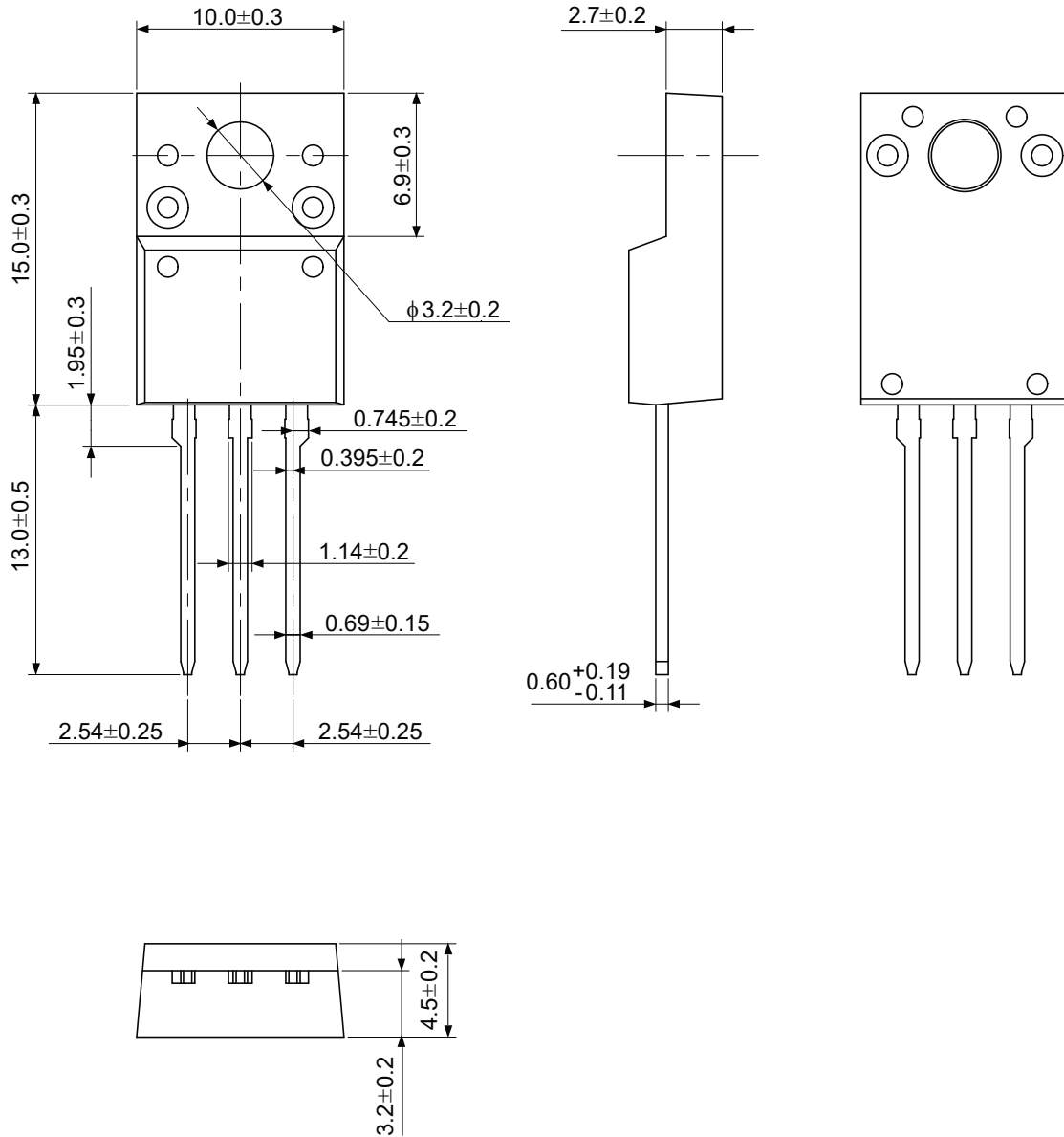


Package Dimensions

TO-220FPA (PRSS0003AP-A)

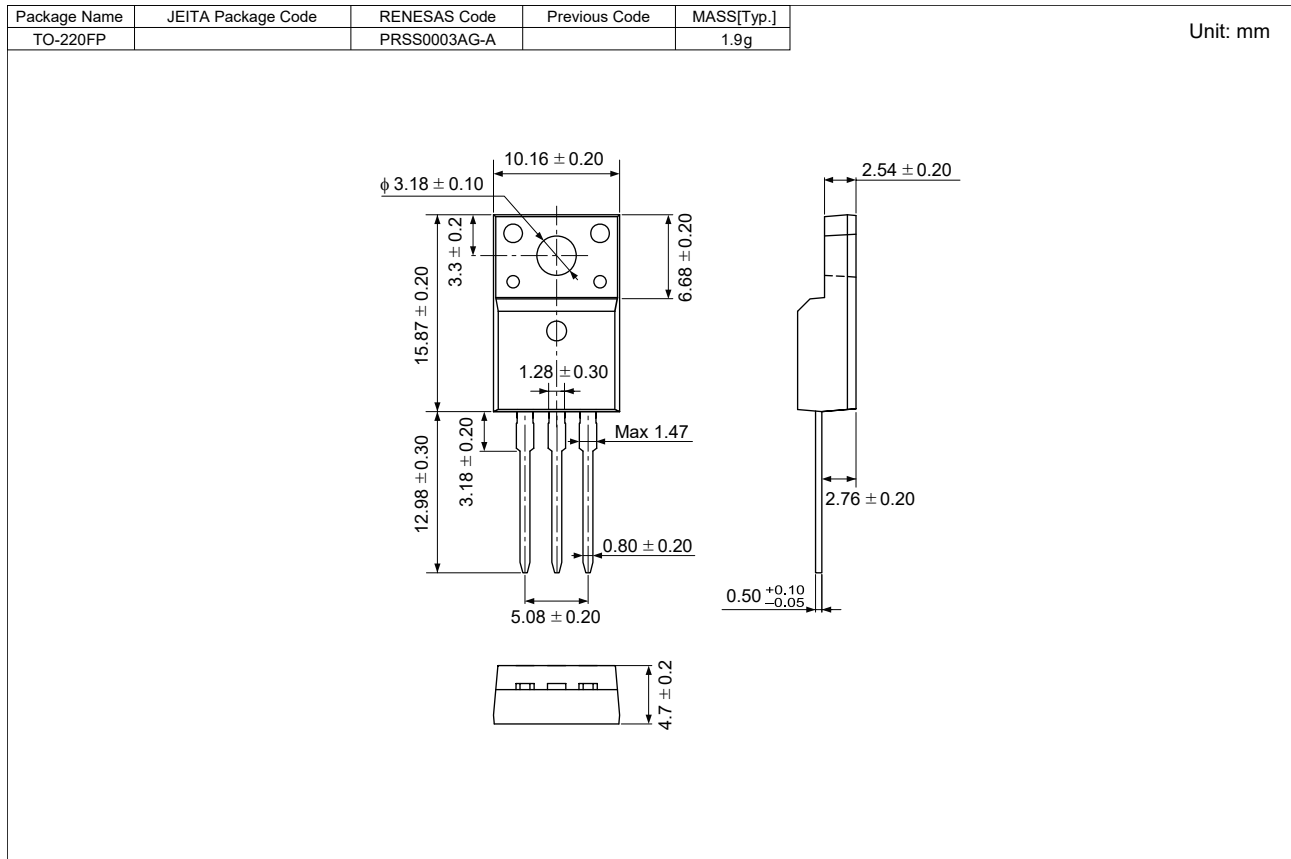
JEITA Package Code	RENESAS Code	Previous Code	MASS (Typ) [g]
-	PRSS0003AP-A	TO-220FPA	1.65

Unit: mm



Package Dimensions

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



Ordering Information

Orderable Part Number	Package	Quantity ^{Note7}	Remark	Quality Grade ^{Note9}
BCR12FM-14LB#BG0	TO-220FPA	50 pcs./ tube	Straight type	General Industrial & General Consumer Use
BCR12FM-14LB-1#BG0	TO-220FPA	50 pcs./ tube	Straight type, IGT item:1	
BCR12FM-14LB□□#BG0	TO-220FPA	50 pcs./ tube	□□:Lead form type	
BCR12FM14LB1□□#BG0	TO-220FPA	50 pcs./ tube	□□:Lead form type, IGT item:1	
BCR12FM-14LB#BB0	TO-220FP	50 pcs./ tube	Straight type	Special Consumer Use ^{Note8}
BCR12FM-14LB#FG0	TO-220FPA	50 pcs./ tube	Straight type	
BCR12FM-14LB□□#FG0	TO-220FPA	50 pcs./ tube	□□:Lead form type	
BCR12FM-14LB#FA0	TO-220FP	50 pcs./ tube	Straight type	
BCR12FM-14LB□□#FA0	TO-220FP	50 pcs./ tube	□□:Lead form type	

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

8. "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.

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

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