BCR16FM-14LB

700V - 16A - Triac

Medium Power Use

R07DS1189EJ0400
Rev.4.00
Jan. 15, 2019

Features

- $I_{T\,(RMS)}$: 16 A
- V_{DRM} : 800 V (Tj=125°C)
- Tj: 150 °C
- I_{FGTI}, I_{RGTI}, $I_{RGT\,III}$:30 mA(20mA) Note6
- Insulated Type
- Planar Passivation Type
- Viso: 2000V

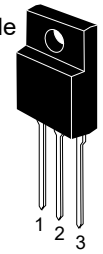
Outline

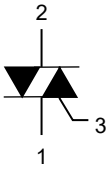
RENESAS Package code: PRSS0003AG-A
(Package name: TO-220FP)

Ordering code
#BB0
#FA0

RENESAS Package code: PRSS0003AP-A
(Package name: TO-220FPA)

Ordering code
#BH0
#BG0
#FG0





1. T_1 Terminal
2. T_2 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 Note1	V_{DRM}	800	V	Tj=125°C
		700	V	Tj=150°C
Non-repetitive peak off-state voltage Note1	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,
				Tc = 98°C (#BH0, #BB0) Note2
				Tc = 87°C (#BG0, #FG0, #FA0) Note2

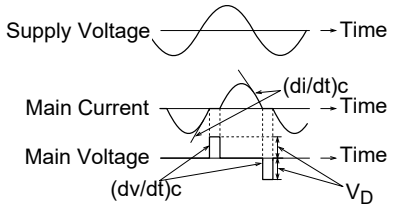
Surge on-state current	I_{TSM}	160	A	50 Hz sinewave 1 full cycle, peak value, non-repetitive
I^2t for fusion	I^2t	106.5	A^2s	Value corresponding to 1 cycle of half wave 50 Hz, surge on-state current
Peak gate power dissipation	P_{GM}	5	W	
Average gate power dissipation	$P_{G\,(AV)}$	0.5	W	
Peak gate voltage	V_{GM}	10	V	
Peak gate current	I_{GM}	2	A	
Junction Temperature	Tj	–40 to +150	°C	
Storage temperature	Tstg	–40 to +150	°C	
Isolation voltage Note7	V_{iso}	2000	V	Ta=25°C, AC 1 minute, T_1 • T_2 • G terminal to case

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

Electrical Characteristics

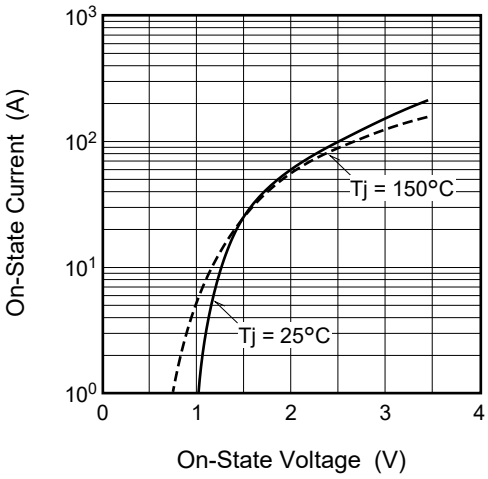
Parameter		Symbol	Min.	Typ.	Max.	Unit	Test conditions
Repetitive peak off-state current		I_{DRM}	—	—	2.0	mA	Tj = 150°C, V_{DRM} applied
On-state voltage		V_{TM}	—	—	1.5	V	Tc = 25°C, I_{TM} = 25A, instantaneous measurement
Gate trigger voltage[Note3]	I	V_{FGTI}	—	—	1.5	V	Tj = 25°C, V_D = 6 V, R_L = 6 Ω, R_G = 330 Ω
	II	V_{RGTI}	—	—	1.5	V	
	III	V_{RGTIII}	—	—	1.5	V	
Gate trigger curent[Note3]	I	I_{FGTI}	—	—	30 [Note6]	mA	Tj = 25°C, V_D = 6 V, R_L = 6 Ω, R_G = 330 Ω
	II	I_{RGTI}	—	—	30 [Note6]	mA	
	III	I_{RGTIII}	—	—	30 [Note6]	mA	
Gate non-trigger voltage		V_{GD}	0.2	—	—	V	Tj = 125°C, V_D = 1/2 V_{DRM}
			0.1	—	—		Tj = 150°C, V_D = 1/2 V_{DRM}
Thermal resistance		$R_{th\ (j-c)}$	—	—	2.9	°C/W	Junction to case[Note4] (#BH0, #BB0)[Note2]
			—	—	3.5	°C/W	Junction to case[Note4] (#BG0, #FG0, #FA0)[Note2]
Critical-rate of rise of off-state commutation voltage[Note5]		(dv/dt)c	10	—	—	V/μs	Tj = 125°C
			1	—	—		Tj = 150°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°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 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.

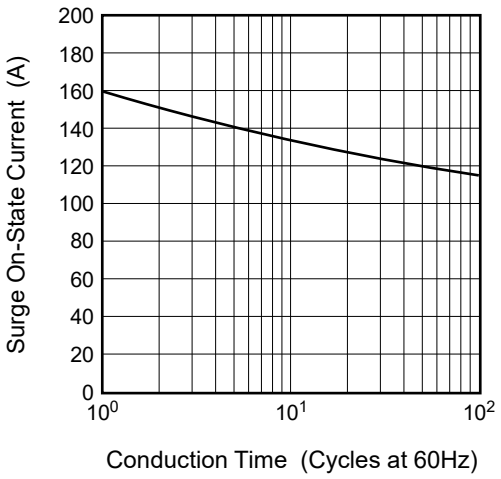
Test conditions	Commutating voltage and current waveforms (inductive load)
1. Junction temperature Tj = 125°C/150°C 2. Rate of decay of on-state commutating current (di/dt)c = – 8.0 A/ms 3. Peak off-state voltage V_D = 400 V	

Performance Curves

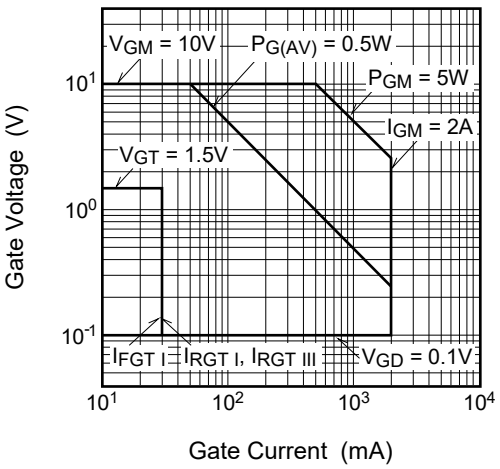
Maximum On-State Characteristics



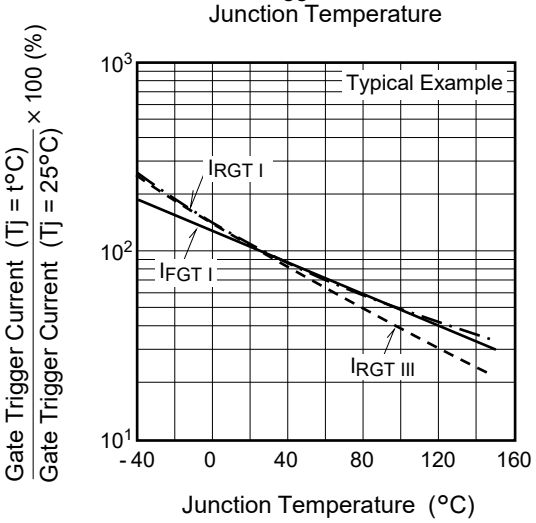
Rated Surge On-State Current



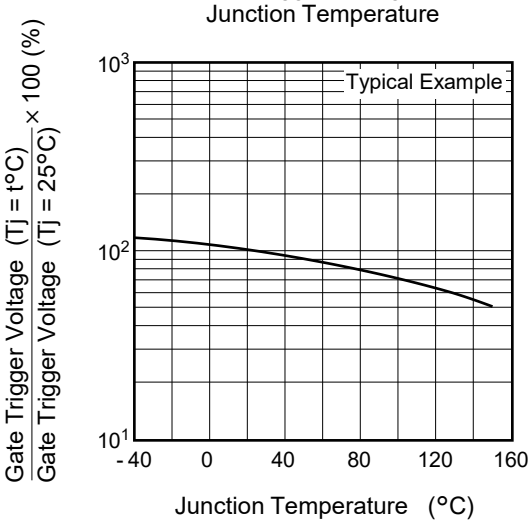
Gate Characteristics (I, II and III)



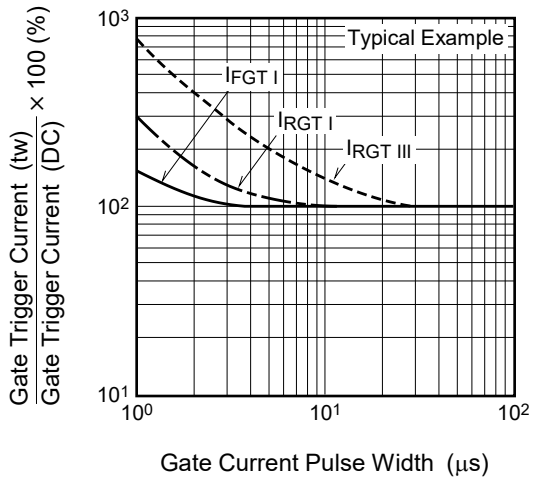
Gate Trigger Current vs. Junction Temperature



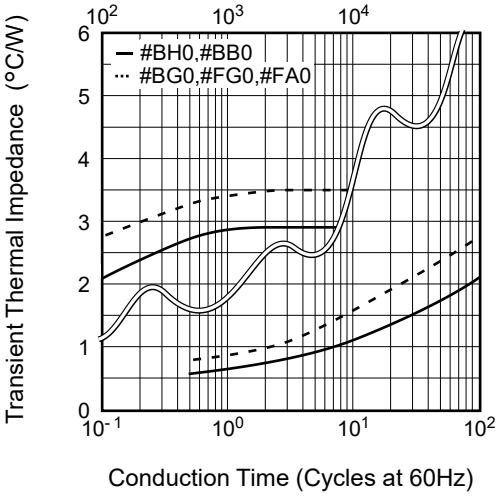
Gate Trigger Voltage vs. Junction Temperature



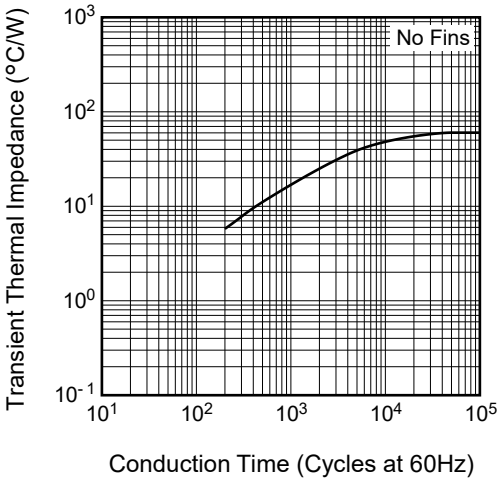
Gate Trigger Current vs. Gate Current Pulse Width



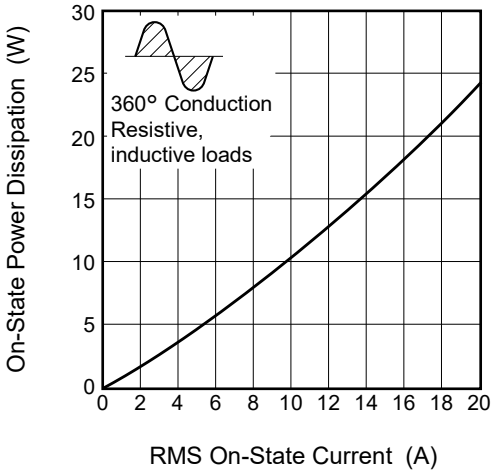
Maximum Transient Thermal Impedance Characteristics (Junction to case)



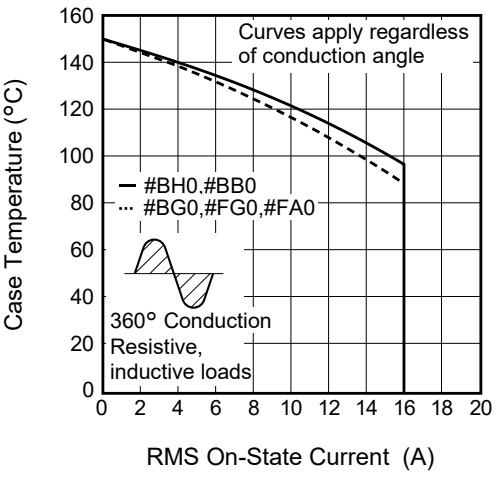
Maximum Transient Thermal Impedance Characteristics (Junction to ambient)



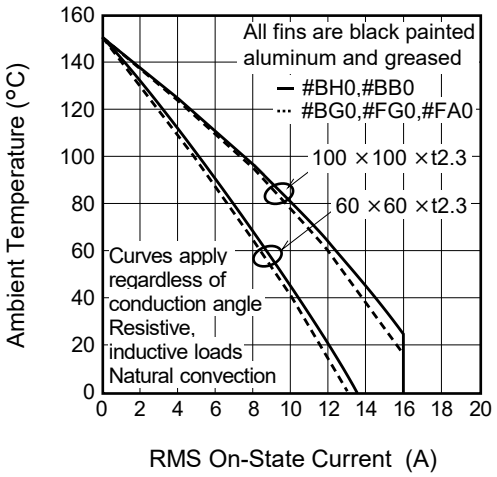
Maximum On-State Power Dissipation



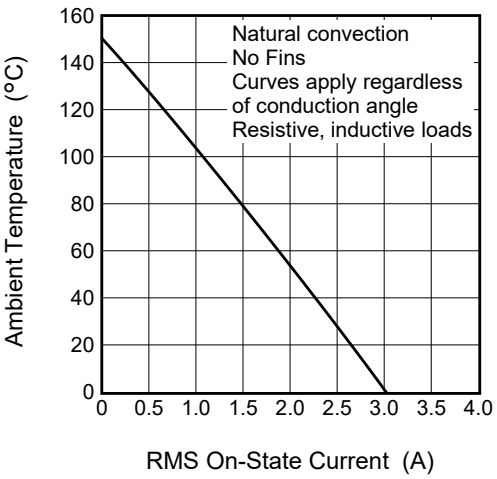
Allowable Case Temperature vs. RMS On-State Current



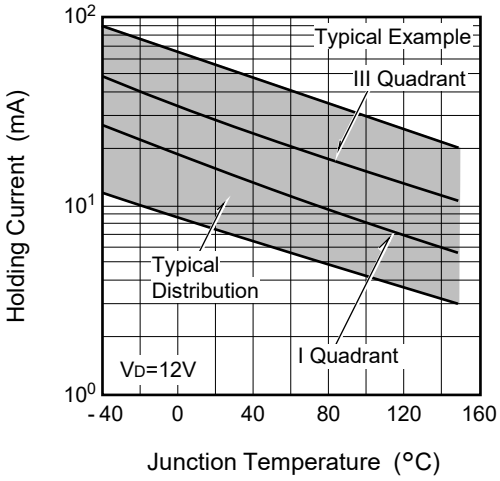
Allowable Ambient Temperature vs. RMS On-State Current



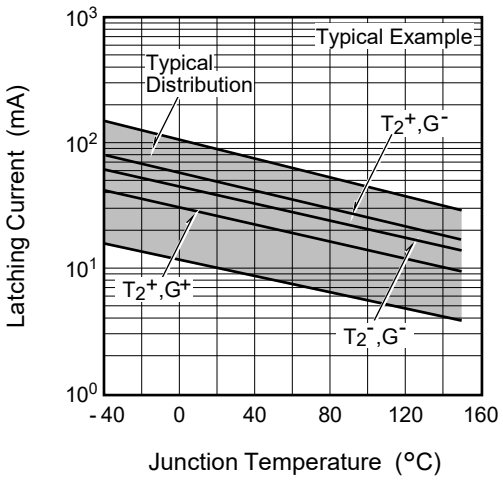
Allowable Ambient Temperature vs. RMS On-State Current



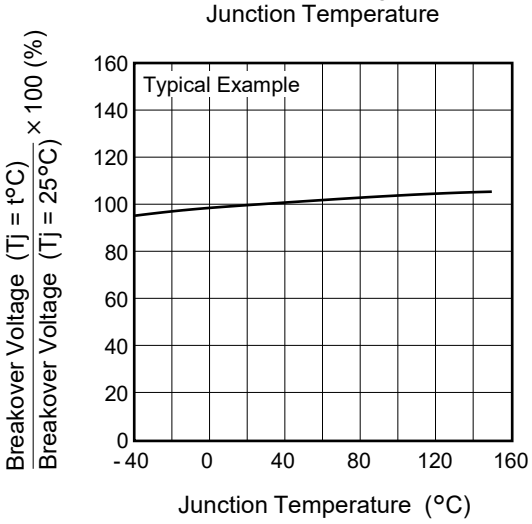
Holding Current vs.
Junction Temperature



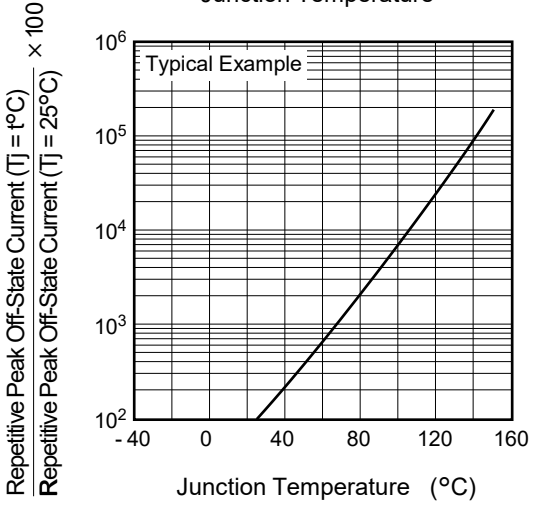
Latching Current vs.
Junction Temperature



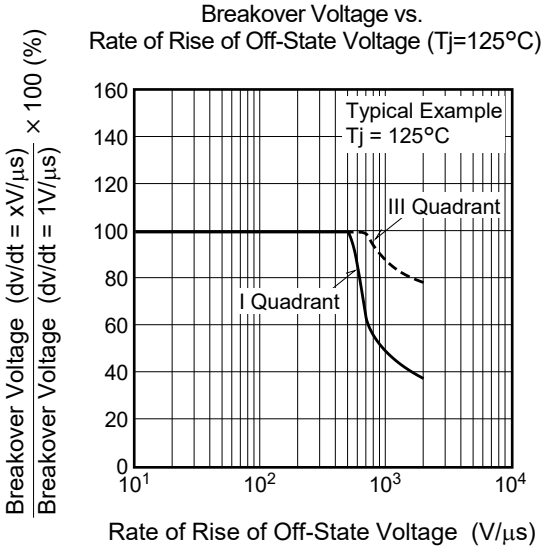
Breakover Voltage vs.
Junction Temperature



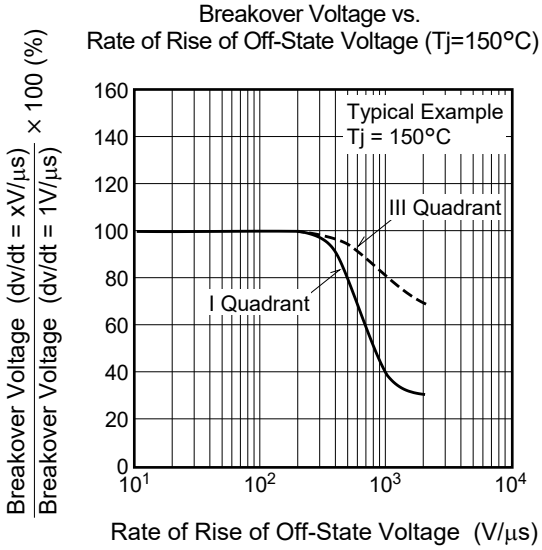
Repetitive Peak Off-State Current vs.
Junction Temperature



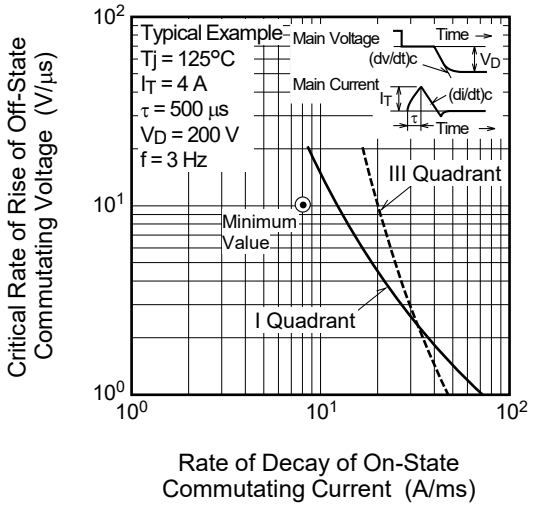
Breakover Voltage vs.
Rate of Rise of Off-State Voltage (Tj=125°C)



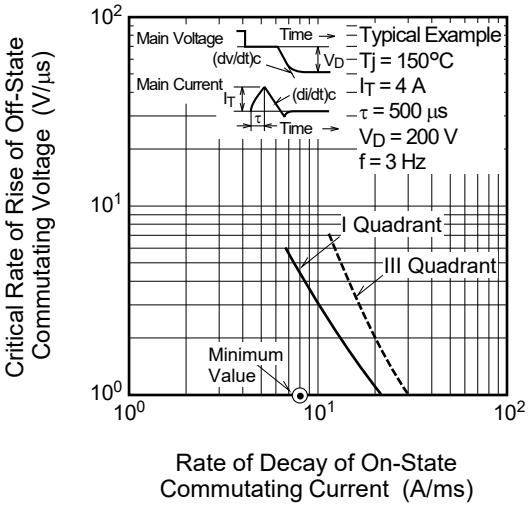
Breakover Voltage vs.
Rate of Rise of Off-State Voltage (Tj=150°C)



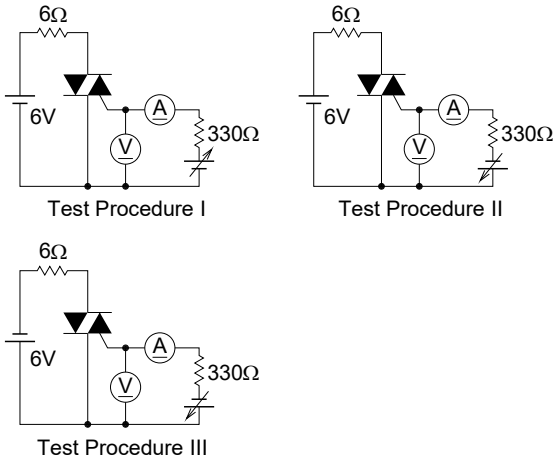
Commutation Characteristics (Tj=125°C)



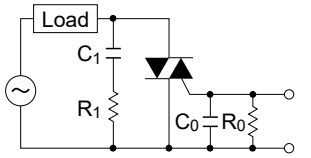
Commutation Characteristics (Tj=150°C)



Gate Trigger Characteristics Test Circuits



Recommended peripheral components for Triac



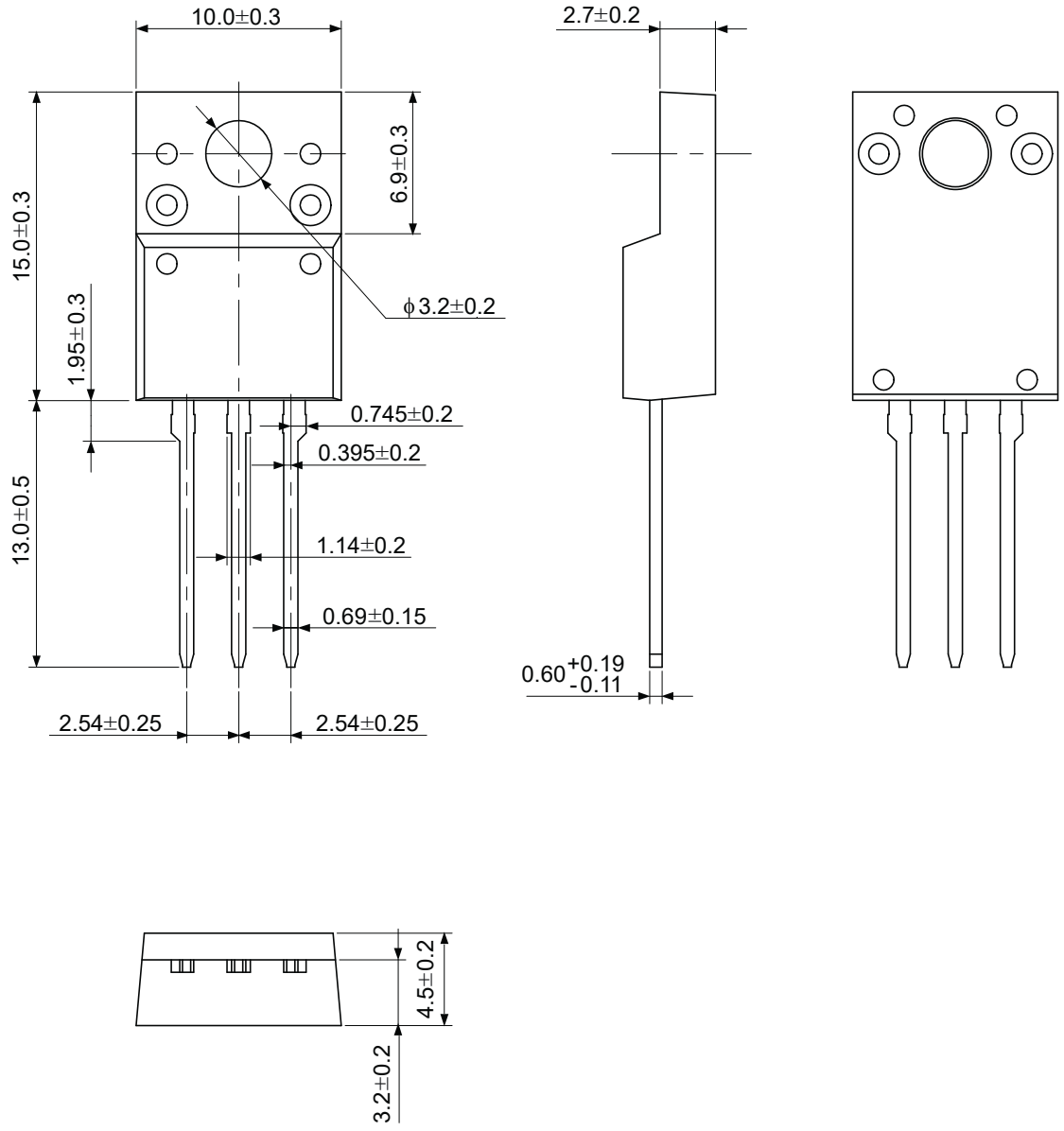
C_1 = 0.1 to 0.47 µF C_0 = 0.1 µF
R_1 = 47 to 100Ω R_0 = 100Ω

Package Dimensions

Ordering code: #BG0, #BH0, #FG0

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

Unit: mm

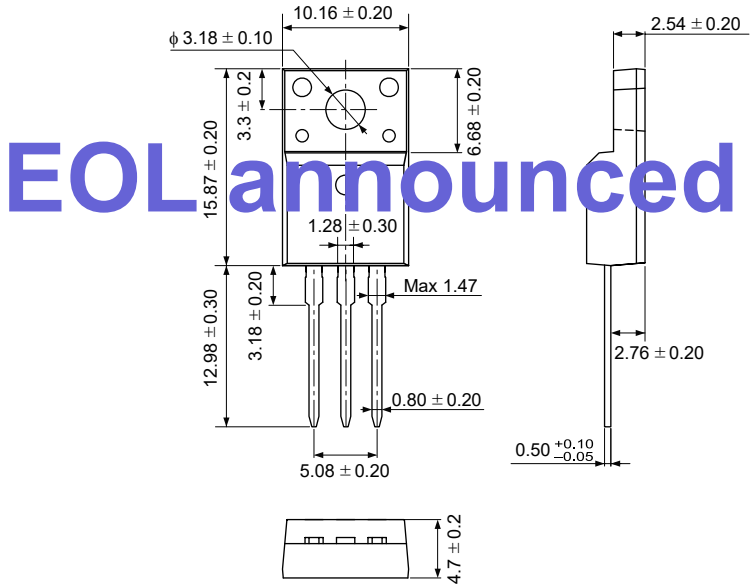


Package Dimensions

Ordering code: #BB0, #FA0 <EOL announced>

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
TO-220FP		PRSS0003AG-A		1.9g

Unit: mm



Ordering Information

Orderable Part Number	Package	Quantity Note8	Remark	Quality Grade Note10
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, I_{GT} item:1	
BCR16FM-14LB□□#BG0	TO-220FPA	50 pcs./ tube	□□:Lead form type	
BCR16FM14LB1□□#BG0	TO-220FPA	50 pcs./ tube	□□:Lead form type, I_{GT} item:1	
BCR16FM-14LB#BH0	TO-220FPA	50 pcs./ tube	Straight type	
BCR16FM-14LB-1#BH0	TO-220FPA	50 pcs./ tube	Straight type, I_{GT} item:1	
BCR16FM-14LB□□#BH0	TO-220FPA	50 pcs./ tube	□□:Lead form type	
BCR16FM14LB1□□#BH0	TO-220FPA	50 pcs./ tube	□□:Lead form type, I_{GT} item:1	
BCR16FM-14LB#BB0	TO-220FP	50 pcs./ tube	EOL announced	
BCR16FM-14LB#FG0	TO-220FPA	50 pcs./ tube	Straight type	Special Consumer Use Note9
BCR16FM-14LB□□#FG0	TO-220FPA	50 pcs./ tube	□□:Lead form type	
BCR16FM-14LB#FA0	TO-220FP	50 pcs./ tube	EOL announced	

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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RENESAS

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