

BCR16LM-12LB

Triac

Medium Power Use

REJ03G1805-0100

Rev.1.00

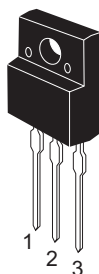
Jul 22, 2009

Features

- $I_{T(RMS)}$: 16 A
- V_{DRM} : 600 V
- $I_{FGT I}$, $I_{RGT I}$, $I_{RGT III}$: 30 mA
- V_{iso} : 1800 V
- The Product guaranteed maximum junction temperature 150°C
- Insulated Type
- Planar Passivation Type

Outline

RENESAS Package code: PRSS0003AF-A)
(Package name: TO-220FL)



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

Applications

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

Maximum Ratings

Parameter	Symbol	Voltage class	Unit
		12	
Repetitive peak off-state voltage ^{Note1}	V_{DRM}	600	V
Non-repetitive peak off-state voltage ^{Note1}	V_{DSM}	720	V

Notes: 1. Gate open.

Parameter	Symbol	Ratings	Unit	Conditions
RMS on-state current	$I_{T(RMS)}$	16	A	Commercial frequency, sine full wave 360°conduction, $T_c = 87^\circ\text{C}$
Surge on-state current	I_{TSM}	160	A	60 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 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	—	1.5	g	Typical value
Isolation voltage	V_{iso}	1800	V	$T_a = 25^\circ\text{C}$, 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}	—	—	1.5	V	$T_c = 25^\circ\text{C}$, $I_{\text{TM}} = 25\text{ A}$, 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	mA	$T_j = 25^\circ\text{C}$, $V_D = 6\text{ V}$, $R_L = 6\ \Omega$, $R_G = 330\ \Omega$
	II I_{RGTI}	—	—	30	mA	
	III I_{RGTIII}	—	—	30	mA	
Gate non-trigger voltage	V_{GD}	0.2/0.1	—	—	V	$T_j = 125^\circ\text{C}/150^\circ\text{C}$, $V_D = 1/2 V_{\text{DRM}}$
Thermal resistance	$R_{\text{th (j-c)}}$	—	—	3.5	$^\circ\text{C/W}$	Junction to case ^{Note3}
Critical-rate of rise of off-state commutation voltage ^{Note4}	$(dv/dt)_c$	10/1	—	—	V/ μs	$T_j = 125^\circ\text{C}/150^\circ\text{C}$

Notes: 2. Measurement using the gate trigger characteristics measurement circuit.

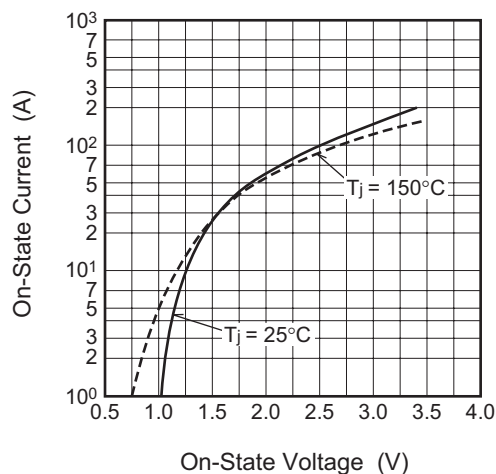
3. The contact thermal resistance $R_{\text{th (c-f)}}$ in case of greasing is 0.5°C/W .

4. Test conditions of the critical-rate of rise of off-state commutation voltage is shown in the table below.

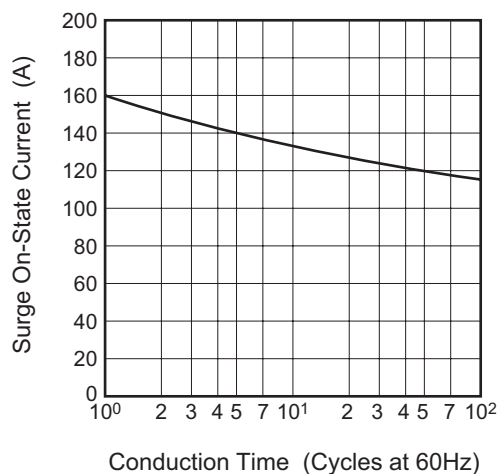
Test conditions	Commutating voltage and current waveforms (inductive load)
1. Junction temperature $T_j = 125^\circ\text{C}/150^\circ\text{C}$ 2. Rate of decay of on-state commutating current $(di/dt)_c = -8.0\text{ A/ms}$ 3. Peak off-state voltage $V_D = 400\text{ V}$	

Performance Curves

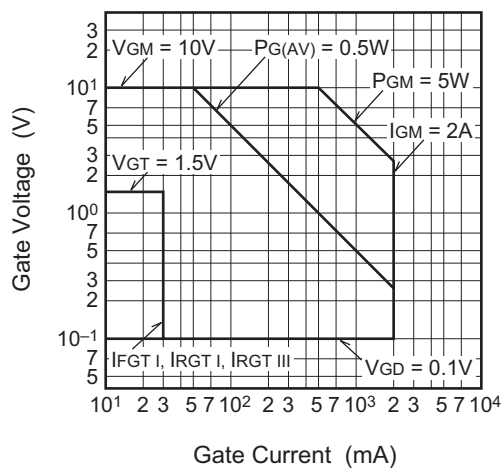
Maximum On-State Characteristics



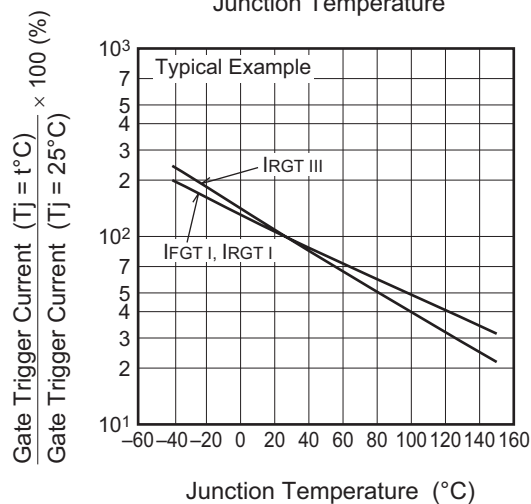
Rated Surge On-State Current



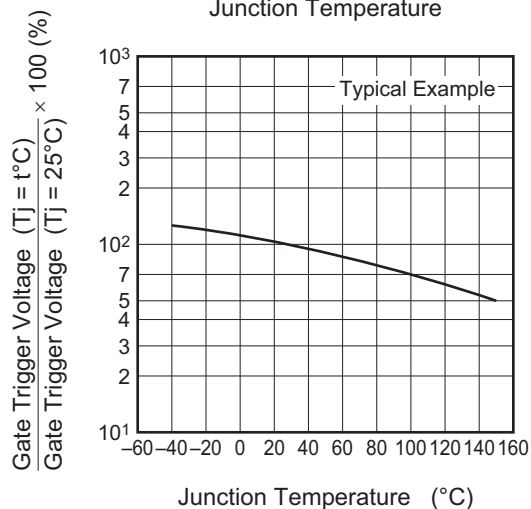
Gate Characteristics (I, II and III)



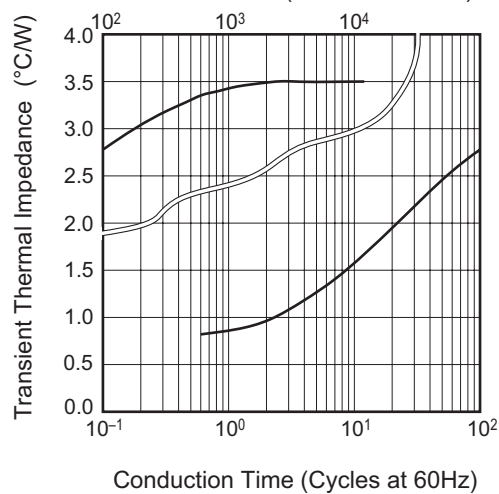
Gate Trigger Current vs. Junction Temperature



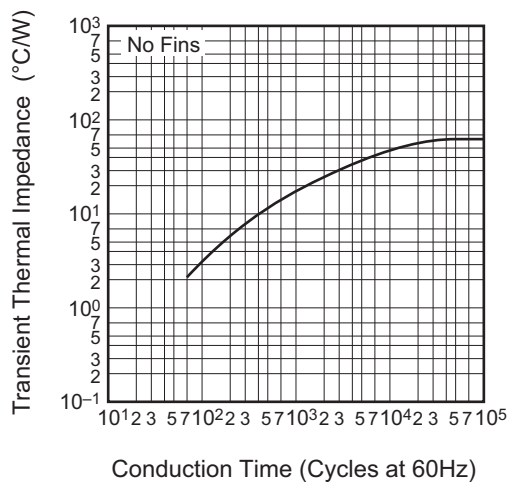
Gate Trigger Voltage vs. Junction Temperature



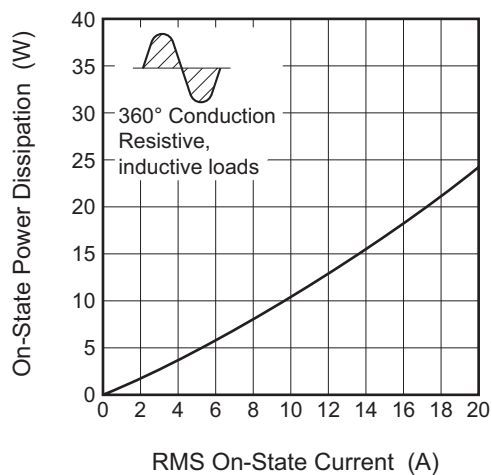
Maximum Transient Thermal Impedance Characteristics (Junction to case)



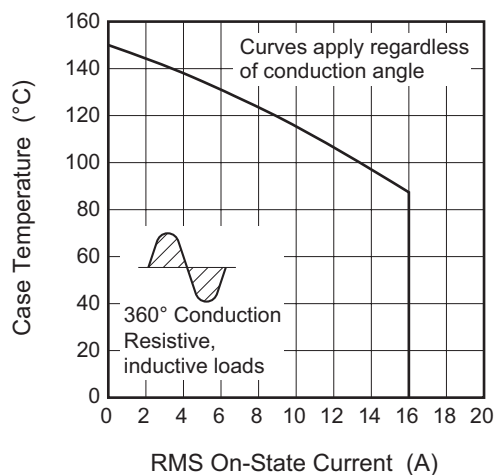
Maximum Transient Thermal Impedance Characteristics (Junction to ambient)



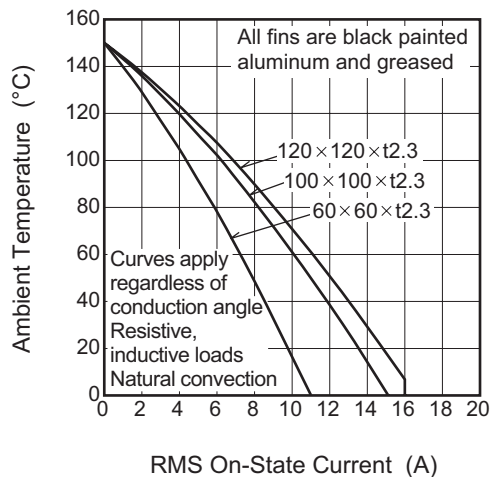
Maximum On-State Power Dissipation



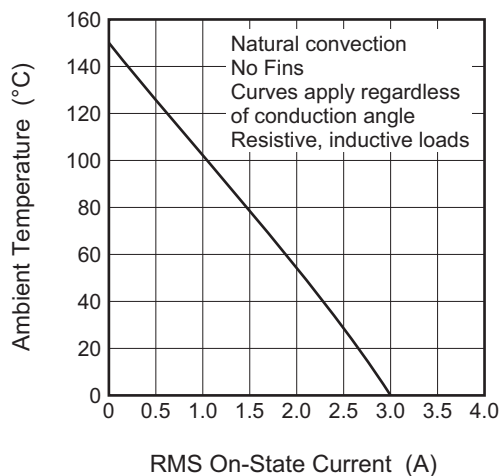
Allowable Case Temperature vs. RMS On-State Current



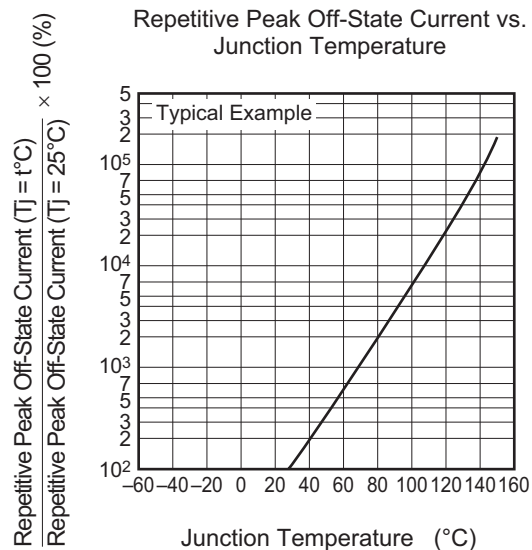
Allowable Ambient Temperature vs. RMS On-State Current

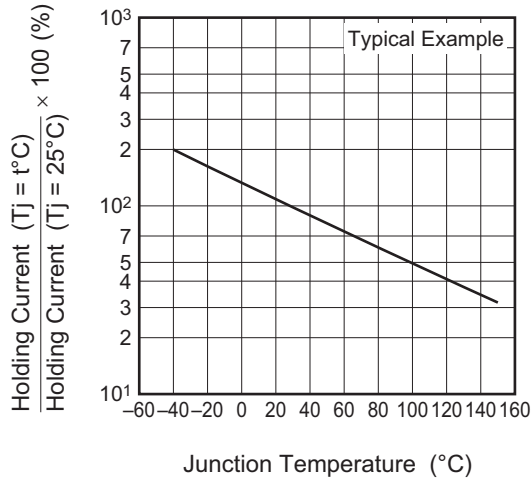
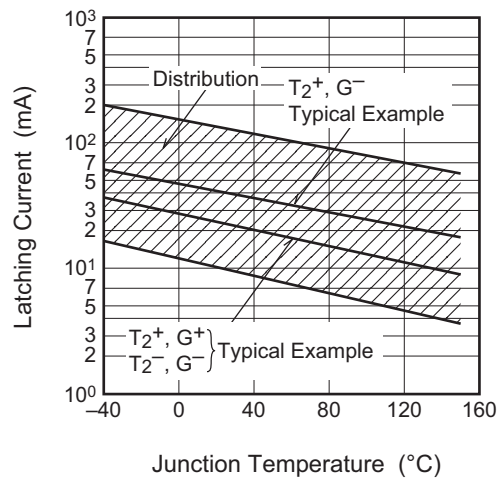
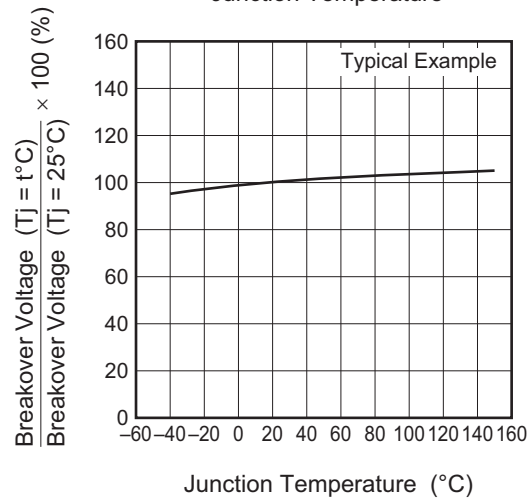
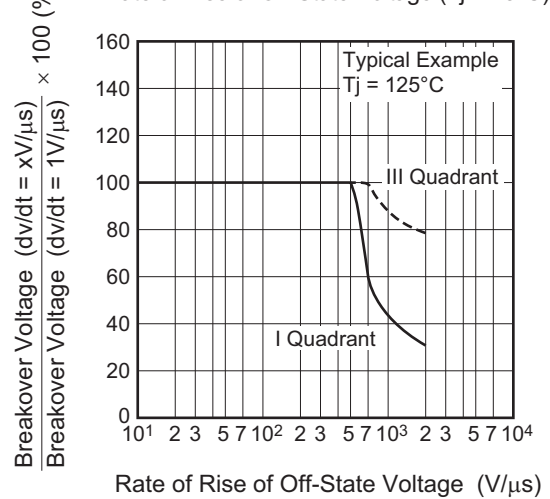
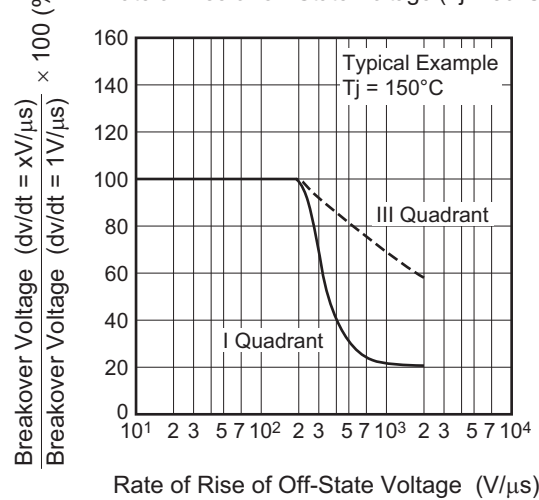


Allowable Ambient Temperature vs. RMS On-State Current

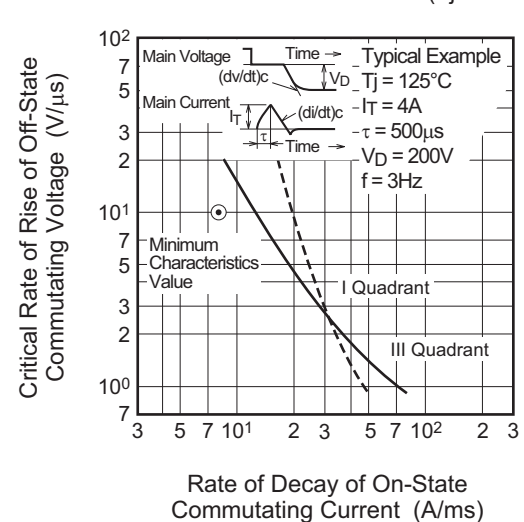


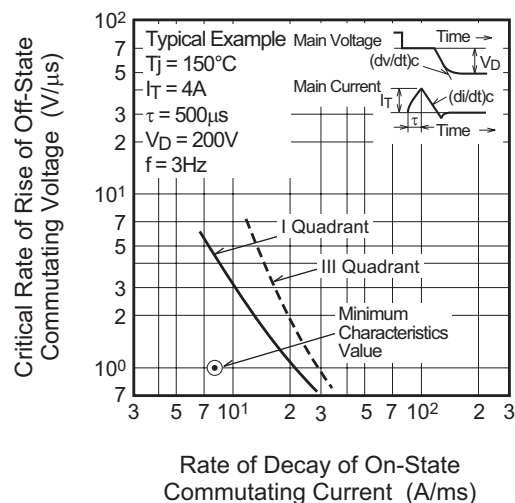
Repetitive Peak Off-State Current vs. Junction Temperature



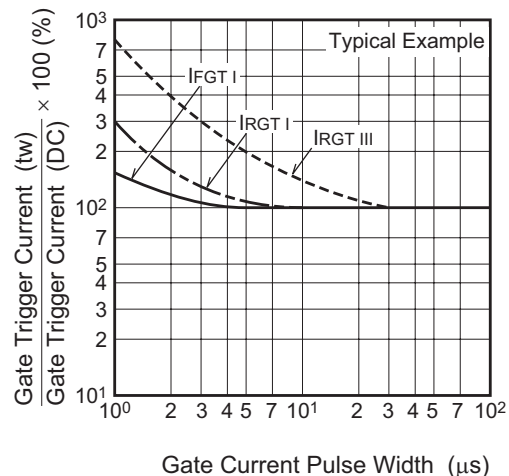
Holding Current vs.
Junction TemperatureLatching Current vs.
Junction TemperatureBreakover Voltage vs.
Junction TemperatureBreakover Voltage vs.
Rate of Rise of Off-State Voltage (Tj=125°C)Breakover Voltage vs.
Rate of Rise of Off-State Voltage (Tj=150°C)

Commutation Characteristics (Tj=125°C)

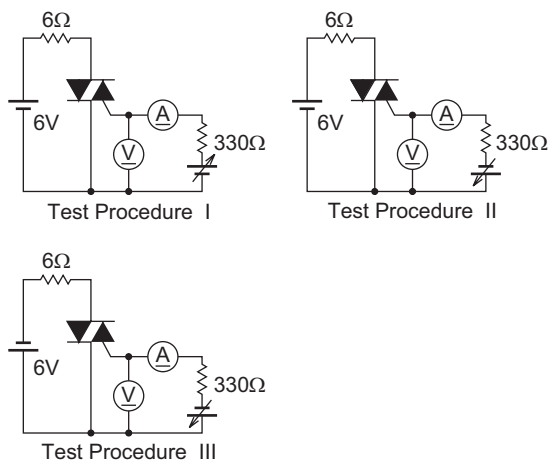


Commutation Characteristics ($T_j=150^\circ\text{C}$)

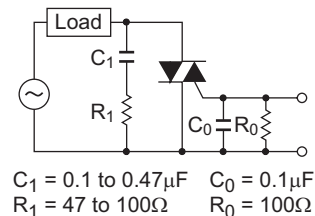
Gate Trigger Current vs. Gate Current Pulse Width



Gate Trigger Characteristics Test Circuits



Recommended Circuit Values Around The Triac



Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]	Unit: mm
TO-220FL	—	PRSS0003AF-A	TO-220FL	1.5g	

The drawing shows the mechanical specifications of the BCR16LM-12LB TO-220FL package. The top view shows a square body with a width of 10.0 ± 0.3 mm and a height of 15.0 ± 0.3 mm. The mounting holes are spaced 3.0 ± 0.3 mm from the top edge and 6.5 ± 0.3 mm from the side edge. The central hole has a diameter of $\phi 3.2 \pm 0.2$ mm. The side view shows a total height of 2.8 ± 0.2 mm. The lead view shows a lead length of 12.5 ± 0.5 mm, a lead thickness of 0.40 ± 0.15 mm, and a lead width of 2.54 ± 0.25 mm. The lead is bent at a 90° angle, with a bend radius of 1.15 ± 0.2 mm and a flat section of 0.75 ± 0.15 mm. The lead is also shown with a 4.5 ± 0.2 mm dimension from the base to the bend and a 2.6 ± 0.2 mm dimension from the base to the lead tip.

Order Code

Lead form	Standard packing	Quantity	Standard order code	Standard order code example
Straight type	Plastic Magazine (Tube)	50	Type name	BCR16LM-12LB
Lead form	Plastic Magazine (Tube)	50	Type name – Lead forming code	BCR16LM-12LB-A8

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

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April 1st, 2010
Renesas Electronics Corporation

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