

# BCR10LM-16LH

Triac  
Medium Power Use

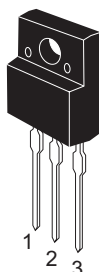
R07DS0319EJ0100  
Rev.1.00  
May 18, 2011

## Features

- $I_{T(RMS)}$  : 10 A
- $V_{DRM}$  : 800 V
- $I_{FGTI}$ ,  $I_{RGTI}$ ,  $I_{RGTIII}$  : 50 mA or 35 mA ( $I_{GT}$  item:1)
- High Commutation
- $V_{iso}$  : 1800 V
- The Product guaranteed maximum junction temperature 150°C
- Planar Type
- Insulated Type
- UL Recognized : File No. E223904

## Outline

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



1. T<sub>1</sub> Terminal
2. T<sub>2</sub> Terminal
3. Gate Terminal

## Applications

Switching mode power supply, motor control, heater control, and other general purpose AC power control applications

## Maximum Ratings

Parameter	Symbol	Voltage class	Unit
		16	
Repetitive peak off-state voltage <sup>Note1</sup>	$V_{DRM}$	800	V
Non-repetitive peak off-state voltage <sup>Note1</sup>	$V_{DSM}$	960	V

Notes: 1. Gate open.

Parameter	Symbol	Ratings	Unit	Conditions
RMS on-state current	$I_{T(RMS)}$	10	A	Commercial frequency, sine full wave 360°conduction, $T_c = 103^{\circ}\text{C}$ <sup>Note3</sup>
Surge on-state current	$I_{TSM}$	100	A	60 Hz sinewave 1 full cycle, peak value, non-repetitive
$I^2t$ for fusion	$I^2t$	41.6	A <sup>2</sup> s	Value corresponding to 1 cycle of half wave 60 Hz, surge on-state current
Peak gate power dissipation	$P_{GM}$	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	
Mass	—	1.5	g	Typical value
Isolation voltage	$V_{iso}$	1800	V	$T_a = 25^{\circ}\text{C}$ , AC 1 minute, T <sub>1</sub> • T <sub>2</sub> • G terminal to case

## Electrical Characteristics

Parameter	Symbol	BCR10LM-16LH-1 (I <sub>GT</sub> item : 1)			BCR10LM-16LH			Unit	Test conditions	
		Min.	Typ.	Max.	Min.	Typ.	Max.			
Repetitive peak off-state current	I <sub>DRM</sub>	—	—	2.0	—	—	2.0	mA	T <sub>j</sub> = 150°C V <sub>DRM</sub> applied	
On-state voltage	V <sub>TM</sub>	—	—	1.5	—	—	1.5	V	T <sub>c</sub> = 25°C, I <sub>TM</sub> = 15 A instantaneous measurement	
Gate trigger voltage <sup>Note2</sup>	I	V <sub>FGTI</sub>	—	—	1.5	—	—	1.5	V	T <sub>j</sub> = 25°C, V <sub>D</sub> = 6 V R <sub>L</sub> = 6 Ω, R <sub>G</sub> = 330 Ω
	II	V <sub>RGTI</sub>	—	—	1.5	—	—	1.5	V	
	III	V <sub>RGTIII</sub>	—	—	1.5	—	—	1.5	V	
Gate trigger current <sup>Note2</sup>	I	I <sub>FGTI</sub>	—	—	35	—	—	50	mA	T <sub>j</sub> = 25°C, V <sub>D</sub> = 6 V R <sub>L</sub> = 6 Ω, R <sub>G</sub> = 330 Ω
	II	I <sub>RGTI</sub>	—	—	35	—	—	50	mA	
	III	I <sub>RGTIII</sub>	—	—	35	—	—	50	mA	
Gate non-trigger voltage	V <sub>GD</sub>	0.2	—	—	0.2	—	—	V	T <sub>j</sub> = 125°C V <sub>D</sub> = 1/2 V <sub>DRM</sub>	
		0.1	—	—	0.1	—	—	V	T <sub>j</sub> = 150°C V <sub>D</sub> = 1/2 V <sub>DRM</sub>	
Thermal resistance	R <sub>th(j-c)</sub>	—	—	4.1	—	—	4.1	°C/W	Junction to case <sup>Note3</sup>	
Critical-rate of decay of on-state commutating current <sup>Note4</sup>	(di/dt) <sub>c</sub>	6	—	—	10	—	—	A/ms	T <sub>j</sub> = 125°C (dv/dt) <sub>c</sub> < 100 V/μs	

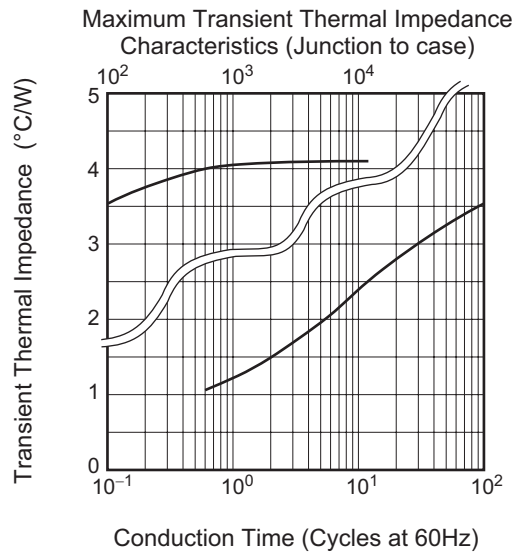
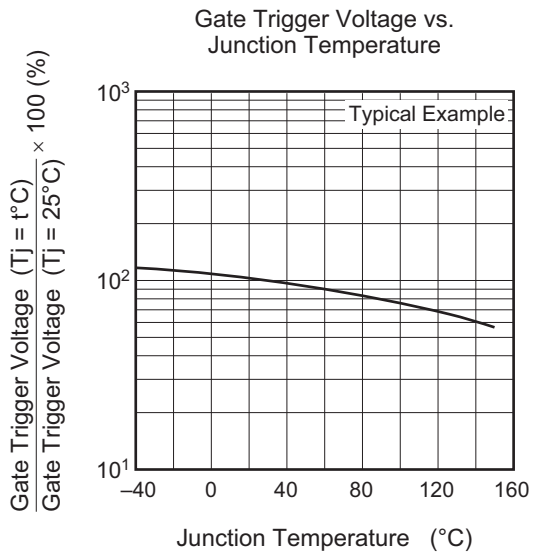
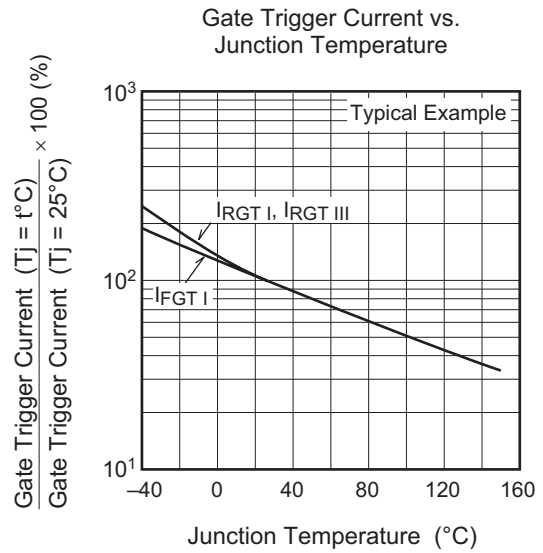
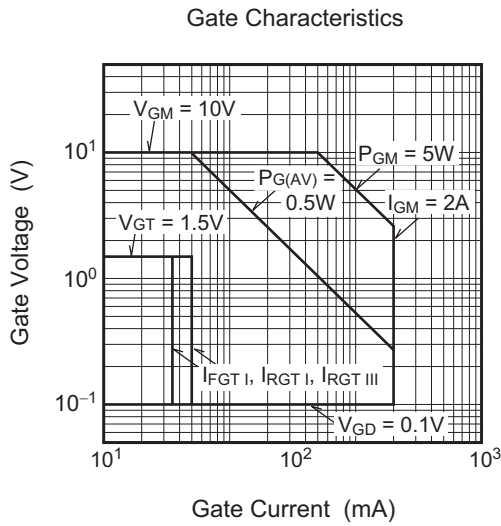
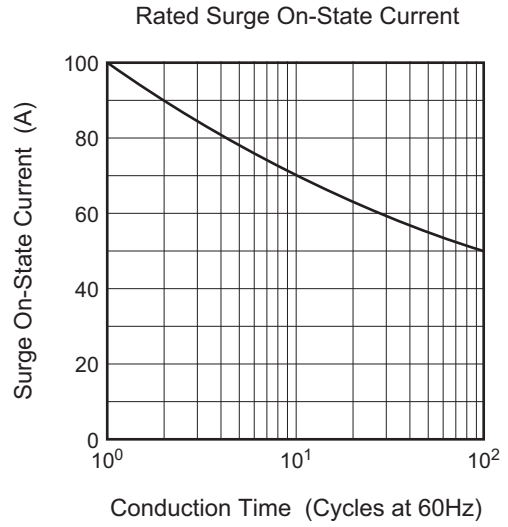
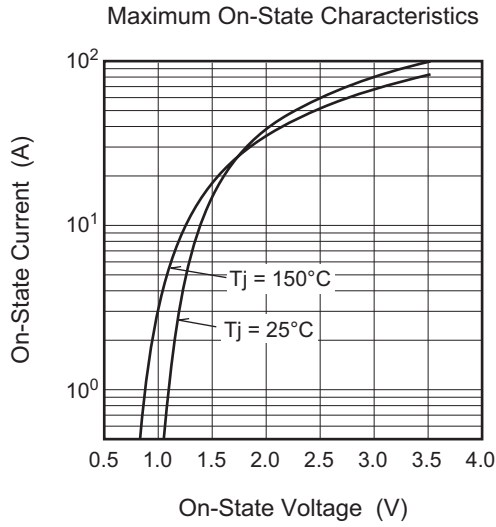
Notes: 2. Measurement using the gate trigger characteristics measurement circuit.

3. The contact thermal resistance R<sub>th(c-f)</sub> in case of greasing is 0.5°C/W.

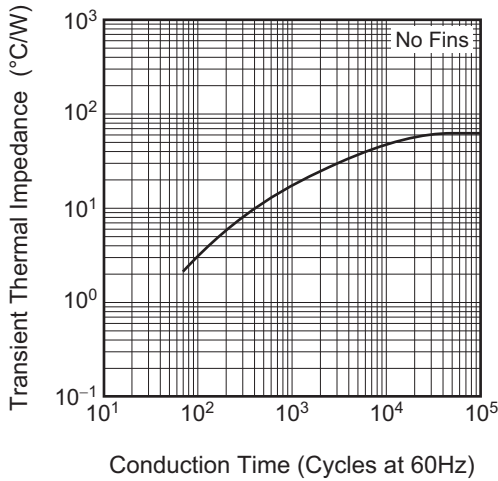
4. Test conditions of the critical-rate of decay of on-state commutation current are shown in the table below.

Test conditions	Commutating voltage and current waveforms (inductive load)
1. Junction temperature T <sub>j</sub> = 125°C 2. Peak off-state voltage V <sub>D</sub> = 400 V 2. Rate of rise of off-state commutating voltage (dv/dt) <sub>c</sub> < 100 V/μs	

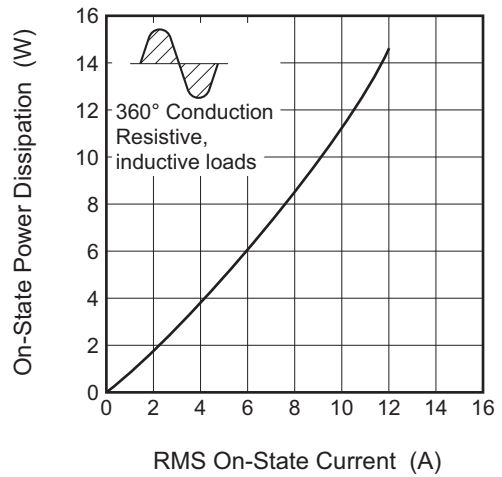
Performance Curves



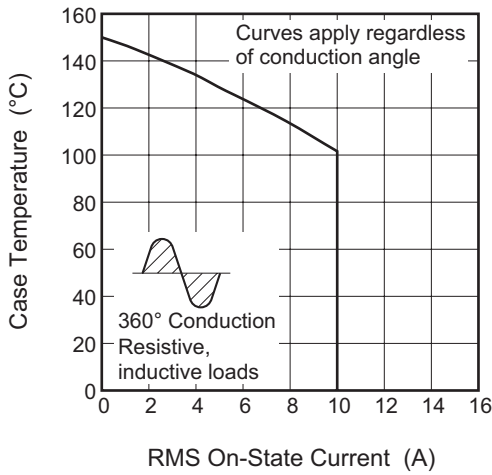
Maximum Transient Thermal Impedance Characteristics (Junction to ambient)



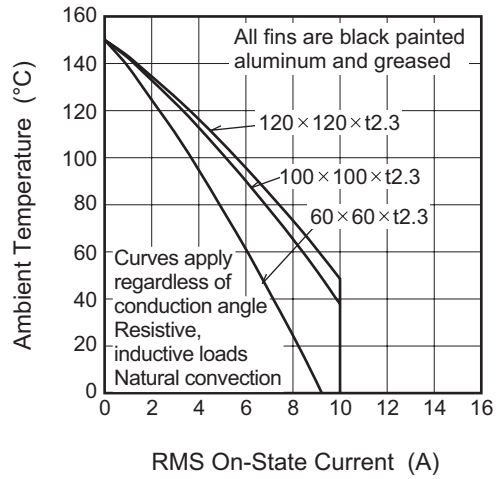
Maximum On-State Power Dissipation



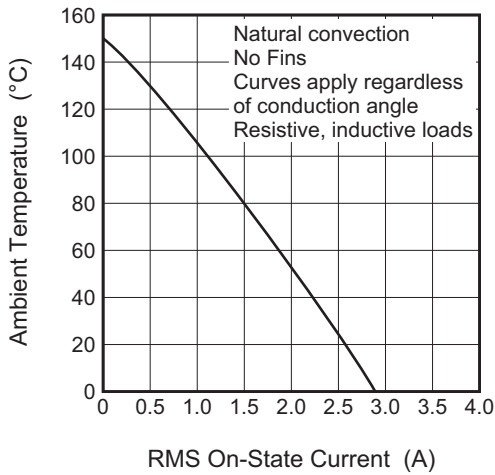
Allowable Case Temperature vs. RMS On-State Current



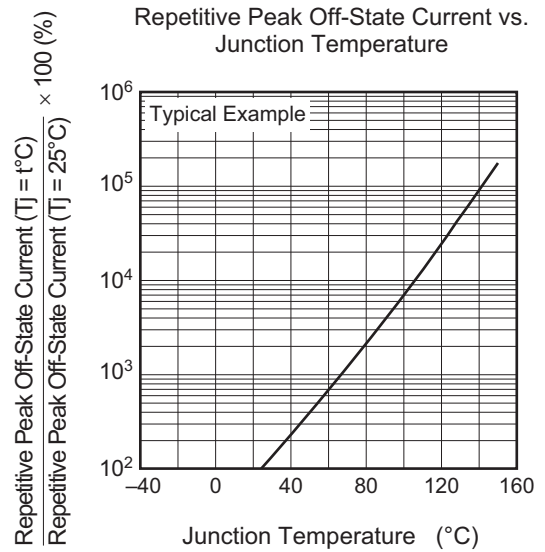
Allowable Ambient Temperature vs. RMS On-State Current



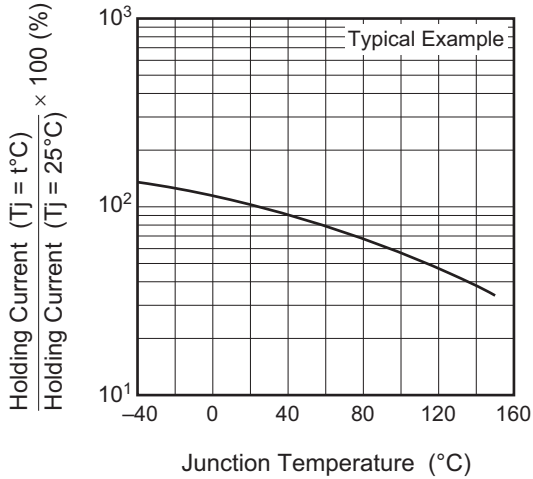
Allowable Ambient Temperature vs. RMS On-State Current



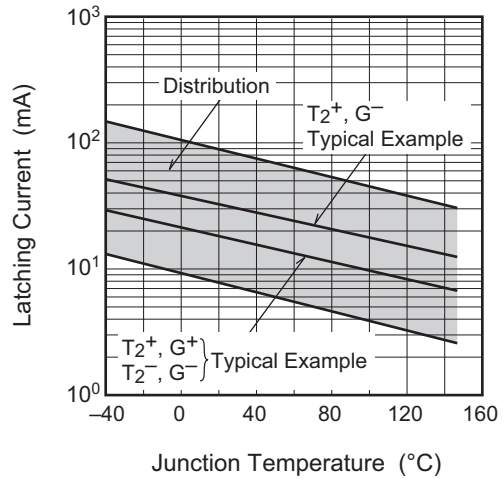
Repetitive Peak Off-State Current vs. Junction Temperature



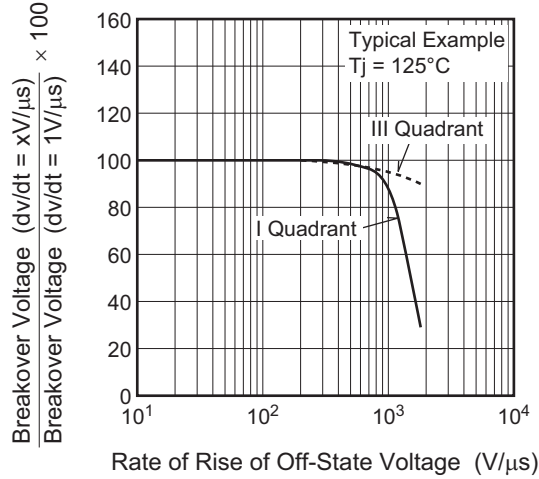
Holding Current vs. Junction Temperature



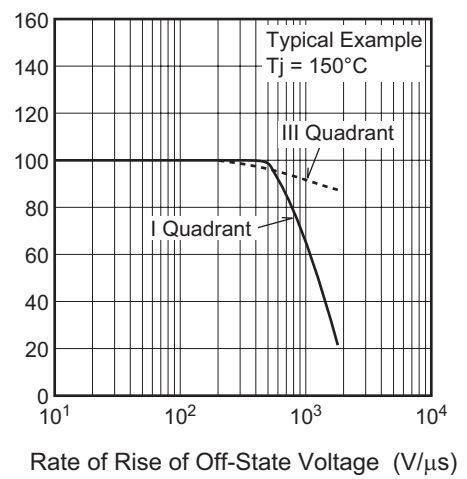
Latching Current vs. Junction Temperature



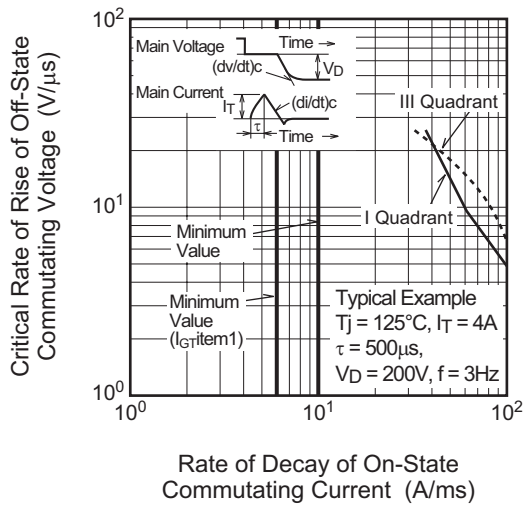
Breakover Voltage vs. Rate of Rise of Off-State Voltage (Tj=125°C)



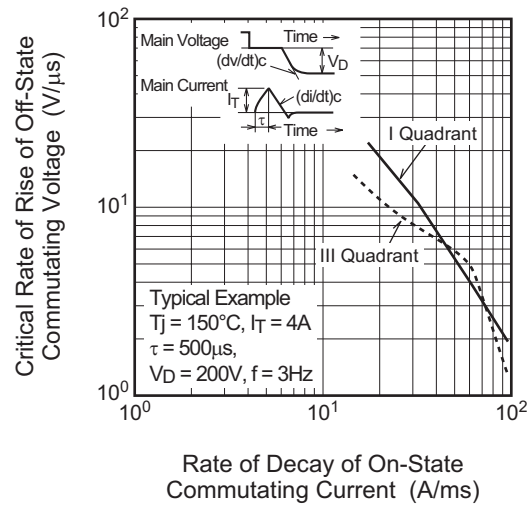
Breakover Voltage vs. Rate of Rise of Off-State Voltage (Tj=150°C)



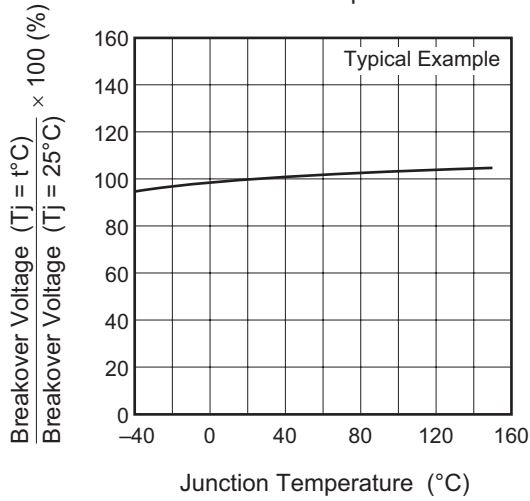
Commutation Characteristics (Tj=125°C)



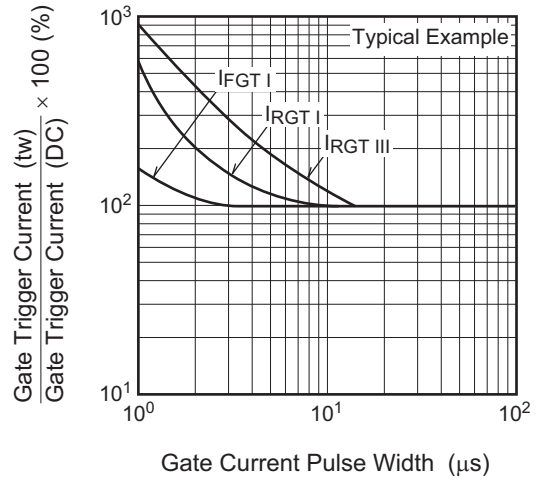
Commutation Characteristics (Tj=150°C)



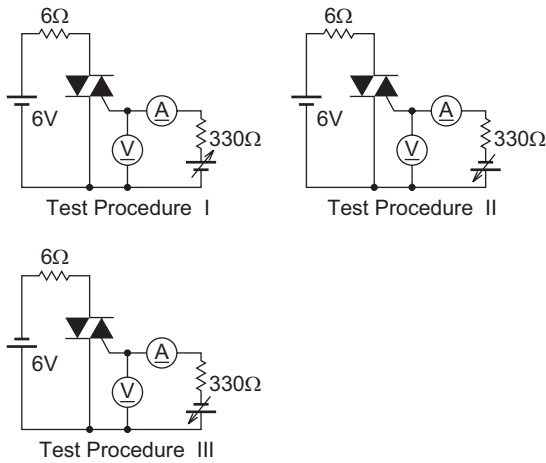
Breakover Voltage vs. Junction Temperature



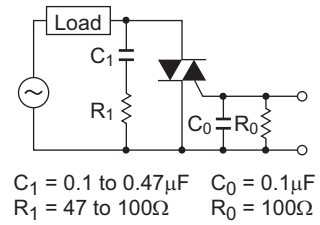
Gate Trigger Current vs. Gate Current Pulse Width



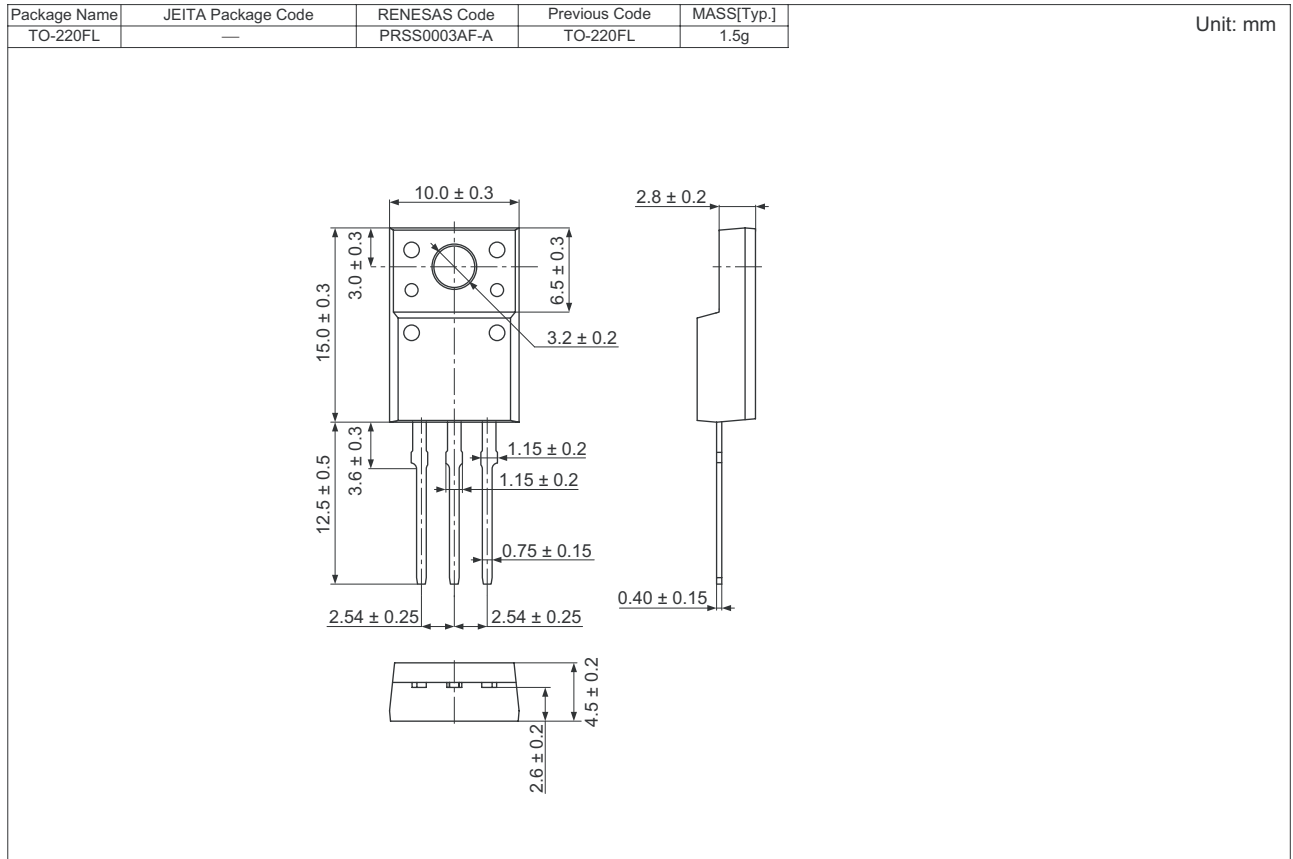
Gate Trigger Characteristics Test Circuits



Recommended Circuit Values Around The Triac



Package Dimension



Ordering Information

Orderable Part Number	Packing	Quantity	Remark
BCR10LM-16LH#B00	Tube	50 pcs.	Straight type
BCR10LM-16LH-1#B00	Tube	50 pcs.	Straight type, I <sub>GT</sub> item:1
BCR10LM-16LH-A8#B00	Tube	50 pcs.	A8 Lead form
BCR10LM-16LH-1A8#B00	Tube	50 pcs.	A8 Lead form, I <sub>GT</sub> item:1

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

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