BCR12FM-14LB

700V - 12A - Triac

Medium Power Use

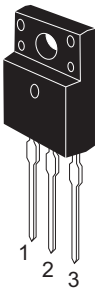
R07DS1064EJ0200
Rev.2.00
Aug 29, 2014

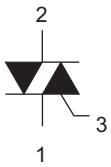
Features

- $I_{T\ (RMS)}$: 12 A
- V_{DRM} : 800 V (Tj =125 °C)
- Tj: 150 °C
- I_{FGTI}, I_{RGTI}, $I_{RGT\ III}$:30 mA
- Insulated Type
- Planar Passivation Type
- V_{iso} : 2000V

Outline

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





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

Applications

Washing machine, inversion operation of capacitor motor, and other general controlling devices

Maximum Ratings

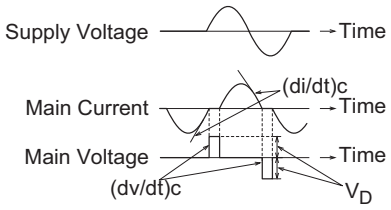
Parameter	Symbol	Voltage class	Unit	Conditions
		14		
Repetitive peak off-state voltage[Note1]	V_{DRM}	800	V	Tj=125°C
		700		Tj=150°C
Non-repetitive peak off-state voltage[Note1]	V_{DSM}	840	V	

Parameter	Symbol	Ratings	Unit	Conditions
RMS on-state current	$I_{T\ (RMS)}$	12	A	Commercial frequency, sine full wave 360°conduction, Tc = { 102°C (#BB0, See Ordering Info.) / 93°C (#FA0, See Ordering Info.)
Surge on-state current	I_{TSM}	120	A	50Hz sinewave 1 full cycle, peak value, non-repetitive
I^2t for fusion	I^2t	60	A^2s	Value corresponding to 1 cycle of half wave 50Hz, 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	
Mass	—	1.9	g	Typical value
Isolation voltage [Note5]	V_{iso}	2000	V	Ta = 25°C, AC 1 minute, T_1 • T_2 • G terminal to case

Electrical Characteristics

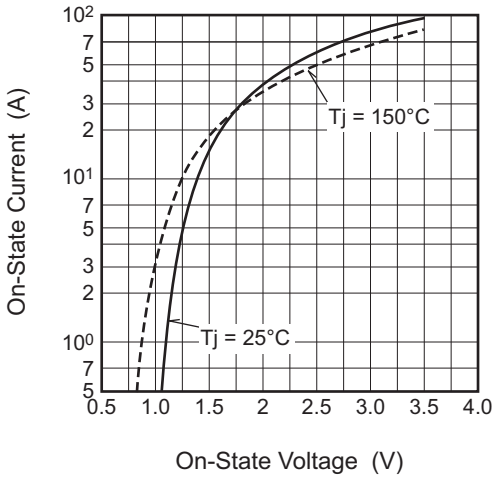
Parameter		Symbol	Min.	Typ.	Max.	Unit	Test conditions
Repetitive peak off-state current		I_{DRM}	—	—	2.0	mA	Tj = 150°C, V_{DRM} applied
On-state voltage		V_{TM}	—	—	1.6	V	Tc = 25°C, I_{TM} = 20 A, instantaneous measurement
Gate trigger voltage[Note2]	I	V_{FGT_I}	—	—	1.5	V	Tj = 25°C, V_D = 6 V, R_L = 6 Ω, R_G = 330 Ω
	II	V_{RGT_I}	—	—	1.5	V	
	III	$V_{RGT_{III}}$	—	—	1.5	V	
Gate trigger curent[Note2]	I	I_{FGT_I}	—	—	30	mA	Tj = 25°C, V_D = 6 V, R_L = 6 Ω, R_G = 330 Ω
	II	I_{RGT_I}	—	—	30	mA	
	III	$I_{RGT_{III}}$	—	—	30	mA	
Gate non-trigger voltage		V_{GD}	0.2	—	—	V	Tj = 125°C, V_D = 1/2 V_{DRM}
			0.1	—	—	V	Tj = 150°C, V_D = 1/2 V_{DRM}
Thermal resistance		$R_{th\ (j-c)}$	—	—	3.3	°C/W	Junction to case[Note3] #BB0 (See Ordering Info.)
			—	—	4.0	°C/W	Junction to case[Note3] #FA0 (See Ordering Info.)
Critical-rate of rise of off-state commutation voltage[Note4]		(dv/dt)c	10	—	—	V/µs	Tj = 125°C
			1	—	—	V/µs	Tj = 150°C

Notes: 1. Gate open.
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. Make sure that your finished product containing this device meets your safe isolation requirements.
For safety, it's advisable that heatsink is electrically floating.

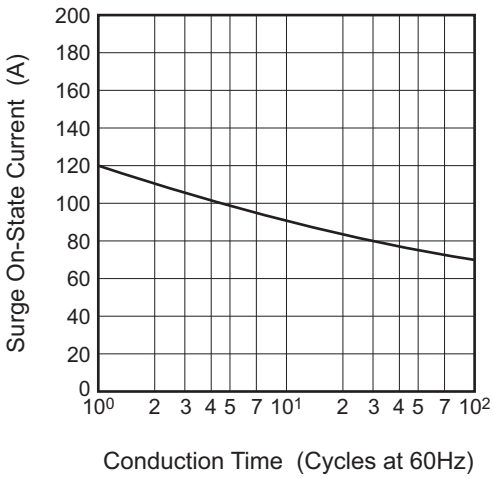
Test conditions	Commutating voltage and current waveforms (inductive load)
1. Junction temperature Tj = 125°C/150°C 2. Rate of decay of on-state commutating current (di/dt)c = –6.0 A/ms 3. Peak off-state voltage V_D = 400 V	

Performance Curves

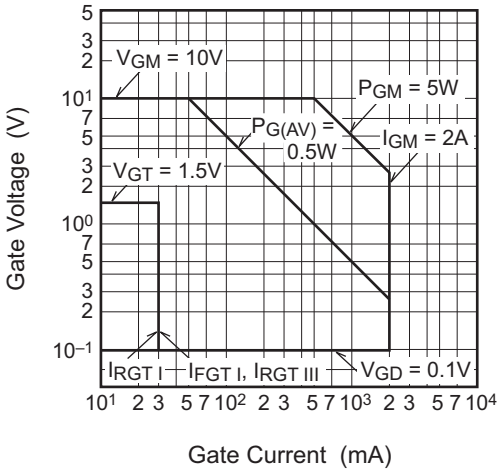
Maximum On-State Characteristics



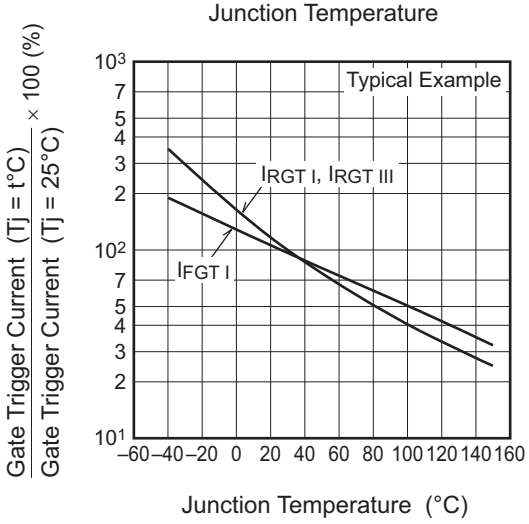
Rated Surge On-State Current



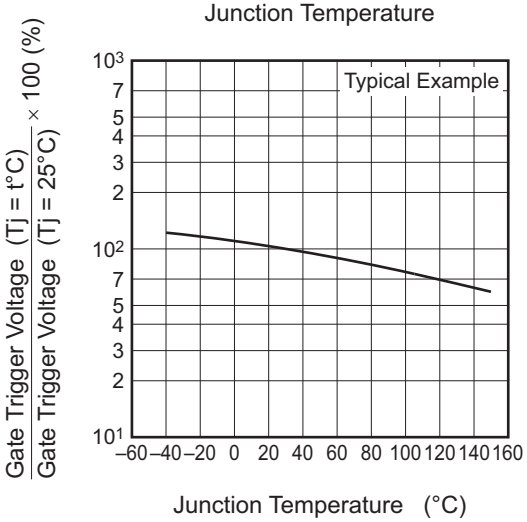
Gate Characteristics (I, II and III)



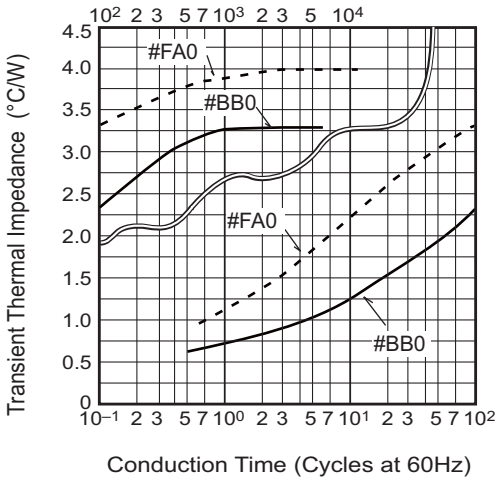
Gate Trigger Current vs. Junction Temperature



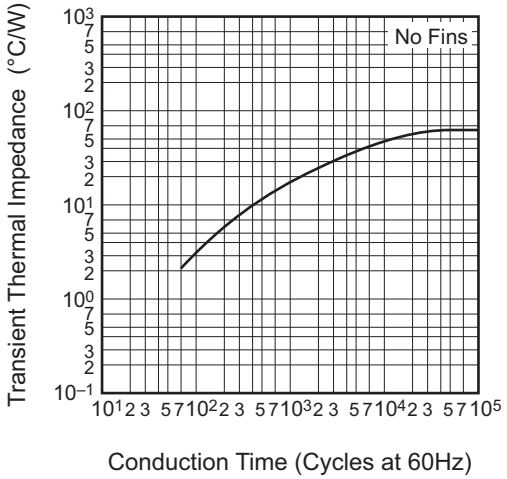
Gate Trigger Voltage vs. Junction Temperature



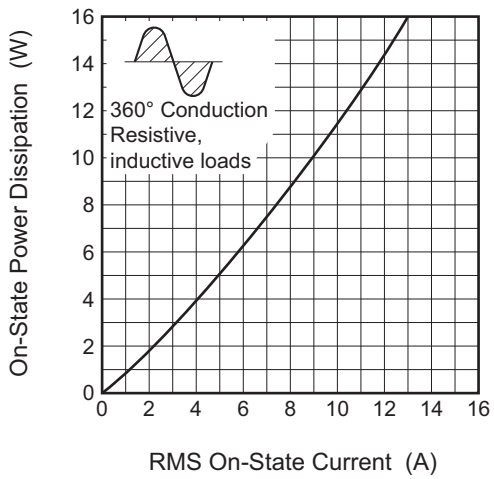
Maximum Transient Thermal Impedance Characteristics (Junction to case)



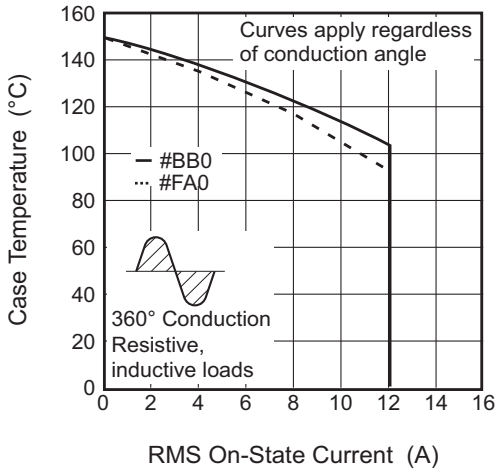
Maximum Transient Thermal Impedance Characteristics (Junction to ambient)



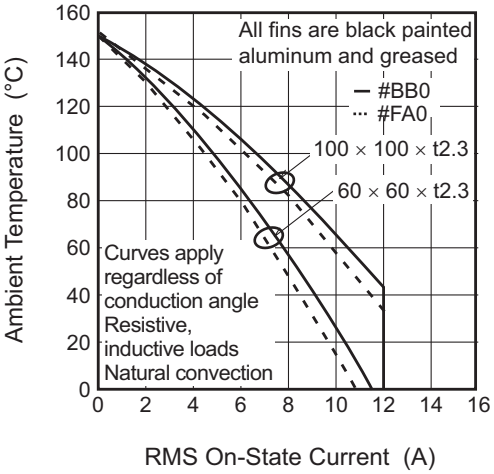
Maximum On-State Power Dissipation



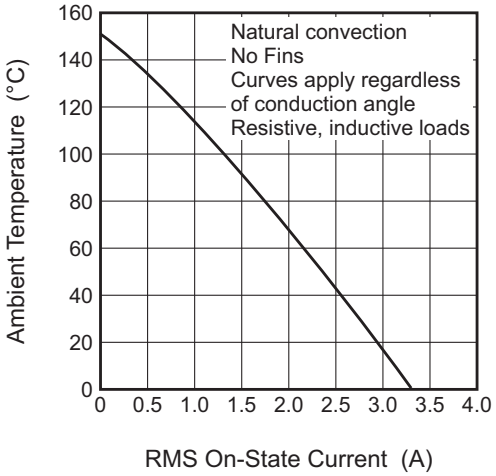
Allowable Case Temperature vs. RMS On-State Current



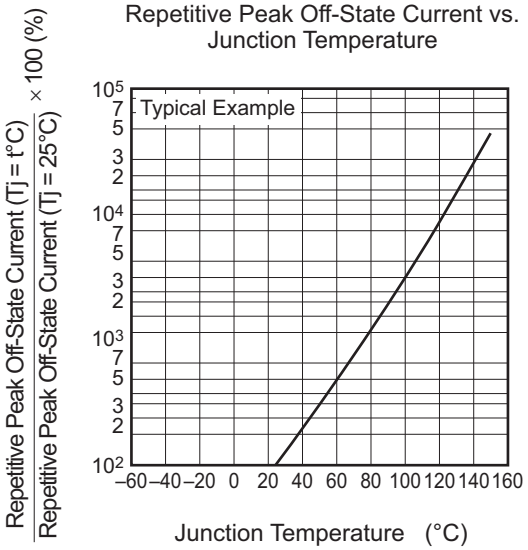
Allowable Ambient Temperature vs. RMS On-State Current



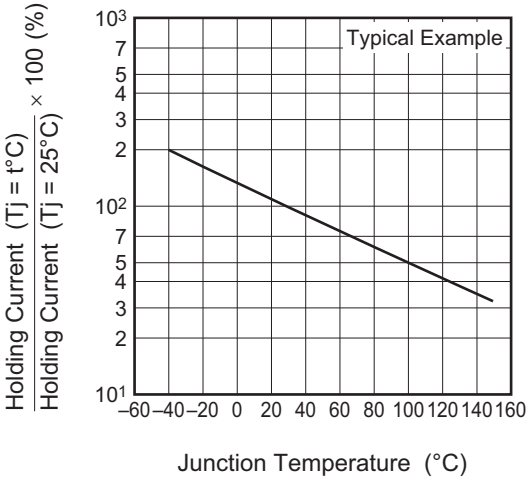
Allowable Ambient Temperature vs. RMS On-State Current



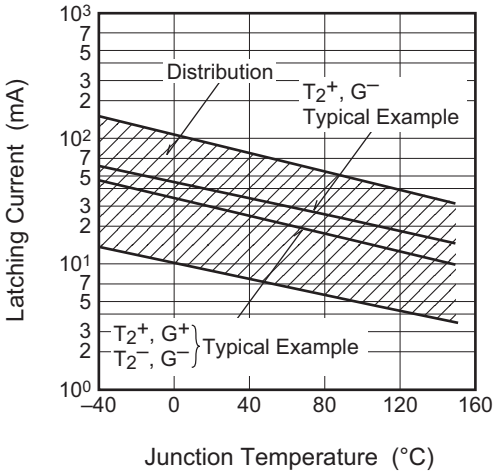
Repetitive Peak Off-State Current vs. Junction Temperature



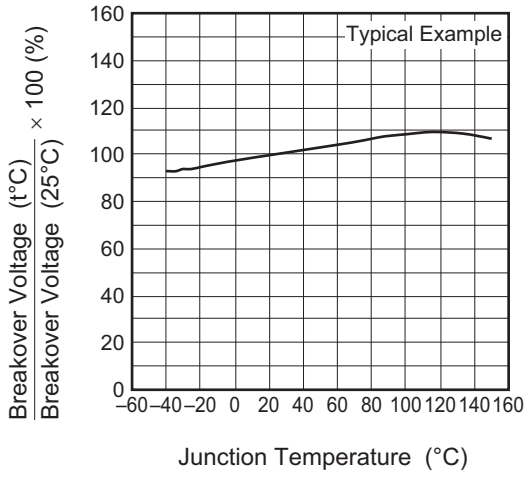
Holding Current vs.
Junction Temperature



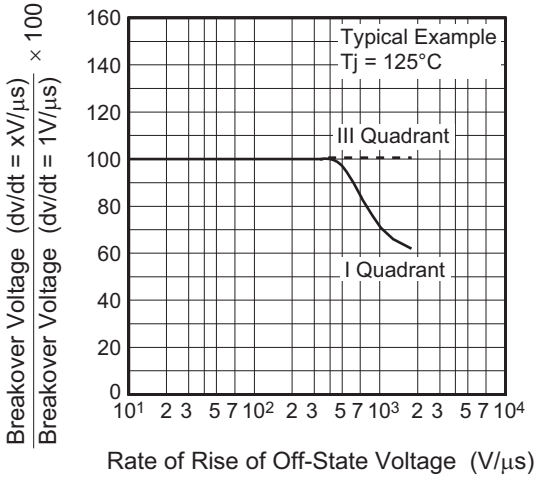
Latching Current vs.
Junction Temperature



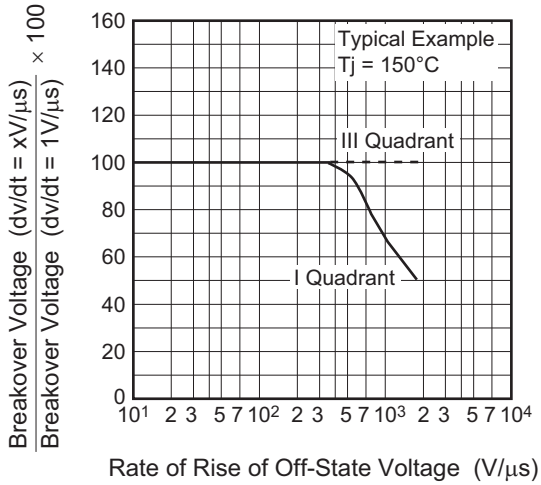
Breakover Voltage vs.
Junction Temperature



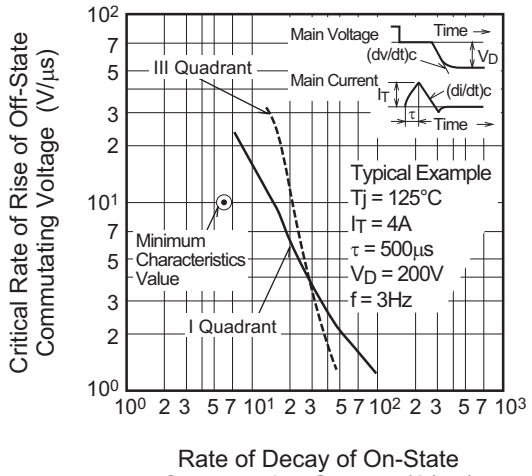
Breakover Voltage vs.
Rate of Rise of Off-State Voltage (Tj=125°C)



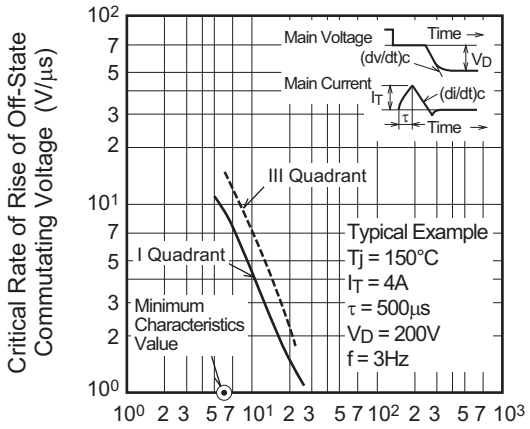
Breakover Voltage vs.
Rate of Rise of Off-State Voltage (Tj=150°C)



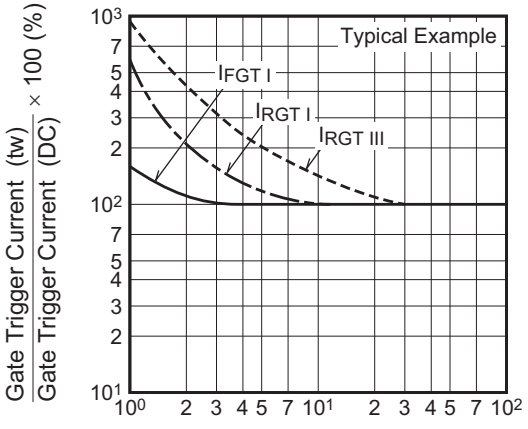
Commutation Characteristics (Tj=125°C)



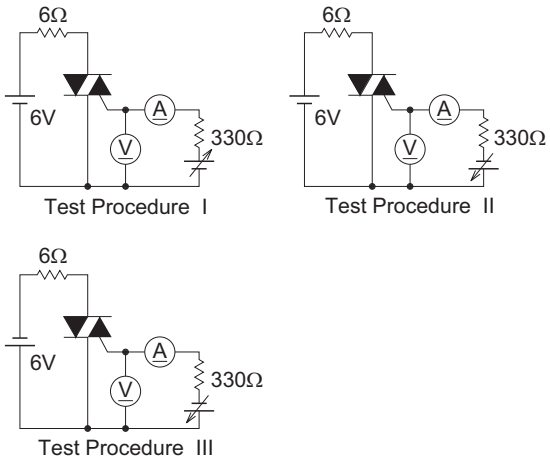
Commutation Characteristics (Tj=150°C)



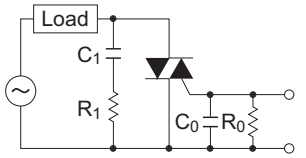
Gate Trigger Current vs. Gate Current Pulse Width



Gate Trigger Characteristics Test Circuits



Recommended Circuit Values Around The Triac

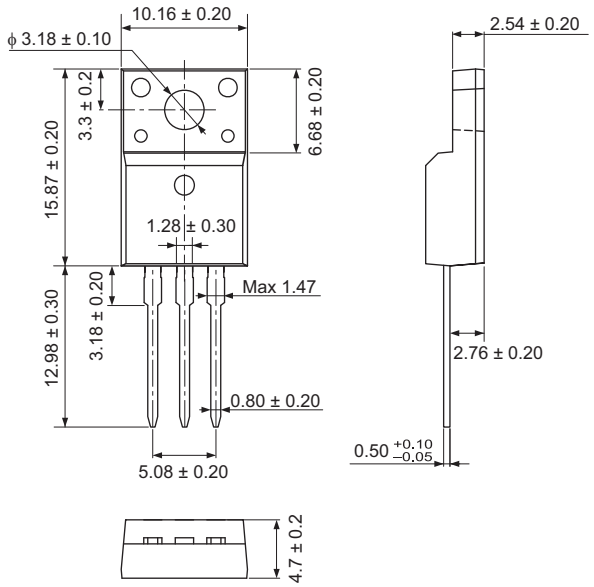


C_1 = 0.1 to 0.47µF C_0 = 0.1µF
R_1 = 47 to 100Ω R_0 = 100Ω

Package Dimensions

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

Unit: mm



Ordering Information

Orderable Part Number	Packing	Quantity	Remark	Quality Grade Note9
BCR12FM-14LB#BB0	Tube Note7	50 pcs.	Straight type	General Industrial & General Consumer Use
BCR12FM-14LB-1#BB0	Tube Note7	50 pcs.	Straight type, I_{GT} item:1	
BCR12FM-14LB□□#BB0	Tube Note7	50 pcs.	□□:Lead forming type	
BCR12FM14LB1□□#BB0	Tube Note7	50 pcs.	□□:Lead forming type, I_{GT} item:1	
BCR12FM-14LB#FA0	Tube Note7	50 pcs.	Straight type	Special Consumer Use Note8
BCR12FM-14LB-1#FA0	Tube Note7	50 pcs.	Straight type, I_{GT} item:1	
BCR12FM-14LB□□#FA0	Tube Note7	50 pcs.	□□:Lead forming type	
BCR12FM14LB1□□#FA0	Tube Note7	50 pcs.	□□:Lead forming type, I_{GT} item:1	

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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