BCR12FM-12LB

600V - 12A - Triac

Medium Power Use

Features

- $I_{T\,(RMS)}$: 12 A
- V_{DRM} : 600 V
- Tj: 150 °C
- I_{FGTI}, I_{RGTI}, $I_{RGT\,III}$: 30 mA(20mA) Note5
- Insulated Type
- Planar Passivation Type
- Viso: 2000V

Outline

•ed
for New Design

Application

Motor control, Heater control, Power supply, Solid state relay, and other general purpose AC 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

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, #BH0) Note2
				Tc = 93°C (#BG0) Note2

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^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

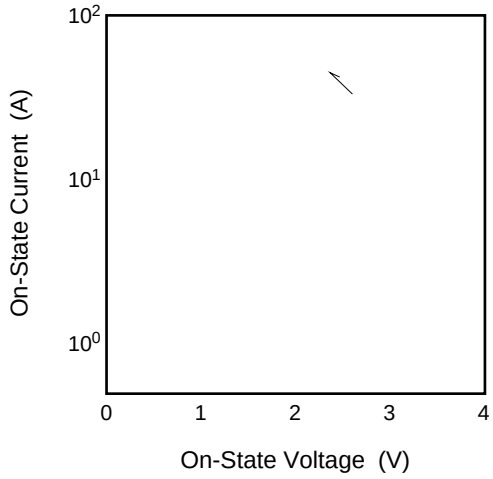
Parameter		Symbol	Min.	Typ.	Max.	Unit	Test conditions
Repetitive peak off-state current		I_{DRM}	—	—	2.0	mA	Tj = 150°C, V_{DRM} applied
On-state voltage		V_{TM}	—	—	1.6	V	Tc = 25°C, I_{TM} = 20 A, instantaneous measurement
Gate trigger voltage Note3	I	V_{FGTI}	—	—	1.5	V	Tj = 25°C, V_D = 6 V, R_L = 6 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		$R_{th\ (j-c)}$	—	—	3.3	°C/W	Junction to case Note4 (#BB0, #BH0) Note2
			—	—	4.0	°C/W	Junction to case Note4 (#BG0) 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.

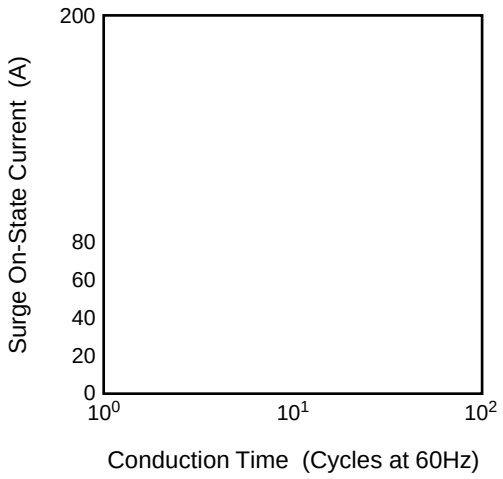
Test conditions	Commutating voltage and current waveforms (inductive load)
1. Junction temperature Tj = 125°C/150°C 2. Rate of decay of on-state commutating current (di/dt)c = – 6.0 A/ms 3. Peak off-state voltage V_D = 400 V	

Performance Curves

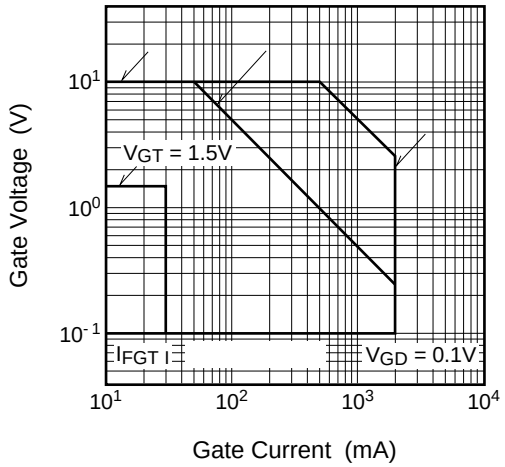
Maximum On-State Characteristics



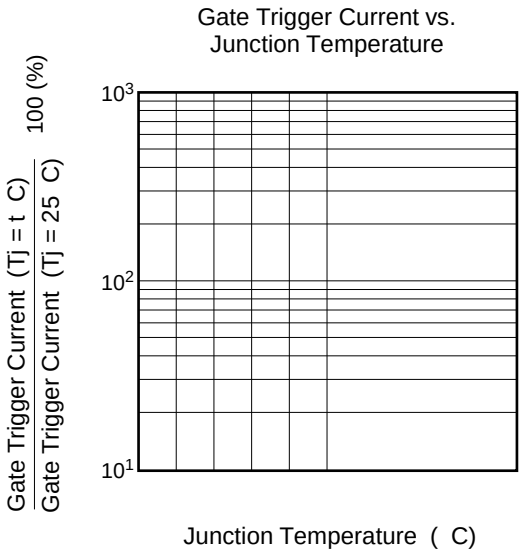
Rated Surge On-State Current



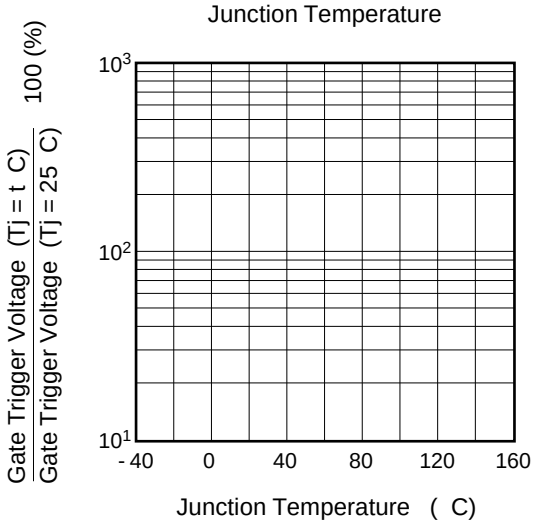
Gate Characteristics (I, II and III)



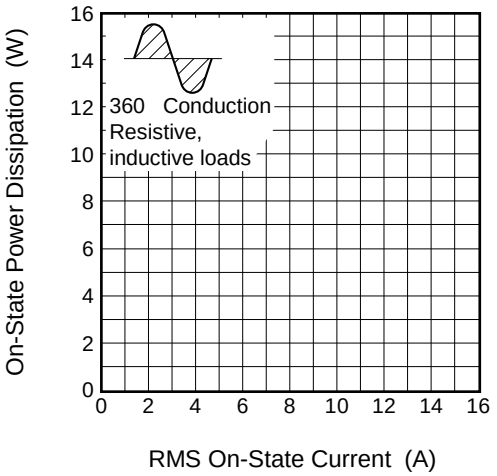
Gate Trigger Current vs. Junction Temperature



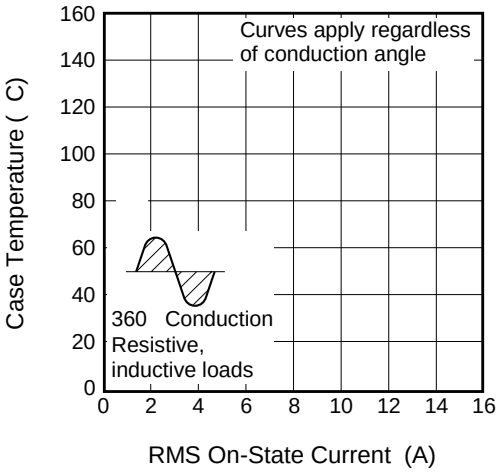
Gate Trigger Voltage vs. Junction Temperature



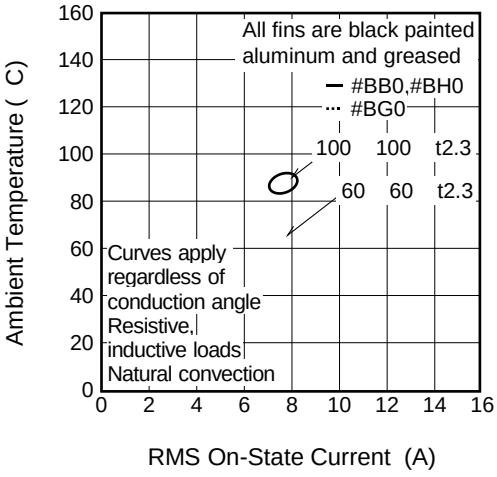
Maximum On-State Power Dissipation



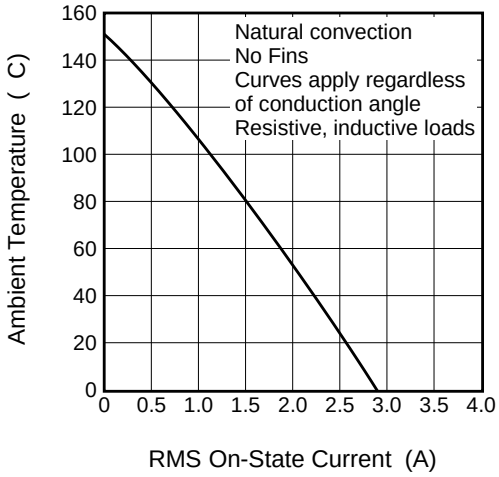
Allowable Case Temperature vs.
RMS On-State Current



Allowable Ambient Temperature vs.
RMS On-State Current



Allowable Ambient Temperature vs.
RMS On-State Current

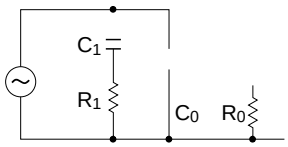


Gate Trigger Characteristics Test Circuits

330Ω

330Ω

330Ω



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

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(Rev.3.0-1 November 2016)

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