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April 1st, 2010
Renesas Electronics Corporation

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BCR5AM-12LB

Triac

Medium Power Use

(The product guaranteed maximum junction temperature of 150°C)

REJ03G0452-0300

Rev.3.00

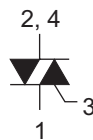
Nov 30, 2007

Features

- $I_{T(RMS)}$: 5 A
- V_{DRM} : 600 V
- $I_{FGT\ I}, I_{RGT\ I}, I_{RGT\ III}$: 20 mA (10 mA)^{Note6}
- Non-Insulated Type
- Planar Passivation Type

Outline

RENESAS Package code: PRSS0004AA-A
(Package name: TO-220)



1. T₁ Terminal
2. T₂ Terminal
3. Gate Terminal
4. T₂ Terminal

Applications

Switching mode power supply, light dimmer, electronic flasher unit, control of household equipment such as TV sets, stereo systems, refrigerator, washing machine, infrared kotatsu, carpet, solenoid driver, small motor control, copying machine, electric tool, electric heater control, and other general purpose control applications

Warning

1. Refer to the recommended circuit values around the triac before using.
2. Be sure to exchange the specification before using. Otherwise, general triacs with the maximum junction temperature of 125°C will be supplied.

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

BCR5AM-12LB (The product guaranteed maximum junction temperature of 150°C)

Parameter	Symbol	Ratings	Unit	Conditions
RMS on-state current	$I_{T(RMS)}$	5	A	Commercial frequency, sine full wave 360° conduction, $T_c = 128^{\circ}\text{C}$ ^{Note3}
Surge on-state current	I_{TSM}	50	A	60Hz sinewave 1 full cycle, peak value, non-repetitive
I^2t for fusing	I^2t	10.4	A^2s	Value corresponding to 1 cycle of half wave 60Hz, surge on-state current
Peak gate power dissipation	P_{GM}	3	W	
Average gate power dissipation	$P_{G(AV)}$	0.3	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	—	2.0	g	Typical value

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}	—	—	1.8	V	$T_c = 25^{\circ}\text{C}$, $I_{TM} = 7\text{ A}$, Instantaneous measurement
Gate trigger voltage ^{Note2}	I $V_{FGT\ I}$	—	—	1.5	V	$T_j = 25^{\circ}\text{C}$, $V_D = 6\text{ V}$, $R_L = 6\ \Omega$, $R_G = 330\ \Omega$
	II $V_{RGT\ I}$	—	—	1.5	V	
	III $V_{RGT\ III}$	—	—	1.5	V	
Gate trigger current ^{Note2}	I $I_{FGT\ I}$	—	—	20 ^{Note6}	mA	$T_j = 25^{\circ}\text{C}$, $V_D = 6\text{ V}$, $R_L = 6\ \Omega$, $R_G = 330\ \Omega$
	II $I_{RGT\ I}$	—	—	20 ^{Note6}	mA	
	III $I_{RGT\ III}$	—	—	20 ^{Note6}	mA	
Gate non-trigger voltage	V_{GD}	0.2/0.1	—	—	V	$T_j = 125^{\circ}\text{C}/150^{\circ}\text{C}$, $V_D = 1/2\ V_{DRM}$
Thermal resistance	$R_{th(j-c)}$	—	—	3.0	$^{\circ}\text{C}/\text{W}$	Junction to case ^{Note3 Note4}
Critical-rate of rise of off-state commutating voltage ^{Note5}	$(dv/dt)_c$	5/1	—	—	$\text{V}/\mu\text{s}$	$T_j = 125^{\circ}\text{C}/150^{\circ}\text{C}$

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

3. Case temperature is measured at the T_2 tab 1.5 mm away from the molded case.

4. The contact thermal resistance $R_{th(c-f)}$ in case of greasing is $1.0^{\circ}\text{C}/\text{W}$.

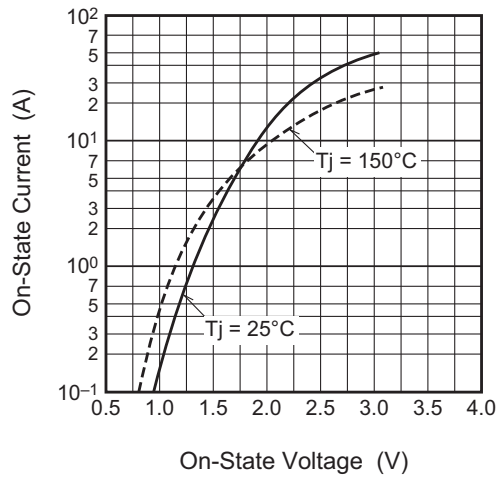
5. Test conditions of the critical-rate of rise of off-state commutating voltage is shown in the table below.

6. High sensitivity ($I_{GT} \leq 10\text{ mA}$) is also available. (I_{GT} item: 1)

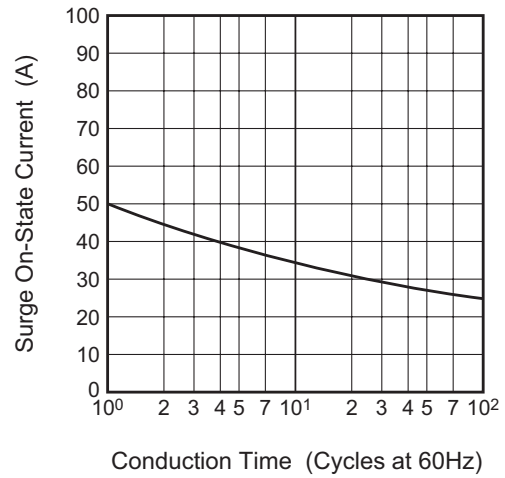
Test conditions	Commutating voltage and current waveforms (inductive load)
1. Junction temperature $T_j = 125^{\circ}\text{C}/150^{\circ}\text{C}$ 2. Rate of decay of on-state commutating current $(di/dt)_c = -2.5\text{ A/ms}$ 3. Peak off-state voltage $V_D = 400\text{ V}$	

Performance Curves

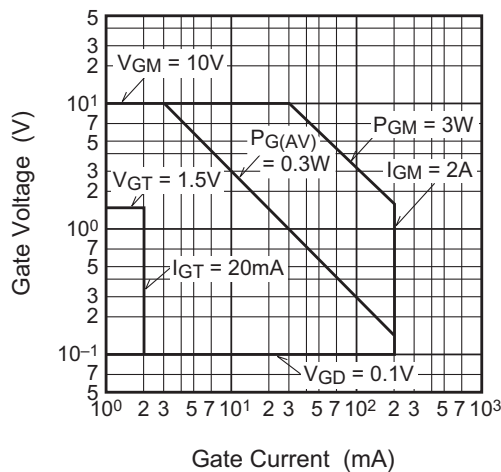
Maximum On-State Characteristics



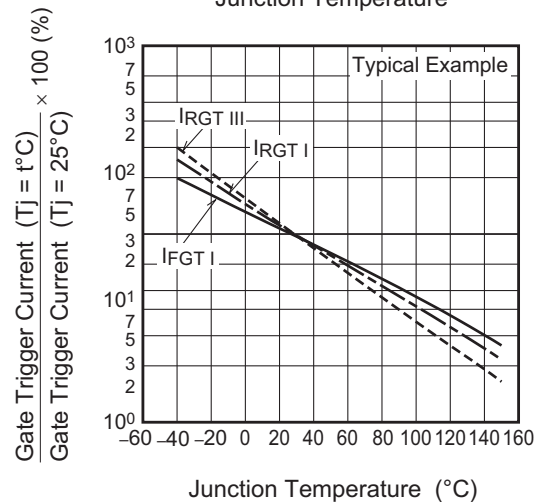
Rated Surge On-State Current



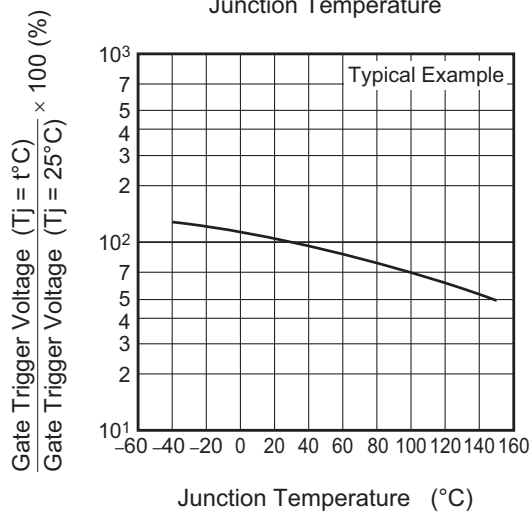
Gate Characteristics (I, II and III)



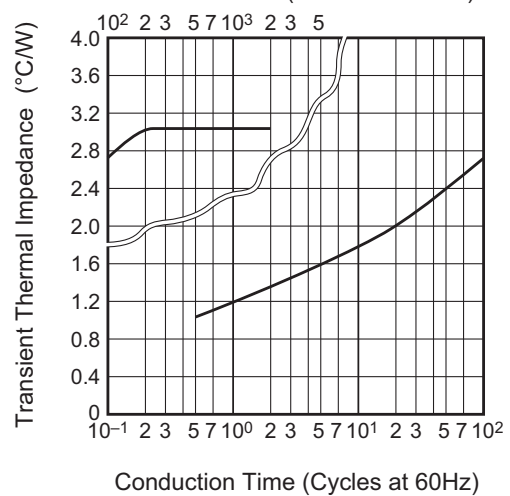
Gate Trigger Current vs. Junction Temperature

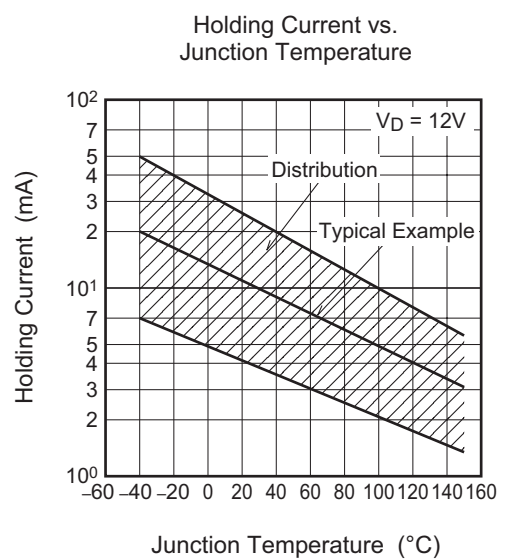
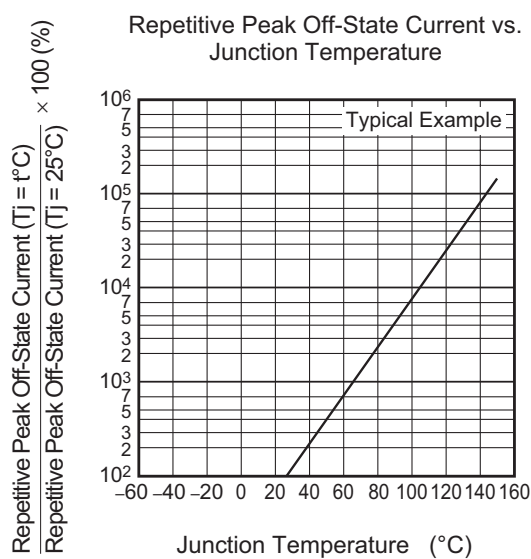
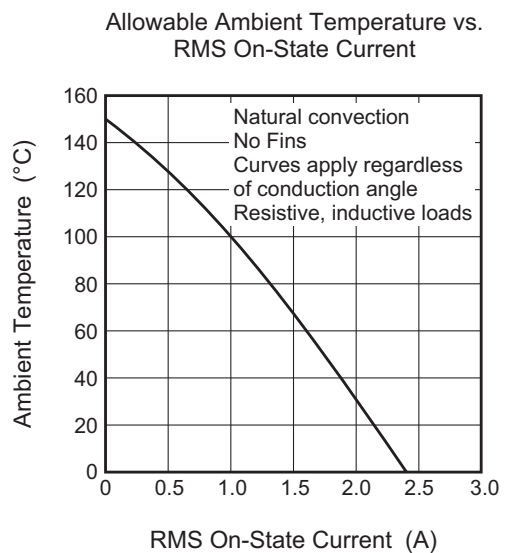
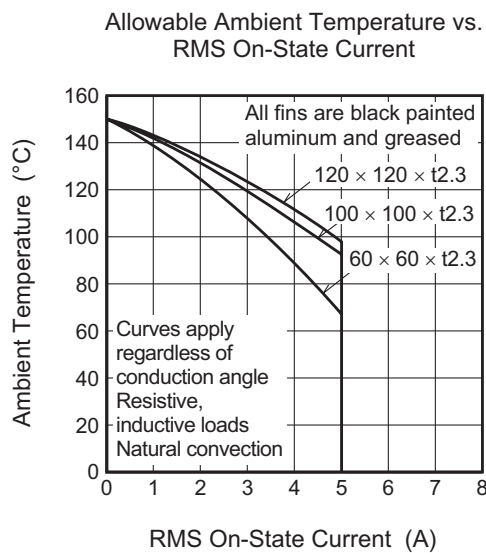
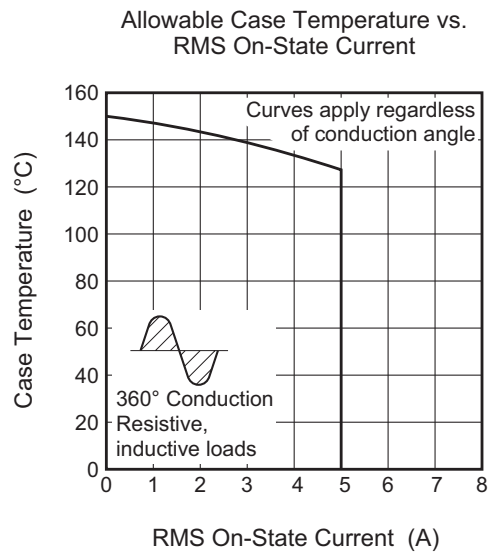
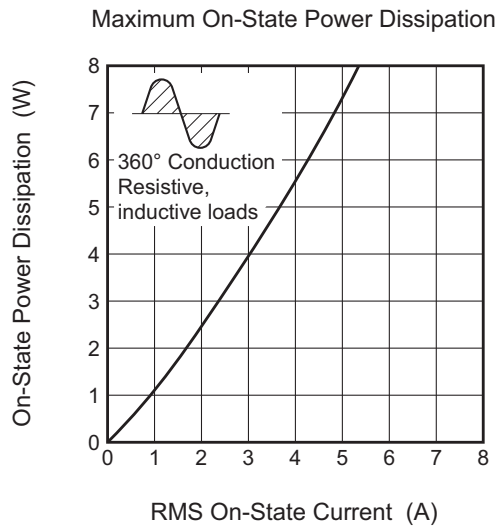


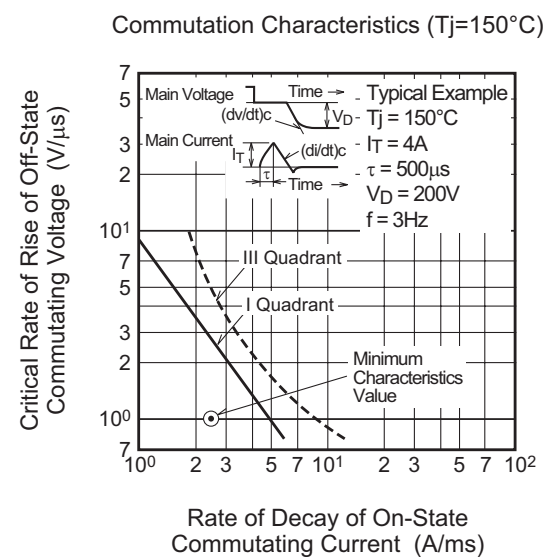
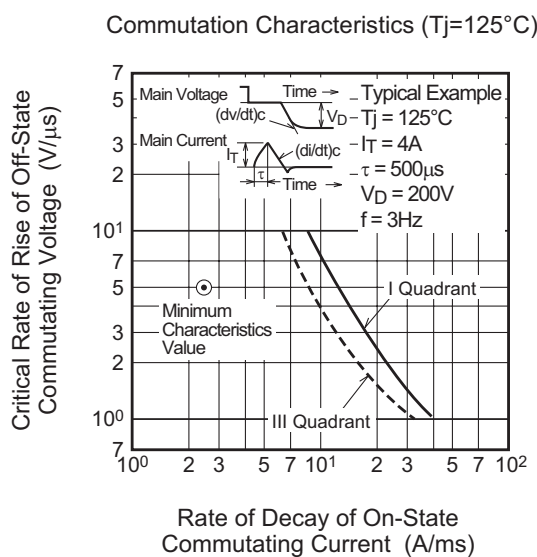
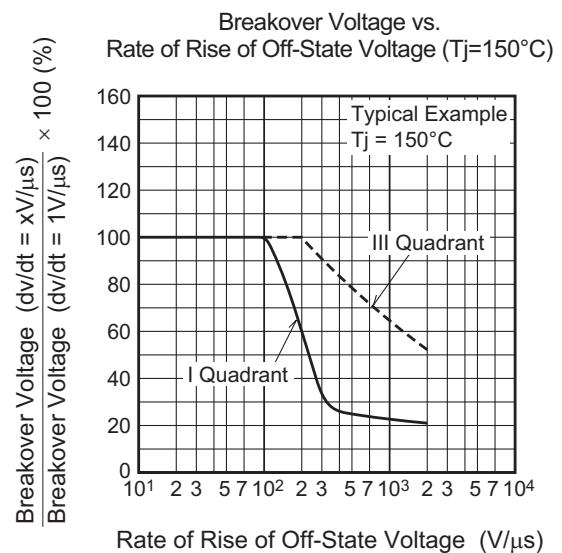
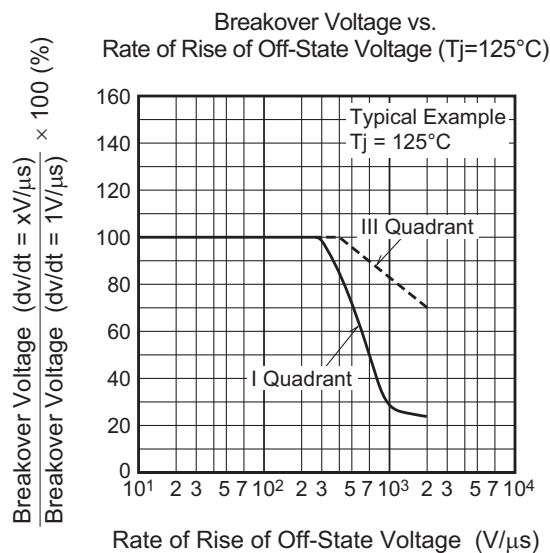
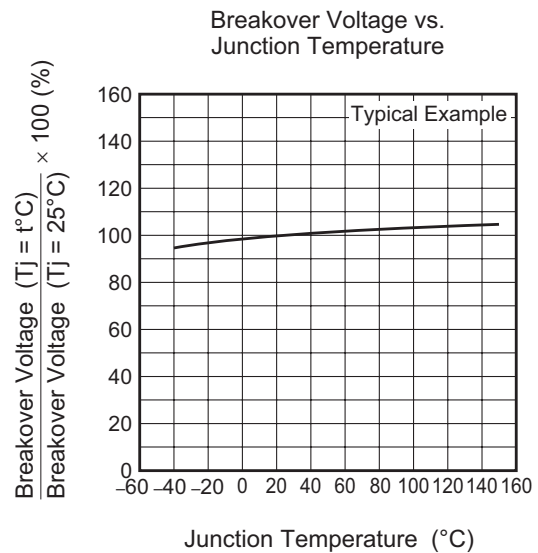
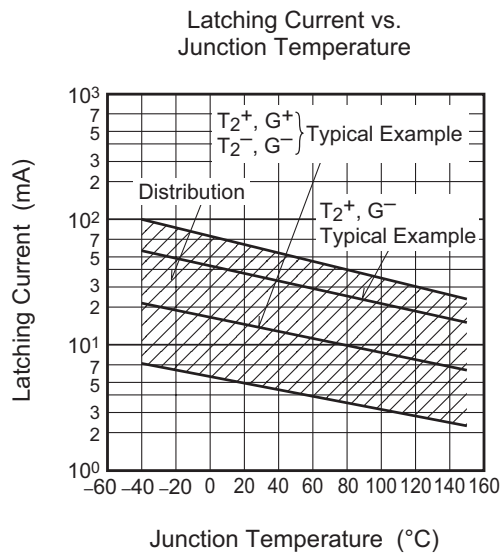
Gate Trigger Voltage vs. Junction Temperature

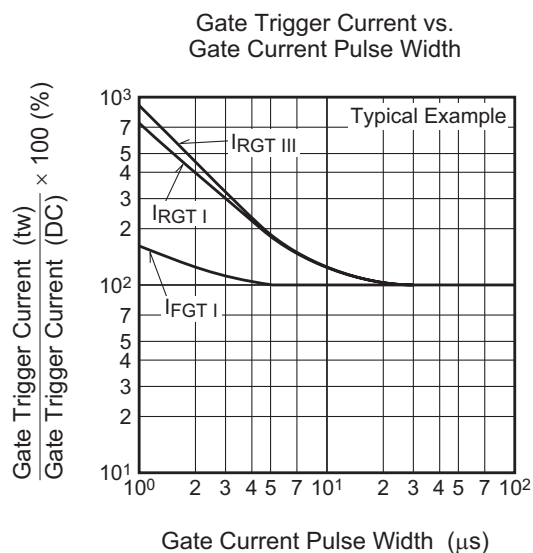


Maximum Transient Thermal Impedance Characteristics (Junction to case)

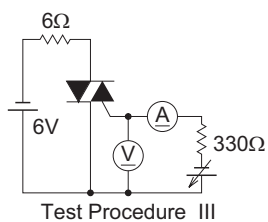
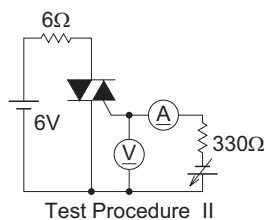
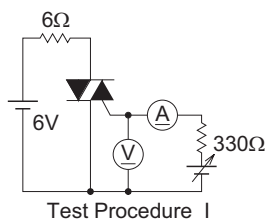




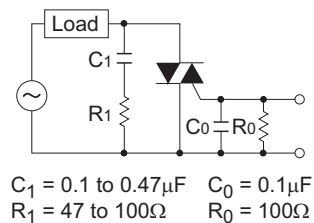




Gate Trigger Characteristics Test Circuits



Recommended Circuit Values Around The Triac



Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
TO-220	SC-46	PRSS0004AA-A	—	2.0g

Unit: mm

The technical drawing illustrates the dimensions of the BCR5AM-12LB TO-220 package. The top view shows a rectangular body with a width of 10.5Max mm and a height of 7.0 mm. A circular feature with a diameter of $\phi 3.6$ mm is located on the top surface. The side view shows a total height of 16Max mm, with a base height of 12.5Min mm. The base has a width of 2.54 mm and a thickness of 0.8 mm. The leads are 3.8Max mm long and 1.0 mm wide. The bottom view shows a width of 2.54 mm and a height of 4.5Max mm. The package is shown in a perspective view with a width of 4.5 mm and a height of 1.3 mm.

Order Code

Lead form	Standard packing	Quantity	Standard order code	Standard order code example
Straight type	Vinyl sack	100	Type name	BCR5AM-12LB
Lead form	Plastic Magazine (Tube)	50	Type name – Lead forming code	BCR5AM-12LB-A8

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

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