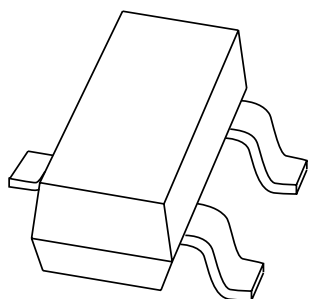


DATA SHEET



BAS29; BAS31; BAS35 General purpose controlled avalanche (double) diodes

Product specification
Supersedes data of 2001 Oct 10

2003 Mar 20

General purpose controlled avalanche
(double) diodes

BAS29; BAS31; BAS35

FEATURES

- Small plastic SMD package
- Switching speed: max. 50 ns
- General application
- Continuous reverse voltage: max. 90 V
- Repetitive peak reverse voltage: max. 110 V
- Repetitive peak forward current: max. 600 mA
- Repetitive peak reverse current: max. 600 mA.

APPLICATIONS

- General purpose switching in e.g. surface mounted circuits.

DESCRIPTION

General purpose switching diodes fabricated in planar technology, and encapsulated in small rectangular plastic SMD SOT23 packages. The BAS29 consists of a single diode. The BAS31 has two diodes in series. The BAS35 has two diodes with a common anode.

MARKING

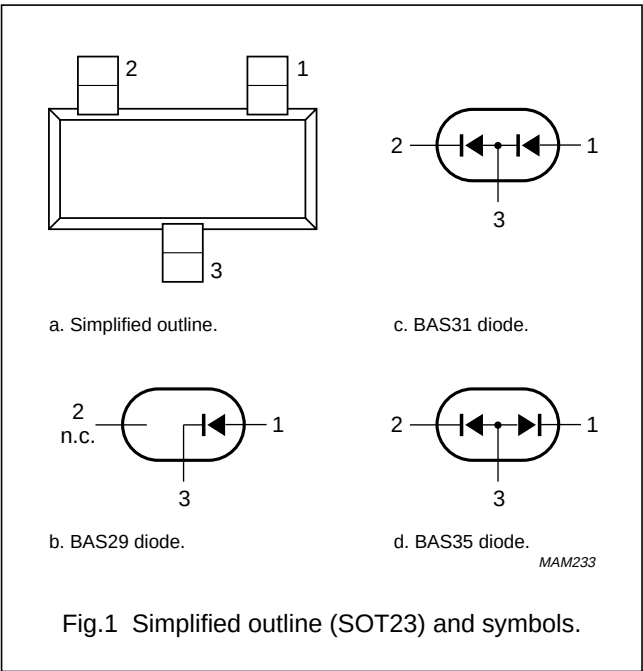
TYPE NUMBER	MARKING CODE ⁽¹⁾
BAS29	L20 or *A8
BAS31	L21 or *V1
BAS35	L22 or *V2

Note

1. * = p : Made in Hong Kong.
* = t : Made in Malaysia.
* = W : Made in China.

PINNING

PIN	DESCRIPTION		
	BAS29	BAS31	BAS35
1	anode	anode	cathode (k1)
2	not connected	cathode	cathode (k2)
3	cathode	common connection	common anode



General purpose controlled avalanche (double) diodes

BAS29; BAS31; BAS35

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_{RRM}	repetitive peak reverse voltage		–	110	V
V_R	continuous reverse voltage		–	90	V
I_F	continuous forward current	single diode loaded; see Fig.2; note 1	–	250	mA
		double diode loaded; see Fig.2; note 1	–	150	mA
I_{FRM}	repetitive peak forward current		–	600	mA
I_{FSM}	non-repetitive peak forward current	square wave; $T_j = 25\text{ °C}$ prior to surge; see Fig.4			
		$t = 1\text{ }\mu\text{s}$	–	10	A
		$t = 100\text{ }\mu\text{s}$	–	4	A
		$t = 1\text{ s}$	–	0.75	A
P_{tot}	total power dissipation	$T_{amb} = 25\text{ °C}$; note 1	–	250	mW
I_{RRM}	repetitive peak reverse current		–	600	mA
E_{RRM}	repetitive peak reverse energy	$t_p \geq 50\text{ }\mu\text{s}$; $f \leq 20\text{ Hz}$; $T_j = 25\text{ °C}$	–	5	mJ
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

General purpose controlled avalanche (double) diodes

BAS29; BAS31; BAS35

ELECTRICAL CHARACTERISTICS

$T_j = 25\text{ }^{\circ}\text{C}$ unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_F	forward voltage	see Fig.3 $I_F = 10\text{ mA}$ $I_F = 50\text{ mA}$ $I_F = 100\text{ mA}$ $I_F = 200\text{ mA}$ $I_F = 400\text{ mA}$	– – – – –	750 840 900 1 1.25	mV mV mV V V
I_R	reverse current	see Fig.5 $V_R = 90\text{ V}$ $V_R = 90\text{ V}; T_j = 150\text{ }^{\circ}\text{C}$	– –	100 100	nA μA
$V_{(BR)R}$	reverse avalanche breakdown voltage	$I_R = 1\text{ mA}$	120	170	V
C_d	diode capacitance	$f = 1\text{ MHz}; V_R = 0$; see Fig.6	–	35	pF
t_{rr}	reverse recovery time	when switched from $I_F = 30\text{ mA}$ to $I_R = 30\text{ mA}$; $R_L = 100\text{ }\Omega$; measured at $I_R = 3\text{ mA}$; see Fig.7	–	50	ns

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-tp}$	thermal resistance from junction to tie-point		360	K/W
$R_{th\ j-a}$	thermal resistance from junction to ambient	note 1	500	K/W

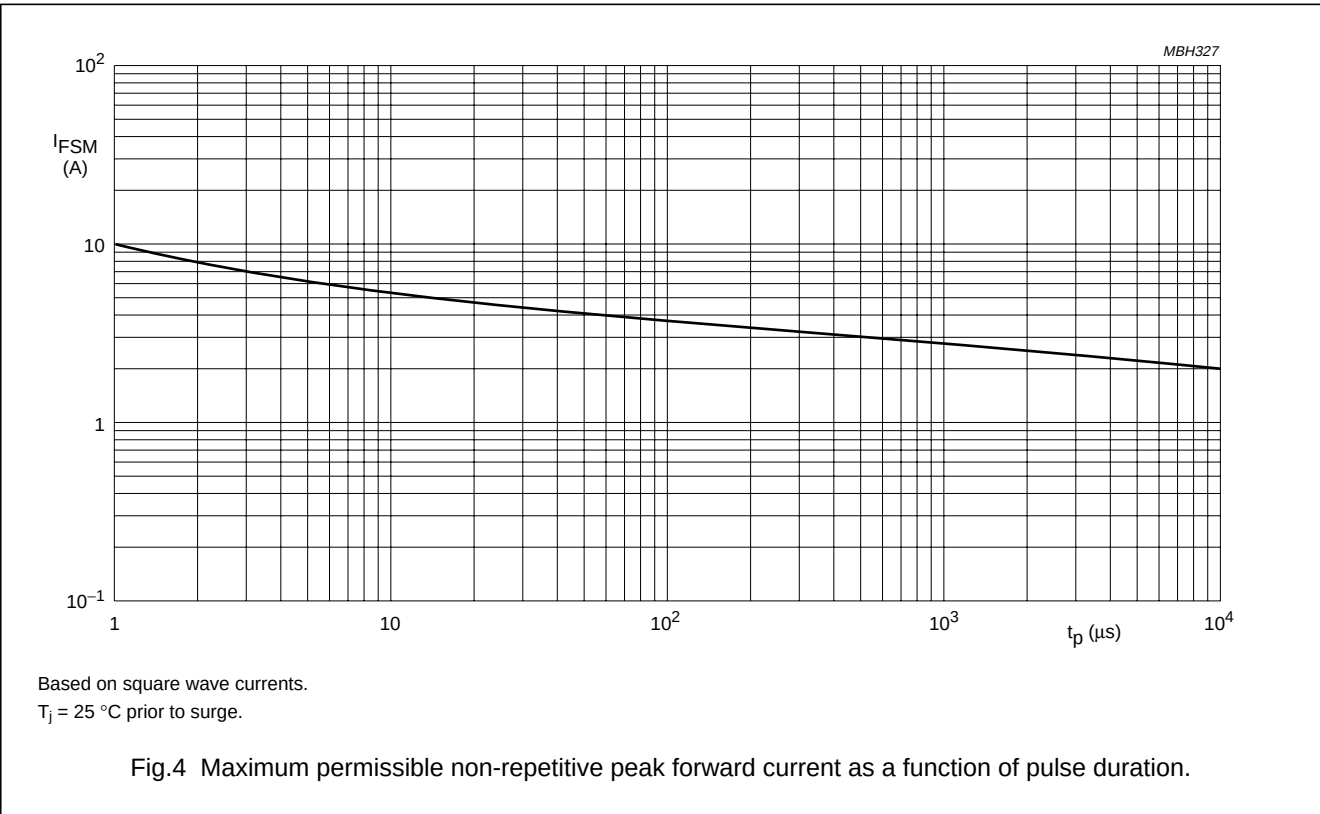
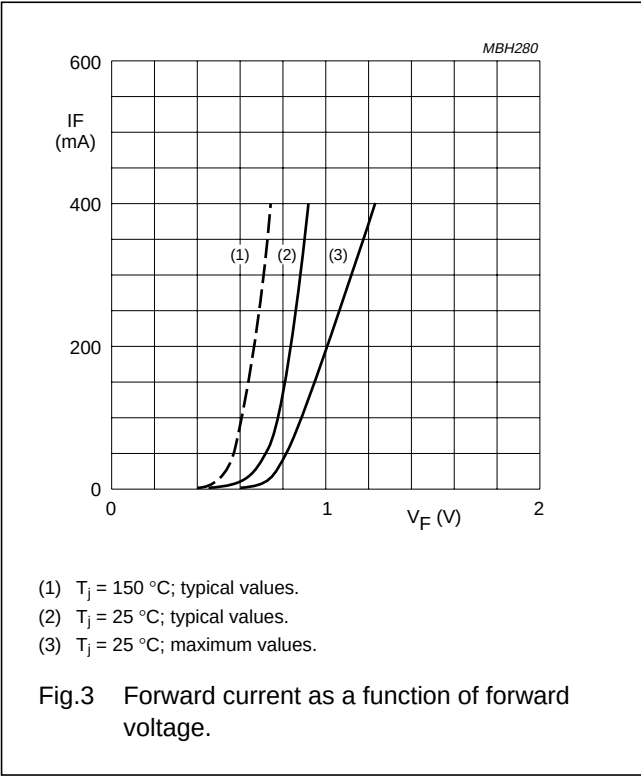
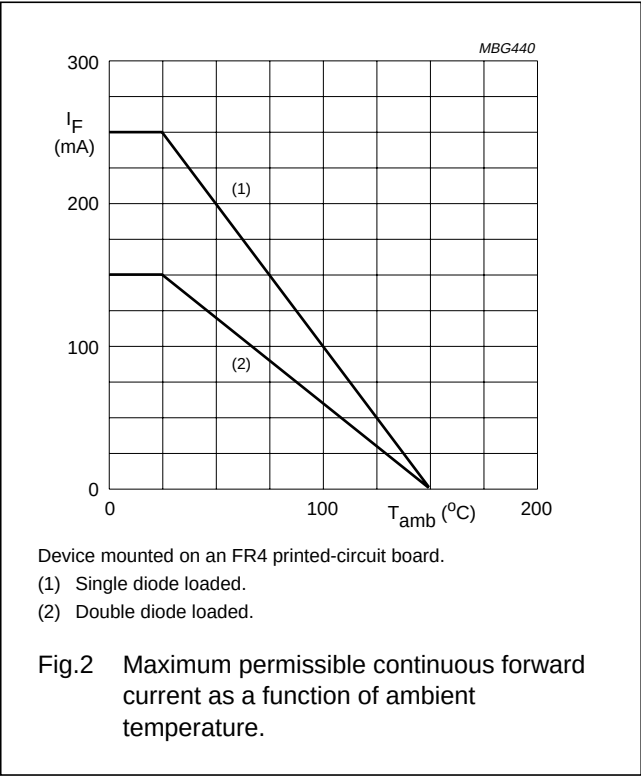
Note

1. Device mounted on an FR4 printed-circuit board.

General purpose controlled avalanche
(double) diodes

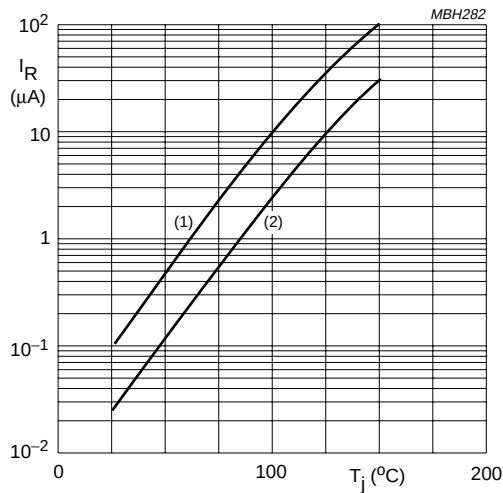
BAS29; BAS31; BAS35

GRAPHICAL DATA



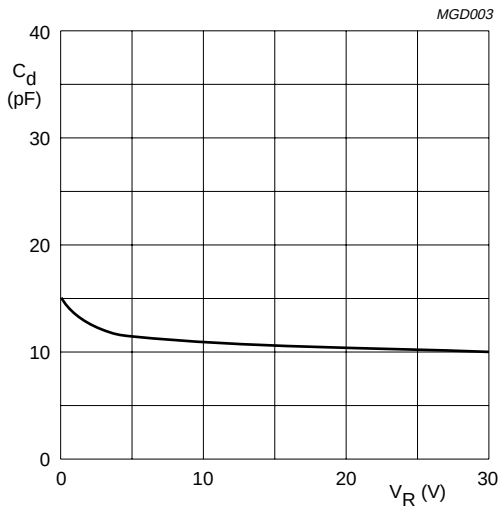
General purpose controlled avalanche
(double) diodes

BAS29; BAS31; BAS35



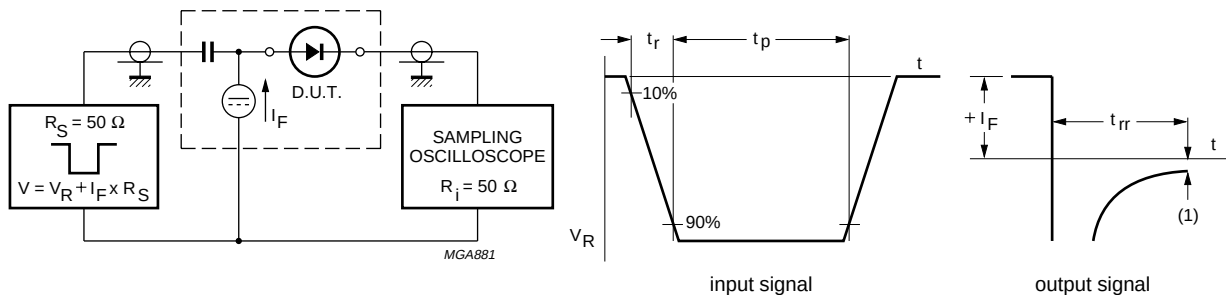
- (1) $V_R = 90\text{ V}$; maximum values.
- (2) $V_R = 90\text{ V}$; typical values.

Fig.5 Reverse current as a function of junction temperature.



$f = 1\text{ MHz}$; $T_j = 25\text{ }^{\circ}C$.

Fig.6 Diode capacitance as a function of reverse voltage; typical values.



- (1) $I_R = 3\text{ mA}$.

Fig.7 Reverse recovery voltage test circuit and waveforms.

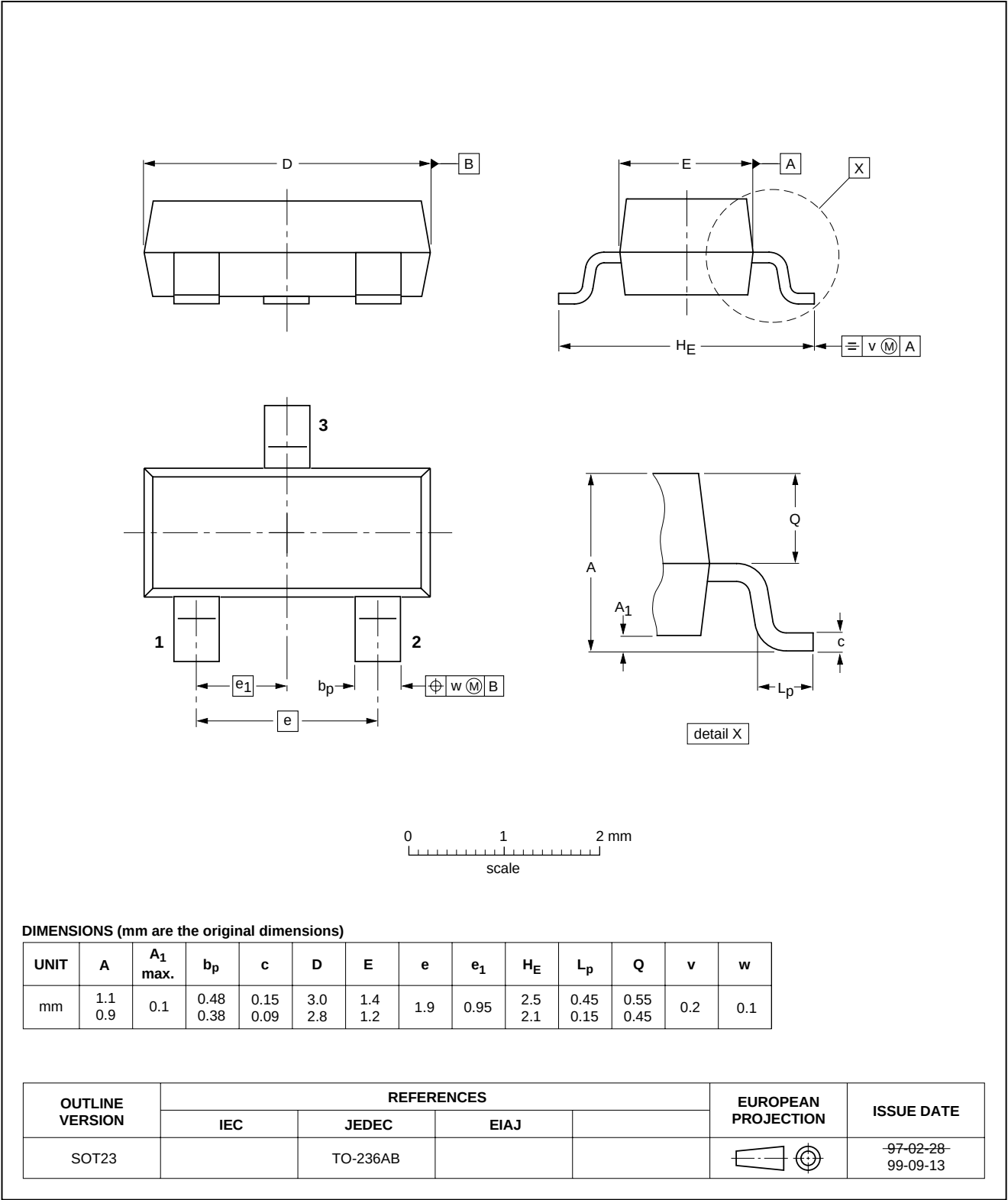
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PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT23



General purpose controlled avalanche (double) diodes

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DATA SHEET STATUS

LEVEL	DATA SHEET STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾⁽³⁾	DEFINITION
I	Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
II	Preliminary data	Qualification	This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.
III	Product data	Production	This data sheet contains data from the product specification. Philips Semiconductors reserves the right to make changes at any time in order to improve the design, manufacturing and supply. Relevant changes will be communicated via a Customer Product/Process Change Notification (CPCN).

Notes

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2. The product status of the device(s) described in this data sheet may have changed since this data sheet was published. The latest information is available on the Internet at URL <http://www.semiconductors.philips.com>.
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Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

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NOTES

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NOTES

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