

# DATA SHEET



**BC868**

**NPN medium power transistor;  
20 V, 1 A**

Product specification  
Supersedes data of 2003 Dec 02

2004 Nov 08

# NPN medium power transistor; 20 V, 1 A

**BC868**

**FEATURES**

- High current
- Two current gain selections
- 1.2 W total power dissipation.

**APPLICATIONS**

- Linear voltage regulators
- Low side switch
- Supply line switch for negative voltages
- MOSFET driver
- Audio (pre-) amplifier.

**QUICK REFERENCE DATA**

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
$V_{CEO}$	collector-emitter voltage	–	20	V
$I_C$	collector current (DC)	–	1	A
$I_{CM}$	peak collector current	–	2	A
$h_{FE}$	DC current gain			
	BC868	85	375	–
	BC868-25	160	375	–

**DESCRIPTION**

NPN medium power transistor (see “Simplified outline, symbol and pinning” for package details).

**PRODUCT OVERVIEW**

TYPE NUMBER	PACKAGE		MARKING CODE
	PHILIPS	EIAJ	
BC868	SOT89	SC-62	CAC
BC868-25	SOT89	SC-62	CDC

**SIMPLIFIED OUTLINE, SYMBOL AND PINNING**

TYPE NUMBER	SIMPLIFIED OUTLINE AND SYMBOL	PINNING	
		PIN	DESCRIPTION
BC868		1 2 3	emitter collector base

**ORDERING INFORMATION**

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
BC868	SC-62	plastic surface mounted package; collector pad for good heat transfer; 3 leads	SOT89
BC868-25			

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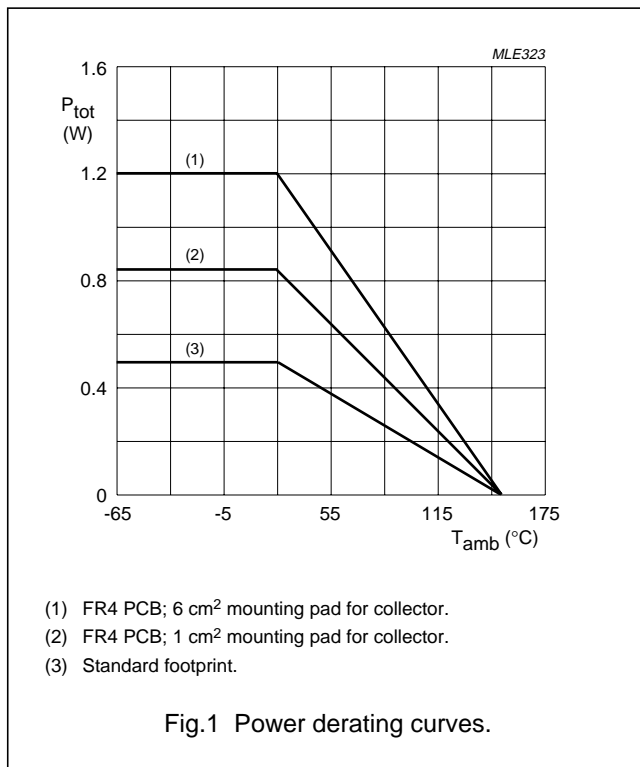
## LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{CBO}$	collector-base voltage	open emitter	–	32	V
$V_{CEO}$	collector-emitter voltage	open base	–	20	V
$V_{EBO}$	emitter-base voltage	open collector	–	5	V
$I_C$	collector current (DC)		–	1	A
$I_{CM}$	peak collector current		–	2	A
$I_{BM}$	peak base current		–	200	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ °C}$	–	0.5	W
		notes 1 and 2	–	0.85	W
		notes 1 and 3	–	1.2	W
		notes 1 and 4	–		
$T_{stg}$	storage temperature		–65	+150	°C
$T_j$	junction temperature		–	150	°C
$T_{amb}$	ambient temperature		–65	+150	°C

## Notes

1. Refer to SOT89 standard mounting conditions.
2. Device mounted on an FR4 printed-circuit board, single-sided copper, tin-plated footprint.
3. Device mounted on an FR4 printed-circuit board, single-sided copper, tin-plated, mounting pad for collector 1 cm<sup>2</sup>.
4. Device mounted on an FR4 printed-circuit board, single-sided copper, tin-plated, mounting pad for collector 6 cm<sup>2</sup>.



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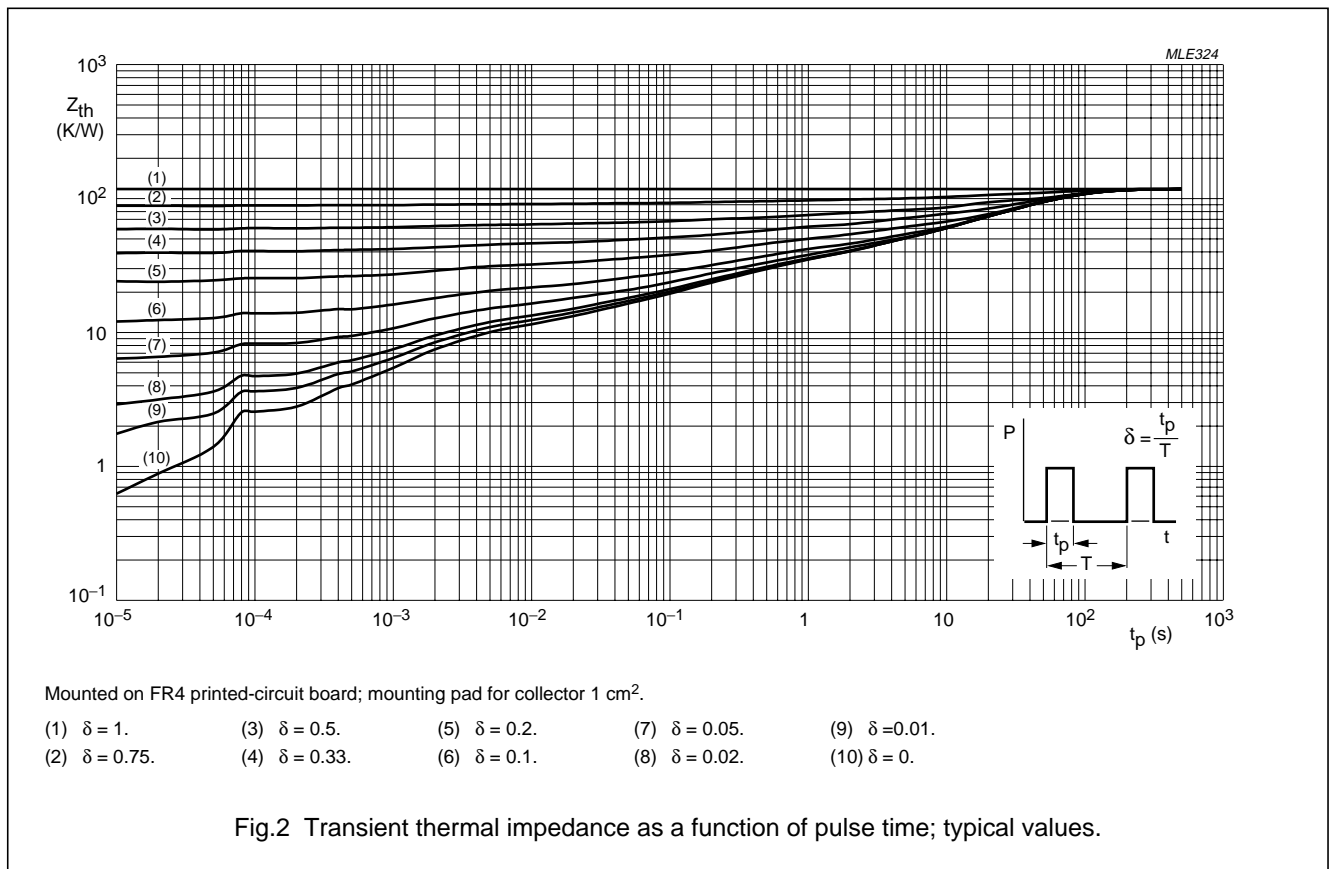
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THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th(j-a)}$	thermal resistance from junction to ambient	$T_{amb} \leq 25\text{ }^{\circ}\text{C}$		
		notes 1 and 2	250	K/W
		notes 1 and 3	147	K/W
		notes 1 and 4	104	K/W
$R_{th(j-s)}$	thermal resistance from junction to solder point	$T_{amb} \leq 25\text{ }^{\circ}\text{C}$	20	K/W

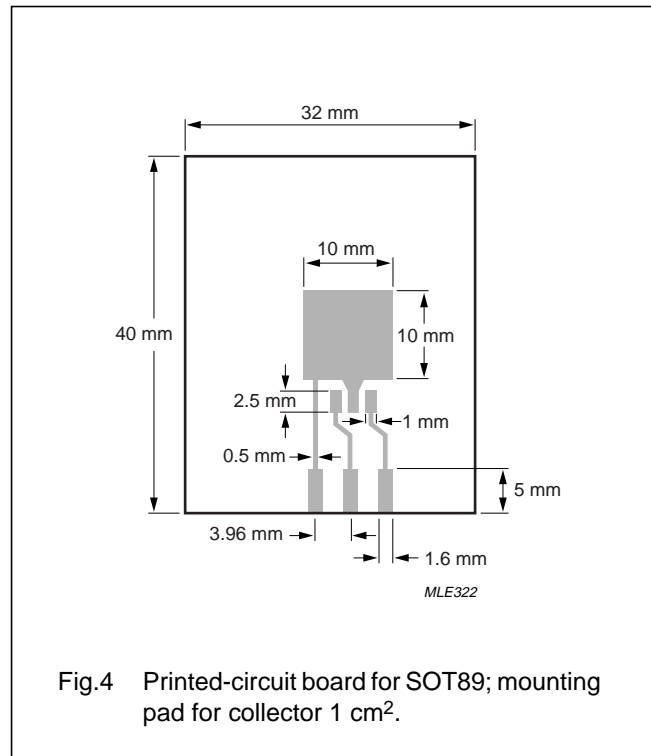
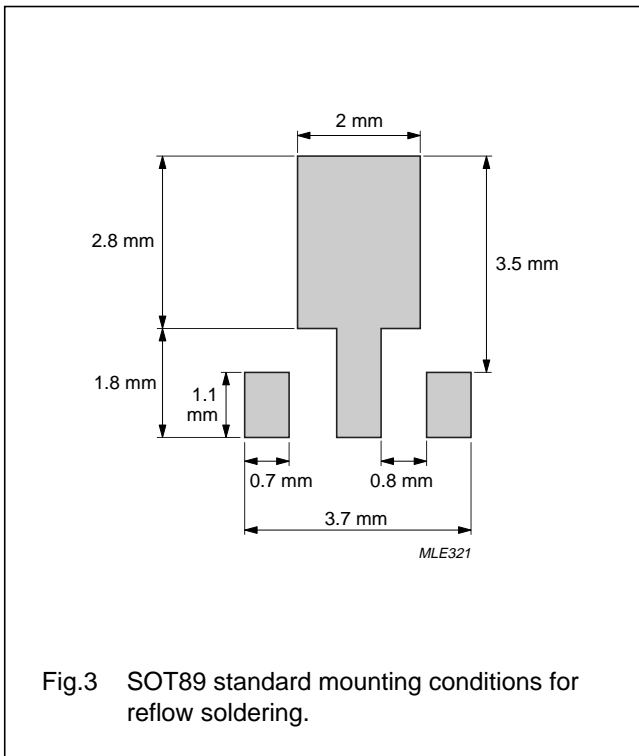
Notes

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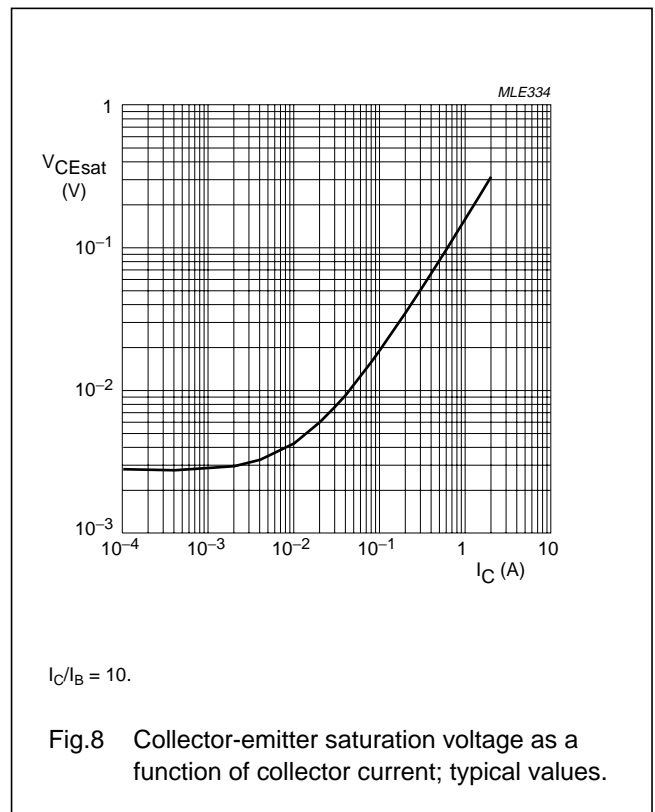
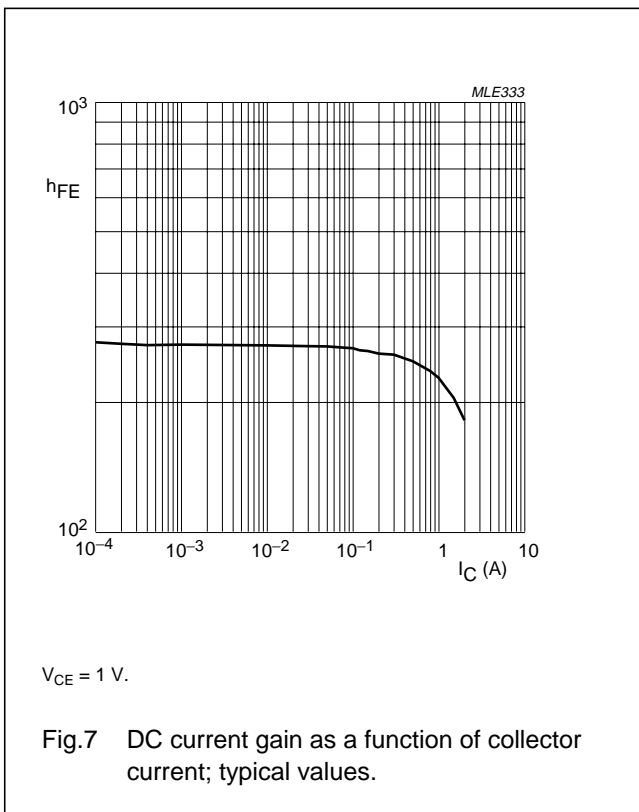
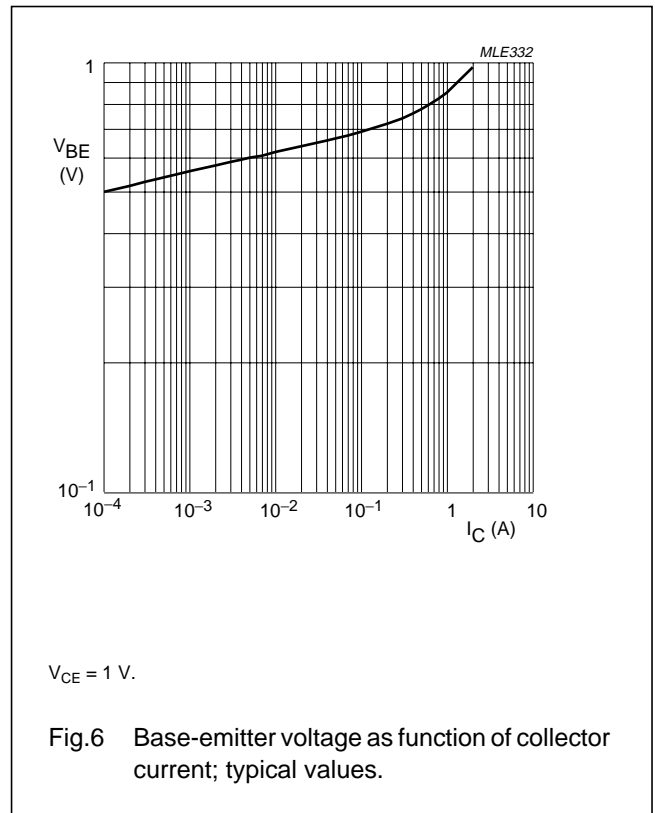
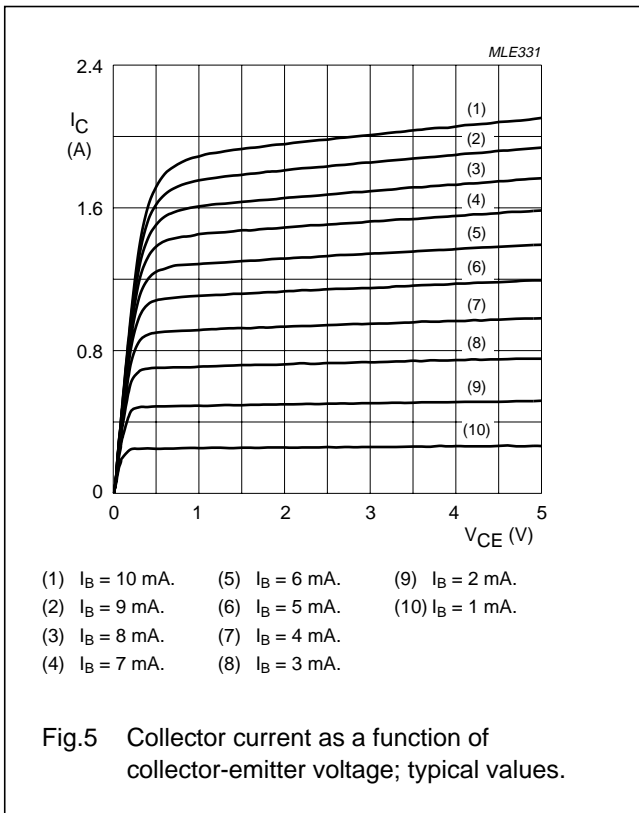
**CHARACTERISTICS**

T<sub>amb</sub> = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I <sub>CBO</sub>	collector-base cut-off current	V <sub>CB</sub> = 25 V; I <sub>E</sub> = 0 A	–	–	100	nA
		V <sub>CB</sub> = 25 V; I <sub>E</sub> = 0 A; T <sub>j</sub> = 25 °C	–	–	10	μA
I <sub>EBO</sub>	emitter-base cut-off current	V <sub>EB</sub> = 5 V; I <sub>C</sub> = 0 A	–	–	100	nA
h <sub>FE</sub>	DC current gain	BC868				
		V <sub>CE</sub> = 10 V; I <sub>C</sub> = 5 mA	50	–	–	
		V <sub>CE</sub> = 1 V; I <sub>C</sub> = 500 mA	85	–	375	
h <sub>FE</sub>	DC current gain	BC868-25				
		V <sub>CE</sub> = 1 V; I <sub>C</sub> = 500 mA	160	–	375	
V <sub>CEsat</sub>	collector-emitter saturation voltage	I <sub>C</sub> = 1 A; I <sub>B</sub> = 100 mA	–	–	500	mV
V <sub>BE</sub>	base-emitter voltage	V <sub>CE</sub> = 10 V; I <sub>C</sub> = 5 mA	–	–	700	mV
		V <sub>CE</sub> = 1 V; I <sub>C</sub> = 1 A	–	–	1	V
C <sub>c</sub>	collector capacitance	I <sub>E</sub> = i <sub>e</sub> = 0 A; V <sub>CB</sub> = 10 V; f = 1 MHz	–	22	–	pF
f <sub>T</sub>	transition frequency	V <sub>CE</sub> = 5 V; I <sub>C</sub> = 50 mA; f = 100 MHz	40	170	–	MHz

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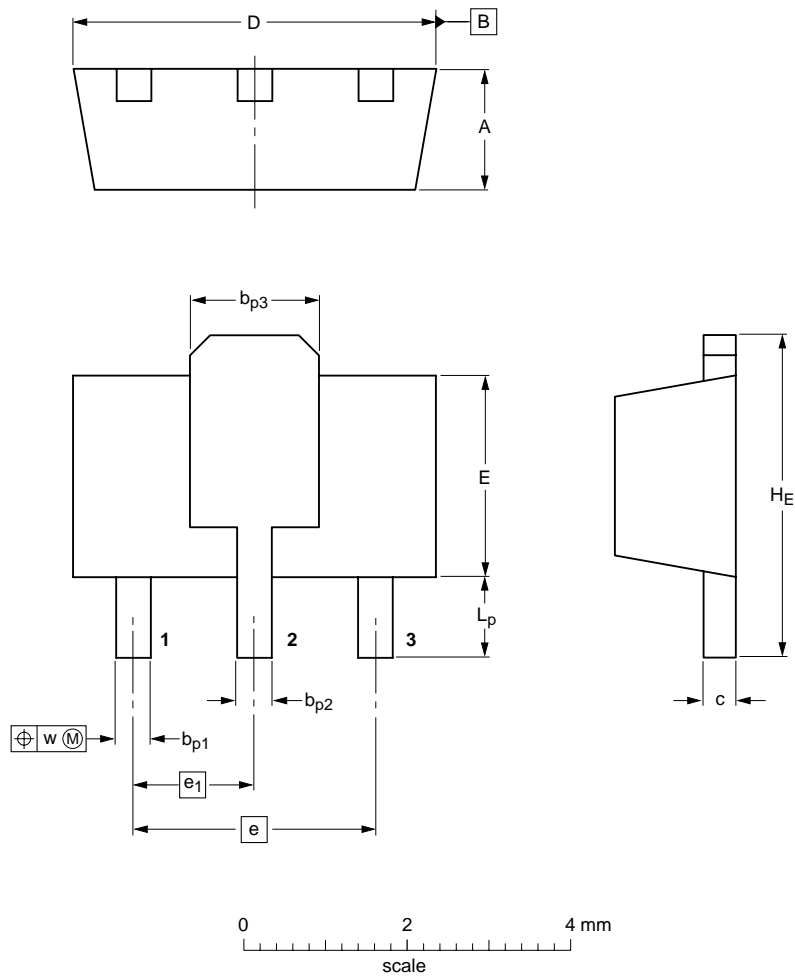
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PACKAGE OUTLINE

Plastic surface mounted package; collector pad for good heat transfer; 3 leads

SOT89



DIMENSIONS (mm are the original dimensions)

UNIT	A	$b_{p1}$	$b_{p2}$	$b_{p3}$	c	D	E	e	$e_1$	$H_E$	$L_p$	w
mm	1.6 1.4	0.48 0.35	0.53 0.40	1.8 1.4	0.44 0.23	4.6 4.4	2.6 2.4	3.0	1.5	4.25 3.75	1.2 0.8	0.13

OUTLINE VERSION	REFERENCES			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
SOT89		TO-243	SC-62		99-09-13 04-08-03

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#### DATA SHEET STATUS

LEVEL	DATA SHEET STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)(3)</sup>	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.
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