



# BAV170M

## Dual common cathode low-leakage diode

19 May 2016

Product data sheet

## 1. General description

Dual common cathode low-leakage diode encapsulated in a leadless ultra small DFN1006-3 (SOT883) Surface-Mounted Device (SMD) plastic package.

## 2. Features and benefits

- High switching speed:  $t_{rr} = 0.8 \mu\text{s}$
- Low leakage current:  $I_R = 3 \text{ pA}$
- Repetitive peak reverse voltage  $V_{RRM} \leq 85 \text{ V}$
- Low capacitance  $C_d = 2 \text{ pF}$
- Ultra small SMD plastic package
- Low package height of 0.48 mm
- AEC-Q101 qualified

## 3. Applications

- Low-leakage current applications
- General-purpose switching

## 4. Quick reference data

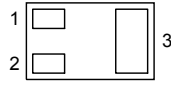
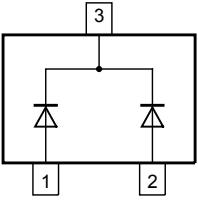
Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
<b>Per diode</b>							
$I_F$	forward current	$T_{amb} = 25 \text{ }^\circ\text{C}$ ; single diode loaded	[1]	-	-	320	mA
$I_R$	reverse current	$V_R = 75 \text{ V}$ ; $T_j = 25 \text{ }^\circ\text{C}$		-	0.003	5	nA
$V_R$	reverse voltage	$T_j = 25 \text{ }^\circ\text{C}$		-	-	75	V
$t_{rr}$	reverse recovery time	$I_F = 10 \text{ mA}$ ; $I_R = 10 \text{ mA}$ ; $I_{R(meas)} = 1 \text{ mA}$ ; $R_L = 100 \text{ } \Omega$ ; $T_{amb} = 25 \text{ }^\circ\text{C}$		-	0.8	3	$\mu\text{s}$

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode (diode 1)	 <p>Transparent top view <b>DFN1006-3 (SOT883)</b></p>	 <p>006aab034</p>
2	A2	anode (diode 2)		
3	CC	common cathode		

## 6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAV170M	DFN1006-3	DFN1006-3: leadless ultra small plastic package; 3 solder lands	SOT883

## 7. Marking

Table 4. Marking codes

Type number	Marking code
BAV170M	M7

## 8. Limiting values

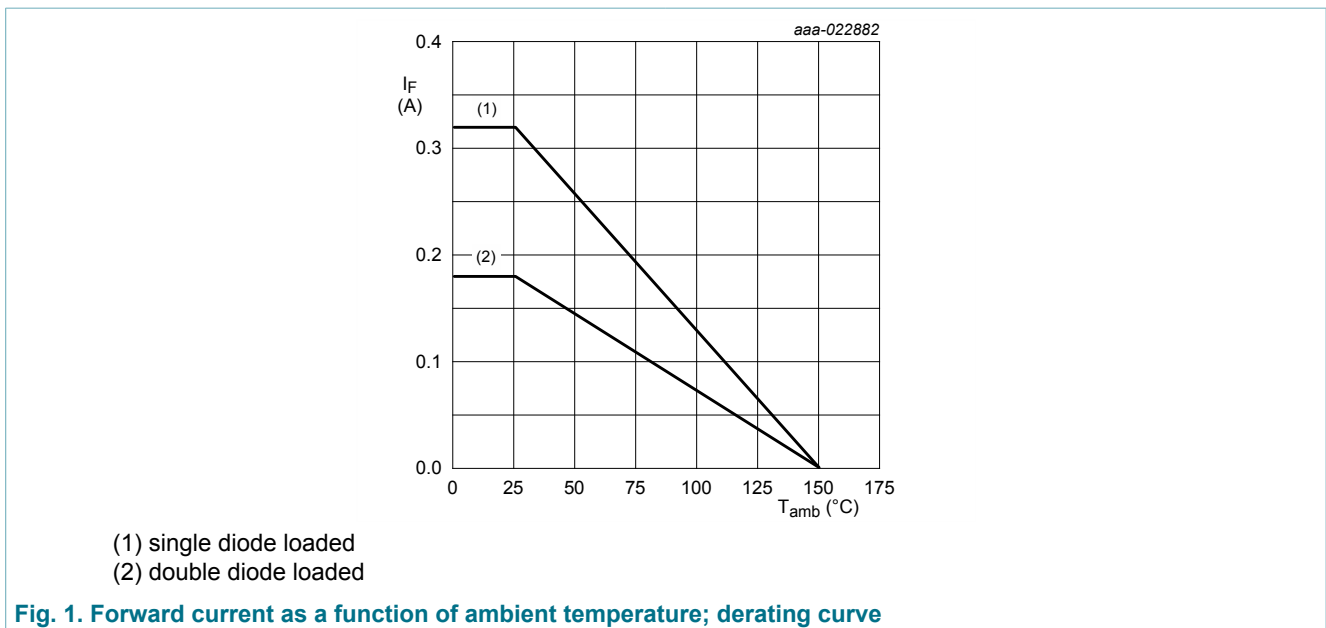
**Table 5. Limiting values**

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

Symbol	Parameter	Conditions		Min	Max	Unit
<b>Per diode</b>						
$V_R$	reverse voltage	$T_j = 25\text{ °C}$		-	75	V
$V_{RRM}$	repetitive peak reverse voltage			-	85	V
$I_F$	forward current	$T_{amb} = 25\text{ °C}$ ; single diode loaded	[1]	-	320	mA
		$T_{amb} = 25\text{ °C}$ ; double diode loaded	[1]	-	180	mA
$I_{FRM}$	repetitive peak forward current	$t_p \leq 0.5\text{ ms}$ ; $\delta \leq 0.25$ ; $T_j = 25\text{ °C}$		-	1	A
$I_{FSM}$	non-repetitive peak forward current	$t_p = 100\text{ }\mu\text{s}$ ; $T_{j(\text{init})} = 25\text{ °C}$ ; square wave		-	4	A
		$t_p = 1\text{ ms}$ ; $T_{j(\text{init})} = 25\text{ °C}$ ; square wave		-	1.5	A
		$t_p = 1\text{ s}$ ; $T_{j(\text{init})} = 25\text{ °C}$ ; square wave		-	0.5	A
<b>Per device; one diode loaded</b>						
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ °C}$	[1]	-	325	mW
			[2]	-	660	mW
$T_j$	junction temperature			-	150	°C
$T_{amb}$	ambient temperature			-55	150	°C
$T_{stg}$	storage temperature			-65	150	°C

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm<sup>2</sup>.



## 9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	385	K/W
			[2]	-	-	190	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[3]	-	-	35	K/W

- [1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
- [2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm<sup>2</sup>.
- [3] Soldering point of cathode tab.

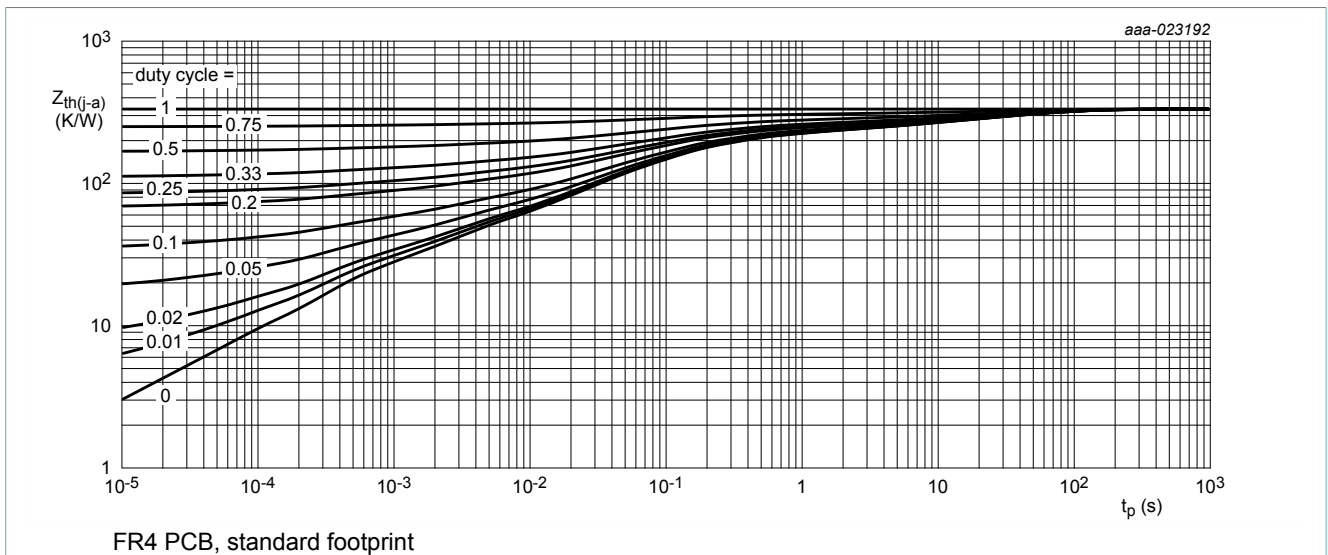


Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

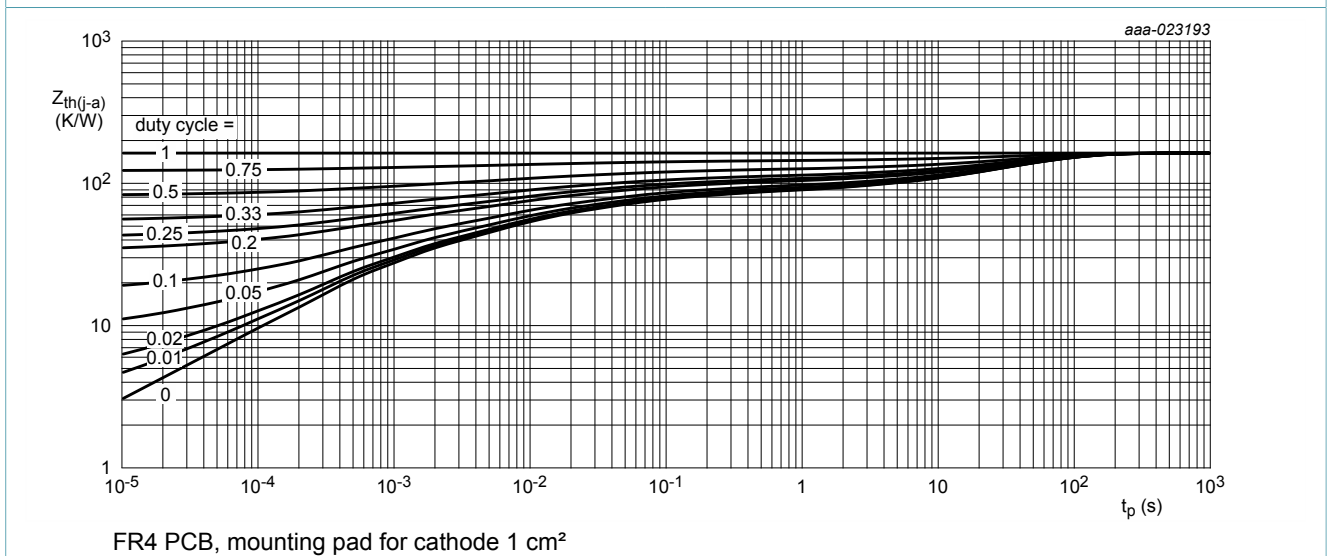


Fig. 3. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

### 10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per diode</b>						
$V_F$	forward voltage	$I_F = 1 \text{ mA}; T_j = 25 \text{ }^\circ\text{C}$	-	-	0.9	V
		$I_F = 10 \text{ mA}; T_j = 25 \text{ }^\circ\text{C}$	-	-	1	V
		$I_F = 50 \text{ mA}; T_j = 25 \text{ }^\circ\text{C}$	-	-	1.1	V
		$I_F = 150 \text{ mA}; T_j = 25 \text{ }^\circ\text{C}$	-	-	1.25	V
$I_R$	reverse current	$V_R = 75 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$	-	0.003	5	nA
		$V_R = 75 \text{ V}; T_j = 150 \text{ }^\circ\text{C}$	-	3	80	nA
$C_d$	diode capacitance	$V_R = 0 \text{ V}; f = 1 \text{ MHz}; T_j = 25 \text{ }^\circ\text{C}$	-	2	-	pF
$t_{rr}$	reverse recovery time	$I_F = 10 \text{ mA}; I_R = 10 \text{ mA}; I_{R(\text{meas})} = 1 \text{ mA}; R_L = 100 \text{ }^\Omega; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	0.8	3	$\mu\text{s}$

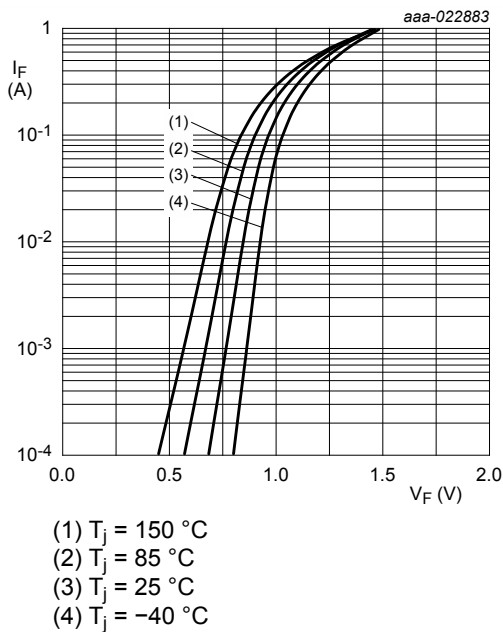


Fig. 4. Forward current as a function of forward voltage; typical values

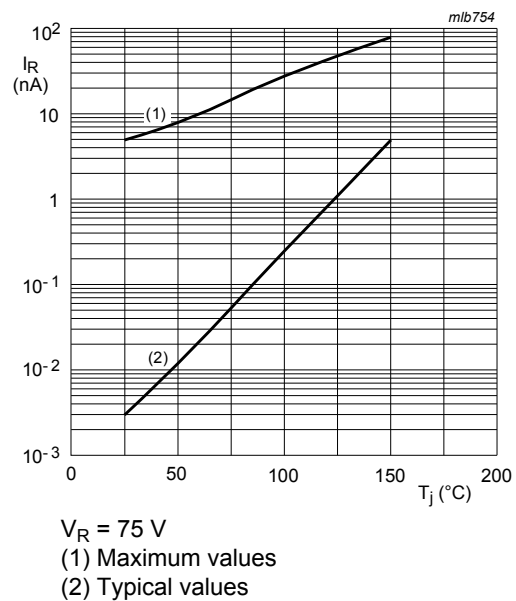


Fig. 5. Reverse current as a function of junction temperature

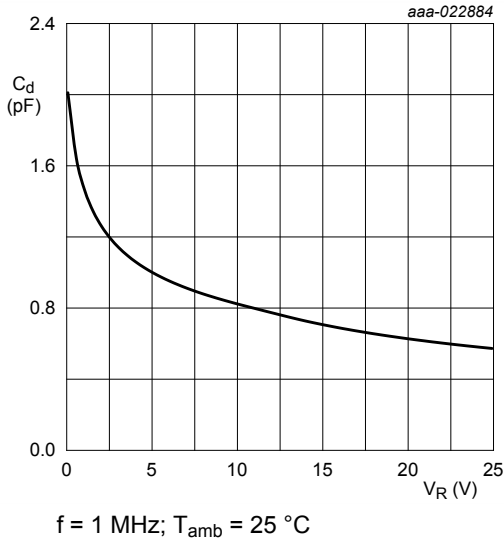


Fig. 6. Diode capacitance as a function of reverse voltage; typical values

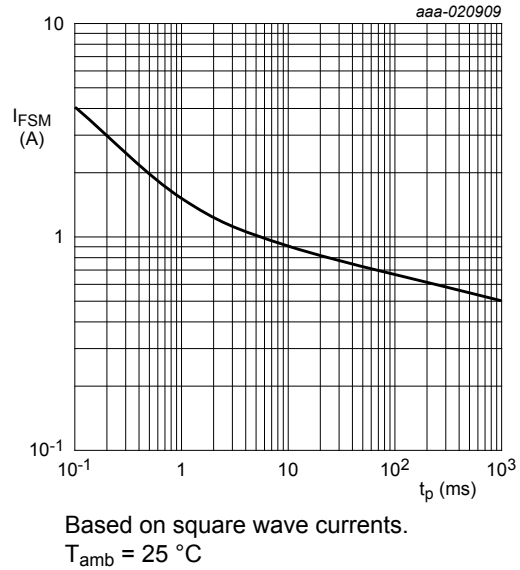


Fig. 7. Non-repetitive forward current as a function of pulse duration; maximum values

## 11. Test information

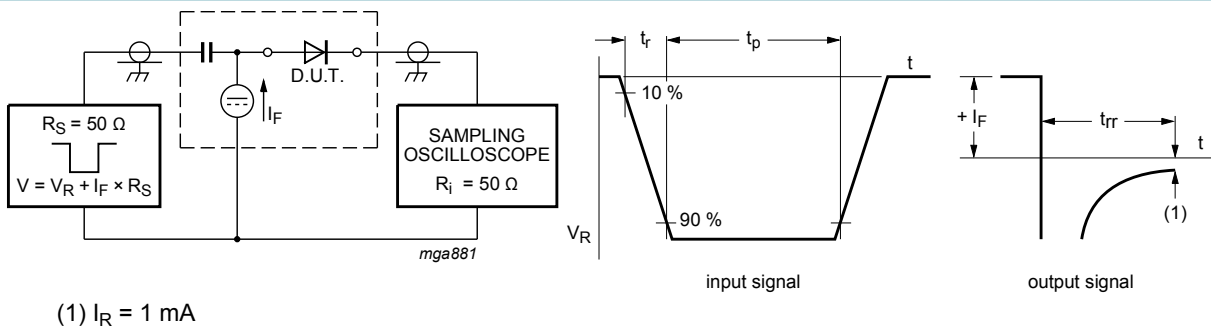


Fig. 8. Reverse recovery time test circuit and waveforms

### Quality information

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard *Q101 - Stress test qualification for discrete semiconductors*, and is suitable for use in automotive applications.

## 12. Package outline

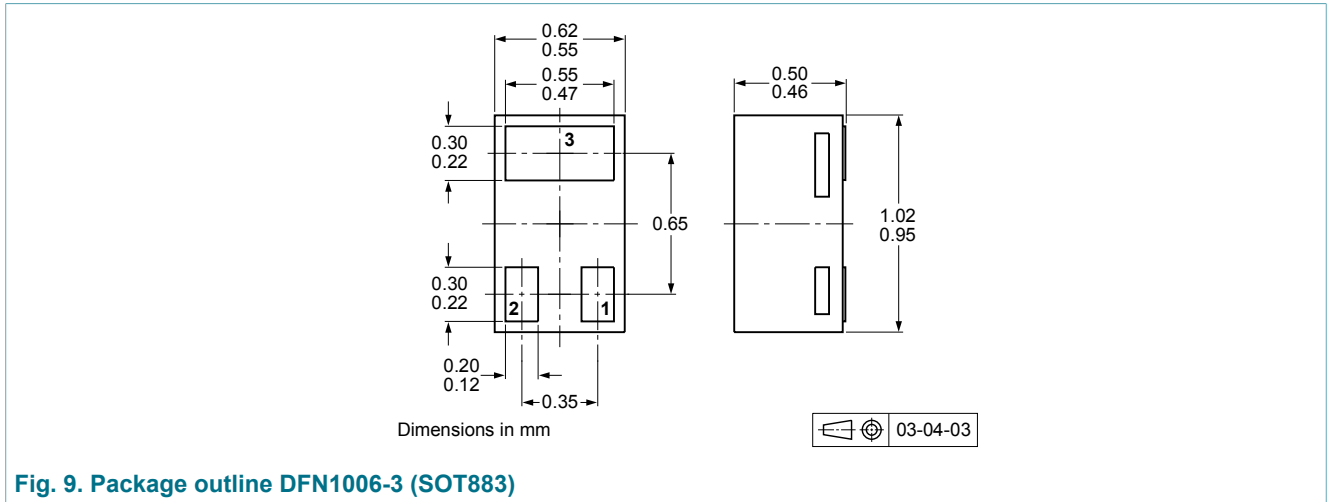


Fig. 9. Package outline DFN1006-3 (SOT883)

## 13. Soldering

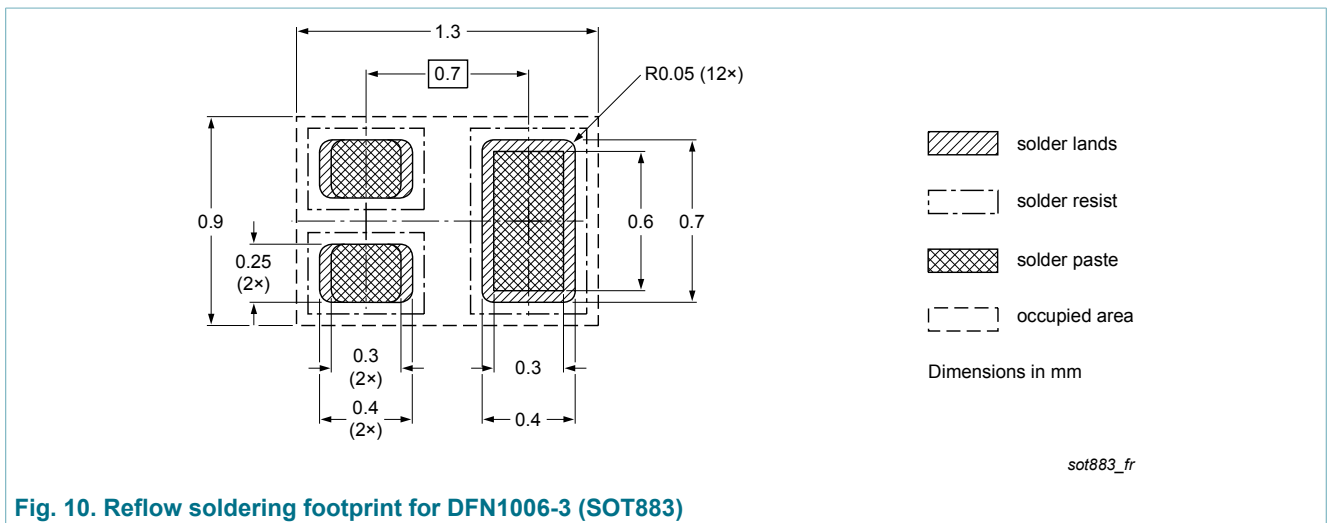


Fig. 10. Reflow soldering footprint for DFN1006-3 (SOT883)

## 14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAV170M v.1	20160519	Product data sheet	-	-



## 15. Legal information

### Data sheet status

Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

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