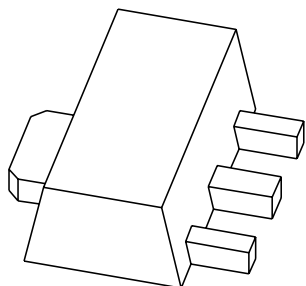


# DATA SHEET



## **BCV29; BCV49** NPN Darlington transistors

Product specification  
Supersedes data of 1997 Mar 19  
File under Discrete Semiconductors, SC04

1997 Apr 21

# NPN Darlington transistors

# BCV29; BCV49

### FEATURES

- High current (max. 500 mA)
- Low voltage (max. 60 V)
- High DC current gain (min. 20000).

### APPLICATIONS

- Pre-amplifier input applications.

### DESCRIPTION

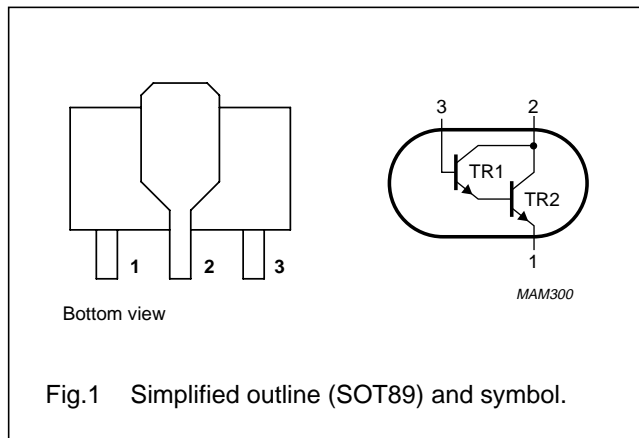
NPN small-signal Darlington transistor in a surface mount SOT89 plastic package.  
 PNP complements: BCV28 and BCV48.

### MARKING

TYPE NUMBER	MARKING CODE
BCV29	EF
BCV49	EG

### PINNING

PIN	DESCRIPTION
1	emitter
2	collector
3	base



### QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{CBO}$	collector-base voltage	open emitter				
	BCV29		–	–	40	V
	BCV49		–	–	80	V
$V_{CES}$	collector-emitter voltage	$V_{BE} = 0$				
	BCV29		–	–	30	V
	BCV49		–	–	60	V
$I_C$	collector current (DC)		–	–	500	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ }^\circ\text{C}$	–	–	1.34	W
$h_{FE}$	DC current gain	$V_{CE} = 5\text{ V}$ $I_C = 1\text{ mA}$ $I_C = 10\text{ mA}$ $I_C = 100\text{ mA}$ $I_C = 500\text{ mA}$	4000	–	–	
			10000	–	–	
			20000	–	–	
			4000	–	–	
$h_{FE}$	DC current gain	$V_{CE} = 5\text{ V}$ $I_C = 1\text{ mA}$ $I_C = 10\text{ mA}$ $I_C = 100\text{ mA}$ $I_C = 500\text{ mA}$	2000	–	–	
			4000	–	–	
			10000	–	–	
			2000	–	–	
$f_T$	transition frequency	$I_C = 30\text{ mA}; V_{CE} = 5\text{ V}; f = 100\text{ MHz}$	–	220	–	MHz

## NPN Darlington transistors

## BCV29; BCV49

**LIMITING VALUES**

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V <sub>CBO</sub>	collector-base voltage	open emitter			
	BCV29		–	40	V
	BCV49		–	80	V
V <sub>CES</sub>	collector-emitter voltage	V <sub>BE</sub> = 0			
	BCV29		–	30	V
	BCV49		–	60	V
V <sub>EBO</sub>	emitter-base voltage	open collector	–	10	V
I <sub>C</sub>	collector current (DC)		–	500	mA
I <sub>CM</sub>	peak collector current		–	1	A
I <sub>BM</sub>	peak base current		–	200	mA
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 25 °C; note 1	–	1.34	W
T <sub>stg</sub>	storage temperature		–65	+150	°C
T <sub>j</sub>	junction temperature		–	150	°C
T <sub>amb</sub>	operating ambient temperature		–65	+150	°C

**Note**

- Device mounted on a printed-circuit board, single-sided copper, tinplated, mounting pad for collector 1 cm<sup>2</sup>.  
For other mounting conditions, see “*Thermal considerations for SOT89 in the General part of handbook SC04*”.

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R <sub>th j-a</sub>	thermal resistance from junction to ambient	note 1	93	K/W

**Note**

- Device mounted on a printed-circuit board, single-sided copper, tinplated, mounting pad for collector 1 cm<sup>2</sup>.  
For other mounting conditions, see “*Thermal considerations for SOT89 in the General part of handbook SC04*”.

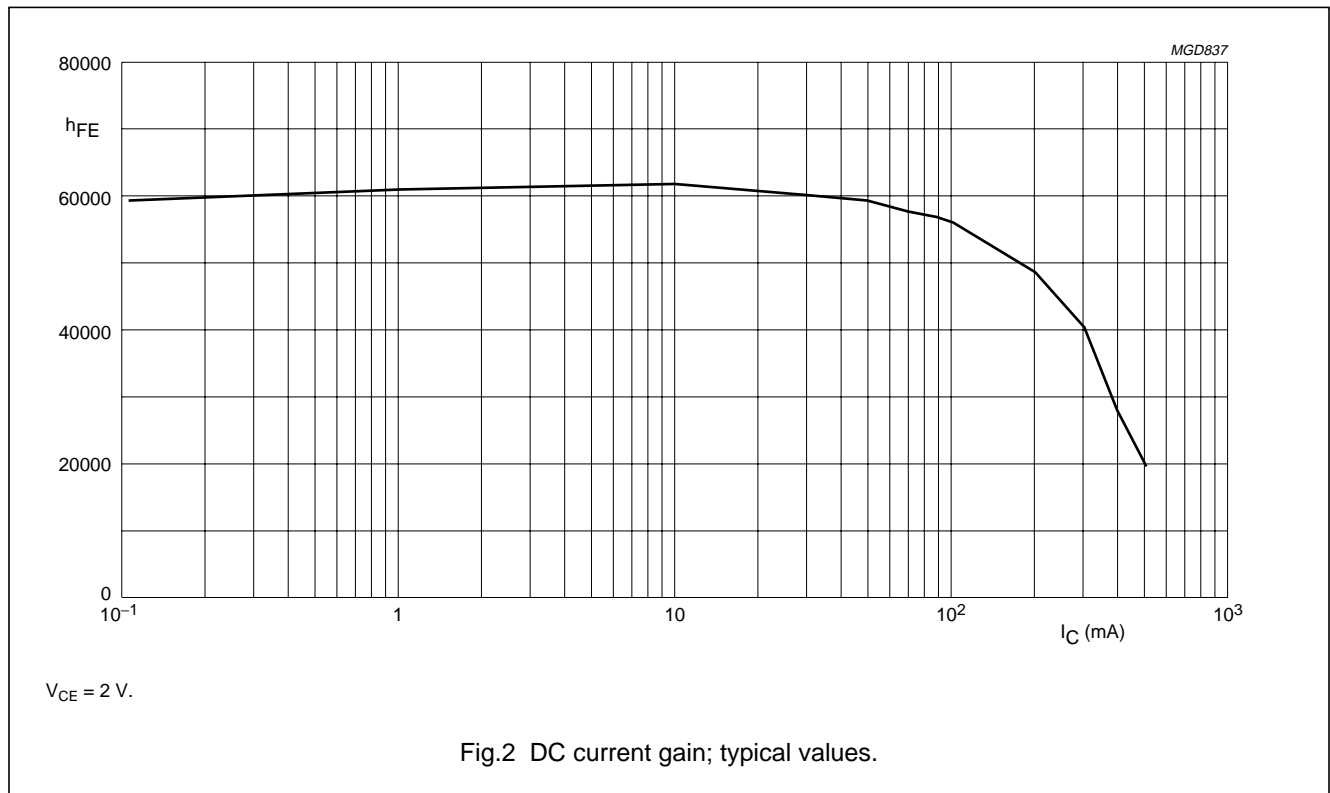
NPN Darlington transistors

BCV29; BCV49

**CHARACTERISTICS**

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT						
I <sub>CBO</sub>	collector cut-off current											
	BCV29	I <sub>E</sub> = 0; V <sub>CB</sub> = 30 V	–	–	100	nA						
	BCV49	I <sub>E</sub> = 0; V <sub>CB</sub> = 60 V	–	–	100	nA						
I <sub>EBO</sub>	emitter cut-off current	I <sub>C</sub> = 0; V <sub>EB</sub> = 10 V	–	–	100	nA						
h <sub>FE</sub>	DC current gain	V <sub>CE</sub> = 5 V; see Fig.2										
							BCV29	I <sub>C</sub> = 1 mA	4000	–	–	
								I <sub>C</sub> = 10 mA	10000	–	–	
								I <sub>C</sub> = 100 mA	20000	–	–	
			I <sub>C</sub> = 500 mA	4000	–	–						
h <sub>FE</sub>	DC current gain	V <sub>CE</sub> = 5 V; see Fig.2										
							BCV49	I <sub>C</sub> = 1 mA	2000	–	–	
								I <sub>C</sub> = 10 mA	4000	–	–	
								I <sub>C</sub> = 100 mA	10000	–	–	
			I <sub>C</sub> = 500 mA	2000	–	–						
V <sub>CEsat</sub>	collector-emitter saturation voltage	I <sub>C</sub> = 100 mA; I <sub>B</sub> = 0.1 mA	–	–	1	V						
V <sub>BEsat</sub>	base-emitter saturation voltage	I <sub>C</sub> = 100 mA; I <sub>B</sub> = 0.1 mA	–	–	1.5	V						
V <sub>BEon</sub>	base-emitter on-state voltage	I <sub>C</sub> = 10 mA; V <sub>CE</sub> = 5 V	–	–	1.4	V						
f <sub>T</sub>	transition frequency	I <sub>C</sub> = 30 mA; V <sub>CE</sub> = 5 V; f = 100 MHz	–	220	–	MHz						



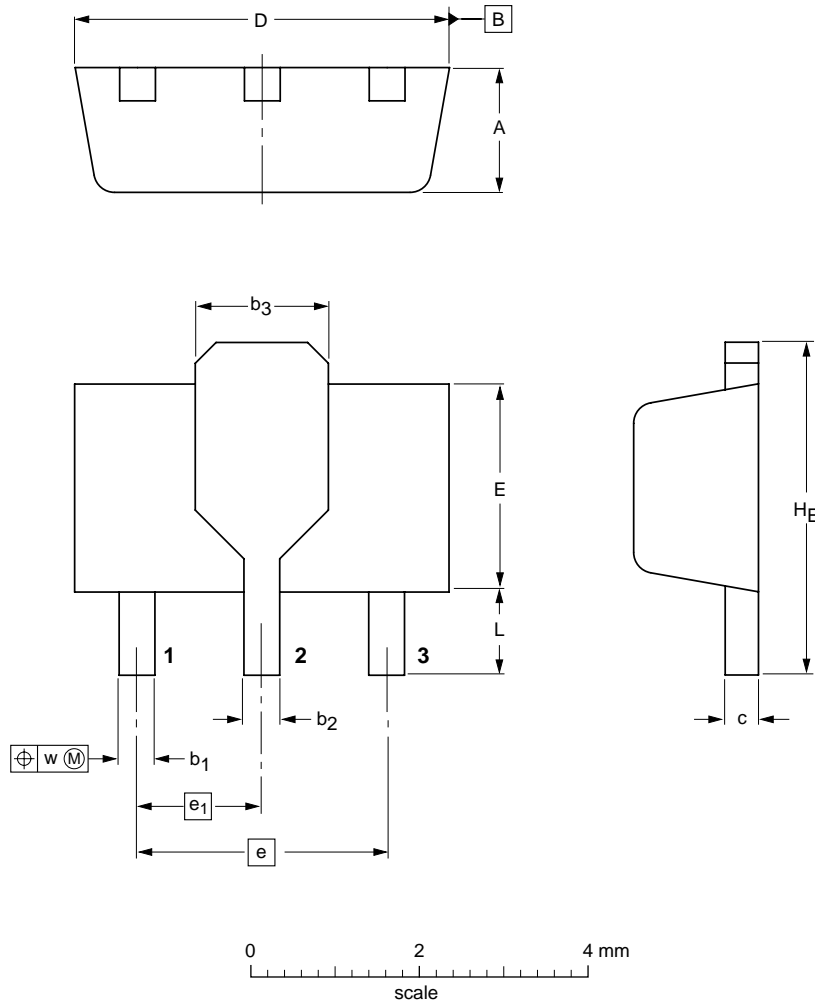
NPN Darlington transistors

BCV29; BCV49

PACKAGE OUTLINE

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

SOT89



DIMENSIONS (mm are the original dimensions)

UNIT	A	b <sub>1</sub>	b <sub>2</sub>	b <sub>3</sub>	c	D	E	e	e <sub>1</sub>	H <sub>E</sub>	L min.	w
mm	1.6	0.48	0.53	1.8	0.44	4.6	2.6	3.0	1.5	4.25	0.8	0.13
	1.4	0.35	0.40	1.4	0.37	4.4	2.4			3.75		

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT89						97-02-28

## NPN Darlington transistors

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**DEFINITIONS**

<b>Data Sheet Status</b>	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
<b>Limiting values</b>	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). 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.	
<b>Application information</b>	
Where application information is given, it is advisory and does not form part of the specification.	

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