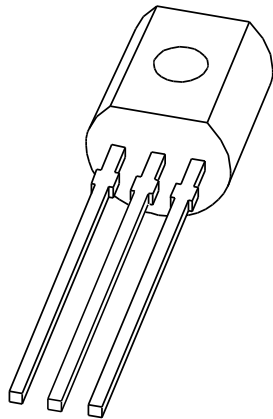


# DATA SHEET



## **BC337; BC337A; BC338** NPN general purpose transistors

Product specification  
Supersedes data of September 1994  
File under Discrete Semiconductors, SC04

1997 Mar 10

# NPN general purpose transistors

# BC337; BC337A; BC338

### FEATURES

- High current (max. 500 mA)
- Low voltage (max. 60 V).

### APPLICATIONS

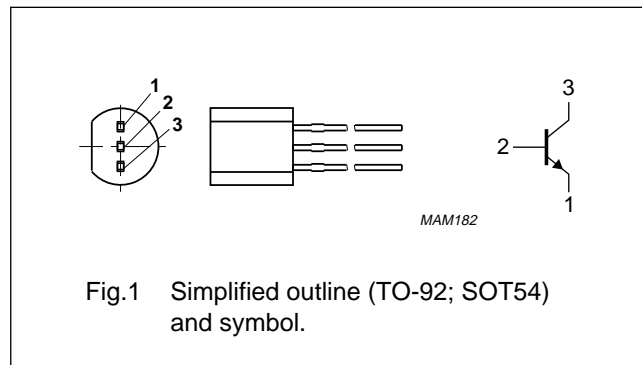
- General purpose switching and amplification, e.g. driver and output stages of audio amplifiers.

### DESCRIPTION

NPN transistor in a TO-92; SOT54 plastic package. PNP complements: BC327, BC327A and BC328.

### PINNING

PIN	DESCRIPTION
1	emitter
2	base
3	collector



### QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V <sub>CBO</sub>	collector-base voltage	open emitter			
	BC337		–	50	V
	BC337A		–	60	V
	BC338		–	30	V
V <sub>CEO</sub>	collector-emitter voltage	open base			
	BC337		–	45	V
	BC337A		–	60	V
	BC338		–	25	V
I <sub>CM</sub>	peak collector current		–	1	A
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 25 °C	–	625	mW
h <sub>FE</sub>	DC current gain	I <sub>C</sub> = 100 mA; V <sub>CE</sub> = 1 V			
	BC337; BC338		100	600	
	BC337A		100	400	
f <sub>T</sub>	transition frequency	I <sub>C</sub> = 10 mA; V <sub>CE</sub> = 5 V; f = 100 MHz	100	–	MHz

## NPN general purpose transistors

## BC337; BC337A; BC338

**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			
	BC337		–	50	V
	BC337A		–	60	V
	BC338		–	30	V
V <sub>CEO</sub>	collector-emitter voltage	open base			
	BC337		–	45	V
	BC337A		–	60	V
	BC338		–	25	V
V <sub>EBO</sub>	emitter-base voltage	open collector	–	5	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	–	625	mW
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**

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

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R <sub>th j-a</sub>	thermal resistance from junction to ambient	note 1	0.2	K/mW

**Note**

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

NPN general purpose transistors

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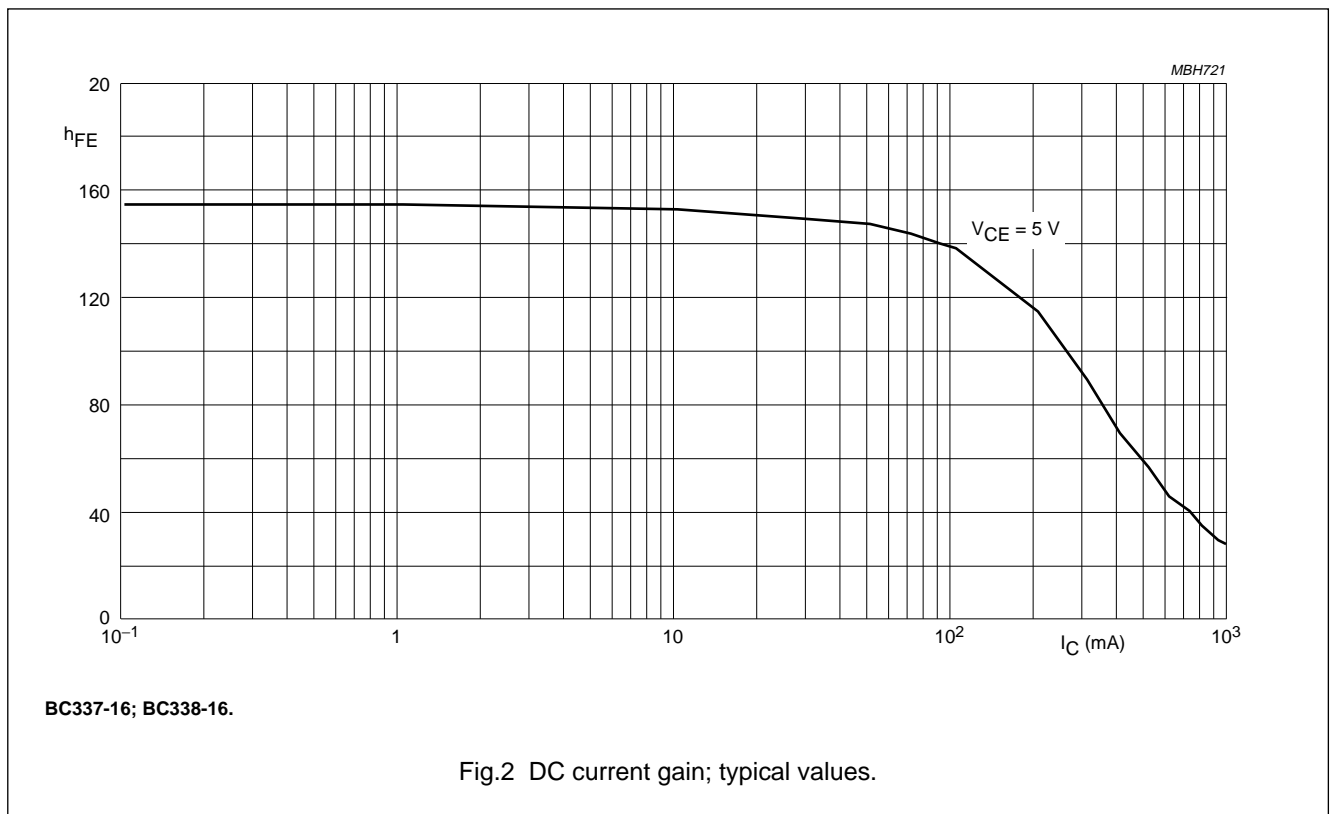
**CHARACTERISTICS**

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I <sub>CBO</sub>	collector cut-off current	I <sub>E</sub> = 0; V <sub>CB</sub> = 20 V	–	–	100	nA
		I <sub>E</sub> = 0; V <sub>CB</sub> = 20 V; T <sub>j</sub> = 150 °C	–	–	5	μA
I <sub>EBO</sub>	emitter cut-off current	I <sub>C</sub> = 0; V <sub>EB</sub> = 5 V	–	–	100	nA
h <sub>FE</sub>	DC current gain BC337; BC338 BC337A BC337-16; BC338-16 BC337-25; BC338-25 BC337-40; BC338-40	I <sub>C</sub> = 100 mA; V <sub>CE</sub> = 1 V; see Figs 2, 3 and 4	100	–	600	
			100	–	400	
			100	–	250	
			160	–	400	
			250	–	600	
h <sub>FE</sub>	DC current gain	I <sub>C</sub> = 500 mA; V <sub>CE</sub> = 1 V; see Figs 2, 3 and 4	40	–	–	
V <sub>CEsat</sub>	collector-emitter saturation voltage	I <sub>C</sub> = 500 mA; I <sub>B</sub> = 50 mA	–	–	700	mV
V <sub>BE</sub>	base-emitter voltage	I <sub>C</sub> = 500 mA; V <sub>CE</sub> = 1 V; note 1	–	–	1.2	V
C <sub>c</sub>	collector capacitance	I <sub>E</sub> = i <sub>e</sub> = 0; V <sub>CB</sub> = 10 V; f = 1 MHz	–	5	–	pF
f <sub>T</sub>	transition frequency	I <sub>C</sub> = 10 mA; V <sub>CE</sub> = 5 V; f = 100 MHz	100	–	–	MHz

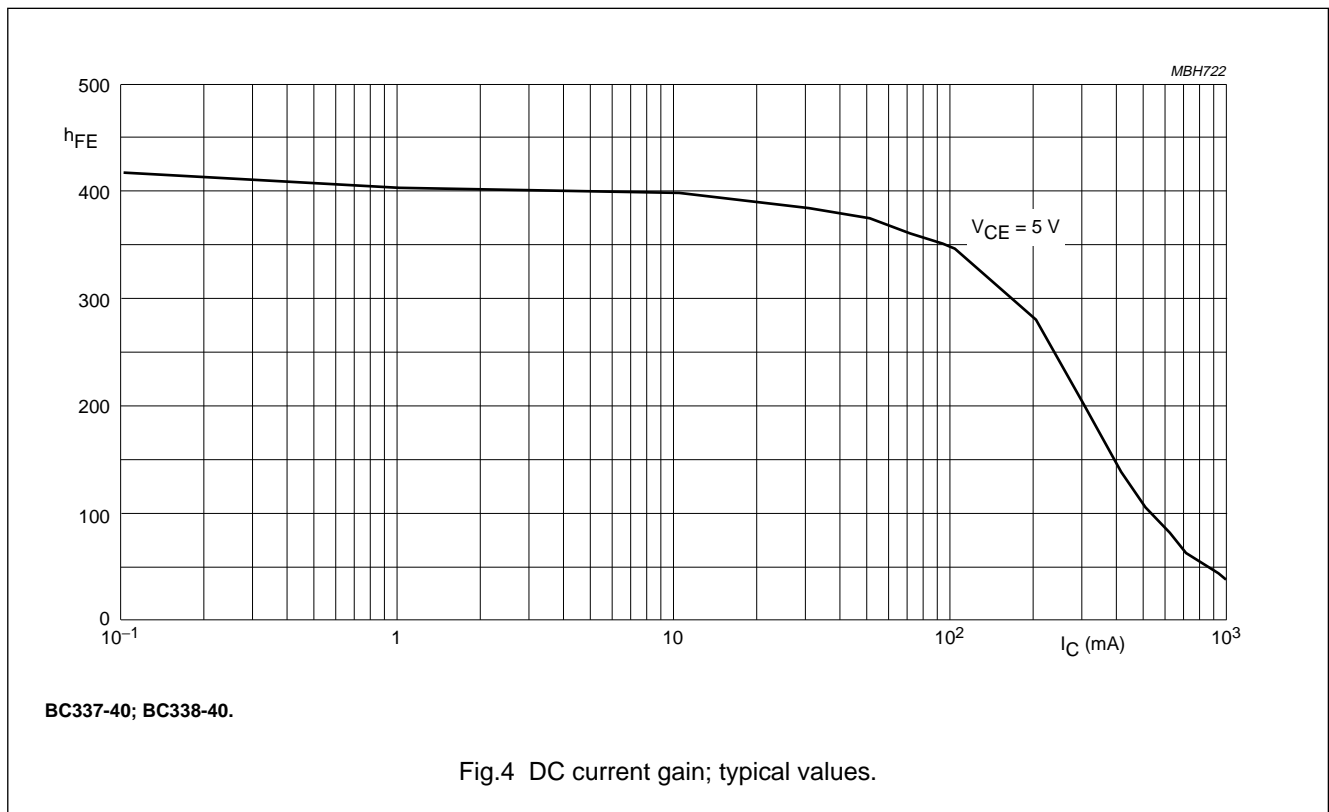
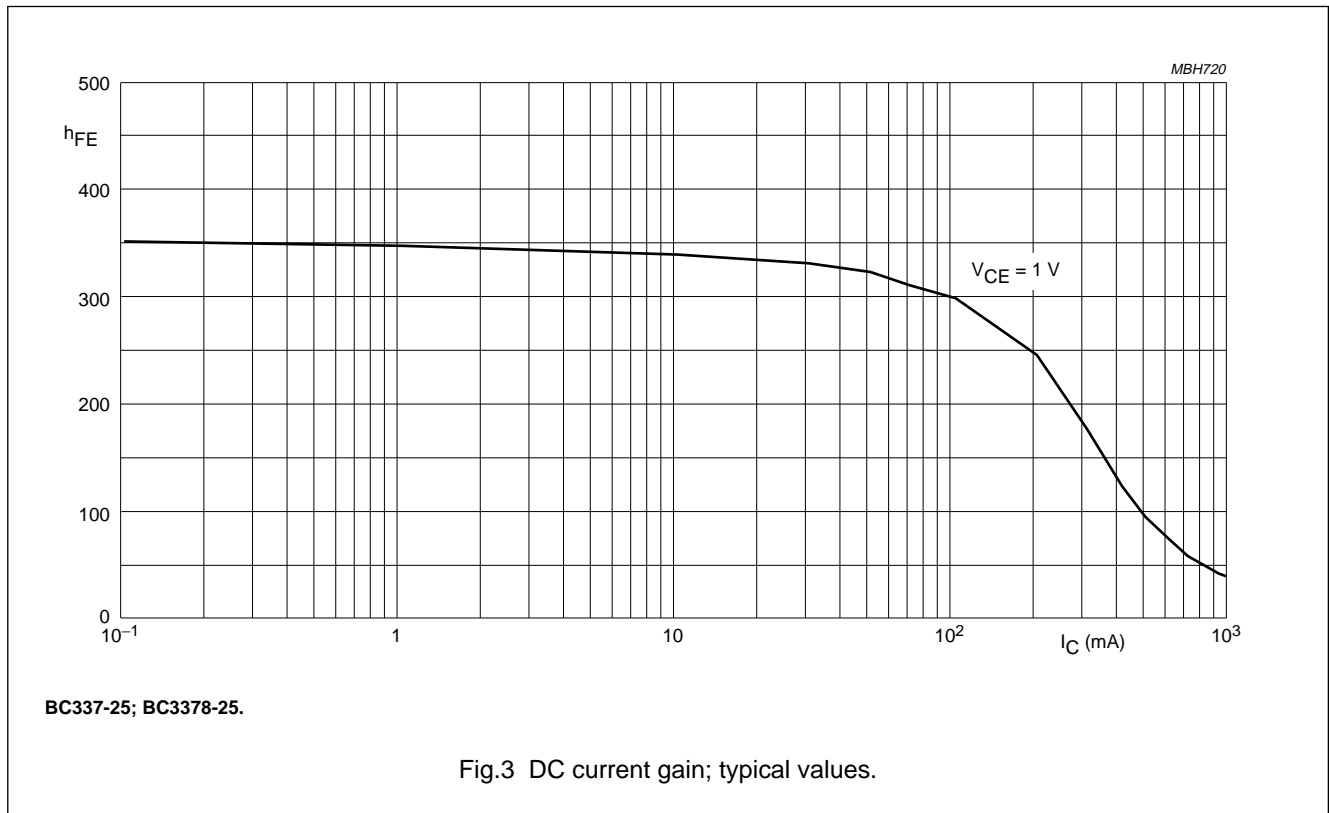
**Note**

- V<sub>BE</sub> decreases by about 2 mV/K with increasing temperature.



NPN general purpose transistors

BC337; BC337A; BC338



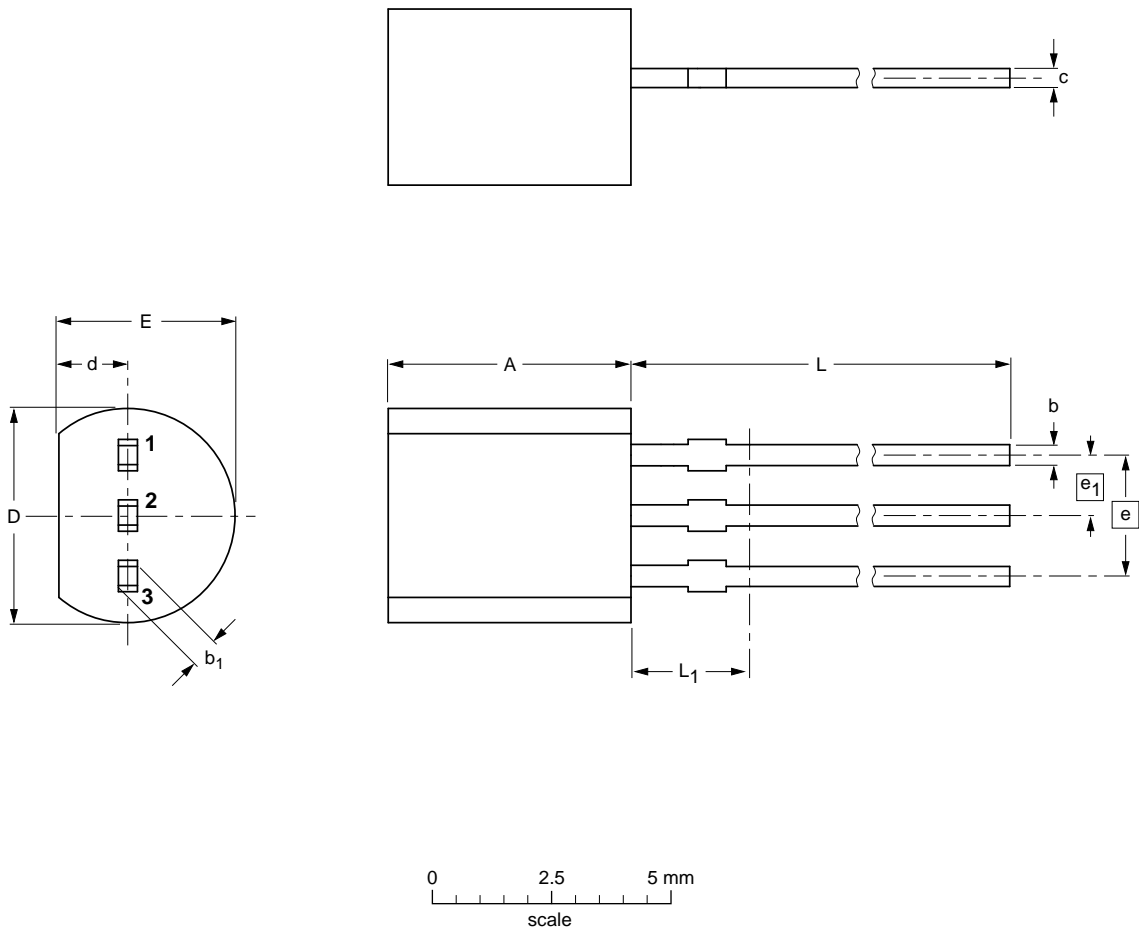
NPN general purpose transistors

BC337; BC337A; BC338

PACKAGE OUTLINE

Plastic single-ended leaded (through hole) package; 3 leads

SOT54



DIMENSIONS (mm are the original dimensions)

UNIT	A	b	b <sub>1</sub>	c	D	d	E	e	e <sub>1</sub>	L	L <sub>1</sub> <sup>(1)</sup>
mm	5.2 5.0	0.48 0.40	0.66 0.56	0.45 0.40	4.8 4.4	1.7 1.4	4.2 3.6	2.54	1.27	14.5 12.7	2.5

Note

1. Terminal dimensions within this zone are uncontrolled to allow for flow of plastic and terminal irregularities.

OUTLINE VERSION	REFERENCES			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ		
SOT54		TO-92	SC-43		97-02-28

## NPN general purpose transistors

BC337; BC337A; BC338

**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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