

BD135; BD139 NPN **BD137;** power
transistors

Product specification
Supersedes data of 1997Mar04

1999 Apr12

NPN power transistors

BD135; BD137; BD139

FEATURES

- High current (max. 1.5A)
- Low voltage (max. 80V).

APPLICATIONS

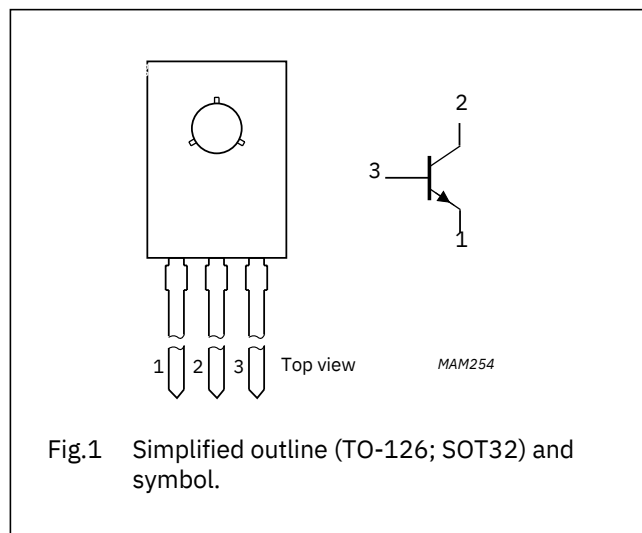
- Driver stages in hi-fi amplifiers and television circuits.

DESCRIPTION

NPN power transistor in a TO-126; SOT32 plastic package. PNP complements: BD136, BD138 and BD140.

PINNING

PIN	DESCRIPTION
1	emitter
2	collector, connected to metal part of mounting surface
3	base



LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
VCBO	collector-base voltage	open emitter	—	45	V
BD135			—	60	V
BD137			—	100	V
BD139					
VCEO	collector-emitter voltage	open base	—	45	V
BD135			—	60	V
BD137			—	80	V
BD139					
VEBO	emitter-base voltage	open collector	—	5	V
IC	collector current (DC)		—	1.5	A
ICM	peak collector current		—	2	A
IBM	peak base current		—	1	A
Ptot	total power dissipation	Tmb ≤ 70°C	—	8	W
Tstg	storage temperature		— 65	+150	°C
Tj	junction temperature		—	150	°C
Tamb	operating ambient temperature		— 65	+150	°C

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THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	note 1	100	K/W
$R_{th\ j-mb}$	thermal resistance from junction to mounting base		10	K/W

Note

1. Refer to TO-126; SOT32 standard mounting conditions.

CHARACTERISTICS

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

	SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector cut-off current		$I_E = 0; V_{CB} = 30\text{V}$	—	—	100	nA
			$I_E = 0; V_{CB} = 30\text{V}; T_j = 125^\circ\text{C}$	—	—	10	μA
I_{EBO}	emitter cut-off current		$I_C = 0; V_{EB} = 5\text{V}$	—	—	100	nA
h_{FE}	DC current gain		$V_{CE} = 2\text{V};$ (see Fig.2)				
			$I_C = 5\text{mA}$	4	—	—	
			$I_C = 150\text{mA}$	0	—	250	
			$I_C = 500\text{mA}$	6	—	—	
	DC current gain	BD135-10; BD137-10; BD139-10 BD135-16; BD137-16; BD139-16	$I_C = 150\text{mA}; V_{CE} = 2\text{V};$ (see Fig.2)	3	—	—	
				23	—	16	
				100	—	0	
V_{CEsat}	collector-emitter saturation voltage		$I_C = 500\text{mA}; I_B = 50\text{mA}$	—	—	25	V
V_{BE}	base-emitter voltage		$I_C = 500\text{mA}; V_{CE} = 2\text{V}$	—	—	0	V
f_T	transition frequency		$I_C = 50\text{mA}; V_{CE} = 5\text{V};$ $f = 100\text{MHz}$	—	190	0.5	MHz
h_{FE1}	DC current gain ratio of the		$I_C = 150\text{mA}; V_{CE} = 2\text{V}$	—	1.3	1.6	
h_{FE2}	complementary pairs						

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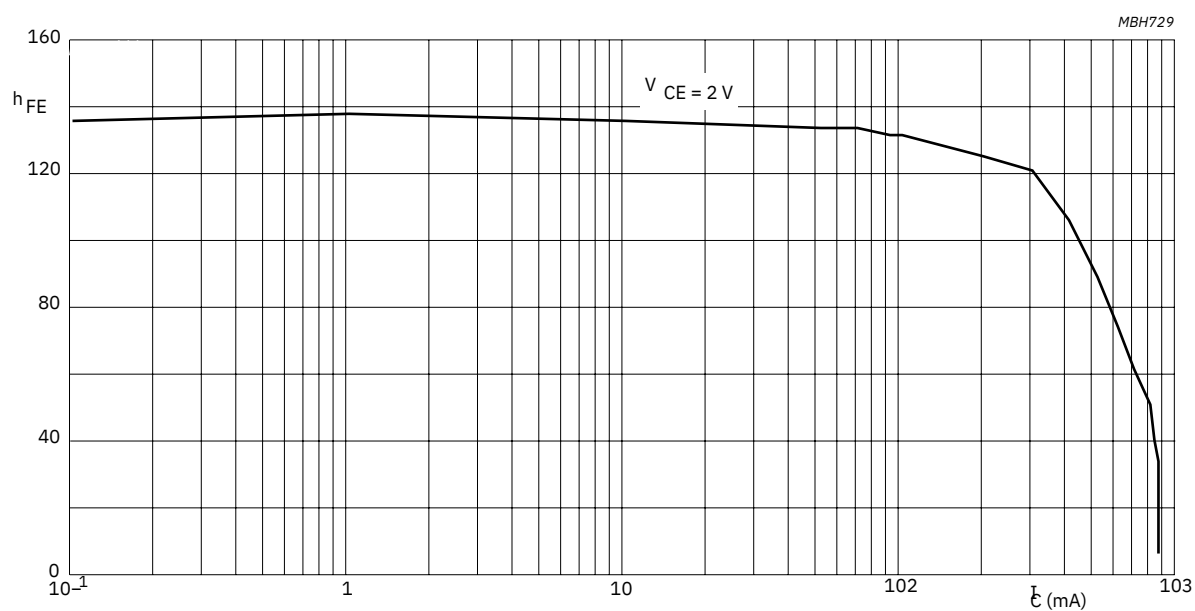


Fig.2 DCcurrent gain; typical values.

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PACKAGE OUTLINE

Plastic single-ended leaded (through hole) package; mountable to heatsink, 1 mounting hole; 3 leads SOT32

0 2.5 5 mm
scale

DIMENSIONS (mm are the original dimensions)

(1)	UNIT	A	b	c	D	E	e	e1	L	L1	P	Q	w	M
1	mm	2.7	0.88	0.60	11.1	7.8	2.30	0.65	4.58	2.29	16.52	5.41	5.3	2.3
2	mm	3.0	0.65	0.45	10.5	7.2	1.5	0.3	3.6					

Note

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

OUTLINE REFERENCES

VERSION	IEC JEDEC EIAJ			EUROPEAN PROJECTION	ISSUE DATE
SOT32TO-126					97-03-04

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DEFINITIONS**Data Sheet Status**

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.

Limiting values

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.

Application information

Where application information is given, it is advisory and does not form part of the specification.

LIFE SUPPORT APPLICATIONS

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