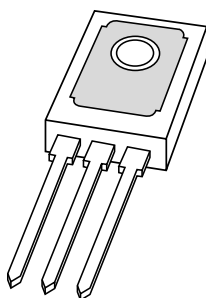


DATA SHEET



BD135; BD137; BD139 NPN power transistors

Product specification
Supersedes data of 1997 Mar 04

1999 Apr 12

NPN power transistors

BD135; BD137; BD139

FEATURES

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

APPLICATIONS

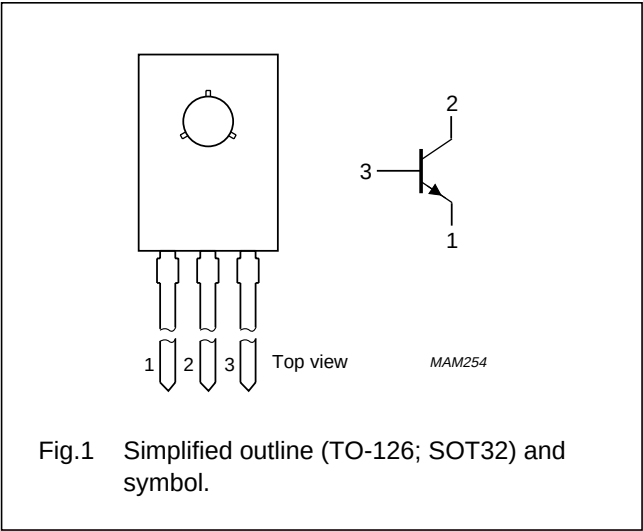
- Driver stages in hi-fi amplifiers and television circuits.

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 (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter			
	BD135		—	45	V
	BD137		—	60	V
	BD139		—	100	V
V_{CEO}	collector-emitter voltage	open base			
	BD135		—	45	V
	BD137		—	60	V
	BD139		—	80	V
V_{EBO}	emitter-base voltage	open collector	—	5	V
I_C	collector current (DC)		—	1.5	A
I_{CM}	peak collector current		—	2	A
I_{BM}	peak base current		—	1	A
P_{tot}	total power dissipation	$T_{mb} \leq 70\text{ }^{\circ}\text{C}$	—	8	W
T_{stg}	storage temperature		−65	+150	$^{\circ}\text{C}$
T_j	junction temperature		—	150	$^{\circ}\text{C}$
T_{amb}	operating ambient temperature		−65	+150	$^{\circ}\text{C}$

NPN power transistors

BD135; BD137; BD139

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

$T_j = 25\text{ °C}$ 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
		$I_E = 0; V_{CB} = 30\text{ V}; T_j = 125\text{ °C}$	–	–	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)				
		$I_C = 5\text{ mA}$	40	–	–	
		$I_C = 150\text{ mA}$	63	–	250	
		$I_C = 500\text{ mA}$	25	–	–	
	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)	63	–	160	
			100	–	250	
V_{CEsat}	collector-emitter saturation voltage	$I_C = 500\text{ mA}; I_B = 50\text{ mA}$	–	–	0.5	V
V_{BE}	base-emitter voltage	$I_C = 500\text{ mA}; V_{CE} = 2\text{ V}$	–	–	1	V
f_T	transition frequency	$I_C = 50\text{ mA}; V_{CE} = 5\text{ V};$ $f = 100\text{ MHz}$	–	190	–	MHz
$\frac{h_{FE1}}{h_{FE2}}$	DC current gain ratio of the complementary pairs	$ I_C = 150\text{ mA}; V_{CE} = 2\text{ V}$	–	1.3	1.6	