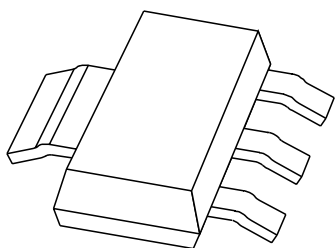


DATA SHEET



BDL31

NPN medium power transistor

Preliminary specification
Supersedes data of 1997 Jul 09
File under Discrete Semiconductors, SC04

1997 Aug 27

NPN medium power transistor

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FEATURES

- High current (max. 5 A)
- Low voltage (max. 10 V)
- Low collector-emitter saturation voltage ensures reduced power dissipation.

APPLICATIONS

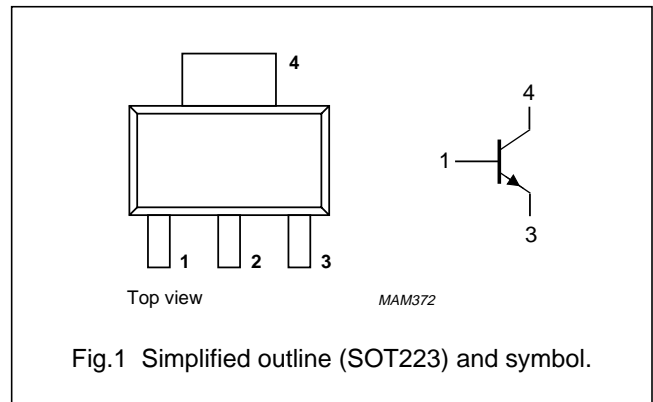
- Battery powered units where high current and low power dissipation are important.

DESCRIPTION

NPN medium power transistor in a SOT223 plastic package. PNP complement: BDL32.

PINNING

PIN	DESCRIPTION
1	base
2	not connected
3	emitter
4	collector



QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	–	40	V
V_{CEO}	collector-emitter voltage	open base	–	10	V
I_{CM}	peak collector current		–	10	A
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ }^{\circ}\text{C}$	–	1.35	W
h_{FE}	DC current gain	$I_C = 1\text{ A}; V_{CE} = 2\text{ V}$	200	–	
f_T	transition frequency	$I_C = 500\text{ mA}; V_{CE} = 10\text{ V}; f = 100\text{ MHz}$	100	–	MHz

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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	–	40	V
V_{CEO}	collector-emitter voltage	open base	–	10	V
V_{EBO}	emitter-base voltage	open collector	–	6	V
I_C	collector current (DC)		–	5	A
I_{CM}	peak collector current		–	10	A
I_{BM}	peak base current		–	1	A
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ °C}$; note 1	–	1.35	W
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C

Note

1. Device mounted on a printed-circuit board, single-sided copper, tinplated, mounting pad for collector 1 cm².
For other mounting conditions, see *“Thermal considerations for SOT223 in the General part of handbook SC04”*.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	note 1	92	K/W
$R_{th\ j-s}$	thermal resistance from junction to soldering point		10	K/W

Note

1. Device mounted on a printed-circuit board, single-sided copper, tinplated, mounting pad for collector 1 cm².
For other mounting conditions, see *“Thermal considerations for SOT223 in the General part of handbook SC04”*.

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CHARACTERISTICS $T_{amb} = 25\text{ °C}$ unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{CBO}	collector cut-off current	$I_E = 0; V_{CB} = 30\text{ V}$	–	50	nA
		$I_E = 0; V_{CB} = 30\text{ V}; T_j = 150\text{ °C}$	–	50	μA
I_{EBO}	emitter cut-off current	$I_C = 0; V_{EB} = 5\text{ V}$	–	50	nA
h_{FE}	DC current gain	$V_{CE} = 2\text{ V}; \text{note 1}$			
		$I_C = 0.5\text{ A}$	200	–	
		$I_C = 1\text{ A}$	200	–	
		$I_C = 3\text{ A}$	150	–	
		$I_C = 5\text{ A}$	100	–	
h_{FE}	DC current gain	$I_C = 2\text{ A}; V_{CE} = 1\text{ V}; \text{note 1}$	180	–	
V_{CEsat}	collector-emitter saturation voltage	note 1			
		$I_C = 1\text{ A}; I_B = 20\text{ mA}$	–	180	mV
		$I_C = 2\text{ A}; I_B = 200\text{ mA}$	–	350	mV
		$I_C = 3\text{ A}; I_B = 60\text{ mA}$	–	450	mV
		$I_C = 5\text{ A}; I_B = 100\text{ mA}$	–	800	mV
C_c	collector capacitance	$I_E = i_e = 0; V_{CB} = 5\text{ V}; f = 1\text{ MHz}$	–	130	pF
f_T	transition frequency	$I_C = 500\text{ mA}; V_{CE} = 10\text{ V}; f = 100\text{ MHz}$	100	–	MHz

Note

1. Pulse test: $t_p \leq 300\text{ }\mu\text{s}$; $\delta \leq 0.02$.

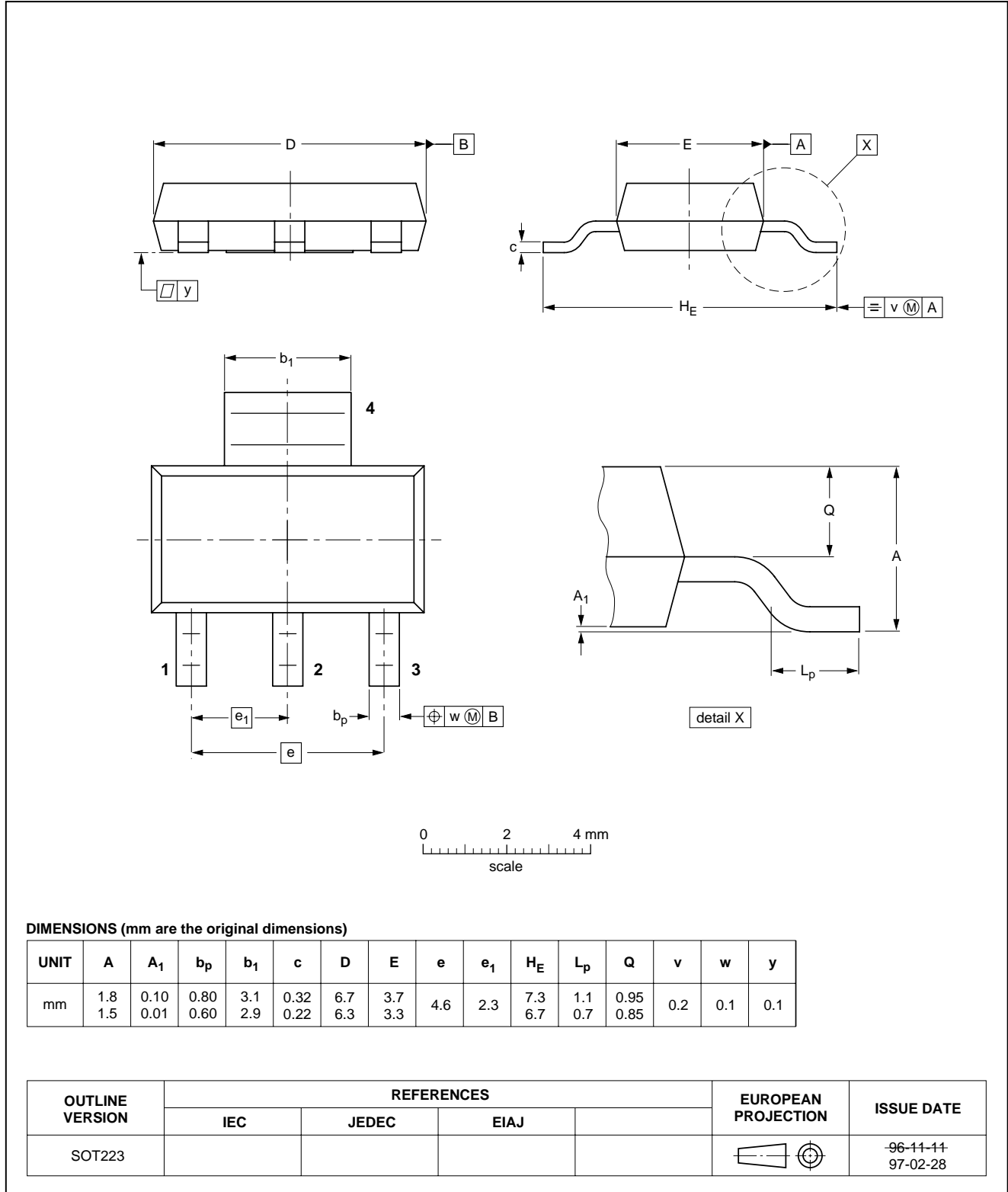
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PACKAGE OUTLINE

Plastic surface mounted package; collector pad for good heat transfer; 4 leads

SOT223



NPN medium power transistor

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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.	

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