

Low voltage high speed switching NPN transistor

Features

- High speed switching
- NPN device

Applications

- Audio amplifier
- High speed switching applications

Description

This device is an NPN low voltage transistor manufactured using epitaxial planar technology and housed in a SOT-32 plastic package. It is designed for low power audio amplifiers and low current, high speed switching applications.

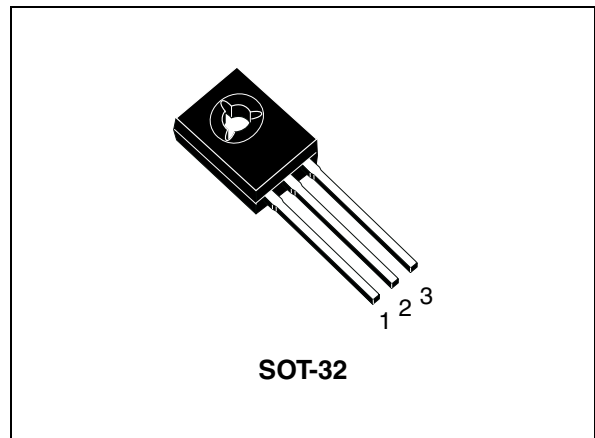


Figure 1. Internal schematic diagram

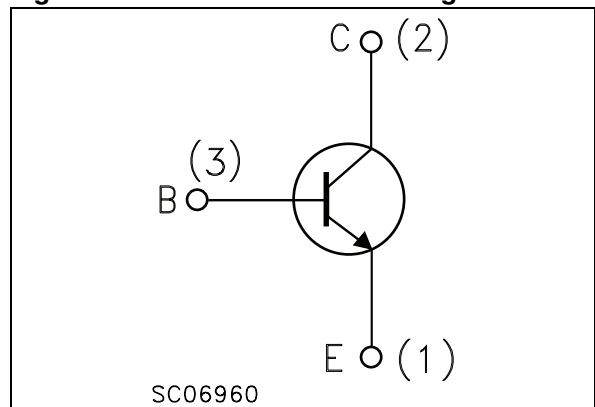


Table 1. Device summary

Order code	Marking	Package	Packaging
MJE172	MJE172	SOT-32	Tube

1 Electrical ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{CEO}	Collector-emitter voltage ($I_B = 0$)	80	V
V_{CBO}	Collector-base voltage ($I_E = 0$)	100	V
V_{EBO}	Base-emitter voltage ($I_C = 0$)	7	V
I_C	Collector current	3	A
I_{CM}	Collector peak current ($t_P < 5$ ms)	6	A
I_B	Base current	1	A
I_{BM}	Base peak current ($t_P < 5$ ms)	2	A
P_{TOT}	Total dissipation at $T_c \leq 25$ °C	12.5	W
T_{stg}	Storage temperature	-65 to 150	°C
T_J	Total power dissipation at $T_c \leq 25$ °C	150	

Table 3. Thermal data

Symbol	Parameter	Value	Unit
R_{thJC}	Thermal resistance junction-case max	10	°C/W
R_{th-amb}	Thermal resistance junction-ambient max	83.3	°C/W

2 Electrical characteristics

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

Table 4. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector cut-off current ($I_{\text{E}} = 0$)	$V_{\text{CB}} = 100\text{ V}$ $V_{\text{CB}} = 100\text{ V}, T_{\text{c}} = 150\text{ °C}$			0.1 0.1	μA mA
V_{EBO}	Emitter cut-off current ($I_{\text{C}} = 0$)	$V_{\text{EB}} = 7\text{ V}$			0.1	μA
$V_{\text{CEO(sus)}}^{(1)}$	Collector-emitter sustaining voltage ($I_{\text{B}} = 0$)	$I_{\text{C}} = 10\text{ mA}$	80			V
$V_{\text{CE(sat)}}^{(1)}$	Collector-emitter saturation voltage	$I_{\text{C}} = 0.5\text{ A}$ $I_{\text{B}} = 50\text{ mA}$ $I_{\text{C}} = 1.5\text{ A}$ $I_{\text{B}} = 0.15\text{ A}$ $I_{\text{C}} = 3\text{ A}$ $I_{\text{B}} = 0.6\text{ A}$			0.3 0.9 1.7	V
$V_{\text{BE(sat)}}^{(1)}$	Base-emitter saturation voltage	$I_{\text{C}} = 1.5\text{ A}$ $I_{\text{B}} = 0.15\text{ A}$ $I_{\text{C}} = 3\text{ A}$ $I_{\text{B}} = 0.6\text{ A}$			1.5 2	V V
$V_{\text{BE(on)}}^{(1)}$	Base-emitter on voltage	$I_{\text{C}} = 0.5\text{ A}$ $V_{\text{CE}} = 1\text{ V}$			1.2	V
h_{FE}	DC current gain	$I_{\text{C}} = 0.1\text{ A}$ $V_{\text{CE}} = 1\text{ V}$ $I_{\text{C}} = 0.5\text{ A}$ $V_{\text{CE}} = 1\text{ V}$ $I_{\text{C}} = 1.5\text{ A}$ $V_{\text{CE}} = 1\text{ V}$	50 30 12		250	
f_{T}	Transistor frequency	$I_{\text{C}} = 0.1\text{ A}$ $V_{\text{CE}} = 10\text{ V}$ $f = 10\text{ MHz}$	50			MHz
C_{CBO}	Collector-base capacitance ($I_{\text{E}} = 0$)	$V_{\text{CB}} = 10\text{ V}$ $f = 0.1\text{ MHz}$			60	pF

1. Pulse test: pulse duration $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 1.5\%$.

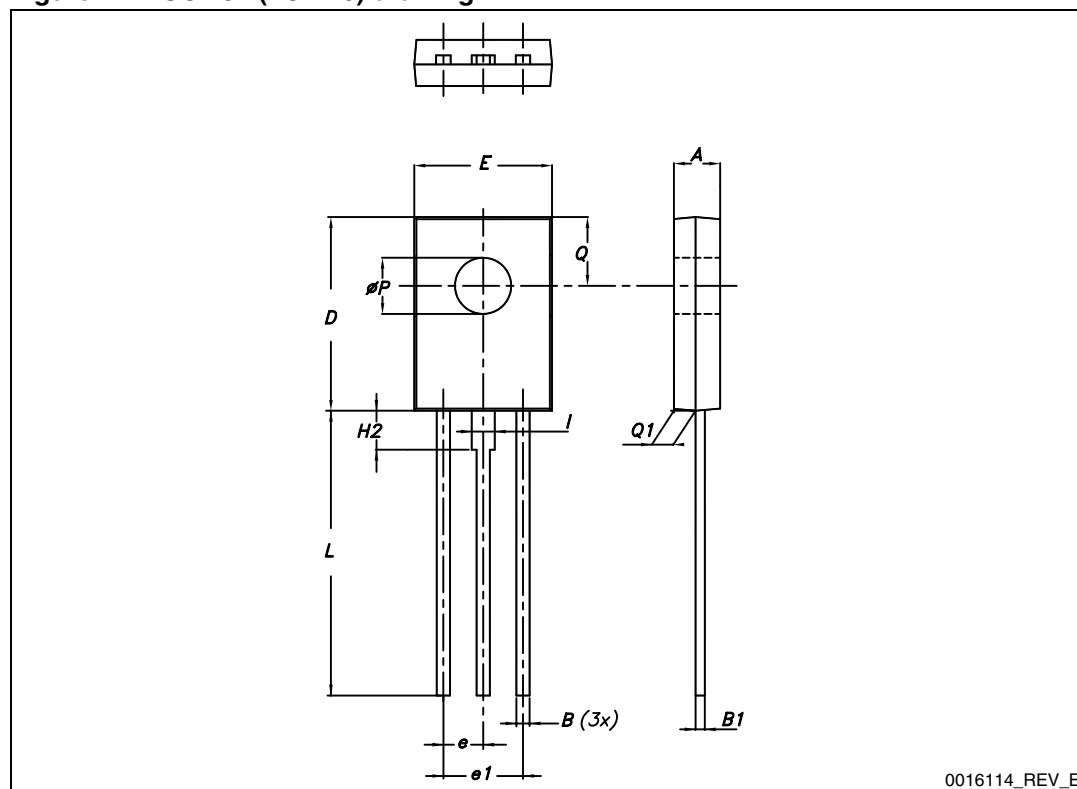
3 Package mechanical data

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Table 5. SOT-32 (TO-126) mechanical data

Dim.	mm.		
	Min.	Typ.	Max.
A	2.40		2.90
B	0.64		0.88
B1	0.39		0.63
D	10.50		11.05
E	7.40		7.80
e	2.04	2.29	2.54
e1	4.07	4.58	5.08
L	15.30		16
ØP	2.90		3.20
Q		3.80	
Q1	1		1.52
H2		2.15	
I		1.27	

Figure 2. SOT-32 (TO-126) drawing



4 Revision history

Table 6. Document revision history

Date	Revision	Changes
22-Sep-2003	4	
08-Aug-2011	5	– Part number MJE172 has been moved to a separate datasheet. – Minor text changes

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