

## High voltage fast-switching NPN power transistor

### Features

- NPN transistor
- Low spread of dynamic parameters
- Minimum lot-to-lot spread for reliable operation
- Very high switching speed

### Applications

- Compact fluorescent lamps at 110V A.C. mains
- Flyback and forward single transistor low power converters at 110V A.C. mains

### Description

The device is manufactured using multi-epitaxial Planar technology for high switching speeds and medium voltage capability. It uses a Cellular Emitter structure with planar edge termination to enhance switching speeds while maintaining the wide RBSOA. The device is designed for use in lighting applications and low cost switch-mode power supplies.

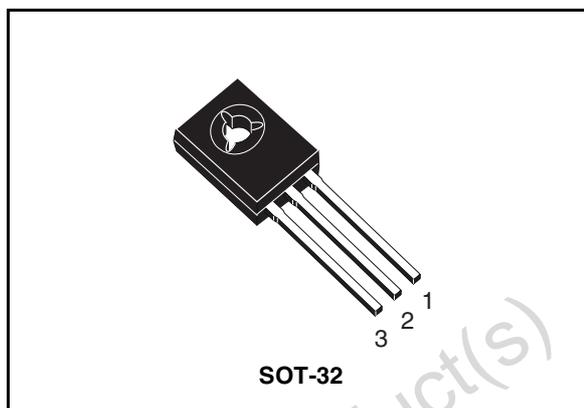


Figure 1. Internal schematic diagram

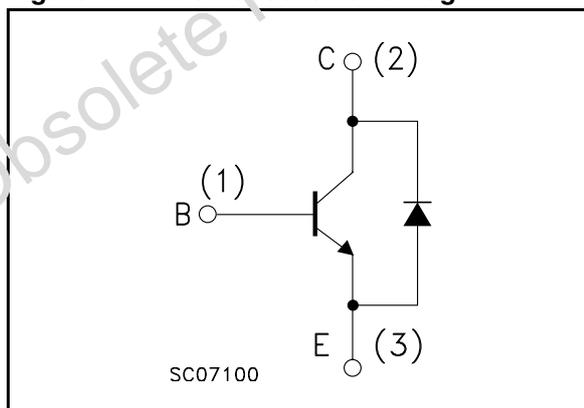


Table 1. Device summary

Order code	Marking	Package	Packaging
BULT106D	BULT106D	SOT-32	Tube

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# 1 Electrical ratings

**Table 2. Absolute maximum rating**

Symbol	Parameter	Value	Unit
$V_{CES}$	Collector-emitter voltage ( $V_{BE} = 0$ )	400	V
$V_{CEO}$	Collector-emitter voltage ( $I_B = 0$ )	230	V
$V_{EBO}$	Emitter-base voltage ( $I_C = 0$ )	9	V
$I_C$	Collector current	2	A
$I_{CM}$	Collector peak current ( $t_P < 5\text{ms}$ )	4	A
$I_B$	Base current	0.4	A
$I_{BM}$	Base peak current ( $t_P < 5\text{ms}$ )	0.8	A
$P_{tot}$	Total dissipation at $T_C = 25\text{ °C}$	32	W
$T_{stg}$	Storage temperature	-65 to 150	°C
$T_J$	Max. operating junction temperature	150	°C

**Table 3. Thermal data**

Symbol	Parameter	Value	Unit
$R_{thj-case}$	Thermal resistance junction-case max	3.9	°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
$I_{\text{CES}}$	Collector cut-off current ( $V_{\text{BE}} = 0$ )	$V_{\text{CE}} = 400\text{ V}$			100	$\mu\text{A}$
$I_{\text{CEO}}$	Collector cut-off current ( $I_{\text{B}} = 0$ )	$V_{\text{CE}} = 230\text{ V}$			250	$\mu\text{A}$
$V_{\text{EBO}}$	Emitter-Base Voltage ( $I_{\text{C}} = 0$ )	$I_{\text{E}} = 10\text{ mA}$	9			V
$V_{\text{CEO(sus)}}^{(1)}$	Collector-emitter sustaining voltage ( $I_{\text{B}} = 0$ )	$I_{\text{C}} = 10\text{ mA}$	230			V
$V_{\text{CE(sat)}}^{(1)}$	Collector-emitter saturation voltage	$I_{\text{C}} = 0.5\text{ A}$ $I_{\text{B}} = 0.1\text{ A}$ $I_{\text{C}} = 1\text{ A}$ $I_{\text{B}} = 0.2\text{ A}$ $I_{\text{C}} = 2\text{ A}$ $I_{\text{B}} = 0.4\text{ A}$			0.4 0.8 1.2	V V V
$V_{\text{BE(sat)}}^{(1)}$	Base-emitter saturation voltage	$I_{\text{C}} = 2\text{ A}$ $I_{\text{B}} = 0.4\text{ A}$			1.5	V
$h_{\text{FE}}$	DC current gain	$I_{\text{C}} = 10\text{ mA}$ $V_{\text{CE}} = 5\text{ V}$ $I_{\text{C}} = 1\text{ A}$ $V_{\text{CE}} = 5\text{ V}$ $I_{\text{C}} = 3\text{ A}$ $V_{\text{CE}} = 10\text{ V}$	10 10 4	20	30	
$V_{\text{F}}$	Diode forward voltage	$I_{\text{C}} = 2\text{ A}$			2	V

1. Pulsed duration = 300  $\mu\text{s}$ , duty cycle  $\geq 1.5\%$ .

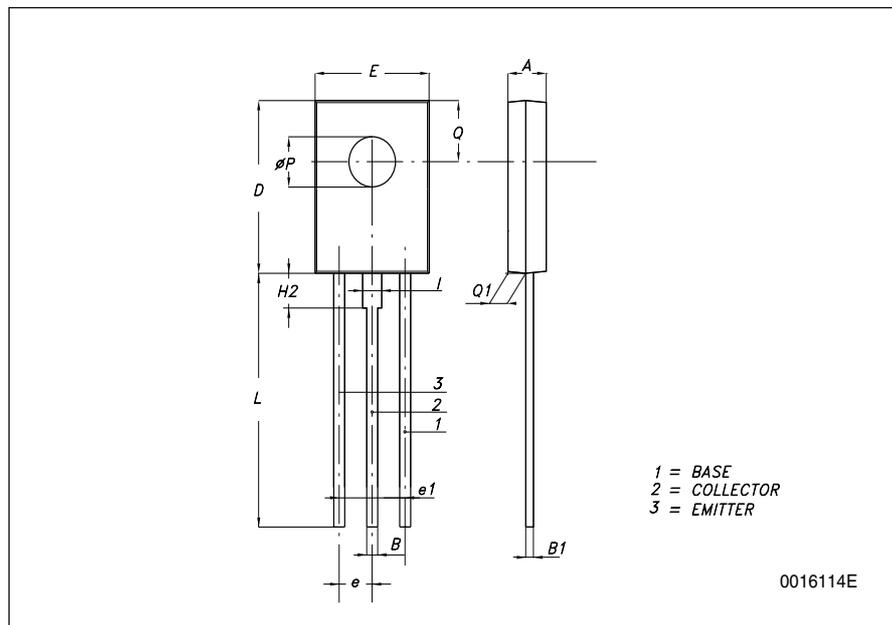
### 3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: [www.st.com](http://www.st.com)

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SOT-32 (TO-126) mechanical data

DIM.	mm.		
	MIN.	TYP	MAX.
A	2.4		2.9
B	0.64		0.88
B1	0.39		0.63
D	10.5		11.05
E	7.4		7.8
e	2.04	2.29	2.54
e1	4.07	4.58	5.08
L	15.3		16
P	2.9		3.2
Q		3.8	
Q1	1		1.52
H2		2.15	
I		1.27	



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## 4 Revision history

Table 5. Document revision history

Date	Revision	Changes
27-Feb-2008	1	Initial release.

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