

## 2kV NPN Darlington transistor

Preliminary Data

### Features

- Extra high voltage capability
- High gain characteristic

### Application

- Active start-up network in 3 phase S.M.P.S. (see application note AN2454)

### Description

The STP03D200 is made by two extra high voltage NPN transistors in Darlington configuration housed in a single package. The resulting device shows high gain performance.

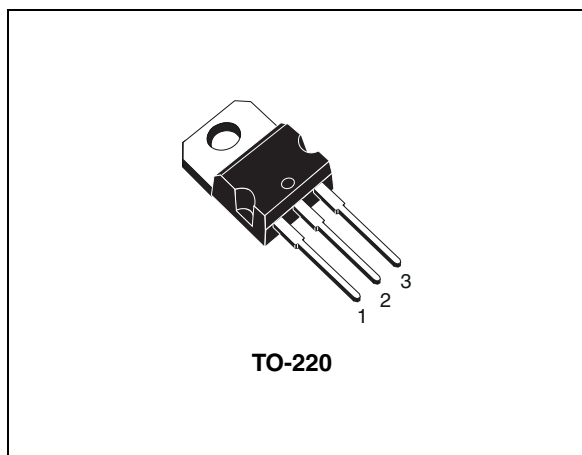


Figure 1. Internal schematic diagram

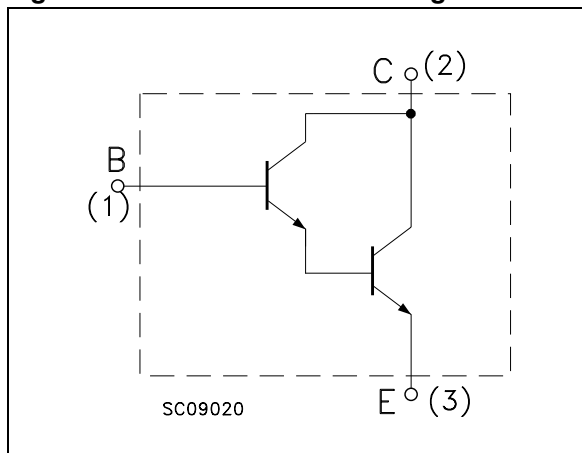


Table 1. Device summary

Order code	Marking	Package	Packaging
STP03D200	P03D200	TO-220	Tube

# 1 Electrical ratings

**Table 2. Absolute maximum ratings**

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-base voltage ( $I_E = 0$ )	2000	V
$V_{CEO}$	Collector-emitter voltage ( $I_B = 0$ )	1200	V
$V_{EBO}$	Emitter-base voltage ( $I_C = 0$ )	20	V
$I_C$	Collector current	100	mA
$I_{CM}$	Collector peak current ( $t_P < 5\text{ms}$ )	200	mA
$P_{TOT}$	Total dissipation at $T_C = 25^\circ\text{C}$	40	W
$T_{stg}$	Storage temperature	-65 to 150	$^\circ\text{C}$
$T_J$	Max. operating junction temperature	150	$^\circ\text{C}$

**Table 3. Thermal data**

Symbol	Parameter	Value	Unit
$R_{thJ-C}$	Thermal resistance junction-case max	3.13	$^\circ\text{C/W}$

## 2 Electrical characteristics

( $T_{CASE}=25^{\circ}\text{C}$  unless otherwise specified)

**Table 4. Electrical characteristics**

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$I_{CBO}$	Collector cut-off current ( $I_E = 0$ )	$V_{CB} = 2000\text{ V}$			100	$\mu\text{A}$
$I_{CEO}$	Collector cut-off current ( $I_B = 0$ )	$V_{CE} = 1200\text{ V}$			100	$\mu\text{A}$
$V_{(BR)CEO}$	Collector-emitter breakdown voltage ( $I_B = 0$ )	$I_C = 1\text{ mA}$	1200			V
$V_{EBO}$	Emitter-base voltage ( $I_C = 0$ )	$I_E = 10\text{ }\mu\text{A}$	20			V
$V_{CE(sat)}^{(1)}$	Collector-emitter saturation voltage	$I_C = 50\text{ mA}$ ; $I_B = 500\text{ }\mu\text{A}$			2	V
$V_{BE(sat)}^{(1)}$	Base-emitter saturation voltage	$I_C = 50\text{ mA}$ ; $I_B = 500\text{ }\mu\text{A}$			2	V
$h_{FE}$	DC current gain	$I_C = 20\text{ mA}$ ; $V_{CE} = 10\text{ V}$ $I_C = 30\text{ mA}$ ; $V_{CE} = 10\text{ V}$	400 350			

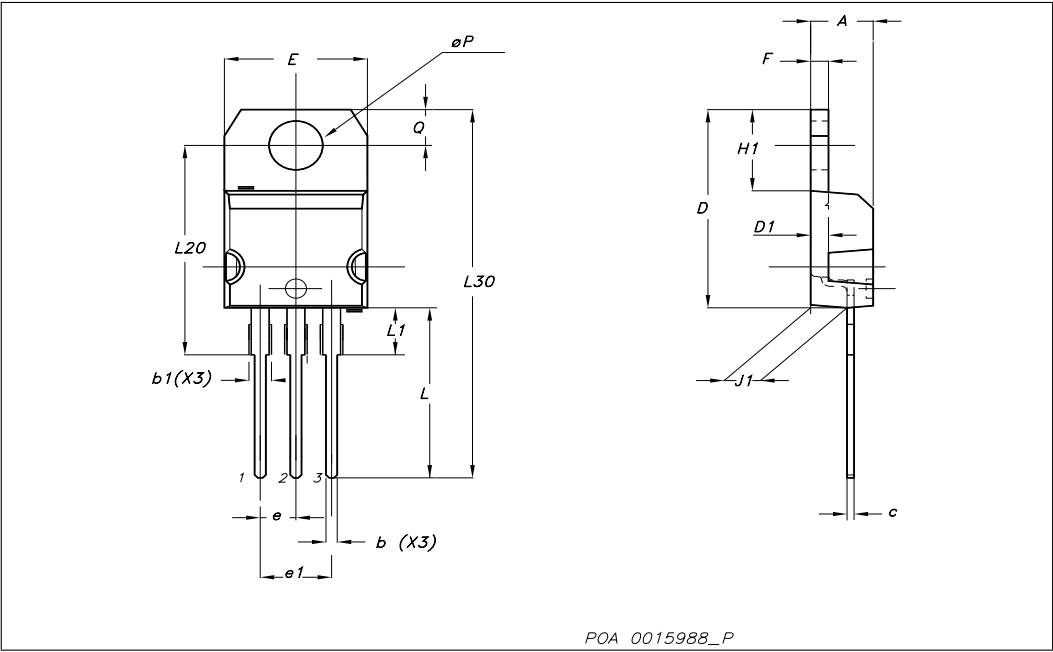
1. Pulsed: pulse duration = 300  $\mu\text{s}$ , duty cycle 1.5%

### 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)

TO-220 mechanical data

Dim	mm			inch		
	Min	Typ	Max	Min	Typ	Max
A	4.40		4.60	0.173		0.181
b	0.61		0.88	0.024		0.034
b1	1.14		1.70	0.044		0.066
c	0.49		0.70	0.019		0.027
D	15.25		15.75	0.6		0.62
D1		1.27			0.050	
E	10		10.40	0.393		0.409
e	2.40		2.70	0.094		0.106
e1	4.95		5.15	0.194		0.202
F	1.23		1.32	0.048		0.051
H1	6.20		6.60	0.244		0.256
J1	2.40		2.72	0.094		0.107
L	13		14	0.511		0.551
L1	3.50		3.93	0.137		0.154
L20		16.40			0.645	
L30		28.90			1.137	
ØP	3.75		3.85	0.147		0.151
Q	2.65		2.95	0.104		0.116



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## 4 Revision history

**Table 5. Document revision history**

Date	Revision	Changes
22-Oct-2007	1	Initial release.

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