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2 kV NPN Darlington transistor

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.

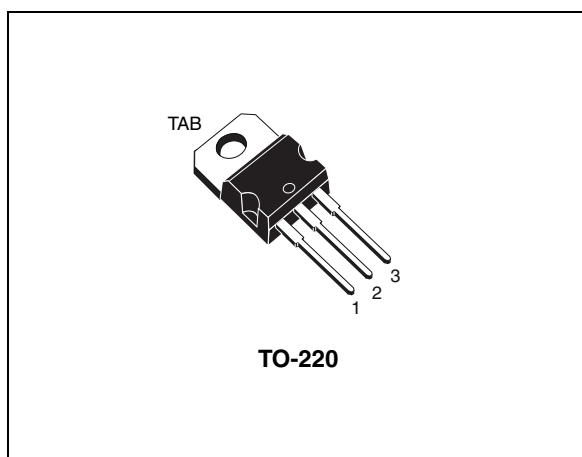


Figure 1. Internal schematic diagram

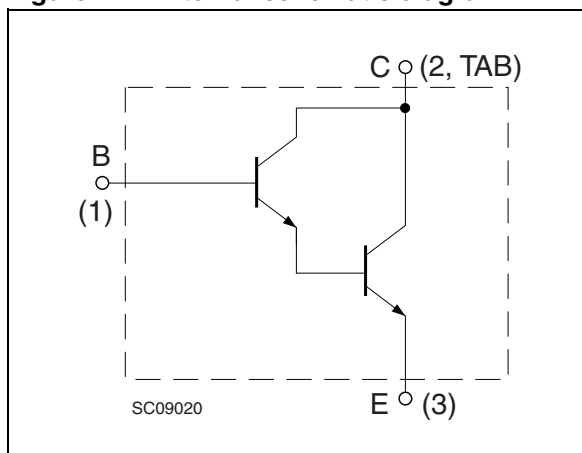


Table 1. Device summary

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 ($t_p < 5$ ms)	200	mA
P_{TOT}	Total dissipation at $T_C = 25$ °C	40	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_{thJC}	Thermal resistance junction-case max	3.13	°C/W

2 Electrical characteristics

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

Table 4. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector cut-off current ($I_E = 0$)	$V_{CB} = 2000\text{ V}$			100	μA
I_{CEO}	Collector cut-off current ($I_B = 0$)	$V_{CE} = 1200\text{ V}$			100	μA
$V_{(BR)CEO}$	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	$I_C = 20\text{ mA}; V_{CE} = 10\text{ V}$ $I_C = 30\text{ mA}; V_{CE} = 10\text{ V}$	230 200			

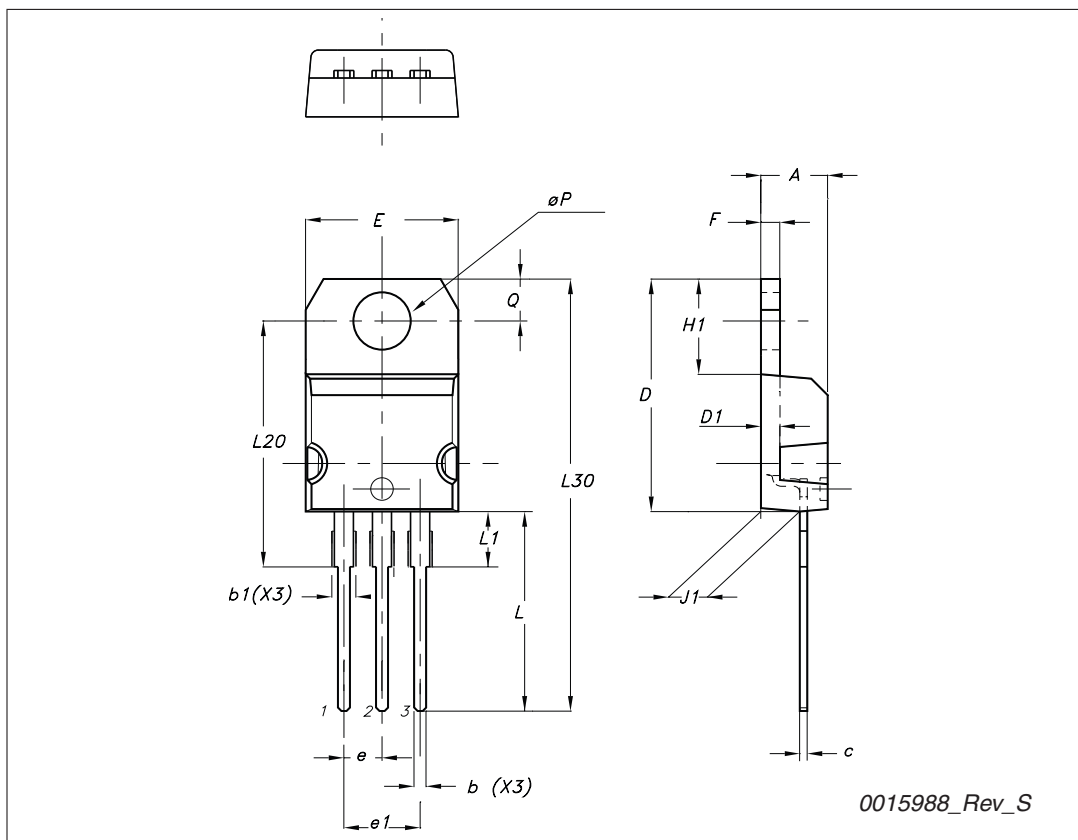
1. Pulse test: pulse duration $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$

3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK[®] packages, depending on their level of environmental compliance. ECOPACK[®] specifications, grade definitions and product status are available at: www.st.com. ECOPACK[®] is an ST trademark.

TO-220 type A mechanical data

Dim	mm		
	Min	Typ	Max
A	4.40		4.60
b	0.61		0.88
b1	1.14		1.70
c	0.48		0.70
D	15.25		15.75
D1		1.27	
E	10		10.40
e	2.40		2.70
e1	4.95		5.15
F	1.23		1.32
H1	6.20		6.60
J1	2.40		2.72
L	13		14
L1	3.50		3.93
L20		16.40	
L30		28.90	
ØP	3.75		3.85
Q	2.65		2.95



4 Revision history

Table 5. Document revision history

Date	Revision	Changes
22-Oct-2007	1	Initial release.
19-Feb-2010	2	Document status promoted from preliminary data to datasheet, modified h_{FE} minimum values Table 4 on page 3 .

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