

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.

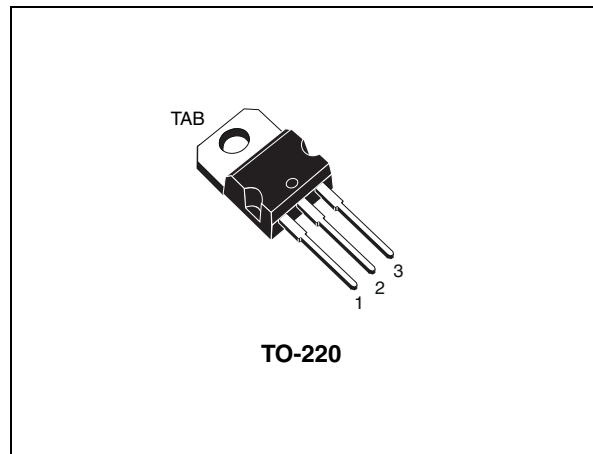


Figure 1. Internal schematic diagram

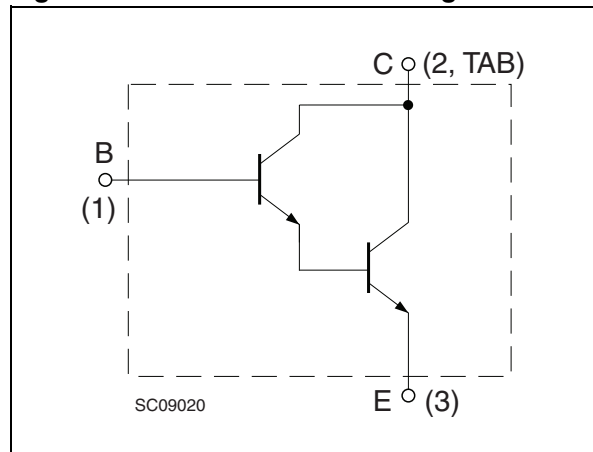


Table 1. Device summary

| 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 | | | |

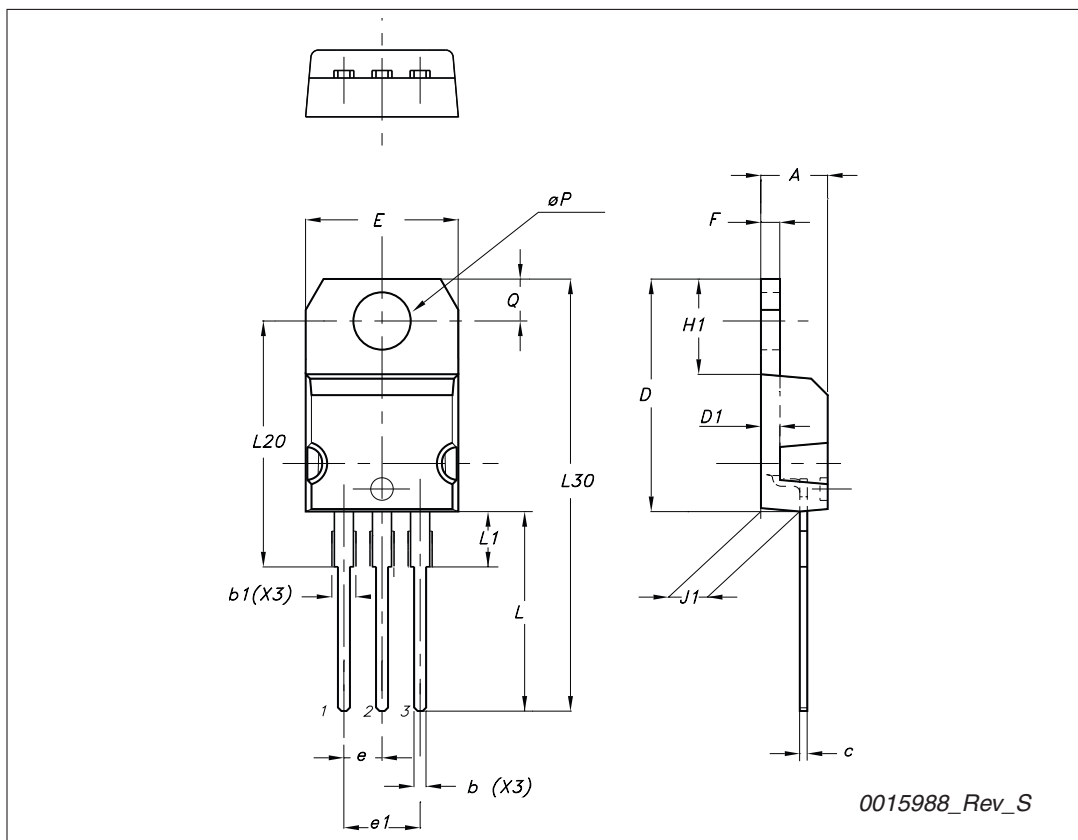
1. Pulse test: pulse duration $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$

3 Package mechanical data

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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 | |
| ∅P | 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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